Bringing climate change into participatory budgeting: a good idea at the wrong time?

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Declaration

I, Thomas William Daniel Cohen, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

This thesis reports on the development and testing of a form of participatory budgeting in which citizens are asked to choose from a set of local authority interventions whilst having to comply with two constraints – one financial and the other relating to greenhouse gas emissions.

The project has its roots in the weak performance to date of the local government sector in responding to climate change, despite its considerable influence. It is also informed by the troubled relationship between local authorities and citizens. Participatory budgeting is selected as the starting point because it has been found to draw a larger and more diverse audience than more orthodox forms of citizen participation and because it can present participants with a requirement to trade off priorities.

The core of the thesis describes the design and development of "participatory emissions budgeting", a central aspect being the estimation of emissions attributable to local authority interventions. This culminates in formal trials of the method with citizens, followed by quantitative and qualitative evaluation. The method is then presented to a range of local authority stakeholders to gauge their views concerning its potential application.

Participatory emissions budgeting is found to be technically feasible: participants consistently arrive, through deliberation, at choice sets that comply with the constraints set. Whilst they report finding the experience interesting and enjoyable, they are critical of the imposition of an emission constraint, in the context of general scepticism concerning the value or legitimacy of tackling climate change through such a decision-making process.

Local authority stakeholders see some value in the method but would not wish to apply it as designed – to decide on the allocation of resources. They would rather use it to support decision making within their organisations, as a market-research or educational tool.

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Glossary

CBO	Community-based organisation
CCP	Cities for Climate Protection
CIPFA	Chartered Institute of Public Finance and Accountancy
CO_2e	carbon dioxide equivalent
COP15	15th Conference of the Parties to the UNFCCC (Copenhagen, December 2009)
CPA	US Climate Protection Agreement
CYPP	Children's and Young People's Plan
E&O	Estate and operations
EEIO	Environmentally-extended input-output
GHG	Greenhouse gas
GRIP	The greenhouse gas regional inventory project
IA	Integrated assessment
ICLEI	International Council for Local Environmental Initiatives; more recently known as *ICLEI –Local Governments for Sustainability*
IPCC	Intergovernmental Panel on Climate Change
LA	Local authority
LA21	Local Agenda 21, later Local Action 21
LAA	Local Area Assessment
LCA	Life-cycle analysis
LCI	Life-cycle inventory
LGMB	Local Government Management Board (subsequently the Local Government Association/Local Government Group)
LSP	Local Strategic Partnership
NGO	Non-governmental organisation
NI	National Indicator
NI185	National Indicator 185: CO_2 reduction from Local Authority operations

NI186	National Indicator 186: Per capita CO_2 emissions in the local authority area
NI188	National Indicator 188: Adapting to climate change
PAS	Publicly available specification
PB	Participatory budgeting
PCR	Product category rule
PEB	Participatory emissions budgeting
REAP	Resources and Energy Analysis Programme (Stockholm Environment Institute)
SCENES	Water Scenarios for Europe and Neighbouring States
ULYSSES	Urban Lifestyles, Sustainability, and Integrated Environmental Assessment
UNCED	United Nations Conference on Environment and Development, more commonly known as “the Earth Summit” or “Rio” (as it took place in Rio de Janeiro)
UNFCCC	United Nations Framework Convention on Climate Change
UNGASS	United Nations General Assembly Special Session
WLC	Whole-life costing

Chapter 1 Introduction

Context for this research

According to the Intergovernmental Panel on Climate Change, "most of the global average warming over the past 50 years is *very likely*[2] due to anthropogenic GHG [greenhouse gas] increases", where "very likely" represents a probability of more than 90 per cent (Intergovernmental Panel on Climate Change 2007a, p.72). This degree of confidence has been sufficient to convince certain governments to take action at the state level to reduce emissions of greenhouse gas: Mexico has enacted legislation (GLOBE International 2013), Australia a carbon pricing scheme (Australian Government & Dept of Climate Change and Energy Efficiency 2011), now under threat following the change of government (Liberal Party of Australia 2013), but the first state to take decisive action was the United Kingdom whose Climate Change Act became law in 2008 (UK Government 2008). The Climate Change Act commits the UK to reduce substantially its emissions by 2050, with intermediate targets set for 2020.

Supporting the Climate Change Act is a process for creating a sequence of "carbon plans" which provide a "carbon budget" for each five-year period leading up to 2050. The UK government asserts that achieving the current Carbon Plan "will require business, government and the public pulling in the same direction" (Department of Energy and Climate Change 2011e, p.1).

Is each of these sets of actors pulling in the same direction? Arguably not, and even actors that are pulling in the direction of emission reductions are not pulling with equal force or, perhaps more important, pulling as hard as they might (Committee on Climate Change 2012b). The many possible reasons for this have been discussed at length and include the fact that climate change is a daunting international collective action problem (Stern 2007), that it is, for many, temporally and spatially remote when compared with current-day challenges (Bai 2007) and that those who will most suffer its effects will tend to be a different group from those who have caused the majority of damaging emissions (Zahran et al. 2008).

Two sets of actors appear particularly relevant: local government and citizens. There is a naturally close relationship between them. The typical citizen's dealings with government will

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[2] The Fifth Assessment Report released on 30th September 2013 revises the probability upwards to "extremely likely" (95 per cent probability or higher) but the current instruction is not to cite it.

almost always take place with her/his local authority and, by association, local authorities tend to be more concerned with the day-to-day experience of individual citizens than central governments, whose portfolio of stakeholders is much broader. In the case of climate change, they are important because, between them, they have very considerable influence over greenhouse gas emissions – citizens because, as end users, their decisions (to purchase, to travel, to heat their homes) play a very important role in determining the overall volume of emissions[3]; and local government because of its extensive capacity to affect citizens' decisions using a range of policy levers (AEA Technology plc 2008), as well the substantial carbon "footprint" associated with its own estate and operations. Yet the literature on the relationship between local government and citizens in the context of climate change is not large.

Where encouraging citizens to reduce their emissions is concerned, a wide range of measures is either in play or under active discussion in the UK. There has been extensive use of marketing (eg "are you doing your bit?"), personalised information (eg smart meters) and the offering of incentives (such as the free installation of insulation), supported by a range of theories concerning behavioural/social psychology and behaviour change (eg Corner & Randall 2011; Martiskainen & Coburn 2011; Staats et al. 1996). Meanwhile, more "stick"-like interventions are discussed: various types of personal carbon limits (allowances and trading schemes) have been conceptualised and compared (Starkey 2012), whilst some form of carbon tax could create a different financial incentive for individuals to limit the emissions associated with their consumption. The potential of "carrot"-like interventions to deliver the required change is unclear (Shove 2010; UK House of Lords Science and Technology Select Committee 2011), whilst governments shrink at least for now from the "stick"-like measures on grounds of political acceptability (Fawcett 2010).

As for local authorities, the UK government has not so far chosen to impose upon this sector a formal requirement to contribute to the emission savings implied by the Climate Change Act, in contrast with other states that have introduced such legislation (Kehew et al. 2013). There are some financial incentives (eg landfill tax, the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme) but these may act indirectly and may not be providing sufficient impetus for change. Beyond these, councils are free to determine the priority they place upon reducing emissions. And, whether as a consequence or not, there is a wide variation in local authority

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[3] An analysis of the carbon footprint of West Sussex concluded that residents were responsible for 13.7 million tonnes of CO_2e and "industry" (including public services) 20.9 million tonnes (Small World Consulting Ltd 2011). On the basis that this division is exhaustive, residents are therefore responsible for 40 per cent of emissions attributable to the county area.

responses to climate change, with commentators of the view that local government is doing considerably less than it could (Bulkeley 2010; Mann et al. forthcoming). Of the many possible explanations, one is that local authorities resemble other actors in seeing climate change as a low priority when compared with the more pressing problems of today (Mann et al. forthcoming). As for the role of citizens in plotting their council's course to a low-carbon future, there have been numerous initiatives leading on from the Local Agenda 21 movement of the 1990s. More recently, in 2009, ten "low carbon zones" were created in London (Greater London Authority 2013) with citizen participation playing a significant role in planning and implementation. The borough of Camden, meanwhile, invites citizen activism under the banner of "Green Camden Zones" (London Borough of Camden 2013). These, though, may be outliers: more orthodox approaches, such as inviting comments on a strategy document, appear more common.

This tendency to circumscribe the role of citizens in environmental decision making is perhaps symptomatic of the vexed relationship between local government and citizens. The UK Citizenship Survey found that 36 per cent of respondents trusted their councils either "not very much" or "not at all" (Cabinet Office 2013, p.3). Other work found that less than half of those polled believe their council "takes account of residents' views when making decisions" (Local Government Association 2012b, p.1), whilst less than a third agree that their council "keeps local residents well informed about their plans to deal with any proposed reductions to their budget" (Local Government Association 2012b, p.3). These findings could of course simply reflect an ambient level of dissatisfaction amongst citizens but the following suggests not: a test of trust in various professions finds that 38 per cent of respondents would not generally trust civil servants to tell the truth whilst politicians are the weakest performers of the categories tested, with 77 per cent of respondents not trusting them to tell the truth. A useful comparator is the ordinary man/woman in the street, whom 26 per cent of respondents do not trust to tell the truth (Ipsos MORI 2013). As for local government representatives, they have a limited appetite for citizens to be involved in policy decisions (Orr & McAteer 2004; Klijn & Koppenjan 2000). Though this does not of itself demonstrate that they have a poor relationship with citizens, it does suggest a desire to maintain some distance.

If the prevailing atmosphere between council representatives and their citizens is poor, it must be asked whether anything can improve the situation. Experiments in widening democracy suggest that it can. The UK has seen growth in the use of less-familiar methods of citizen participation in recent years, with a certain amount being learnt in the process about which methods have the effect of empowering participants (Department for Communities and Local Government 2009a).

Aims and objectives

Given the limited progress made by local authorities and their troubled relations with citizens, this project asks whether the methods of citizen participation thought to empower participants could help to open a "new front" in the response to climate change. In particular, it asks whether an adapted form of participatory budgeting can assist councils and their citizens in reducing greenhouse gas emissions.

The broad objectives of the project are:

- To develop a working form of "participatory emissions budgeting" (PEB)
- To test PEB with citizens
- To conduct a detailed evaluation (process and outcome) of the tests
- To survey local authority stakeholders to learn their views of PEB

Project structure

Leading on from the objectives above, the project will proceed as follows. Through a process of desk research, expert interviews, informal and formal piloting, a version of PEB will be developed which is sufficiently coherent and robust to provide a framework for formal trials. The principal technical tasks involved in developing the method will be:

- Arriving at a working approach to the estimation of project-level greenhouse gas emissions and financial impacts
- Selecting an appropriate set of candidate local-authority interventions
- Designing a user interface that enables the choice-making exercise to take place

Two formal trials of PEB will then be conducted with citizens recruited to a socio-demographic profile consistent with that of the English/UK[4] population. Evaluation of the trials (see *Research methods* below), drawing on recordings of the sessions, self-completion questionnaires and follow-up interviews with a sample of participants, will provide evidence concerning the feasibility and potential value of PEB. A separate set of interviews with local authority stakeholders (officers and members) will be used to determine to what extent the local government sector might use the method, in which ways and with which motivations. The sampling of these stakeholders will be structured to minimise obvious types of bias.

Research methods

The project will draw on the following research methods (summarised in Table 1.1), informed by the typology of Beissel-Durrant (2004). The development of the decision-making method

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[4] The spatial reference will depend on the data used to derive the quota in each case

will be founded upon a literature review that encompasses the response of local authorities to climate change, the involvement of citizens in public decisions, and greenhouse gas accounting. The development process will also be informed by semi-structured interviews and small-group discussions with citizens and experts, which will be qualitatively analysed. Two pilot tests will be subjected to a process evaluation using qualitative analysis of the session recordings, a semi-structured interview with an expert observer and quantitative analysis of questionnaires completed by the participants. The subsequent formal trials will be subjected to evaluation (process and outcome). First, the recordings of the sessions will be transcribed and thematically analysed, then semi-structured telephone interviews with participants will be recorded and their contents examined for material relevant to the themes arising from analysis of the transcripts. Paired before- and after- questionnaires will be quantitatively and qualitatively analysed. These data will be complemented by the researcher's personal observations from acting as facilitator of the events. A final wave of semi-structured interviews with local authority stakeholders (conducted in person or by telephone) will be subjected to "light" thematic qualitative analysis.

Table 1.1 – Research methods by project stage

Project stage	Research method					
	Literature review	**Semi-structured interviews/small-group discussions**	**Feasibility test/formal trial**	**"Light" thematic analysis**	**Thematic analysis**	**Questionnaires – quantitative and qualitative analysis of responses**
Concept development	✓	✓		✓		
Development of pilot PEB method	✓					
Pilot testing		✓	✓	✓		✓
Development of version for formal testing	✓	✓				
Formal testing		✓	✓		✓	✓
Testing local authority opinion		✓		✓		

Thesis structure

This thesis is in three parts. **Part I – Background** includes three chapters. Chapter 2 – *Local authorities and climate change* surveys the literature on the response of local government to this global challenge, including its involvement of citizens. Chapter 3 – *Citizen participation and the case of participatory budgeting* starts with a survey of the literature on citizen participation in general and the specific case of citizen participation with respect to climate change before turning to participatory budgeting. Chapter 4 – *Bringing climate change into participatory budgeting* briefly reviews the two previous chapters before setting the scene for what follows, including the presentation of the project's research questions.

Part II – Design has three chapters. Chapter 5 – *The climate-change and financial impacts of local authority interventions* surveys the literature on greenhouse gas accounting in general before exploring its implications for projects initiated by local councils. It then discusses the practice of costing and budgeting in local government. Chapter 6 – *Definition of an approach to impact estimation* applies the findings from the previous chapter in setting out a proposed method for estimating project emissions and financial impacts. Chapter 7 – *Design issues for participatory emissions budgeting* discusses a series of questions concerning the operation of PEB, remitting several matters to be further investigated during the development and testing process.

Part III – Development and testing has four chapters. Chapter 8 – *The development process* begins by describing the stages of the development process before returning to issues raised in Chapter 7 and explaining how each has been addressed as the PEB method has taken shape. Chapter 9 – *Evaluation of the formal trials* reports on the evaluation conducted of two formal trials of PEB carried out in November 2012, giving particular attention to the responses of participants to the experience. Chapter 10 – *Possible applications of PEB* relates and analyses the findings of a series of interviews with local authority stakeholders conducted in order to learn the reaction of local government to participatory emissions budgeting. Part III (and the thesis) ends with Chapter 11 – *A good idea at the wrong time?* in which progress with the research questions is assessed and the key themes arising across the project are drawn together and discussed, before possible future research directions are identified.

Part I

Background

Chapter 2 Local authorities and climate change

This chapter is a discussion of local government's response to climate change, with a particular focus on the UK. It has the following sections:

- History – a short survey of the significant developments that have shaped the relationship between local government and sustainable development and climate change, up to the present
- Dynamics and influences of local government action – a summary of how things stand, in terms of the actions available to local authorities, their potential reasons for acting, and the possible extent of resultant impacts
- Performance – an assessment of how local government has performed, encompassing the identification of relevant drivers and exploring variation across authorities

The chapter's conclusion discusses, amongst other things, perceived gaps in the literature.

Before embarking on the survey proper, it is important to acknowledge at this point that the relevant literature spans climate change, sustainability and sustainable development (the definition of which is contested, as will be seen) as well as wider "environmental policy". Much local authority action with respect to climate change in fact springs from sustainable development as a policy issue. Where the distinction is significant, this will be pointed out. It should also be noted that there is a bias towards the US in the literature concerning local government and climate change. Though much of what holds for the US will be equally true of the UK, there are important differences which, again, are pointed out as they arise. Finally, the emphasis in this survey is on mitigation though, where the literature on adaptation offers relevant insights, it is included.

2.1 History

Smardon (2008) characterises the UN Stockholm Conference of 1972 on the Human Environment as the birth of environmental consciousness in creating the "brown agenda", though it was based on a decidedly human-centred concept of environment couched in terms of living conditions, with particular emphasis on the developing world. Perhaps it is therefore accurate to see the Brundtland Report (Brundtland 1987) more as the official beginning of environmental consciousness in international government. Brundtland is credited with providing a definition of sustainable development that has proved highly influential over subsequent years. Another international development seen as a significant milestone by Lafferty and Eckerberg (1998) was the Oslo Declaration on Environment, Health and Lifestyle,

adopted in 1991 by the International Union of Local Authorities (IULA). The declaration asserted the duty of municipalities to contribute to sustainable development.

The step-change came in 1992 with the UN Conference on Environment and Development (UNCED) in Rio de Janeiro (the "Earth Summit"). If Stockholm produced the "brown agenda", then Rio produced the "green agenda", a less anthropocentric view of the need for environmental protection (Smardon 2008), though one which definitely reflected a human desire for a liveable world. Whilst the summit set in train the creation of the UNFCCC and the process that led to the Kyoto protocol, its most significant aspect for local government was the creation of Agenda 21, a chapter of which was dedicated to Local Agenda 21 (LA21), an invitation for councils to take action on all aspects of "sustainable development", on the basis of dialogues with their "communities" (United Nations 1992, para.28.3). This prompted a major change in the level of activity relating to sustainable development and, within it, climate change, on the part of local authorities around the world.

Various events have served to reinforce or redirect the principles of Local Agenda 21. In 1990, ICLEI, which has come to be one of the most effective transnational sustainability networks (as discussed below), was set up in New York, thus setting in train a process of collaboration between local councils in disparate nations that has been a key part of local government action on sustainable development. In 1994 a meeting at Aalborg in Denmark resulted in the so-called Aalborg Charter, the Charter of European Cities and Towns Toward Sustainability. The last of its three sections explicitly addressed engagement with Local Agenda 21 processes (European Union 1994). Two years later, the second conference of the European Sustainable Cities and Towns produced the Lisbon Action Plan, a programme of 12 principles confirming the LA21 process which was endorsed by delegates (European Sustainable Cities & Towns Campaign & European Sustainable Cities Project 2002). And, in 1997, the UN General Assembly held a special session (UNGASS) on the environmental theme, an event known as Earth Summit+5 (Church & Young 2001).

Ten years after Rio, LA21 was revisited at the UN World Summit on Sustainable Development of 2002 in Johannesburg, where delegates representing local governments tabled a call to action ("the Johannesburg Call") intended to revitalise the initiative, renaming it *Local Action 21* in the process (City of Johannesburg 2012). And, in 2004, by which time 2,300 councils had signed the Aalborg Charter (Evans et al. 2005), it was refreshed, with 1,000 delegates signing the Aalborg Commitments, "specifying 'concrete actions' to be undertaken to secure more sustainable lifestyles and policies in their municipalities" (Evans et al. 2005, p.5).

The relative significance of these various events can be debated, though the impact of Local Agenda 21 (as seen below) places the Rio Earth Summit in a special category. What is more

important is their regularity, which served to maintain an international interest in the issue of sustainable development, when the topic could easily have been submerged by other global priorities.

In the UK, progress can be seen to have tracked the international events to some extent. One of the most active NGOs in the environmental sector, Friends of the Earth, published in 1989 its Environmental Charter for Local Government (McLaren & Adams 1989), considered the most significant milestone in "greening" the UK in advance of Rio (Morris & Hams 1997). In the same year, the Green Party attracted an unexpectedly high share of votes in elections to the European Parliament, thus increasing attention on environmental matters. For its part, the UK government produced *This Common Inheritance* in 1990 (Department of the Environment 1990), a white paper on environmental policy that reflected the work of Brundtland. In the following year, the Planning and Compensation Act and two related policy planning guidance notes instructed councils to take account of the environment in a wider sense than before though, as Young (1998) argues, the UK was starting from a low base. Then, inspired by the Friends of the Earth Charter, local authority representatives became closely involved in preparations for Rio and many attended alongside central government delegates. Leicester was in fact honoured as an "Environment City" at the summit, one of 12 worldwide.

Following the Earth Summit, the Local Government Management Board (LGMB) took on a prominent role as facilitator of the implementation of the call to action contained in Local Agenda 21, setting up the LA21 Steering Group, comprising councillors from UK local authority associations and representatives of various national bodies including environmental NGOs. And, in 1994, the government itself responded formally to LA21 by producing its first sustainable development strategy (Department of the Environment 1994), accompanied by a number of topic reports, one of which related to climate change. The policy prominence of sustainable development was then reaffirmed in 1997 when the prime minister, Tony Blair, attended UNGASS, where he undertook that all UK local authorities would produce an LA21 strategy by 2000. His deputy, John Prescott, subsequently launched a document on the preparation of an LA21 strategy (Local Government Association 1998) that some thought directive but which galvanised many previously inactive local authorities (Church & Young 2001). This move was given added impetus by the decision to set the first of the forthcoming Best Value performance indicators on the creation of an LA21 strategy (Office of the Deputy Prime Minister 1998). The indicator was, though, softened the following year to a form that did not explicitly require an LA21 strategy, instead seeking evidence of "a long-term sustainable vision" (Office of the Deputy Prime Minister 2000, p.18) and was removed altogether from 2005/6 onwards. There was therefore a hiatus in requirements set by central government until Best Value performance indicators were replaced from April 2008 by the

National Indicator Set (Audit Commission 2013), three of which related specifically to climate change. The new performance management system introduced by the government at this time was called Comprehensive Area Assessment and gauged how each authority (in England) was performing against its "Local Area Agreement", a series of targets set against certain of the indicators in the National Indicator Set. None of the indicators relating to climate change was compulsory so authorities were free to choose whether they adopted any of them, with quite varied results (Impetus Consulting Ltd 2010; Cooper & Pearce 2011).

A history of sustainable development and local government in the UK needs to mention the Climate Change Act 2008 (UK Government 2008), whose existence must be attributable to some extent to the actions of local authorities, despite their omission from one account of its development (Rutter et al. 2012). No action has yet been taken to translate the national targets into local reductions that individual authorities are required to achieve and this may be connected to the change of government in 2010 which set a firm policy of moving away from the centre "performance managing" local authorities.

To summarise, local authorities have been centre-stage at the international level with respect to sustainable development since the run-up to Rio, with regular events of the type described above serving to reinvigorate the agenda. As will be seen, performance at the state level has been very varied, reflecting countries' respective circumstances and the differing responses of individual governments to the calls made at global and continental forums. In the UK, central government action followed the international lead, somewhat in arrears, with occasional peaks or troughs of policy prominence, until the change of government in 2010, since which time policy at the centre on environmental issues such as climate change has been ambiguous.

As for British local authorities themselves, performance has been very mixed. Leicester is an example of the councils that were in the vanguard prior to the Earth Summit, argued to have been instrumental in driving central government policy towards the adoption of sustainable development as a priority. Most other councils were at that time taking no action on this front. The efforts of the LGMB to stimulate action following Rio had a beneficial effect, with considerable growth in activity. Young, writing in 1998, reported that about 32 per cent of local authorities were at that time planning to produce an LA21 strategy, though he also argues that "LA21s have only been one part of councils' attempts to respond to Rio and promote sustainable development" (Young 1998, p.186). Writing three years later with Church, he asserts that the involvement of local authorities in environmental policy had brought considerable benefits, one example being the widespread setting of local energy use targets, many of them tied to fuel poverty (Church & Young 2001). But penetration was patchy: a 1996 survey found that there was "more integration [of sustainability principles into

local authority activities] in the more traditional 'green' areas like planning, transport and environmental health than in areas like housing, tourism, tendering and social services" (Morris & Hams 1997, p.5).

The final substantial push for LA21 came from the events of 1997 and 1998 reported above, as a prime ministerial undertaking to ensure that all authorities had a strategy by 2000 (combined with the fact that council performance would be partly judged on this point) led to a further flurry of activity. According to the government's assessment, over 90 per cent of local authorities met the target of having an LA21 strategy "in place" by the end of 2000 (Department for Environment, Food and Rural Affairs 2002, p.96). But having a strategy "in place" may well mean that a document had been written and little more: further investigation showed that quality of strategies varied considerably (Young 1998; Lucas et al. 2003). Evans and Theobald (2003) saw little evidence of penetration beyond the explicitly environmental policy areas, with limited links even to waste disposal; though they acknowledged good progress in the energy sector, they felt little to have been done with respect to areas such as car use. LA21 strategies in fact were often not the most effective mechanisms being used by authorities to promote sustainable development (Lucas et al. 2003).

If 2000 represents the peak of UK council activity with respect to LA21, what follows seems to have been a gradual lessening of policy emphasis. For Jonas et al (2004), LA21 lost its potency when issues relating to sustainable development (such as land use planning and waste management) were adopted into more mainstream policy areas that lay outside the jurisdiction of LA21, and when the relabeling of Sustainable Community Strategies as simply Community Strategies reduced the emphasis on environmental issues. They argue too that the concept of sustainable development itself was watered down by the Local Government Act 2000, as environmental issues were drawn together with other priorities under the banner of the forthcoming Community Strategies: could the environment be expected to command the same level of attention when it was vying with health, unemployment and education?

Certainly, the Johannesburg Call does not seem to have made a big difference in the UK – there is little mention of Local Action 21 amongst British authorities, though this is perhaps because the vast majority of councils, having created a Local Agenda 21 strategy, foresaw unnecessary confusion arising from renaming. As for Local Agenda 21, there is now only a vestigial presence, with some authorities retaining it as a badge for a range of environment-related policy activities. But most authorities have dropped the term, preferring instead to label relevant activities as "environment" or "green", or to name them more specifically according to the theme, such as climate change, biodiversity, or waste. And the term

"sustainable development" itself has lost currency, in part perhaps because of the closure in 2011 by the coalition government of the Sustainable Development Commission.

But, If Young is right in claiming that LA21 was only a part of the picture, this suggests both that during LA21's heyday much else was going on and that current council activity that would before have earned the title "sustainable development" may be extensive. Given the lack of a ready means of identifying such activity, a focus on climate change from this point on is helpful.

There is sparse evidence in the literature of methodical assessments of UK local authority responses to climate change. One, dating back to 2004, is quite critical of progress made (Allman et al. 2004). It refers to a survey of authorities conducted two years before by the Local Government Association (Allman et al. 2002) which painted a picture of disappointing progress and a lack of direction. It is interesting to consider the most recent version of the same survey (Local Government Group 2010) which is cast in much more positive terms but which, on fuller examination, demonstrates plenty of cosmetic adjustment but little actual progress in the intervening eight years.

As for the impact of the Comprehensive Area Assessment regime upon council action, there is, again, a mixed picture. Of the three indicators relating specifically to climate change, the most widely adopted was NI186 (per capita CO_2 emissions in the local authority area), with two thirds of English authorities setting a target. Adoption varied across regions from 50 per cent of authorities in the North East to 78 per cent in the East Midlands. It also varied by authority structure, county councils being likelier to adopt it (77 per cent) than both metropolitan boroughs (61 per cent) and London boroughs (55 per cent). National Indicator 188 (Adapting to climate change) was adopted by 37 per cent of English councils, with the least popular of the three proving to be NI185 (CO_2 reduction from Local Authority operations), taken up by 23 per cent. Five of a total of 150 authorities had not adopted any of the three indicators for their Local Area Agreements (Impetus Consulting Ltd 2010).

With respect to NI186, there was a consistent level of ambition in the targets adopted. Of the 100 authorities that included the indicator in their Local Area Agreements, all but seven set a reduction target equal to or greater than that required to achieve the national targets derived from the carbon budget set under the Climate Change Act (Impetus Consulting Ltd 2010, with subsequent analysis of LAA datasets).

Of course, setting a target, like writing a strategy, is not the same as having the policies in place that will mean its achievement. But authorities had considerable freedom over their choice of indicators and will therefore have picked those relating to climate change because they both seemed a priority and appeared achievable. And the level of ambition implicit in the

targets (which were arrived at through negotiations with regional government offices) also implies that these authorities were not looking on NI186 as a soft option. So the picture seems to be one of a widespread (but not comprehensive) desire to tackle climate change combined with a willingness to set challenging goals.

As discussion in Chapter 10 will help to demonstrate, any finding of this kind is only a snapshot and the relative prominence of climate change in Local Area Agreements in 2008 will undoubtedly reflect the economic situation of the time; it seems unlikely that agreements formulated according to the same principles today would show the same degree of commitment on climate change.

This survey serves to demonstrate, amongst other things, the wide spectrum of response on the part of UK local authorities to the various policy prompts administered over time, a theme which has persisted to the present day. But, before discussion turns to the current situation, it is appropriate to consider the roles first of networks, and then of citizens and groups in the response of local government to climate change.

Networks – transnational and domestic

> "Representatives of associations of local authorities are encouraged to establish processes to increase the exchange of information, experience and mutual technical assistance among local authorities" (United Nations 1992, para.28.5).

This is one of the aspects of Chapter 28 of Agenda 21 that were taken very much to heart by local authorities across the world. A wide range of networks sprang up in the years following the Earth Summit, some of which remain very active. The following are prominent transnational examples:

- C40 Cities Climate Leadership Group (an initiative of the Clinton Climate Initiative)
- Sustainable Cities Programme (an initiative of UN Habitat)
- Cities for Climate Protection (an initiative of ICLEI – Local Governments for Sustainability)
- Climate Alliance ("Climate Alliance of European Cities with Indigenous Rainforest Peoples")
- Energy Cities
- European Covenant of Mayors

There are also various national networks, significant because attention has been found to shift to the national stage from transnational activities "once models are available closer to home" (Schreurs 2008, p.353). The most prominent US example is the Conference of Mayors Climate Protection Agreement, discussed further below. Within the UK, the Nottingham Declaration (Nottingham City Council 2000), though not strictly a network, acted as a focus for information

sharing and collaboration (Shaw & Theobald 2011). Another UK example, again not strictly a network, is the Improvement and Development Agency (IDeA), a now-defunct arm of the Local Government Association. Its Beacon scheme was intended to share best practice by identifying high-performing authorities in a variety of policy areas, one of which was climate change. Finally, the Nottingham Declaration has now been formally replaced by Climate Local, an initiative of the Local Government Association. Based, like its predecessor, on the making of a commitment to act on climate change (Local Government Association 2012a), its activity mainly takes place on-line though there are periodic gatherings such as its annual conference.

Signing up to a network does not carry any legal weight, though there may be some reputational risk associated with joining and then failing to deliver on undertakings. Rather, the networks' power lies more in harnessing enthusiasm amongst member local authorities such that it is not frustrated but instead leads to a meaningful outcome. This is achieved mainly through the sharing of experience and policy innovation through conferences, study visits, and publications (Davies 2005) whilst, for authorities that are looking for guidance on implementing the principles of LA21, the networks can provide a template and a degree of practical assistance with implementation. For exemplar local authorities, the networks provide a "shop window" that enables achievements to be celebrated and generates kudos (discussed above) that may make a meaningful difference to sceptical senior stakeholders. The networks are therefore credited with supporting the spread of a sustainable development consciousness in the local government sector (despite limited evidence that this is the case (Krause 2012)).

These networks are not all alike, though: membership of Cities for Climate Protection (CCP) was found to be associated with more concerted action to combat climate change than membership of the US Climate Protection Agreement (Krause 2012). The most plausible explanation is that ICLEI (which sponsors CCP) both offers more assistance and demands more action than the CPA; any commitments made as a resulting of joining the latter can be in essence nominal. But, whilst Krause's comparative study helpfully shows that some networks are associated with more progress than others, this is not the same as demonstrating that a given authority will make more progress if a network member than if not, a point on which there is little evidence. There is the inevitable possibility that those authorities which join networks are predisposed to do more about sustainable development than those which do not, which creates scope for dubious inferences concerning network impact. A more pragmatic approach to evaluating the networks' impact is to note their continued existence which, if nothing else, demonstrates that members consider the support they receive to be of sufficient value to justify the subscription fee.

In addition the distinctive role of networks, local government's response to climate change has been characterised by increased efforts to involve those outside the council in the development and delivery of policy, as discussed next.

Citizens, community-based organisations and NGOs

The important links between citizens and local authorities were identified in Chapter 1. The nature of much environmental policy is such that at least the co-operation of citizens and other agents outside government is essential to success whilst, for Ravetz (1999), citizens are essential to the environmental planning process. These themes are reflected in the original text of Agenda 21:

> "Each local authority should enter into a dialogue with its citizens, local organizations and private enterprises and adopt 'a local Agenda 21'. Through consultation and consensus-building, local authorities would learn from citizens and from local, civic, community, business and industrial organizations and acquire the information needed for formulating the best strategies" (United Nations 1992, para.28.3).

In addition to this general appeal for local authorities to base the development of strategies on a *dialogue* with various partners, the text of Agenda 21 made specific reference to the representation of women and youth in "decision-making, planning and implementation processes" (United Nations 1992, para.28.2). These calls for consensus-building and the involvement of historically under-represented groups appear to have inspired a considerable degree of experimentation and innovation amongst local authorities whose consultation practices had, up to that point, tended to be very conventional. LA21 in fact enabled a more general "rethinking [of] past 'givens' about how the authority interfaces and interacts with local people" (Morris & Hams 1997, p.5).

The development of Local Agenda 21 strategies in the UK included a variety of citizen participation techniques such as visioning, future search, Planning for Real and parish mapping. Responding to the call to involve youth in particular, Plymouth created an informal steering group of young people. The group's status grew such that it was referred certain issues by councillors and asked to advise other groups. Many of these participation methods had not previously been used in the local authority sector to any extent; others were being used in the context of sustainable development for the first time (Morris & Hams 1997).

Whilst this innovation was perhaps triggered by the wording of the UN text, Young (1998) argues that it was fuelled by an influx of people from the NGO sector who brought with them detailed ideas concerning participation. He also attempts to quantify the extent of innovation in participation, estimating that about 40-50 of 478 authorities had made "a conscious effort to promote these more ambitious strategies" (Young 1998, p.193). And he addresses the issue of "bottom-up" strategies (as opposed to "top-down"), concluding that 50-60 authorities were

aiming at "something like a bottom-up strategy" (Young 1998, p.195). If Young is right, the experimentation may have been striking but its reach was limited: most authorities pursuing an LA21 strategy relied instead on an LA21 forum, a steering group typically consisting of citizens, NGO representatives and council representatives. This involvement of the council turned out to be crucial, as numerous visions developed by LA21 forums without reference to the local authority's constraints were found to be unworkable (Church & Young 2001).

The LA21 strategy development process appears, then, to have been much more inclusive than the average council policy development exercise, but was it also representative? Seemingly not: programmes struggled to recruit the seldom heard, especially black and minority-ethnic participants (Church & Young 2001), people from excluded or deprived backgrounds. Despite the example of Plymouth, young and older people more generally played a very limited role (Lucas et al. 2003), whilst a study of a west London borough demonstrated a failure to heed the call of Agenda 21 concerning the representation of women (Buckingham-Hatfield 1999). According to Lucas et al, "this has led to a perception that, in the UK at least, LA21 is largely promoting a white, middle-class agenda and has nothing to offer disadvantaged and marginalised groups and communities" (Lucas et al. 2003, p.5). Making the point more strongly, Young (1998) saw the LA21 exercise as being for the already-green, a group that is typically middle-class and wealthier than average.

Though these criticisms are important, they do not undermine the point that the LA21 strategy process was for the most part more community-based than other council activities. Whether any process could be truly bottom-up, meanwhile, is debatable. Certainly, motivated local people could initiate the development of LA21 strategies and many did, often launching local activities wholly independent of the council in the process. Much of the time, local people were the driving force behind LA21, nudging a recalcitrant local authority to action. But the UN text on LA21 was directed at local authorities and they were seen as the ultimate delivery agent. And this was bound to be the case for purely practical reasons, given the range of activity streams relevant to LA21 that fell within the council's jurisdiction. Moreover, in areas where local people for whatever reason did not initiate activity, it was surely reasonable for the council to take the lead. There were of course conflicts in both cases, with local activists becoming frustrated with council figures for "feeding the UK a diet of 'Sustainability Lite'" (Church & Young 2001, p.125) and evidence that participation was actively managed by the local authority to achieve a desired outcome (Sharp 2002). The topic of citizens' involvement in councils' response to climate change is returned to in Chapter 3 in the context of a more general survey of citizen participation.

Turning to the role of non-governmental (NGO) and community-based organisations (CBOs) in LA21, this was an interesting mixture. On the one hand, national NGOs changed their focus to broad policy issues (such as the Brent Spar affair) following the Earth Summit (Young 1998). On the other, limited resources forced NGOs to adopt the role of consultant, serving local authorities, rather than driving the agenda through campaigning (Church & Young 2001). Nonetheless, though Lipshutz and McKendry stop short of crediting NGOs with the development of environmental consciousness, they argue that "various forms of environmental action and activism [on the part of NGOs] have played a significant role in setting the stage for greater sustainability" (Lipschutz & McKendry 2011, p.379). In terms relating more specifically to LA21, Church and Young argue that it is in specific sustainable development projects run by NGOs and CBOs that "success is most obvious" (Church & Young 2001, p.122). In a more recent example involving Friends of the Earth (one NGO thought to have successfully bridged national and local policy concerns), its Faith and Climate Change Project offers training to local people on initiating sustainability projects, organises regional events for faith leaders and provides an information exchange forum (Lipschutz & McKendry 2011). This project serves as a good example of the role that NGOs can play as enablers and connectors in the context of sustainable development.

Local Agenda 21 having clearly been a milestone in the involvement of citizens, NGOs and CBOs in sustainable development policy, what has happened in the years following the peak of LA21 activity? The gradual reduction in emphasis on LA21 reported above has been accompanied by a similar fall in the level of citizen participation on environmental matters. This was possibly caused in part by the transfer of environmental policy responsibility to local strategic partnerships (LSPs) as part of the Sustainable Communities Act 2007. LSPs (responsible for developing community plans and Local Area Agreements) were found to use the involvement of key stakeholders (such as councillors and representatives of local public bodies) as a proxy for fuller citizen participation (Jonas et al. 2004). And it is likely that some of the more radically-minded activists who participated in LA21 have chosen to pursue a path independent of their councils, perhaps through the Transition Town movement.

But it is hardly the case that environmental policy has reverted to being set *in camera* by local authorities. As Lipschutz and McKendry put it, "what cannot be denied is that civil society action and activism addressing climate change and its ostensible sources run the gamut from very localized home- and community-based efforts all the way to participation in a seemingly endless string of international meetings" (Lipschutz & McKendry 2011, p.369). In fact, some citizens may have been spurred on by what seems a diminishing policy prominence for climate change: "in the face of the intransigence of many governments, such non-governmental publics [eg those attending conferences of the parties] continue to provide ideas, energy, and

pressure necessary to respond to climate change" (Dryzek et al. 2011, p.8). What may have changed is the profile of participants, with the committed activists likely to cling on despite an apparent policy move away from sustainability on the part of government, whilst the more casual participant, presented with no convenient means of taking part, has withdrawn. The fact that local councils are increasingly talking of specific environmental issues rather than sustainable development as a whole is likely to have had its own effect: it must be remembered that sustainable development has a broad definition that encompasses a large number of themes of interest to the citizens, including those who are not overtly environmentally minded. Climate change, in contrast, has a rather narrower appeal.

Having surveyed the development of local government responses to climate change over time, discussion now turns to the current situation.

2.2 Dynamics and influences of local government action

This discussion is divided into three topics:

- Local authority powers – the range of actions available to a local authority in tackling climate change
- Motivations – the various reasons an authority might have for taking action
- Potential – the scope for reductions in greenhouse gas emissions

Local authority powers

Given the debate concerning how much local government can achieve with respect to climate change, it is useful to investigate the range of relevant action available to the typical council. The following list is drawn from a report that summarised activities amongst some of the more progressive English councils and which in some sense represents the "state of the art":

- "Developing a Vision for addressing climate change
- Securing and maximising senior commitment
- Integrating Climate issues into other policies and practice
- Encouragement of staff and members to become climate change champions
- Carbon reduction in own estate
- Carbon reduction in community
- Mitigation measures – renewable energy, energy efficiency
- Climate risk assessment
- Development of an adaptation strategy
- Minimisation of climate impacts to disadvantaged communities
- Cost effective adaptation measures
- Raising awareness and engagement in community, VCS and local business
- Partnership working
- Sustainable procurement
- Integrated approach to air quality and greenhouse gas reduction
- Environmental management system

- Climate change and planning/building design/construction
- Education for sustainable development
- Financing action on climate change" (Improvement and Development Agency 2008, pp.30–31)

Though the list is somewhat meandering, it helps to show the spread of potentially useful activity, spanning inculcation, data gathering/analysis, policy development and integration, implementation, dissemination and funding. Only a few of the measures in the list could be expected to have a direct effect on emissions but they all might have a role to play in helping councils to fulfil their potential in tackling climate change.

Against this, it is helpful to remember that some of these actions are easier for local authorities than others:

> "The kind of climate change initiatives that local governments can most easily do appear to be such activities as climate change and renewable energy target setting, energy efficiency incentive programs, educational efforts, green local government procurement standards, public transportation policies, public–private partnership agreements with local businesses, and tree planting" (Schreurs 2008, p.353).

Thus a typical pattern of local authority activity will probably be a subset of the Improvement and Development Agency list and is likelier to feature some actions than others. This is discussed as part of a general survey of performance in §2.3.

Motivations

A given local authority may be intrinsically motivated to mitigate the effects of climate change (perhaps because of facing climate hazard or because either key stakeholders or influential constituents consider it important). Should a local authority lack intrinsic motivations, there are numerous other reasons why it might see taking action as potentially beneficial, as discussed below.

Whilst LA21 stands out, several other legal or regulatory measures provide or used to provide a motive for authorities to act on climate change, often indirectly. The Sustainable Communities Act 2007 gave councils the scope to set a strategy which, amongst other things, would promote local sustainability (Shaw & Theobald 2011): the Home Energy Conservation Act 1995 (HECA) imposed a requirement upon authorities to improve the energy efficiency of housing stock in their area (Allman et al. 2004; Fleming & Webber 2004; Shaw & Theobald 2011); and the Warm Homes and Energy Conservation Act 2000 was designed to tackle fuel poverty (Fleming & Webber 2004), though this would not guarantee a reduction in emissions. The Comprehensive Area Assessment regime, described above, created the option for authorities to commit themselves to reductions. And building regulations have become increasingly demanding with respect to energy efficiency such that a council initiating a

building project will be obliged to deliver a lower-emission construction than would previously have been the case (Fleming & Webber 2004).

It could be argued that what are missing are specific "carbon budgets" for local authorities in line with the Climate Change Act. They have been much discussed (eg Friends of the Earth 2010; Janke et al. 2010), but have not been implemented and are not an immediate prospect. Instead, the Local Government Group established with the UK Department of Energy and Climate Change a memorandum of understanding concerning the role of local government in tackling climate change (Local Government Group & Department of Energy and Climate Change 2011) which does not impose any binding requirements.

There are, too, financial incentives: landfill tax is paid by waste producers (including councils) for diverting waste into landfill (HM Revenue and Customs 2012); the Carbon Reduction Commitment (CRC) imposes a surcharge on organisations for consuming electricity and certain fossil fuels above a specific threshold (Environment Agency 2013). In addition to these financial "sticks", there have been numerous funding streams available to local authorities which align with principles of sustainability in some way and therefore provide the means to implement pro-environmental programmes. Examples include CIVITAS which supports sustainable transport and SAVE II Energy Agencies (preceded by PERU) which promoted local energy management (Fleming & Webber 2004). The European Union has been the source of many of these but opportunities also arise at the state level, for example through the Local Sustainable Transport Fund (LSTF) administered by the UK Department for Transport which is intended to "enable the delivery by local transport authorities of sustainable transport solutions that support economic growth while reducing carbon" (Department for Transport 2011a, p.4).

Were the typical UK council able to benefit, the sums available from funding streams such as these would be dwarfed by the economic savings that are thought potentially to arise from pursuing pro-environmental strategies. One example is the "Mini-Stern" report compiled for Manchester which concluded that the economy of the "city region" stood to lose $20billion over 12 years if it failed to adapt to climate change; conversely, it was argued that a significant economic opportunity would be available if the city region instead took early action (Deloitte 2008). This is only one of many studies of the area's sustainability potential (see, eg, Ravetz 2000) and the area is considered to be amongst the better performers in terms of climate change (Scott 2011). But Manchester's "city deal" places it in the unique position (amongst UK local government) to be able to gain financially from local economic development (Cabinet Office 2012b). All other local authorities have very little scope to levy taxes or even to determine the level of the taxes that they can levy. And their overall income is in any case

determined at the centre which adjusts its support grant to reflect what is earned locally. This greatly reduces the financial motivation for councils in the UK, in contrast with the US where local authorities are argued to be able to make real gains. Bai (2007) refers to the American cities which were part of Cities for Climate Protection and collectively saved $600million in 2004 through efficiency measures; Trisolini makes a more general point that "because some local programs provide fiscal benefits, they may face fewer political hurdles than federal and state efforts to reduce emissions" (Trisolini 2010, p.735). Despite the relative fiscal disadvantage faced by UK local authorities however, this does not alter the fact that considerable financial savings are still potentially available, especially from reduced energy consumption within a council's own estate, provided the capital is available to finance any initial works.

Beside money, other motivations may exist. Where actions that reduce emissions happen also to respond to an established local concern, this can provide a local authority with a politically acceptable argument for addressing climate change, or may simply mean that climate change is tackled in passing. The example most frequently given is local air quality (Bulkeley 2010; Bai 2007; Betsill & Bulkeley 2007) though there is an associated risk of problem exportation (Bai 2007), whilst Bulkeley makes the more general point that coming to climate change by way of local concerns can mean an excessive focus on "easy wins".

Alternatively, in a period when government was generally becoming more constrained, Local Agenda 21, in particular, has been characterised as an opportunity for autonomy (Jonas et al. 2004). More generally, Romero-Lankao and Dodman (2011) look on climate change as a governance opportunity, given the redistribution of government functions, especially downwards to [US] states, regions, urban areas and cities. The extent to which authorities will experience true freedom will be a function of many factors including the availability of resources (returned to below). And Jonas et al sound a note of caution, claiming that "national and international policy frameworks and rule regimes maintain crucial roles in setting the parameters for local governance" (Jonas et al. 2004, p.153).

Finally, the pursuit of a pro-environmental agenda can bring fringe benefits. As Leeds and Leicester experienced in the early 1990s, the status of Environment Town brought a degree of kudos to the cities (Jonas et al. 2004; Fleming & Webber 2004, respectively). A related benefit can be the gratification of senior personalities in the authority, some of whom may actively enjoy the sense of being at odds with central government (Bulkeley 2010). Bulkeley also points to the leadership opportunities that addressing climate change can offer. On a more practical front, measures that mitigate climate change can also have far-reaching social benefits, such as reduced trips to the doctor and school absences amongst residents of

housing following the installation of more efficient heating (Fleming & Webber 2004). And there can be positive consequences in terms of policy innovation for the more radical authorities: Shaw and Theobald (2011) present climate change discussions as a way in to wider action on resource efficiency as well as the development of new environmental technology.

Potential

> "We are convinced that the city or town is both the largest unit capable of initially addressing the many urban architectural, social, economic, political, natural resource and environmental imbalances damaging our modern world and the smallest scale at which problems can be meaningfully resolved in an integrated, holistic and sustainable fashion" (European Union 1994, p.I.3).

The above quotation from the Aalborg Charter suggests that local authorities are in an excellent position to address climate change (amongst other environmental issues). But how much can the local authority sector do to mitigate climate change? As will be seen, views differ.

The starting point is to develop an understanding of the sectors within the reach of local authorities where a reduction in greenhouse gas emissions is feasible. One schema (Centre for Sustainable Energy 2007, pp.41–54) sets out actions under the following headings:

- Domestic energy efficiency
- Business energy efficiency
- Public sector energy efficiency
- Renewable and low carbon technologies
- Transport (which divides into own travel and local transport)

As for then estimating the potential size of effect, a variety of factors must be considered:

- The magnitude of the emission source
- The degree of control that the authority is thought to exert over it (with this quantity likely to vary considerably within and between authorities)
- The probable proportion of total potential impact that action, if taken, will have

These factors are additional to the numerous issues inherent in estimating greenhouse gas emissions, discussed in more depth in Chapter 5. This explains the range of predictions relating to the local government sector's potential effect upon emissions. The Committee on Climate Change (2012a) picks out buildings, surface transport and waste as being particularly promising areas for emission reduction and so bases its estimates on these. It proposes that local government could, by concentrating on these aspects, reduce overall UK greenhouse gas emissions by eight per cent by 2020 (compared with 2010 levels). For its part, AEA Technology (2008) provides the following predictions:

> "These [figures] show that most LAs in England could expect to achieve 11% to 13% reduction in emissions compared to 2004 by 2010 and about 19% to 23% compared with 2004 emissions by 2020" (AEA Technology plc 2008, p.46).

One approach to interpolating between the AEA figures suggests a reduction of between nine and 11 per cent for the period 2010-2020. But great care must be taken in comparing these numbers given the many differences in their derivation.

Looking at only these two estimates shows how unlikely it is that there will be agreement on a single figure. Nonetheless, there seems some justification for arguing that the local government sector has considerable scope to reduce community-wide emissions even if such predictions are overstated (Pearce & Cooper 2009). The lack of agreement concerning the exact size of the potential reductions can be looked on as unavoidable and in fact an irrelevance – if the number is in the region of ten per cent, this is grounds for action. It must, though, be acknowledged that uncertainty concerning impact can be exploited as a weakness by those favouring other priorities whose likely impacts are more robustly quantified.

2.3 Performance

Previous sections have presented views concerning the range of measures available to local authorities in pursuing reductions and the potential impact that local authorities could have on emissions. How, then, are they performing?

A 2011 survey showed that approximately three quarters of English local authorities had not instituted a target to reduce carbon emissions across their area by 2020; of those that had, only a quarter had set a target of or above 40 per cent, the amount recommended by the Committee on Climate Change (Friends of the Earth 2011). In contrast, analysis of how councils performed against their NI186 targets (discussed in §2.1) shows that 65 of the 100 authorities achieved or bettered their targets over the period 2005-2010, whilst 35 fell short (see Figure 2.1)[5], a result which may stem to a great extent from the effects of recession. Another survey of English local authorities assessed the "action index" of local authorities based on their reporting on climate change-related indicators set by national government. Fourteen per cent were classified in the high-action bracket and 55 per cent and 30 per cent, respectively, classified as medium and low. The authors found a greater tendency to attend to climate change adaptation than mitigation (Mann et al. forthcoming). The overall pattern,

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[5] Performance has been gauged using the latest data (Ricardo-AEA 2013) which means that the baseline figure for 2005 will not necessarily match the one used in formulating the NI186 target that featured in an authority's LAA. Figure 2.1 presents a comparison of changes in actual levels of CO_2 per capita with target changes (Energy Saving Trust 2008). It omits City of Bristol which achieved a reduction 15 times as large as its target. See Appendix E for further details.

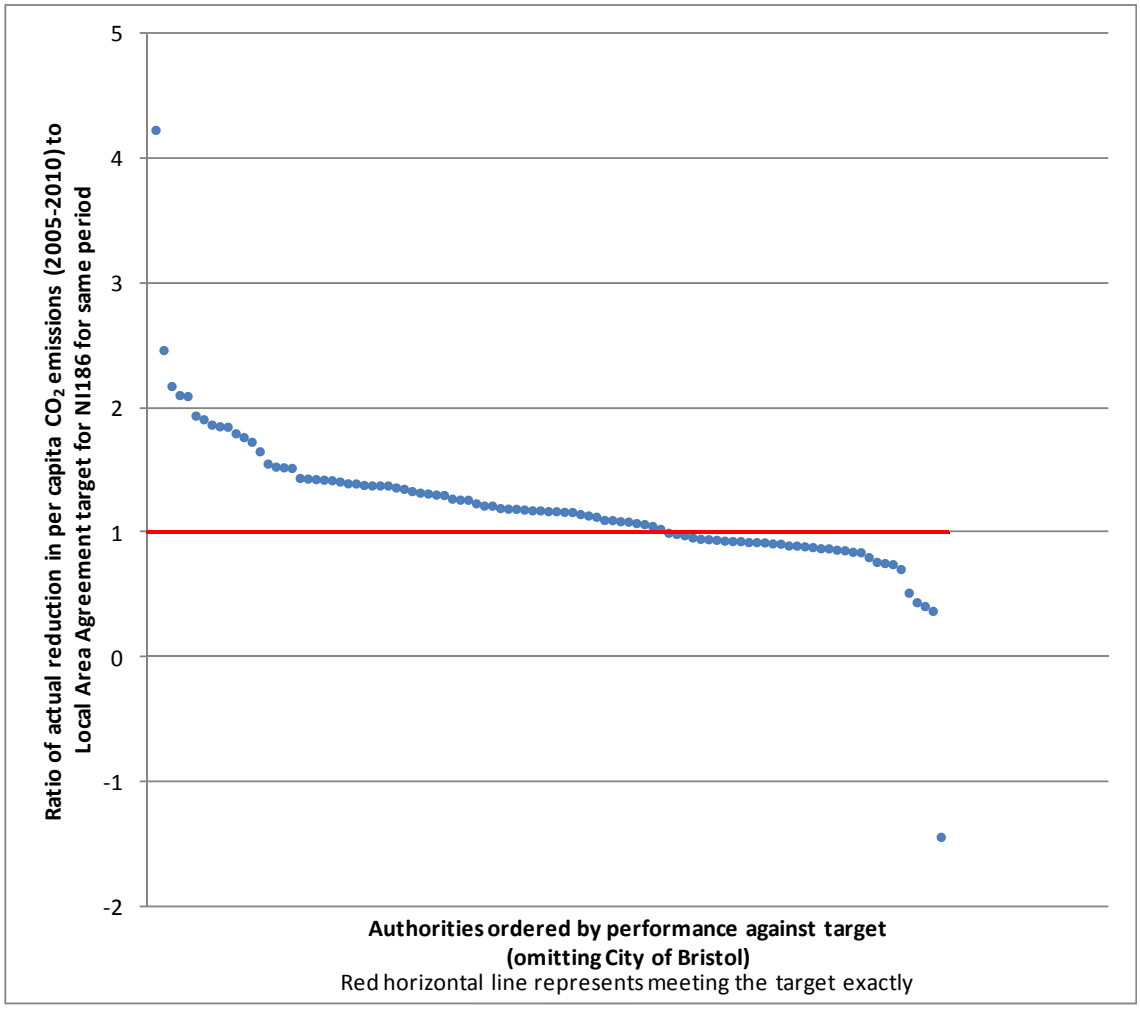

Figure 2.1 – Local authority performance against targets for reduction in per capita CO_2 emissions (NI186)

then, seems to be one of diminishing attention to climate change over the past five to seven years.

These findings are supported by a view found in the literature that the local government sector could be doing better. Bulkeley's (2010) international review offers several criticisms of local authority action: she finds it unsystematic and unstructured, focused on authorities' own estates and operations, centred on the energy sector and tending to prioritise the easiest measures and those which carry little risk. Tang et al find that climate change plans tend to concentrate on the built environment (eg energy, transport, waste and buildings), paying little attention to significant aspects of the rural environment such as forestry and water (Tang et al. 2010; Tang et al. 2011). With respect to LA21 in particular, the number of completed strategies did not make up for the fact that performance did not appear to live up to level envisaged by the authors of Chapter 28 of Agenda 21 (Church & Young 2001).

The similarities between the climate-change-specific situation and that relating to sustainable development reveal an underlying pattern of not straying beyond certain areas. They may both constitute examples of "local strategic selectivity":

> "As a non-statutory function – and without additional resources – LA21 could easily be detached from other local functions such as service delivery and policy development, and often became a fairly self-contained exercise in itself" (Jonas et al. 2004, p.156).

It is of course easy to criticise councils for failing to live up to ideals and by no means all of the commentaries are negative. A survey of climate change action plans in the US concluded that they demonstrated good awareness of the issues and moderate analysis capabilities (though relatively limited action approaches) (Tang et al. 2010). In the UK, a study of Leicester led the authors to conclude progress was being made despite the poor quality of the data available (Fleming & Webber 2004). And the verdict of Zahran et al in assessing the Urban CO_2 Reduction Project, an initiative involving 14 municipalities from north America and Europe, was that it had been "remarkably successful" (Zahran et al. 2008, p.547).

In the case of LA21, which does not tend to be considered a success, the initiative is nevertheless thought to have fostered longer-term thinking (Evans & Theobald 2003) and was considered by local government to be "an important political process" (Joas & Grönholm 2004, p.506). Moreover, LA21 is a peculiarly difficult initiative to evaluate fairly, given the tendency for constituent projects to be small; assessments of LA21 will often therefore be based on an incomplete picture of impacts (Lucas et al. 2003).

Various writers point to the practical benefits that have flowed from local authority responses to climate change. Bulkeley (2010) mentions direct provision of low-carbon services and infrastructures, whilst Fleming and Webber (2004) point to the creation of a lasting sustainable energy network. On the governance side, there are examples of collaboration amongst neighbouring authorities where classical theory would have predicted competition (Trisolini 2010), whilst a more radical interpretation has the response to climate change playing a role in the restructuring of government as part of the process of "ecological modernisation" (Jonas et al. 2004, p.152).

Explaining underperformance

If performance is not what it could be, why is this? Much of what is written concerning the generally perceived difficulty of tackling climate change relates to boundaries and this is equally true of the local government sector. One formulation is that of Hardin (1968) who discussed the concept of the "tragedy of the commons" and whose exposition of the general problem aptly included the example of pollution. In summary, a group of individual actors, each pursuing her/his own interests, can in certain circumstances cause the suffering of all

members. Because "the costs and benefits of climate-policy action and climate-policy inaction are spatially nonrandomly distributed" (Zahran et al. 2008, p.545), climate change may constitute a tragedy of the commons. Looked at another way, the level of governance "should match the geographic scale of the harm" (Trisolini 2010, p.674) and this is manifestly not the case where climate change is concerned (though the impact of local climate risk is examined further below in the discussion of action taken by authorities). Bai (2007) contrasts the global scale of climate change and the generally tightly drawn boundaries of local government; this disparity is exacerbated in the case of local government by the fact that the majority of powers to reduce emissions remain at the centre (Shaw & Theobald 2011). So Climate Change appears a classic challenge of multi-level governance: impacts are felt in a way that defies the standard administrative geography; moreover, the task of tackling climate change requires action at several levels simultaneously. Even where the different tiers share a single policy outlook, there is no guarantee that mechanisms will exist to support the sort of co-ordinated action needed. In most countries, Kern and Alber (2008) argue, responding to climate change at a local-authority level is voluntary, whilst national governments limit themselves to an enabling role. Meanwhile, Bulkeley (2010), who points to the scope for climate change action to be paired up with addressing local problems, concedes that this does not apply to every aspect of the climate change challenge. Trisolini (2010) identifies the risk that the spatial disparity mentioned above can have knock-on effects: the unregulated environment can lead to a muddle as neighbouring jurisdictions develop incompatible responses to the same problem, and local action can lead to leakage (eg the export of emissions), a difficulty that motivates some to argue against local action altogether.

There is some practical evidence of these boundaries at work. Under the banner of LA21, Hertfordshire attempted to create an integrated approach to spatial and environmental planning but the resulting development plan was rejected at the Examination in Public (Counsell 1999). More general surveys of the integration of environmental and spatial planning are no more encouraging: Tang et al (2011) studied "climate change action plans" and "local land use plans" in north America and saw limited interaction. They found the land-use plans to tend to have shorter timescales and the climate change plans to lack a spatial element, despite the fact that land use planning officers had, according to their research, the necessary knowledge and skills to integrate the two. The question of handling boundaries arises extensively in later chapters (especially Chapters 5 and 6).

Another fundamental barrier is remoteness. Climate change is often characterised as spatially and temporally remote compared with the problems that a typical authority in the developed world is tackling (Bai 2007). It is certainly understandable that a local authority will have

limited interest in what happens outside its borders. But Bai questions the validity of the temporal remoteness claim in political terms:

> "The 'not in my term' contention can be counterposed by the fact that a mayor's decisions often have impacts on a much longer time span, which may exceed his/her term or even lifetime" (Bai 2007, pp.19–20).

Perhaps the flaw in this argument is that a mayor will almost always wish to be seen tackling a current problem: the redesign of a city may indeed have long-term effects but it is bound to be motivated by a belief that the city's current form is a source of difficulty. A longer view, designed to capture future costs and benefits, such as that employed by Stern (2007), is rarely witnessed in local government.

Uncertainty is a third fundamental impediment. Leaving aside the well-worn debates about the level of atmospheric concentration of CO_2 that would trigger irreversible climate change, uncertainty pervades more immediate discussions of impact. For example, the necessarily tentative causal links which are drawn between climate change and contemporary extreme weather events (such as Stott et al's (2004) examination of the 2003 heat wave in continental Europe) allow the effects of climate change to be described as unproven, thus weakening the environmental case when juxtaposed with the *relative* economic certainty of development (Betsill & Bulkeley 2007; Tang et al. 2011).

There is then a set of political factors that can considerably influence progress. The probability that a given authority will prioritise climate change mitigation is related to the emphasis placed on it at nation level (Evans & Theobald 2003; Jonas et al. 2004), even if certain councils will take pleasure in going against the grain. In the US, a municipality may find itself prevented from pursuing certain policies because of a ban at the state level, as in the case of LA21 in Alabama (Newman 2012). A lack of political support can more generally hamper the establishment of pro-environmental policies (UK House of Commons Environmental Audit Committee 2008) as can the absence of a champion figure (Betsill & Bulkeley 2007). And this impediment can be compounded by limitations in the scope of relevant regulations: Allman et al (2004) see the lack of a statutory requirement to tackle climate change as a significant shortcoming. The same was said of LA21, whose non-statutory nature is seen as a weakness: it "lacked the regulatory clout and clarity needed to provide a force for major change" (Jonas et al. 2004, p.164). Jonas et al see this as an example of a tendency of the state to use "territoriality" in such a way as to preserve control – here, the responsibility for promoting sustainable development was handed to local authorities but the necessary powers remained with the state.

The prevailing tension between economic and environmental priorities has been mentioned above in the context of uncertainty. Economic conditions help to determine whether the

narrative will be about fuel poverty or environmental citizenship (Shaw & Theobald 2011) with the consequence that, in an area of low incomes, the authority may have fewer pro-environmental policies or behaviours in its "basket". Economic conditions also help to determine whether climate change will be "trumped" by priorities considered more pressing, such as development, as found in Cambridgeshire by Bulkeley and Betsill (2003).

Economic factors also appear in quite practical terms. In the UK, the fact that local authorities have very few tax-raising powers, for example, has already been identified as a possible reason for limited action in a range of policy areas including climate change. A connected consideration is the authority's control over the local economy. The degree of state privatisation is a significant factor (Bulkeley 2010), in that authorities have much less control over activities that have been contracted out; in contrast, there appears to be more progress in areas where the authority has greater traction, such as in changing its own energy mix (Allman et al. 2004; Bulkeley 2010). And councils generally have only limited influence over local industry but, the more tenuous that influence, the less likely the authority is to make ambitious commitments regarding climate change (Bai 2007; Bulkeley 2010).

There are also numerous possible internal reasons for difficulty. The lack of funds to support climate change action is raised repeatedly in the literature (Betsill & Bulkeley 2007; Jonas et al. 2004; Trisolini 2010) and there is mention of the complexity of the arrangements for funding such measures (Fleming & Webber 2004). Many authors refer to a deficit in human resources, be that in terms of skills, knowledge or numbers (Allman et al. 2004; Betsill & Bulkeley 2007; Evans & Theobald 2003; Shaw & Theobald 2011). There are also structural issues: climate change tends to be placed in an environmental silo (Bulkeley 2010) whilst the nature of the challenge requires the collaboration of disparate council departments (Allman et al. 2004; Betsill & Bulkeley 2007) such that, where progress is made, this may actually result from structural innovation (Bulkeley & Schroeder 2012). The wider point is that, to tackle climate change effectively, multi-level governance is required (Shaw & Theobald 2011).

Communication is another important strand. Authorities will fare better if the issue of climate change has been properly articulated and absorbed (Bulkeley 2010). Even then, they may encounter an unexpected degree of inertia when implementing initiatives, as with the promotion of energy efficiency measures in both domestic and business settings (Fleming & Webber 2004). They may have difficulty engaging citizens (Allman et al. 2004), or may be met with active resistance from the business community (Bulkeley & Schroeder 2012).

A final impediment relates to emission data which are needed to show progress and enable programme revisions. The lack of reliable, relevant data is widely mentioned (Allman et al. 2004; Bulkeley 2010; Fleming & Webber 2004; Romero-Lankao & Dodman 2011), with Cooper

and Pearce (2011) citing in particular the two-year time-lag in England in obtaining information concerning per-capita emissions of carbon dioxide. They go on to say that data do not exist to support the inference of causality, making it difficult to know whether any specific intervention achieved its goals. For Fleming and Webber (2004), the lack of data makes it impossible to arrive at a sound understanding of the relative cost-effectiveness of competing measures. The best use of such data as is available is a key theme of Chapters 5 and 6.

Alongside this set of largely practical considerations, it is important to allow for cultural issues too: a local authority can be characterised as the sum of the personalities that represent it and there is no guarantee that they will have a coherent or internally consistent position on climate change (or any other topic, for that matter). According to Hajer's (2005) concept of a discourse coalition, there may be an apparent corporate position on climate change but this could be a "storyline" adopted by disparate individuals whose underlying internal explanations are quite different. Put another way, progress on climate change may be slow because, despite the appearance of an authority-wide commitment to action, the values of key stakeholders may be inconsistent with that action. For Hajer, because storylines are context-specific, "it becomes possible to come to terms with the fact that some actors might utter contradictory statements, or indeed help reproduce different discourse coalitions." (Hajer 2005, p.303)

Most of the above points contribute to a general picture of nervousness in the typical council: they lack the structure and resources to take decisive action and are hide-bound by the relative weakness of environmental arguments when set against economic propositions. In addition, the above arguments seem to provide good evidence that officers contemplating an emission reduction target would have little control over its achievement. Given Cooper and Pearce's (2011) finding that public bodies display a tendency to avoid committing to targets over which they do not have control, this provides additional explanation for the nervousness identified.

Temporal and spatial variation

There is very considerable variation in local authority responses to climate change over time and across location. The UK provides an excellent case study of the first, given the change in government in 2010 and associated "austerity measures" which greatly limited the freedom of local authorities at the same time as a reducing emphasis on climate change at the centre (The Guardian 2011). The prediction was that activity would reduce but that a number of committed pro-environmental authorities would plough on (Shaw & Theobald 2011), bearing out experience in Canada (Parker & Rowlands 2007). This appears to be the case, if the number of signatories to Climate Local is considered symptomatic of a drift away from the

climate change agenda: since Climate Local is simply the replacement for the Nottingham Declaration, even allowing for inertia effects, not dissimilar numbers of signatories might be expected. But the Nottingham Declaration was signed up to by over 300 authorities (Climate East Midlands 2013), whereas the total signatories to Climate Local as of January 2013 was 39 (David 2013).

In contrast with these trends of diminishing prominence, Shaw and Theobald (2011) detect evidence of movement in the opposite direction. They identify the growing presence of the Green Party on the political scene as likely to increase focus on environmental policy issues and suggest that the increasing number of directly elected mayors may also help overcome political deadlock on this and other matters. Taking a more general view, there are predictions that a diminution in the role of the state will be attended by growing activity at the local level (Betsill & Bulkeley 2007), whilst a more radical look to the future has the structure of government itself altering around a low-carbon agenda (While et al. 2010).

The degree of spatial variation is striking. At the international level, one survey found 6,000 sustainability plans in European authorities, 100 in north America and 20 in India (Smardon 2008). China, meanwhile, is an outlier, managing both to continue to rely on coal and car-based development, and to embark on a highly ambitious decarbonisation agenda, though one based on reducing growth in emissions rather than their absolute quantity (Schreurs 2011). Within Europe, a broad range of activity levels with respect to LA21 was detected (Joas & Grönholm 2004), whilst there are also pronounced differences with respect to climate change within individual countries such as the US (Tang et al. 2010). In the UK, LA21 was embraced more by "relatively resource-rich county-level authorities" (Jonas et al. 2004, p.156) than urban councils. Some commentators see a polarised picture, with a small number of authorities very active (and recognised trans-nationally) alongside the more pedestrian remainder (Bulkeley 2010; Cooper & Pearce 2011).

As to why there is such variation, numerous potential explanations offer themselves. The application of classical economics would suggest that some authorities have more to gain from action than others and this is borne out in the US to some extent in Zahran et al's (2008) study which concluded that climate risk was a predictor of joining a transnational network, though the *quality* of resultant action plans is not thought to be correlated with historical hazard (Tang et al. 2010). Turning to socio-demographic factors, a correlation was found between the volume of vehicle emissions in American jurisdictions and plan quality but, the further people commuted, the worse the plan tended to be (Tang et al. 2010), whilst the presence of carbon-intensive or highly-polluting industry was negatively correlated with network membership (Zahran et al. 2008). Other factors that predicted network membership in the US included an

authority being more urban, having a relatively liberal electorate (Zahran et al. 2008), and having a relatively large and educated population (Krause 2012) though, echoing the distinction made above between producing a plan and its quality, it is possible to join a network and do little more afterwards. Further, there are potential benefits for a local politician who represents pro-environmental constituents in adopting pro-environmental policies (Zahran et al. 2008). Mann et al (forthcoming) repeated Zahran et al's methods in the English context, finding that an environmentally-inclined electorate and action on the part of neighbouring authorities predicted a higher level of climate change response, as did the presence of one or more Green Party councillors. Authorities facing resource-intensive needs such as crime and housing were found to be less active with respect to climate change. Shaw and Theobald (2011) report significant variation in knowledge of climate change amongst citizens so it is perhaps not surprising that progress on sustainable development amongst local authorities was correlated with "increased awareness amongst the general public" (Fleming & Webber 2004, p.770), though appropriate care must be taken in inferring causation.

Analysts have also found evidence of factors internal to government that help to explain the variation. A mandate from a higher tier of government to produce a climate change action plan was correlated with higher plan quality (Tang et al. 2010) and healthy council finances predicted network membership (Krause 2012; Zahran et al. 2008) though, again, there may be an underlying common cause. Allman et al (2004) found good internal co-ordination was linked with above-average performance, as well as the presence of internal and/or external support, a finding confirmed by Fleming and Webber (2004) who also identified strong technical knowledge amongst energy and other relevant professionals.

Conclusion

Local authorities could achieve considerable reductions in greenhouse gas emissions, both within their own estates and operations and across their wider communities, but they are not tending to achieve this potential, though performance varies significantly by location and has changed recently in England in line with major shifts in financial circumstances and central policy. The numerous explanations for underperformance are found at all levels from the conceptual (for example the characterisation of climate change as a tragedy of the commons) to the very practical (the lack of skilled staff to do the work). Nevertheless, some authorities continue to outperform their neighbours despite the apparently shared challenges they face and, where this is the case, various factors, both external and internal to the council, are found to be related to these differences. Some, such as how liberal constituents are, seem more compelling than others: lack of funds, for example, might well be offered as an excuse for

inaction given that some authorities have clearly managed to secure money, under similarly challenging circumstances, to pursue pro-environmental programmes.

There are various comments in the literature that point out its own failings. A strong theme is the relationship between environmental policy and the political and economic context in which it unfolds: “The power relations, economic dimensions and politics of engaging with carbon and climate change have been under-theorized” (Romero-Lankao & Dodman 2011, p.117). This is a view echoed by Jonas et al who find the lack of connection in the literature between environment and economy “does not square comfortably with reality” (Jonas et al. 2004, p.153). Evans and Theobald (2003) point to a lack of understanding of process with respect to LA21 and Romero-Lankao and Dodman make a connected point that more attention needs to be given to “the ways in which carbon and climate are addressed in ‘ordinary cities’” (Romero-Lankao & Dodman 2011, p.117) which could be taken as a call for a greater number of methodical case studies, in contrast with the numerous studies that draw inferences from models built using aggregate indicators.

One strong theme arising from this survey has been the extensive and, in places, innovative involvement of citizens in the development of environmental strategy: for reasons that may have been circumstantial or otherwise, UK local authorities made a greater effort to bring citizens into the development of their LA21 strategies than was typical, thereby creating an association between environmental policy making and citizen participation that has to some extent persisted. In the next chapter, the theme of citizen participation is addressed from first principles in a survey that also examines general practice as well as the specific case of participatory budgeting.

Chapter 3 Citizen participation and the case of participatory budgeting

The Local Agenda 21 movement discussed in the previous chapter placed citizens at the heart of the planning and delivery of pro-environmental programmes, perhaps partly for ideological reasons. But the association of citizen participation with environmental planning also has a degree of empirical backing: Evans et al (2006) find a clear correlation between sustainable policy success and civic engagement with local government policy-making and action. Given that citizen participation is the form of civic engagement initiated by government (as opposed to citizen-led forms), it is therefore appropriate to study it in more depth.

The chapter has the following sections:

- Citizen participation – a survey of the topic in conceptual and practical terms
- Requirements, preferences and current practice in UK citizen participation – an analysis of how things are currently done and why
- Citizen participation with respect to emission reduction – how practice with respect to this particular topic area resembles and differs from the more general use of citizen participation
- Deliberation – an investigation of this specific aspect of citizen participation
- Participatory budgeting – an exploration of this particular type of citizen participation, its use to date and perceived strengths and weaknesses

3.1 Citizen participation

There is a broad range of opinion concerning the desirability and legitimacy of bringing citizens into the making of public decisions. In the following sections, arguments for and against are summarised and discussed.

Varieties of citizen participation

A wide range of terms is in use to describe the set of processes by which citizens participate in public decision making. For the purposes of this discussion, it is helpful to adopt the definition offered by Sprain (2008), which stipulates that public (citizen) participation needs to be action/activity/involvement, by the public (either individuals or organisations), to influence government decisions/action/policy. So, for clarity, this definition excludes participating in ballots to elect politicians, participating in the decision-making processes of non-public bodies (eg works councils), and participating in groups or activities with an essentially social or

community focus. In practice, many writers conflate participation in elections and involvement aimed at a particular decision or policy and many of the arguments for and against apply equally to elections and decision-based participation.

Citizen participation as defined in this way varies greatly depending on the circumstances (including prevailing regulatory requirements) and on the attitudes of both citizens and decision makers. A range of ways has been devised to categorise citizen participation methods, the classic being Arnstein's ladder (1969), whose rungs reflect the extent to which the holder of power is prepared to share it with citizens. This approach bears comparison with Pateman's (1970) identification of pseudo, partial and actual participation, which similarly reflects the attitude of the decision maker.

Other taxonomies are designed in more methodological terms (Beetham et al. 2008; Brodie et al. 2009; Sprain 2008; Rowe & Frewer 2005), whilst at least one approach is outcome-based, presenting a "discourse quality index" reflecting the standard of debate achieved by participants, being a function of both the method adopted and the specific attributes of the setting (Steenbergen et al. 2003).

In addition, a recurring preoccupation amongst writers in the literature is with deliberation, it being argued from both theoretical (eg Habermas 1995) and empirical grounds (eg Fishkin & Luskin 2005; Beierle 2002) that there is a positive correlation between extent of deliberation and decision quality. Deliberation is therefore discussed in its own right below.

Arguments in favour

Arguments in favour of citizen participation are presented in two categories: normative and instrumental.

According to Christiano (1996), arguments in favour of deliberative democracy as a system (of which citizen participation in public decision making can be presented as a sub-system) typically fall into three categories: libertarian, egalitarian and instrumentalist. The first two of these can be seen as normative. Christiano considers the egalitarian argument the strongest, a view echoed by Dahl (1956) who presents deliberative democracy as a means of protecting the interests of minorities. This position is of course only valid if a subtler form of decision making is used than simple majority voting, a point on which the definition of deliberative democracy turns. As Dahl points out, voting alone cannot capture intensity of feeling.

For Pitkin (1972), participation in decision making is an essential part of representative government, a position which may seem curious given that representative and participatory democracy are ordinarily distinguished precisely by the extent to which citizens participate in processes beyond the election of politicians. In all but the smallest communities, a democratic

deficit is inevitable, leading Pateman (1970) to argue for providing citizens with more local influence. Though her stance is informed by instrumental motives (both citizens and institutions benefit from local participation, including participation in employer decisions, she argues), it can be seen to have normative foundations, being a philosophical commitment to filling structural gaps in citizens' opportunities to contribute.

In the realm of spatial planning and in the connected field of public policy where a decision may have an uneven impact upon a politically-defined community, one argument in favour of citizen participation in decision making arises from the limitations of the election process to allow for this subtlety: citizens may in general support their representative but oppose a given initiative. Equally, the representative may feel that making such a decision without citizen participation would be invidious.

Discussion now turns to instrumental arguments.

> "There may be many ways to produce decisions of high technical quality, but there are relatively few methods that do so while also educating the public, eliciting public values, resolving conflict, and building trust in agencies, as many stakeholder processes do. That society can make some headway on these more "political" features of decision making and not sacrifice quality is indeed a positive endorsement for engaging stakeholders in environmental decision making" (Beierle 2002, p.748).

The above quotation helpfully summarises some of the principal instrumental arguments put forward in favour of citizen participation in public decision making and, at the same time, conveys the enthusiasm for the practice encountered in the work of many writers on the subject, enthusiasm which meets with occasional criticism, as discussed further below.

The primary category of instrumental arguments are those relating to decision quality (National Research Council 2008). First, citizens can be expected to have relevant, specific knowledge that would be of use to decision makers (Innes & Booher 2010; Callon 2009), though it is important to avoid the trap of conflating market research (eliciting that knowledge) with citizen participation (enabling citizens to apply that knowledge themselves in the decision-making process).

Second, involvement in decision making on the part of citizens can help to avert conflict (Rowe et al. 2008) which is likely to reduce the cost of implementation and help to manage risk associated with it. Andersson et al (2011) in fact argue that it can lead to a net saving in cost. This introduces a general theme of efficiency gains resulting from participation. It is also argued that citizens will have more sympathy with a decision taken on the basis of participation (International Association for Public Participation 2009), an outcome which further assists with risk management and suggests a more general outcome of citizen contentment. Finally, when citizen participation is successful, politicians are content with the

outcome (Kathlene & Martin 1991). This, though, is not a clear-cut point in favour of citizen participation, given that no particular instance of it is guaranteed to be successful: whilst a good example engenders acceptance on the part of politicians, this suggests that a poor example may have the opposite effect.

Secondary instrumental arguments centre on the effect of participation on citizens and society. For Elster (1989), more democratic citizens are better citizens, a position echoing J S Mill. Ledwith and Springett (2009) use the language of transformation to describe the journey taken by citizens who participate in democratic processes whilst, for Pateman (1970), participation helps to integrate citizens into society. And, at the societal level, Cohen's argument "[a pluralist system] in which democratic politics consists of fair bargaining among groups each of which pursues its particular or sectional interest, is unsuited to a just society" (1989, p.18), could be seen as purely normative but an instrumental side can also be detected: the more just citizens consider their society to be, the better it might function.

Arguments against

> "Public participation is providing a ready weapon for delay – and downright disruption – in the hands of determined minorities…This shows, in probably the worst single decision of its type, the pure lunacy of public participation" (Hamer 1987, p.75).

The above quotation, attributed to the director of the British Roads Federation in connection with highway planning, helps to set the scene for certain of the arguments against citizen participation in public decision making. In the following sections, arguments are introduced as conceptual, practical, and arising from realism.

Arising from the debate about utilitarianism, there is the concern about unacceptable and adaptive preferences, and/or dishonest statements of preference (Elster 1989; Cohen 1989; Kymlicka 2002): individuals can, for a number of reasons, arrive at or present preferences that would not serve their true interests or that could be unjustifiably harmful to others. The argument is that this could lead to perverse outcomes.

Arising similarly from the philosophical perspective, Elster (1989) asserts that there is no guarantee of agreement. The importance of this objection rests on the nature of the decision and whether a) the citizen contributions are expected to be decisive or b) agreement is considered an essential characteristic of the process.

Other points relate to technical feasibility. Pateman (1970) offers an argument from scale: above a modest size of institution, it is hard for an individual's voice to be heard (and she uses this as the basis for advocating involvement in small-scale democratic processes). Connected to this is the question of achieving representativeness. For a start, the concept of representation is itself contested (Pitkin 1972): do those who participate act for, act in the

interest of, or stand in for the wider population? Or are they in fact sent as delegates? If any of the first three definitions is adopted, it is hard to see how a subset of that population could be truly representative, however selected. When the subset is self-nominated, a range of possible biases comes in to play: those who participate will probably have an age, gender and ethnic profile different from that of the wider population (Fishkin & Luskin 2005; Lowry 2009; Brodie et al. 2009). The participants' interest in the topic is also likely to be greater than average (Kathlene & Martin 1991) and there is no obvious reason for expecting that their views will mirror those of the wider population. One response to this is to question the importance of representativeness (Involve & National Consumer Council 2008), substituting diversity as the characteristic of importance, presumably on the basis that a priority is for the wider population to feel that the process has not been exclusive, particularly if true representativeness is, as argued, unattainable.

There is a further way of looking at the representativeness issue, from the economic concept of collective action problems (Rydin & Pennington 2000): individuals' assessment of the value to them of taking part may lead them to decide to stay away, the result being a negligible response or a skewed profile of participants. Finally, it is argued that those who participate are changed by the process, thereby becoming unrepresentative in another way (International Association for Public Participation 2009).

The most obvious practical argument against citizen participation in public decision making is made from representative democracy: elected representatives have been appointed to do a job and should be allowed to get on with it, the understanding being that dissatisfied citizens will be able to remove them at the next election. This is the classic position of Schumpeter as summarised by Pateman (1970). Underlying this view, it can be argued, is a paternalistic perspective. But it can equally be presented in efficiency terms: periodic elections provide sufficient means for the citizenry to regulate their political environment and more frequent involvement may waste resources.

Another commonly cited objection is based on voter/citizen apathy and the decreasing degrees of participation witnessed in western countries in general (Giddens 2009) and the UK in particular (Power Inquiry (Great Britain) et al. 2006). Though this argument could be put either way, the practical objection to attempting to foster citizen participation is that citizens do not appear to be interested, at least in conventional forms of participation (Lowndes et al. 2001b). This may arise from a systemic problem, such that it is in effect impossible to engage citizens (Theiss-Morse & Hibbing 2005) and/or it may be rooted in a popular dislike of the political process and distrust of politicians (Hay 2007). A decision not to engage may equally be a practical response to a perception that citizen contributions do not influence policy

(Lowndes et al. 2001b). Even so, minimalist models of participation have been in effect discredited (Brooks 2006), lending weight to the argument that there is some sophistication to citizen preferences, whatever their weaknesses.

One reason for a failure to engage may arise from a lack of the necessary social infrastructure, as identified in the spatial planning field. It is argued that there may not be the supporting structure to enable an effective citizen participation process to happen (Healey et al. 2003) or a well-defined community to do the participating (Taylor 2002). A purist response to these arguments might be that citizens do not need to be organised in any sense to participate in decision making but the authors in these cases present empirical evidence that suggests they do.

Whether citizens can be engaged or not, it is argued that they are not equal to the task of participating coherently in decision making. They are susceptible to framing effects (Chong & Druckman 2007) which could suggest either that their opinions are insufficiently grounded or that the methods by which they are elicited cannot be trusted not to distort them. Citizens tend to think irrationally (Shafir & LeBoeuf 2002) and to prioritise irrationally (Marshall & Tse 2010). Bartels (2003), meanwhile, suggests that democratic theorists are guilty of romanticism in their conceptualisation of citizens, ignoring their tendency not to consider questions comprehensively. Perhaps the ultimate criticism is a Kohlbergian one that presents ordinary citizens as less morally advanced than philosophers (though this is not necessarily a problem in the view of Habermas (1995)).

Another category of criticism lies in the supposedly unattainable nature of the conditions stipulated by theorists as necessary for the functioning of true deliberative democracy. For example, Cohen and Rogers (1983) make financial equality a requirement. Leaving aside the likelihood of achieving this particular position, there are philosophical problems associated with even establishing the conditions of participation in principle, as identified by Nagel (1998). In particular, should agreement of the terms of deliberative democracy be reached through democratic means? If so, how can this not be circular (D'Agostino & Gaus 1998)?

Perhaps the most significant of the practical problems is the one identified by Beierle (2002), who points out the limited literature concerning the actual impact of citizen participation upon decision quality: if it is not clear that citizen participation will lead to a better decision (however defined), why should decision makers cede any more power than they have to?

The principal theme of arguments from realism against citizen participation is the preservation of power: the government knows what it plans to do, thus making citizen participation at best a distraction, and at worst actively disingenuous (Kathlene & Martin 1991). Power structures remain unaffected by citizen participation processes (Theiss-Morse & Hibbing 2005), an

assertion supported by the tenor of guidance on consensus building (eg Susskind & Cruickshank 2006) which advises the practitioner to identify existing locations of power as part of initiating a negotiation process. These points recall the cynicism of Arnstein (1969) who classifies most of the examples she sees as non-participation or tokenism. There is a complementary argument that the reasonable citizen response to such processes is rational ignorance, if it is perceived that any contribution is unlikely to influence the result (Kathlene & Martin 1991), leading to a situation in which the elites obtain the outcome they desire (Rydin & Pennington 2000).

The appropriate use of citizen participation

It is appropriate to dwell briefly on this topic for both theoretical and practical reasons. From the theoretical perspective, much attention is devoted in the literature to the sorts of questions which should be remitted to citizens and those which cannot or should not be. According to Habermas (1995), questions can be classed as relating to fact, judgement, preference etc, and there is no point in voting on a matter of fact. But, within the realm of judgement, there is still considerable room for debate: Nagel (1998) contrasts, for example, abortion and the death penalty, claiming that abortion cannot be a subject of deliberative democracy because it ultimately comes down to a matter of personal conviction, whereas the death penalty has to be within the purview of citizen participation because the state (or some other relevant government body) will make the decision to execute a criminal. For his part, Christiano (1996) sets out his own criteria concerning what constitutes a topic amenable to consideration through citizen participation, including non-exclusivity and alterability. To the extent that there is agreement, it seems that a question must have the potential to affect all for it to be a legitimate theme for citizen participation.

The practical considerations relate mainly to the instrumental issue of citizen and member reaction to the use (or avoidance) of citizen participation. It seems desirable to use citizen participation where it has the potential to have a net positive effect though this will not necessarily lend itself to the establishment of principles concerning the precise types of decision that merit citizen involvement given that the perceived success or failure of a given exercise is a function of many variables, including both the history of an issue and the circumstances in which a question is posed.

Discussion

The arguments marshalled above do not readily submit to a forensic assessment that would enable one set to be judged superior to the other. Instead, the impression is that there is a

considerable ideological element to the proposals on both sides, as with the (unsubstantiated) call in Agenda 21 to involve citizens in the development of plans.

With respect to the theoretical objections concerning the feasibility of creating conditions in which deliberative democracy would take place, it can be said that these do not constitute a formal proof that deliberative democracy is an unattainable ideal. To begin with, any democratic structure (any governmental structure, in fact) requires certain conditions in order to perform optimally. That these conditions are not achieved only means that the system will not perform optimally, not necessarily that it is unworkable. This, Neblo (2005) argues, means that it is not appropriate to capitulate. An alternative response is to reconstruct the ideals underpinning deliberative democracy in light of the problems associated with prevailing formulations (Rosenberg 2005).

If the theoretical foundations of deliberative democracy can withstand attacks of the nature discussed, the focus then shifts to the validity of the instrumental arguments and whether practical and realist objections unseat them. The limited amount of empirical evidence either way, together with the fact that outcome is closely related to the specific circumstances of the planning process, means that this too is likely to remain for the time being a matter of preference. Returning to the environmental theme, it can at least be said that the topic of climate change appears to satisfy the requirements of writers such as Christiano (1996) concerning matters that can reasonably be put to the populace: it is non-excludable and alterable. In any case, the general trend has for some time been of increasing participation and this to some extent makes the debate about its merits academic. Citizen participation is taking place, in many cases because it is required or strongly advised by governmental institutions (see §3.2); the questions then become a) what the relationship is between initial conditions, method and outcome; and b) how, in normative terms, to derive the greatest value from the participation process.

3.2 Requirements, preferences and current practice in UK citizen participation

There are numerous laws which require UK public bodies to “consult” concerning policies and developments (See McGee et al. 2003 for a limited and now somewhat outdated survey). These range in the extent to which they prescribe who should be consulted and in what way. But they are generally consistent in avoiding any requirement to act upon the views of citizens or other stakeholders. The key counterexample is referendums but these take place very rarely and, in the case of local authority referendums, it is argued that they are not initiated by councils for truly democratic reasons but to resolve political conflicts (Laisney 2012). The other significant mechanism which, since 2011, obliges government to respond to citizens is

the e-petition (a petition launched on-line through the UK government's portal): if 100,000 signatures are received within a calendar year, the motion is passed to the House of Commons Backbench Business Committee, with the presumption that a debate on the topic will be scheduled provided a number of conditions are met (UK Parliament 2013a). As of April 2013, 20 debates had taken place on motions that had surpassed the threshold (UK Parliament 2013b). But for citizens to be able to prompt a debate falls far short of their being given the power to decide on the issue in question.

The approach in England to consultation has been significantly altered since the change of government in 2010. The most recent consultation guidance for central government (Cabinet Office 2012a) removes rules concerning time periods and methods that had previously been standard (Better Regulation Executive 2008), and is based instead on an argument of proportionality: users are encouraged to design their approach to reflect the audiences they wish to reach and the significance and complexity of the topic. The current administration has also reversed a "duty to involve", applying to local authorities, that had been introduced by the previous government, with the aim of "embedding a culture of engagement and empowerment" (Department for Communities and Local Government 2008b, p.19). In its place, the coalition government has introduced new guidance: though it still requires local authorities to consult, the guidance relates largely to service commissioning and is rather weaker in its formulation (Department for Communities and Local Government 2011b). Meanwhile, the Localism Act (Department for Communities and Local Government 2011a) provides the clearest picture yet of the current administration's view: in contrast with the Labour government's emphasis on empowerment and engagement (eg Department for Communities and Local Government 2008a) based on a picture of citizens needing help in order to participate (Lowndes et al. 2001b), the coalition's perception is of a citizenry fully capable of participating but frustrated by obstructive systems and the unhelpful behaviour of public bodies. The Act provides, for example, a community right to challenge local authorities on the provision of services. It also imposes on councils an obligation to hold a referendum on council tax rises that exceed an upper limit set centrally (perhaps another example of local referendums serving to resolve political differences). And its introduction of neighbourhood plans (based on boundaries determined by local people rather those of administrative geography) further emphasises the proposition that people are keen and already sufficiently skilled to manage their localities, but need to be given the power to do so.

Neighbourhood plans provide a good test of citizens' appetites to be more fully involved in public decision making, given their tendency, when asked, to express this desire (Ipsos MORI 2010; Department for Communities and Local Government 2011c). According to one list, 245 plans have been initiated in England, including the 17 "frontrunners" (Much Wenlock

Neighbourhood Plan 2013). It is too early to comment on the impact of this new initiative but the impression is that the majority of these are based in wealthier areas of the country and that, so far, the total area of neighbourhood plans encompasses a relatively small proportion of the English population. This seems consistent with the finding that, in 2010-11, approximately one sixth of adults engaged in "civic consultation"[6] (Department for Communities and Local Government 2011c). The current government's localism agenda in fact provides an excellent means of testing more generally whether the coalition's picture of the frustrated would-be activist is a more accurate representation of the facts than Labour's disempowered citizen. If participation increases, this will favour the coalition view; but, if that growth is not socio-demographically balanced, this may suggest that both narratives have some validity.

What then of the views of local authority stakeholders concerning the participation of citizens in decision making? These tend to be difficult to ascertain but some evidence is available, producing a second contrasting picture. Lowndes et al detected "commitment and enthusiasm across local government for innovation in this area" (Lowndes et al. 2001a, p.214).

> "This growth in participation opportunities reflects more than simply a response to the current democratic renewal agenda or, indeed, a party political programme. Rather, it demonstrates a sense of ownership within individual authorities of the democratic possibilities which such initiatives hold and a willingness to develop them" (Lowndes et al. 2001a, p.214).

More recent work based on Scottish local authorities (Orr & McAteer 2004) suggested a less positive attitude. A majority of councillors participating in the associated survey thought that there was little desire amongst citizens to participate and that people used participation processes to complain. And councillors and senior officers agreed in thinking that "public participation exercises always result in the 'usual suspects' participating more than others" (Orr & McAteer 2004, p.146). The most telling finding is that a majority of councillors did not wish to be bound by the results of participation. It is perhaps not therefore a coincidence that, when they were asked what would increase participation, the most popular answer was *improved access to councillors*. Evidence from the Netherlands suggests a similar attitude amongst councillors there (Klijn & Koppenjan 2000), whilst research in Norway, though generally more positive about councillors' use of citizen input, found that the most senior and the most educated councillors gave it the least attention (Askim & Hanssen 2008). Given this lack of enthusiasm on the government side, it is understandable that the current emphasis on engagement on the part of public bodies arises from a fear of being legally challenged over

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[6] This term "covers taking part in consultations about local services such as completing questionnaires, attending public meetings or being involved in discussion groups" (Taylor & Low 2010, p.10).

compliance with relevant legislation relating to consultation (Consultation Institute et al. 2012) rather than a zeal to devolve power.

Before turning to citizen participation in the context of climate change, the final topic to address in this general discussion is the range and prevalence of methods used by local authorities for participation. A general picture is provided by Lowndes et al (2001a) whose division of methods into five types (consumerist methods, traditional methods, forums, consultative innovations and deliberative innovations) was designed to differentiate amongst the motivations for initiating a participation exercise. They found that more than 90 per cent of authorities were using at least one "consumerist" form (complaints scheme, satisfaction survey or other opinion poll), with nearly the same proportion using traditional methods, most commonly public meetings and consultation documents. Use of forums was also almost as widespread. Nearly half of councils used focus groups and an only slightly smaller proportion involved citizens in community planning exercises. On average, authorities surveyed used approximately nine different participation methods in the census year though this number conceals the frequency with which a given method may have been used. Subsequent research, conducted upon very similar lines, provides some insight on this point: the methods used most frequently were area/neighbourhood forums (15 uses on average in a calendar year[7]), question and answer sessions (12 uses), and public meetings (11 uses), with referendums, citizens' juries used least (once in a year) (Birch 2002).

A more recent survey of public sector bodies (Consultation Institute et al. 2012) found consultation documents to be the method used by the greatest proportion of respondents' organisations (93 per cent), followed by online surveys (87 per cent), focus groups/discussions (84 per cent) and public meetings (83 per cent). The least prevalent methods were deliberative events (42 per cent), telephone surveys (40 per cent) and participatory budgeting (16 per cent). The survey was not limited to local authorities, however, and respondents were self-nominating so the results cannot be seen as definitive. But, if they approximately represent current practice, they demonstrate significant growth in online methods, which is not unexpected, and an attendant decline in use of the telephone. Where they tally with the results of the earlier work is in the emphasis on methods that rely on mass dissemination and/or established structures and are therefore relatively efficient. Also of interest in the survey results is a strong indication that the volume of public engagement has been increasing; reasons given include the pace of change and the need to seek public approval for difficult

[7] The implication in the source is that this is an average across respondents who had used the method at least once, as opposed to a cross-sample average.

decisions in light of reduced funds. Respondents also mentioned the Localism Act and other legislation as a reason for conducting more participation activity.

Work relating to consulting on budgets in particular (Delib 2006) reveals a different pattern: paper surveys were the commonest method used (29 per cent), closely followed by focus groups (26 per cent), public meetings (25 per cent) and online surveys (23 per cent). It is notable that this survey was conducted before the change of government led to significant cuts in funding to local authorities. Research conducted by Headland (2012) after the start of the austerity regime shows how councils have encouraged the participation of citizens in these more challenging budget decisions. The growth in internet use in the six years between the two research exercises helps to explain the dominance of online surveys (used by 77 per cent of respondent authorities) though their internet-based cousins are less extensively employed – social media were used by 23 per cent of respondents and an online budget calculator by 21 percent. These lower rates are probably explained by the relative novelty of social media as a communication tool in the public sector and limited awareness of the scope to use budgeting tools. After online surveys, the most widely used methods are citizens' panels (52 per cent), public meetings (39 per cent), written submissions (36 per cent) and discussion groups (30 per cent). As with general consultation exercises, "mass" forms are widely used and more deliberative exercises play a lesser role.

Alongside this research into methods used in engaging the general citizenry, it is important to note that local authorities are obliged to conduct consultation exercises with respect to certain specific services and these can be both more intensive and more innovative. A study of approaches taken by local authorities to the development of their Children and Young People's Plans (CYPPs) (Halsey et al. 2009) found that the vast majority had attempted to engage young people aged six to 19 and that a third had made efforts to involve children from zero to five years of age. Authorities had also made extensive efforts to engage seldom-heard groups, including black and minority-ethnic groups and children with learning difficulties or disabilities. Methods used included small-group events, such as school councils, youth parliament and summer schools, surveys/questionnaires, large events and focus groups. There were also examples of more innovative tools: "web-based consultations/'blogs', creative activities such as art competitions, drama and video productions, and trips out" (Halsey et al. 2009, p.12). Of course, one significant difference here is that the CYPP has a user group from whom conventional participation methods could be expected to elicit only a weak response, leaving authorities with little choice but to deploy the necessary resources and subtlety to learn their service users' views. This prompts the question of how low response rates to general citizen participation exercises would need to become before authorities felt compelled to review their approaches. Another difference is that, whereas children and young people are a well-defined

audience, the audience for many other policies on which a public body might seek views will be more diffuse. Climate change is a case in point since most relevant policies will affect all citizens to a greater or lesser extent. How, then, does government engage citizens on this specific issue?

3.3 Citizen participation with respect to emission reduction

A discussion of this topic can helpfully be structured by identifying three categories of initiative:

- Those aimed at encouraging citizens to adopt low-carbon behaviours
- Those in which citizens are invited to or opt to become participants in low-carbon activities such as the development of renewable energy infrastructure
- Those intended to inform, determine or endorse the selection of pro-environmental interventions that are to be delivered by the sponsoring governmental body

The third category is of greatest interest given the focus of this research but there is some overlap, a point emphasised by the head of communications at the UK Department of Energy and Climate Change who saw his work as having four objectives: to provide relevant information; to provide consumers with the means to adopt low-carbon behaviours; publicly to encourage wider grassroots movements/coalitions of the willing; and "to provide the sign-off for the larger decisions required for the development of sustainable infrastructure; for example, the investigation and use of nuclear and/or renewable energies as alternatives" (Regniez & Custead 2010, p.210). His emphasis on endorsement rather than participation in the decision making may reflect his role in communications but the point is nonetheless strongly made that citizens' own behaviour is not far removed from their attitudes to the pro-environmental interventions pursued by government. The first two categories are examined together before attention turns to the third.

Individual behaviour change (1) and citizen as partner (2)

Looking briefly at initiatives designed to promote behaviour change in citizens, three examples help to show the range of activity beyond "classical" marketing/communication (in the form of advertising).

- The Act on CO_2 calculator (Department for Environment, Food and Rural Affairs 2005) is a good example of a method that invites individuals to reflect on their emissions and to consider possible changes on the basis of information they have provided concerning their circumstances and lifestyle.
- Carbon Conversations (The Surefoot Effect 2013), though not a tool of government, promote reflection upon emissions and adoption of low-carbon behaviours. The

Conversations are a series of themed meetings amongst citizens living within a neighbourhood and involve some information dissemination, simple board games and group discussion concerning possible actions (Todhunter 2010).

- The deployment of "smart meters" (Department of Energy and Climate Change 2013) represents the least reflective end of the spectrum. From the perspective of climate change, the thinking behind smart meters is that they provide consumers with accurate and comprehensive data concerning their use of energy, leading in many cases to reduced consumption if only out of self interest. There is some evidence to suggest they are effective (eg Ehrhardt-Martinez et al. 2010), Darby (2010) arguing that having information about one's energy use is a necessary (if not sufficient) step towards reducing it.

With respect to taking part in a low-carbon initiative, a common phenomenon in continental Europe, there is an increasing number of cases in the UK of citizens being enticed by government to share in the delivery of renewable energy infrastructure. The nature of the preceding dialogue varies with the circumstances but will involve some balance between an appeal to individuals' concern about the environment and one to their self-interest, given that renewable energy measures ordinarily offer a financial return to the communities that adopt them. According to Marsh, "nothing, it seems, talks louder to the people who have to live with turbines and other infrastructure in their midst than a sense of ownership, money and other direct benefits" (Marsh 2013, p.17).

Citizen participation in determining pro-environmental actions and policies (3)

Turning now to the third category identified above, practice varies quite widely. To frame the discussion, three characteristics of relevance are identified (drawing upon Rowe & Frewer 2005):

- The way in which citizens become involved and participate – whether or not recruited, whether involved over an extended time, whether participating simultaneously and/or face-to-face
- The content of the participation process – whether using expert evidence, scenarios, quantitative data, trade-offs etc
- The nature of the outcome – how specific, whether relating to policies or programmes, whether advisory in status or deciding the public body's course of action

How citizens participate

There are several examples where citizens are recruited to take part, often because the participation concept makes the likelihood of self-nomination low. New South Wales in

Australia, for example, held a "community climate summit" in 2009 and recruited citizens to fit a profile in order to obtain a demographically representative result (Kikken 2009). The City of Edmonton in Canada similarly recruited a "citizens' panel" to participate in a series of deliberative meetings very like a citizens' jury (The City of Edmonton et al. 2012). And international examples, where a deliberate effort was made to gather the views of people in a range of countries, also involved the recruitment of participants: in 2008 there was a European youth town meeting (Pan European eParticipation Network 2008) as part of the IDEAL-EU project (European Commission 2009) for which young people in three municipalities were invited to volunteer (as was a wider group that took part on-line). The participants gathered in each of the three cities and electronic links between the locations enabled joint deliberation to take place. World Wide Views on Global Warming (Bedsted & Klüver 2009) meanwhile, which gathered the opinions of citizens from numerous countries in the run-up to COP15 in Copenhagen, was based on the recruitment by each partner agency of a group of 100 citizens to match a demographic profile.

The extent of the involvement varies across these examples: for the most part, those participating in World Wide Views attended for a day, whilst the Edmonton citizens met for six sessions over two months. There is a similar variety amongst those examples that are based on self-nomination or more "organic" participation. As explored in §2.1, much of the work done in developing Local Agenda 21 strategies involved citizens quite informally, with a spectrum of commitment ranging from casual participation in a particular event to serving long-term on a steering group (Morris & Hams 1997). And the origins of the Transition Town movement in Kinsale, Ireland are visibly informal, with staff and students at a local college engaging local residents in a process of dialogue that led to the council's subsequent involvement (Students of Kinsale Further Education College 2005).

Most of the examples given here involve face-to-face, simultaneous contact. The World Wide Views project was posed a technical challenge in bringing participants together across time zones which meant that there was limited interaction between partners during the deliberation day (though the participants in any one location were together in a single room). The limited evidence available suggests that government is wary of using online platforms for the determination of policy given the only slight control that can be exerted over contributions. Royo et al (2012) find that most e-participation on climate change takes the form of information provision, with much less "interactivity" occurring. They find very little evidence of e-rulemaking or e-petitions.

A distinctive approach deserves separate mention: Ramsay and Naidoo (2012) report on door-stepping local residents in Durban, South Africa, to gather data that informed a carbon

footprint for the local area. This is quite different in style and is located at an earlier point in the planning process than other examples discussed here. But it is interesting because it asks relatively little of participants yet was found to generate interest and enthusiasm. Given that the topic of climate change either tends to attract the already-concerned or requires event sponsors to pay participants an honorarium in order to achieve a demographically representative sample, this is a useful finding.

Content of participation exercises

Most of the cases discussed here involved some form of dialogue amongst citizens, be it facilitated or not. The following examples are therefore differentiated according to whether they included other specific components or methods.

As already identified in §2.1, a variety of then-innovative participatory methods were used in the UK in the development of Local Agenda 21 strategies (Morris & Hams 1997), including visioning, Future Search (Janoff & Weisbord 2013), Planning for Real (Planning for Real 2012) and parish mapping.

Planning for Real and parish mapping both involve a strong element of visualisation, which has also been used more recently in the district of North Vancouver, Canada. The Local Climate Change Visioning (LCCV) Project (Cohen et al. 2012) that took place there was a participatory integrated assessment exercise (Ravetz 1999) that exploited advances in three-dimensional computer imaging in order to present participants with landscape pictures under a range of future scenarios. The project is rare in that its impact was evaluated, with the evaluation indicating increased understanding amongst participants of the problem and its urgency, as well as support for the pro-environmental measures discussed. Further, according to one of the designers of the event, "combined with other salient information, [science-based pictures] help people to know, see and recognise what was previously vague, abstract or hidden" (Sheppard 2011, p.403). Visual representation is also used by Metroquest (MetroQuest n.d.), though in a perhaps less "custom-built" manner, ie employing local imagery to render familiar a generic template. GRIP (Carney & Shackley 2009) and REAP (see Chapter 5) are both designed first as emission estimation models but each has the capacity to operate as a planning/decision-support tool, using pie- and bar-charts to convey the emissions associated with business as usual and prospective courses of action.

Scenarios are widely used (for example in Future Search) and were a major part of work done in Geraldton, Australia (Armstrong 2010) in developing a sustainability plan for the town, *Geraldton 2029*. Ivner et al (2010) saw encouraging results when they trialled a scenario-based method for energy planning in Sweden. Scenarios also feature in the open-access, web-based initiative *My2050* launched by the UK Department of Energy and Climate Change (Delib

n.d.), in which individuals are asked to find a mix of energy provision and demand restraint that will achieve the targets set by the Climate Change Act. And, whilst not explicitly relating to climate change, SCENES uses "fuzzy cognitive mapping" as a way of expressing visually the relationships within a complex system, in this case water (Kämäri et al. 2008). Less common is the use of explicit trade-off between priorities (though it is implicit in *My2050*). One example is provided by Stagl (2006) who used multi-criteria evaluation experimentally with citizens in working towards future energy policy in the UK, a second being Lo et al's work on discussing alternative carbon-pricing mechanisms in Australia (Lo et al. 2013).

Another commonly-seen component is expert evidence, a staple of citizens' juries, and used in both Edmonton and Geraldton. And voting appears more or less formally in several examples, playing a key role in World Wide Views of Climate Change and in the youth town meeting that took place as part of IDEAL-EU, whilst *Geraldton 2029* used the 21st Century Town Meeting model (America Speaks 2010) which employs electronic voting to aggregate the views of participants. *Geraldton 2029* also used deliberative polling (Fishkin & Luskin 2005) as a way of tracking participants' opinion over the course of their involvement in the planning process.

A technique that also deserves mention is the Integrated Assessment (IA) focus group as incorporated in the project known as ULYSSES (Urban Lifestyles, Sustainability, and Integrated Environmental Assessment) (Tolba 2003). The IA focus group gives participants access to "state of the art IA models to support their debate" (Tolba 2003, p.460). ULYSSES invited citizens to discuss possible responses to climate change drawing on the models as necessary during their deliberations. A distinction of this project was the use of cultural theory in its design, with various categories of individual defined in terms of their attitude to climate change (hierarchist, fatalist, etc) identified as part of proceedings (van Asselt & Rotmans 2003). For van Asselt and Rotmans, ULYSSES marked a watershed in the evolution of participatory integrated assessment, quantitative modelling of the IA type having hitherto played a largely exogenous role in participatory choice processes.

Outcome of participation

As will be seen, there is a correlation between how citizens participate, the content of participation exercises and their outcomes. For example, the international cases (World Wide Views and the IDEAL-EU town meeting) both produced quite general recommendations to policy-makers concerning climate change. This is understandable, given the spatial range over which they took place though, in the case of World Wide Views, the intention was that participants would be able to reach more specific conclusions concerning their own countries in addition to voting on generic pre-agreed propositions. It is perhaps more surprising that certain local exercises produced few "hard" outcomes: *Geraldton 2029*, for example, despite

the use of a range of deliberative methods and technology, arrived at an action plan (City of Geraldton-Greenough 2010) that allows a considerable margin of interpretation. In contrast, the New South Wales summit and Edmonton citizens' panel produced more specific and "enforceable" policy recommendations. And those examples that used detailed scenarios to compare different packages of policy measures tended to arrive at firm conclusions (eg Local Climate Change Visioning project in Vancouver), whilst it is nearly axiomatic that methods involving the use of trade-offs will arrive at a defined result, given that trade-offs can only take place if the options' impacts have been quantified, a pre-requisite of which is that they be well defined.

There appears to be no evidence of citizens being given the power to decide over pro-environmental measures or programmes, with all of the examples discussed here at most informing policy, even where councillors have themselves participated (eg Vancouver). In contrast, a design "charette" that took place in the City of North Vancouver[8] produced a 100-year sustainability vision (Condon et al. 2009) that received the mayor's imprimatur and therefore, in some sense, can be seen as policy. The charette was notable in that it included numerous "stakeholders" representing various sectors but no ordinary citizens.

One case deserves special mention: members of the Transition movement in Monteveglio, Italy, collaborated with the local council in the drafting of its legislation such that it included a 350ppm carbon dioxide concentration target and stipulated the review of local planning law with a view to its incorporation of regional statutes bearing on Energy Efficiency and Building Energy Certification (Hopkins 2009). This probably represents the zenith to date of citizens determining climate policy but it is remarkable specifically because of its rarity.

Discussion

The examples above display a variety of methods used to bring the issues of climate change to life for participants and to make the resultant choices explicit and intelligible. It should be noted that they probably represent the exceptions rather than the rule where citizen involvement in public decisions concerning climate change are concerned, with most consultation that does take place being rather more perfunctory. And they confirm what has been shown more generally in this chapter, that the transfer of any quantity of true power to citizens is rare. Nevertheless, they do suggest some interesting lessons:

- The more local the exercise, the more specific the outcome

[8] Note that the District of North Vancouver is distinct from the City of North Vancouver.

- The more specific the scenarios or options being considered, the better-defined the conclusions reached

There is a clear link between quantification and specificity: where an impact is quantified, participants will be better equipped to make decisions concerning it and so are likely to reach more specific conclusions. There is also an important role for visualisation, given the lack of indisputable evidence of climate change that can be directly experienced. But, according to Sheppard, "it appears that even without visualisation, knowledge and motivation can be somewhat increased by processes which use clear graphics, describe alternative future scenarios, and address local climate change impacts and solutions" (Sheppard 2011, p.406).

As for whether these examples relating to climate change demonstrate that public bodies conduct citizen participation in this policy context in a special way, this does not seem to be the case. That councils expended greater-than-average effort on involving citizens during LA21's heyday has been discussed and the methods used then were perhaps novel. But it seems that citizen participation in other fields has caught up: Planning for Real is seen in the participative design of housing and town centres and Future Search is used in a wide range of settings as are scenarios more generally. Deliberative methods too are seen being used in numerous settings (eg Sciencewise ERC (n.d.)). But Sheppard's point, quoted above, probably constitutes the most useful finding from this survey, that certain design characteristics (though hardly unique to citizen participation on climate change) can help to bring an otherwise vague and remote topic into focus.

3.4 Deliberation

Sheppard does not, however, opine concerning the contribution that deliberation can make to citizen participation on responding to climate change. Deliberation is a topic that arises extensively in the literature and so its role in citizen participation is considered here. In particular, to what extent can its inclusion alleviate some of the problems identified above relating to citizen participation in general?

Definition

According to Elster, there are three ways of getting past a decision-making impasse – arguing, bargaining and voting (Elster 1998). He claims that arguing (deliberation) is naturally prior to the other two, in that it is through argument that decisions are made as to how voting and bargaining might work.

As for what deliberation consists of, the following quotation is representative of the definitions encountered in the literature. "Generally speaking, we can say that deliberation is debate and discussion aimed at producing reasonable, well-informed opinions in which participants are

willing to revise preferences in light of discussion, new information, and claims made by fellow participants" (Chambers 2003, p.309). For Fishkin and Luskin (2005), deliberation must be informed (supported by reasonably accurate factual claims); balanced; conscientious (participants are willing to talk and listen, with civility and respect); substantive (arguments are considered on their merits); and comprehensive ("all points of view held by significant portions of the population should receive attention" (Fishkin & Luskin 2005, p.285)).

Alongside these definitions based on the characteristics of a process, Yankelovich (1991) offers a distinctive view of the result of the deliberation journey in terms of its outcome: *public judgement* (his term for the result of true deliberation) occurs when citizens are prepared to take responsibility for the consequences of their views.

Various forms of citizen participation can be claimed to be explicitly or incidentally deliberative, from Deliberative Polling itself (Fishkin & Luskin 2005; Siu et al. 2010) through to the consensus-building techniques encountered in the environmental planning literature (eg Innes & Booher 2010) and elsewhere (Susskind & Cruickshank 2006).

Variations in deliberation

Whilst different citizen participation methods may imply different degrees of deliberation, it is possible to identify a range of variables peculiar to the deliberation element itself.

One significant practical factor is whether deliberation is conducted face-to-face or, as is increasingly the case, online. Within online deliberation, there are both synchronous and asynchronous variants. Opinions differ as to their merits: Lowry (2009) sees a place for online deliberation, as do Janssen & Kies (2005), though they raise concerns about the extent to which real deliberation can take place in this medium, pointing out that there is much online behaviour (eg "flaming", the practice of extreme criticism) that seems to fall far short of the Habermasian ideal, and there is ongoing debate concerning how fully individual identity needs to be revealed as part of the process. But Lowry makes the important point that online deliberation presents an opportunity for participation to people who may not wish to attend a meeting in person.

Certain deliberation processes are unavoidably quantitative to a degree (for example the consideration of options that have different financial costs and revenues) whilst others do not feature numbers at all. This is significant because concerns about the capacity of participants to think rationally (raised as a general concern by Shafir & LeBoeuf (2002)) are translated into well-established evidence of bias and error in consideration of gains and losses in general, and probabilities in particular (Baron 2007).

Another area of variation is in the scope for option generation or modification. For some theorists (eg Christiano 1996), this is an essential element of truly democratic deliberation; it is also argued for on practical grounds (eg Jones et al. 2009). Connected to this issue is the question of whether the task is to find a single preferred option or not, recalling Stirling's dichotomy between "opening up" or "closing down" discussed below. And any deliberation exercise is likely to take place within at least some constraints, if only simply that the final choice needs to be compliant with the law. But there may be many further constraints, in terms of budget or the nature of the items considered.

Probably the most important area of difference is in expected outcome. For Mansbridge (1980), there is a place for both unitary and adversary democracy, an assertion borne out by the empirical findings of Carpini et al (2004). Deliberative Polling, for example, does not ordinarily lead to a single answer. And many governmental bodies inviting citizen participation do not expect (or perhaps even want) to be presented with one preferred option. But, where citizen participation is intended to drive a decision, some resolution is necessary, whether this be in the form of true unanimity or, more likely, the selection of the option which best represents the wishes of the participants (leaving aside for now the difficulties associated with defining "best").

The role and benefits of deliberation

Having offered a brief introduction to the concept, it is necessary now to consider the circumstances in which deliberation is a desirable attribute of citizen participation. One guide is the dichotomy proposed by Stirling (2005) between planning processes that involve opening up (exploring a topic and considering new facets of it) and those aimed at closing down (moving towards a single answer). Broadly speaking, deliberation belongs more to the former type of decision, though Stirling argues it can also serve well in "closing down" settings. Referring back to the Chambers definition above, it is notable that reaching a single conclusion is not seen as an essential characteristic of deliberation. So, if deliberation does not help to provide a single answer, what benefits does it bring?

There are various formulations of the view that deliberation fosters a shared understanding (if not unanimity): there is the "unforced force of the better argument" (Habermas 1995, p.163) which leads people of different opinions to shift towards each other as they are impelled to accept the views of all other participants. This process is assisted by the capacity of participants' preferences to alter (Dietz 1994) and for preference structuration (the creation of a degree of collective order amongst individuals' desires) to occur through deliberation (Dryzek 2005). Not only are participants more respectful of others' opinions as a result of deliberations, they also take fuller account of the evidence and arguments relevant to the

topic, particularly if these are supported by the provision of information (Yankelovich 1991), though Kriesi (2005) warns that this is not automatically the case and that information can sometimes serve to entrench views.

Though there is a strong relationship between context (for example the contentiousness of the topic or the competitiveness of the debate) and output (extent of unanimity and participant satisfaction) (Bächtiger et al. 2005), several writers assert that deliberation brings benefits: it can foster consensus and even engender a sense of harmony amongst participants (Bächtiger & Steiner 2005); it leads to comparatively high levels of satisfaction with the process amongst those taking part (Carpini et al. 2004); and, as noted above, certain authors claim that it leads to better decisions than non-deliberative processes.

Objections

Many difficulties are asserted with deliberation as a practice, some of which resemble arguments against citizen participation in general.

Two technical arguments are that the process of consensus building through the change of preferences is undesirable because that change in fact results from manipulation (Kriesi 2005; Crano & Prislin 2006); and that it is difficult to evaluate deliberation, making a robust assessment of its benefits problematical, not least because of the role of context in determining outcome (Habermas 2005).

Various practical concerns are voiced in the literature. Deliberation is thought unlikely to come about without moderation (Fishkin & Luskin 2005) or explicit organisation (International Association for Public Participation 2009), if more than a simple vote is desired. And debate continues concerning the extent to which participants need to be provided with information in order for "real" deliberation (as defined above) to take place: how, if not through information, can laypeople be expected to tackle a topic of any complexity or technical content? Put another way, uninformed deliberation is at risk of producing outcomes that are inconsistent with the evidence. But what kind of information should be provided? The so-called Public Understanding of Science movement was based on the "deficit model" which identified public ignorance of the facts as the barrier to its arriving at well-informed, rational opinions. According to Wilsdon & Willis (2004) the movement has been largely discredited though Bell (2006) discusses an interesting case of scientists who felt strongly that the public should not be told about all the uncertainty inherent in scientific research. Perhaps the most that can be said is that the fuller the deliberation that takes place, the more participants are likely to be able to manage learning about differing interpretations and uncertainty.

There are concerns about perverse phenomena that are witnessed in small group deliberation (eg dishonesty or manipulation), inconsistent with the Habermasian ideals of open and honest debate (Kerr & Tindale 2004); and questions are raised by Bächtiger & Steiner (2005) as to whether equality can obtain in deliberative settings, whether a lack of equality might lead to manipulation of certain participants or game-playing, and whether participants are in fact equal to the intellectual task of deliberation to begin with. Carpini et al (2004), meanwhile, raise issues of lack of engagement, interest and trust in processes, reminiscent of similar concerns regarding citizen participation in general. And Thompson (2008) identifies a negative relationship between deliberation and subsequent participation in voting, suggestive of a form of consultation fatigue. He also argues that it is hard to establish rules for conducting engagement that do not fall foul of one or other governing principle of deliberative democracy. Perhaps his most damning criticism is that no attempt appears to have been made to evaluate the *justice* of decisions reached through deliberation. And deliberation is seen to face the same real-world obstacles as citizen participation in general. According to Yankelovich we live in a "culture of technical control" (1991, p.11) which greatly constrains the capacity of deliberation on the part of laypeople to influence decisions made using technology as a means to isolate citizens.

Discussion

It is interesting that no writer appears to argue against thinking about and discussing a topic *per se*. But the objections named above cannot be brushed aside lightly. Some, such as concerns about intra-group inequality and manipulation, can be managed to some extent through careful design and facilitation (see Chapters 7 and 8). As for Yankelovich's complaint about the use of technology to isolate citizens, this is very relevant to the issue of climate change, where some technical intervention is unavoidable if the issues and questions are to be meaningfully articulated, so there is a need for this aspect to be handled with care. But the benefits of deliberation may ultimately outweigh the costs, given earlier remarks concerning citizen apathy and distrust on the parts of officers and members. If deliberation leads to a richer and more meaningful experience for participants, what of impact? Citizens are often wary of participating because they suspect that their contributions will have no effect, a point eloquently made by Lowndes et al in this summary expression of citizen frustration with government: "they are prepared to listen but then they do what they want" (Lowndes et al. 2001b, p.452). Citizens understandably want their participation to be productive. This is an area in which participatory budgeting can stand out, so it is discussed next.

3.5 Participatory budgeting

The following is a helpful working definition of participatory budgeting (PB): "a mechanism (or process) through which the population decides on, or contributes to decisions made on, the destination of all or part of the available public resources" (Global Campaign on Urban Governance 2004, p.20). The definition can be seen to allow for a number of variants, though it fails to identify the critical issue of who "the population" is. These points are discussed further below.

PB is generally agreed to have been first practised in Porto Alegre, Brazil (Baiocchi 2003; Wainwright 2009). It has since been widely exported and examples of it are found in all continents though, other than in Latin America and so-called developed countries, it tends to have taken place under the auspices of development organisations (Shah 2007a).

For the purposes of this examination of PB, its use in Porto Alegre is briefly discussed, before UK applications are surveyed. There then follows a discussion of the general method.

PB in Porto Alegre

Participatory budgeting (*orçamento participativo*, literally "participative budget") was first instituted in 1989 after the Workers' Party came to power in local elections (de Sousa Santos 1998). Given criticisms of modification to the system following a change in administration (Chavez 2008), its original form is discussed here.

The system is delegate-based, with each of 16 districts electing representatives whose task it is to articulate at weekly cross-city meetings the views arising in their respective districts' sometimes-heated debates (Wainwright 2009). The delegates' meetings follow an annual cycle leading up to the setting of the city budget, where citizens are thought to determine the distribution of approximately three per cent of overall spend (International Association for Public Participation 2009). Participation is balanced in terms of educational attainment, ethnicity and gender though representatives are more likely to be male and tend to have a higher-than-average level of education. A distinction of the Porto Alegre system is the extent of "infrastructure" supporting participation, including a committee whose purpose is to provide participants with education designed to enable informed contributions (Baiocchi 2003).

Though comparisons are not straightforward, it is argued that Porto Alegre has benefited from the PB process, now having better sewerage, more schools and lower levels of truancy than comparable cities not using this method (Wainwright 2009). Prior to the change in administration, the Workers' Party continued to enjoy high levels of popularity in the city and Porto Alegre received many accolades for its quality of life (de Sousa Santos 1998). An attempt

to transfer the system to the state level, however, was not a success (Schneider & Goldfrank 2002).

UK experience

Varying styles of PB have been used by public bodies in the UK, including health providers (Tower Hamlets Partnership 2010), police authorities (Church Action on Poverty 2011b) and fire authorities (Church Action on Poverty 2011a). Central government launched a pilot programme to support its drive to establish PB in all local authorities (Department for Communities and Local Government 2008c) and, as part of this, established the Participatory Budgeting Unit (PB Unit), a non-governmental organisation with a specific mission to roll out PB in order to assist people in poverty in the UK. Following the change of government, *Your Local Budget* (launched under the banner of Big Society) involved the selection of nine pioneer authorities whose principal challenge was to bring PB "into the mainstream" (Bowers & Bunt 2010).

Evaluation to date of the PB experience in the UK shows that it has tended not to emulate the methods of Porto Alegre, being for the most part "community chest" exercises, with relatively small discretionary sums being made available to communities to allocate to projects. It has been common for the allocation process to take the form of a "beauty parade" in which applicants have presented their proposals at a public meeting (SQW Consulting et al. 2010) prior to a selection process.

Two examples are worthy of fuller examination.

Tower Hamlets has allocated more of its budget than most authorities, investing approximately £2.5 million in each of 2009 and 2010, across eight "local area partnerships" (clusters of electoral wards) (Tower Hamlets Partnership 2010). The borough imposed a relatively firm structure on proceedings by presenting citizens with a fixed menu of options (under six themes). The voting process ensured that at least one item was selected per theme before the remaining resources were freely allocated across the full set of options. Voting took place at a single meeting in each Local Area Partnership; officers analysed the socio-demographic profile of those who had registered to participate and took active steps to recruit to fill gaps. It is interesting that the borough decided to exclude under-18s from voting in 2010, having allowed them to participate in 2009 (London Borough of Tower Hamlets 2010a).

Manton in Nottinghamshire is interesting because PB is seen by community representatives there as being part of a much wider process of building social capital in an extremely run-down area. It is also notably a smaller area (covering less than a ward) than has tended to be involved in UK PB exercises. The PB in Manton can be seen as building on the work done over

time on community empowerment in the context of various regeneration initiatives in the area. Its managers report that 35 per cent of those participating had never before voted in any capacity (SQW Consulting et al. 2010).

Tower Hamlets and Manton provide helpful examples at opposite ends of the spectrum in terms of size and budget. They are similar in that, in both cases, the PB has been seen as part of a wider process (of improving perceptions and performance of local services and extending participation, in the case of Tower Hamlets, and of building social capital, for Manton) The evidence in Manton is of progress being made, though it is not possible to disentangle the effects of PB from those of the other strands of activity. Nonetheless, an evaluation concluded that residents are taking more ownership over services being provided in their area (SQW et al. 2011). In Tower Hamlets, meanwhile, engagement with "hard to reach groups" and influence on local decisions were both identified as areas in which moderate to high levels of improvement had been seen (SQW et al. 2011).

Varieties of PB

Several variables can be discerned amongst the examples of PB in Porto Alegre and the UK.

As already identified in the discussion of UK examples, the motivation for using PB ranges from service improvement to building social capital, a variety borne out in the literature, with some writers arguing for its benefits in improving governance (Shah 2007a) and others seeing PB as a tool of citizen liberation (Wainwright 2009). And PB exercises also vary in the extent to which power is devolved to citizens, the outcome of deliberations being either a firm decision on spending or a contribution to a decision taken at member- or officer-level. Where the citizens' decision is final, the example of Tower Hamlets suggests that authorities will place constraints on spending options in proportion to the amount of finance made available.

The sum of money to be allocated (in proportionate terms) has varied considerably: most UK examples have involved amounts considerably less than one per cent of the host authority's overall budget, in comparison with the three per cent of City Hall's spend released in Porto Alegre. As for how it is spent, the focus in Porto Alegre has been on budget allocation across various spending heads such as education, sewerage and housing, with decisions concerning specific projects subsequently made by officers. The tendency in the UK has been to concentrate on projects instead, the term "budget" applying only in the sense of a constraint. This is interesting because, in the Brazilian example, a degree of trust is required on the part of citizens that a given financial allocation will be translated into worthwhile projects. Meanwhile, the lack of mention in UK examples of "the budget" (in the sense of a formal process of resource allocation) serves to keep the process out of the mainstream. This fits with the findings of a piece of wider research that concluded PB would not empower citizens if

it was tokenistic and if the surrounding political institutions did not shift (Department for Communities and Local Government 2009a).

The voting process differs across instances of PB: some use a single gathering whilst others allow on-line and written contributions within a deadline. The voting mechanism itself varies too: first-past-the-post methods are used, sometimes in an adapted form (such as Tower Hamlets' rule of allocating funds to at least one item under each of six themes); in some cases, participants grade each option (from zero to five points, say) and scores are then summed; another method is the allocation to each participant of a hypothetical sum of money which she/he then distributes across the options. Certain authorities have used more sophisticated systems still, designed to introduce a sense of unit cost to services under consideration (eg Research for Today Ltd 2010).

Discussion

At least in principle, PB's greatest strength is that, if the decision reached is implemented, it represents power for citizens rather than influence (Pateman 1970), giving it the potential to lie towards the top of Arnstein's ladder (1969).

From the instrumental perspective, the principal benefits of PB lie in its accessibility and immediacy: whereas other forms of citizen participation (such as citizens' juries or deliberative polling) are not automatically intelligible to participants and tend to provide a more tenuous link between what citizens conclude and any subsequent policy decision, there is a clarity about the concept of setting budgets/allocating funds that places it apart. Participants have reason to think, in attending, that their contributions will have a real influence on the policies or measures subsequently pursued by the organising body. Moreover, PB is viewed as a method that can "inspire" (Blakey 2008, p.63) and that perhaps, because of this, can bring in larger crowds than are seen at more orthodox citizen participation events. A minor associated criticism is that, because PB deals with resource allocation, it necessarily omits the large range of interventions available to a governmental body that are not defined by cost, most notably regulatory actions which either require or prevent action on the part of citizens and organisations. Their omission means that PB is automatically limited to a subset of potential local authority interventions, albeit the subset which most people – councillors, officers and citizens alike – might consider the most important.

The evidence is that PB attracts a diverse range of participants (SQW et al. 2011) and one that is therefore perhaps more representative of the group whose views are being sought by the sponsoring institution than could be expected from more orthodox methods of citizen participation such as open-access surveys and exhibitions. The consequences of this may be a) that the political engagement achieved through PB is therefore more meaningful and b) that

the institution's future policies better reflect the wishes of its constituency than would be the case if a less representative group had participated in the planning process. But both of these assertions are open to debate. A good socio-demographic fit between those attending and the wider constituency is intuitively desirable but is not a guarantee of a satisfactory outcome.

Turning to the relationship between citizen and government, in the case of the UK pilots, "those [elected members] that were involved reported improvements in relations with their constituents" (SQW Consulting et al. 2010, p.114). This must be taken alongside the finding that certain elected members felt sidelined by the PB process, particularly where they were not directly involved in its planning (SQW et al. 2011). The implication appears to be that PB has the capacity to improve elected members' connections with their constituents, provided the members are involved from the beginning and do not object in principle to a process that they see as at odds with representative democracy. And, with regard to the population at large, though participants often give glowing feedback about the experience of participating, there is little evidence of the impact of PB upon the wider citizenry, ie those who do not take part (SQW Consulting et al. 2010). If better policies have been selected as a result of the planning mechanism than would otherwise be the case, these citizens are presumably better off (though they may not know it), but they may be no more democratised than they were at the outset or than they would be if a different citizen participation model had been adopted.

With respect to its form, the broad definition adopted for PB means there is no deliberative element intrinsic to it, though various writers on the subject consider deliberation to be an essential ingredient (Participatory Budgeting Unit 2008; Wampler 2007). It is open to those designing a PB exercise to introduce deliberation formally to the structure, to create a space for it in the hope that it will happen of its own accord, or to allow nature to take its course. A possible consequence of a lack of structured deliberation is that the decision-making process can be unreflective and therefore unsophisticated, with people out for what they personally want (Rios & Rios Insua 2008), though UK practitioners have been known to refer with pride to the decisions of young participants to allocate funds to projects serving older people.

As to whether PB is representative, PB as practised to date is open to all (subject to certain basic constraints of eligibility) which would win it favour in the eyes of many democratic theorists. This does, though, introduce questions of representativeness, notwithstanding the relative diversity of participants in Porto Alegre and the UK examples studied. No subset of any population can be truly representative of it but quota-based recruitment (as used in citizens' juries and deliberative polling) has evolved as a way of reducing the risks of obtaining a sample very unlike the population from which it is drawn. Certain PB organisers in the UK (eg Tower Hamlets) have sought a compromise by carrying out targeted outreach in response

to perceived gaps in representation. And, in Porto Alegre, the number of delegates chosen to represent a given neighbourhood is calculated in a non-linear manner to favour areas where participation is low (Baiocchi 2003).

This boils down to a question of whether the result of PB can be taken to represent the wishes of the population: on the one hand, a group recruited according to a socio-demographical profile may produce findings that would be rejected by the wider population precisely because the procedure would be perceived as closed. On the other, the conclusions of a self-nominated group may arouse concern on the part of citizens and government stakeholders alike on grounds of representativeness, as was the case in Tower Hamlets (London Borough of Tower Hamlets 2010a). This is not a problem that is peculiar to PB, of course; it is shared by referendums and any other exercise in which power is delegated to citizens, and reflects the fact that civic participation tends to be weighted towards certain socio-demographic groups (Taylor & Low 2010). And this family of techniques also shares conceptual problems concerning the definition of the relevant "population" itself, leaving aside the composition of the subset that participates.

The decision-making element of PB is another area of interest. Versions of PB that involve formal voting are subject to a range of theoretical criticisms relating to the aggregation of preferences (Mueller 2003) which cannot be described in detail here. Of particular interest is the concern that simple ballots may not take into account the options' range of impacts and their desirability (Edwards & Fasolo 2001), an argument in favour of more nuanced scoring. This at least provides scope for individuals to express their strength of feeling more than if casting a vote.

Where a mainstream budget is being considered, there is a clear issue of unit cost, in that some activities cost more per unit of "value added" than others, a subtlety that might not be captured if money is being allocated across budget heads. One response is to introduce additional sophistication to the decision-making process (as with SIMALTO, see Research for Today Ltd 2010) with the attendant risk that the process will become overly complex for participants.

Here there is an interesting division between PB as a one-dimensional decision process and the family of multi-criteria decision analysis (MCDA) methods (Department for Communities and Local Government 2009b) which typically are designed to capture additional complexity through multiple criteria and weighting. The appeal of PB is its relative simplicity and the fact that participants will ordinarily grasp immediately the nature of the task. The risk with MCDA methods is that the unavoidable complexity of the exercise proves a deterrent. There is a consequent trade-off between the likely validity of the decision reached (being the product of

careful weighing of the various attributes) and the size, profile and satisfaction-level of the crowd attracted to participate. This generates a question of whether a middle way can be found by marketing the PB event in a way that does not imply complexity whilst introducing a degree of sophistication to the process without making it unintelligible for participants.

According to Shah, challenges faced by local authorities attempting to use PB include "lack of capital, limited understanding of the roles and responsibilities of all actors, limited scope of participation, legislative constraints, inadequate monitoring and evaluation systems, lack of transparency and trust, breakdown in communication, insufficient resources, and political and social differences" (Shah 2007a, p.10). He is writing about PB exercises in sub-Saharan Africa but he might be writing about any location. The way to overcome these challenges is set out by Wampler who identifies the following success factors: "strong mayoral support, a civil society willing and able to contribute to ongoing policy debates, a generally supportive political environment that insulates participatory budgeting from legislators' attacks, and the financial resources to fund the projects selected by citizens" (Wampler 2007, p.24).

It can be seen, therefore, that successful PB is not easy to deliver, leaving aside the technical concerns discussed under earlier headings. But the wide interest in it as a practice suggests that authorities consider it a risk worth taking. This is perhaps because of the benefits identified above, including that it attracts an untypically diverse audience, and can engender confidence amongst politicians in the results. Given the difficulties that local government has been shown to be having with the issue of climate change, PB may have something to offer here, if a workable way of combining the two can be found.

Conclusion

The survey above permits the following conclusions to be drawn. *When successful*, citizen participation can be found to produce better decisions than would be delivered otherwise and to lead citizens to feel more positive about both the decisions reached and government in general. It can also foster confidence amongst decision makers. But this summary risks circularity: unsuccessful examples of citizen participation have been seen to fail on all these fronts, leaving open the question of what will lead to success. At this stage, it is possible only to assert that citizen participation has the *potential* to produce these desirable results and the somewhat polarised nature of the literature on the topic serves to indicate how few of these assertions have been tested empirically.

Similarly guarded conclusions can be drawn about deliberation as defined in this chapter. Properly conducted, it can lead participants to be more understanding and accepting of others' positions (perhaps including the positions of those in power) though perhaps at the cost of

adaptive preferences. It can also help participants to develop a more sophisticated grasp of a topic and a more coherent personal viewpoint.

An examination of current and past practice in the UK demonstrates that a range of methods is in use by local authorities, though motivation and enthusiasm varies, with attitudes of sponsors and citizens alike falling short of the ideals expressed in the literature. There is, though, evidence to suggest that more innovative and deliberative participation methods can help to overcome both decision-maker resistance and citizen indifference or distrust. Some of the more innovative methods are in use in the context of climate change and these appear to help bring the topic alive for participants.

The recurring theme of whether citizens' views will be taken into account prompts an assessment of participatory budgeting (PB), a method that typically translates participant preferences directly into policy action. PB is found to draw a larger and more diverse audience than more conventional methods and, where relations with politicians have been managed successfully, to foster amongst them trust in the method. This is despite the quite limited way in which it has been applied to date in the UK. The more general conclusions concerning PB are that it has much to recommend it but that it also has some weaknesses, mostly relating to its application rather than its essence. Like all other forms of citizen participation, its success depends in no small part on the underlying intention of the sponsor authority.

In the next chapter, the findings from this and the previous chapters will be brought together to set the framework for developing a form of participatory budgeting designed to enable climate change to be included alongside financial impacts.

Chapter 4 Bringing climate change into participatory budgeting

The challenge posed by anthropogenic climate change has led several national governments, including the UK, to take action on reducing greenhouse gas emissions. Against this background, British local authorities are considered to be performing poorly in terms of both tackling their own emissions and promoting emission reductions amongst actors based in their jurisdictions. There is an array of reasons for this, including that climate change is seen as spatially and temporally remote and that it constitutes a quintessential collective action problem. Alongside these fundamental obstacles, there are numerous contingent impediments reflecting the operations and politics of local councils.

Of these, that which has the greatest relevance for what follows is the relationship between councils and their citizens. Engaging citizens on the subject of climate change has been found difficult, especially where the climate change problem has not been effectively articulated and absorbed. An inertia problem may be encountered even where the outcome sought is likely to be only beneficial to the citizen, such as with the installation of energy efficiency measures. And there is a secondary factor which reflects the well-established link between public opinion and policy decisions (eg Miller 1999; Soroka & Wlezien 2005). In addition to the difficulties identified concerning citizen opinion, considerable evidence indicates that the views of key stakeholders within councils, notably members, can significantly hinder the response to climate change. If, as some argue, citizen opinion influences decision-maker opinion, the problems identified above can be expected to be compounded by an equivalent response amongst members and senior officers. If, on the other hand, council stakeholder opinion to some extent influences citizen opinion, the established level of resistance within councils will be reflected in an intransigent position on the part of citizens. In either case, there appears a strong argument for attempting to improve the relationship between citizens and local authorities with respect to climate change.

Not that there is any lack of communication taking place between local authorities and their citizens on the topic, as explored in Chapter 3. First, there are attempts to persuade citizens to adopt low-carbon behaviours. But the council that attempts to change the behaviour of its citizens, to the extent that it succeeds in engaging them to begin with, always risks “nanny state” accusations; more specifically, it may well be met with the response “cast out first the beam out of thine own eye”. This may occur even if the council is one of the best-performing

authorities in climate change terms, as there are bound still to be aspects of the organisation's operation that fall even slightly short of sustainable ideals.

Where a council instead invites citizens to contribute to the formulation of its environmental policy or strategy, the exemplars discussed in Chapter 3 notwithstanding, a great many cases resemble that of Derby City (2013), where comments are invited on a document that sets out general principles/policies of sustainability. Whilst there may be nothing wrong with producing documents containing general undertakings to be sustainable and in seeking a citizen imprimatur to them, such undertakings are vague and lack any sense of trade-off with competing objectives (such as economic growth). Citizens and others can therefore endorse them lightly because they imply no specific course of action and, in particular, will not compel anyone to forgo something they hold dear.

In contrast, when councils are developing their strategy (ie specific actions) in respect of climate change, some seek a degree of citizen participation as part of the process: this can be as simple as inviting comments on a draft document or may take a more dialogue-based form. For example, Sunderland City Council both circulated a draft climate change action plan document for comment and conducted workshops (Sunderland City Council 2008b), leading to the finalisation of the action plan itself (Sunderland City Council 2008a). This avoids the pitfall of making vague statements of the sort mentioned in the case of Derby above. But inviting contributions on an environmental strategy/action plan is likely to lead to responses from a quite particular sample of the population (Peters et al. 2010; Pidgeon et al. 2005), with those who do not self-identify as environmentally-motivated abstaining. A council can respond to this problem by conducting sampled market research but at the risk of being accused of carrying out a closed exercise. If the council instead does not attempt to influence the composition of the group that chooses to contribute, this is not necessarily a problem (in terms of finalising the strategy) but it does mean that an important category of the population – the non-environmental – has been untouched by the process. Given that climate change requires all actors to make substantial changes and that pro-environmentalists are the most likely to have adapted already to some extent, this seems a significant shortcoming.

So there appear to be problems with exhorting citizens to change their behaviour, seeking endorsements of vague sustainability policies, and inviting comments on climate change action plans alike. How to respond? Can a method of citizen participation be found that does not appear lecturing, leads to "hard" decisions reflecting the climate change imperative, but at the same time attracts the interest of those who do not consider themselves pro-environmental?

The survey of citizen participation in Chapter 3 identified some general themes: that well-conducted exercises can have a series of positive outcomes for both participant and decision

maker; that deliberation can help participants to reach a more considered position; and that innovative and deliberative approaches can help overcome some of the classical problems of decision-maker resistance and citizen apathy. Participatory budgeting (PB), in particular, has been shown to draw a broad audience and its design can successfully tackle citizen concerns about whether their contributions have any impact. For these reasons, PB is proposed as a possible way forward. So the question is whether environmental factors can be effectively incorporated into it.

In adapting PB to serve environmental goals, it seems desirable to retain its perceived strengths – openness, transparency, a focus on what is most important to citizens, and the scope to allocate real resources (Participatory Budgeting Unit 2009). But, if climate change is to feature, it must play a meaningful role in order to avoid the criticism made above of citizen participation in formulating general environmental policy. And there is a parallel risk that making climate change too prominent in the exercise will deter the non-environmental citizen, thereby falling into the trap identified with respect to defining environmental strategies. So emissions need to play an active role but not an overly dominant one. Designing a version of participatory budgeting that meets these objectives forms the next part of this project.

The first task is to arrive at a coherent method of quantifying climate change and financial impacts for incorporation into participatory budgeting (Chapters 5 and 6). After this, a series of issues needs to be addressed concerning the structure and function of the method (Chapter 7). Subsequent development and testing (Chapter 8) should make it possible to tackle the first research question:

Research Question 1 Is it technically feasible to create a variant of participatory budgeting that meaningfully includes climate change impacts?

It should be noted at this point that assumptions concerning the motives of a local authority contemplating the use of the method are deliberately being kept to a minimum, as are assumptions concerning the *ways* in which it might be applied. For this reason, Research Question 1 is neutral in form, avoiding any mention of, say, building public acceptance or fostering behaviour change. To the extent that they cannot be avoided, such assumptions will be made.

On the basis that the answer to Research Question 1 is positive, the method will be formally tested with citizens (Chapter 8) and the tests evaluated (Chapter 9). From this point, the method is given the working title *participatory emissions budgeting* (PEB) which, though not a perfect description of it, adequately conveys its principal features. The formal tests and subsequent evaluation will provide the means to address Research Questions 2 and 3:

Research Question 2 How do PEB participants arrive at their decisions?

Research Question 3 What are the opinions of participants concerning PEB and the experience of taking part in it?

As with Research Question 1, neutrality is deliberately sought in the phrasing of Research Questions 2 and 3, so as to avoid unnecessarily limiting or framing the findings. But, because PEB has been conceived in the context of a troubled relationship between citizens and local government with respect to climate change, it is appropriate to include a more specific question on this theme:

Research Question 4 What effect, if any, does PEB have upon participants' attitudes towards local government in the context of climate change?

The final phase of the research will be a survey of local authority stakeholders designed to elicit their views of PEB's potential use by their organisations (Chapter 10). Hence Research Question 5:

Research Question 5 What role(s), if any, could PEB play for English local authorities, and why?

To summarise, Chapters 5, 6 and 7 will be devoted to developing a working version of PEB, with Chapter 8 reporting on the process of testing this at various stages with citizens, addressing Research Question 1. Chapter 9 will present findings from the evaluation of formal tests of PEB with citizens, thereby addressing Research Questions 2, 3 and 4. Research Question 5 will be tackled in Chapter 10.

Part II

Design

Chapter 5 The climate-change and financial impacts of local authority interventions

Having introduced the idea of participatory emissions budgeting (PEB) on the basis of survey of the literatures concerning local authority responses to climate change and citizen participation in public decision making, the task now turns to creating a working version of PEB, and this chapter centres on the two key pieces of information that will be required for the choice-making process, emissions and financial impact. Quantifying emissions (or "carbon accounting") is a relatively young science and its application in a local government context is not well developed, so this theme occupies the bulk of the chapter. The estimation of financial impact is a much longer-established practice, though one that is not free of both theoretical and practical issues; these are explored towards the end of the chapter.

It is necessary at this stage to stipulate that PEB will involve choosing between *interventions*. This is in contrast with the Porto Alegre model of participatory budgeting (§3.5) based more on the allocation of funds to budget heads but is similar to the majority of PB exercises that have taken place to date in the UK. Interventions must be the focus of PEB because it is not practicable to estimate the emissions associated with spending areas, for reasons which will become clearer as this chapter unfolds.

The chapter has the following sections:

- Motives for greenhouse gas accounting
- Sources of emissions – a discussion of the various entities or activities whose emissions can be estimated
- Technical considerations – analysis of themes relating to the practicalities of greenhouse gas accounting
- The roles of judgement and arbitrariness
- Estimation methods – a review of three common approaches
- Treatment of financial impacts

5.1 Motives for greenhouse gas accounting

Accounting for greenhouse gas emissions arises from a concern about their magnitude in the context of their effect on average global temperatures. The automatic reference point is the Kyoto Protocol (United Nations 1998), established in 1997 as part of the United Nations Framework Convention on Climate Change as an attempt to start to bring global emissions

under control in order to avoid the extreme harm that could be brought about by climate change. The protocol imposed upon participating national governments a target to meet in terms of their total emissions and implied fines in the case of those who fell short.

At the national level, the Kyoto protocol constitutes the object case of an externally imposed motive: though nations collaborated in its formulation, the targets from Kyoto were handed down to them. This can be contrasted with situations where an institution adopts a reduction target of its own volition: in the case of an externally-imposed motive, a body may seek to minimise effort in accounting and may also seek the measurement approach which presents its performance in the most positive light. Where a body has of itself undertaken to monitor its emissions, it might be expected to seek a "warts and all" approach on the basis that what is needed is the truth. This is arguably what has happened with UK local authorities that have used tools such as REAP (eg Sheffield City Council (2008)) which adopt the consumption-based approach. The consumption-based approach, discussed in detail below, will not necessarily help the organisation to appear to be making progress, given prevailing trends. Another important example is the UK government itself, which has set itself testing emissions targets through the Climate Change Act 2008 (UK Government 2008). In this case, the accounting method adopted cannot be described as "warts and all", though later discussion will show that this may be justifiable.

It is in fact slightly simplistic to present the source of a requirement to monitor as simply external or internal: the national governments that signed the (external) Kyoto protocol did so voluntarily; English local authorities, in contrast, are required by the UK government to collect and publish data concerning their emissions (Barker 2013). Major UK companies will also shortly be expected to report their emissions as part of changes to general annual reporting procedures (Department for Business, Innovation and Skills 2013). This difference in freedom of movement is likely to be a factor. There is at present no prospect of emissions targets being imposed upon English local authorities following the passing of the Climate Change Act so it is possible to believe that those authorities lacking an intrinsic motivation to monitor will do the least necessary to comply. Companies, meanwhile, are increasingly judged on their "corporate social responsibility" but commitment is nonetheless bound to vary.

The provenance of the need to monitor is only one consideration, though. A second relevant dimension is the likely *result* of monitoring: in some cases the information is simply collected and published (a prominent case being the Carbon Disclosure Project (2013a), a voluntary scheme supporting the publication of emission figures for organisations and cities); in others, there is a practical consequence of reaching or falling short of a given number, as in the case of the Kyoto targets introduced above. There is therefore likely to be a relationship between the

probable gain or loss that the outcome of monitoring would trigger and the effort expended on it.

A third dimension is focus. In many cases, the task is to gauge an organisation's overall emissions. But extensive activity is also dedicated to estimating the life cycle emissions of a good or service and this may constitute a very small part of an organisation's collective activity or may be conducted in isolation from any particular organisation. Similarly, those testing or evaluating efforts to mitigate climate change may be interested in quite specific activities rather than organisation-wide emissions. And, the more removed from the institutional viewpoint the measurement exercise is, the more it is likely to be autonomous and therefore free from any organisational pressure to achieve a particular result.

These three dimensions all play a part in determining the approach a given organisation takes to measuring emissions in a particular context.

5.2 Sources of emissions

"Source of emissions" here is intended to mean the *item* whose emissions are under scrutiny. There is a natural division in greenhouse gas accounting between what can be described as organisations/individuals and activities/the products of activities; various guidance documents exist for each category. In comparison, there is a limited amount of attention paid in the literature to policies, actions or projects. These are discussed in turn.

Organisations/individuals

The range of entities in this category is wide. In governmental terms, a descending hierarchy can be defined. At the global level, the Kyoto Protocol can be seen as evidence that the collected countries of the world constitute an entity in terms of emissions resulting from human activity. Then there are certain supra-national bodies which monitor emissions, (eg the European Union, a signatory of the Protocol, (European Environment Agency 2011)). Nation states are well defined in terms of emissions monitoring and detailed guidance exists for the compilation of their greenhouse gas "inventories", produced by the Intergovernmental Panel on Climate Change (IPCC) in accordance with Kyoto (Intergovernmental Panel on Climate Change 2006). The national level marks the end of the Kyoto Protocol's jurisdiction so, beyond this point, practice varies. In the case of the UK, emissions (currently only carbon dioxide) continue to be reported regionally. Outside London, these figures are calculated by summing those of their constituent authorities. London has chosen its own path, estimating emissions of all the Kyoto greenhouse gases independently of its 33 local authorities (Mattai et al. 2010).

The lowest formal greenhouse gas accounting tier in the UK is the local authority level, where two indicators introduced in Chapter 2 are the focus of attention: *carbon dioxide emissions*

within the scope of influence of local authorities (previously NI186[9]*)*; and *greenhouse gas emissions from local authority own estate and operations (previously NI185)*. The first of these is closely aligned in coverage to the national inventory collected in accordance with IPCC guidance but it excludes gases other than carbon dioxide and omits certain CO_2 emission sources which would feature in the national inventory but either cannot be disaggregated or are considered beyond the reach of local authorities, such as motorways and diesel railways (Department of Energy and Climate Change 2011c) – see discussion of spatial boundary in §5.3. The second distinguishes the local authority as an entity from the agents based within its geopolitical boundary.

To the extent that local authorities are given special treatment in the existing guidance, this tends to be because of perceived structural differences, as identified in a version of the Greenhouse Gas Protocol written for public bodies in the United States (Greenhouse Gas Protocol Initiative 2010). This is based on the same principles as the standard for companies (see below) but reflects certain idiosyncrasies of such organisations, relating mainly to their governance (Hardison & Jonassen 2009). A distinct reference to the issues of "additionality, permanence, and secondary effects" (Hardison & Jonassen 2009, p.625) which could apply to philanthropic organisations as well as to public bodies, raises a theme which will be returned to. The Global Reporting Initiative's Public Sector Supplement (2005) is another example of guidance (this time with a focus upon sustainability in the round) written with public bodies in mind. It includes two indicators for greenhouse gases: one is very similar to "Estate and Operations" emissions; the other (which reporting bodies can choose whether to adopt) is defined as "emissions that are a consequence of the activities of the reporting entity, but occur from sources owned or controlled by another entity" (Global Reporting Initiative 2005, p.41).

Beyond the local authority level, there is nothing to prevent a smaller entity such as a town/parish council or even ward from estimating its emissions, but data availability and labour required would probably present significant barriers.

Moving on from formal government, *organisations* are treated as a single category: the reference standard for greenhouse gas accounting (Greenhouse Gas Protocol Initiative 2004) is described as being written for companies but there is no expectation that a separate version will be drafted for non-profit organisations, and an international standard which is based on the Greenhouse Gas Protocol (British Standards Institution 2006c) is targeted at "organisations" in general. All of the guidance has in common a series of steps leading from

[9] The indicator originally had the title *per capita CO2 emissions in the local authority area*.

the definition of boundaries, through the quantification of activity that is associated with emissions, to estimation of the emissions themselves.

Finally, there is a range of material, mainly web-based, relating to entities such as households and to individuals. One example of the "carbon calculator" was produced by the UK government as part of its Act on CO_2 initiative (Department for Environment, Food and Rural Affairs 2005). It collects basic information about the respondent's activities and uses it to produce an estimate of carbon dioxide emissions. Another is *REAP-Petite* which allows self-defined communities to measure their carbon footprints (Stockholm Environment Institute 2012).

Activities and their products

Products (goods) and services have been subjected to "life cycle analysis/assessment" (LCA) and, within this process, "life cycle inventory analysis" since the 1960s (Suh & Huppes 2005). The inventory element of LCA is the part most similar to greenhouse gas accounting, in that it involves the lifetime quantification of a product's inputs and outputs. The emphasis of the practice has evolved from local pollution to resource depletion (in the context of ecological footprints, (Wackernagel & Rees 1996)) and, more recently, to greenhouse gas emissions.

LCA is now a well-established practice supported by international standards (British Standards Institution 2006a; British Standards Institution 2006b). The greenhouse gas-specific variant (PAS 2050) is much newer and documentation relating to it has a lower status (British Standards Institution 2008; British Standards Institution et al. 2008) but the Greenhouse Gas Protocol Initiative has recently given weight to the topic through a publication compliant with the British specification of 2008 (Greenhouse Gas Protocol Initiative 2011b).

It seems that goods may have proved easier to subject to LCA than services: in the case of "carbon footprinting" in particular, there are numerous examples of the former (see, for example, Flysjö et al. 2011 on milk production; Dias & Arroja 2012 on office paper); the literature on services or processes is much thinner, though examples exist (eg Shrake et al. 2011; Brown et al. 2012).

There is more than one possible reason for this difference. It may be that there is greater demand for product footprinting than its service counterpart. Or service footprinting may be a more challenging activity. This is the view of Graedel who asserts "The service industry approaches customer needs and wants differently [from manufacturing]: the added value is not centered on the transfer of material or finished products, but on providing a function desired by the customer – a 'dematerialised' added value, at least from the customer's standpoint" (Graedel 1997, p.58). Perhaps connected with this claim is the proposition that

boundaries are harder to draw for services than for products. To invoke the examples provided in the PAS 2050 Guidelines (British Standards Institution et al. 2008), it seems easier to define the boundaries of croissant production than those of one night's stay in a hotel. Should breakfast be included in the hotel example? This is explicitly acknowledged: "however, correctly identifying and understanding the service 'product' definition and the life cycle stages in the process map may be more challenging [than for products] and may require extra effort to define" (British Standards Institution et al. 2008, p.43).

Policies, actions and projects

There is at least one strand of guidance directed at "policies and actions" but it assumes the interventions in question are designed to mitigate climate change (Greenhouse Gas Protocol Initiative 2012). The thinking in this document (currently a consultation draft) shows considerable advances over an earlier document relating to "projects" (Greenhouse Gas Protocol Initiative 2005) which was also based on a presumption that the projects would be mitigatory. In particular, the interest in mitigation means that the guidance stipulates the calculation of the net emissions of an intervention rather than its gross emissions, a theme discussed in §5.3.

Discussion

Does a local authority intervention fit neatly into any of the categories discussed above? Arguably not: a project or policy is distinct from the organisation that initiates it; and it does not sit easily with the notions of product or service. Of the three categories, the best match may be with the third – policies, actions and projects – but there are two possibly important differences. One relates to project character: in order to be of interest to potential participants, participatory emissions budgeting is likely to include as options a wide range of projects, only some of which could be characterised as mitigatory.

The second difference relates to the nature of the local authority. A local authority can be looked on as an institution in much the same way as a company can – it performs various functions, generates and spends money; this perspective explains the "estate and operations" approach to measuring its emissions. But, as a public body, the local authority does not have the same status as either a profit-making enterprise or charity. A profit-making enterprise exists to make money, subject to various constraints such as operating lawfully; a charity will have philanthropic aims but is very largely self-determining. A local authority, on the other hand, is *obliged* to fulfil certain functions in promoting the welfare of those under its jurisdiction. In addition to these duties, it enjoys powers which it can use to achieve its ends:

in the UK, these powers lie mainly in the capacity to introduce regulations and impose charges, given the limited tax-raising powers of local government.

Whether these two differences affect the extent to which project-based guidance can be applied to local authority interventions will become clearer as the discussion becomes more specific.

5.3 Technical considerations

In accounting for greenhouse gas emissions, several important issues arise. The majority appear peculiar to the specific context of greenhouse gases (or life-cycle analysis more widely); others are more generic but nonetheless deserve brief mention here. Because the literature on this subject is not extensive and greenhouse gas accounting has not been widely practised by local authorities, some of the following discussion is of necessity from first principles.

In any estimation task, there is bound to be a trade-off between effort expended and accuracy achieved. The relationship between these variables will differ with the context. Where greenhouse gas emissions are concerned, the complexity of the causal chains connecting emissions sources is matched by the complexity of quantifying emissions produced by those sources, making the achievement of accuracy probably more challenging than in many other measurement processes.

Directly connected to the issue of accuracy is the treatment of uncertainty. In all but the rarest situations, it will be necessary to choose one point from a range of possible outcomes. Practice varies: in some settings, it is common to use sensitivity analysis as a means of understanding the likely impact of a given variable having different values (eg appraisal procedures, (HM Treasury 2011)). More sophisticated methods based on probability distributions can also be employed, as recommended for the calculation of national greenhouse gas inventories (Intergovernmental Panel on Climate Change 2006, vol.1 chapter 3). In the case of greenhouse gases at the project level, a principle of *conservativeness* is promoted (Greenhouse Gas Protocol Initiative 2005): where there is doubt about a number's exact value, the presumption is to assume its highest likely value if it represents an emission and its lowest if it represents a saving. Thus the chances of overstating the benefits of a mitigation project, for example, are minimised, which seems a sound approach.

The final generic topic to mention is bias, which can arise in various ways. Measurability bias describes a tendency to gravitate towards the impacts which are easiest to measure. The relative ease of measurement may to some extent reflect standard practice, the source of another kind of bias – functional fixedness – in which the practitioner follows established procedures which may not suit the task. Finally, as identified in the discussion of motives for

greenhouse gas accounting, there is scope for those wishing for a particular outcome to choose their measurement approach accordingly.

Turning now to considerations that seem more specific to the greenhouse gas accounting task, the following will be discussed:

- What to measure
- "Gross" or "net" emissions
- Double counting
- Territorial and consumption approaches
- Criteria for inclusion/exclusion

What to measure

Given that the task is greenhouse gas accounting, this may seem a trivial question but it does deserve some consideration. There are in fact two issues:

- Whether to consider only greenhouse gas emissions (as opposed to a fuller set of environmental impacts)
- Which greenhouse gases to quantify

The first question is a policy issue: Rockström et al (2009) for example, place climate change in a set of seven processes that they see as threatening the maintenance of a safe "operating space" for humanity; in contrast with this global focus, there is the more local perspective brought by ecological footprinting which enables a project or process to be seen in terms of the extent it depletes finite natural resources (see, eg, Rees & Wackernagel 1996). And the organisational practice of environmental management systems allows for a wide range of indicators, including emissions of various kinds, use of resources and energy, waste and so on (British Standards Institution 2004). If impacts relating to environmental effects other than climate change are to be included, this decision will reflect the policy value of having a wider scope and the practical matter of incorporating additional impacts in the participatory emissions budgeting framework.

The question of which greenhouse gases to quantify is more a practical one. The full set of greenhouse gases is large and not all have been investigated thoroughly in terms of their global warming potential (Intergovernmental Panel on Climate Change 2006). The set for which global warming potentials have been estimated is itself large (Intergovernmental Panel on Climate Change 2007b, p.212). Moreover, capacity to estimate emissions of some of the more obscure gases relies on investigations having taken place at the product or activity level (indirect conversion factors produced for the UK government, for example, are limited to emissions of CO_2, CH_4, N_2O and F-gas (AEA 2011a)). These practical considerations may have

influenced the decision to place only six greenhouse gases in the "basket" covered by the Kyoto Protocol (United Nations Framework Convention on Climate Change 2008, p.106), a move mirrored by the UK government in its Climate Change Act (UK Government 2008, p.44). A decision to attempt to account for more than the Kyoto set would imply additional effort and would render the exercise inconsistent with the reporting process of other national governments.

"Gross" or "net" emissions

Greenhouse gas emissions can be looked at in absolute or comparative terms. The total emissions of an organisation or country in a given year will be an absolute figure ("gross", for the purposes of this discussion); any reduction made from the last year to this is a comparative figure (and subtracting one gross figure from another suitably selected gross figure produces a "net" result). Gross figures will tend to be non-negative (carbon sinks being the obvious counterexample), whereas net figures can be either positive or negative, reflecting which of the two quantities being compared is larger. This distinction between gross and net is not peculiar to greenhouse gas accounting but the issue of mitigation makes it particularly important: projects designed to reduce emissions are assessed in terms of the reduction they achieve – their net effect as calculated by comparing the "with-project" scenario with a suitably defined baseline.

Much of the interest in local authority interventions has a "net" character: what has the project done compared with what would have happened otherwise? But it is also reasonable to ask what resources a project has consumed – a "gross" question. This is most commonly seen in the context of finance ("what did it cost?") but applies equally to any scarce resource. With respect to "gross" emissions, the question may ask what contribution a project makes to the sponsoring authority's overall emissions in a given period. The London Borough of Haringey, for example, has set a carbon reduction target whose achievement will mean that its carbon dioxide emissions should not exceed approximately 1,000 kilotonnes in 2020 (Cox & Sherlock 2012). Such sums are typically divided by sector (eg domestic, commercial and industrial, transport) but they could theoretically be apportioned to the interventions carried out by the council such that a given intervention's share of the 1,000 kilotonnes would be a gross figure. As will be seen in Chapter 7, the gross emissions of a local authority intervention (its contribution to the authority's total) may in fact be the quantity required to operate PEB. A method may therefore be required for deriving this figure so the final section of Chapter 6 discusses one possible approach.

Double counting

Double counting arises when a single emission is included in more than one estimate. A simple example is emissions from the burning of fuel at a power station. These will typically be included in the emissions "inventory" of the power station (though note subsequent discussion of territorial and consumption-based measurement approaches). But they will also be included in the inventories of organisations using electricity generated from the fuel. They may further feature in the inventories of organisations that buy products made using that electricity (or, equally, in the life-cycle inventory of products made using that electricity).

One practical response to double counting is the concept of scopes (also sometimes referred to as tiers) of emissions (Greenhouse Gas Protocol Initiative 2004). Scopes separate emissions according to type: the direct emissions from burning the fuel would be considered Scope 1; indirect emissions from the electricity generated would be considered Scope 2; and further indirect emissions arising later in the "value chain", in product purchase, for example, would be considered Scope 3. A given emission can only be counted as Scope 1 once; and as Scope 2 once. Thus there is no double counting within Scope 1 or Scope 2. There is, however, considerable potential for double counting in Scope 3 as each agent in a given value chain may include a particular emission in its inventory. This is considered correct practice by the British Standards Institution (2008), which stipulates that each actor should take responsibility for emissions up to and including their stage in the value chain, such that the final vendor of a product and its consumer both take responsibility for the full set of emissions. The avoidance of double counting in Scopes 1 and 2 is only preserved, meanwhile, if emissions are not summed across the three scopes.

How much does this matter? Some are relaxed: Matthews et al argue "double-counting is only a problem when participation in calculating footprints gets to a much higher degree than it already has or comprehensive regulation is imposed" (Matthews et al. 2008, p.5841). But they may be in the minority, as various writers have propounded ways in which the double-counting problem can be addressed. Lenzen et al (2007) suggest using "value added" as the criterion for sharing emissions amongst the agents in a supply chain. Bastianoni et al (2004), instead argue for an allocation system in which agents' emissions are calculated as normal then factored down on a pro-rata basis so that their sum is equal to a single estimate of the full value chain emissions. Both of these methods could be used to arrive at a mutually exclusive and exhaustive way of allocating emissions but they could work only within a single partitioning system (eg by organisation). Once organisations and products/services are being discussed together, an allocation process seems bound to lead to double counting.

A more rudimentary response to problems of double counting is truncation, commonly adopted in life cycle analysis (Minx et al. 2009). Here, an arbitrary point in the value chain is chosen and emissions beyond it disregarded. Though not conceived as a means to manage double counting (truncation is, rather, regarded as a practical necessity), it could be seen as a way in which the extent of double counting that occurs when all agents include emissions up to and including their stage in the value chain, is reduced. But it is not clear that this would be helpful: the word "arbitrary" implies that important emissions beyond the truncation point could be missed. If one of the purposes of managing double counting is to identify the agent in the value chain best placed to mitigate emissions, such distortions could prove counterproductive.

One response is to separate measurement from responsibility, as hinted at by Matthews et al: "understanding the total life-cycle emissions associated with a firm's products will be helpful to the firm no matter how much of its Tier [Scope] 3 emissions it wishes to take responsibility for" (Matthews et al. 2008, p.5841). Returning to the question of identifying the agent with most leverage to reduce emissions, this may be the most pragmatic stance though it cannot control for the possibility that more than one agent will attempt to tackle the same emission, possibly resulting in wasted effort.

Territorial and consumption approaches

In greenhouse gas accounting, three approaches – territorial, production, and consumption – are contrasted (Hill et al. 2012; UK House of Commons Energy and Climate Change Committee 2012a). In the first, emissions are associated with their location: hence, burning fuel at a power station results in emissions and these are associated with the site irrespective of what happens to the electricity generated. The production approach is instead linked with the goods and services produced by an entity. And the consumption approach is different again: it associates emissions with the acts of final consumption. A ready example is a T-shirt manufactured in China but bought by a UK consumer (Dawkins et al. 2010). The territorial and production models would associate the emissions produced in generating the energy supporting production with the site of those emissions (probably China); the consumption model, in contrast, would associate those emissions with the purchase, placing them instead in the UK's inventory. The differences between the territorial and production approaches are subtle and do not have a great bearing on this discussion so comparison will henceforth be made between the territorial and consumption approaches.

There are arguments in favour of both approaches: a pure territorial approach reduces the difficulties associated with double counting because Scopes 2 and 3 are excluded – only direct emissions count. This is one reason why the method is preferred at the nation level and

underpinned the estimation process used in accordance with the Kyoto Protocol (Intergovernmental Panel on Climate Change 2006). Another reason is that the consumption approach requires a quite sophisticated understanding of trade and consumption patterns as well as of the energy requirements of a range of processes including manufacturing. Whilst increasingly robust methods exist of modelling these from the perspective of a single country (eg Wiedmann et al. 2010), an international model showing flows between all nations is for the foreseeable future beyond reach.

In favour of the consumption approach is the claim that it better represents the true climate change impact of behaviour, on the basis that consumption drives the industrial processes that emit greenhouse gas. If emissions are to reduce, this will be achieved largely through reduced and/or altered consumption, so the indicator used should reflect this. Minx et al (2009) point out, in particular, the possible risks of not using a consumption model, explaining that the UK's emissions profile has reduced according to a territorial measure, despite the fact that its consumption-based emissions are increasing. In the context of a need to reduce global emissions, it can be argued that the practice of "exporting" emissions by purchasing energy generated in foreign countries (something a territorial measure encourages), is evidence of a perverse incentive.

The consumption approach may in due course become dominant, despite inertia at the national level – the UK's Department of Energy and Climate Change has for example resisted a strong call for the adoption of consumption-based targets (UK House of Commons Energy and Climate Change Committee 2012), on the grounds that data are insufficiently robust. Where the consumption approach is espoused, meanwhile, the guidance can appear to encourage some blending of approaches. ICLEI (2009), for example, recommends a consumption-based approach in greenhouse gas accounting for local authorities but the guidance requires that authorities also take into account emissions from power stations within their borders. Its guidance on more specific sources seems inconsistent too: emissions from public transport should be calculated on a territorial basis; those from private cars can be calculated territorially or linked instead to parties based within the boundary (ie consumption). Corporate guidance tends to conflate the two approaches by inviting organisations to report all "scopes" (Greenhouse Gas Protocol Initiative 2011a; Global Reporting Initiative 2011). This conflation may be of limited importance because it will not lead to perverse incentives mentioned above, threatening at worst to result in overstatement of emissions. And sub-national practice in the UK at the moment falls between the two approaches: local and regional estimates of carbon dioxide emissions are based on an "end user" measurement method but this only extends to the consumption of electricity. Thus, if a household uses electricity generated overseas by the combustion of fuel, the estimate of carbon dioxide for

that household will include an amount relating to the electricity's generation but it would not go beyond that to include emissions embodied in the products purchased and consumed (AEA 2011b).

Inclusion boundaries

The specification of a greenhouse gas measurement approach requires a series of decisions concerning what to include and exclude. The following are the salient dimensions:

- Temporal boundary
- Spatial boundary
- Orders of impact
- Value chain
- Policy/jurisdiction

Each of these is described in the following sections. There is some interdependence amongst the dimensions which is discussed at the conclusion of this section.

Temporal boundary

The temporal boundary is important because it determines how projects with different emission profiles over time will compare.

Practice differs quite distinctly between organisation-level accounting and product/service analysis. In the former, there is a working assumption that the appropriate period is one year, reflecting the decision-making cycle of most such bodies (Greenhouse Gas Protocol Initiative 2004; Global Reporting Initiative 2011). But it is acknowledged that the inclusion of emissions from the full "value chain"(see below) may mean that the total for a given year will actually include emissions from previous years and may include predicted emissions from future years (Greenhouse Gas Protocol Initiative 2011a).

Life cycle analysis of greenhouse gas emissions has adopted an "assessment period" of 100 years (British Standards Institution 2008; Greenhouse Gas Protocol Initiative 2011c). Its provenance appears to be as follows: in order to understand the relative global warming potentials of various greenhouse gases, it is necessary to measure their impacts over a specified period. This has been done experimentally using periods such as 20, 100 and 500 years (Intergovernmental Panel on Climate Change 2007b, p.212), with the finding that relative global warming potentials vary significantly with respect to carbon dioxide, the reference gas, depending on the assessment period. A standard period has to be chosen in order for each greenhouse gas to be convertible to carbon dioxide equivalent (a notional aggregate greenhouse gas that enables comparisons to be made between sources producing different combinations of various greenhouse gases) and the period typically chosen is 100 years

(Intergovernmental Panel on Climate Change 2007c). The life cycle analysis guidance indicates that the same period has been adopted as a temporal boundary in estimating impacts of products/services (British Standards Institution 2008). In addition to limiting the consideration of emissions to that period, the guidance also recommends that emissions be adjusted according to the timing of their release: an emission in Year 99 will be present for only one of the 100 assessment years and so will do a fraction of the damage *within the assessment period* that it would do if released in Year 1. This approach has the advantage that the effective emissions profile approaches zero at the end of the assessment period, thus avoiding any significant discontinuity, and is motivated by a perception that short-term emissions are a higher priority than those far in the future (Sinden 2009; Sinden 2012). This recalls the practice of discounting cash-flows as discussed below at §5.6. But it has the effect of treating later emissions as if they are less damaging than earlier emissions, which is not actually the case.

The category of mitigation projects dealt with in the dedicated guidance (Greenhouse Gas Protocol Initiative 2012) is given special treatment, reflecting the fact that such projects can take time to "bed in" and reach full effectiveness. The guidance points users to a default period of 100 years but allows them to choose a longer or shorter period depending on the circumstances, provided this is explained and then used consistently.

Spatial boundary

The concept of spatial boundary is particular to organisational greenhouse gas accounting, as the practice of life cycle analysis (of goods/services) is neutral with respect to location. In the case of an organisation such as a company, the selection of a spatial boundary may be a matter of deciding whether to associate all relevant activity with the location of the head office or distribute it instead in line with the locations of its various sites. In this case the issue can be thought of more as one of spatial division rather than boundary setting. But, where a public body is concerned, there will often be a defined geopolitical area over which the body has responsibility. And this responsibility may extend in some sense to the people within the area.

To turn to a practical example, a local authority seeking a measure of its greenhouse gas emissions has to make a decision concerning the interpretation of its geopolitical boundary. Does it include only qualifying acts that occur within the boundary? This would mean that a car journey in the local authority's area would qualify, regardless of the origin of the driver, and that only the section of a cross-border journey that took place within the boundary would qualify. Or should it instead start from the residents and organisations based within the boundary and include their actions? This may mean that actions far outside the physical

boundary of the body's geopolitical boundary would qualify. There are arguments in favour of both approaches, reflecting mainly the concepts of control and influence, which are discussed further below.

The dilemma can be characterised as being a trade off between seeking the best measure of emissions that a local authority can influence and finding a measure that it is manageable to compile. This is reflected in both the theory and practice reported in the literature. ICLEI, for example, argues for including the emissions "associated with activities occurring within the local government's geopolitical boundary" (ICLEI 2009, p.13) claiming that this is because the authority has control and influence over these activities through its various policy levers. But it goes on to concede that "in some cases it is important to consider emissions that occur outside of the geopolitical boundaries of the community as a result of decisions or actions taken within the community" (ICLEI 2009, p.13). The detailed guidance allows for this flexibility, indicating that practitioners can choose in the case of air travel between air travel "originating within" or "serving the needs of" the community (ICLEI 2009, p.36).

In the UK, the current administration collects data on behalf of local authorities under the heading "CO_2 emissions within the scope of influence of local authorities" (Department of Energy and Climate Change 2011a). This indicator replaces one that was in the national set under the title "NI186 - Per capita CO_2 emissions in the LA area" (Department for Communities and Local Government 2007) and the change in title reflects a deliberate attempt to characterise the indicator as representative of an authority's reach. The dataset is in fact a subset of a fuller measure - *Local and regional CO_2 emissions estimates* (Department of Energy and Climate Change 2011b). The underlying data collection method for the "scope of influence" set involves the exclusion of certain items from the "full" set on the grounds that local authorities have little purchase on these emissions sources (see Figure 5.1). The inevitably arbitrary nature of these boundary decisions is openly admitted: "in deciding on

Emissions within scope of influence of local authorities exclude:

- EU Emission Trading Scheme (with some exceptions)
- Motorway traffic
- Diesel railways
- Land Use, Land Use Change, and Forestry (LULUCF) sector

(Department of Energy and Climate Change 2011b)

Figure 5.1 – Differences between "complete" CO_2 emissions and CO_2 emissions "within scope of influence of local authorities"

these exclusions we were aware that whilst arguments could be made for other exclusions, a line had to be drawn somewhere which would result in an indicator which was considered fair in terms of authority actions actually effecting change in the indicator, and where real change at the local level will be captured" (Department of Energy and Climate Change 2011b, p.11).

Leaving the details to one side, the philosophy behind the spatial boundary for these UK indicators is to include actions that take place within the geopolitical boundary. For example, carbon dioxide emitted during the generation of electricity is treated as belonging to an authority if the electricity is used within the boundary (though the gas may have been released elsewhere). But if a resident of the authority uses electricity in another authority, this does not qualify. In terms of the trade off introduced at the start of this section, practicality of measurement may well be a determining factor since it is much easier to estimate the quantity of electricity used within an authority than to estimate the electricity use of the authority's citizens. Whether an authority can really be claimed to have much influence over the electricity use of visitors is, though, debatable.

Orders of impact

Activities can often have knock-on impacts (both intended and unintended) and, under certain circumstances, it may be legitimate to include the emissions associated with these impacts. For example, if a local authority introduces a window insulation programme, there are "direct" emissions associated with the production of the insulation material, its transport and its installation. Once installed, the insulation is likely to reduce heat loss in treated buildings, leading to automatic energy savings as heaters maintain the target temperature more efficiently. It may also lead to higher-order effects as occupants respond to better heat retention by spending money saved in other ways, or putting up the thermostat ("the rebound effect" - see, eg, Haas & Biermayr 2000).

Where the window insulation programme is being introduced as a mitigation project, it is standard practice to include the consequent savings and to evaluate the intervention in terms of its net emissions (ie the result of deducting the resultant savings from the direct emissions). But the identification of the correct quantities to include in the calculation is not necessarily straightforward. The principal issues, which are linked, are:

- Order
- Estimation
- Attribution

To the extent that it is possible to define order robustly, "first-order impacts" are those directly caused by an intervention, "second-order" are those directly caused by the first-order,

and so on (Edwards-Jones et al. 2000). Order is to be distinguished from scope (see Figure 5.3). The assessment of any intervention requires a line to be drawn concerning the number of orders to consider, if for no other reason than to make the process manageable. This is because each additional order brings considerable extra complexity. The orders of impact can be thought of as a tree diagram, the number of branches associated with a given order being many times that of the previous order.

With increasing order, estimation also becomes more challenging, as the uncertainties present at each stage combine to create very wide possible impact ranges. As discussed under the theme of uncertainty, there are various responses to this predicament but they can be labour-intensive and are bound to be probabilistic in some way, ie to produce at best a defensible number from the possible range. Equally, with increasing order, attribution also becomes more difficult, it being increasingly likely that other factors will be contributing to events. For example, a local authority may increase the provision of buses which may lead citizens to use their cars less (first-order impact). Some of those citizens may then choose to sell their cars which may lead to a general reduction in distance travelled (second-order impact). But, by this point, the decision to sell one's car is likely to be a product of more than a drop in driving in response to bus improvements. This creates a requirement to identify a suitable proportion of any benefit/cost resulting from the sale of the car to attribute to the bus intervention.

Given the imperative to make very large reductions in global emissions, these issues, though not unique to greenhouse gas accounting, are of fundamental significance. As the example of insulation shows, the project will appear very different depending on which orders of impact are included in the calculation. And the literature is weak on this topic, perhaps because of the tendency for greenhouse gas accounting to have been focussed on organisations or products up to now. Relatively little thought is given in either strand to considering the possible consequences of courses of action: in the organisational context, the emissions estimation process is based on a consumption model in which there is limited interest in higher orders of impact; products meanwhile (as opposed to services) are defined tightly and the "system boundary" (European Commission - Joint Research Centre - Institute for Environment and Sustainability 2010; British Standards Institution 2006b) drawn around them limited to the well-understood "necessary" events directly connected to the product's creation, consumption and disposal. The guidance on policies/actions admits the concept of causal chain but seems almost naïve, instructing the user to "map the causal chain including identifying all possible GHG effects" (Greenhouse Gas Protocol Initiative 2012, p.17). It does, in fairness, offer an exit to users where data are lacking: "when relationships are largely undefined, a more general coverage of consequences (or lack of) is all that is necessary to draw the line and not proceed further in the causal chain" (Greenhouse Gas Protocol Initiative 2012, p.38). But the

implication seems to be that, provided data are available, the final calculation could include arbitrarily long causal chains.

Value chain

The concept of scopes (1, 2 and 3) has been introduced above in the context of double counting. Scopes are a practical means of partitioning the value chain (a phrase now increasingly preferred to supply chain) of an organisation, product or process. Two terms also frequently used are "cradle to gate", and "cradle to grave", referring to the extent of the chain under consideration (British Standards Institution 2008). The first describes the "upstream" section of the supply/value chain, ie that leading to the point at which the next actor in the life cycle of a product takes receipt of it. The second refers to the full life cycle, including final disposal of the product's constituents. To repeat the (slightly simplified) definition of scopes: a given actor's *Scope 1* emissions are those resulting from the actor burning fossil fuels; her/his *Scope 2* emissions result from burning fossil fuels to generate electricity which the actor uses; and *Scope 3* describes all other emissions in the value chain (and can therefore arise both up- and down-stream of the actor's part in the chain) (Greenhouse Gas Protocol Initiative 2004).

There is some variation of practice in greenhouse gas accounting (see Table 5.1): organisations following the Greenhouse Gas Protocol's Corporate Accounting Standard are at present free to decide whether to include Scope 3 emissions in their inventories (Greenhouse Gas Protocol Initiative 2011a), the inclusion of Scopes 1 and 2 being mandatory. The position is changing, though: the Global Reporting Initiative's sustainability reporting guidelines differentiate between "core" and "additional" indicators. Its 2002 version presented "other relevant indirect greenhouse gas emissions" (very similar in range to Scope 3) as an *additional* indicator (Global Reporting Initiative 2005, p.41). The latest version makes this a *core* indicator alongside "total direct and indirect greenhouse gas emissions" (Global Reporting Initiative 2011, p.28). The definitions of core and additional allow for some interpretation but the significant point is that the two indicators now have the same status. The ICLEI guidance for the local government sector appears to reflect this transition in stipulating that Scope 3 emissions should be included (ICLEI 2009), though subject to principles of control and influence, discussed further below.

Where product life cycle analysis is concerned, there is a standing presumption that the "full" chain will be captured in accordance with the principle of completeness (British Standards Institution 2008, p.6), though this is bound to be a matter of interpretation. An exception relates to the "business-to-business" practice of adopting cradle-to-gate measures, reflecting the idea that an intermediate actor in the supply chain should account for emissions up to and including the point at which the product passes to the next participant.

Table 5.1 – Varying requirements to report Scope 3 emissions

Guidance document	Accounting for Scope 3 emissions mandatory?
Greenhouse Gas Protocol Initiative	✗
Global Reporting Initiative (2011 version)	✓
ICLEI	✓
Carbon Disclosure Project[10]	See note

In common with orders of impact discussed above, the value chain does not always have a well-defined beginning and end, particularly in "cradle to cradle" cases where a line has to be drawn between the "end" of the previous generation and the "beginning" of the new one, using materials recycled from one in the next. This fact, combined with the possible complexity of the value chain, implies the need for pragmatism, the most obvious example being a rule of "materiality" which allows for impacts contributing less than 1 per cent of overall emissions to be excluded from the calculation, provided total immaterial resources do not exceed 5 per cent (British Standards Institution et al. 2008, p.14). This may result in a simplification in reporting terms but of course does not free the practitioner from conducting the measurement in order to be confident in claiming a given impact is indeed immaterial.

As for what is and is not typically included, practice varies (see Table 5.2). The life-cycle analysis guidance offers various sets of broad impact categories as a departure point for identifying all material emissions. The organisational guidance equally sets out lists of qualifying sources (for example, the 15 categories of Scope 3 emissions identified by the Greenhouse Gas Protocol, (Greenhouse Gas Protocol Initiative 2011a, p.32). Neither category of guidance can provide exhaustive instructions concerning qualifying emissions, given the wide range of activities/organisational types covered, thus implying an element of judgement (see §5.4).

How much does the latitude offered by the guidance matter? Possibly a great deal, if Matthews et al (2008) are right in asserting that Scope 3 may account for 70 per cent of the overall total of supply chain emissions. That reporting Scope 3 remains optional in the leading measurement standards is perhaps a political necessity for now and something that is bound

[10] The CDP Reporting Roadmap grades responses from "basic" to "best practice". A basic response names and describes Scope 3 emissions; higher-grade responses quantify and verify these emissions (Carbon Disclosure Project 2013b).

to change. Even so, it remains highly doubtful that any two randomly selected "all scopes" inventories would have exactly the same coverage.

Table 5.2 – Examples of emission categories

Life cycle emission calculation – items within the "system boundary"	**Organisational categories of emissions**
• Raw materials • Energy • Capital goods • Manufacturing and service provision • Operation of premises • Transport • Storage • Use phase • GHG emissions from final disposal (from British Standards Institution 2008)	Scope 1 (emissions arising from burning fossil fuel) Scope 2 (emissions arising from generation of electricity used) Scope 3: • Purchased goods and services • Capital goods • Fuel- and energy-related activities • Upstream transportation and distribution • Waste generated in operations • Business travel • Employee commuting • Upstream leased assets • Downstream transportation and distribution • Processing of sold products • Use of sold products • End-of-life treatment of sold products • Downstream leased assets • Franchises • Investments (Greenhouse Gas Protocol Initiative 2011a, p.32)

Policy/jurisdiction

This topic deserves brief attention given its particular relevance to the public sector: in addition to the criteria discussed so far, a public body's policies and jurisdiction (a term intended to imply the reach of its policies) can be a reference point in determining which emissions should be included in an inventory.

With respect to policy goals, if an emission source is associated with a public body's intention of achieving a given outcome, this might be grounds for including it. But the dangers of allowing intention to function as a criterion have already been identified in the discussion of bias. So, looking instead at policy reach, the two terms *control* and *influence* (eg ICLEI 2009, p.15; California Air Resources Board et al. 2010) deserve consideration. They are defined in

The "carbon footprint" of the 2012 London Olympic and Paralympic Games excluded emissions associated with worldwide use of television to watch events on the grounds that "most observers would probably agree that these impacts are well outside London 2012's control" (London Organising Committee of the Olympic Games and Paralympic Games Ltd (LOCOG) 2010, p.14). In contrast, emissions relating to food purchased by spectators were included on the grounds that the Games organisers had some control/influence over this even though the catering arrangements would be managed by third parties.

The Games' footprinting principles included the following additional criteria: if an impact could not be "estimated" it would be excluded; and, subject to other criteria, if there was not "high stakeholder interest" in an impact, it too would not appear (London Organising Committee of the Olympic Games and Paralympic Games Ltd (LOCOG) 2010, p.15).

Figure 5.2 – The carbon footprint of London 2012

the corporate context principally to guide the allocation of emissions in situations where assets are shared. In the context of the public sector, they have a different weight reflecting the typical public authority's capacity (and, perhaps, also its duty) to affect a wider community than itself. In summary, an authority is encouraged to include an emission if it arises from a source over which the authority has either control or influence.

Both control and influence are terms which allow considerable room for manoeuvre: if they wished to, the organisers of London 2012 (see Figure 5.2) could have expended efforts on encouraging those watching events on television to buy efficient sets or to switch their sets off standby when not watching. The influence achieved might have been very limited but it is not clear that it would have been zero. Hence it seems inevitable that the terms will be interpreted differently by different actors and perhaps differently within a single inventory.

For this reason, the concept of "function", though also open to interpretation, may be of more use. This is the principal inclusion criterion offered by the Department for Environment, Food and Rural Affairs (2008) in its guidance on the now-defunct NI185 (CO_2 reduction from Local Authority operations[11]). Function is not exhaustively defined but is explained to mean "both the duties and powers of an authority" (Department for Environment, Food and Rural Affairs 2008, p.3). In particular, it includes "contracted-out" activities (services that used to be provided by the council but which now are provided by contractors). But, coming as it does from an estate and operations perspective, the term "function" does not have an immediate

[11] This indicator has since been replaced by the measure *greenhouse gas emissions from local authority own estate and operations.*

application to community-wide emissions. An artificial interpretation can be constructed in which the activities fulfilling the duties and powers of an authority are combined with a working assumption concerning orders of impact. For example, relevant councils have a duty under the School Standards and Framework Act 1998 entitled "maintenance and other funding of schools" (UK Government 1998). First-order impacts resulting from fulfilling that duty include that teachers are employed and children attend. So the emissions associated with those two impacts could be included in a community-wide inventory for such a council. The difficulty with this is that a council can take a minimalist approach to service delivery, doing only that which is absolutely essential. An emissions inventory based on this could therefore appear narrow in comparison with that of a more expansive neighbouring authority. If comparability across authorities is not a high priority, this may not be considered a problem; if, though, it is important to compare authorities on a like-for-like basis, this would suggest founding the definition of community-wide emissions on a common basis, most likely authorities' duties.

Interactions/interdependence between criteria

Certain of the criteria discussed above interact to some extent with each other; the interactions can be subtle so they are briefly explored below.

With respect to the relationship between territorial/consumption approach and spatial boundary, there is scope for conflict if a territorial approach is adopted in combination with a spatial principle of including impacts arising from actions of agents based within the geopolitical boundary: actions of such agents when outside the boundary would qualify on spatial grounds but resultant emissions may be excluded because they arose outside the boundary. In contrast, the choice of a consumption-based approach would imply that emissions arising beyond the geopolitical boundary (associated with qualifying actions taking place either within or outside) may be included. A comparable situation obtains for the relationship between spatial boundary and scopes/value chain: if the spatial boundary is defined to include only actions within the geopolitical area, and if all scopes are included, this will tend to imply that (Scope 2 or 3) emissions arising outside the geopolitical area will be counted in the inventory.

There is also an interaction between the territorial/consumption approach issue and that of scopes/value chain. Under a territorial model, emissions from a local power station would feature in a country's inventory; under a consumption model, they may not, and instead the inventory would include the emissions associated with the manufacture of an imported t-shirt. In contrast, an "all-scopes" inventory for the country would include both sets of emissions: the

power station's emissions would feature under Scope 1 and the t-shirt emissions under Scope 3.

Finally, there is the potential for confusion concerning the issues of scopes/value chain and orders of impact: Figure 5.3 is intended to show the difference using an example project in which printed social marketing materials are used to discourage problem drinking. First-order impacts are a **contingent** consequence of the project implementation (people may start to reduce their drinking or they may not); value chain emissions, on the other hand, are **necessary** events connected with the core process (eg leaflet paper must be disposed of in some way). In particular, there is a value chain associated with each impact.

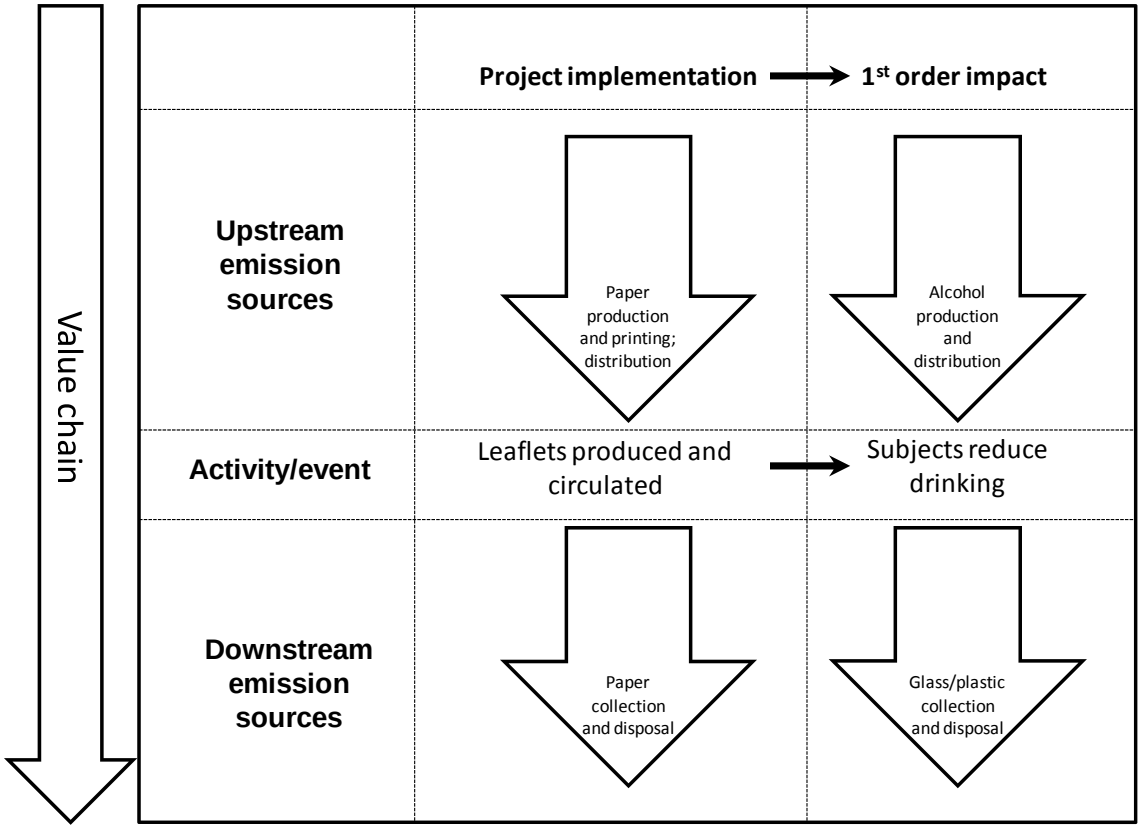

Figure 5.3 – Interaction of orders of impact and value chain

5.4 The roles of judgement and arbitrariness

The guidance on product greenhouse gas accounting requires the use of a product category rule (PCR) where one is available (British Standards Institution 2008, p.12). A PCR is a pre-existing template for products of a certain kind which, amongst other things, determines the system boundary for the compilation of the inventory. Apart from saving effort on the practitioner's part, this requirement is the surest way of achieving some degree of consistency across life-cycle analysis exercises; as discussion above has shown, a large number of context-specific decisions concerning coverage would otherwise have to be made.

Because PCRs exist for only some product types and as they do not have a counterpart where organisational inventories are concerned, there are various circumstances in which the practitioner is advised to exercise judgement and apply some pragmatic principles in determining boundaries. These are discussed below.

Relevance

This concept appears in several settings. Its primary definition derives from the principle of relevance, one of five (or occasionally six) presented as the foundation of Greenhouse Gas Protocol guidance documents (eg Greenhouse Gas Protocol Initiative 2004, p.7). Its practical application is articulated in the context of US Public Sector organisations, where the criteria for including a Scope 3 emission source are:

- Size/expected size compared with Scope 1 and 2 emissions;
- Potential for the organisation to reduce/influence the emission;
- Contribution to the organisation's GHG risk exposure;
- Key stakeholder opinion;
- (If an outsourced activity) whether the activity was previously carried out by the organisation or would typically be by comparable organisations (Greenhouse Gas Protocol Initiative 2010, p.31 paraphrased).

A British example (Department for Environment, Food and Rural Affairs 2009) is very similar, but includes the criterion of *importance to the reporting body's business* rather than one relating to risk exposure.

Whilst the principle of relevance appears superficially reasonable, it can lead to anomalies. For example, a focus upon emissions that an organisation is in a position to influence makes sense in the context of that organisation's attempts to manage down its impact; it makes less sense if what is wanted is a complete summary of attributable emissions. And criteria such as importance to business and stakeholder opinion appear to offer opportunities for bias to creep in: in both cases, emissions that are peripheral to an organisation's focus may be discounted as not important or interesting enough, despite perhaps being large.

Certainty

The theme of certainty also features to some extent in accounting guidance.

In earlier discussion, questions of estimation and attribution have been identified in the case that an initial impact leads to first-, second-order effects and so on. The Greenhouse Gas Protocol guidance for companies allows that, if the probable eventual use of a product is unknown and the possible uses of it would lead to very different emissions profiles, Scope 3

emissions may be excluded from the inventory, provided this is declared (Greenhouse Gas Protocol Initiative 2011a, p.60).

As with relevance, the idea of excluding emissions in situations of uncertainty has some intuitive soundness, arising from the fact that a complete unknown cannot feature in any quantitative analysis. But uncertainty will in fact always be relative and there are arguments that even the seemingly most imponderable effects are susceptible to at least rudimentary estimation (Hubbard 2007). To return to the question of the eventual use of an intermediate product, that product is presumably sold to other actors who may then go on to use or sell it. It therefore seems that there is scope for some investigation of the product's future. This investigation may be laborious and its conclusions tentative but it would allow the allocation of a figure. This is nothing more than an instance of the trade-off between effort and accuracy raised at the beginning of this chapter: the situation is difficult because "remote" emissions can be large so to omit them on the grounds of uncertainty may be irresponsible.

A further criticism of the use of uncertainty as an exclusion criterion is that it conflicts with the set of principles underpinning greenhouse gas accounting. Amongst the five core principles are *completeness* and *accuracy* (Greenhouse Gas Protocol Initiative 2004, p.7), both of which would seem ill served by an arbitrary decision to exclude an impact on grounds of uncertainty.

Pragmatism

A further category consists of rules of thumb for managing otherwise complex accounting decisions.

As introduced above, the concept of materiality allows emissions sources that would not exceed one per cent of the total to be omitted (provided the combined impact of excluded "immaterial" sources would not exceed five per cent of the total). A similar rule applies in slightly simpler form under the name – *de minimis* (ICLEI 2009, p.14): here, emissions can be excluded on *de minimis* grounds if they amount in total to less than five per cent of emissions. It remains the case that these freedoms represent a reduction in reporting effort but do not save the organisation from establishing on at least one occasion the approximate magnitude of the impacts in order to be able to justify their exclusion.

The demands of pragmatism have also led to the development of a series of principles which, whilst justifiable to some extent, are equally open to debate. Of the many possible examples, the following one is illustrative: if fruit is picked by hand, the "human energy inputs" are excluded as are those of animals providing transport services whereas, if machinery is used to harvest or transport, its emissions should feature (British Standards Institution 2008, p.16).

5.5 Estimation methods

The fundamental building block of any emission estimation method is the relationship between a given "elementary" activity or event and the greenhouse gases it produces (Hill et al. 2011). This might be the burning of a litre of a particular fuel, the operation of refrigeration equipment or the decomposition of a particular substance. Each elementary activity can be studied empirically in controlled conditions in order to obtain a robust measure of emissions. These building blocks are then combined to develop a fuller picture of the emissions associated with activities. For example, the "full" emissions attributable to consuming a litre of fuel are calculated by combining the combustion emissions with emissions resulting from extracting, processing and transporting that fuel (AEA 2011a). Such numbers, when presented in unit form (eg per kilogram or per litre) are called "conversion factors". Practitioners are able to compile an inventory for an organisation or a product, say, by applying these conversion factors to estimates of activity levels (eg number of litres of fuel consumed).

The above description assumes that practitioners know *ex ante* the relevant activity levels, but this will be so only when the item under investigation is very simple. The great number of situations where activity levels are not known in advance has led to three standard responses:

- Life cycle analysis;
- Environmentally extended input output modelling; and
- Hybrids of the two.

These are discussed in turn.

Life cycle analysis

Process-based life cycle analysis can be characterised as an iterative process of breaking the item under investigation down into discrete stages until each stage is an elementary activity or event to which a conversion factor can be applied.

The process has already been referred to extensively in previous discussion of inclusion boundaries but it deserves a brief summary:

- For a given product or service, the steps in its creation, consumption and end of life (where applicable) are identified, the resulting diagram being called a process map (British Standards Institution et al. 2008, p.13)
- A "system boundary" is then defined which specifies which items on the process map will feature in the inventory (see Figure 5.4)
- Quantities (activity levels) are associated with each item within the system boundary

- The activity levels are converted using emissions factors to arrive at estimated emissions for each item within the system boundary and these are then summed to a total (sometimes called the Life-cycle inventory, or LCI)

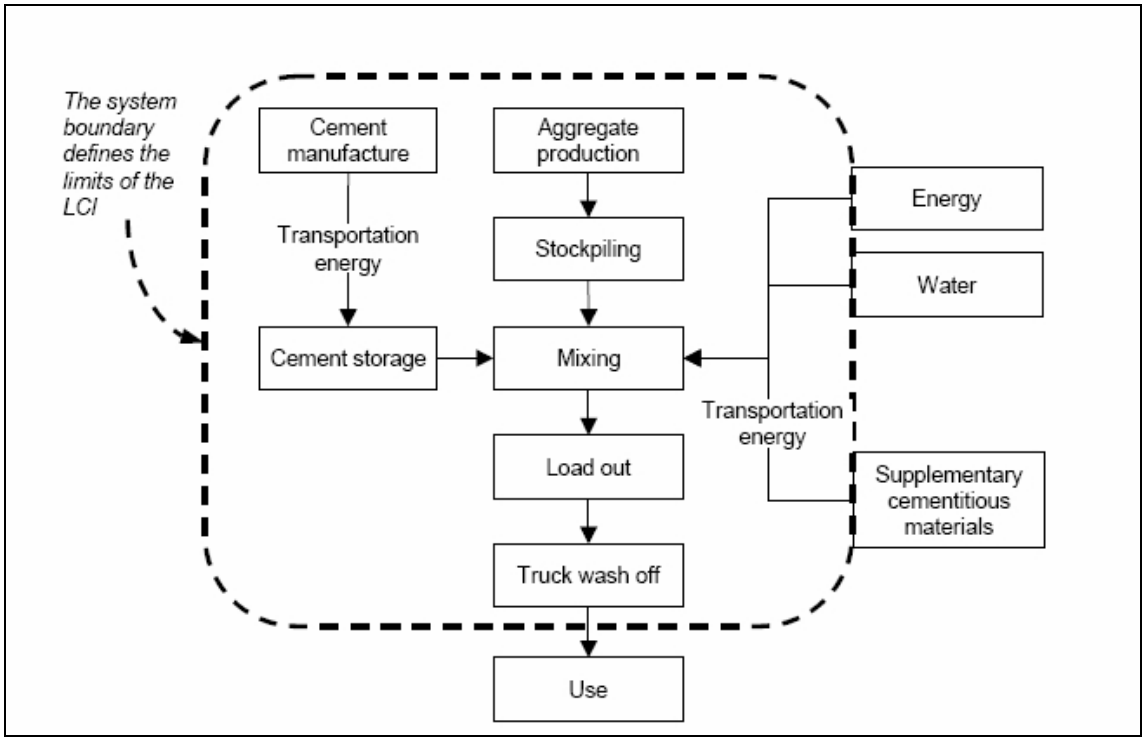

Figure 5.4 – Example of system boundary for life cycle analysis (from Portland Cement Association 2013)

Where a product category rule does not yet exist, the process is necessarily detailed and can be time-consuming; this is the principal criticism made of life cycle analysis (eg Minx et al. 2009). One "short cut" is to identify common characteristics amongst a set of products in order to benefit from economies of scale by reusing elements of one life cycle analysis across similar products (Best Foot Forward 2011) but this relies on a sufficient degree of resemblance.

Minx et al. (2009) also pick on what they see as shortcomings of the LCA approach, in its tendency to truncate the supply chain both upstream and downstream for reasons of practicality, but this criticism seems more one of the practice of LCA than its essence: as discussion above has shown, reasons are frequently found for placing limits upon the impacts included within the system boundary but LCA as a method does not of itself impose any constraints. A more compelling criticism of LCA is that its outcomes are rarely transferable, being of necessity quite specific. For example, PAS 2050 requires that "primary activity data shall be collected from those processes owned, operated or controlled by the organization implementing this PAS" (British Standards Institution 2008, p.17). The benefit of this requirement is that emissions estimates for a given product will be more accurate than if derived using reference values. But the disadvantage is that applying the results of the

analysis in a different context requires the practitioner to review all the numbers in order to test whether they are appropriate to the new setting.

Environmentally Extended Input-Output Modelling

This method, often abbreviated to EEIO, is an adaptation of input-output modelling, an economic technique generally attributed to Leontief (Gallego & Lenzen 2005). It involves the use of a matrix that describes in monetary terms the flow of inputs (eg domestically produced goods and imports) through to outputs (eg domestic final consumption and exports) defined by a fixed set of industrial and consumption categories. Emissions factors are then applied to each industrial sector, thereby enabling an estimate to be made of the aggregate emissions associated with the value chain of a particular good (Tukker et al. 2006). A diagram of the general structure of EEIO matrices is at Figure 5.5.

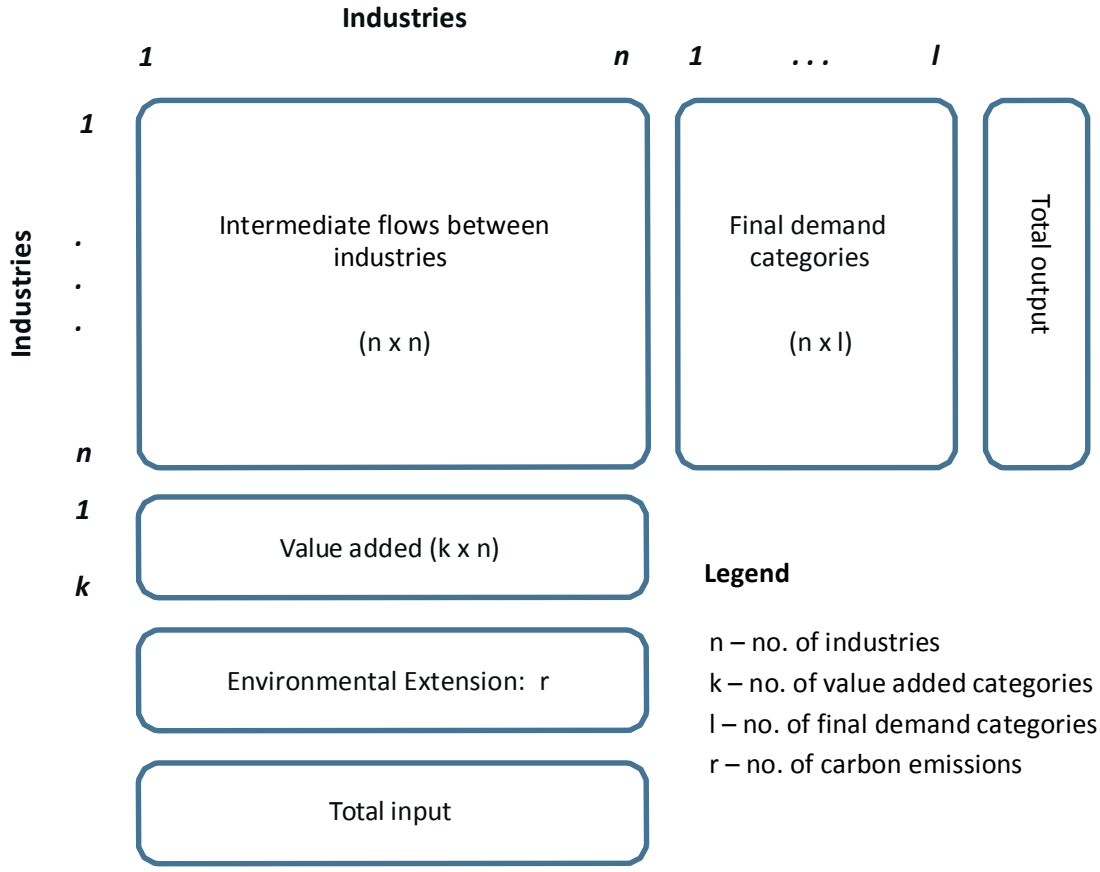

Figure 5.5 – General structure of an environmentally-extended input-output table (from Dawkins et al. 2010)

The key advantage of EEIO is that it exploits data that will typically be collected as a matter of course for economic reporting reasons. This frees the practitioner from having to carry out a life cycle analysis on each occasion that emissions data are required. This advantage is also its key shortcoming, as EEIO will be limited in its precision to the categories used in the underlying data. For example, the REAP tool (based largely on EEIO) which provides pollutant data at a

local authority level in the UK (Stockholm Environment Institute 2007), offers a total of 12 food categories. For a broad understanding of policy impacts, this is likely to be adequate but it clearly would not support the detailed analysis of emissions arising from the production of a tightly-defined food product. Practitioners using EEIO methods must accept the averaging effect that arises from creating broad industrial categories of this sort, which can lead to under- or over-estimation of true impact.

In order to support the estimation of emissions, EEIO depends on environmental inputs to combine with the trade flow information. These are gathered at the category level and so compound the averaging effect: "It is assumed that the amount of environmental intervention associated with an industry is proportional to the amount of output of that industry" (Tukker et al. 2006, p.21).

EEIO is based on the full journey from initial raw inputs through to final consumption, which enables it to represent the full upstream value chain. But, because the final disposal stage is not typically a matter of trade (and, where it is, linking waste trade sectors to industrial sectors is a challenge), EEIO models do not feature stages of the life cycle beyond final purchase (Tukker et al. 2006).

Other criticisms of EEIO are that it can rely on elderly data given the time it takes to gather input-output tables, that the underlying data will ordinarily relate to a period of one year, requiring practitioners to make adaptations in order to capture longer life cycles (Minx et al. 2009) and that the role of imported goods needs to be minimal in order to avoid errors due to truncation or misspecification (Suh & Huppes 2005).

Hybrid methods

The various criticisms of life cycle analysis and EEIO have led to the creation of a number of "hybrid" emissions models which are designed to combine the best features of both methods. These take various forms (Suh & Huppes 2005), reflecting the interaction of the two components within the whole. In summary, a hybrid model is defined in such a way as to manage down the inaccuracies within the input-output data and to fill gaps created by any truncations, specifically those arising at the final use/disposal stages. Because they are designed to improve upon the pure EEIO methods, hybrid models will always require more resource. But they can be less labour-intensive than pure process-based approaches, because they exploit the readily available economic data within input-output tables.

Hybrid models have been developed for various tasks. For example, Wiedmann et al (2011) apply a hybrid approaching to estimating the carbon footprint of wind power; Chang et al (2012) look at a high-rise education building whilst Marheineke et al (1998) look at a freight

transport task. As for their overall quality, according to Suh and Huppes (2005), a form of hybrid which they call "integrated hybrid analysis" represents the future of estimating life cycle impacts, with only the comparatively high resource requirements standing in the way.

Discussion

The granular nature and limited accuracy of EEIO models make them better suited to the assessment of policies than microscopic comparisons of products, but their inclusion of the upstream value chain makes them attractive in settings where "full" emissions are required. Because they are grounded in trade between actors, they are also well suited to the consumption-based approach. Life cycle analysis can be specified to match EEIO on these desiderata without its inaccuracy problems but at possibly high resource cost. The hybrid form appears to offer a good compromise but seems best suited to either a policy model context or a sector-specific application. This is because a hybrid model sufficiently sophisticated to estimate accurately the emissions of very diverse products/processes would need to incorporate numerous process-based modules such that the EEIO component would be likely to become insignificant.

5.6 Treatment of financial impacts

Though the treatment of financial impacts arising from local authority interventions is a much longer-established topic than that of greenhouse gas, it nonetheless generates a series of questions which to a considerable extent mirror those asked in the previous sections concerning emissions. As will be seen, many of these are ducked by continuing with standard approaches that have well-known weaknesses, though not without justification. This is a fact recognised by the Chartered Institute of Public Finance and Accountancy whose report *Counting Costs* (Chartered Institute of Public Finance and Accountancy 2011a) is predicated on a need for the public sector to improve its performance in this regard.

Approaches to costing

Numerous costing techniques exist and are in use to a greater or lesser extent in the UK public sector. Of particular interest given the nature of this project is "whole life costing". The method has much in common with others such as life cycle analysis, whole life appraisal, and total cost of ownership but the term "whole life costing" (WLC) will be used in this discussion. A useful working definition of a basic form of WLC (which displays its origins in construction) is provided by El-Haram et al (2002):

> "WLC can be defined as a technique for examining and determining all the costs – in money terms – direct and indirect, of designing, building and facility management (operating, maintenance, support and replacement) of a building throughout its entire service life including disposal cost" (El-Haram et al. 2002, p.145).

Very commonly, though not necessarily, WLC involves the discounting of future cash-flows. Of the various justifications for this practice, the one propounded by economists is *social time preference*, the proposition that society in general prefers to receive goods sooner rather than later (HM Treasury 2011). The result is the "net present value" of an intervention's financial impact, a single figure derived by summing annual (discounted) net impacts over a suitable period.

The practice of WLC is motivated by "the disconnect between decisions about purchasing and decisions about operating and maintaining assets" (Chartered Institute of Public Finance and Accountancy 2011b, p.21) as well as the divisions of responsibility along similar lines. It has evolved from its origins in the construction sector (Office of Government Commerce 2007) and grew in prominence in the UK as a result of the extensive use of the Private Finance Initiative in the 1990s and 2000s (Chartered Institute of Public Finance and Accountancy 2011b), gradually extending to other sectors. Its expansion to encompass environmental as well as financial impacts is argued to spring from environmental pressures (Chartered Institute of Public Finance and Accountancy 2011b). Guidance exists on the inclusion of environmental impacts in WLC (Energy Saving Trust 2005) and at least one operational calculator incorporating such impacts has been developed (Forum for the Future & Fife Council 2009). Hunter et al (2005) report on efforts to convert WLC specifically for use in a local government context though it also has a role to play in a purely commercial setting, where the likely profitability of a product over its "life cycle" informs research and development funding decisions (Lalli 2012).

It is acknowledged that WLC is a laborious method for estimating financial impact compared with more conventional methods such as standard costing, and the inclusion of indirect financial (or other) impacts raises issues of uncertainty discussed in §5.3 in the context of greenhouse gas emissions. This may explain reported hostility to its use (Hunter et al. 2005). There is also some inertia arising from the fact that decisions to invest typically remain separated within institutions from decisions concerning upkeep (Chartered Institute of Public Finance and Accountancy 2011b). Hence its limited use to date.

The range of costing approaches available means that WLC is only one candidate amongst many, albeit one being increasingly championed: *Counting Costs* lists eight methods other than WLC (Chartered Institute of Public Finance and Accountancy 2011a). And in direct competition with it is activity-based costing, a method which is equally designed to capture "true" financial impacts, though in this case more on the basis of the correct allocation of overhead than any attempt to account for indirect or longer-term financial impacts. Activity-based costing can be presented as a good means of achieving clarity on local authority costs, as indicated by the title

of a guidance document advocating its use: *Delivering efficiency: understanding the cost of local government services* (Institute of Public Finance & North West e-Government Group 2008).

The task of choosing the most suitable costing method depends to a great extent on what is to be costed. Relevant guidance calls for pragmatism: the cost of costing needs to be justified (International Federation of Accountants 2009). In particular, the costing method chosen needs to be as simple as is needed, relevant to the decision type and economical in its level of accuracy (Chartered Institute of Public Finance and Accountancy 2011a). So, in which cases is the above-average burden of WLC merited? According to CIPFA, its costs should be outweighed by its benefits, which means "that it makes sense to use WLC for projects or assets that are either:

- High in value, or
- Lower value/cost but purchased in high volume" (Chartered Institute of Public Finance and Accountancy 2011b, p.29).

In addition to the above size criterion, time is seen as a relevant factor:

> "The focus of short-term decision [sic] is on how costs change in line with the level of activity…For longer-term projects where the time horizon can run to many years, the emphasis is on the total project cost" (Chartered Institute of Public Finance and Accountancy 2011a, p.15).

Though the above differentiation is superficially reasonable, discussion of greenhouse gas emissions showed that including indirect impacts can mean that a short-term intervention will have long-term impacts, making the determination of a given project's true timescale challenging.

There is a third factor: significance. "For significant change proposals, costing techniques are critical. These generally look to establish all relevant costs, including opportunity costs and externalities, and will look beyond the organisation's boundaries" (Chartered Institute of Public Finance and Accountancy 2011a, p.15). But this is open to dispute, since a large number of "insignificant" changes could, in combination, be "significant". Nonetheless, the mention of third parties is interesting. Indeed, general practice in appraisal of major schemes is to calculate the financial impacts across a range of groups of actors (HM Treasury 2011). For the typical local authority, this may mean members of the public and local businesses.

Alongside these pragmatic considerations is the procedural separation of revenue and capital in the UK public sector. The definition of a capital item is drawn from the International Accounting Standard: "costs associated with property, plant and equipment shall only be capitalised if it is probable that there are future economic benefits or service potential associated with them and that the costs can be reliably measured" (Chartered Institute of

Public Finance and Accountancy 2012, p.19, paraphrasing IFRS Foundation 2012). In practical terms, items are treated as capital if they have a lifetime of more than one year. This typically applies only to physical assets though public bodies can seek permission to "capitalise" items that would ordinarily be characterised as revenue. The clear implication is that WLC would not normally be expected to be applied to revenue items.

The relationship with budgeting

This distinction between revenue and capital is seen very clearly in the budgeting practices of public bodies. Revenue budgets are drawn up separately from capital budgets (see, for example, London Borough of Tower Hamlets 2012) and the funding arrangements for the two categories are quite different (Chartered Institute of Public Finance and Accountancy 2012). This recalls the remark made above concerning the institutional separation between purchase and maintenance decisions.

Whatever the merits of the revenue/capital divide, there is, as with costing, a perception that this is an area in which public bodies could improve, particularly given their currently straitened circumstances (Chartered Institute of Public Finance and Accountancy 2008). And again, as with costing, several approaches to budgeting are available, including zero-based budgeting (where an expenditure plan is built up from a tabula rasa) and activity-based budgeting (which applies its costing counterpart to the development of spending plans). But calls to conduct budgeting in a more circumspect manner do not appear to have influenced UK local government. Danziger (1978) found in the 1970s that local authorities practised incremental budgeting to a great extent and more recent guidance warns against expecting major change.

> "However, relatively few options will be easy or uncontroversial to implement. So results may be less than radical – faced with difficult choices organisations will often prefer to explain their inability to invest in a new service initiative rather than their decision to disinvest from an existing service" (Chartered Institute of Public Finance and Accountancy 2008, p.4).

Part of the explanation comes from this desire to limit disappointment but Danziger also found the process of budget setting was managed by a small elite who paid little attention to external opinion, a view corroborated more recently by Jacobs (2001). Such a group could not hold enough detailed knowledge to be able to judge the merits of one intervention against those of another and so would very probably opt to make adjustments to an existing budget.

Another very important factor is a one-year focus, or the "annual budgeting trap" (Lalli 2012, p.146). The responsible financial officer in a local authority is required to declare the (annual) budget is balanced and is legally required to report to the authority if expenditure is likely to exceed available resources, with the implication that the authority cannot agree to incurring expenditure until the report has been considered (HM Government 1988, pt.114). This

partially explains a tendency to pay very close attention to the one-year horizon. "And even if indicative budgets for future years are rehearsed, the dominant focus of interest (and often argument) is still the annual budget" (Chartered Institute of Public Finance and Accountancy 2008, p.3).

The annual cycle does not fit well with objectives and/or activities that stretch over more than one year. One response is to budget over a longer period; Tower Hamlets is typical in maintaining a three-year budget for its capital programme, ensuring that income and expenditure are balanced across that period but not necessarily in any constituent year. But what of items whose lifespan does not match this three-year period? More to the point, how are interventions with different life spans to be compared?

The economist's answer to the latter question is to use net present value but this has the effect of typically favouring larger projects. The obvious alternative would be benefit-cost ratio which takes account of cash-flows over a series of years and, as a ratio, removes (at least in theory) the dimension of project size but with the consequence that the magnitude of financial impacts is also lost. A third option is the annualised WLC equivalent value, which is calculated by dividing the net present value by the number of years over which costs have been calculated. All of these methods can be useful in comparing between options for capital investment but they have nothing to offer from the perspective of the balanced annual budget. In fact, the annualised equivalent, though intended to aid comparison between options with different expected life spans, would be a dangerous quantity to adopt when budgeting because the net financial impact of an intervention in a given year could differ dramatically from this normalised figure. The point here is that there is a difference between a good decision and a decision that ensures continued solvency. Both of these are desirable, implying a process of at least two stages: first a method such as whole-life costing (as part of cost-benefit analysis) is used to establish which, of a set of options, has the strongest case; if that option is adopted, its net annual impacts must then be reconciled with annual budgets to establish whether it is affordable year-on-year, subject to the additional subtlety that its impacts may be split across the revenue/capital divide.

The above discussions have not addressed the issue of third parties but the points made concerning multiple years apply equally to multiple interests: it may be sound to choose an option on the basis of its aggregate financial impact across a set of actors but this does not remove the requirement to check that the impacts experienced by each actor in turn are tolerable.

In summary, despite good reasons for using WLC (and not only for large or long-term projects), the resource requirements imply its application in only a subset of cases. More significant is

the difficulty of reconciling the results of WLC with budgeting practices that are strongly orientated to a one-year cycle, especially where the intervention in question would normally be seen as a revenue item. The continuing practice of ignoring longer-term financial impacts and impacts experienced by third parties except in the case of major schemes is therefore understandable, even if it may produce perverse outcomes.

Conclusion

The discussion in this chapter has shown greenhouse gas accounting to present many challenging methodological questions to which it is difficult to arrive at a robust answer from first principles. It has also displayed the relative "youth" of greenhouse gas accounting as a practice, as demonstrated by the degree of freedom afforded to the practitioner and the relative absence of orthodoxy.

Discussion of the treatment of financial impacts reveals a number of ways in which this activity generates dilemmas similar to those encountered in the context of emissions, in areas such as temporal boundary and indirect effects. Whole-life costing may offer a workable response to many difficulties but it is incompatible with the one-year budgeting cycle which is so entrenched in the practice of public bodies.

The task now is to develop an approach to impact estimation for participatory emissions budgeting that strikes a suitable balance between the ideals explored with respect to emission estimation and the constraints implied by the well-established, though flawed, approach to financial impact estimation that the public sector employs so extensively. This task is addressed in the next chapter.

Chapter 6 Definition of an approach to impact estimation

6.1 Principles

The task in this chapter is to employ the findings from the previous chapter's survey of theory and practice in developing a workable approach to estimating the greenhouse gas emissions and financial impacts of the interventions from which participants will be choosing in participatory emissions budgeting (PEB). A practical way of working towards an answer is to propose a set of principles with which the chosen approach ought, as far as possible, to comply.

The PEB method will probably involve a wide range of local authority interventions, including those that may not have a "mitigatory" character, in order for it to have as wide appeal as possible to potential participants. These interventions will be presented to citizens who will be asked to make selections according to a financial budget and a greenhouse gas constraint. A fundamental goal of the exercise is to enable observers (especially local authority sponsors) to see how participants respond to the task and, for their findings to be meaningful, the participants will have needed to understand what was asked of them. These observations provide the basis for the first two principles:

1. **The method should produce results that are intelligible to participants**
2. **The method should produce results that are relevant to local authority stakeholders**

Though the decisions made as part of PEB as currently envisaged would be marginal to the overall strategic direction of a sponsoring local authority, this does not mean that estimates of emissions can simply be invented. This is because one possible benefit of PEB would be to show to local authority stakeholders how citizens trade off climate change impact with other factors such as the desirability of a given intervention and its financial impact. Choices made on the basis of fictitious emissions numbers would provide a less reliable guide for future decision making than those made on the basis of robust estimates. The use of fictitious numbers more generally would arguably invalidate the exercise as a democratic process. A further argument relates to citizen behaviour: participants may, as a result of taking part in PEB, make changes to their own lifestyles. It would therefore be unfortunate if imprecise figures led them to make false inferences concerning the relative value of potential changes in behaviour. These comments prompt the third principle:

3. **The method must, as far as possible, capture the true climate change impact of a given course of action**

Much of the discussion in the previous chapter dwelt on the resource implications of greenhouse gas accounting: EEIO models, for example, are favoured by some authorities because they promise a saving in effort compared with process-based approaches. As currently envisaged, PEB will concern the allocation of relatively small sums and have a limited effect on an authority's emissions profile. Thus the fourth principle:

4. **The resource requirements of the method should be proportionate to the potential impact of the decisions made**

6.2 Comparative treatment of financial and emission impacts

As will be seen, the proposed approach set out in §6.3 treats financial impacts differently from greenhouse gas emissions in several ways. This deserves discussion.

It is very probably feasible to treat financial impacts in much the same way as greenhouse gas emissions are to be treated; is it also desirable? There is certainly a natural attraction in treating different impacts consistently: it gives the impression (though perhaps not more than this) that individual options will themselves be assessed consistently as a consequence. Further, if the approach taken to assessing emissions is seen as robust, there may be a presumption in favour of extending it to financial impacts.

The rationale for treating the two impacts differently arises from a desire to conform with the very well-worn practice of financial budgeting in the local government sector, as discussed in §5.6, and reflects other decisions concerning the likely broad range and modest scope of the decision-making process being designed. It must be remembered that PEB has not been designed specifically to support the development of mitigation strategies (though it could be adapted to serve this purpose). This helps to explain why no attempt has been made to conflate financial and climate-change impacts by applying a price of carbon. Of course, to adopt an approach to financial impacts because it is consistent with current local authority practice leaves the approach open to the same criticisms as can be made of local authority practice. But to adopt a more sophisticated approach to finance could have the effect of making resultant numbers unintelligible to local authority stakeholders so the retention of standard practice is a pragmatic choice. Greenhouse gas accounting for projects, meanwhile, is novel, the rules set out below have been developed from first principles and represent, in some sense, an ideal. Harmony could be achieved between the two by either simplifying the emission accounting method or making the approach to financial impacts more sophisticated;

the costs of both actions seem to outweigh the benefits at this stage in the method's development (see Figure 6.1).

Various differences have been settled on for the treatment of financial and emission impacts. To achieve consistency would mean either that the emission estimation method would have to be simplified or the measurement of financial impact made more sophisticated.

A simplified emission estimation method: this could mean omitting indirect impacts and/or considering only first-year impacts. Installation of low-energy street lighting would therefore look weak because lifetime operating savings would be excluded.

A more sophisticated treatment of finance: this could mean including impacts across multiple years and including indirect impacts. Thus the financial impact of a community bus project would no longer be limited to the first-year cost of running the service but would reflect costs over an extended period and would be offset by fuel savings made as a result of reduced escort trips. The result would be the "social" cost in some sense though not a figure that the local authority would be likely to be able to use.

Figure 6.1 – Consistent treatment of emission and financial impacts?

6.3 The approach to be taken

A method for estimating project impacts for PEB is set out in the following sections and summarised in Table 6.1, each aspect explained with reference to the four principles stated above. The list of themes moves from the general to the specific. The reason for this is to maximise coherence by establishing conventions as high up the decision tree as possible, allowing for divergent approaches to measurement only where there are compelling reasons for doing this.

Table 6.1 – Summary of proposed impact estimation approach

Theme	Proposed approach
Quantities estimated	• Financial impacts to local authority • Greenhouse gases (Kyoto basket) emitted at the community-wide level – gross and net values • Greenhouse gases (Kyoto basket) emitted at the Estate and Operations (E&O) level – gross values
Orders of impact included	• Emissions: project implementation impacts and 1st-order impacts subject to evidence-based confidence in their magnitudes • Financial impacts: project implementation impacts

Theme	Proposed approach
Temporal boundary	• Emissions: 100 years following implementation, rolling pre-implementation emissions into implementation year • Financial impacts: implementation year, rolling pre-implementation impacts into implementation year
Community-wide emissions – spatial boundary	• Impacts arising from actions of agents based within the geopolitical boundary
Emissions – territorial/consumption approach	• Consumption-based approach - include emissions arising from qualifying acts/events, regardless of the location in which they arise
Emissions – inclusion of scopes/value chain	• Include all scopes ("cradle to grave")
Emissions – identification of relevant estate and operations impacts	• Include impacts that fall within the local authority's "function", extending to contracted-out activities
Estimation of emissions	• Employ conversion factors calculated using environmentally-extended input-output modelling (EEIO) • For cross-project consistency, compile a unified set of impact areas and check all projects against each
Distillation of emissions estimates	• Use annual average emissions calculated by dividing total emissions (CO_2e) by 100 (years)

Which quantities to estimate

Proposed approach

- Financial impacts to local authority
- Greenhouse gases (Kyoto basket) emitted at the community-wide[12] level – gross and net values
- Greenhouse gases (Kyoto basket) emitted at the Estate and Operations (E&O) level – gross values

Explanation and notes

Financial impacts to the local authority are chosen to reflect the discussion in §5.6 which showed that impacts to other actors are rarely considered in local government finance, and almost never in the case of smaller projects or those typically thought of as having a revenue character. This approach is therefore consistent with standard practice *(Principle 2)*.

The exclusion of environmental impacts other than that relating to climate change (represented by greenhouse gas emissions) has the benefit of keeping the decision-making

12 This concept is defined in more detail under subsequent themes.

process simple *(Principle 1)* and will limit the resource involved in the calculation process *(Principle 4)*. The use of the Kyoto basket is intended to avoid possible distortions arising from a focus on carbon dioxide alone: whilst CO_2 represents the bulk of emissions, certain local authority projects could be envisaged which resulted in a significant change in methane emissions, for example *(Principle 3)*.

Both E&O and community-wide emissions should be collected, according to ICLEI (2009). They serve distinct, useful purposes: measurement of E&O emissions helps the local authority in its role as an *organisation* to manage both its finances (eg energy costs, CRC) and its climate change impact *(Principle 2)*; community-wide emissions (ie the emissions associated with the authority's jurisdiction) are a helpful metric of climate change impact within the geopolitical boundary (see *Spatial boundary*, below) *(Principle 3)*.

The collection of "gross" and "net" figures at the community-wide and "gross" figures at the E&O level looks ahead to a technical detail relating to the nature of the emission constraint see §7.5 and reflects an assumption that community-wide emissions are considered a more meaningful figure than E&O figures, being more representative of the true climate change impacts attributable to a local authority intervention *(Principle 3)*.

Which orders of impacts to include

Proposed approach

- Emissions: project implementation impacts and 1st-order impacts subject to evidence-based confidence in their magnitudes
- Financial impacts: project implementation impacts

Explanation and notes

The discussion in Chapter 5 of orders of impact showed that any decision on this front is bound to be arbitrary. The rationale for including first-order impacts for emissions is that this will ensure a home insulation project, for example, is credited with the energy savings that result from it *(Principle 2)* and will avoid an unworkable degree of complexity *(Principle 4)*.

It is feasible at least in principle to incorporate indirect financial impacts, subject to the availability of relevant data and, as discussed at §5.6, appraisal methods that apply to major projects tend to capture at least some indirect financial impacts. But this is not done in the case of small, revenue projects, and councils do not include indirect financial impacts in their standard budgeting practices. To do so in the estimation method would therefore be an unhelpful departure from the norm *(Principle 2)*.

Temporal boundary

Proposed approach

- Emissions: 100 years following implementation, rolling pre-implementation emissions into implementation year
- Financial impacts: implementation year, rolling pre-implementation impacts into implementation year

Explanation and notes

This approach to emissions means that long-term effects of projects will not be distorted to the same extent as with the adoption of a much shorter period *(Principle 3)*. It is clear that some temporal limit must be placed on the estimation of impacts in order to prevent projects with cyclical effects from appearing to produce infinite emissions/savings. One hundred years is an arbitrary limit (as any would be) but it appears to have been adopted as the standard (British Standards Institution 2008) *(Principle 2)*.

A possible consequence of adopting this approach is that projects with recurrent effects (eg in terms of behavioural response) will amass large volumes of emissions/savings compared with projects whose emissions are produced over a much shorter period (see *Distillation of emissions estimates* below).

The calculation of financial impacts over multiple years has been discussed at §5.6 and this is standard practice where major investments are being considered. But the same discussion identified the incompatibility between whole-life costing and the annual focus of the budgetary cycle. For this reason, a single year's financial impacts will be calculated *(Principle 2)*, despite the risk that this will misrepresent the true financial impact of projects.

Community-wide emissions – spatial boundary

Proposed approach

- Impacts arising from actions of agents based within the geopolitical boundary[13]

Explanation and notes

The local authority has greatest purchase over agents based within its boundary and its powers and duties relate mainly to this category of agent. This approach is consistent with the control/influence principles of corporate GHG accounting (Greenhouse Gas Protocol Initiative

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[13] "Based within" implies residency in the case of individuals; organisational location implies having some operational autonomy within the geopolitical boundary. For example, actions within the control of a branch office based within the boundary would qualify whereas actions imposed by an external head office would not.

2004) and sits well with the types of projects from which participants are likely to be asked to choose (these being designed principally to affect agents based within the boundary) *(Principle 2).*

This approach has the consequence that certain types of intervention would have impacts which might be considered important by the local authority but which would be excluded. For example, an increase in parking charges might deter agents based in a neighbouring authority from driving into the authority. If the neighbouring authority were using the same approach to spatial boundary, it would receive any benefits as a windfall. This suggests the possibility of developing a trading system such that this type of benefit could be reallocated to the authority implementing the measure without risk of double-counting.

Emissions – territorial/consumption approach

Proposed approach

- Consumption-based approach – include emissions arising from qualifying acts/events, regardless of the location in which they arise

Explanation and notes

Consumption-based measurement is argued to be the most representative gauge of the true climate change impacts of actions (Minx et al. 2009) *(Principle 3)*. It is also argued to be a more intuitive representation of climate change impacts (UK House of Commons Energy and Climate Change Committee 2012b; Hatter 2011) *(Principle 1)*.

Emissions – inclusion of scopes/value chain

Proposed approach

- Include all scopes (“cradle to grave”)

Explanation and notes

Given the estimate that Scope 3 emissions may account for almost three-quarters of total value-chain emissions (Matthews et al. 2008), to concentrate on only Scopes 1 and 2 would very probably misrepresent a project’s impact *(Principle 3)*. Moreover, guidance is increasingly indicating that Scope 3 emissions should be reported (eg Global Reporting Initiative 2011) *(Principle 2)*.

Emissions – identification of relevant estate and operations impacts

Proposed approach

- Include impacts that fall within the local authority's "function" (Department for Environment, Food and Rural Affairs 2008), extending to contracted-out activities

Explanation and notes

Given that community-wide emissions are measured separately, it is desirable to make E&O emissions clearly distinct from them *(Principle 1)*. This will be partly achieved by adopting a tight definition of E&O emissions, using the successor to NI185 (Department of Energy and Climate Change 2011d). Local authorities are still being asked to compile this information (Barker 2013) so this approach should fit well with their work *(Principle 2)*.

Estimation of emissions

Proposed approach

- Employ conversion factors calculated using environmentally-extended input-output modelling (EEIO)
- For cross-project consistency, compile a unified set of impact areas[14] and check all projects against each

Explanation and notes

Most process-approach-based emissions estimates relate to products rather than services so the volume of potentially useful existing information will be low; it would also be prohibitively time-consuming to carry out new analysis to fill the gaps *(Principle 4)*. Despite the acknowledged weaknesses of EEIO-based numbers, they present the best chance of being able to assign a number to most emissions sources. A further advantage of prevalent conversion factors is that they account for (upstream) Scope 3 emissions (AEA 2011a, pp.49–50) *(Principle 3)*.

Where EEIO conversion factors do not provide values for the whole-life emissions of a given item, it will be necessary to extrapolate using appropriate additional factors.

[14] Structured in accordance with the categories of Scope 3 emissions sources set out in Greenhouse Gas Protocol Initiative (2004; 2011a)

Distillation of emissions estimates

Proposed approach

- Use annual average emissions calculated by dividing total emissions (CO_2e) by 100 (years); do not use the temporal cut-off recommended in PAS 2050 (British Standards Institution 2008, p.29)

Explanation

Use of the annual average rather than 100-year total will not affect projects' relative performance but may make the numbers easier to understand *(Principle 1)*.

The appropriateness of factoring down emissions in Year two, three etc has been discussed in §5.3 and ruled out. The consequence of not adopting it is that projects with short-term emission profiles may look insignificant when compared with those that have a long profile. If, however, Project A emits 100 tonnes of GHG in total and Project B emits 1 tonne in total, it seems appropriate that Project A should be seen as 100 times as damaging as Project B *(Principle 3)*.

6.4 A note on calculating "gross" and "net" emissions

In §5.3, the distinct applications of gross and net emissions figures were discussed. Whilst the approach for calculating net emissions is relatively straightforward (see below), an equivalent for calculating gross emissions needs to be worked up. This is because there is interest in a project's effects as well as the impacts associated with its implementation. Whilst the gross emissions associated with implementation do not pose a particular challenge, the definition of the gross emissions to be associated with a project's *effects* is not self-evident.

If the aim is to measure net emissions (ie the difference between total emissions in the with-project scenario and total emissions in the baseline), the definition of that baseline is critical to reaching a trustworthy figure. The Greenhouse Gas Protocol Initiative offers a detailed method for identifying the baseline for mitigation policies/actions, being "what would have happened in the absence of those policies and actions" (Greenhouse Gas Protocol Initiative 2012, p.6). This definition can be generalised for policies/actions of other types: the task is to articulate what would have happened if the intervention had not gone ahead, controlling meanwhile for exogenous change. Once the baseline is defined, the guidance on calculating net emissions can be summarised in simple terms as follows:

- Identify all the *impact areas* (ie all the ways in which the project is expected to effect a change of some kind), up to first order

- For each impact area, estimate the difference in emissions between the with-project scenario and the baseline
- Sum across impact areas

This approach provides a means to calculate gross emissions as well: a pragmatic approach to determining a project's gross emissions is to say an area should feature if and only if the project causes a change in that area. The gross emissions of a project will then be the sum across impact areas of emissions in the with-project scenario. This is best illustrated using a practical example: suppose the council starts running a community bus for older people, one impact of which is to reduce the number of escort trips made by users' friends and families. Using the approach to net emissions defined above, escort journeys are an *impact area* (because the project leads to a change in this area). Prior to the introduction of the bus service, ten escort journeys took place involving future bus passengers; following its introduction, this number reduces to eight. The net emission impact in this impact area is calculated by estimating the emission savings resulting from there being two fewer escort journeys. The gross emission impact, meanwhile, is the emissions associated with the eight escort journeys that take place in the with-project scenario.

There is an associated question of domain that applies to both net and gross emission calculations, as follows. Suppose the community bus runs only on Wednesdays. Should the relevant impact area therefore be escort trips on Wednesdays? Presumably not, if escort trips that would have taken place on other days are displaced by the bus service. There are similar questions concerning types of escort trip: if the bus goes only to the supermarket, should the relevant impact area be shopping-related escort trips as opposed to escort trips in general? The risk is that a large volume of emissions could be included in a project's gross emissions unless care is taken to exclude irrelevant impact areas (ie areas in which the net effect of the project compared with the baseline would be zero).

The implication appears to be that impact areas should be defined as tightly as possible subject to the following:

- All non-zero net effects are captured; and
- Impact area definitions are not unreasonably complex[15].

[15] For example an impact definition "escort trips on Mondays, Wednesday and Fridays" seems excessively specific; the definition "escort trips on weekdays" is likelier to capture the class of behaviour that the bus service might influence.

Conclusion

In this chapter, the findings from the previous chapter have been put to use in developing an approach to estimating emission and financial impacts for the projects that will be available in participatory emissions budgeting. As has been seen, each decision has involved a trade off between what is accurate, meaningful for a key audience (local authority stakeholders), intelligible for the participant, and not unduly onerous to calculate. The resultant approach therefore has a decidedly pragmatic character.

The next chapter describes how other aspects of the design of PEB will fit around the method elaborated here and, in Chapter 8, the practical experience of attempting to apply this method will be discussed.

Chapter 7 Design issues for participatory emissions budgeting

The previous two chapters rehearsed the question of how to estimate the key impacts attributable to a local authority intervention and presented a method for conducting this task.

A working approach to impact estimation having been chosen, the task now moves on to the resolution of various other design issues that will determine the operation of participatory emissions budgeting. In this chapter, each issue is introduced and discussed, leading to one of the following conclusions:

- Where it is possible to settle on a preferred way forward, this is identified
- Where the options are more finely balanced and the issue is central to addressing the research questions, a range of approaches is identified for testing during the development phase
- Issues that do not allow ready resolution and are not central to addressing the research questions are identified as areas for possible future research

The chapter starts with the discussion of some preliminary items that have overarching relevance. After this, a series of specific topics is addressed; these fall into two broad categories: the first relates to the "mechanics" of PEB – the characteristics of project options and how they are chosen; various issues of scale; the setting of constraints in general and emission constraints in particular. The second category has a more operational character, dealing with the way in which the PEB exercise is framed and presented, the possible role of deliberation and ways of handling decision making.

7.1 Preliminaries

As discussion of participatory emissions budgeting with local authority representatives will show (see Chapter 10), a wide range of possible applications can be conceived for the method or an adapted form of it, and different applications would imply different design decisions. For example, if PEB is to be used only to obtain a qualitative understanding of citizens' attitudes, there is less need for the options to be realistic than if participants' decisions will determine the spending of actual funds. In order to keep the discussion of variables within manageable limits, a working assumption is made in this chapter that PEB is initiated by a local authority as a variant of classical participatory budgeting: it will support citizens in choosing amongst

potential local authority projects, subject to financial and emission constraints, with the expectation that the projects chosen will be implemented.

There are three significant "process variables" that are raised now since the majority of design decisions discussed below will have a bearing on them:

- Cognitive burden
- Level of participants' understanding
- Consistency with local authority practice

The degree of cognitive burden involved in participating in PEB is at first a normative consideration: the more technically challenging participants find PEB, the greater the risk of that they will become confused or will make random choices which in either case will probably mean that they do not express their true preferences. For this reason, there is a clear argument for minimising the mental effort required. But it is rather more than a merely normative consideration. The harder it is to participate in PEB, the greater the chance that people will be deterred from taking part or will become so frustrated by the experience that they drop out or attempt to subvert it. To summarise, then, there are strong arguments for minimising the cognitive burden involved in taking part in PEB.

The level of participants' understanding overlaps to some extent with cognitive burden but is of interest for different reasons. There is a spectrum ranging from designs which leave participants knowing nothing about the rationale for including an emission constraint or its calculation to designs which serve mainly educational purposes. Depending on the sponsoring authority's motivation in holding a PEB exercise, the design would lie nearer one or other of these extreme points. For example, a local authority may be motivated by a desire to widen democracy, seeing climate change merely as a reality that must take its place in decision making in much the same way that finance does. Its representatives would probably therefore place PEB towards the less educational end of the spectrum. Another authority may see as a priority the raising of citizen awareness concerning climate change, in which case PEB might be conceived as a vehicle for imparting information, which would suggest a more educational approach to design. This variable differs from cognitive burden in that there is no *a priori* argument for seeking a particular level of participant understanding, but it is likely that there will be a positive relationship between time spent imparting relevant information to participants and level achieved. If a sponsor authority is concerned about the overall time used for a PEB exercise, this is likely to be a key consideration.

Finally, the concept of fit with local authority practice reflects the fact that participatory budgeting has not been widely done in the UK and so to propose a variant of it that incorporates climate change impacts may be quite challenging enough for the typical officer or

member. This consideration helps to address more general questions of method. For example, a strategic approach to climate change mitigation would suggest the estimation and use of long-run impacts when weighing different intervention options and this certainly underpins the process by which marginal abatement cost curves (MACCs) are developed. By extension, only interventions with a mitigatory character would be considered. The decision to use a wider range of projects (possibly including projects that make a net contribution to emissions) is discussed in §7.2 and this immediately distinguishes PEB from mitigation strategy development. And the limited use of long-run financial impacts in the local government sector has been discussed above in Chapter 5, with reference to within- as opposed to cross-sector decision making. In order to answer the Research Question 5 (what role(s), if any, could PEB play for English local authorities, and why?), it seems desirable to minimise the extent to which the method departs in other ways from typical council practices (to the extent to which such practices can be identified). This principle has already been extensively applied in determining the approach to estimating financial impacts (Chapter 6).

7.2 Defining project options

PEB, as so far defined, will be an exercise in which choices are made from a range of local authority projects. What form will these projects take and how will they be identified?

As for how project options are identified and defined, this can happen in a variety of ways: ideas can be elicited from citizens and/or non-government organisations, worked up by officers and/or members, or developed collaboratively. As discussed in Chapter 3, certain writers consider it an essential aspect of deliberative democracy that citizens should have some control over the definition of options. However they are defined, a degree of research is required to estimate the emissions attributable to projects if this is being done for the first time; for that matter, if a project is novel, its financial implications too may take some time to estimate. This implies a time-lag between the project definition stage and the choice-making exercise itself (though there may of course scope for citizens to participate in both aspects). This situation may change if project emission accounting becomes more embedded such that it will be possible to acquire the relevant estimates from a database of pre-calculated values. For now, it is realistic to assume a delay. More significant, perhaps, is the implication that it will not be possible for participants to invent new project options during the decision-making exercise itself, which places more emphasis on ensuring the adequacy of any citizen involvement at the definition stage.

A second question relates to project character. How large a role should climate change mitigation play? This will of course depend on the motivation of the sponsor authority. If the goal is to involve citizens in determining a climate change action plan, it makes sense to

concentrate exclusively upon projects that have the potential to reduce emissions. A more general emphasis on awareness raising would suggest less emphasis on mitigation. Here, a critical consideration is likely citizen interest, a point dealt with more fully below in §7.6, where the risk that an exercise presented in environmental terms will attract a skewed audience is discussed. For the purposes of this design exercise, it is best to maximise the potential application of PEB and this will be achieved by including a wide range of projects, perhaps including some that would cause an increase in emissions. It seems likelier this way that what is learnt could subsequently be translated to a setting in which only mitigatory projects were considered than if only emission-reducing projects featured in the trials and inferences were then made concerning a wider range. Likely citizen interest provides a stronger argument for the same course of action: the adoption of a narrow set of project options could be expected either to filter the audience (such that only environmentally motivated individuals took part) or to provoke dissent amongst participants expecting a wider range of options. Before having a clear picture of actual application, it seems undesirable to make design decisions likely to limit audience interest.

A further aspect of project character requires consideration. Classical participatory budgeting that is applied to projects, because it is intrinsically related to finance, deals only with projects that have an investment/expenditure character. A wide range of potential areas of activity for a local authority, including regulation and charging, are automatically thereby excluded (despite typically involving some associated financial costs). This is presumably because it would seem incongruous for non-investment projects to be included given their minimal financial impact upon spending budgets: participants could choose a large number of such projects (as compared with “spending” projects) without approaching the budget limit. The addition of a climate change aspect to participatory budgeting allows the range of project types to be widened because many that may have negligible cost will have a significant emission impact and so would “bite” in the PEB exercise. The financial argument is, though, only one possible explanation for the omission of non-spending projects from classical PB: expenditure, regulation and charging will tend to be handled separately and differently in a local authority, making the juxtaposition of a new community centre and the introduction of road user charging highly unfamiliar to most local authority stakeholders. Given a need to develop a method that is as intelligible as possible to authorities who might apply it, it is probably desirable to limit projects to those with an investment/expenditure character.

Is it desirable for there to be variety in the emission impacts of the project options? If the sponsoring authority wishes participants to become more aware of the different climate change impacts of various courses of action, this would seem desirable and would suggest some intervention on officers’ parts to ensure a suitable mix. But, if the authority merely

wishes climate change to be reflected in the choice exercise, variety of emissions may be considered unimportant. It may in fact be the case that many local authority projects have a negligible effect in climate change terms. One argument would be to omit such projects from the set on the grounds that they would be immaterial to the satisfaction of the emission constraint. But it seems desirable to minimise the manipulation of the set of projects if citizens have been involved in its definition and, in any case, it could be argued that such projects are of interest precisely because they make little difference in terms of emissions. There is, instead, the possibility that the range of emission performance amongst the projects will be so extreme as to render the choice-making exercise trivial. For example, if one project offers savings many times that of all other options, this is likely to mean that a) participants have little choice but to include this project and b) having done so, they are free to choose other projects without having to pay heed to their emissions. So there may be grounds for some adjustments in light of the emission (and perhaps finance) profile of the option set but it is desirable to keep such adjustments to a minimum.

When PB takes the form of citizens choosing amongst projects proposed by community organisations, the task is normally a matter of determining, for each project, whether or not it is funded. This binary decision is also seen in variants of PB where the sponsoring council proposes the projects, such as Tower Hamlets (Tower Hamlets Partnership 2010). This practice, though undoubtedly appealing in its simplicity, ignores the fact that citizens may both favour a project and have a view concerning how extensive its delivery should be. Where a project is well defined (in the sense that citizens can readily understand what it would achieve) there may be strong opinions amongst participants concerning the corresponding level of need in their local area. This possibility argues for providing the scope for participants to determine volume. A further argument arises from the possibility that the emission estimation process will, as discussed above, introduce limitations on the scope for citizens to determine the set of project options: if citizens have limited control over the composition of the set, a modest compensation may be to offer them greater control over what is chosen than simply to say "yes" or "no" to individual projects. And a final "windfall" argument arises in relation to another topic discussed below – number of compliant combinations. The freedom to choose the number of units of a given project will, in most circumstances, increase the number of combinations available to participants that would satisfy both the financial and emission constraints.

But a binary choice concerning each project has, as mentioned, appealing simplicity, and introducing the scope to determine volume brings complexity (possibly adding to the cognitive burden on participants). In particular, there may be practical limits to the volume of a given project, determined by resources (the number of qualified staff, for example), geography (the

number of relevant facilities in the area) or demography (the number of residents). There may equally be a smallest volume, beneath which it would make little sense to deliver the project. This could reflect economies of scale or other considerations. Finally, there may be natural "chunks" in which the project would need to be delivered. If, for example, the project involved the installation of equipment in buildings, the natural unit might well be a building, in that installing equipment in only half a building would probably be at least inefficient. All of these considerations seem manageable in themselves but it is likely that the three quantities will not be perfectly compatible. That is, in the ideal arrangement, the unit size (the size of a natural "chunk" of project) would be such that the minimal volume would be one unit and the maximal volume would be a whole number of units. The issue of maximum is the more easily dealt with of the two: the maximal number of units could simply be set as the largest whole number within the practical limit. The minimal number is more challenging: as with the maximum, it can be rounded to the nearest whole number of units, but then to say to participants that at least two (or three etc) units of a project must be chosen seems likely to induce unwelcome confusion. There are two obvious possible "fixes": to recalibrate *unit size* to match the minimal quantity; or to revise the *minimal quantity* to match unit size. Both would be likely to lead to some inefficiencies, but this might be seen as tolerable given that the compensation would be a reduction in the complexity of the decision-making task.

Though the case for allowing citizens to determine volume appears strong, the complexity it would bring does partially counterbalance the arguments in favour. For this reason, the option of setting volume will be discussed in the early development of the tool and a decision then taken. If it is decided to adopt it, the most accessible approach possible will be adopted. The nature of the development process is such that it will be sufficient to use hypothetical values for maxima.

Project options – conclusions

Projects from a wide range of policy areas will be selected, though non-investment projects (eg regulation, charging) will be excluded. As little manipulation of project set will take place as possible. If the profile of project impacts is such as to render the decision-making process trivial, remedial adjustments will be made.

The issue of allowing participants to determine project volume will be raised with citizens early in the development process. If seen as desirable, its contribution to cognitive burden will be managed by making any user interface as intelligible as possible and by setting the minimal volume for any project at one unit.

The involvement of citizens in the project selection phase and the inclusion of non-investment projects are beyond the scope of this development process but could be the subject of future research.

7.3 Scale

The above discussion concerning project options leads to several questions of scale:

- Size of typical project
- Policy spread
- Temporal scale
- Spatial scale

7.3.1 Size of typical project

What should be the size of the projects dealt with in a PEB exercise? This is much more a policy question than a technical one, since PEB can, at least in principle, be applied to projects of any magnitude. The experience of PB in the UK to date has largely involved relatively small projects (those with a budget of between £1,000 and £50,000) and there are two prominent reasons for this: on the one hand, because UK local authorities have so far made only tentative steps with respect to PB, larger sums of money would probably seem inappropriate for now. On the other, local authorities tend to locate spending decisions within departments. It is therefore rare to see decisions spanning multiple spending departments. Local authorities implementing PB across multiple policy areas have responded by keeping project size small and therefore avoiding a situation in which a given department's budget could be significantly reduced as a result of participants' preferences.

7.3.2 Policy spread

Just as PEB can be used with small or large projects, it can be applied across policy sectors or within a given sector: if the financial and emission impacts of a project can be estimated, it can feature in a PEB decision-making exercise. But there are two advantages to adopting a wide policy spread: in developmental terms, this maximises the likely future applicability of PEB. And it also is likely to suit the preferences of participants whose interests are unlikely to lie exclusively within a single department's remit.

7.3.3 Temporal scale

Turning to temporal scale, in cases where a local authority's budget (or part thereof) is being determined by citizens, the natural lifespan of the decisions will coincide with the budgetary period. In Porto Alegre, this is 12 months, and there is an annual cycle of activity, involving citizens, designed around the municipal budgeting timetable (Wainwright 2009). But PEB has no intrinsic temporal limit – as with policy spread, if it is possible to calculate the financial and emission impacts of candidate projects over a given period, the method can be used to choose amongst them. The issue of which scale to adopt has been discussed as part of the development of the estimation method in Chapter 6, with the conclusion that the relevant period will be the implementation year. For this reason, it is desirable for the typical project to have a comparable lifespan, which is to say that activity relating to the project should be complete within a year. This does not, of course, preclude the project's effects being felt for a considerable time afterwards.

7.3.4 Spatial scale

PEB can be applied over any spatial area (provided, once again, that financial and emission estimates are available) so this too will be a pragmatic decision. It is, though, helpful to identify a distinction between two spatial scales: the "area of interest" will determine the location in which projects' benefits would hopefully be felt and whose citizens would be invited to participate in the decision-making process; the "accounting area" reflects the jurisdictional level at which the financial and emission impacts will be enumerated. The two areas need not be coextensive though it is important that the area of interest be entirely contained within the accounting area.

Certainly, PB in the UK has tended to operate at the neighbourhood level (typically one to three electoral wards) in that choices have been made by a given neighbourhood's residents amongst projects designed to serve that area. This pattern may reflect consideration of cognitive burden since a need to think about a larger area may require participants to weigh the needs/interests of distinct neighbourhoods. It may equally reflect a tendency for people to

identify themselves more with their neighbourhood than with their local authority. In either case, it seems wise to adopt a neighbourhood scale as the area of interest for reasons of consistency with local authority practice.

Where money is concerned, only in a few cases have neighbourhood committees been given more than token control over spending decisions so project cost is ordinarily thought of in whole-authority terms. This standard has been adopted for the development of the method, with the small additional benefit that this will be consistent with the method for estimating greenhouse gas emissions (see Chapter 6).

Scale – conclusions

The method will be used to choose amongst pre-defined projects (as opposed to budget heads) with costs ranging between £1,000 and £50,000, spanning a wide range of policy areas. Projects will be limited in character to investment/spending and project delivery will be complete within a year. Regarding spatial focus, a neighbourhood will be the area of interest but financial (and emission) impacts will be measured at the level of the local authority.

Future research could test regulation/charging projects alongside investment/spending projects. It could also investigate the effects of considering the financial impacts experienced by a wider set of actors than the authority alone.

7.4 The setting of constraints

To set the scene for this discussion, two contrasting approaches to "classical" (financial constraint only) PB are introduced: they will be given the names "interventionist" and "laissez-faire". The interventionist approach reflects a desire to manage the decision-making process such that participants have some freedom but are at the same time forced to make difficult decisions. This desire determines the level of any constraint. The laissez-faire approach instead reflects the budget available and the projects that have been put forward. Under this model, it is possible that all projects will be affordable within the available budget; it is also possible that the relationship between projects and constraint will restrict the choice-making process to an extent that participants find very frustrating. In contrast, because the "interventionist" constraint is being set to achieve an effect, it may bear no relation to the actual financial circumstances of the sponsoring authority and is therefore open to accusations of unfair manipulation. As this brief introduction has shown, a purist application of either model raises problems.

There are three variables in play: the number of projects available, their average cost, and the sum of money that can be spent. The range of project costs also can become a consideration if it is very wide but this can in most cases be tackled by adjusting project size. There does not appear to be a consistent relationship amongst UK examples of PB between the number of projects available in an exercise and the number that can/do receive funding. For example, in Durham's *It's up 2 U £500k* (Durham County Council 2013a), there were 12 project proposals but the full sum of £500,000 was awarded to a single project. Elsewhere, the ratio appears more generous: 14 of 34 candidates were funded in Stanley, Durham (Durham County Council 2013b), and 12 of 45 were funded in Mile End East and Bromley-by-Bow (London Borough of Tower Hamlets 2010b). It is not clear whether participants derive more or less satisfaction from choosing a third of candidate projects than from allocating all the funds to a single one.

Sponsors have only limited control over the final outcome of a PB exercise, this being a product of participants' preferences and, where community groups are invited to work up proposals, the nature of the proposals received. But sponsors do tend to define the preference aggregation and decision-making systems and may have some control over the range of project costs, all of which will contribute to the final proportion of project options that are funded. If citizens have been involved in defining project options, there may be no difficulty in the PB exercise itself being a fait accompli (because the budget is sufficient to fund all the options). If not, it seems necessary for the constraint to prevent at least some of the projects from being chosen in order to give the PB exercise some purpose. Further, if sponsors actively wish participants to forgo projects they favour (as part of making "hard" decisions), the constraint may need to be tighter than this given that, in any set, there are likely to be at least a few projects that do not impress participants.

If this principle is adopted for finance, how then should emissions be included? The answer depends in part on the nature of the emission constraint, a topic dealt with in §7.5. For the purposes of this discussion, a working assumption is made that the emission constraint would resemble a financial budget (ie would give participants greenhouse gas emissions to "spend").

Whereas the "interventionist" aim in establishing financial conditions that prevent the selection of all projects is to force citizens to make hard decisions, there is almost certainly an additional aim when setting any greenhouse gas limit: to impose upon the decisions of participants the gradual reductions in emissions implied by the Climate Change Act or any targets adopted more locally. Of course, the last few years in the UK have been associated with an "age of austerity" in which public spending has been significantly reduced, so one might expect to see parallels between the treatment of finance and emissions. And authorities have involved citizens in the process of determining budget cuts (Headland 2012), but in all

such cases the final decisions have been made by councillors. This may be because it was seen as invidious for a subset of citizens to make decisions to cut services; more probably it reflected the fact that PB, in the UK at least, operates at the margin whereas decisions concerning cuts need to take an entire budget into account. Either way, for the time being, PB of the form in which citizens decide the allocation of resources continues to relate to the spending, not the saving of money.

If the emission constraint is to reflect the Climate Change Act or a local equivalent, the hypothetical first step would be to calculate the relationship between local authority spend and a suitable measure of emissions, both taken at the aggregate level. If, say, the authority spends £1 billion per annum and the community-level emissions are 2,000 kilotonnes per annum, this suggests that each pound spent by the authority is associated with two kilograms of emissions. The association is tenuous of course, given the only limited purchase which the authority has over the community's actions. And the relationship is naturally not linear, since (as the footprinting of projects shows) a given sum of money can be associated with very different levels of emissions, depending on how it is spent. But, at an aggregate level, a relationship of this kind can be asserted; it is not unlike the concept of carbon intensity (emissions per unit of gross domestic product). Having calculated this relationship, the carbon descent path would be used to factor the figure down. So, to continue the hypothetical example above, the Carbon Budgets for 2008-12 and 2013-2017 (Department of Energy and Climate Change 2011e) are such that an annual compound decrease of approximately 2.7% is needed on the 2008-12 figure in order to arrive at the 2013-2017 total. Thus, a participatory budgeting exercise with a financial budget of £100,000 might be set an emission budget of 194.6 tonnes, being the result of applying the 2.7% reduction to the 200 tonnes nominally associated with the funds available.

Whether such a calculation would produce a budget that would make for a meaningful decision-making exercise is questionable. For a start, earlier discussions have identified significant differences between the treatment of financial and emission impacts, not least of these being the temporal scope. So the simplistic association made above between council spend and emissions would not apply to projects as neatly as suggested. Even if it did, a set of projects selected to reflect the interests of local residents could not be expected to replicate as a matter of course the aggregate relationship between council spend and emissions. And, just as there is a need for the financial budget to be such as to ensure that participants have to make a choice, it seems that the emission constraint too should live up to its name; for, if the emission constraint does not "bite", what purpose will it have served? This suggests a role for the interventionist approach. Given the task at hand – the development and testing of PEB – the interventionist approach will be adopted.

The setting of constraints – conclusions

The constraints will be set so as to ensure that participants are able to choose at least a quarter but not more than three quarters of available projects. The emission constraint in particular will be set in accordance with this principle rather than on the basis of a calculation involving a specified carbon descent path. With respect to the effect of the emission constraint's effect, it will be set at a level that "bites", by reducing the number of possible choice sets compared with the scenario in which only the financial constraint applies.

7.5 The nature of a greenhouse gas emission constraint

As introduced above, the notion of an emission "budget" has a natural affinity with a financial budget of the sort which is very widely used when citizens are making choices in participatory budgeting. As such, an emission budget is likely to be readily intelligible to participants. And a suitably-worded explanation of the calculation of the budget may assist participants in understanding that it reflects the need to make reductions against business as usual.

A sponsor intending participatory emissions budgeting to achieve increased understanding of climate change and the imperatives it imposes could, though, argue that this approach is insufficient. Participants may take on board a message that the emission budget available to them is smaller than it would be in the absence of emission reduction targets but this may not mean that they approach the task of choosing projects with climate change in mind. The sponsor might argue that only if the emission budget is exhausted before the financial budget (and the constraints could be set so as to make this likely) might participants pause and think about the policy context of the exercise.

This hypothetical sponsor's position is supported by the observation that money and greenhouse gas are playing different roles. To speak of a *budget* of greenhouse gases is to import a concept from the financial world which is only partially appropriate, since emissions are not, strictly speaking, "spent". Instead, the implication of there being established targets for reducing greenhouse gas emissions is that the greenhouse gas constraint within participatory emissions budgeting should itself take the form of a reduction target. For the sponsor keen to raise awareness of climate change, this may succeed in bringing the issue to the fore in participants' deliberations.

The use of a reduction target as opposed to a budget for emissions would have a set of important implications, in terms first of the nature of the exercise and second its technical aspects. For the participants, a reduction target would significantly alter their experience of PEB. Under the "budget scenario", participants will satisfy the constraints even if they choose

not to include any projects; the "target scenario" instead requires action: choosing no projects will mean breaching one of the constraints. In particular, where participants cannot agree on a course of action, this is an important difference: in the budget scenario, the participants may at worst feel frustrated whilst, in the target scenario, the implication will be that they have failed in their task.

This difference may affect participant response more generally. It may be that the introduction of an emission saving target (and the consequent implication that falling short of the target constitutes failure) will bring to deliberations a fixation upon projects that can help to achieve the target. Deliberations under a "budget scenario" would probably have much less emphasis on projects' emission performance. Again, at least two views of this can be taken: first, the need to choose projects that deliver a saving is, simply, part of the PEB exercise so a certain amount of discussion about the relative merits of the emission-savers is inevitable. It may even be desirable, in that such a discussion is indicative of a degree of reflection upon the topic of climate change. Alternatively, the need to pay so much attention to the projects that can contribute to the achievement of the target may be seen by participants as an irritant and may engender more general feelings of resentment about the exercise. At worst, it may lead to sabotage. This is in contrast with a budget model in which participants need to pay attention to the emission performance of projects chosen but where this issue does not need to dominate deliberations.

Turning now to technical matters, the budget/target dilemma has an important consequence concerning the calculation of project emissions. In short, a budget approach implies the use of projects' gross emissions, whilst a target approach implies the use of their net emissions. This is because a budget deals with absolute sums (be they of money, greenhouse gas or another quantity), whilst a saving target is inherently comparative, a saving taking place only when the emissions of a given entity or process are less than those of a suitable comparator (generally "business as usual"). The distinction between these two measures has been discussed in Chapter 5, and a working approach to estimating both proposed in Chapter 6.

The use of gross, as opposed to net, emissions is not technically problematic. More significant is the potential for the use of gross emissions as part of a budget-based PEB exercise to lead to a net increase in emissions. This can occur as follows.

A set of project options is gathered for a PEB exercise. An emission budget is set such that it is possible to select some, but not all, projects. This budget reflects a reduction in emissions against business as usual, perhaps derived using the ratio of emissions to spend described in §7.4. The projects vary in performance: some offer a net emission saving against business as usual, whilst others would cause a net increase (though this information is not imparted to

participants). In such circumstances, it will normally be possible to select projects such that the budget is not exceeded but with the projects that are chosen likely to lead to an increase in emissions (see Figure 7.1).

Does it matter if PEB increases net emissions? On the one hand, if PEB is seen as having largely symbolic significance, then it is perhaps more important that participants come away having taken on board the need to reduce emissions than that their particular selection of projects should itself achieve a reduction. Supporting this view is the fact that projects chosen for their broad policy appeal are likely to have very small effects per pound spent than projects chosen specifically for reasons of climate change mitigation. On the other hand, if PEB is unsuccessful in influencing the attitudes of citizens or local authority representatives, it seems desirable that it achieve at least some benefit in the form of an emission reduction, however small. Put another way, a PEB exercise that both failed to influence stakeholders and led to an increase in emissions would seem a hard initiative to justify in the context of climate change.

A further technical consequence of choosing a target over a budget relates to the emissions that are included in the choice exercise. As the emission estimation method sets out (Chapter 6), the presumption is to estimate project emissions at two levels – community-wide and council (estate and operations). A budget-style constraint allows two spending sums to be allocated to participants, one for each level, on the understanding that the choices made must stay within both sums. Under the target approach, it is almost certainly unworkable to use two measures: projects would probably perform quite differently in terms of their community and council emissions, making the achievement of two saving targets very challenging for participants, and greatly increasing the risk that they would become confused and/or frustrated. Given the view in the literature that, of the two, community-level emissions are the more meaningful quantity, this measure would be used if a target approach were adopted.

Project reference	Project's "gross" emissions	Baseline emissions (project-specific)	Net emissions ("gross" *LESS* baseline)
A	8	24	-16
B	12	44	-32
C	4	9	-5
D	30	39	-9
E	14	33	-19
F	24	11	13
G	32	14	18
H	30	10	20
I	0	9	-9
J	28	45	-17
K	9	1	8
L	9	11	-2
Budget	40		
Total emissions of selection (C, F & K)	37		16

In the example above, participants have a budget of 40 emission points (gross) and choose projects C, F and K which collectively "spend" 37 points so comply with the budgetary constraint. But the sum of the three projects' net emissions is positive, implying that these projects would increase emissions overall.

Figure 7.1 – Budget-based emission constraint: selection that increases emissions

The budget/target dilemma generates a different question in circumstances where some form of mechanical preference aggregation is required because participants are too numerous to reach a decision through single-group discussion. Whereas the budget scenario presents no technical challenges – the most popular projects are chosen in descending order until the one or other budget is exhausted[16] – the target scenario requires a more sophisticated arrangement. There is no guarantee that participants will favour any of the projects that offer savings sufficient to reach the target, which would imply stalemate. One solution is to present participants with compliant sets of projects and invite them to vote for the one they prefer but this seems unduly restrictive and may provoke resentment. Another, perhaps more realistic, option would be to require of participants that they rate all of the projects on a pre-defined

[16] It is acknowledged that this is a simplistic representation which does not take account of the findings of public choice theory but, if every participant votes for her/his favourite project, there is an intuitive sense to the project with the greatest number of votes being chosen first etc.

scale. Subject to decisions concerning the treatment of differing ratings, an algorithm could be used to select the most popular compliant project set. If there were scope for the volume of a given project to be specified as part of the exercise (see §6.1), assumptions would need to be built into the algorithm to allow for this. And, the more complex the preference aggregation method, the more scope there would be for participants to take umbrage at the results, feeling that their favoured projects had been unfairly excluded.

As can be seen, the dilemma has several facets and it is not obvious that one option is better than the other, as there are technical and policy arguments in favour of both. For this reason, the testing of the method will be designed to enable the two options to be compared.

The nature of a greenhouse gas emission constraint – conclusions

Two variants of the method will be developed and tested. One will incorporate an emission "spending" budget and the other will be based on an emission saving target.

7.6 Framing, presentation and structure

Participatory budgeting was described in Chapter 3 as a form of citizen participation that attracts a larger and more diverse audience than more conventional forms and this characteristic is one reason for attempting to bring climate change into PB. This being so, how should a form of PB that includes a climate change constraint be marketed to potential participants?

Two contrasting approaches can be offered in order to frame the discussion. In the first, an event is advertised and presented as being an opportunity for citizens to make choices amongst projects subject to a financial constraint and a greenhouse gas constraint. In the second, the event is advertised as if it were classical participatory budgeting, making reference only to spending money or "making choices". Only once participants have arrived and settled down are the full rules explained.

The immediate advantage of the first approach is that there will be no unpleasant surprises: because the rules of the exercise are explicit, those attending will be ready for two types of constraint (provided they have read the information). The potential disadvantage of this approach is that the environmental framing will act as a filter, deterring potential participants who do not see themselves as environmentally motivated (Peters et al. 2010; Pidgeon et al. 2005). Whether this is seen as a problem will depend upon the sponsor's specific motivation in running a PEB exercise but the value of gathering pro-environmental citizens to choose amongst projects spanning a wide policy spectrum seems questionable. Given their

motivations, such citizens might prefer to be choosing amongst mitigation projects whilst the wider citizenry might feel that the process had in effect excluded them.

The second approach has the advantage that the large and diverse audience historically associated with PB might attend, at least to begin with. But difficulty may arise at the point when the climate change component was introduced. The constraint may be accepted but it may equally excite objections. Some participants may choose to withdraw at this point, leaving only those who are happy to continue. But perhaps the worst case scenario is some form of protest, with unhappy participants questioning the exercise as a whole and criticising the sponsoring authority.

Both options can be seen to have disadvantages, prompting the question of whether there is a suitable compromise. Given that the tests taking place within this project will be limited to simulated exercises conducted with individuals recruited for the purpose, the issue will not need to be resolved as part of the development process. It will, however, be raised with local authority stakeholders (see Chapter 10).

Leading on from the way in which the exercise might be framed in advance, there are questions concerning the presentation of climate change and the emission constraint once the exercise has begun. On the one hand, the Climate Change Act (or any locally-set reduction targets) provides a simple basis for presenting the constraint in quite bald terms: the UK (or local authority) has set itself targets for the reduction of emissions. There is a requirement to attempt to meet them (backed up by law, in the case of the Climate Change Act). Hence the need for an emission constraint. Reflecting on discussion in §7.5, this approach would be more compatible with a saving target than a spending budget. The opposite approach would be to provide participants with a briefing on climate change that covered the nature and extent of the problem and the consequent need to act; a requirement to reduce emissions would then be presented as flowing from this.

These two approaches both have strengths and weaknesses. The first would be quicker than the second and this can be seen as desirable when PB exercises are often time-consuming. It may also, by circumventing any detailed discussion of climate change, curtail debate concerning its reality and/or the best way to respond. But it may equally prompt a degree of incomprehension: why, participants may ask, pick only this target? Are there not other priorities at a local or national level that should act as constraints upon the choices? The second approach may have the advantage of averting assertions that the constraint has been chosen arbitrarily: by providing a narrative concerning climate change (and thereby some policy emphasis), it may legitimate the inclusion of this constraint as opposed to any other. Whether it would be more or less likely than the first approach to prompt debate concerning

climate change is less clear and may depend on the way in which the topic was presented and discussed. An authoritative presentation that emphasised aspects on which there is wide agreement in the academic community (eg that the earth's atmosphere is warming as a result of human activity) would seem less likely to elicit a sceptical response than one which draws attention to areas of uncertainty such as the highest tolerable concentration of CO_2 in the atmosphere.

It is in fact necessary to see this as more than a binary choice. For there are at least two distinct areas of understanding that any introduction may be designed to promote. The first is the fundamental science of climate change – why climate change is happening, its likely implications, how to respond – whilst the second relates to the derivation of the greenhouse gas constraint and the emission numbers allocated to projects. An introduction on the latter would be designed to help participants to grasp how a goal of reducing emissions had been converted into a constraint upon the choices to be made as well as what it meant for a project to contribute or save emissions. Does the introduction need to address both of these? If not, which is more important?

In attempting to answer these questions, the issue of participant understanding is a relevant consideration. The topic of constraints and derivation of estimates is necessarily more technical than basic climate change science, the headlines of which are quite readily absorbed, particularly given the extensive work that has gone into finding accessible ways of presenting the problem. This point appears to favour the general climate change material. If participants receive this but are told nothing about the technical side, then participate in the choice-making exercise, they are likely to leave knowing that they have taken part in a process that had something to do with climate change. With luck, they may also know that their choices have in some sense been constrained with respect to emissions. If, on the other hand, participants receive only guidance concerning the technicalities of constraints and emission forecasting, they may understand better the quantitative aspect of the process they have undergone (possibly at the cost of greater cognitive burden) but the link to climate change will possibly be weak, relying on their prior knowledge and the few references to climate change that are inevitable as part of the technical explanation. Given the high general awareness of climate change in the UK (Lorenzoni & Pidgeon 2006), this may be sufficient but the decision is not clear-cut. Therefore, this aspect of the method will be varied as part of the development process.

A final, specific aspect of structure is the numerical presentation of budgets and impacts. A risk associated with presenting numbers "as they come" is confusion amongst less numerate participants. It may also be difficult to understand the potential damage represented by a

kilogram or tonne of emissions. The sight of two or three sets of numbers presented in distinct units (pounds sterling and tonnes of greenhouse gas emissions, say), compounded by a difference in scale (projects costing thousands but perhaps producing one- or two-digit emission figures) could be bewildering. A possible solution to this is to normalise figures so that units become unimportant (all quantities are converted to points) and scale problems fall away (all constraints are expressed as a round number of points such as 100).

A potential consequence of a conversion to points is that participants will be less engaged with the policy imperative underlying their task than if real numbers of greenhouse gas are used – that points would turn the exercise into a game. This could be managed, to some extent, by accentuating in the introduction the link back to the original quantities. A separate concern is that, if two greenhouse gas measures are being used (community-wide and council-level), to convert them both to points would create an anomaly: since both measures are of masses of greenhouse gases but the constraints would almost certainly be different amounts, conversion to points would mean that one point of community-level emissions would be worth a different mass of emissions than one point of council-wide emissions. This concern is quite possibly of greater importance to the technician than to the putative participant, however. If the participant understands the task and is comfortable with points, the anomaly will not present any practical obstacles.

The choice here is probably best remitted to participants, who know what they find easy or difficult to understand.

Framing, presentation and structure – conclusions

The development process will employ a range of approaches to introducing the decision-making task to participants in order to establish which elements are most desirable, taking into account issues of cognitive burden, participant understanding and probability of dissent.

The issue of normalising impacts by converting them to points will be resolved through discussion and trial.

The framing of a PEB exercise lies outside the scope of the development of the method but could be the subject of future research.

7.7 Deliberation

In Chapter 3, the extensive discussion of deliberation in the literature was described. A definition of deliberation provided by Chambers (2003) was adopted that presented it as debate and discussion designed to foster reasonable, well-informed opinions. For many

writers, deliberation is an essential ingredient of any process that deserves the name citizen participation and this would of course extend to participatory budgeting, as argued by the Participatory Budgeting Unit in its document on values, principles and standards in PB (Participatory Budgeting Unit 2008). Nonetheless, deliberation is curiously absent from many PB exercises conducted in the UK which instead take the form of a set of presentations on candidate projects followed by voting by individuals. This may partly reflect a perception that participants should be detained for as short a time as possible and that learning about the project options is time consuming enough. It may also result from a lack of obvious means of structuring deliberation in a large group of participants, particularly when the size of the group is known only once all participants have arrived. And organisers might think that, if individual voting will ultimately occur, the value of deliberation is questionable (though Tower Hamlets has employed group deliberation followed by individual voting (London Borough of Tower Hamlets 2010a)).

For the purposes of this decision-making method, deliberation (in the form of facilitated group discussion) needs to feature during the development phase to help address Research Question 2 (how do PEB participants arrive at their decisions?) and, to some extent, Research Question 3 (what are the opinions of participants concerning PEB and the experience of taking part in it?): asking participants to discuss the options and to reach their decisions through negotiation can be expected to provide useful insights into their thinking. But deliberation is not a technically essential aspect of the method, in that choices could be derived by participants expressing their preferences privately. The ultimate inclusion or not of deliberation in the method might therefore come down to practical considerations (eg size of group, time available) or to the more philosophical considerations in the literature, most notably the assertion that a decision resulting from deliberation will be a better one. There is, though, a further factor specific to participatory emissions budgeting: depending on the sponsoring authority's motivation in initiating the exercise, its representatives may draw some value from understanding how citizens approach the task set them, something which will not be discernible without discussion taking place. They may also wish to know to what extent positions change as a result of deliberation, since a key challenge in relation to climate change is to foster greater citizen acceptance of mitigation and adaptation policies.

Deliberation – conclusions

Deliberation (in the form of facilitated group discussion) will be a part of the method during the development and testing process, to assist the answering of the research questions on participant response.

Future research could explore the different impacts of PEB models with and without deliberation elements.

7.8 Decision making

There is a practical limit to the size of a group that can be expected to reach a joint conclusion. This size is determined by the need to provide time for those who wish to speak and for all to be able to listen; it is also a function of the complexity and contentiousness of the topic. Kerr and MacCoun (1985) found, for example, a positive correlation between jury size and tendency to hang (fail to reach a verdict). Citizens' juries, meanwhile, rarely exceed 25 (Smith & Wales 1999). Size of group aside, how consensual any agreement arrived at actually is can be called into question, given the tendency for certain participants to dominate discussion (eg Littlepage et al. 1995) and the social discomfort associated with asserting a minority view (eg Asch 1956). The classical alternative, secret voting, removes these concerns about dominance and expression of preference but instead brings with it a host of questions concerning the aggregation of preferences. Nonetheless, voting is a familiar practice for most UK citizens, who appear unfazed by the theoretical difficulties that lie between their expression of preference and the final outcome. A further consideration recalls the discussion of deliberation above. Whilst there is a natural link between group deliberation and group decision making (the first seeming a pre-requisite of the second), the link between group deliberation and private voting is less obvious. Participants may feel that, if they will ultimately express their preference individually, there is no obvious need to discuss the merits of the options with others.

To return to the practical limit on group size mentioned to begin with, as soon as the number of participants exceeds this size, a group decision arrived at without voting becomes very unlikely. Hybrid options could be used instead: the participants could be allocated to groups that were within the size limit and each group asked to reach a conclusion, with some mechanism then needed for converting the collection of group decisions into a single outcome. Each group could alternatively despatch a delegate to a secondary discussion at which she/he would present the group's conclusions. But participants might reasonably raise objections about either approach: the mechanism used to derive a single decision from the conclusions of multiple groups would be bound to be open to criticism; and, in the case of the delegate model, the outcome would be highly dependent upon both the delegates' communication skills and their adherence to their group's views. Either way, PEB presents an additional challenge if the emission constraint is a saving target: the requirement to meet this goal makes the decision-making process recursive – participants will consider their next choice after seeing the effect of their last – which seems to render two-stage systems unworkable.

It has been established above that a budget-based emission constraint presents few problems for deriving the "most popular" set of options from individual preferences. Discussion also indicated that a emission constraint based on a saving target is compatible with deriving a "preferred" set of project options from individual preferences, but that the aggregation process required may not be particularly intelligible to participants and may excite resentment. So, then, both the hybrid-deliberative and the mechanical approaches appear to have weaknesses, though the incompatibility of hybrid-deliberative methods with the recursive nature of PEB under a saving-target model arguably decides the matter in favour of individual voting as the least-worst option.

This issue does not have to be resolved as part of the development and testing process, since this will take place with groups of 12 participants or fewer in order for deliberation to provide evidence towards addressing the research questions concerning participant response to PEB. It remains a subject for possible future research.

Decision making – conclusions

In the development and testing process, the method will be used with groups of 12 or fewer, so making joint decision making possible.

The development and use of preference aggregation methods that are compatible with a saving-target variant of PEB could be a subject of further research.

Conclusion

This chapter has set out a series of design issues, some of which needed to be resolved as a prerequisite, some as part of the development and testing process, whilst others would have to be addressed in the event that participatory emissions budgeting is used in practical applications. With respect to those remitted to the development and testing process for fuller assessment, the next chapter describes this process and shows how the specific items are progressed.

Part III

Development and testing

Chapter 8 The development process

Having discussed in Chapter 7 a series of design issues, in this chapter I report on the process by which participatory emissions budgeting (PEB) was taken from concept to working prototype, explaining, in the process, how the management of each of the design issues has developed.

The chapter is divided into three sections:

- The first section (§8.1) describes the development process chronologically and in quite practical terms, dealing only briefly with the findings from each stage
- The second section (§8.2) is thematic and leads on from Chapter 7 by describing progress made with each of the design issues remitted to the development process, drawing as appropriate on the findings of the individual development stages
- The third section (§8.3) is a discussion of the findings from the development process as they relate to the technical operation of participatory emissions budgeting

8.1 Stages of the development process

The stages are set out in Figure 8.1 below.

In summary, I held discussion groups in September 2011 at which I explored the concepts of PEB with citizens. I then tested a pilot version of PEB with citizens in November of that year. A second pilot took place in July 2012 after which I interviewed a sample of local authority officers to gauge their views on certain design issues. Then, in November 2012, I conducted two formal trials of PEB.

The design and execution of each stage is described in brief in this section, with fuller detail provided in the appendices.

Discussion groups, September 2011

My first activity was a pair discussions held with citizens, designed to test out the concepts inherent in PEB. One took the form of an interview with a resident of the London Borough of Haringey (following the late withdrawal of other participants) whilst the other involved eight residents of Tamworth, Staffordshire who had come into contact with the district council through voluntary work. I used a discussion guide (as for a focus group) in order to explore participants' experience of citizen participation before moving on to participatory budgeting in general and the concept of PEB specifically (see Appendix F).

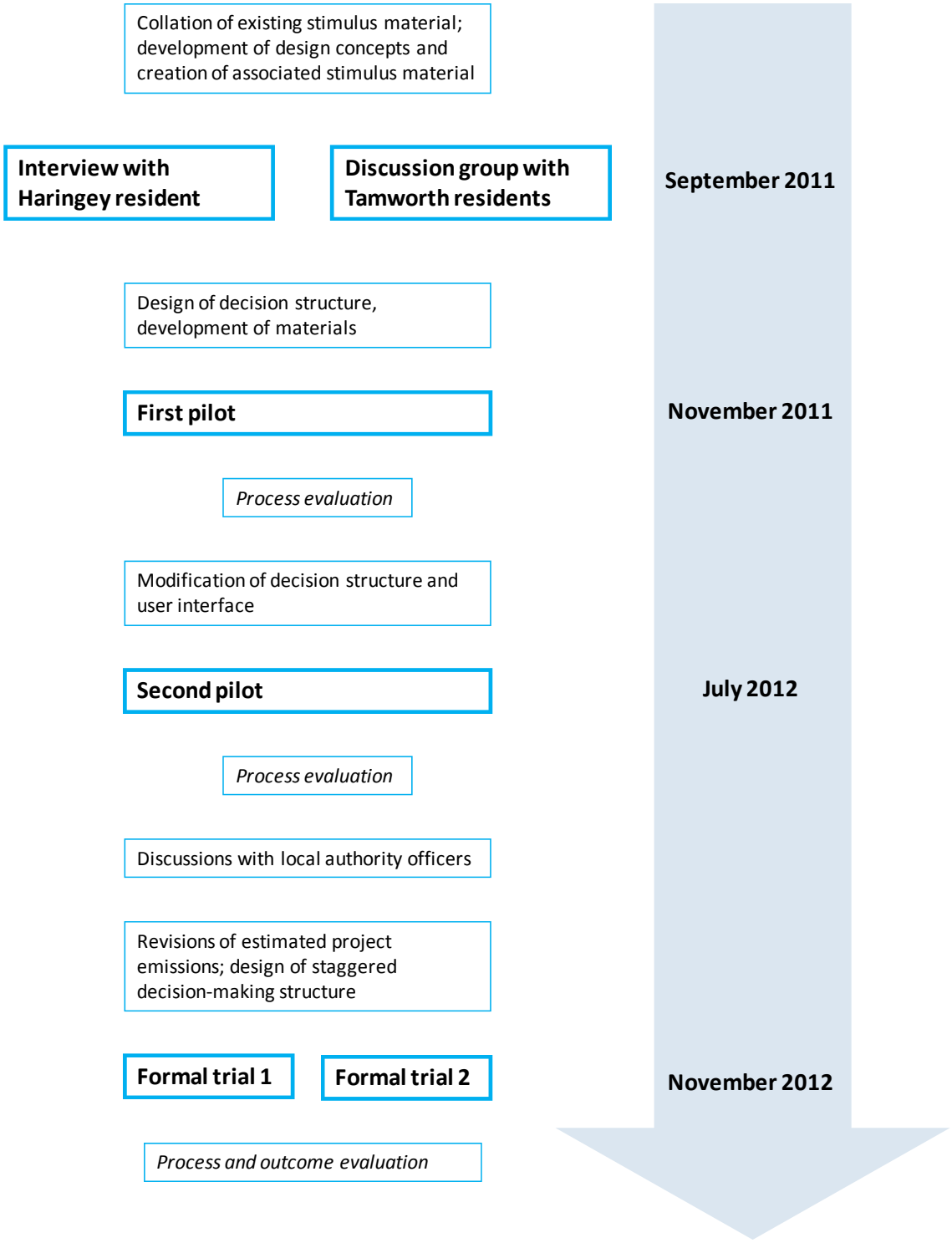

Figure 8.1 – Stages of the development process

The two discussions followed the same basic structure. The following topics were raised in order:

- Experience of and attitude towards citizen participation in local decision making
- Experience of and attitude towards participatory budgeting (PB), with specific reference to any local examples
- Review of examples of posters advertising PB events

- Review of examples of project lists used in PB events
- [Following the introduction of climate change as an issue] discussion of a series of approaches to presenting projects and their impacts, both financial and emissions (see below)
- Brief trial of decision making using participants' preferred presentation style
- Discussion of the trial and other aspects of PEB execution, including how options might be generated

I took the examples of posters and project lists from the Participatory Budgeting Toolkit (Participatory Budgeting Unit 2010), deliberately choosing a range of approaches and presentation styles (see Appendix F).

The presentation variants each set out the same six hypothetical council projects. These were as follows:

- 4 full-time equivalent community safety officers
- Insulating 200 privately-owned homes
- Park improvements - three parks
- Community bus for older people's day trips
- 100 laptops for GCSE students most in need of assistance
- "Eco-driving" training for all council drivers

There were in all seven presentation options, which varied the following factors:

- Whether impacts were shown as actual numbers (pounds, carbon dioxide equivalent (CO_2e)) or points (rounded to the nearest integer such that the budget would always be 100 points)
- Whether greenhouse gas emissions were presented in a single category (without further explanation) or in two categories – council (ie estate and operations emissions) and community-wide emissions
- Whether, for each project, the choice was binary (ie having the project or not having it), or allowed participants to select a number of units (up to a stipulated maximum in some cases)

The characteristics of the options are set out in

Table 8.1 and the full set is at Appendix F.

Because the discussions were intended to test only the concept of PEB, both the financial and emissions figures were developed without reference to likely actual impacts. By the same token, the "budgets" were chosen quite arbitrarily and bore little relation to the projects' values.

Table 8.1 – Characteristics of presentation options

Option	Financial impact		Emissions				Volume	
	Actual numbers	Points	Actual numbers	Points	Single category	Two categories	Binary choice	Units
A	✓		✓		✓		✓	
B		✓	✓		✓		✓	
C		✓		✓	✓		✓	
A+1	✓		✓			✓	✓	
C+1		✓		✓		✓	✓	
A+2	✓		✓			✓		✓
C+2		✓		✓		✓		✓

The findings from the discussion groups are discussed in Appendix A. In summary, they demonstrated a willingness on the part of citizens to participate in the choice-making process subject to financial and emission constraints though they also provided grounds for expecting the role of climate change to be contentious. They also showed that citizens were likely to be equal to the cognitive task of working with the constraints. More specifically, they helped to inform the decision concerning volume and reinforced the choice of a local spatial scale (see §8.2).

First pilot, November 2011

It was now necessary to develop the tool from its theoretical form into a functioning model that could be more thoroughly tested.

In outline, the tasks were as follows:

- Select a set of projects to form the list of options
- Gather evidence to support estimates of the financial and climate change impacts of the projects
- Decide on appropriate budgets to use in the exercise (I had decided to use a budget-based emission constraint in the first pilot)
- Prepare a summary of the projects for participants to use in considering the options
- Develop a user interface that would allow participants to see the standings at any stage, reverse previous decisions and, if possible, make clear which options it would still be possible to choose at a given point in proceedings

I chose twelve projects from a list used by Tower Hamlets for its *You Decide!* participatory budgeting exercises of 2010, seeking a spread across the six policy themes used by Tower Hamlets (see Table 8.2). I adopted the text of the Tower Hamlets project brochure concerning each project's justification and likely impact (Tower Hamlets Partnership 2010), making minor amendments where I considered them helpful. I also adopted the unit costs as stated in the brochure. I included a "maximal number of units" to reflect the fact that there would in the case of certain projects be practical limits upon the extent to which it could reasonably be implemented in a given neighbourhood. For each project, I then attempted an initial estimate of likely greenhouse gas emissions at the two levels – estate and operations (ie emissions directly attributable to the council) and community-wide (ie emissions arising from activities of all those based within the council boundary). My approach to estimating emissions at this point was rudimentary but adequate for the task of testing the technical feasibility of PEB.

Having gathered for each project a verbal description, maximal number of units (where applicable) and estimate of impacts (cost and two categories of emissions), I then set the constraints that would determine the degree of freedom enjoyed by participants (see §8.2). Finally, I normalised the three sets of values (financial cost, net council emissions and net community emissions[17]) by converting them from numbers of pounds or tonnes of carbon dioxide equivalent on the basis that the "budget" would be 100 points in each case, and rounded all values to the nearest integer. See Figure 8.2 which shows the resulting impact values for each project within the "decision support tool".

Table 8.2 – Projects available in pilots and formal trials

Policy theme	Project reference	Project name	Description
Improving cleanliness and quality of the public realm	1	Park improvement project	Refurbishment of a local park, to include new planting, ironwork, paving and/or lighting
	2	Better street lighting	Upgrade of lighting to new LED fittings
	3	Speed indicator devices to encourage slower driving	Installation of a sign that warns drivers exceeding the posted speed limit
Raising GCSE results to be the best in the country	4	Study support – learning beyond the classroom	Extra-curricular creative activities led by third-sector providers
Reducing levels of youth unemployment	5	Skillsmatch graduate placement programme	Six-week placements with local employers

[17] I had not, at this stage, concluded that a budget-based emission constraint required the use of gross, rather than net values.

Policy theme	Project reference	Project name	Description
	6	Community football coaching for young people	Coaching in football or multi-sports leading to a tournament
Supporting older people	7	Community bus for older people	Regular bus service taking older people to amenities
	8	Support for carers	Co-ordination of support provided to those caring for relatives
Tackling crime and anti-social behaviour	9	Warrior women personal safety training	Training for women addressing safety at home and outdoors
	10	Targeted policing operations	Additional patrols to respond to crime and anti-social behaviour
Health and wellbeing items	11	Reducing alcohol's harm in young people, older people and A&E attendees	Development of marketing materials concerning the risks of excessive drinking
	12	Sexual health – under-18 pregnancies	Peer education, marketing and events aimed at improved sexual health

I then created a printed brochure which, for each of the 12 projects, set out:

- A summary of the rationale for it and its likely effects
- A definition of one unit – eg "1 term's support for at least 30 students"
- The maximal number of units that could be purchased, where applicable
- Project unit "costs" expressed in points – financial, emissions (council-level and community-wide)

The brochure was sent to participants by post in advance of the pilot event with an invitation to read it if they wished; the extent to which they did was then tested in the questionnaire at the end of the session.

The design of the brochure altered only slightly from this point on so the versions used in the formal tests are included for reference at Appendix K.

I then used Microsoft Excel to create the "decision support tool". This would provide:

- A list of the projects together with an automatically-updated statement of the number of units that could be purchased given remaining budgets
- A record of choices made
- A "live" statement of budget remaining under the three headings

A screenshot of the decision support tool is at Figure 8.2.

Having prepared the materials, I specified a set of recruitment quotas designed to deliver a group of 12 people who would mirror British/English[18] society in terms of gender, ethnicity, age, socio-economic status (using nature of employment and housing tenure as proxies for social class and wealth, respectively), whether resident of an urban or rural area, and extent of civic engagement. My rationale was that a sample meeting these quotas would be free of any obvious intrinsic bias. Evidence collected from such a group, though it could not be generalised, could be presented as how a typical group of British citizens might respond.

The participants were recruited by a professional market research recruiter who used a database of former participants augmented through targeted internet advertising, the use of the intranets of certain companies with which she had established a working relationship, and recommendations made by past participants. The recruiter revealed little about the event, apart from to say that it would involve "decision making and policy making in your local area". The recruiter told me that certain potential participants expressed concern that they would be expected to know about policy matters but that she allayed these fears. Participants were offered £50 (to include travel costs) for attending a two-hour session.

The first pilot took place in a seminar room at University College London in the evening of 28th November 2011. Nine participants attended (following some late withdrawals). The event was observed by a senior officer from Tower Hamlets who was introduced to participants as an assistant (helping with refreshments etc) so prevent participants from feeling they were under scrutiny.

The first part of the session was my presentation (see Appendix G for the slides). I spoke for approximately thirty minutes, responding to a small number of questions during this time. A considerable proportion of the presentation set out the basics of climate change and the argument for reducing greenhouse gas emissions. To support this, I used a well-known bathtub analogy which contrasts three emissions scenarios and in which severe harm arising from climate change is represented by the bath overflowing (Schlumberger Excellence in Educational Development, Inc 2007). I made a point of presenting climate change as a fact rather than a topic for debate, saying, for example, that it suited the media to draw attention to disagreements amongst experts but that there was actually overwhelming academic consensus concerning the fundamental issues.

Several slides were dedicated to setting out the rationale for the emission estimation approach and its implications for individual projects in the context of the application of a limited emissions budget. I spent only a few minutes speaking about the projects themselves.

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18 Depending on the geographic scope of the base data used

PROJECTS

Number	Name	Unit	Max units	Unit financial cost (points)	Unit COUNCIL greenhouse gas emissions (points)	Unit COMMUNITY greenhouse gas emissions (points)	Units available
1	Park improvements	1 park improved	8	35	19	18	2
2	Better street lighting	1 average street - all lamps replaced		11	CREDIT 37	CREDIT 34	9
3	Speed indicator devices	1 device for 1 year (3 locations)		3	1	18	5
4	Study support	1 term's support for at least 30 students		5	10	10	10
5	Skillsmatch	4 sixteen-week placements		8	4	5	12
6	Community football	One 10-week course for up to 30 people		4	1	2	25
7	Community bus	1 bus for 4 hours, one day per week for 1 year	7	6	55	51	1
8	Support for carers	Volunteer co-ordinator supporting 10 befrienders for 1 year	5	7	34	34	2
9	Warrior women	One 12-week course for 12 women trainees		5	15	15	6
10	Targeted policing	Additional patrols for 1 year	5	24	1	40	2
11	Reducing alcohol's harm	Engagement, marketing and events programme over 1 year	10	24	48	CREDIT 33	2
12	Sexual health	Education, communication and events programme over 1 year	10	24	6	CREDIT 28	4

CHOICES

Round	Project	Units	Financial cost	COUNCIL greenhouse gas emissions points	COMMUNITY greenhouse gas emissions points
1					
2					
3					
4					
5					
6					
7					
8					
9					

POINTS REMAINING

Finance	COUNCIL greenhouse gas emissions	COMMUNITY greenhouse gas emissions
100	100	100

Figure 8.2 – Decision support tool (1st pilot)

Following the presentation, participants were asked to start discussing which projects they wanted to choose. I facilitated this process, attempting to identify consensus where it occurred and generally encouraging those present to use their debates to arrive at conclusions. I had allowed 45 minutes in the schedule which was approximately the time taken. Once the choice process was complete, I invited participants to reflect on the experience and to share their thoughts using a small number of opening questions.

The final stage of the event was the completion of an evaluation questionnaire. This tested participants' opinions of the projects offered and of the exercise in general. It also asked participants to describe how they had approached the exercise and tested the extent to which they had understood the technical elements of the presentation.

Following the event, I carried out the following data gathering and analysis:

- A detailed discussion with the Tower Hamlets officer who had observed the event
- Review of the recording of the deliberations and subsequent group discussion
- Examination of the evaluation forms

The first pilot provided much useful intelligence concerning the design and execution of PEB as well as its framing and presentation. These points are discussed below at §8.2. In more general terms, it indicated that PEB was technically feasible, in that participants arrived at a set of choices that complied with the constraints and did so comfortably within the time allocated. Evaluation questionnaire responses (see Appendix G) expressed comfort with the process and some enthusiasm for it, though three questions designed to test whether the detailed explanation of emission estimation had been understood produced a mixed response.

Second pilot, July 2012

In preparing for the second pilot, I adopted an emission saving target (as opposed to budget), in accordance with my resolution (§7.5) to test both approaches.

Having developed my approach to greenhouse gas accounting since the first pilot, I revised my estimates of community-wide emissions (there no longer being a requirement to calculate council-level emissions, as discussed in §7.5). I introduced the concept of a 100-year horizon and calculated an average year from across that period. This meant that the variation across projects reduced, with many having a low score relative to those that had ongoing impacts beyond their opening year. The estimates were to change further following the second pilot.

The adoption of a saving target required me to set a suitable constraint in light of the somewhat revised project impacts. (Neither the financial impacts nor the nature of the financial constraint had altered so there was no requirement for action on this front.) In contrast with the first pilot, I did not have a ready means of deriving an emission saving target

from the impacts of the projects. I therefore experimented with different values for the target until I found a level that appeared to strike a suitable balance between allowing participants to arrive at a compliant set and making the selection process challenging.

I then revised the decision support tool, introducing a graphical representation of progress against constraints. The adoption of an emission saving target meant that it would no longer be possible to say how many units of a given project could be purchased at a particular juncture so I simplified the decision support tool accordingly. The revised decision support tool is shown at Figure 8.5.

I revised the introductory presentation so that it covered climate change more briefly; an additional alteration was the introduction of charts which showed the relative financial and emission scores of the 12 projects (Figure 8.3 and Figure 8.4, respectively).

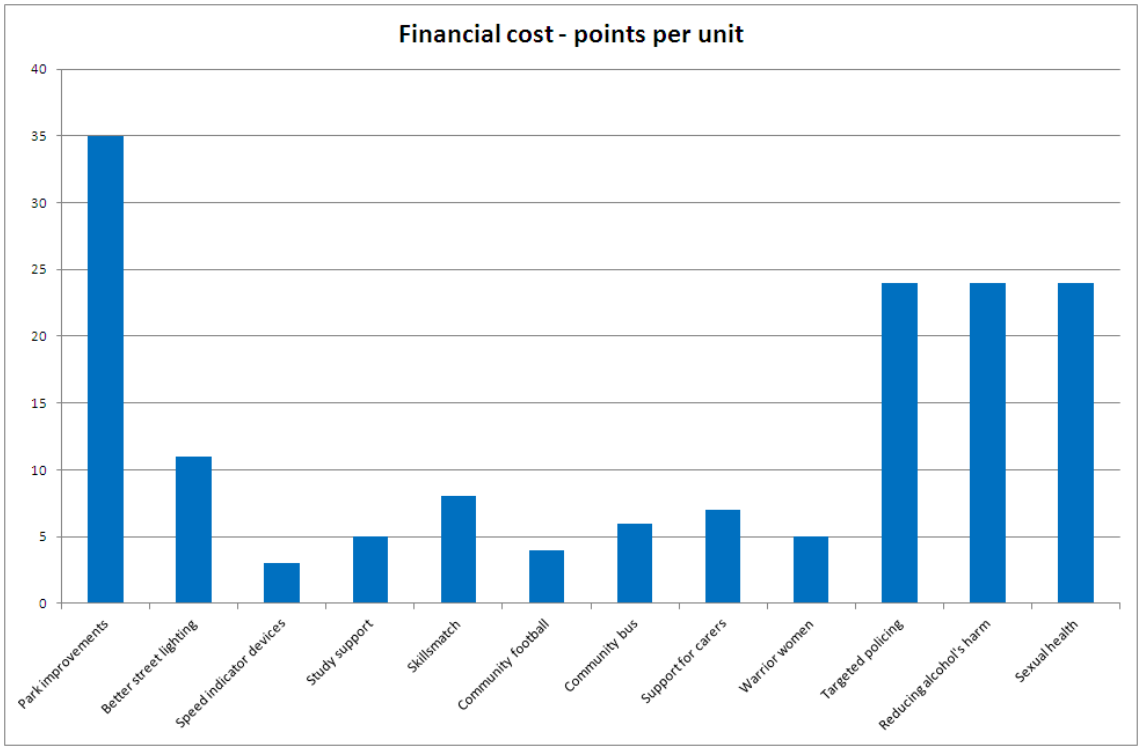

Figure 8.3 – Projects' relative costs (2nd pilot)

The second pilot differed significantly from the first in terms of participant profile: instead of recruiting people to attend, I was able to make use of University College London's programme of "masterclasses", designed to enable those considering an undergraduate degree to obtain an understanding of what this might entail. The masterclasses are aimed at "target groups" – the intention is to engage young people without a family history of participating in higher education.

A total of 11 students attended the masterclass which took place in a classroom at University College London in the evening of 16th July 2012. All participants were 16-17 year-olds

interested in entering higher education. The group was ethnically diverse but my impression was that it was also diverse in terms of socio-economic group, and informal conversation gave me to believe that many present did in fact come from families with experience of higher education. Participants had selected the masterclass from a set of options on the basis of its description on the relevant webpage[19], suggesting a bias towards interest in climate change and/or politics, but several comments on the evaluation questionnaires indicated that participants had hoped to gain a better understanding of university life than the event gave them, implying that the principal motivation of participants was to obtain an insight into undergraduate study.

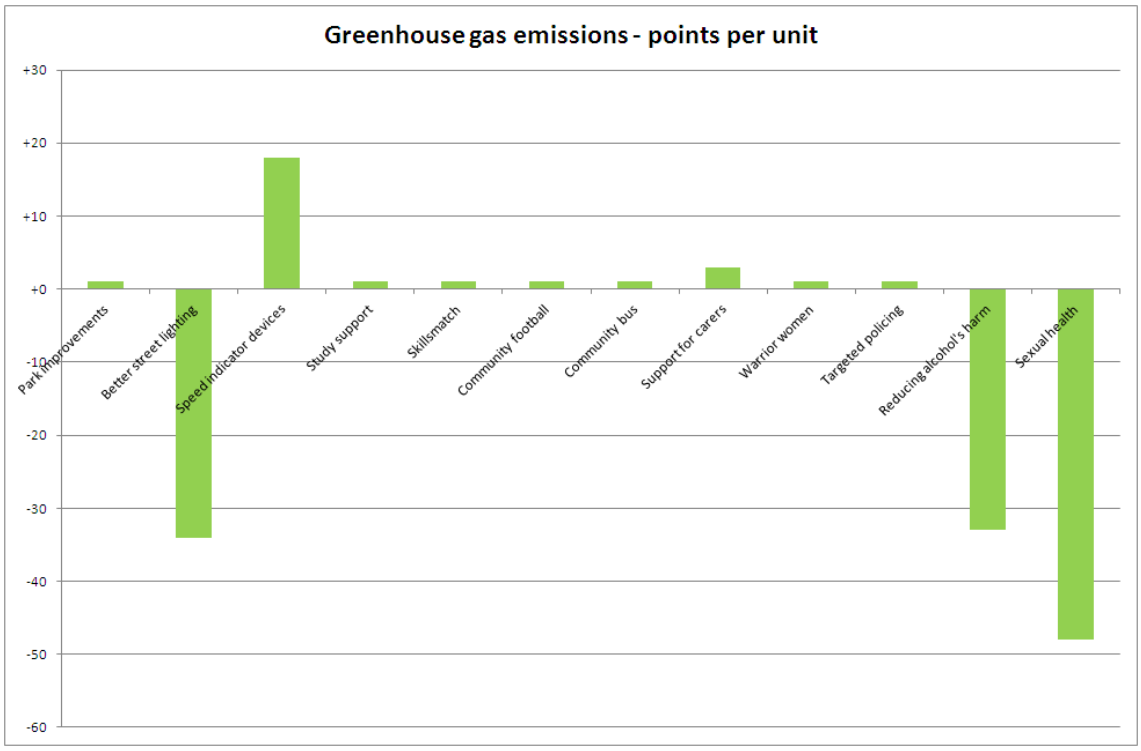

Figure 8.4 – Projects' relative emissions (2nd pilot)

Once participants had arrived and been provided with refreshments, I briefly explained the background to the session: I had agreed with the masterclass organisers that I would use the event to test the decision-making method I was developing with the participants, on the basis that this would provide them with an insight into how social research is conducted in the university sector. I also gave a summary of my journey through higher education up to that point and fielded questions on this.

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19 "In the masterclass, participants will be making decisions about the projects which a local council will implement. After an introductory presentation about climate change, you will split into groups to make choices amongst a set of policy options, taking into account their financial costs and climate change impacts. There will be discussion, negotiation and voting" (University College London 2012).

PROJECTS

Number	Name	Unit	Max units	Unit financial cost (points)	Unit greenhouse gas emissions (points)
1	Park improvements	1 park improved	8	35	+1
2	Better street lighting	1 average street - all lamps replaced		11	-34
3	Speed indicator devices	1 device for 1 year (3 locations)		3	+18
4	Study support	1 term's support for at least 30 students		5	+1
5	Skillsmatch	4 sixteen-week placements		8	+1
6	Community football	One 10-week course for up to 30 people		4	+1
7	Community bus	1 bus for 4 hours, one day per week for 1 year	7	6	+1
8	Support for carers	Volunteer co-ordinator supporting 10 befrienders for 1 year	5	7	+3
9	Warrior women	One 12-week course for 12 women trainees		5	+1
10	Targeted policing	Additional patrols for 1 year	5	24	+1
11	Reducing alcohol's harm	Engagement, marketing and events programme over 1 year	10	24	-33
12	Sexual health	Education, communication and events programme over 1 year	10	24	-48

CHOICES MADE

Round	Project	Units	Financial cost (points)	Greenhouse gas emissions (points)
1				
2				
3				
4				
5				
6				
7				
8				
9				

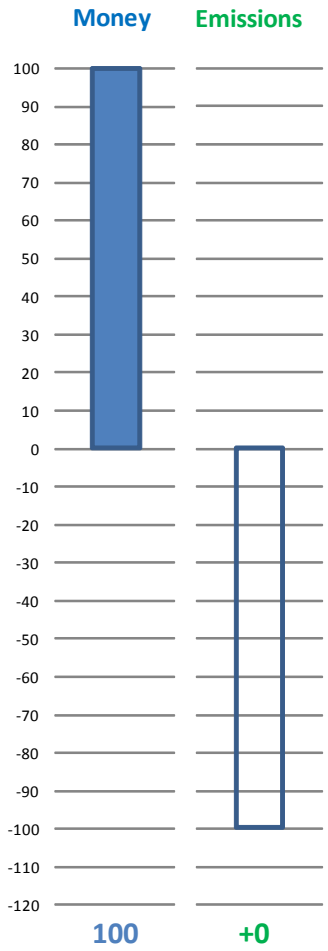

Figure 8.5 – Decision support tool (2nd pilot)

Having set the scene, I then gave the introductory presentation (see Appendix H) which provided the rationale for the exercise and explained its structure. Participants had not seen projects prior to the event so I paused during the presentation and gave them ten minutes to read the project brochure, before showing the concluding slides.

Once I had dealt with questions of clarification, I invited participants to begin discussing their options. I facilitated the discussions as in the first pilot but with two differences: I invited participants to resolve any stalemates by "striking deals" in which both parties would get the project they favoured; and at one point I announced that I would leave the room for a few minutes to enable participants to reach a decision on their own. I had allocated 45 minutes for the decision-making element which was approximately how long the deliberations took.

Once the decision-making process was complete, there was a short break, after which I invited participants to reflect on the exercise and share their thoughts. The final stage of the event was the completion of evaluation questionnaires which I subsequently analysed, together with the recording of the event.

As with the first pilot, the second pilot provided much useful evidence to support the fuller development of the PEB method in advance of the formal trials. The specific points are discussed more fully in §8.2. More generally, the second pilot consolidated my finding from the first pilot that the method was technically feasible, as the participants reached agreement concerning a compliant set of options without significant difficulty and within the time that I had allocated. The evaluation questionnaire responses (see Appendix H) displayed a similarly positive response to PEB and the experience of taking part.

Formal trials, November 2012

The two pilots had satisfied me that it was not necessary to make major revisions before subjecting the method I had developed to detailed trials.

The main purpose of the trials was to address two of my research questions:

Research Question 2 How do PEB participants arrive at their decisions?

Research Question 3 What are the opinions of participants concerning PEB and the experience of taking part in it?

I also hoped that the trials would give further evidence to support the answer to Research Question 1 (is it technically feasible to create a variant of participatory budgeting that meaningfully includes climate change impacts?)

In terms of preparation, the principal activity that preceded the formal trials was a thorough revision of my estimates of the greenhouse gas emission impacts of the 12 candidate projects,

which I carried out with reference to the emission estimation method I had developed (see Chapter 6). The decision to retain a saving-based emission constraint meant that my task was to estimate the net community-wide emissions of each project. I provide here a summary of the approach I took; further details are at Appendix B.

I formulated an initial view of the likely relevant direct and indirect impacts that would result from each of the 12 projects and "sense checked" this with a group of four peers. Taking their views into account, I then formulated an impact diagram for each project which showed both the relationship between impacts and their "order" (degree of directness). An example is shown in Figure 8.6; the full set is at Appendix B.

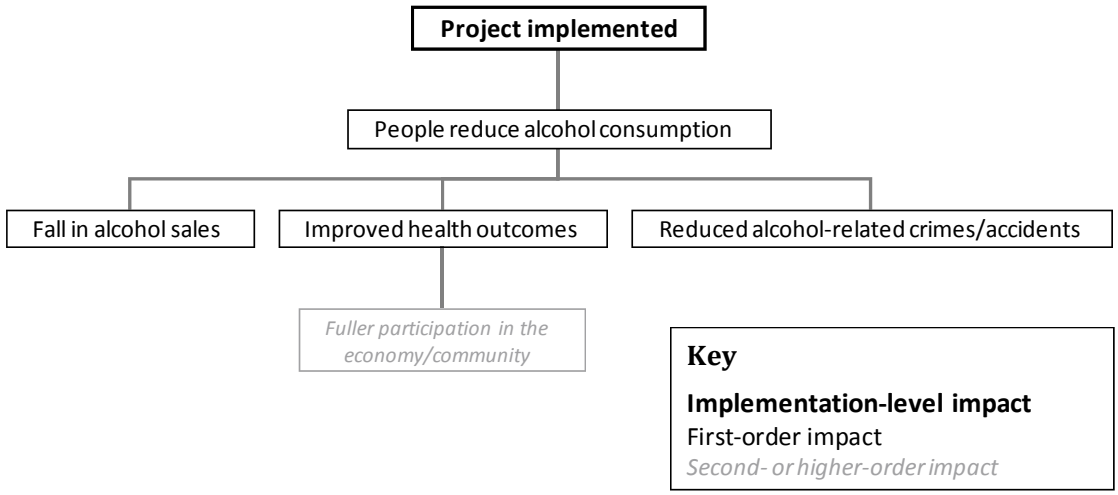

Figure 8.6 – Example project impact diagram

My next step was to perform a targeted literature search for evidence on the extent of each impact that lay within my inclusion boundary. Where I encountered conflicting sources in the literature, I gave weight to review papers which surveyed a range of work on the subject, to work relating to the United Kingdom, and to the most recent publications I had obtained. I put relevant findings concerning impact rates into a spreadsheet together with an estimate of the volume of initial activity taken from the documentation for the Tower Hamlets exercises that were the source of the 12 projects (Tower Hamlets Partnership 2010). From this I derived estimates of the magnitude of relevant impacts, using published national statistics to make additional conversions between quantities where needed. In all cases, I was working towards either an explicit emission estimate or a quantity that could be readily converted into an emission estimate using standard conversion factors (AEA 2012). As a result of this work, I resolved to adjust the unit size of one project (see §8.2.1). Appendix I is an Excel workbook containing the calculations underlying the emission estimates for the 12 projects. I review the experience of estimating emission impacts in §8.2.4.

Only minor changes were required to the decision support tool that I had used in the second pilot. I included the revised emission numbers and I also resolved to remove the column setting out the maximal number of units as this had not played any part in either of the pilots: budgets had been exhausted (and/or constraints met) considerably before numbers of units began even to approach any maximum. Since this element had been adding to the cognitive burden without making a meaningful contribution to the decision-making process, it seemed appropriate to remove it. I adjusted the design of the project brochure accordingly. The version of the decision-support tool used in the formal trials is at Appendix J.

I had budget sufficient to finance the recruitment and remuneration of two groups of 12 participants, it seeming sensible to continue with approximately the same group size as had featured in the pilots. I considered making the two sessions identical but concluded that a sample as small as two would prevent me from drawing inferences from any similarities which the two groups might display. Instead, I resolved to make one of the events similar in form to the pilots, whilst the other would proceed in stages. The simpler event would involve participants choosing projects subject to the two constraints (financial and emission-based) following a brief introductory presentation. In the more complex event, participants would first make a selection of up to eight project units without financial or emission constraint ("***You Decide!* Projects**") then a second selection with only a financial constraint ("***You Decide!* Money**") before a final selection with both constraints ("***You Decide!* Climate**"). My reasoning was as follows: holding one event that replicated the structure of the pilots would further test the robustness of this model at the same time as providing an opportunity to gather more detailed evidence of participant response to it than had been possible during the pilots. And holding a second event in which constraints were added singly would provide evidence on participant response to specific aspects of the task – the need to observe a limit of some kind, the need to work within a fixed financial budget, and the need to respect an emission constraint.

I was mindful of the risk that adding the financial constraint before the environmental constraint would bias participants against the latter – with each additional constraint participants would be further deflected from their first-choice path with the possible result that the greenhouse gas limit would be "blamed" for participants' inability to choose certain project combinations. As it was, there was a practical argument against introducing the environmental constraint before the financial limit: because certain projects were forecast to save emissions, it would be possible to continue selecting projects *ad infinitum*.

As with the first pilot, members of the public were recruited by a professional market research recruiter, in accordance with a series of quotas I had set relating to gender, ethnicity, age,

socio-economic status (using nature of employment and housing tenure as proxies for social class and wealth, respectively), whether resident of an urban or rural area, and extent of civic engagement. In both cases, 12 individuals were recruited; there were two drop-outs on the day of the first trial and one drop-out on the day of the second. A series of histograms in Appendix N shows profile of actual participants against quotas.

As with the first pilot, participants were told that, at the event, they "would take part in making decisions about local authority projects". Nothing was said in advance about climate change. Participants in the first trial (two hours) were paid £50 each; the second trial lasted for three hours and each participant was paid £70. Participants were provided with a project brochure in advance (which omitted information on financial or emission impacts) and asked to read it before attending. I used the same set of projects as in the pilots, on the grounds that there appeared no requirement for significant change. There were some modifications of unit size, explained in §8.2.

Both trials took place at University College London on weekday evenings in November 2012; I acted as facilitator. Each began with an initial questionnaire (Appendix L) that had three sections:

- Participants were invited to nominate the projects they felt would be most beneficial to the community
- A set of questions tested participants' feelings concerning their capacity and desire to influence public decisions and likely strategy for attempting to do so
- The final set of questions established which environmental issues concerned participants, how well informed they felt about environmental matters, and whether they felt the UK did too much or too little about environmental problems.

I included the first section in order to learn participants' preferences with respect to projects prior to any group deliberation and in the absence of any constraint. The questions about influencing decisions and environmental issues were intended to show how similar to the general population the participants were in these respects. I therefore adopted questions that had been used in national and international surveys to enable comparison. Each participant was issued with an envelope into which they were asked to insert completed questionnaires. This enabled me to make the questionnaires anonymous whilst ensuring that I would be able to pair the "before" answers of each participant with their "after" responses.

In the first trial, I then gave a presentation (Appendix L) that introduced the evening's exercise, drawing on the material used in the pilots. This involved explaining that participants were residents of "Anyborough", a typical urban authority in southern England, and that the focus of our deliberations would be Anyhood, an area of about one square mile with a population of

13,000. I next turned to a summary of the Climate Change Act before explaining that Anyborough had set an emission reduction target which meant that the choices participants would be making were subject to a greenhouse gas constraint.

The next stage of the presentation was an explanation of the method used to estimate project emissions. I ended by explaining the rules of the exercise: participants could spend up to 100 financial points (each point being worth approximately £1,500) and had to save at least 100 emission points (approximately 30 tonnes of GHG in total). In so doing, they could specify multiple units of a given project and could reverse previous decisions if they had second thoughts. I then circulated copies of the brochure which now included financial and emission impacts, as well as a brief explanation of the emission impact for each project.

I invited participants to spend a few minutes examining the impact numbers, drawing attention to a page that presented these in tabular form as well as the two histograms (Figure 8.7 and Figure 8.8). I next asked participants to discuss the projects in pairs to establish any shared views or differences concerning their merits. After each pair had reported to the plenary, I invited participants to start working as a group towards their decisions. I intervened after this point as necessary, either to respond to questions or to encourage participants to come to agreement when debate was becoming stalled. I had allowed 50 minutes for the deliberation; in the event, participants took 43 minutes to reach their conclusions (which are described in Chapter 9).

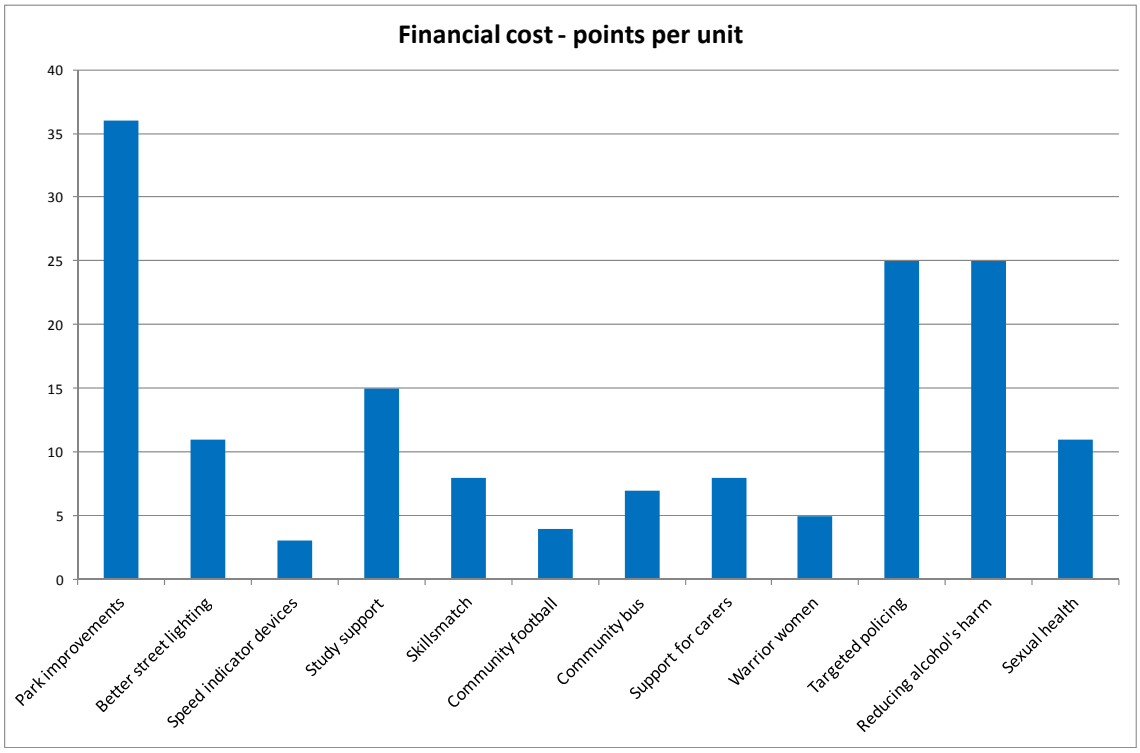

Figure 8.7 – Projects' relative costs (formal trials)

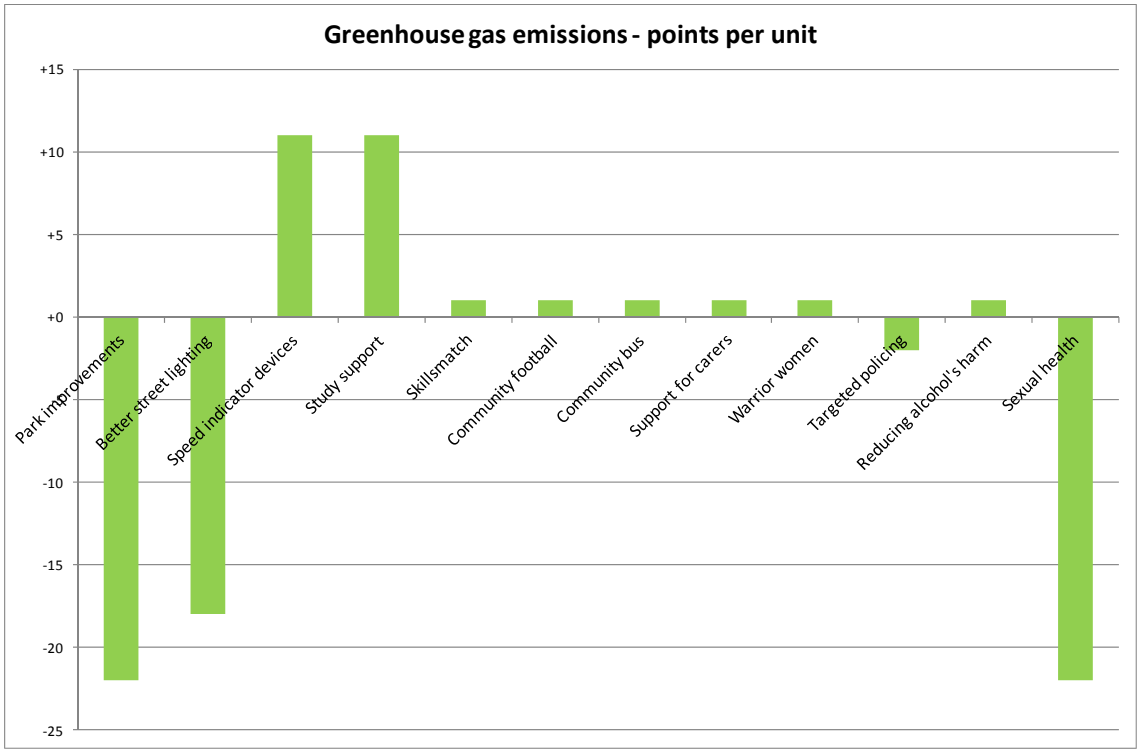

Figure 8.8 – Projects' relative emissions (formal trials)

Once the participants were satisfied that they had arrived at the best set of choices possible given the constraints, I circulated a final questionnaire. This had the following sections:

- A set of questions about the usefulness of the information given and the range of the projects offered
- Questions about the approach taken by participants to the decision making and their views of the deliberation element
- Three questions designed to capture whether participants had grasped the technicalities of the greenhouse gas emission aspect
- Questions which invited participants' views concerning the exercise

The staggered nature of the second trial required a slightly different approach. I gave a brief initial presentation (Appendix L) in which I introduced Anyborough and Anyhood before explaining that, in the first exercise, participants would be able to choose up to eight units, with freedom to choose multiple units of a given project if they wished. As in the first trial, I then invited participants to speak in pairs about their preferences. Once each pair had reported back, I asked participants to set about working towards their decisions.

Once participants felt that they had made the best set of choices possible, I gave a further, short presentation, in which I introduced the financial constraint – participants would be able to spend up to 100 finance points – after which I circulated copies of a sheet on which the

projects' financial impacts were set out in tabular and graphical form. I then asked the participants to agree on a set of choices reflecting the introduction of the new constraint.

When participants were satisfied with their choices, I circulated an interim questionnaire. This asked participants how they had approached the second choice exercise (***You Decide!*** **Money**) and collected their opinions of the exercise in general as well as in comparison with the first exercise (***You Decide!*** **Projects**) where the constraint had related to number of units. There was then a short break for food and drink.

After the break, I introduced the third decision-making task, ***You Decide!*** **Climate**. I presented the emission constraint in the context of the Climate Change Act and, as in the first trial, described my approach to estimating emissions. Having explained that participants again had up to 100 financial points available, as before, but that they now had to achieve a saving of at least 100 emission points, I invited them to recommence their deliberations.

At the conclusion of this third choice exercise, I circulated a final questionnaire. This covered much the same ground as the final questionnaire used in the first trial but asked participants to compare the third exercise (***You Decide!*** **Climate**) with the second (***You Decide!*** **Money**) in particular before asking them to select which of the three had been best and which worst and to explain the reasons for their answers (see Chapter 9).

The deliberations of participants were recorded and transcribed and I carried out a thematic analysis of the transcripts. Following the trials, I conducted follow-up telephone interviews with four participants from each session. I used these data together with the questionnaire responses to evaluate the trials in detail. The results of this analysis are described in Chapter 9.

8.2 Progress made with design issues

This section returns to various issues discussed in Chapter 7 and shows how progress was made on each during the development process. It also returns to the emission estimation method presented at the end of Chapter 6, describing the experience of putting it into practice.

8.2.1 Project options and scale

Since PEB was conceived as a variant of "classical" participatory budgeting, I decided to use an existing form of PB as a platform. I chose Tower Hamlets' *You Decide!* because the projects that made up the option set had been generated by the council and other public bodies (albeit with reference to citizen views) and were therefore likely to resonate with local authority officers elsewhere. The set was also appealing because it had a wide policy range (in keeping

with my decision to adopt a wide spread of policy areas) and the typical project cost was consistent with the cost range of £1,000 to £50,000 on which I had settled.

The evaluation questionnaires completed by participants after the two pilots suggest that the approach taken was successful: in answer to the question "what did you think of the range of the projects?", 17 answered "about right" and one "not varied enough"; none chose the option "too varied". This led me to think that the set of 12 projects did not require alteration in advance of the formal trials. (And evaluation of the formal trials shows a similar pattern – see Chapter 9.)

I made modest changes to the sizes of two of the projects before first using them in the pilots, reducing the unit sizes of Project 4 (Study support – learning beyond the classroom) and Project 7 (Community bus for older people). Both projects, as defined in the Tower Hamlets exercise, were relatively expensive; reducing their size made them more affordable (at the cost of reducing their scale). I made additional changes in advance of the formal trials: once I had collated emission values for the 12 projects, I concluded it was necessary to reduce the unit size of Project 12 (sexual health). If left unadjusted, its greenhouse gas emission impact was a very large saving which would have made the project selection process trivial, in that participants would have been forced to select this project, after which the greenhouse gas emissions of other projects would have become irrelevant. I also returned Project 4 (Study Support – learning beyond the classroom) to its original size, having reduced it for the pilots. My reason was that the project was originally conceived to run for an academic year and evidence I had found concerning impact assumed the same timescale; the reduced version of the project would have run for only a term and I felt there was no justification for assuming that it would simply have a third of the full project's effects.

Though the issue of spatial scale was resolved before the development process began, it is worth noting that the discussion groups validated my decision to adopt a local spatial scale for PEB. Participants gave a variety of reasons for preferring a neighbourhood focus:

- If local, projects would be likelier not to be "core" to the council's activities such that essential services would not be at risk if a given project did not receive sufficient support.
- On a similar note, the Haringey interviewee was concerned that certain worthy council-wide projects would suffer in a PB exercise because they would not be perceived as desirable by voters in comparison with other more immediately attractive projects. A local focus would imply that "core" projects were not at risk.
- The more local the focus, it was argued, the more homogeneous the community in question, thereby making it easier to select projects that met its principal needs as well

as lessening the pressure upon participants to consider a diverse set of needs when selecting projects.

- A local focus was felt likely to engender a stronger desire to participate – with respect to a council-wide event "you'd think 'other people will go so I won't bother'" (Tamworth participant).
- Local projects would be easier to deliver because of their modest scale and therefore would present lower risks.

8.2.2 Volume

The discussion groups gave a clear indication that there would be an appetite for being able to set the quantity of a given project rather than being forced to choose between simply having a project at the stipulated size and not having it at all. Associated discussion also raised the connected issues of minima and maxima, with the observation that, as well as there being a practical maximum, there might also be a pragmatic minimum:

> "But also you kind of have to think what if the things that need doing, you can't just have one of them you need [a minimum of…]" (Tamworth participant).

Participants gave me no reason to think that they would struggle with the additional cognitive burden arising from the introduction of units but simple exercises as part of the discussion groups confirmed my belief that complexity in the management of volume should be controlled by setting the minimum number of units at one.

8.2.3 Categories of emissions

The emission estimation method set out in Chapter 6 stipulates that two categories of emissions should be calculated – "council-level" (ie estate and operations) and "community-wide" (relating to the actions of agents based with the local authority's jurisdiction). The discussion groups provided an opportunity to explore the feasibility of using two separate measures and the first pilot enabled a meaningful test of this approach.

When the two categories were presented in discussion groups, this prompted a mixed response. The Tamworth participants were at first bemused but appeared content with the distinction between the two categories once it had been explained. The Haringey interviewee was comfortable with the idea of looking at emissions from two perspectives, saying in response to the suggestion that the council might be expected to sort out its own emissions, "no because I can see how they [council-level emissions] impact on these [community-wide emissions]". In addition, when presented with the hypothetical scenario of a project that offered a considerable emissions saving at the community level but at the expense of a significant increase in council emissions, leading the council to rule it out, the interviewee answered:

> "Well I wouldn't blame the council. I'd say that the system for imposing those thresholds was wrong and I could see why they'd make that decision" (Haringey interviewee).

One consequence of adopting two emission measures is that participants would then be working with three constraints – one financial, and two relating to greenhouse gas. The presentation of multiple "budgets" prompted some confusion on the part of Tamworth participants:

> "So which one are we saying you've got to get to a hundred? The total financial cost, or the gas costs?" (Tamworth participant)

Discussion in the groups also gave some evidence that normalising two sets of greenhouse gas emissions (measured using the same native units) to fit a budget of 100 points created scope for misunderstanding, as one "community" point would probably represent a different quantity of greenhouse gas than one "council" point.

The pilots provided useful additional intelligence on this theme. In the introductory presentation for the first pilot, I devoted some time to attempting to explain how the two categories of emissions differed. I then tested participants' understanding of the difference using the evaluation questionnaire. The fact that seven of eight respondents answered the question incorrectly indicated that either my explanation had fallen short, the difference was overly subtle, or both.

The findings of the discussion groups and the first pilot made me wary of persisting with two emission measures. As it was, I had decided to test a target-based emission constraint in the second pilot and had concluded that this type of constraint was not compatible with using two measures (see §7.5). My survey of the greenhouse gas accounting literature had indicated that, of the two, the community-wide measure was the more meaningful but I invited participants in the first pilot to give their own views, by asking "which of the two greenhouse gas limits do you think matters more?" in the evaluation questionnaire. No respondent chose "council-level"; two chose "community-wide" and five "matter the same", with one choosing "don't know/mind", which suggested a slight preference for community-wide emissions, a preference shared by the local authority officers whom I interviewed at this point in the development process.

8.2.4 Emission estimation

The process of estimating project-specific emission impacts in accordance with the method articulated in Chapter 6 proved very challenging. I list the principal difficulties encountered below before discussing each more fully.

- Lack of information concerning project characteristics
- Scope for a wide range of indirect effects

- Definition of order of impact
- Management of the absence of evidence
- Interpretation of conflicting evidence from the literature
- Adherence to the principles of the method
- Inconsistencies amongst the emission data available

In calculating my estimates, I was using the brochure developed for the Tower Hamlets PB exercises from which I had taken my 12 projects (Tower Hamlets Partnership 2010), a document which provides only limited information about each project. I could expect to have had fuller information had I been working within a local authority on a "live" PB exercise but, even then, there is a good chance that little would have been known about any previously untried projects. And, even where a project had run before, there may not exist a full picture of how it had operated, nor could one assume that a further run of it would be identical. In some cases, vagueness would reflect a deliberate decision to leave detailed planning until the project had been selected. For example, the brochure stipulates with regard to the park improvement project that the works will be the subject of "community consultation" (Tower Hamlets Partnership 2010, p.8). In summary, even with the best information available, there are likely to be considerable areas of uncertainty concerning the detail of project implementation.

The next area of difficulty relates to the prediction of impacts arising from the project. Many of my 12 projects involved services to people, who might respond in a number of ways. For example, the project aimed at reducing alcohol's harm (see Table 8.2) was intended to encourage those drinking at a harmful level to reduce their consumption. It is possible that someone who successfully tackled problem drinking would not only enjoy better health but may become more economically active or may enter a new relationship, ultimately moving in with their new partner. Each of these consequences could be associated with a significant change in greenhouse gas emissions compared with the "without-project" scenario. In fact, there are many more plausible potential consequences of the project, only some of which are likely to have been the subject of methodical study. My assessment of the emission effects of a project was therefore limited to the impacts which seemed likely to me (and to the group of peer researchers to whom I presented my initial views). This is perhaps an unavoidable source of bias but the magnitude of any resultant error may be large.

My estimation method stipulates that I should exclude any impact that is beyond first order, where first-order impacts are defined as being those "directly caused by the project itself" (Edwards-Jones et al. 2000, p.145). My interpretation of the concept of increasing order was as follows: if there is a contingent behavioural response to an impact of order n, this response

is classed as being of order n+1. For example, if the improvement of street lighting is of order n, then the response of local people to walk down the better-lit street is of order n+1. It is important to note that some consequences are inevitable (or, in the language of philosophical logic, necessary); therefore, though they result from an event (are caused by it), they are allocated the same order as the event. For example, improved street lighting is found to lead both to a change in perceptions of personal safety and to a drop in the number of falls but neither of these is a matter of choice so it is allocated the same order as the improvement of the lighting.

Though the location of any boundary is sure to be arbitrary, my argument for limiting impacts included to first order was that this would capture the types of effect that are explicitly intended when projects aimed at climate change mitigation are conceived (eg savings of energy resulting from insulation) whilst avoiding the great complexity that would follow from allowing higher orders of impact. Having defined the boundary, however, I found applying it consistently to be very challenging.

For example, the principal impact of interest (in emissions terms) resulting from the sexual health project (see Table 8.2) is a reduced pregnancy rate amongst participating women. Because women may or may not alter their behaviour as a result of participating in the project, I treat the effect on pregnancy rates as first order. And, because childbirth follows on from pregnancy (without requiring a behavioural response), I treat the birth as being first order too. Meanwhile, with respect to the community bus project (see Table 8.2), I included a reduction in escort trips (first order) but excluded (as higher order) a possible reuse of the time saved by those previously doing the escorting. The difficulty arose as I attempted to estimate the associated emissions. Having decided that childbirth was a first-order impact (and therefore to be included), I did not see an obvious point following birth at which to draw an emission boundary, since human lives follow a myriad paths and the first contingent behavioural response following birth would be hard to identify in any individual case. I was also exercised by the thought that, whilst human lives are a sequence of contingent behavioural responses, the vast majority of such choices lead to the continuation of life, not its end. I therefore obtained estimates of average life-time emissions and associated these with the project's forecast impact upon birth rates. The equivalent, in the case of the community bus project, would have been to obtain estimates of average emissions associated with use of free time, in order to capture the climate change impact of people discontinuing escort journeys and reallocating the time saved to other activities. But I did not do this and so introduced an inconsistency: with respect to the sexual health project, I included a very large number of higher-order impacts (thereby violating my first-order boundary) whereas I adhered to the first-order rule for the community bus project. My rationale for doing this seems to have a

degree of merit but, to the extent that it does, this appears to prove that the first-order rule is unworkable.

As stated, I conducted a targeted search of the academic literature for evidence to use in estimating the magnitude of each impact. I discuss the management of conflicting evidence below but more challenging was the management of an absence of evidence: in certain cases, as far as I could ascertain, there was no academic research into the impact in question (eg long-term health impacts of Project 6 – Community Football). I felt that I had little choice but to assume a zero impact in such cases, despite a sense that this could be quite inaccurate. The alternative would have been to use an "educated guess" but such a guess would not have been particularly educated. It is troubling that the arbitrary boundaries of academic research should, in effect, determine whether a project appears to perform well or badly in terms of greenhouse gas emissions. There is perhaps some solace in thinking that the projects are of modest size and that, but for exceptional circumstances, the impacts are likely to be modest. Were decisions being taken concerning a large investment, an absence of evidence concerning impacts would, I expect, translate into a requirement to conduct primary research.

As mentioned, I preferred review papers as my starting point for the estimation of impacts, on the basis that they would hopefully offer a balanced view of a range of relevant studies. In cases where I was able to obtain them, I found this to be the case. Review papers did not invariably offer a firm position in cases where different studies had produced findings that were significantly different, but they tended to offer a "way through" the conflicts amongst the evidence that enabled me to reach a position which I felt able to defend. Where review papers did not appear available, I was obliged to look at reports from individual research projects. I had neither the resources nor the expertise to conduct thorough literature reviews across the extensive range of impacts I was investigating so tended to find two or three papers relevant to each. And, where those papers presented very different opinions of the likely scale of impact, I was obliged to take a view. I did this on the basis of my own assessment of the quality of the research – sizes of samples, management of confounding variables, survey instruments used (where applicable), etc. I am comfortable that this was a reasonable course of action in the circumstances but feel it important to acknowledge that an expert in each given field would have been likely both to find more authoritative sources and make more informed judgements in cases of conflicting evidence.

Having found such evidence as I readily could and decided which sources to follow in cases of conflicting evidence, my final task was to convert the impact into an estimate of greenhouse gas emissions. This was challenging first because the method I had defined is uncompromising and asks much of the analyst, and second because such emission factors as are available tend

to have been derived in quite different ways (with the inclusion or not of Scope 3 emissions a particular issue). Indeed, it is frequently not possible to know how a number has been calculated. For example, I used an estimate of lifetime greenhouse gas emissions in my calculations of the impacts of the sexual health project (amongst others). I derived this from Haq et al (2007) who provide estimates of carbon dioxide emissions by age bracket but omit the other gases in the Kyoto basket. I thought it important to capture variation by age since other data I found provided averages across a population, thereby missing the key factor of consumption varying with age. I therefore accepted Haq et al's numbers in the knowledge that they were only partial. As in other stages of the exercise, then, I opted for pragmatism: where it was not possible to achieve all the demands of my estimation method, I chose a path that I felt would provide the highest level of accuracy possible. But, in doing this, I did not carry out exhaustive checks to identify the range of numbers that would result from the various estimation paths open to me. As I suggested in connection with cases where evidence is lacking, I would expect such checks to take place in the event that a major investment were being contemplated.

8.2.5 Constraint setting – budget or target

I explore the respective cases for using an emission "budget" or an emission-saving target in detail in Chapter 7, concluding that a target may be preferable but that the budget approach has a certain amount to recommend it nonetheless, and therefore deciding to test both approaches in the pilots.

I adopted the budget approach for the first pilot, asking participants not to use more than 100 points (of either category of greenhouse gas). In the second pilot, I introduced a saving target ("save at least 100 points"), using community-wide emissions as the indicator, reflecting the discussion at §8.2.3 to the effect that this is a more meaningful measure than the council's own emissions.

The choices made in the first pilot comfortably satisfied the constraints in the case of both council-level and community-wide emissions. In fact, the selections made led to the near exhaustion of the financial budget without ever threatening to breach either greenhouse gas constraint. In the second pilot, participants (who, it must be remembered, may have been more environmentally motivated than average) moved quickly to a discussion of the projects that offered the largest greenhouse gas savings and then achieved the required saving with their first two selections, improving it further with their third, after which they chose additional projects that only slightly reduced the cumulative saving already achieved. Though the participants said in the subsequent discussion that they favoured the most pro-environmental projects on the basis of their *general* benefits, it seems improbable that they

would have prioritised all three emission-saving projects in the absence of information concerning greenhouse gases. So, in contrast with the first pilot, in which emissions played quite a minor role in the deliberations, the introduction of the saving target seemed to place an immediate emphasis on emissions in the minds of participants.

I discussed in Chapter 7 the question of how prominent a role emissions should play in the decision-making process, raising the concern that participants may object to the exercise if they felt climate change was dominating proceedings. In contrast, I also raised the key reservation that a budget-based approach may be counterproductive, in allowing a net increase in emissions. In addition, local authority officers whom I had interviewed at this point in the development process had uniformly favoured targets over budgets. As it turned out, the (perhaps untypical) participants in the second pilot had expressed no concerns about working with a saving target. I therefore decided to base the formal trials on an emission-saving target. In passing, this would remove the issue of whether to persist with using two categories of emissions which had, on the evidence of the discussion groups and the first pilot, caused some confusion.

8.2.6 Constraint setting – practicalities

For the financial impacts, I treated the project costs set out in the Tower Hamlets *You Decide!* documentation (Tower Hamlets Partnership 2010) as the one-year financial costs to the council, this being the measure decided upon to represent financial impact (§6.3). I started by calculating the ratio of available funds to average project cost in the full Tower Hamlets PB exercises from which I had taken my candidate projects. Each area carrying out a PB exercise had £275,000 available to it (Tower Hamlets Partnership 2010) and the average cost of the 45 candidate projects was approximately £24,000, meaning that participants would be able to choose, on average, 11 projects in each exercise (though there was in fact considerable variation in project cost across the set). It clearly made little sense to enable participants to choose as many as 11 projects in the pilots/trials since this would allow nearly all the projects to be purchased (ignoring for now the emission constraint) which would hardly constitute a difficult decision. An alternative approach would be to calculate the ratio of spending budget to total cost of the 45 project options and apply this to the total cost of the 12 selected for the pilots. But this would have had the result of limiting participants to purchasing only three projects of average cost, which I felt was likely to cause frustration. I concluded that a reasonable compromise was to set the spending budget at eight times the average unit cost. (This factor of eight was then used to set the number of project units available in the first stage of the second formal trial.)

The first time I set a greenhouse gas constraint was for the first pilot, where a budget approach was being used. I describe here the approach I took for completeness but note that my methods became considerably more rigorous later on. I started with the average of my estimated emissions for those of the 12 projects that would not cause a net saving. I applied the same factor as for cost (eight) to these averages but then applied a further factor of 0.8 to reflect the need for emissions savings. So, if all projects had an equal emission "score", participants would have been able to buy 6.4 units (subject to satisfying other constraints). The underlying thinking was that the emission constraint would "bite" before the financial constraint, in order to give the exercise the effect of communicating the need for emissions reductions. As already discussed, participants exhausted their financial budget without making much impact on their emission budgets (and subsequent testing using the Monte Carlo method replicated this tendency) so this approach appears not to have had the desired effect.

I do not describe my approach to setting the constraint for the second pilot but move instead to the formal trials which, like the second pilot, used a target-based emission constraint. Having attempted to apply the emission estimation method (Chapter 6) to the 12 projects, I found that they had a wide spread of performance in terms of greenhouse gas emissions. Three (Project 1 - park improvement, Project 2 - better street lighting and Project 12 - sexual health) promised sizeable net emission reductions; two (Project 4 - study support and Project 3 - speed indicator devices) were forecast to add noticeably to overall emissions and the remainder had relatively little impact either way. As stated at §8.2.1, I concluded it was necessary to reduce the unit size of Project 12 (sexual health) in order to avoid a pointless choice process.

I did not have "gross" emission estimates for the projects – having resolved on a target-based approach, I would no longer need these figures – and this prevented me from calculating a relative saving as I had done for the first pilot. I therefore had to use my judgement in determining the level of the saving target so as to achieve the twin goals of making the exercise challenging and avoiding unnecessary frustration. Having said this, the dispersed performance of the projects (with only three of the 12 offering a saving) was likely to mean that even a lenient saving target could be interpreted as restrictive. Having set the target (a saving of approximately 30 tonnes of emissions), I found it was not out of keeping with the magnitude of annual reduction implied by the prevailing carbon budget set under the Climate Change Act 2008 (Department of Energy and Climate Change 2011e) though aspects of the estimation method (eg a 100-year horizon) make such comparisons dubious.

8.2.7 Constraint setting – results

It is important to give some attention to the effects that the various constraints and their levels had upon the choices available to participants.

The first section of the 28th November trial allowed participants to select up to eight units without reference to financial or emission impacts. Compliant combinations (including between zero and eight units and allowing for repetition) number slightly fewer than 126,000. The second section introduced a financial constraint on its own but there was now no limit on the total number of units chosen. There are close to 1.2 million combinations of projects that would comply with the financial constraint, again allowing for multiple units of any given project.

In the third section of the 28th November trial, the emission saving target was introduced (thus making the exercise identical to the one carried out by participants in the first formal trial, on 12th November). The additional constraint reduced the number of compliant combinations to 7,267. It is interesting, in passing, to consider alongside this number the size of the set of compliant combinations available to participants in the first pilot (though the project-specific emission estimates were very different at that stage). This exercise, which included three constraints (money, community-wide emissions and council-level emissions), allowed approximately 281,000 distinct combinations.

The participants clearly had very significantly less room for manoeuvre in the second formal trial with two constraints than they had enjoyed when working with only the financial constraint and participants across the formal trials had considerably fewer options open to them under two constraints than their counterparts had done during the first pilot. This was to be expected and is consistent with the decision made in Chapter 7 to ensure that the emission constraint should "bite". It is nonetheless interesting to examine how "free" the participants were when operating under two constraints, as discussed below.

Combinations that comply with the two constraints set for the formal trials include between five and 15 units in total, the average being 10.43. Ten is the greatest number of units of any one project to appear in a compliant combination, in this case Community Football Training (Project 6). Compliant combinations include between one and seven distinct projects, the average being 4.34. There is considerable variation across projects in terms of their representation in compliant combinations, as shown in Figure 8.9. The most prevalent is Sexual Health (Project 12), which appears in 93 per cent of compliant combinations. Project 11 - Reducing Alcohol's Harm (2.6 per cent) and Project 1 - Park Improvements (2.7 per cent) are the least common.

It stands to reason that projects which achieve a saving in emissions would typically feature more prominently in compliant combinations than those that make a net contribution to emissions. The fact that the park improvements project features in only a small number of combinations is explained by its relatively high financial impact, meaning that the emission saving it brings comes at a significant cost. Whilst it is possible to find other project options which, together with the park improvements, satisfy the constraints (there are 196 such combinations and the participants in the first trial arrived at one before modifying their choice set), this is not as easy as compiling a compliant combination based on the sexual health or street lighting projects.

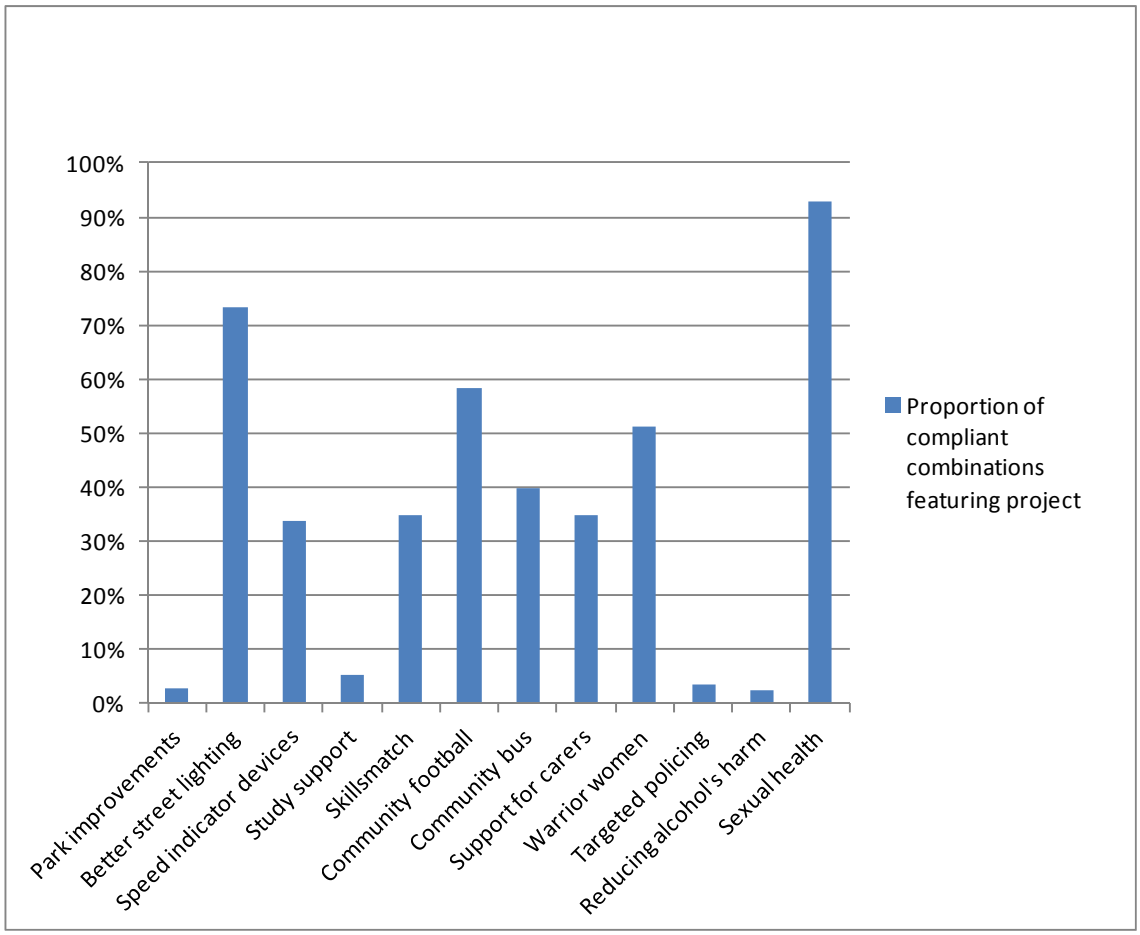

Figure 8.9 – Representation of projects in compliant combinations

There is also variation across projects in terms of the number of units appearing in compliant combinations. As shown in Figure 8.10, three projects (Park Improvements, Targeted Policing and Reducing Alcohol's Harm) appear only as single units in compliant combinations; Sexual Health (4.1 units on average), Better Street Lighting (3.0) and Community Football Training (2.1) appear in the greatest volume in compliant sets, with all other averages lying between one and two.

Participants in the formal trials became increasingly aware of the impact of the constraints and expressed a degree of resistance at times – this theme is returned to in detail in the next chapter.

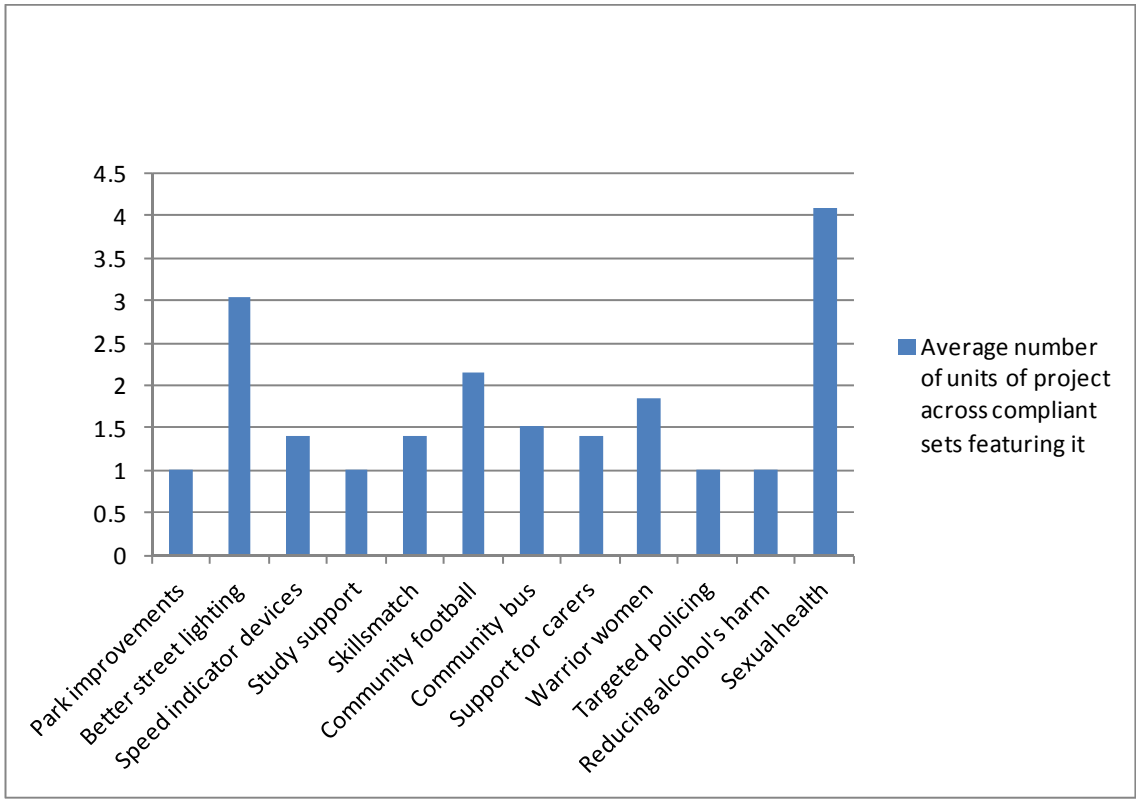

Figure 8.10 – Average volume of projects featuring in compliant combinations

8.2.8 Framing, presentation and structure

The introductory presentation in the first pilot dwelt extensively on climate change, the risks it poses in general and its likely effects on the UK specifically. Having been alerted at the Tamworth discussion group to the risk of debate concerning the reality of climate change, I presented information clearly as fact rather than opinion, leaving participants to raise any doubts about climate science during their deliberations. The material on climate change, combined with the detailed explanation of the emission estimation process, meant that I was speaking for 30 minutes before participants began their task. The reactions of participants to this quantity of information suggested that they found it excessive and the Tower Hamlets officer who observed the session was also of this view. I therefore took a much more succinct approach for the second pilot, retaining information about the estimation process (though this was now less lengthy as a result of removing one of the emission categories) and recasting the information on climate change. Now, instead of attempting to provide a primer on the subject, I presented it in very brief terms as the motivation for the Climate Change Act, thereafter framing the PEB exercise as being driven by the reductions required by the Act (ie a need to conform with the law). This change did not appear to have a detrimental effect upon

participants' understanding of the exercise and meant that they were able to start thinking and talking about the projects rather earlier in proceedings, so I adopted this approach for the formal trials. I am unable to say whether the change altered participants' attitudes to climate change given that these were not tested as part of the evaluations conducted early on but there is no evidence that enthusiasm for the exercise was affected either way.

Following the introductory presentation, participants were shown the decision support tool (Figure 8.4 and Figure 8.5). Its creation had arisen from the cursory tests of the choice-making method as part of the discussion groups, during which participants had expressed a hope that the calculations would be made on their behalf and that they would be able to see what previous decisions meant in terms of projects that remained available given progress against constraints. Comments made after the first pilot led me to introduce a more visual way of showing progress against constraints; these "progress bars" appeared from the second pilot onwards.

Another aspect of the task was management of numbers. Participants in the discussion groups had been asked to consider a variety of ways of presenting impacts, including variants that contrasted the use of actual numbers with the use of points (where each budget would be normalised to 100). The consensus was in favour of points:

> "You're dealing with a lower number [using points] which makes it simpler anyway. It's more practical for everybody" (Tamworth participant).

As to whether this would mean voters lost touch with the quantities represented, most participants felt at ease:

> "So long as you've got the comparison there, that's what the cost is real money and that's what it's converting to I don't think anyone would complain if they dealt in that" (Tamworth participant).

There was, however, some concern:

> "The simplicity that this gives also means that it can become slightly abstract from what you're talking about" (Haringey interviewee).

My conclusion was that a points-based approach was preferable on grounds of cognitive burden but that it would be important to explain clearly what the points represented in order to avoid the abstractness problem.

The final component, alongside my presentation and decision support tool, was printed material. Participants in the first pilot were given the brochure on being recruited (which was, for most, several days prior to the event) and were told that they could look at it if they wished but not instructed to read it. The evaluation questionnaire included the question "did you read about the projects in advance of the workshop?", to which three answered "no", four answered "yes, a bit" and one answered "yes, in detail". Though the introductory

presentation included a few words on each of the projects, this was not equivalent to the detail included in the brochure, so those who had not read it thoroughly (the majority) were making decisions on the basis of less information than would have been the case if they had. Leaving aside the question of how informed participants should be, this finding convinced me that, if I wished participants to be conversant with the projects available, I would need either to request explicitly that they read the brochure in advance or allocate time during decision-making events to this activity. The nature of the recruitment process for the second pilot made it impossible to circulate the brochure to participants in advance so I allocated a period of time to reading just after the introductory presentation. It was possible to provide brochures in advance for the formal tests so the recruiter circulated these, asking participants to read them prior to attending.

8.3 Discussion

The following chapter discusses in detail the response of participants to the formal trials (thereby addressing Research Questions 2 and 3) so I limit myself here to a review of the technical performance of the PEB method during its development, having regard to my first research question (is it technically feasible to create a variant of participatory budgeting that meaningfully includes climate change impacts?) In summary, the answer is positive. It is perhaps noteworthy that the method appeared technically feasible from the beginning of its development, and this is reflected in the fact that the development process was linear.

To be more specific, it is possible, using projects chosen nearly at random, to structure an exercise which is feasible in that participants are able, after a modicum of deliberation, to arrive at combinations of projects that would deliver a meaningful reduction in greenhouse gas emissions whilst observing the stipulated financial constraint. I may have been slightly fortunate in the composition of my project set: I felt it necessary to adjust the size of one project in order to retain a meaningful decision process but I would have encountered more difficulty had fewer (or, worse, none) of the projects offered a net emission saving. The key learning point here is that it is probably necessary to have a greater number of projects available than will actually feature in the final set of options in order to deal with an inconvenient emission profile.

The most challenging aspect of the process was undoubtedly the attempt to estimate emission impacts, a theme that also arose repeatedly in conversations with local authority stakeholders (Chapter 10). Whilst this difficulty did not render the method unfeasible, it introduced a considerable burden which, given the nature of the decisions being made, may render the costs of applying the method too great when weighed against modest benefits. It also fostered significant doubt about the robustness of the emission estimates eventually used.

This is, of course, the lot of anyone attempting to estimate the emissions attributable to any but the simplest of interventions. How important it is will be a function of the use to which PEB is put and, more specifically, whether the projects available in a PEB exercise would make more than a marginal impact upon an organisation's footprint.

The most significant change in the method over the course of its development was the replacement from the second pilot onwards of a greenhouse gas emission budget with an emission saving target. In the first pilot, participants reached a compliant combination without ever nearing either environmental constraint. Perhaps for this reason, they expressed little discomfort with the task they had been set and did not dispute the imposition of a limit relating to climate change. The target was introduced in the second pilot but was accompanied by slight changes to emission estimates and by the simplification of the presentation of emissions (through the removal of council-level impacts). Deliberation during the second pilot indicated a high level of focus upon climate change mitigation in comparison with the first pilot but this is likely to have resulted at least in part from the framing of the event and the consequent motivation of the participants, not to mention their distinctive demographic profile. The formal trials introduced a new set of project emissions (though, by coincidence, three of the 12 projects offered a net saving as had been the case in the second pilot). Here the deliberation was centred less on climate change mitigation than on the difficulty of complying with both constraints and was accompanied by debate concerning the reality of climate change and the perceived futility of acting unilaterally to combat it. These differences from the second pilot are possibly attributable mainly to the distinct profiles of participants but the common theme is the salience in the deliberation concerning climate change in comparison with the first pilot. The fact that project-level estimates of emissions as well as other aspects changed at the same time as the type of constraint makes it difficult to draw inferences from the development process but (as discussed in Chapter 7) it seems intuitive that a need to achieve a saving will naturally place more emphasis on the emission aspect than would having a budget to "spend".

Having described the development process of PEB in quite practical terms, I turn in Chapter 9 to the decisions of participants and their reactions to taking part.

Chapter 9 Evaluation of the formal trials

Two formal trials of participatory emissions budgeting (PEB) took place in November 2012. Their recruitment process and the trials' structure and management have been explained in Chapter 8. In this chapter, the trials' evaluation is described and discussed.

The chapter has three sections of reporting and analysis:

- Evaluation method
- Analysis of questionnaire responses and decision-making processes
- Thematic analysis of deliberations and interviews

The chapter ends with a section entitled "discussion of findings" which has three elements:

- A summary of the findings reported in the chapter
- A comparison of these findings with the literature
- A discussion of how the findings enable responses to the research questions, and of several specific aspects of participatory emissions budgeting

9.1 Evaluation method

The conversations that took place during the trials were recorded and transcribed. I then carried out a thematic analysis of the transcripts.

Questionnaires were completed by participants before and after both trials. A single "after" questionnaire was used in the first run (12th November 2012); in the second run (28th November 2012), there was in addition an interim questionnaire completed after the first two choice exercises and before the third.

The "before" questionnaire was designed to elicit participants' unconstrained project preferences in advance of any deliberation. It also tested their opinions concerning relevant environmental matters and their capacity to influence public decision making. The purpose of this was to establish to what extent participants resembled the wider English/UK population on these points. Questions were therefore adopted from various large-scale surveys in order to allow comparison.

The interim questionnaire completed during the second run invited participants to compare ***You Decide!*** **Projects** with ***You Decide!*** **Money**, with the final questionnaire from that run seeking views on the comparative merits of ***You Decide!*** **Money** and ***You Decide!*** **Climate** and on the evening as a whole. The "after" questionnaire completed at the end of the first run

naturally omitted comparative questions as participants had only used one decision-making method, but contained the same general evaluative questions as the final questionnaire used in the second run. Questionnaires were completed anonymously but participants were provided with envelopes in order that a given individual's two/three questionnaires would be kept together. Draft questionnaires were tested out in advance with my peers to eliminate errors of comprehension. The questionnaires used are at Appendix L. A full set of histograms showing the responses given in the questionnaires is at Appendix N. Various histograms are used in this chapter to illustrate points.

Follow-up telephone interviews lasting approximately 30 minutes apiece were conducted with four participants from each of the trials. The interviews were semi-structured (see Appendix M for the topic guide). My approach to sampling was to attempt to speak with both vociferous participants and those who had said little during the sessions; I also tried to capture both those who had displayed some enthusiasm for the task and those who were openly critical of it. Those taking part in follow-up interviews were each offered a £10 Amazon voucher to compensate them for their time. I was not able to achieve my first-choice sample for various reasons (one participant thought the compensation insufficient; others did not respond at the agreed time) so I made substitutions as necessary, retaining the principle of seeking a range on the dimensions of level of contribution and enthusiasm for the exercise.

9.2 Analysis of questionnaire responses and decision-making processes

Participants' initial knowledge, attitudes and preferences

The initial questionnaire completed by participants (before the exercise was explained) invited them to nominate up to three projects that "would be of greatest benefit to the community"[20]. Ignoring ranking, the cumulative results are presented below in Figure 9.1. The most striking aspect is the difference between the preferences of the two groups. This is a potent example of a key weakness of small-group deliberative processes such as citizens' juries: a small sample of any population, however representative the recruitment design, is very unlikely to display the aggregate preferences of that population. This is of course not a problem in the case of this exercise since the trials were not intended to ascertain which projects a hypothetical population might favour. But the difference between the groups shows that, to obtain an accurate picture through small-group deliberation of what the wider population might do in response to this task, a considerably more than two trials would be required.

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[20] When the exercise proper began, I asked participants to "do as you think best" in the context of a description of the fictional Anyhood.

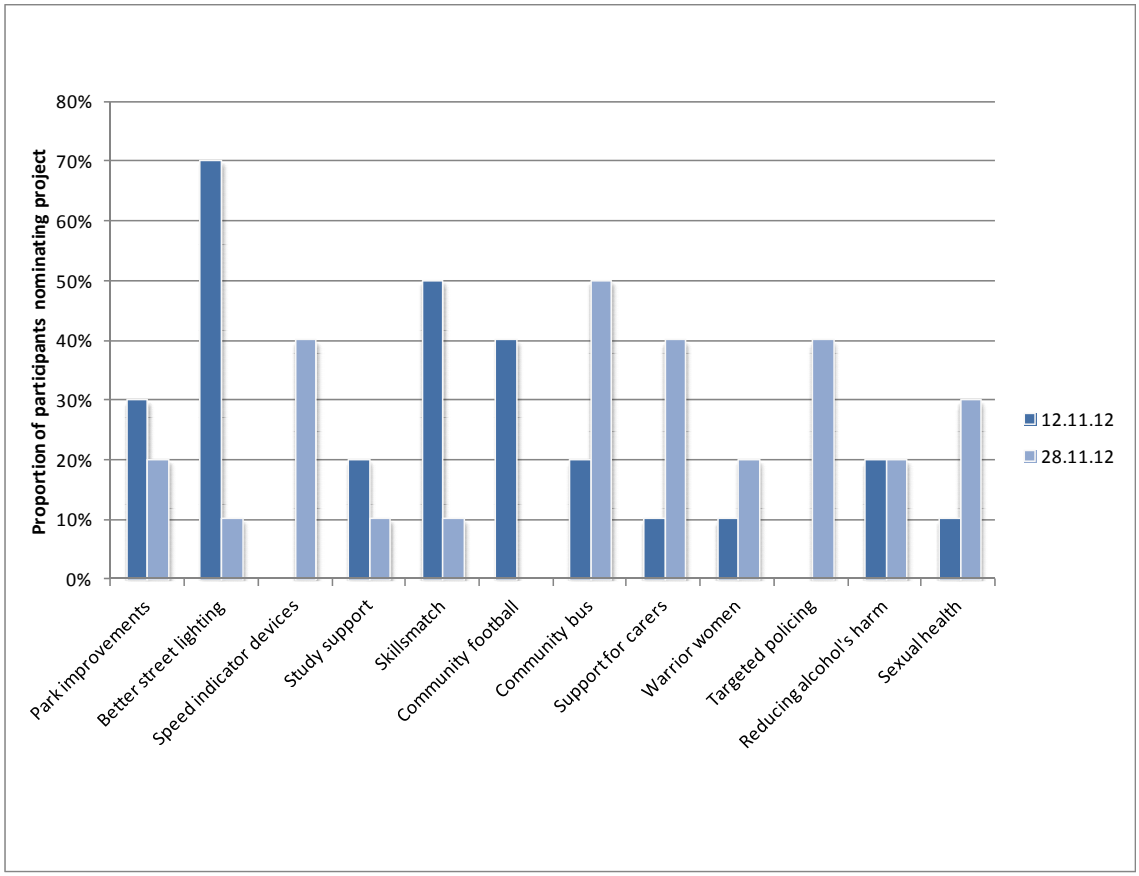

Figure 9.1 – Participants' unconstrained project preferences prior to deliberation[21]

Participants were also asked some attitudinal questions relating to governance and environmental issues. The questions on governance were taken from the Citizenship Survey (Taylor & Low 2010) and, in the following analysis, comparisons are made between the responses of participants and the findings of that survey, conducted with English and Welsh citizens between April 2008 and March 2009.

Views concerning capacity to influence decisions (locally and nationally) and importance placed on this influence are broadly in line with the findings of the Citizenship Survey: participants tended to feel more able to influence local decisions than national decisions, with 70 to 90 per cent stating that it was important to feel that they could influence decisions in their local area. Where participants differed from the wider population was in showing a greater desire to be involved in council decisions affecting their local area (see Figure 9.2).

With respect to how participants would go about influencing decisions in their local area, the 12th November group displayed a greater-than-average faith in council-related initiatives

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21 These choices were made in response to the following question in the "before" questionnaire: "this question refers to the brochure that you received. It's about the project(s) that you think would be of greatest benefit to the community. Please list up to three projects, giving a brief explanation in each case."

(contacting the council, an officer or councillor or attending a council meeting), with the 28th November group displaying opposite tendencies but instead showing an above-average inclination towards signing petitions.

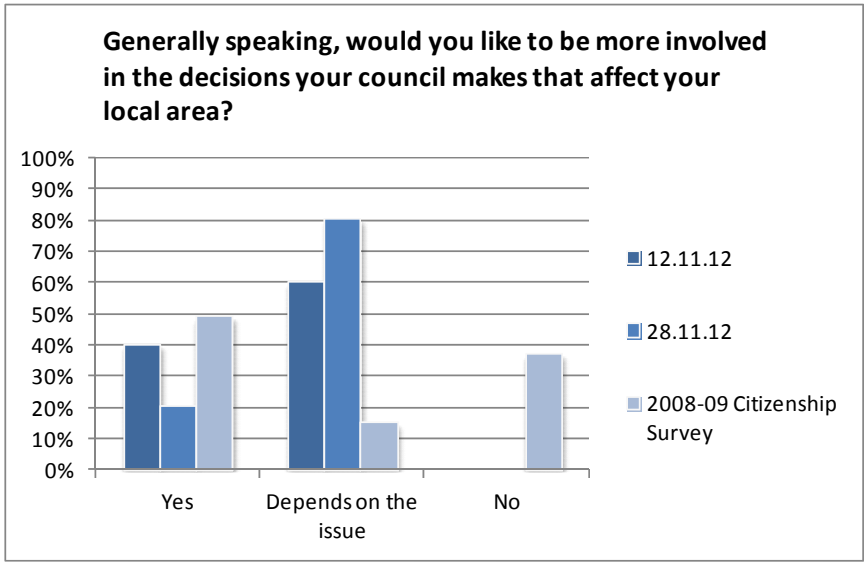

Figure 9.2 – Stated desire to be more involved in council decisions

Questions concerning environmental attitudes were drawn from a Eurobarometer survey (TNS Opinion & Social 2011) and the British Social Attitudes Survey (Centre for Comparative European Survey Data 2012). When asked about which environmental issues they worry, the 12th November group showed above-average concern about "our consumption habits" and air pollution, whilst the 28th November group displayed above-average concern about growing waste and noise pollution; the 28th November showed a comparatively low level of concern about climate change in particular whilst the 12th November group was broadly in line with the average on this front.

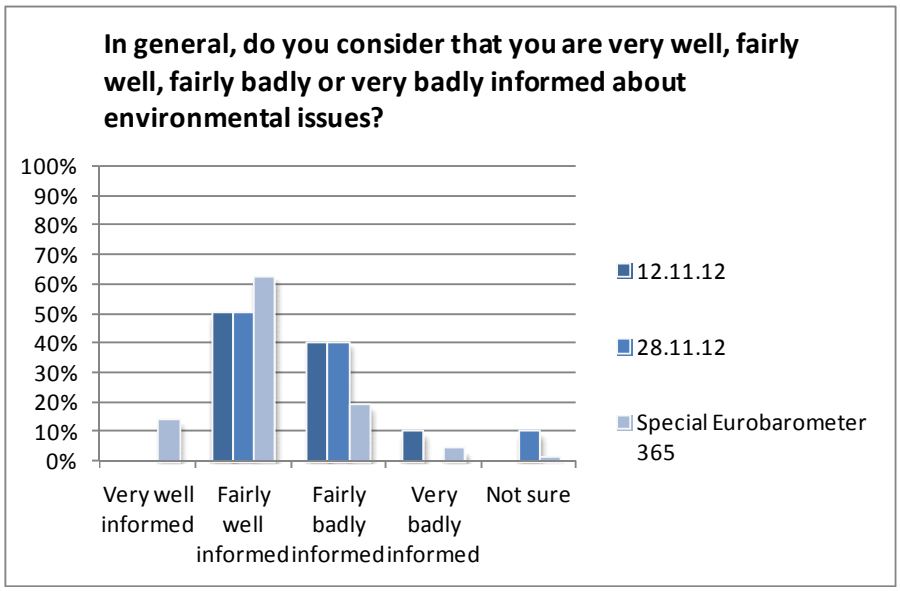

Figure 9.3 – Knowledge of environmental issues (self assessment)

Participants had a slightly lower opinion of their level of environmental knowledge than average (see Figure 9.3) whilst, on the question of how much Britain is doing to protect the world environment in comparison with other countries, the 12th November group was broadly consistent with the findings of the British Social Attitudes Survey but above-average numbers of the 28th November group thought that Britain is doing too much or were unsure.

The differences between those recruited and the wider population are not so great as to raise serious doubts concerning how "typical" their subsequent responses to the exercises were. The above-average stated desire to be involved in public decision making may reflect the characteristics of individuals who respond positively to approaches to participate in market research. As for the below-average self assessment of environmental awareness, this may mean that the groups were less likely to query the emission impacts presented than a group of people who considered themselves more knowledgeable.

Deliberations – points of interest and decision-making processes

12th November 2012

There was extensive debate over the merits and consequences of not exhausting the financial budget, the general mood being that it would be unwise to leave money unspent. One participant, meanwhile, advocated ignoring the emission saving target. Though he was not shouted down, the collective view was to find a set of choices that complied with it.

The sexual health project was by some margin the option most discussed during the deliberations. It was at first widely criticised as unlikely to be effective, as part of a lengthy debate about the problem of teenage pregnancy, but was ultimately adopted in order to support the achievement of the emission saving target.

Project	Units	Financial cost (points)	Greenhouse gas emissions (points)
Better street lighting	4	44	-72
Community football	1	4	+1
Support for carers	1	8	+1
Sexual health	2	22	-44
Skillsmatch	1	8	+1
Community bus	2	14	+2
Final standings		0	-111

Figure 9.4 – 12th November 2012 – final choice set

Projects Added	Projects Removed	Running totals Money	Running totals GHG
		100	0
2 x Park Improvements		28	-44
	1 x Park Improvements	64	-22
2 x Better Street Lighting		42	-58
1 x Community Football		38	-57
1 x Support for Carers 1 x Sexual Health		19	-78
1 x Sexual Health		8	-100
2 x Better Street Lighting	1 x Park Improvements	22	-114
1 x Skillsmatch 1 x Community Bus		7	-112
1 x Community Bus		0	-111

Figure 9.5 – 12th November 2012 – sequence of group's choices

Towards the end, one participant (who had been effectively leading discussion of the quantitative aspects) advocated removal of the (widely-supported) park improvement project in order to release finance for use on other projects (though the choice set was at this point already compliant). This idea was reluctantly adopted, largely out of a desire to leave no budget unspent, and various additional projects then selected. The sequence of choices is shown in Figure 9.5 and the final (compliant) choice set arrived at by the group in Figure 9.4. For clarity, participants started with 100 "money" points which decreased with each project chosen; they could not go beneath zero. Their emissions started at zero points and their task was to reach or pass -100 points.

28th November 2012

Participants dwelt fleetingly on whether to use all the eight units available to them in ***You Decide!*** **Projects** before doing so. There was some debate as to whether the final selection should be used to increase the volume of one of the existing choices or bring a new project into the set. A show of hands decided in favour of the latter and there was then another show of hands to pick the final project from a short-list created by participants. Participants went on to use this form of voting to resolve dilemmas in subsequent exercises.

Participants requested that their selections from ***You Decide!*** **Projects** be imported into ***You Decide!*** **Money** as a starting point (which left them overspent by 15 points). They then swapped one unit of Targeted Policing for one of Supporting Carers, leaving a balance of two points. There was a lengthy debate concerning the need to spend the entire sum and likely consequences of not doing so. The decision to leave things as they were was made by show of hands.

As with ***You Decide!*** **Money**, participants opted in ***You Decide!*** **Climate** to start with their choices from the previous exercise. But this selection fell so far short of the emission saving target that one participant independently developed a compliant set which the group adopted as a work in progress. After wide-ranging discussion, several iterations were made to this set. At one point, the same participant suggested a new combination but this was found not to comply because of a calculation error. And, as with the group from 12th November, there was widespread unease with the selection of the sexual health project but participants saw it as inevitable if targets were to be met.

The three final (compliant) choice sets arrived at by the group are shown below as follows:

- ***You Decide!*** **Projects** (selecting up to eight units without other constraint) – Figure 9.6
- ***You Decide!*** **Money** (selecting projects subject to spending no more than 100 finance points) – Figure 9.7
- ***You Decide!*** **Climate** (project selections subject to a 100-point spending limit and a requirement to achieve a emission saving of at least 100 points) – Figure 9.9

In addition, the sequence of choices made in ***You Decide!*** **Climate** is shown below in Figure 9.8.

The significant difference between the two groups with respect to the exercise involving an emission constraint is seen in the choice process: progress was gradual on 12th November, with most selections involving the addition or removal of one unit. In contrast, on 28th November, significant changes were made at one go. This group reached its final position after five "decisions" (introduction and/or removal of projects), compared with nine decisions made by the earlier group. This is probably explained by the fact that the later group was turning to

***You Decide!* Climate** having already made two sets of decisions. Not only had they already discussed many of the projects at length earlier in the evening but they were also quite possibly tiring of the exercise. It is also possible that rapport had developed to a greater extent as a result of the longer time spent in deliberation, making it possible to reach decisions more quickly. The use of show of hands by the 28th November group, however, is probably not attributable to the different structure of this session; one participant on 12th November suggested it but the idea was not taken up. On 28th November, however, it became an efficient way of resolving dilemmas.

Project	Units
Targeted policing	2
Speed indicator devices	1
Support for carers	1
Park improvements	1
Community bus	2
Community football	1
Total units	8

Figure 9.6 – 28th November 2012: *You Decide!* Projects – final choice set

Project	Units	Cost (points)
Targeted policing	1	25
Speed indicator devices	1	3
Support for carers	2	16
Park improvements	1	36
Community bus	2	14
Community football	1	4
Points remaining		2

Figure 9.7 – 28th November 2012: *You Decide!* Money – final choice set

Projects Added	Projects Removed	Running totals Money	Running totals GHG
		100	0
1 x Targeted Policing 1 x Speed Indicator Device 2 x Support for Carers 1 x Park Improvements 2 x Community Bus 1 x Community Football		2	-8
4 x Better Street Lighting 1 x Sexual Health	1 x Targeted Policing 2 x Support for Carers 2 x Community Bus	2	-104
	1 x Speed Indicator Device	5	-115
1 x Sexual Health	2 x Better Street Lighting	16	-101
1 x Sexual Health 1 x Support for Carers 1 x Community Bus	1x Better Street Lighting	1	-103

Figure 9.8 – 28th November 2012: *You Decide!* Climate – sequence of group's choices

Project	Units	Financial cost (points)	Greenhouse gas emissions (points)
Better street lighting	1	11	-18
Sexual health	3	33	-66
Park improvements	1	36	-22
Support for carers	1	8	+1
Community football	1	4	+1
Community bus	1	7	+1
Final standings		1	-103

Figure 9.9 – 28th November 2012: *You Decide!* Climate – final choice set

Participants' understanding of technicalities

In Chapter 6, a set of four principles was used to govern the definition of an approach to estimating project emissions and financial impacts, the first of which was that the method should produce results that are intelligible to participants. The formal trials provided an opportunity to test whether this principle had been achieved, in the context of a slightly wider assessment of participants' grasp of the climate change imperative. Participants were asked three questions in the final questionnaire designed to test the extent to which they had absorbed certain technical issues relating to project impacts and their estimation:

- The first tested whether participants' had absorbed the key requirement of the Climate Change Act
- The second tested whether the distinct treatment of financial impacts and emissions had been understood
- The third tested how well participants had understood the use of an annual average of emissions taken from a 100-year total

With respect to the first, there was a tendency to confuse the reduction of growth in greenhouse gas emissions with their absolute reduction (see Figure 9.10). With respect to the second, a majority of participants on 28th November answered correctly, in contrast with the 12th November group (see Figure 9.11). As for the third, the 28th November group unanimously answered correctly in contrast with the much more mixed performance of the 12th November group. In the case of both the second and third questions, these themes were discussed in more detail during the 28th November trial, which may explain the greater extent of understanding.

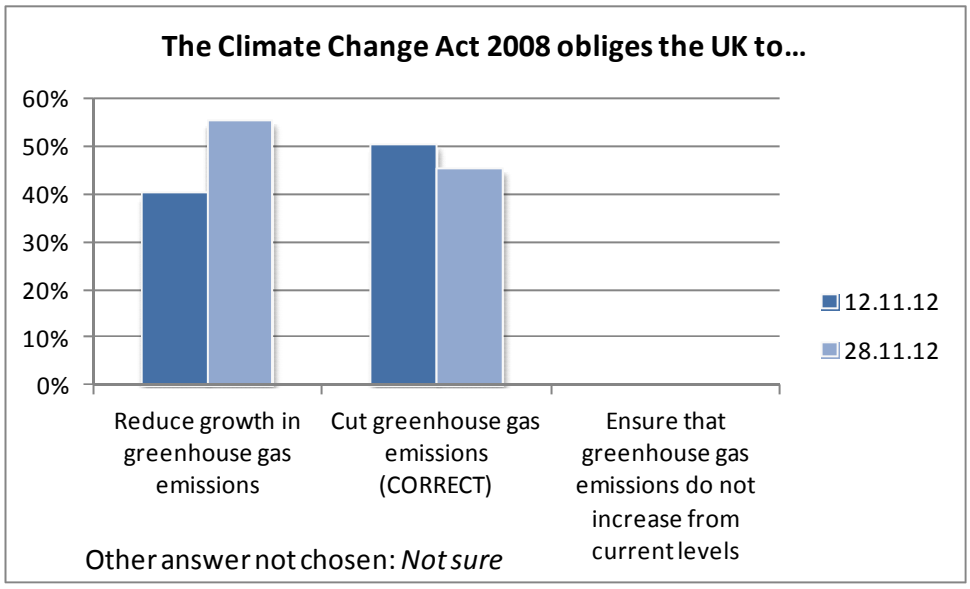

Figure 9.10 – Participants' understanding of the Climate Change Act

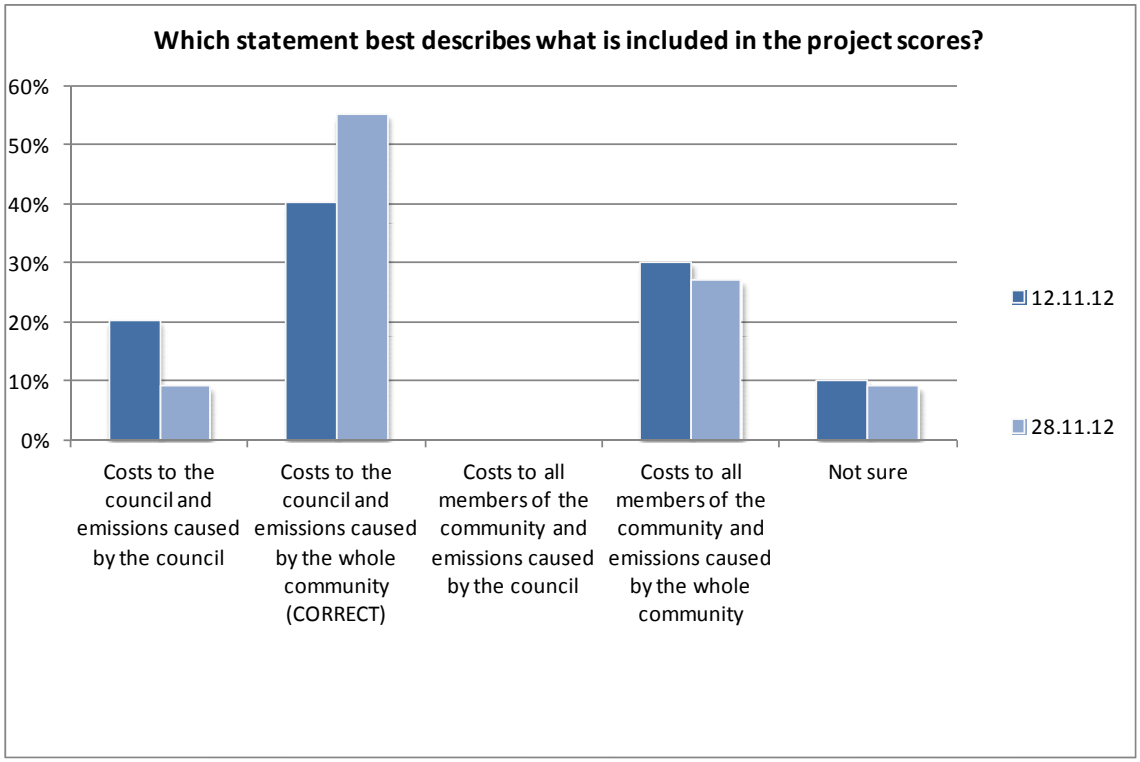

Figure 9.11 – Participants' understanding of the impact calculation method

Participants' assessment of process

The questionnaires asked participants various questions concerning the approach they had taken to the exercise and their reaction to taking part. In terms of their stated approach to the financial budget ("Which of these best describes how you approached spending the money?"), those from 12th November leant towards spending the full amount ("I wanted to use up all the money") whilst a majority of the 28th November group chose the answer "I was interested in choosing the best projects, whether or not all the money was spent." Meanwhile, with respect to the emissions saving target, the commonest answer amongst participants from 12th November was that they did not care about it, whilst the most popular answer amongst 28th November participants was "I wanted to hit the emissions savings target exactly".

Participants stated that they were generally content with the range of projects offered, with only one participant across the two trials describing the range as not varied enough. As for "discussing the projects together", all but one participant across both trials described this as either helpful or very helpful and a large majority favoured this as a decision-making method if taking part in such an exercise in future. It is perhaps not unconnected that participants assessed the group's choices as close to what they would themselves have chosen (see Figure 9.12).

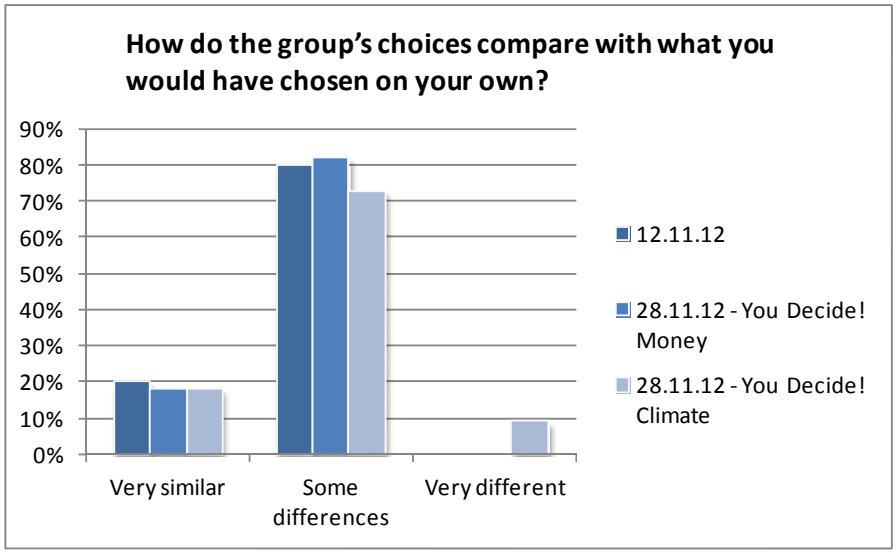

Figure 9.12 – Participants' comparison of group choices with own preferences

The questionnaires given to participants on 28th November invited them to compare the methods they had been using. A majority found ***You Decide!* Projects** (selecting up to eight units) easier to use than ***You Decide!* Money** (financial constraint). ***You Decide!* Projects** was considered to have resulted in a better set of choices for the hypothetical area of Anyhood (see Figure 9.13) but a large majority of participants was "personally happier" with the choices made using ***You Decide!* Money** (see Figure 9.14).

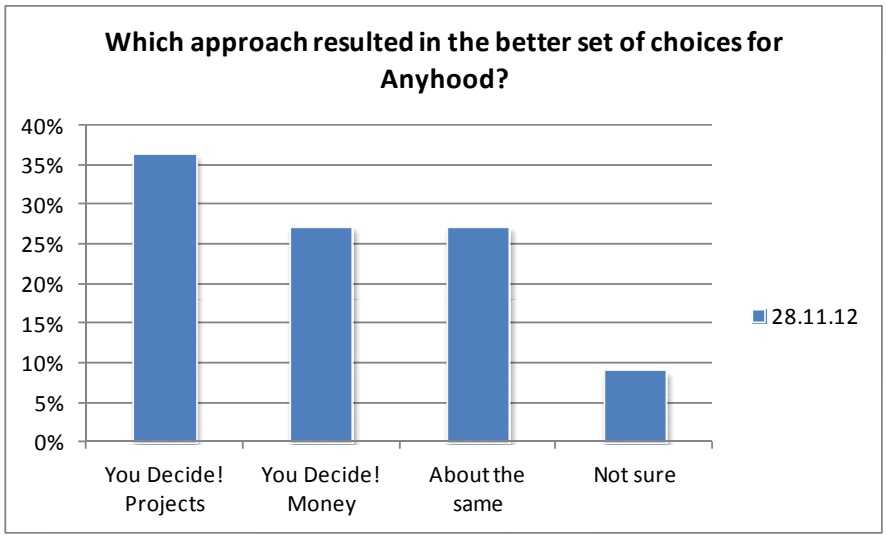

Figure 9.13 – Comparative benefits of unit-based and financially-constrained approaches

When asked to compare ***You Decide!* Money** (financial constraint) with ***You Decide!* Climate** (financial and emission constraints), the same group more clearly favoured the former in terms of ease of decision making, happiness with the results and benefit to Anyhood. Then, when asked to consider all three together, they thought ***You Decide!* Projects** to be the "best" approach overall and considered ***You Decide!* Climate** to be the "worst"; reasons given included that ***You Decide!* Projects** reflected the group's initial wants and focused on the most

beneficial projects for the community whilst, with ***You Decide!*** **Climate** "the compromise is too great".

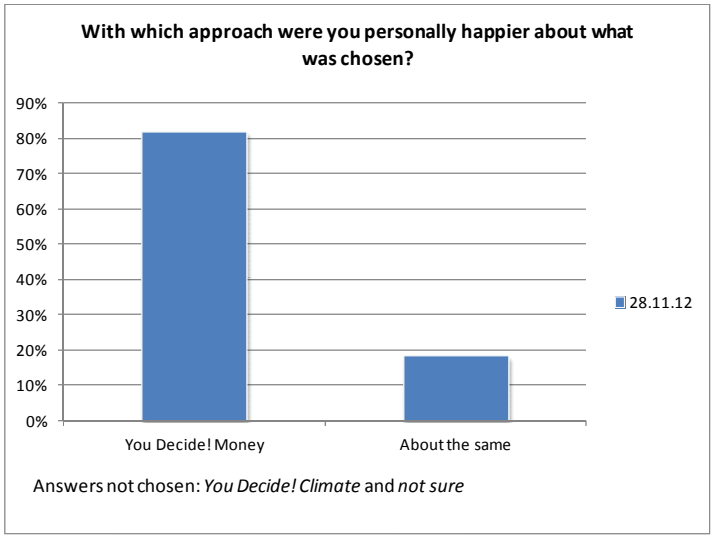

Figure 9.14 – Comparative satisfaction with unit-based and financially-constrained approaches

Though the lack of enthusiasm for ***You Decide!*** **Climate** is clear and understandable given the limitations it placed upon participants' options, the inconsistencies in participants' other answers are perplexing. In particular, it seems odd to be personally happier with the conclusions reached under a financial constraint and at the same time to think that the unit-based exercise had produced a better set of choices for the hypothetical neighbourhood. If this can be explained, the answer may lie in remarks made by participants when they first learned the relative costs of the various projects that indicated the introduction of a sense of value for money[22]. On this basis, they might feel that the eight units chosen without reference to money may constitute the best package for Anyhood whilst at the same time feeling that they had done their duty as citizens in the second exercise by looking for the best return on investment.

Participants on 12th November (who used only the ***You Decide!*** **Climate** approach) were positive in their assessment of it as a way of involving citizens in council decisions and compared it favourably with other council consultations to which they had contributed in terms of both interest and value.

As to how likely they would be to participate in ***You Decide!*** if it were carried out "in anger", answers differed: participants from 12th November (who had used only one approach) were on balance positive whilst participants from 28th November expressed a much higher probability

22 For example, one participant said "we've got expensive tastes obviously".

of participating in ***You Decide!*** **Money** than ***You Decide!*** **Climate** but, even in the latter case, were marginally more enthusiastic than the 12th November group (see Figure 9.15).

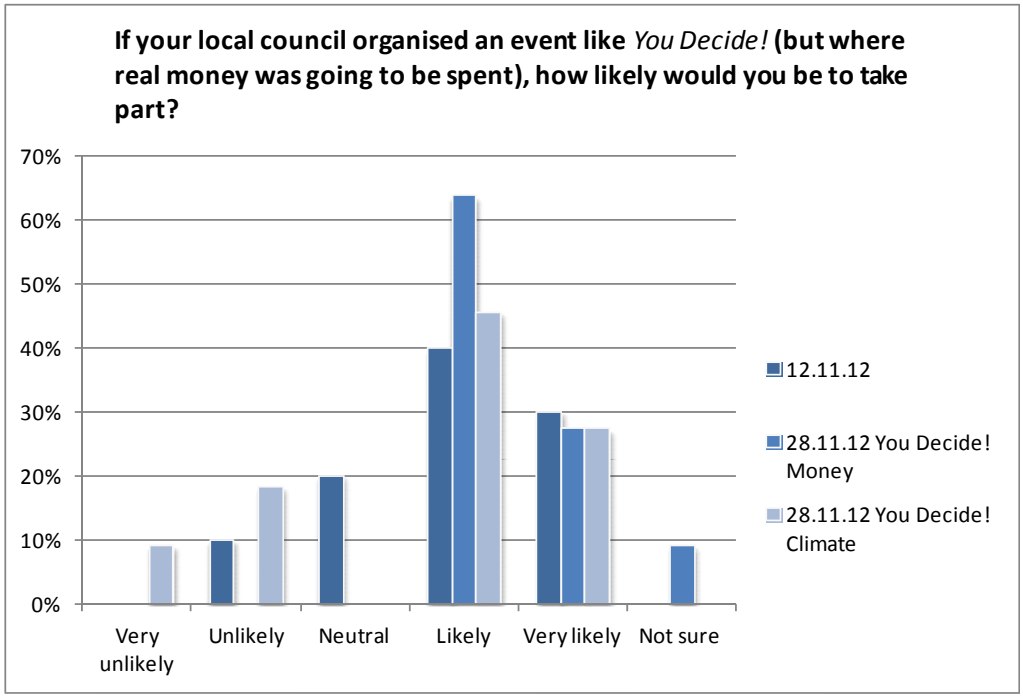

Figure 9.15 – Stated likelihood of participating in comparable "real" exercises

9.3 Thematic analysis of deliberations and interviews

Approach to analysis

Deliberation sections of both events were transcribed and the transcripts examined for themes arising. The resultant long-list was then distilled to a set of eight which was cross-checked against my review of the citizen participation and deliberation literatures. The discussion below reflects the prevalence of views expressed under each heading. A similar process was undertaken with the eight follow-up interviews, with themes arising in the discussion drawn out and note taken of the frequency with which particular sentiments were expressed. Where the interviews cover the same ground as the group deliberations, this is reported alongside. There are certain topics that arose only in the interviews and these are brought up separately.

Analysis

Introduction

Examination of the session transcripts and subsequent distillation led to the identification of the following eight topics, which naturally overlap to some extent:

- Need – whether a need could be identified for a given project and how great that need might be; to what extent the supposed recipients "deserved" assistance; what the baseline of provision in "Anyborough" might be

- Project characteristics – discussion of how a project might work and identification of knowledge gaps as well as aspirations to modify or combine projects
- Project outcomes – what a project could be expected to achieve; whether the forecast outcomes really would come about; windfall effects
- Decision making – the challenges that the task posed and practical responses as the process unfolded
- Climate change – views concerning the nature of the problem and appropriate responses
- Local government – comments made in passing concerning the competence and functioning of councils
- Social context – comparisons between the present day and times past; assessments of the comparative moral rectitude and self-reliance of citizens
- Authenticity – remarks arising from the artificial nature of the exercise

Follow-up interviews with participants covered much of the same ground and relevant findings are reported alongside the analysis of the session transcripts. But additional themes appeared in the interviews which are reported on separately:

- Participant reaction to the experience
- The relationship between local government and climate change
- Deliberation

Need

The dominant theme in the context of need was the number of units required to make a worthwhile difference; beneath this was a question of what the magnitude of the need was in the hypothetical population (participants having been told that approximately 13,000 people lived in Anyhood). Conversation turned often to the issue of how many people would benefit from a project (the park improvement often mentioned as benefitting all) and this was discussed too in the context of degree of need. Some groups, eg older people and carers, were described as especially deserving of assistance, in the sense that the small numbers affected by a given project would be justified by their extreme need. Against this was a recurring theme of seeking balance: comments were made concerning the desire to ensure that all principal age groups received something from the package. A peripheral consideration was extent of personal benefit: projects were preferred if they were perceived as making a significant as opposed to marginal change.

> "If all it is is making it brighter then yeah, it doesn't become a priority, but if there's stuff that needed replacing because there wasn't light there then it would be, but if it's just making it a bit more efficient and things like this." (Session 28.11.12, concerning Better Street Lighting)

Where specific needs were discussed, personal security was the dominant consideration, followed by isolation, especially amongst elderly people and carers; the theme of overpopulation was raised in the context of climate change. The occasional remark touched on the notion that need would vary, for example with the seasons and, in the context of study support, it was suggested that those that would volunteer to participate would be unlikely to be the group most in need of assistance.

As to perception of need, one participant drew attention to their non-driving status in the context of speed indicator devices and another participant mildly criticised comments as coming from a younger person and lacking empathy towards those in caring roles.

Finally, there were practical discussions of baseline – whether the projects under consideration would be additional to standard provision – and quality, with one participant questioning the wisdom of increasing the volume of an activity that may not be the best response to a problem.

> "The way I look at it is there's lots of things that are done now that you sort of think they could be done better, and if it's just going to be more done how it is now, if I don't agree with it then I think what's the point?" (Session 28.11.12)

Project characteristics

Discussion of individual projects threw up some questions of magnitude, especially where the brochure was inexact; it also led to the occasional positive assertion that one unit represented a significant volume of activity. Several questions were raised about the way in which a project would be delivered whilst one participant imputed attributes to a favoured project: following improvements to the park, it would, they asserted, be staffed. One remark about timescale suggests that discussion of approach to estimating emission impacts had caused confusion:

> "Ah some are 100 years and some are just for one year." (Session 12.11.12)

There was general contentment with the range of projects offered though one participant called for 15 projects as opposed to 12 when this was discussed in a follow-up interview. Certain participants were critical of projects as being either a misguided or cut-price response to a complex problem and there were discussions of the implementation of one project making another unnecessary or implying modifications to the delivery of the second.

> "With regards to the policing I was just thinking that the better lighting will reduce crime, you know, and having the community football which a lot of people base crime around the kids." (Session 28.11.12)

The strongest theme to arise overall related to altering the scope of projects, generally in order to enlarge the number and/or range of people served. One participant favoured Warrior Women but argued for converting it into a single two-hour session in order that many more

women could benefit from it; discussion of the community bus for older people dwelt on there being time for two runs in a given day's session and concentrating activity in winter months. Underlying these points was a frequent reference to citizen input to the design of projects, a theme that had arisen in the discussion groups held earlier in the development process.

Project outcomes

Discussion of outcomes can, broadly, be separated into two elements: remarks that were supportive of a given project and others that expressed doubt. With respect to the former, the dominant theme was of windfall benefits – many projects were discussed in terms of meeting their primary objective but then delivering additional benefits to the community. For example, the community football training was thought likely to endow confidence, teamwork skills, and keep children off the streets (thereby reducing the need for the additional policing project). An underlying theme was of prevention being better than cure, that giving children a meaningful activity would reduce, for example, the likelihood that they would become pregnant.

There appeared an implicit hierarchy amongst outcomes, with community benefit clearly thought more important than the achievement of greenhouse gas savings, though projects that delivered on both were recognised for this. Of the community impacts, preservation of life (in the context of speed indicator devices) was argued to be paramount:

> "If you're looking at the accident rate that if that could be reduced then of course it's life and death isn't it." (Session 28.11.12)

Amongst those advocating a given project, personal experience was occasionally cited as evidence in favour:

> "I found that when we did have these wardens you could see things calming down a bit." (Session 28.11.12)

In contrast with these supportive remarks was a considerable amount of doubt, the dominant theme being that a project was thought unlikely to achieve its objectives, principally because people would not respond to the intervention. Comments of this sort frequently drew upon the probabilistic nature of interventions, contrasting the sexual health project, for example, with better street lighting, the impacts of which were seen as certain (despite the fact that a component of the emission impacts of the latter derive from personal security gains). The doubt arose in part from a perception that there may be a wealth of ways to tackle a given social problem such as teenage pregnancy, throwing into question the validity of the method adopted for the candidate project, with one participant saying in a follow-up interview that it would be helpful to know what other approaches are available. Associated with such

expressions of doubt was a sceptical position concerning the forecasting that drove predicted outcomes and a desire for more evidence concerning likely impacts:

> "Thing is you're trying to make loads of decisions on lots of maybes aren't you really?" (Session 28.11.12)

Where projects were favoured, this was sometimes in light of a perception of their longevity, with participants convinced by the thought that the benefits of park improvements would be felt for years to come, in contrast with a speed indicator device, the impacts of which were thought fleeting at best. And, despite the commonly-voiced scepticism about certain projects, there were occasional hints of giving them the benefit of the doubt, perhaps reflecting the fact that the need to achieve the emission savings target forced certain projects on the participants against their will.

> "Even if what they do doesn't work, it's something else they've tried and it might work. It might." (Session 12.11.12, re Sexual Health)

Decision making

The themes under this heading fall broadly into three categories:

- Philosophical/conceptual responses
- Trading off
- Response of participants to the challenge

The strongest philosophical theme was one of resentment at the perception that serving "government" was being allowed to overrule meeting community need, where the emission saving was seen as coming from "government" and as being in opposition to the interests of the local community. One participant expressed a general feeling that targets were being allowed to drive policy. These complaints acquired a practical character as participants confronted having to sacrifice their first-choice projects in order to stay within the financial budget and, to a greater extent, to achieve the emission saving target. Several remarks were made during follow-up interviews to the effect that the saving target should have been less exacting but there was, in contrast, some enthusiasm for the introduction of the financial constraint, on the basis that this brought realism.

Two distinct approaches to creating a project portfolio could be discerned: certain participants were keen to maximise the number of distinct projects, and conversation indicated a presumption that this first year would be used to pilot projects such that successful projects would be retained in the second year and unsuccessful projects discarded. This assumption that the second year would be available was also revealed as participants attempted to reconcile themselves to losing one or other project – it would be possible to have it next year, they thought. In contrast with this rationale was a "critical mass" approach, where

participants sought to ensure a sufficient number of units for each project chosen, reflecting discussion in several cases that one unit would not be enough. This tension remained unresolved in the second run, with participants opting to vote on whether to add a further unit to one of the projects already chosen or to select a new project.

Certain working assumptions were made explicit through participant remarks. One related to timescale:

> "I agree with thinking about the long term but you know, the people that you're, if you're doing this real, the people you care most about are yourself and your children, so you're thinking more the short term, as well you've got to think about what's going to have a positive impact during your [life]." (Session 28.11.12)

Another related to balance:

> "But if we cut park improvements we're going to have to add another one on to either street lighting or sexual health, which I think is just going to be over the top. It's nice to have sort of a balanced table where you've only got twos and ones rather than…" (Session 28.11.12)

It is interesting to note that this desire for balance is distinct from the wish to ensure that all age groups receive something, as discussed under the heading of need.

A range of responses was apparent as participants grappled with arriving at a compliant set of projects. One participant was content to fall marginally short of the emission savings target despite claiming in a follow-up interview to realise that this might mean losing everything. The same participant advocated keeping money back as a contingency. But these were distinctly minority views: all participants in the first section of the second run (where up to eight units could be allocated) were in favour of using all eight; and there was general discomfort at the idea of money being left unspent (confirmed by questionnaire responses concerning approach to financial budget) with both groups fearing that this would be reflected in a reduced budget in future years. In contrast with this was the view that the group should not adopt second-choice projects only so as to exhaust the budget. An underlying theme was disagreement concerning the magnitude of any unspent sum: in the second run, two points (£3,000) were left and certain participants argued that this was a significant sum in light of cuts and inflation whilst one looked on it as a small (and therefore negligible) proportion of the whole.

Debate concerning responding to the constraints revealed a general desire to avoid losing a project altogether – there was a presumption in favour of reducing the number of units (from two to one, say). And the difficulty of reaching a compliant set prompted a measure of defiance:

> "You shouldn't have to find the money, it's what people want." (Session 12.11.12)

When responding to the challenge of achieving compliant project sets, participants made several remarks about the difficulty of the exercise, with the word "juggling" often used.

Associated with this stated difficulty were occasions where one or more participants became confused by the calculations:

> "Yeah, there's too much maths involved in this." (Session 28.11.12)

On two occasions during the second run, participants who had adopted the role of "accountant" were forced to withdraw propositions as they realised they had made errors.

Alongside the quantitative aspect, there was some evidence of horse trading:

> "[I'll accept the speed indicator device] for now, so long as I get my park improvement project." (Session 28.11.12)

And one participant expressed a desire to be convinced concerning a project, subsequently asserting that they had been.

Despite differing on various points, both groups displayed team spirit, as demonstrated by this reaction when one participant apologised for errors of calculation:

> "No, you've done a brilliant job." (Session 28.11.12)

There was also some evidence of preference adjustment: one participant, who had favoured the speed indicator device, became critical of it in light of evidence that it increased emissions. In the second run, as participants sought a project set that complied with both financial and emissions constraints, it was suggested that the set from one of the previous exercises should be imported. When asked whether this should be the unconstrained exercise or ***You Decide!*** **Money** (financial constraint), participants chose the latter, one saying:

> "Kind of evolved to that, haven't we?" (Session 28.11.12)

It is interesting that the participant did not refer to the fact that this set would already comply with the financial constraint (which would be a rational argument for starting with it because it would reduce the workload). And the process of arriving at a set that complied with the financial constraint had been accompanied by a number of critical remarks about having to forgo favoured projects.

Finally, whilst the prevailing mood concerning making compliant choices was critical, there was some evidence of contentment:

> "I think it looks like a better cross section of everything than I thought we were going to achieve when I first looked at it, because I felt as if we'd gone away from everything that we talked about but you can kind of see that it covers a lot of areas in the community with the way it is now." (Session 28.11.12)

Climate change

Greenhouse gases were mentioned on many occasions as participants debated their choices. One participant (who self-identified as "eco-friendly" in a follow-up interview) appeared to be confusing GHG emissions with the more general issue of air quality, when contrasting the

experiences of breathing fresh country air with that of London. Another participant, in discussing climate change during a follow-up interview, was clearly thinking more of fossil fuels being finite than the effects of burning them. No reference was made to the phenomenon of climate change itself during either session and there was very little knowledge of the Climate Change Act in particular amongst those participating in follow-up interviews. One participant sought clarification during the session concerning which gases counted as greenhouse gases and asked further what the principal sources were. And a few remarks were made about population control as a means of tackling climate change.

As a policy issue, one participant explained that it was not a top priority:

> "You think it's imperative that you improve gas emissions, but it's not the thing that goes through your mind every day when you eat your breakfast in the morning, you just don't think about it." (Session 12.11.12)

General discussion of the topic identified the collective action problem with frequent mention of China, the US and India:

> "But that doesn't work like that does it, it's like we're not getting our own little bit of nice air and China's shunting out gallons of stuff" (Session 28.11.12)

This was often accompanied by comments concerning the UK's relatively small contribution and low significance relative to its previous international standing. And it was asserted that the UK was doing more than it should given the failure of other nations to respond to the challenge. With respect to the decision-making task, one participant argued against attempting to make savings in Anyhood given its size relative to the major emitters:

> "So looking at all this really you'd be better off to tackle it at sort of source really wouldn't you, I mean find better ways of heating and making electricity and all the rest of it. I know they are doing that but I mean all this you're just juggling little bits…" (Session 28.11.12)

Arguing against this position were participants putting the case for universal action:

> "Well if every council does it in the country, something similar, it will make a significant difference won't it?" (Session 28.11.12)
>
> "Well if we didn't do anything about it can you imagine the environment we'd be living in if we didn't control it or try to control it?" (Session 28.11.12)

Local government

Many remarks were made in passing concerning the functioning of local government, most of them negative. One participant was critical of a targets culture, arguing that staff doggedly pursued targets because they risked losing their jobs if targets were not met; this predicament was characterised as immoral. In their defence, it was suggested that they were not acting in accordance with their wishes:

> "Not what their heart or their common sense … it's like all of us, we picked that to get the emissions, we didn't pick it because it's particularly what we really, really want." (Session 12.11.12)

Other critical remarks related to:

- Not carrying budgets forward
- Politicians' operating on a four-year timescale (re-election)
- Corruption and financial imprudence (eg through exceeding budgets)

A few comments displayed some sympathy for the council's plight, with references made to cuts in the context of paddling pools not being filled and to the fact that decisions have to be made on the basis of probabilities (in common with many of the choices made by the participants themselves).

Social context

Many comments were made about the social context of the decisions being made, mainly in connection with personal security, youth and sexual behaviour. Personal security was revealed as a preoccupation for many participants in the context of a perceived lack of police presence. Young people were spoken of mainly critically, as being contemptuous both of authority in general and of the education offered to them in particular. But this was tempered by more supportive remarks about needing to provide youngsters with "something to do" (Session 12.11.12) and to foster non-academic ability, and by sympathetic views concerning the plight of new graduates in the current economic climate.

Sexual behaviour was extensively discussed, especially during the first session, in the context of the sexual health project. There was a theme of needing to remove perceived incentives for single mothers (such as the provision of housing) and to tackle our sexualised culture as displayed by certain television programmes. But sexual behaviour was also discussed in the context of moral fibre, participants arguing that the wider population needed to practise self control. And the behaviour of young people in general was framed in a slightly nostalgic representation of times past, when youngsters "still got a clip round the ear hole from the local copper" (Session 28.11.12).

Other remarks made in passing referred to a tendency towards personal risk taking in defiance of evidence, in the context of alcohol and smoking.

Authenticity

The artificial nature of the exercise arose many times in discussion. Several remarks were made about the "fictitious" Anyhood or "Whatever Hood" and participants referred to the limited information about the place and the need to make assumptions in order to reach

decisions. The lack of information concerning the current status of particular items such as the park arose several times and many participants responded to this by speaking from personal experience and arguing for projects because they would help in their own neighbourhoods. There was one policy question about how the hypothetical council would handle unspent budget and two requests for demographic information. Participants otherwise tended to feel able to carry out their task on the basis that Anyhood was an "average" urban area in southern England.

Participant assessment of experience

All those interviewed were asked whether they had any reflections on taking part. Almost all described the process as interesting with one asserting that it had been more interesting than they had expected and another saying that it had really made them think:

"I thought it would be more like everyone sit in a circle and there'd be we'd place our views of what we thought about the actual topic of the day. But it was kind of different it was more exciting as well because it was like feeling it was more like a task and it was getting everyone involved." (12.11.12 participant)

Another term that arose several times is "stimulating" with one interviewee saying they would feel a moral obligation to participate if such an event were run for real in their area. Two saw policy value in the *You Decide!* process in terms of building acceptance:

> "A lot of people are not going to particularly like a lot of the things that have to be done but it's got to be done because otherwise how can we make the savings? It just made people own it more." (12.11.12 participant)

In terms of personal impacts, there were numerous remarks about how the exercise had provided an insight into the challenges faced by decision makers. And two interviewee said that they had been thinking about their own emissions more since the event.

Interviewees were asked whether the introduction of new information (about cost and GHG emissions) had affected their opinions of projects' merits. Some said they had been influenced by financial information and had begun to think of certain projects as good value for money or too expensive but none changed their opinion of a project's actual worth on learning of its likely climate change effect.

There were numerous comments concerning the difficulty encountered by interviewees in attempting to arrive at a compliant choice set, in the context of critical remarks about the targets imposed. One, though, indicated that they had gradually become more accepting of the emission target as the exercise went on.

The relationship between local government and climate change

In follow-up interviews, participants were first asked if they had views concerning who is responsible for tackling climate change and, if they had not mentioned local government in their initial answer, they were prompted concerning its role in particular.

Most responses had a universal aspect, contrasting the role of government as enabler/enforcer with that of individual as end consumer. Where interviewees identified a specific role for local government, provision of information and encouragement were mentioned, with one referring to a council's local focus as a means of connecting people to climate change.

> "For an individual to get affected by that then you have to get it close to home and you do that by trickling down to having it as a council thing because people are more aware of what's going on their own little area and I think people do live in the bubble of their everyday lives; I know I do." (28.11.12 participant)

One participant was openly sceptical about the role of councils, citing their lack of access to professionals, in contrast with central government. Another spontaneously mentioned using ***You Decide!*** as a means of getting citizens involved in climate change policy.

Deliberation

Interviewees were asked their opinion concerning having to reach compromises when making decisions as a group. Views on this were overwhelmingly positive, with references made to the benefits of hearing others' views and to being persuaded by the debate. This stance is echoed by the answers given in written questionnaires, showing a high opinion of group discussion and a strong preference for it as a decision-making method, over open or secret voting.

There was some criticism of the opinions voiced during group discussions, one interviewee accepting that people had to be allowed to say their piece though they were talking "quite a lot of rubbish" (12.11.12 participant). Another interviewee was keen that everyone should have their say but was unhappy at the idea that policy decisions would be made by inexpert people on the basis of subjective opinion:

> "You always want people making the decisions based on who actually has the most well-rounded knowledge so you can think more objectively about what's going to have the most benefit." (28.11.12 participant)

9.4 Discussion of findings

Summary of findings

Significant points arising from analysis of the decisions made, the questionnaire responses and thematic analysis of the deliberations and follow-up interviews are as follows.

Participants were in general engaged and stimulated by the task set them though they found it challenging, partly because the constraints (particularly the emission saving constraint) were limiting and partly because the quantitative nature of the exercise was difficult for less numerate group members. There was general resistance to the imposition of an environmental constraint, with discussion showing both doubts about its usefulness given the nature of the climate change challenge and a view that other priorities (such as community need) should transcend it. Within each group and across groups, participants had quite different initial preferences and presented wide-ranging arguments in favour of and against the project options. Despite this, the groups arrived on each occasion at choice sets that complied with relevant constraints within the time allocated. Participants consistently expressed enthusiasm for the deliberative element of the exercise and the 12th November group in fact reached its decisions through discussion alone, whereas the 28th November group used a show of hands on several occasions to resolve dilemmas.

Comparison of findings with the literature

The following is a brief discussion of how the findings from these trials compare with assertions in the literature concerning citizen participation, deliberation and participatory budgeting in particular.

The first theme is participant response. There are claims in the literature that participation in government decision making can both avert conflict (Beierle 2002; Rowe et al. 2008) and promote "buy in" on the part of citizens (International Association for Public Participation 2009). These trials suggest that the first of these cannot be assumed given the strong anti-target sentiments expressed by participants as they struggled to arrive at compliant combinations of projects. Discussion during the events gave the impression that, had they been present, government representatives would have been challenged by participants concerning the constraints imposed by the emission target at least and, possibly, the financial spending limit as well. As for buy in, the evidence is that citizens may as a result of participating in this type of exercise display a deeper appreciation of the plight of the decision maker (Yankelovich 1991) but it does not follow that they would champion the choices reached. This could of course be tested by inviting the participants to present their conclusions to a wider group but there is a suspicion that they would distance themselves from the results on grounds of not sympathising with the policies underlying the constraints.

A separate assertion in the literature is that participants are more satisfied with the decision-making process when deliberation has taken place (Carpini et al. 2004). In Chapter 3, a definition of deliberation was taken from Chambers: "debate and discussion aimed at producing reasonable, well-informed opinions in which participants are willing to revise

preferences in light of discussion, new information, and claims made by fellow participants" (Chambers 2003, p.309). The discussions that took place during the formal trials could be argued to comply for the most part with that definition except in terms of the objective, since decisions rather than opinions were sought. Turning to the issue of satisfaction, the trials suggest a mixed picture: participants were happy about discussing their choices, which supports the assertion of Carpini et al; but they were not happy with the decisions themselves, which suggests that a distinction needs to be drawn between the fact of deliberating (which may in general be well received) and the context (where participant response will surely depend largely on feelings about the options available and freedom of movement).

In discussion of participatory budgeting, writers tend to differentiate this form of citizen participation from more orthodox forms, claiming, in particular, that participants can feel inspired by the process (Blakey 2008). The evidence from the trials appears to support this, in that people engaged enthusiastically in the exercise and compared it favourably with other consultations to which they had contributed. Again, though, there is a tension between happiness at being given a modicum of power and frustration at feeling that unfair constraints have been imposed. PB may be popular principally because it differs from most other forms of citizen participation in devolving some true decision-making power to citizens but this does not mean that participants will automatically be content with what they are given, particularly once the novelty has worn off. It is possible to envisage a similar problem with "classical" PB (ie a version using only a financial constraint), were citizens forced to choose amongst projects which they considered inferior or irrelevant.

The second theme is the effect upon citizens of participating and/or deliberating. There is the somewhat paternalistic claim that people become "better citizens" (Elster 1989) but this is a vague term. If it is used to mean that citizens become more aware of and sympathetic concerning the business of government, the trials provide some support. As to whether citizens conduct themselves in a more laudable fashion following participation, this is less clear: the trials indicated that some participants were thinking more about their behaviour in respect of climate change following the events though this does not mean their behaviour has changed or will change and it implies a rather narrow interpretation of good behaviour. The trials provided some evidence that participants would become more involved in their local areas following the event which suggests that participation can beget participation.

A connected claim is that deliberation leads to harmonisation within the group (Dietz 1994; Habermas 1995) and the trials support this, if only in that quite disparate preferences did, over the course of deliberation, crystallise into sets of choices which appeared generally palatable.

It must be noted, though, that different phenomena might have been observed if decisions were being made about real money.

A third theme relates to the nature of decisions taken. On the one hand, there is the Habermasian concept of people being persuaded by a good argument to modify their position (Habermas 1995). The opposing view is that unhealthy preference adaptation takes place as participants either capitulate in the face of authority or bend to the will of more forceful peers (Cohen 1989; Kymlicka 2002). The trials certainly provide evidence of some participants altering their views concerning which projects to choose and of participants generally becoming reconciled to the reality of working with the constraints. It is not certain whether these changes are of the healthy or unhealthy kind but the generally cordial discussions amongst participants suggest that they did not feel overwhelmed by their more vociferous colleagues and none of those taking part in follow-up interviewees expressed such a view. Whether coming to accept unwelcome constraints is an example of preference adaptation is less clear: the comments made during the deliberation and in follow-up interviews suggest that most participants did not change their views of projects significantly but one or two remarks indicate that participants were at least pleasantly surprised when, on considering their chosen set of projects (that complied with both constraints), it was better than they had feared.

There is debate in the literature concerning the quality of decisions made by citizens, with writers citing empirical evidence of irrationality (Shafir & LeBoeuf 2002) and more general concern about the qualifications of the average citizen to make sound choices (Bartels 2003). The trials provide limited evidence to support or dispute the claims. If a compliant combination constitutes a "good" decision (in that it fits with the decision rules), then the trials suggest that citizens are sufficiently qualified. Whether the combination of projects chosen, beyond its meeting the constraints, is a good one, is more difficult to say and. Indeed, some writers on deliberative democracy (and participatory budgeting in particular) start from a philosophical premise that a good decision is defined as being *what the citizens choose*. That said, the forecasting carried out to provide impact estimates for the projects did reveal a certain amount concerning the likely effectiveness of the various projects. Neither group, for example, selected the *reducing alcohol's harm* project; this could be characterised as rational given the evidence that such interventions are ineffective. More interesting is the case of the sexual health project: it was presented, on the basis of evidence, as being likely to affect the sexual behaviour of its target group. But participants were for the most part sceptical about the project. One interpretation is that they behaved irrationally in choosing to ignore the "authoritative" empirical evidence presented to them. But the evidence on the impact of this type of project is in fact mixed so their scepticism was not unfounded.

Moving now from the detail of the trials to the nature of PEB as a form of citizen participation, PB was in Chapter 3 presented as a method that had the potential to lie towards the top of Arnstein's ladder (1969), in that, by passing spending decisions to citizens, it constitutes a true transfer of power. The difficulty with this is that even the most radical formulations of PB (in Brazil) continue to involve a great deal of supervision and administration on the part of government. Because PB, for now, always operates within a conventional governance structure, there must be at the very least a mechanism for connecting it to that structure. Arnstein's model can be applied with a focus upon the decision-making process itself, in which case PB does perform strongly, or on a broader scale including the governance context, in which case it can look weak because, for good or bad reasons, the PB method is forced to fit into a surrounding structure that has not been designed by citizens. PB in the UK arguably deserves a lower ladder "score" than Brazilian examples because of the tendency to constrain it to community chest exercises, where either the sum of money at stake is a negligible proportion of budget, or the choices available to citizens are highly constrained, or both. But PB in fact defies the one-dimensional scoring system of Arnstein since power is undeniably transferred but under constraints that may erode the value of the transfer. All PB arguably belongs on Arnstein's Rung 7 – delegated power – but this rung can include both substantive and token power. (I think it better to adopt this distinction than to pursue the idea that token power is not actually power, since there will be no natural boundary between the two categories.) What then of PEB? Compared with radical forms of PB, it performs poorly and it in fact seems weaker than most UK examples, given the additional environmental constraint and the lack of citizen involvement in option design. If done "for real", PEB would nonetheless probably deserve to be called "citizen power" within Arnstein's model but with the provisos discussed above.

And how does PEB compare with other forms of participatory decision making as reviewed in Chapter 3? Here a crucial factor is the influence of citizen opinion on outcome: numerous models of citizen participation more open and creative than PEB were identified but, without exception, these gathered citizen views *for consideration* by decision makers in reaching their conclusions. In fact, it was argued above that, with respect to PB, there is an inverse relationship between sum available and freedom of movement in decision making. So PEB offers participants the scope to make binding decisions about public spending but at the cost of having to work with a limited palette and to comply with unwelcome constraints. Alternative forms of environmental citizen participation impose fewer constraints but at the cost of removing any guarantee that the participants' views will determine the final outcome. It would be interesting to know which of the two a typical citizen might prefer, given the choice.

In summary, the trials appear to confirm the assertion made in Chapter 3 that the literature on citizen participation is lacking in terms of evidence base and seems divided instead on ideological grounds. The implementation of PEB combined a form of citizen participation which has been found to be popular and stimulating – PB – with a set of decision rules that participants found unpalatable. So the behaviour and reflections of participants understandably mirror this conflict: instead of a clear-cut finding in favour of or against the advocates of deliberative democracy, the trials provide a mixed result suggesting that good things can come of running PEB but that there is a concomitant risk of rebellion. And this is a fundamental point for the literature: what government chooses to ask of citizens (in the context of deliberation) may often be very much at odds with citizens' initial beliefs and preferences. No amount of care in structuring citizen participation will compensate for that tension. There is too little acknowledgement of this in the literature (Bächtiger et al (2005) being notable exceptions): writers often either gloss over the institutional/policy background within which citizen participation will take place or make a rather naïve assumption that the governmental context will be benign. But climate change is an excellent example of a policy area where the position of the typical citizen is distinctly at variance with what climate science suggests it should be. If government continues to align itself with the findings of climate science, there is likely to be considerable conflict, conflict which the application of best practice in design of citizen participation will not be sufficient to avert.

Discussion

The fact that each of the formal trials resulted in a compliant choice set that participants would (perhaps reluctantly) accept provides further evidence to support a positive answer to Research Question 1 (is it technically feasible to create a variant of participatory budgeting that meaningfully includes climate change impacts?) PEB as designed can be argued meaningfully to include climate change impacts: an effort has been made to calculate the true GHG emissions attributable to the candidate projects and the resulting numbers play a very active role in the decision-making process. If anything, the extent to which the emission constraint limited participants' options suggests that climate change impacts played *too* meaningful a role but this only serves to strengthen the conclusion that the task is indeed technically feasible. This feasibility is actually a function of several factors – the structuring and facilitation of the decision-making method, the projects offered, information provided and the nature of its presentation, etc – so I shall return in Chapter 11 (the final chapter) to these elements as part of a discussion of potential avenues for future research.

This chapter also provides considerable material to respond to Research Question 2 (how do participants arrive at their decisions?). The role of shows of hands apart, the evidence is that,

in small groups, discussion and persuasion are the tools used. But this conclusion must be viewed in the context of facilitation that clearly guided participants down this path and needs also to reflect the fact that, in a larger group, decision making would have to take another form. Participants' conduct during the trials (and the pilots before them) suggested a degree of mutual respect and willingness to listen. Again, it is not certain that this would be repeated were real money at stake.

Research Question 3 (what are the opinions of participants concerning PEB and the experience of taking part in it?) and Research Question 4 (what effect, if any, does PEB have upon participants' attitudes towards local government in the context of climate change?) have been extensively addressed in this chapter and the findings will not be repeated here but, again, the small sample of trials means that it would be inappropriate to generalise what has been learnt from participants here. This issue as well as those relating to Research Question 2 will feature again in Chapter 11.

Turning to more specific topics, the response of participants to the emission constraint demands further thought. It is perhaps helpful to differentiate three elements – the presence of such a constraint, its form (ie that it was a saving target), and its level. Some level of opposition to the very notion of an environmental constraint arose in early discussions (see Chapter 8) so it is not surprising that this has been repeated in the formal trials. Nor is it surprising that there was more complaint about the emission saving target when it was introduced following an exercise governed by only a financial constraint than when the two constraints were introduced together: participants were more poignantly aware of the limiting effect of the new constraint. And the possibility that presenting the constraint as a saving target rather than a spending budget would elicit a stronger reaction was discussed in Chapter 7. In the event, the saving target approach was adopted from the second pilot on so this hypothesis has not been proven. The aspect that has not been investigated is the level of the constraint: the numbers of combinations complying with relevant constraints in the three scenarios used with the 28th November group have been compared (§8.2.7), revealing that the introduction of the emission constraint reduced the number of compliant combinations to a small fraction of its level under the financial constraint alone. But the fact that neither the type nor the level of the constraint was varied between the two trials makes it impossible to judge their respective effects upon the participants. Even if there had been variation, the small sample size would permit only very tentative conclusions to be drawn.

A second issue is participant understanding, a theme discussed in Chapters 6 and 7. The evidence from the formal trials is that participants' grasp of the technicalities varied and that, the more an issue was discussed as part of proceedings, the more accurately participants

answered related questions. This positive correlation between time spent on technical matters and their absorption by participants was predictable; the task is to identify the optimal balance, given that time may be at a premium on the one hand and, on the other, that participants may quickly tire of technical instruction with possibly unwelcome consequences. The goals of the sponsoring authority would help to determine what level of participant understanding is desired and this would inform the design decision.

The trials raise a separate set of questions concerning research method. As identified, participants were recruited as for market research and paid to attend an event in which they made hypothetical decisions concerning a fictional neighbourhood. Their willingness to take part may mean that they differ from the wider population in terms of readiness to deliberate and/or a general interest in matters of public policy. Probably more significant is that they had no personal stake in the choices made, in that their own neighbourhoods would not be changing as a result of the decisions. Thus, as in many such experiments, the participants brought their own knowledge and experiences to the exercise but these were not matched with the context of the task. The simulated nature of the process can be usefully explored in terms of two components – an artificial locality and hypothetical decisions. It is possible to imagine a situation in which citizens who have just moved to an area might take part in the making of decisions about an unfamiliar neighbourhood, in the company of others who would almost certainly be strangers. Were the decisions hypothetical, I suggest the exercise might run similarly to the formal trials (or at least the first trial) despite the fact that even an unfamiliar neighbourhood would not be as unknown to the participants as Anyhood. In the case that the decisions were "real", I predict this same group would be quite tentative – aware of what their past experience indicated but nervous of assuming that it would apply in the case of their new home. In the case of the trials, Anyhood was a blank canvas onto which participants projected their private experiences; whilst some of them made reference to the unknown characteristics of the locality about which they were meant to be making decisions, none demurred from making such decisions on the grounds that they might not be appropriate for the context.

This leads on to the question of how participants drawn from a real neighbourhood would have responded to spending real money on it. They could certainly be expected to assert more passionately their beliefs about what the area needed and this suggests that they would be more stalwart in their support of the projects they favoured. It may therefore prove more difficult to negotiate the trade-offs essential to achieving the two targets. Also, the prospect of seeing investment in their locality could prompt a greater degree of resistance to the imposition of a climate change constraint. For, in the trials, this was resented both because participants did not sympathise with the underlying reasoning and because it prevented them

from having their first-choice projects. Were real money at stake, participants would probably be thinking not just of the projects they preferred but of the benefits these might bring to the neighbourhood, and thus would react more forcefully to what they saw as an unfair restriction of their choices.

The vigour with which participants engaged in the exercise suggests that they were able to overlook this fact to some extent but it nonetheless seems reasonable to suppose that the deliberations would have been more energetic and perhaps less consensual were real money at stake. This revives Research Question 1: whether it is possible to say that PEB is technically feasible is a matter of definition. It has been shown to function "in the laboratory", as it were, but remains untested "in the field".

There is a sampling issue of possibly less significance but still deserving of mention. The desire to create decision-making groups that resembled the wider population in socio-demographic terms led me to include the factor of geography (rural or urban residential location) in the recruitment quotas. And, because urban residents considerably outnumber rural residents in England, the result was that rural residents were a small minority in both trials. Whereas other socio-demographic differences did not appear to create significant anomalies in the deliberation, the geographic dichotomy did: a discussion of improving street lighting, for example, involved one participant saying that there was no street lighting to improve, whilst all others were speaking from the viewpoint of living on fully-lit streets. The implication appears to be that it is possible to create the impression of a neighbourhood despite drawing people from quite different locations provided there is a shared "mental map", however vague. The rural/urban distinction proves the exception to this rule, however: it implies differences of form and daily life too great to be glossed over.

In conclusion, the evaluation of the formal trials has provided much useful information that enables certain of the research questions to be addressed, and points towards a series of other possible research avenues that would shed light on questions of design and presentation. But such considerations are arguably subordinate to the question of how, if at all, local authorities might make use of PEB (my fifth research question). So in the next chapter I present the results of polling the views of local authority representatives, after which I shall return in Chapter 11 to addressing these themes.

Chapter 10 Possible applications of participatory emissions budgeting

This chapter reports on interviews I conducted with representatives of various English local authorities in Autumn 2012 and early 2013. The interviews were designed to elicit from participants their reaction to participatory emissions budgeting (PEB) and to explore how, if at all, it might be applied within their authorities. The information obtained was expected to address my fifth research question: what role(s), if any, could PEB play for English local authorities, and why?

The chapter begins with a section on survey approach, describing how I obtained an adequate sample of participants, the survey instrument I used and my approach to analysis. There are then four sections of analysis:

- Characteristics of interviewees' organisations – relevant findings concerning the councils as potential sponsors of PEB
- Possible applications – discussion of the potential constituency, application and scale
- Practicalities – how the method would be applied in practice in terms of decision rules, estimation of impacts etc
- Perceived benefits and risks

The chapter ends with a section entitled "discussion of findings", including a summary of the findings from the chapter, a comparison of these with the relevant academic literature and a short conclusion.

10.1 Survey approach

Sample

My initial supposition was that I would learn most from authorities that both showed some commitment to involving citizens in decision making and had either a record of tackling climate change or a motivation to respond to it. This was on the basis that authorities that did not have these characteristics may well find PEB perplexing. I therefore settled on the following inclusion criteria:

Evidence of commitment to involving citizens in decision making - one or more of the following:

- IDeA beacon status in a relevant category in Round 9 (2008-9) or Round 10 (2009-10) (Improvement and Development Agency 2010b; Improvement and Development Agency 2010a)
- Big Society Vanguard status (Cabinet Office & Prime Minister's Office, 10 Downing Street 2010)
- Big Society "Your Local Budget" (participatory budgeting) pioneer (Big Society Network & NESTA 2010)
- Oneplace survey "green flag" in an area relevant to citizen participation (Audit Commission et al. 2010)
- Being amongst the top twenty authorities rated as part of the Place Survey (Department for Communities and Local Government 2009c) for citizens' perceived capacity to influence local decisions

Response to or motivation to respond to climate change - one or more of the following:

- Signatory to Climate Local (Local Government Association 2013)
- Member of ICLEI – Local Governments for Sustainability (ICLEI - Local Governments for Sustainability 2013)
- Assessed by the Environment Agency as having more than 7,500 properties "with significant likelihood of flooding" (Environment Agency 2009, p.27)

This produced the following list:

- Cambridge
- Camden
- Haringey
- Lewisham
- Liverpool
- Newcastle upon Tyne
- Waltham Forest
- Windsor & Maidenhead

In order to select the most representative sample possible from this list, I compared the eight authorities in terms of political control, governance structure (leader or mayor), authority type (district/unitary etc), level of deprivation (Department for Communities and Local Government 2011d), and urban/rural class allocated[23]. This led me to prioritise Cambridge, Camden and

[23] Defra places all authorities in one of six classes reflecting the extent to which its population is urbanised. See Department for the Environment, Food and Rural Affairs (2011).

Liverpool. I initiated contacts with these three authorities, seeking meetings with relevant members, senior and junior officers at each, and was ultimately successful in meeting the first two, though not in meeting the range of stakeholders that I was seeking at each. An officer at Liverpool City Council proposed to the portfolio holder with responsibility for climate change that I might interview him but the request was refused. The officer, however, studied my materials and sent some considered comments by e-mail.

As it became apparent that I would not be able to meet as wide a range of stakeholders in my target authorities as I had wished, I resolved to expand my sample. Having encountered great difficulty in arranging meetings of any kind with the authorities I had selected, I concluded that it would be wise to contact individuals and authorities with an established interest in my area of research, on the basis that they might see more value in meeting. I therefore contacted the following authorities/individuals, all of which had an interest in both participatory budgeting and climate change:

- The leader of Durham County Council, who was presiding over a series of local participatory budgeting exercises and whose council was consulting on its climate change strategy
- A former leader of Southampton City Council, whose background in political studies included a strong interest in democratic theory and whose more recent activity had a significant theme of sustainability
- The head of customer insight at West Sussex County Council, which had been contemplating the use of participatory budgeting and which had commissioned innovative work on its carbon reduction strategy
- The head of sustainability at Surrey County Council, whose participatory budgeting project, TravelSMART, was distributing funds from the Local Sustainable Transport Fund which includes amongst its goals a reduction in carbon (Department for Transport 2011a)

I was able to meet all of these except the leader of Durham, who instead kindly participated in a telephone interview to discuss some initial comments he had made by e-mail concerning my work.

During my piloting of the method, I had met representatives of four local authorities and had also presented my work to a gathering of environmental officers working for London councils, some of whom raised comments at the meeting or using a survey that I subsequently circulated. The four authorities (and my reasons for meeting them) were:

- Essex – an environmental officer had responded to my appeal for advice posted on a web forum relating to Climate Local

- Suffolk – as Essex
- South Gloucestershire – this authority had been experimenting with the devolution of highways budget to localities
- Bristol – the city had set some ambitious emission reduction targets and had experience of online participatory budgeting

At each meeting I arranged, I met between one and seven individuals (see Table 10.2). The relevant characteristics of the authorities whose views I succeeded in obtaining are set out below in Table 10.1. The sample achieved represents a reasonable spread of the characteristics I had identified as significant – tier, structure, political control, degree of urbanisation and deprivation. Amongst the participating authorities, there is an interesting range of performance with respect to both climate change and citizen participation. And my interviewees helpfully include relatively junior officers, senior officers and members. In addition, I succeeded in involving sustainability experts, those with a focus upon citizens, and generalists. Whilst it would never be appropriate to attempt to generalise from a sample of this size, I am satisfied that the variety achieved means that my findings will be free of any significant sampling bias.

Survey instrument

I took a semi-structured approach to the interviews (see Appendix O). Having first asked some general questions about the treatment of climate change and citizen participation, I circulated to interviewees the project brochure used during the formal trials then demonstrated the decision support tool and described the choices made by participants in one or other of the pilots/trials. This tended to generate a number of technical questions which I attempted to answer; it also often meant that the conversation concerning possible application of the method or its perceived strengths and weaknesses began of its own accord.

My central question was whether the method, in approximately the form I had demonstrated, had any potential application at the interviewees' authority. I asked this question as openly as possible, allowing interviewees to say whether PEB might be used in the future if not immediately. This generally led into discussion of alternative uses of the method, if it was not to be used for citizens to decide on the allocation of resources to projects. And this naturally meant that any necessary changes to the method were discussed. Where strengths and weaknesses were not being automatically identified, I invited interviewees to set these out. And, where time permitted, I asked certain more specific questions concerning the presentation of the method, the setting of the constraints and participants' understanding of the technicalities. I also invited any further questions from interviewees. I recorded all interviews.

Table 10.1 – Characteristics of participating authorities

Authority	Tier	Political control[24]	Structure	Urban/rural classification[25]	Deprivation rank[26]	Emission reduction target?	Member of Climate Local?	Citizen participation - distinctions	Experience of PB?	Contacts with
Bristol	Unitary	Liberal Democrats (minority)	Leader[27]	Large urban	65/149	Y	N		Y	3 officers
Cambridge	District	No overall control	Leader	Other urban	188/326	Y	Y	In top 20 in Place Survey[28]	N	3 officers
Camden	London borough	Labour	Leader	Major urban	44/149	Y	Y	In top 20 in Place Survey	N	1 officer
Durham	Unitary	Labour	Leader	Predominantly Rural	52/149	Y (draft)	Y		Y	1 member
Essex	County	Conservative	Leader	Significant rural	117/149	N[29]	N		N	1 officer

24 At time of interviews

25 Using categories created by Defra (Department for Environment, Food and Rural Affairs 2011)

26 Rank of average rank, quoted together with total number of authorities ranked; a smaller number implies a higher level of deprivation. As a lower-tier council, Cambridge is ranked within a larger set than all others. Taken from the 2010 English Indices of Deprivation (Department for Communities and Local Government 2011d).

27 Interview took place in September 2012; Bristol elected a mayor in November 2012.

28 The Place Survey (Department for Communities and Local Government 2009c) asked "Do you agree or disagree that you can influence decisions affecting your local area?" Councils were ranked by the percentage of people who chose "definitely agree" or "tend to agree".

29 Note that Essex has a target for increasing the energy efficiency of its buildings

Authority	**Tier**	**Political control**[24]	**Structure**	**Urban/rural classification**[25]	**Deprivation rank**[26]	**Emission reduction target?**	**Member of Climate Local?**	**Citizen participation - distinctions**	**Experience of PB?**	**Contacts with**
Liverpool	Metropolitan	Labour	Mayoral	Major urban	5/149	Y	Y	Your Local Budget pioneer[30]	Y	1 officer[31]
South Gloucestershire	Unitary	Conservative (minority)	Leader	Large urban	141/149	Y	N		N	2 officers
Suffolk	County	Conservative	Leader	Predominantly Rural	114/149	Y	N		Y	2 officers
Surrey	County	Conservative	Leader	Predominantly Urban	147/149	Y	N		Y	4 officers
West Sussex	County	Conservative	Leader	Significant Rural	125/149	Y	Y		N	7 officers
[Southampton]	[District[32]]	[Labour]	[Leader]	Large urban	N/A	N/A	N/A	N/A	N/A	1 former member

30 Nine authorities responded to the Big Society Network and NESTA's call to be pioneers in a participatory budgeting initiative (Big Society Network & NESTA 2010)

31 Comments were received by e-mail

32 Interviewee led the council from 1984-1992; Southampton became a unitary authority in 1997

Table 10.2 – Local authority interviewee roles

Reference number	Authority	Role of interviewee
1 2 3	Bristol City	Sustainable City Service Manager Sustainability Manager Green Capital Partnership Manager
4 5 6	Cambridge City	Strategy & Partnerships Manager Climate Change Officer Sustainability Officer
7	Camden	Sustainability Manager
8	Durham County	Leader of the Council
9	Essex	Environmental Project Officer
10	Liverpool	Senior Environment Development Manager
11 12	South Gloucestershire	Sustainability Coordinator Corporate Strategy and Partnerships Manager
13 14	Suffolk	Specialist Leader - Environment Strategy Manager - Suffolk Climate Change Partnership
15 16 17 18	Surrey	Sustainability Group Manager Travel SMART Engagement Manager Travel SMART Engagement Officer Travel SMART Engagement Officer
19 20 21 22 23 24 25	West Sussex	Head of Customer Insight Performance Manager, Strategy and Policy Team Climate Change Officer Sustainability Manager Senior Research Assistant, Insight Team Member of Insight Team Member of Community and Economic Development Team
26	[Southampton]	Former leader of council

Analysis

I listened to the recording of each interview in detail, noting significant points and transcribing noteworthy quotations. I then distilled these summaries into a long list of points. Examining this set of points led me to identify a small number of topics around which to structure the discussion which follows.

10.2 Characteristics of interviewees' organisations

In this section I report on relevant comments of participants concerning their organisations' structure and the legal and practical contexts in which councils operate, including the effects of the austerity programme; and their current approaches to citizen participation and climate change.

The demonstration of PEB was frequently followed by comments from interviewees concerning the structure within which it would have to work. Any form of citizen decision making needed to be consistent with the legal framework governing councils, particularly the requirement for the overall budget to be approved by the full council, and budget/responsibility would need to be formally devolved by the executive. A specific mention was made of the Corporate Plan: any activity not explicitly part of the plan would be difficult to deliver. In the case of Essex, whose corporate plan does not mention climate change, this appeared a substantive obstacle to the use of PEB. Where funds in particular are concerned, matters were made more challenging in Cambridge by the very rushed general budget negotiation process. Durham, meanwhile, stood out as an authority which, in having recently become a unitary, had been able to isolate and protect a sum of money which was being dedicated to participatory budgeting; other authorities would have to find funds from either core budgets or new sources.

Associated points were made concerning the wider legal and regulatory framework. In PEB's favour was the localism agenda and an increasing expectation for citizens to be involved in public decision making. And the Social Value Act was mentioned with reference to its requirement for attention to be given to "environmental well being" (HM Government 2012, p.1) as part of the letting of contracts by public bodies: one interviewee thought this would provide a practical use for quantitative information such as my emission estimates. Another interviewee felt that PEB would have fitted in rather better with the local area agreement (LAA) system of performance management than in the present, more laissez-faire climate that prevailed in the wake of the abolition of LAAs in 2010.

Discussion of the context within which PEB would have to operate frequently turned to the concept of silo working. Despite the fact that, in most councils whose personnel I interviewed, climate change and citizen participation both have a "cross-cutting" character, many interviewees' perception was of a lack of shared goals. Departments other than those containing the environmental function, such as Social Care, would be preoccupied with their own priorities which were not necessarily consistent with reducing emissions. A good example of this was the attempt by a sustainability officer to interest colleagues from other teams in participating in a meeting with me. Only one recipient of the e-mail replied, a Senior Strategy

and Improvement Manager, and she declined, saying "this is clearly focused on climate change/sustainability and as such it does not relate to any work I am currently undertaking" (Macfarlane 2013). This lack of policy coherence left sustainability and environmental officers with the task of lobbying such colleagues and attempting to persuade them of the merits of environmental targets. In the best case, they thought, it might be possible to design participatory budgeting to include an environmental criterion together with criteria reflecting the priorities of the department in question. But they doubted whether Social Care officers would accord any validity to the method if it was based on only financial and emission constraints, unless it was actively championed:

> "If you had someone who was doing PB in [Housing and Adult Social Care directorate] who was a real green champion for example, they would champion a project like this and just think it's a great idea. Sometimes it might be down to the individuals I suppose." *Interviewee 7*

A practical consequence of this separation of function in councils was that decision makers would not ordinarily be presented with a list as heterogeneous as that offered to participants in the pilots and formal trials of the method, a point I return to below. And, on a connected note, councils tended to make significant decisions singly and so would not typically choose from a range of distinct projects even within a single policy area. This functional characteristic had its analogues in funding, as revealed by a discussion with officers at a county council concerning ECO (Energy Company Obligation, a programme of household energy efficiency measures). In response to one officer's suggestion that ECO could feature amongst other, less obviously pro-environmental options as part of a neighbourhood budgeting exercise, a colleague pointed out that the programme is targeted predominantly at low-income and vulnerable households, which would make it difficult to offer as a project option.

The climate of austerity arose many times during interviews, producing two opposing perspectives. The first was that the cuts had meant anything beyond statutory provision had become "nice to have" (Interviewee 9). One interviewee felt that PEB suggested the spending of new money and that this was incongruous given "for most areas the direction of travel is for cuts" (Interviewee 10). The same individual said that the depth of the cuts was making the consequent decisions "emotive", and suggested that small changes in greenhouse gas emissions would sit uneasily with the strength of feeling concerning the wider impacts of losing services.

In contrast with these comments, certain interviewees felt that austerity had created fertile territory for PEB. One argument was that, in straitened times, we need to make the best use of limited funds, which attention to emissions (energy) would help us to do. Another view was that austerity had prepared citizens for the reality of making difficult decisions. A third was

that the austerity programme placed members in an unenviable position and that participatory budgeting provided them with a means to "hand difficult decisions on" (Interviewee 8).

In all interviews there was discussion concerning the involvement of citizens – both the council's stated aspirations and the reality. A recurring theme was that true devolution of power to citizens had barely begun. In many councils I visited this was accompanied by a view that neither members nor officers were particularly keen to transfer power to citizens, regardless of any policies in this regard. In one county council, the council leader was seen to be a lone enthusiast amongst members. The way in which citizens were typically involved reflected this, with several references to "consultation" in which citizens were presented with a fully-developed document such as a climate change strategy and invited to give their views, but with no guarantee that their contributions would have any influence. This was the case both in authorities with experience of participatory budgeting and in those without. Some authorities had used on-line consultations in light of the need to make budget cuts, inviting citizens to identify service areas that they felt needed investment and others that were a lower priority. One interviewee in fact felt that the existence of such web-based methods would "militate against developing other systems" (Interviewee 10) such as PEB.

Many of the councils had experience of participatory budgeting (PB) and two had active programmes at the time of the interviews. Durham's was a neighbourhood-based model in which local people were invited to propose projects which, once tested for feasibility by officers, would be voted on by local residents. Surrey's programme used funding from the Sustainable Local Transport Fund (Department for Transport 2011a) and therefore required proposals put forward by community groups to promise a reduction in either travel or the need to travel.

Opinions of PB understandably varied amongst interviewees: one described PB as being for a "time of plenty" (Interviewee 26), saying that the austerity programme meant that services were pared down to essentials and that members would not want to surrender power over decisions (concerning statutory services) for which they would remain accountable. Interviewees working on live PB programmes were enthusiasts for the method but nervous of doing anything that might either unbalance the process or appear to undermine the principle of devolving power. Officers did carry out basic checks to establish that projects proposed for funding were viable but they intervened only reluctantly and were loath to enlarge their role. For example, when discussing the idea of imposing an emission constraint on a panel of members and citizens considering project proposals, one officer baulked, describing this as "decision making on their behalf" (Interviewee 16). Another view was that extending or developing PB had to be carried out in small steps given its relative novelty. This was seen as a

reason not to rush into the addition of constraints such as a climate change target. One interviewee felt that citizens would need a considerable time to adjust to PEB, especially if there were not an established practice of PB in their authority.

As shown in Table 10.1, most of the councils I interviewed had some form of emission reduction target and this tended to be accompanied by a strategy document of some kind, describing the efforts the council would make to reduce emissions within its own estate and operations and, where community-wide emissions had been identified as a target, amongst residents and businesses. Arrangements for the management of activity varied but there tended to be at least one sustainability or climate change officer, often within an environment team. Cambridge City was noteworthy because the climate change portfolio was located in the Chief Executive's Department together with responsibility for the maintenance of standards in the council's consultations; elsewhere, relevant staff were not in the centre despite the fact that climate change was a cross-cutting theme in these councils. Bristol was distinctive because it had adopted a "framework" rather than a strategy on the basis that this would give individual departments more freedom to develop their plans; officers felt that a strategy would not provide sufficient flexibility for the pursuit of opportunities as they arose. In keeping with this, the council had cascaded its carbon targets down from the whole-council level: the transport director had their own target, for example, and was responsible for achieving it.

Wider discussion of targets revealed a pragmatism in the approach taken by councils. On the one hand, there was a desire to set targets that officers felt they could achieve.

> "As an authority we wouldn't want necessarily to choose a target that we're going to get a kicking at because we have no control over it." *Interviewee 9*

On the other, interviewees elsewhere felt that members and senior officers were happy to ignore what they could ignore, with community-wide emissions being one such example. And, in one county council, where a target for community-wide emissions had been set, officers felt that it was not taken seriously by members and that there would be no significant penalty attached to falling short of it. As to achieving emission reductions, a holistic approach was being taken in only certain authorities, with thought being given to the effects of all policy decisions and not only those directly aimed at mitigation. Other councils appeared to see their priority as being the implementation of the projects that offered the greatest emission savings per pound invested, at the risk of decisions in other policy areas undermining the benefits achieved.

The general treatment of sustainability in decisions was discussed with many interviewees, particularly with reference to reports to members. Whilst it appeared standard practice to

assess the sustainability impact of a decision, the reporting was rudimentary (often simply "positive impact" or "negative impact") and there was little or no analysis supporting the conclusion. As discussed further below, this prompted a degree of interest in the prospect of obtaining more authoritative, quantitative data. One interviewee argued that the treatment of sustainability in reports was a useful guide to a council's maturity with respect to climate change: a paragraph of bland text would indicate that the authority had not taken sustainability to heart. The more general impression is that sustainability impacts were considered on a case-by-case basis, with only limited weight given to them in comparison with financial and economic impacts.

Alongside the selection and promotion of mitigation projects within the council estate, the principal other activity with respect to climate change was the promotion of pro-environmental behaviours amongst residents and businesses. The nature and level of such initiatives varied widely, with Camden and Bristol amongst the most active. Other authorities were doing little more than providing advice on their websites. And discussion gave the impression that officers saw these two strands – within-estate mitigation and promotion of behaviour change amongst citizens – as discrete activities. In conversation with officers at a county council, I characterised PEB as possibly functioning as a bridge between the two. Was such a bridge necessary? They felt not.

As implied by remarks reported above, there was a strong theme in interviews of emission reduction targets being a low priority, at least for now. Members in several authorities were thought by their officers to be much more interested in jobs and the economy, and environmental benefits were gaining traction only if presented as financial savings. A consequence of this was that sustainability officers felt they had to dedicate all their energy internally (ie within the council) in order to make as much progress as possible in this unpromising environment and, in many cases, were nonetheless having only limited success. This perception tended to be paired with a belief that citizens more generally had no interest in climate change as a topic, that they were "not ready for carbon" (Interviewee 19). The implication was that PEB was ahead of its time and that greenhouse gas emissions would not for now be accepted as a decision-making criterion.

> "I don't think we're far enough internally or in the public to say we're not prepared to have that service because of the environmental impact that is associated with it. I just don't think we're there." *Interviewee 22*

I encountered a different perspective in Camden, Bristol and Cambridge, all of which have very active pro-environmental communities. In Camden, I was told "the loudest people in our network are the greenest people" (Interviewee 7). Cambridge and Bristol officers found they were often criticised by pro-environmental citizens for having an insufficiently "green" agenda.

With respect to terminology, West Sussex officers were using the language of energy efficiency and warmer homes, climate change being mentioned only fleetingly in the context of floods or droughts. Even in Camden, officers had found they were having to avoid using the terms "climate change" and "carbon" when dealing more generally with residents, preferring instead "green action" and "energy saving". The justification was that residents found climate change overwhelming:

> "So we bring it down to a level where [people] can take action." *Interviewee 7*

This experience of encountering resistance both internally and externally helps to explain the frequency with which interviewees discussed using PEB in an educational setting, a point to which I return below.

10.3 Possible applications

This section presents the views of interviewees concerning possible uses of PEB: constituency (who would be involved), application (in what context it might be applied) and scale (the potential spatial and policy scope of an application). A visual representation is provided in Figure 10.1: a hypothetical application is presented as a benchmark under the title "Radical – Porto Alegre", being what might be conceived as the most ambitious way of applying PEB. The remainder of examples are drawn from discussions with local authority stakeholders and show the range of possible motivations, constituencies and possible outcomes that interviewees had in mind.

When discussing with interviewees the possible use of PEB, whilst much discussion centred on the participation of citizens, a range of other possible constituencies arose. The most commonly mentioned were councillors on the grounds that they may not currently be thinking as much about sustainability as they might. There was a theme of councils needing to get their own houses in order (by educating members) before going out to citizens. And the precision of the method's underlying emission figures was thought likely to be helpful given the bland nature of most of the sustainability information currently provided to members. Several other possible constituencies were also mentioned: in West Sussex, given the possibility that the county's carbon reduction target might be cascaded down to individual staff members' personal work objectives, PEB was suggested as a possible way of helping them to identify actions they could take to contribute to meeting the target. In Camden, where there is extensive engagement with the business community on climate change, the interviewee suggested that business networks might find the method helpful for optioneering. In Suffolk, it was suggested that PEB could be used by a group made up of members, officers and citizens that had been meeting periodically to discuss the development of a specific site. Bristol officers mentioned creating an educational application for schoolchildren. And both Camden

and West Sussex officers talked of passing PEB to local environmental groups. In the case of the latter, this idea was motivated by a desire to assist such groups in grasping the financial realities that accompany decisions about mitigation.

A specific issue I raised as part of discussions concerning constituency was understanding: given experience in the pilots and formal trials, how important was it that participants should understand the technicalities of the emission calculations? Interviewees tended to be relaxed about this: full understanding was neither necessary, they felt, nor a realistic aspiration.

> "I suspect with the best will in the world you'll never get to a position where everybody knows chapter and verse [about carbon accounting] but in general we can never really claim that people have more than a basic knowledge of anything that they vote on so…I don't see that as an issue particularly." *Interviewee 8*

One interviewee drew a parallel between understanding and confidence, in the context of social capital: in a location of low social capital, deliberations amongst citizens would probably be dominated by the most confident or articulate participants, with undesirable results. This had a bearing on a distinct discussion concerning the general structure that would surround the use of PEB. Rather than simply invite citizens to attend an *ad hoc* decision exercise, a former council leader argued for an ongoing arrangement where a number of citizens would act as representatives of their area and would hold this role for an agreed period. The question of how they would be chosen remained open but an interesting consequence was the sense that these individuals, once appointed, might begin to see their participation as a duty, in contrast with the more common model of PB in the UK which people might see as an enjoyable way of spending an afternoon or evening. A longer-term arrangement such as this may have numerous consequences, including that the citizen representatives would in time come to be seen as part of the elite and be shunned by their former peers.

Given that there was very little enthusiasm for a "live" use of PEB, where real money would be spent on the basis of citizens' choices, much was said about what else it could be used to do. In Camden, it might be used to involve citizens in the prioritisation of schemes put forward by residents for funding from an environmental pot; in West Sussex, there are County Local Committees that have small discretionary budgets, and the method could be used to support the process of selecting projects to fund. PEB could equally support the early development of a council's next climate change strategy; one Bristol interviewee envisaged using it in various neighbourhoods to identify whether there were significant differences of preference, in order to decide between creating locality-specific carbon reduction strategies and retaining a single cross-authority document.

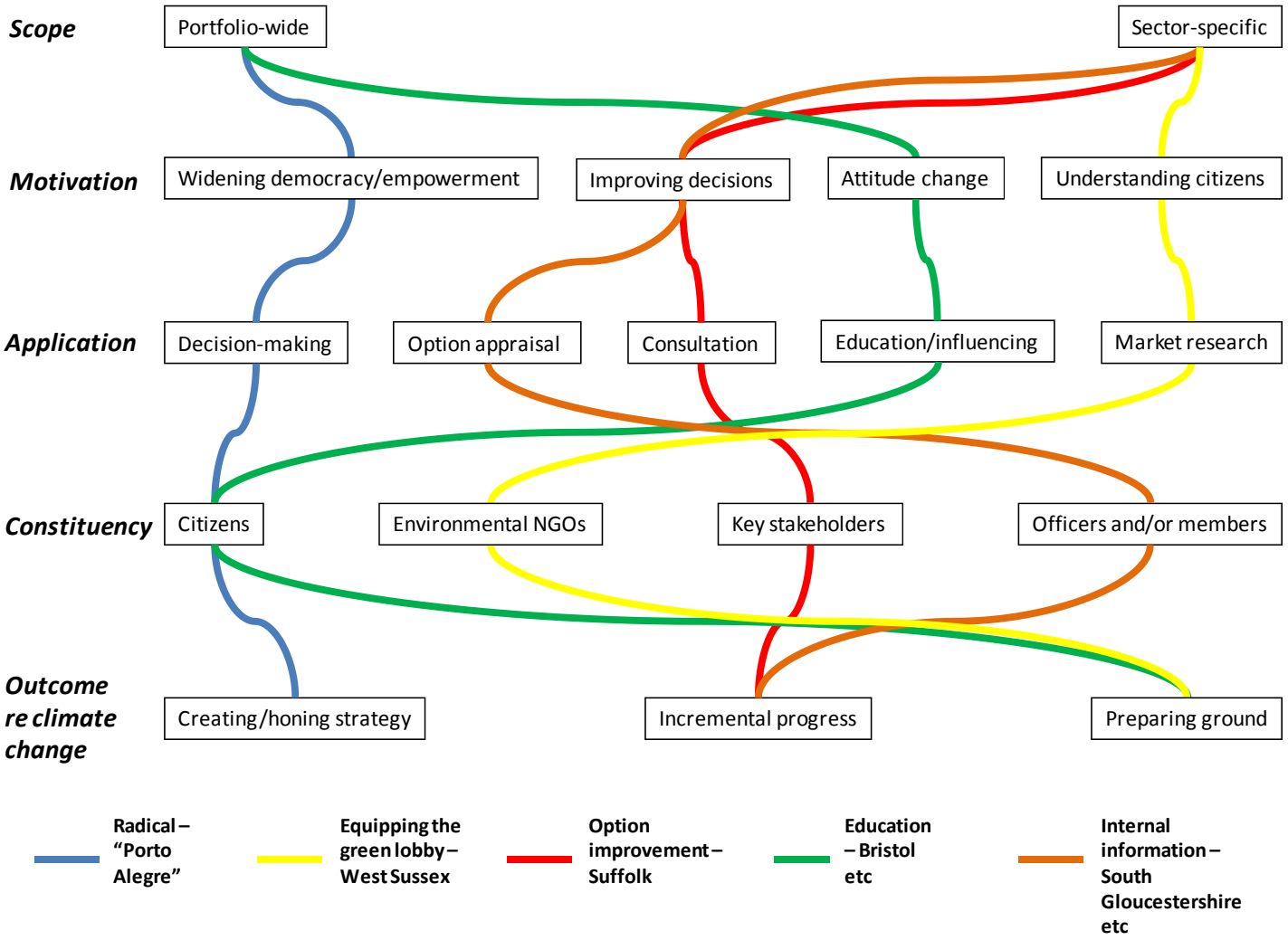

Figure 10.1 – Possible applications of PEB

There was some interest in using PEB to support the investigation of scenarios as part of the early stages of planning. It was equally seen as of potential value at a later stage, to support option appraisal, particularly in the context of a cost-effectiveness exercise, where various ways of meeting a given objective were being compared. This was justified on the basis that the austerity programme had left councils delivering the bare minimum, making discussion of whether to do A or B academic; it would be more useful to compare different ways of meeting an essential need. Finally, there was repeated mention of inserting the emission numbers into decision reports.

Interviewees also saw a use for PEB in non-decision-making contexts: as an educational tool, it could help users to understand the difficulty of making decisions or could increase users' understanding of project impacts. One South Gloucestershire interviewee suggested its conversion into an online game, whilst a market research application was identified by officers in Bristol and West Sussex. Careful subsequent study of the decision-making process would shed light on both participants' preferences and their approach to decision making.

Despite misgivings about using PEB "in anger", interviewees participated actively in discussions of how this might be managed. One theme was the underlying structure: the former council leader argued for a staged process, with a validation exercise (involving citizen representatives) determining the "rules" of the exercise prior to the choice event itself. This would help to manage down the risk that the event would be hijacked by climate sceptics. A county council interviewee voiced a similar view about the need for a longer-term decision-making process to avoid the risk that projects would receive funding more because they had been well presented at the decision event than because they had real merit.

There was also extensive discussion of the framing of any decision event. Interviewees generally agreed that to present a decision event in terms of climate change would pre-select environmentally motivated participants. This was generally thought undesirable: such individuals would not have the same demographic profile as the wider citizenry so there would a chance that the process would be criticised as unrepresentative. And, if the exercise was seen as having an educational element, there seemed limited benefit for a group that had already absorbed the climate change message. The direct opposite would be to avoid mention of climate change until the beginning of the event, which was thought likely to lead to at least some resentment and, possibly, worse. But views differed on this: one officer did not see cause for concern:

> "I don't necessarily think people would be kind of like 'oh well I don't care about the environment: I'm not going to do it'. It's like a task isn't it and people tend to do tasks as per instructions." *Interviewee 7*

Another officer expected a degree of dissent but did not see this as disastrous:

> "Somebody would start ranting or just leave but I don't think it necessarily would be a problem if it was only a few people." *Interviewee 14*

And a third interviewee saw a possible benefit as the emission constraint moved people on from their initial, entrenched positions:

> "It would be interesting to know whether the carbon aspect of it might be a leveller, might be…something that would come in and take away some of that ill-thought through vested interest." *Interviewee 3*

Many argued for a middle way, reflecting the practice of using concepts such as energy efficiency in preference to climate change. Whilst it would be appropriate to mention the emission constraint early in the description of the event (if not in its title), there was scope to manage down the risk of a bad reaction, by emphasising that environmentally-friendly initiatives were for the benefit of participants' children, for example. Additional justifications included resource scarcity and the need to avoid wasting useful material, incurring unwanted costs or causing unnecessary pollution. It was also argued that the existence of a council target lessened the need to convince participants concerning climate change. Instead, the explanation would follow the line that the council had committed itself to a given goal and that the exercise needed to be consistent with it, the expectation being that participants would accept this as a parameter of the task.

Having discussed possible constituency and application of PEB, I turned to questions of scale and content.

Interviewees were unanimous in seeing participatory emissions budgeting working best at a local, perhaps neighbourhood level. County interviewees asserted that citizens have a very local focus and do not think about the county as a whole, which is in any case highly diverse. Perhaps for this reason, they referred to district councils as more appropriate settings for the method. The former council leader saw a double benefit from a local scale: not only did this suit the perspective of the average citizen but it could also reduce risks for the council:

> "These are sums of money that people can relate to their own lives and therefore will get particularly exercised by them in a way that they wouldn't with different levels of decision making and they're also the ones that councils can be particularly tripped up on." *Interviewee 26*

The tension between a local focus and a global issue – climate change – was identified. Would one undermine the other? In the opinion of one interviewee, this was a potential strength. According to analysis he had seen, council consultations tended predominantly to draw "settlers", a group noted for its intensely local focus[33]. The method would provide an

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[33] *Settlers*, *Prospectors* and *Pioneers* are three categories of people differentiated by their behavioural and attitudinal characteristics (Rose 2011).

opportunity for such people to take on board a global issue whilst thinking about their immediate environment.

Turning to policy scale, there was a presumption in favour of using the method to select climate change mitigation projects, consistent with observations that councils did not ordinarily decide amongst such wide-ranging projects as had featured in the pilots and formal trials. And interviewees predicted that pro-environmental participants would be surprised if the list of options did not consist mainly of mitigation projects. There was little discussion of using the method to decide amongst projects within a policy sector such as social care, reflecting the observation made that officers in such sectors had their own preoccupations, of which climate change was unlikely to be one.

The issue of whether participants would have any influence on the list of options was raised with reference to Arnstein's ladder (Arnstein 1969). If the list was set by officers/members, this could undermine any sense of power being devolved. But a Cambridge interviewee cited a relevant example in which citizens had been invited to develop proposals for using money arising from a land-use development. Those whose proposals were not ultimately adopted were, he felt, more annoyed than they would have been had they not been included in the process.

A further consideration was officer/member involvement in the development or refinement of the list of options. The former council leader referred to vocal complaints when a strict rule of avoiding ongoing revenue liabilities, however small, meant that certain proposals were ruled ineligible for funding. In a similar vein, the Durham interviewee had recent experience of protests by sponsors of one proposal who felt that the council should have ruled another out for reasons of financial viability. These two examples serve to show that the council initiating a decision exercise can be criticised both for intervening and for opting not to intervene.

10.4 Practicalities

This section addresses the "nuts and bolts" of applying PEB: how decision rules would be established and impacts estimated.

On the assumption that PEB was to be used to choose between projects, how might it work? With respect to criteria, the use of financial impact was not disputed and cost to the council was accepted as the most appropriate measure except in discussion with South Gloucestershire interviewees. Here, where work was taking place on renewable energy schemes, there was interest in the balance of income and expenditure across the community, given an existing outflow of £650 million per annum on energy. Interviewees argued that the financial measure should fit the context: if decisions were being taken concerning the actions

of a partnership (rather than the council alone), the financial impact on the partnership as a whole was the quantity of interest.

The measure of greenhouse gas emissions drew rather more comment. Interviewees were content that it was an appropriate quantity given a focus on climate change but several felt that other criteria needed to be included with it, most notably some measure of potential impact (on social problems) or a social value criterion. I should note that interviewees appeared comfortable with a decision-making model in which financial impact would be the sole criterion, which I took to mean that they assumed citizens would naturally prioritise the "best" projects subject to available funds. The desire to complement an emission criterion with one or more additional criteria seemed motivated by a fear of bias. But, in some cases, it appeared motivated by a fear of a *perception* of bias; proponents saw additional criteria as a pragmatic way of deflecting attention away from the potentially contentious inclusion of a climate change constraint.

As to the use of an emission constraint, views differed. Those who saw PEB as a market research tool argued against using a target: participants would be provided with information on emissions and would learn the cumulative impact of their choices but there would be no obligation to reach a threshold. Officers could then study their deliberations to gauge any effect the information had had. A more nuanced version of this idea was to invite participants to make two sets of choices – one with the emission constraint and one without – then ask them to choose which set they preferred. One officer suggested offering two emission targets: one would be ambitious, reflecting the testing goal the council had set of achieving a 40 per cent reduction by 2020; the other less challenging. Once this had been explained, participants would be asked to choose which threshold they wished to adopt. In contrast with these views, the former council leader recommended presenting the financial and emission constraints simultaneously "as non-negotiable" (Interviewee 26). However it was presented, interviewees recognised the difficulty of setting a suitable threshold if the council had not adopted a reduction target. One idea was a principle of not contributing to emissions (ie for the net emission effect of the choice set to be at most zero) but it was acknowledged that the differing characteristics of sectors within a locality such as housing and industry made this a rather unsubtle approach. Meanwhile, county council interviewees who were uncomfortable with imposing a requirement to reduce emissions sought other ways of incorporating the impact. They suggested (but soon discarded) the notion of weighting the financial impact of a project to reflect its greenhouse gas performance such that greener projects would appear cheaper. They also wondered about using a "carbon pass mark" to test the eligibility of candidate schemes, with only those that achieved a satisfactory level proceeding to the choice exercise. But this notion caused unease both because it would be a further instance of officers

appearing to manipulate the process and because it would arguably defeat the object of the exercise, by effectively removing emissions from the deliberation process.

There was also discussion of preference aggregation, with questions raised about how decisions would be reached if the group of participants was too large for a single discussion to take place. Interviewees accustomed to a method in which some form of ballot decided the successful projects were nervous of any need for iteration or council-led adjudication. One interviewee was concerned about achieving meaningful deliberation in a large group, particularly from the perspective of building social capital: did PEB offer anything that could not be achieved using Surveymonkey? I conceded that I had not developed a formal means of aggregating preferences in a large group but that this was feasible; as for large-group deliberation, we discussed the notion of fostering discussion in groups of a certain size prior to individual voting.

The estimation of emissions generated a great deal of comment. The context was a high level of desire for and, in some cases, expectation of "hard numbers" within interviewees' organisations. Officers found that their cases were taken more seriously by members when accompanied by quantified impacts; when those impacts could be converted into money, more notice still was taken. Against this was a view that unquantified impacts had little traction with decision makers. It was felt that there was a very good connection between greenhouse gas emissions and the phenomenon of climate change so this measure was more compelling than many others relating to environmental impacts, such as had been developed for the National Sustainable Development Indicators (National Statistics & Department for Environment, Food and Rural Affairs 2010). This general acceptance of the appropriateness and validity of emissions as a measure was augmented by an increasing interest, noted by a Suffolk interviewee, in whole-life costing of projects (including their energy implications). There was therefore considerable interest in obtaining reliable estimates of the greenhouse gas emissions attributable to a project.

But interviewees perceived considerable difficulty in deriving these numbers. The general task of predicting the full ramifications of a policy intervention was identified as challenging, with one interviewee citing the difficulty of estimating the level of torch use in response to a partial switch-off of street lights. Another example was that there is, according to another interviewee, no agreement concerning the environmental benefits of local food growing. Those with recent experience of participatory budgeting predicted that emission numbers would become a battleground:

> "With this you'd have something else where potentially we'd come in and say this is the impact of this project and that's the impact of the other and then in a sense it becomes a political situation, it becomes almost like an election situation and people say well hang on a minute why

> have you done that why have you said that rather…and to think the understanding is quite low, obviously the risks are correspondingly high because people do have a tendency to blame the referee if you like…and that for me detracts from what the exercise is really about." *Interviewee 8*

Interviewees also saw difficulties in connecting project-level estimates with other emission data. Practice varied in approaches taken to aggregate emission numbers: most relied on the community-wide figures released by government (Department of Energy and Climate Change 2012) but these were greatly affected by high-level changes such as population growth and are released two years in arrears. West Sussex had commissioned a carbon footprinting exercise based on input-output modelling (Small World Consulting Ltd 2011) but both its officers and other interviewees were unable to see how project-level impacts could be reconciled with the aggregate figures. Tracking, according to the West Sussex sustainability officers, required nothing less than a further run of the economic models that had produced the original estimates, and they felt members would expect any estimate of impact to be followed up by analysis to identify whether implementation had produced the forecast effects.

These intellectual challenges were paired with practical concerns: interviewees felt it unlikely that the considerable resource needed to develop the estimates could be found in light of the austerity programme. This problem was exacerbated by not being able to predict in advance how much effort would be required, given that only after initial scoping is it possible to identify which impacts are likely to produce non-trivial changes in emissions. These challenges had in part led Surrey officers to use mode shift (transfer of trips to more sustainable forms of transport) as a proxy for reductions in emissions, a decision that could be justified in their case given that all projects being considered in the PB exercise had a transport theme.

10.5 Perceived benefits and risks

On reflection, interviewees saw a number of potential benefits in the use of PEB. It could be an antidote to general disillusion with the consultations typically run by councils and, by forcing people to make trade-offs, it could foster an increased understanding of the decision-making process. In light of broad experience that general outreach on environmental matters brings in the already motivated, its relative simplicity and the attraction of spending money on local facilities may draw in the seldom heard, as may the method's subtle inclusion of environmental considerations:

> "What I quite like about it is that it's not an overtly environmental exercise. It's an exercise about what you want from your community and for your community but you have to consider the environmental implications." *Interviewee 5*

West Sussex officers felt that it might be easier to use in decision making than marginal abatement cost curves (MACCs) which were perceived to be conceptually challenging. Bristol officers, meanwhile, saw its advantage over MACCs as lying in the scope to allow a range of

considerations other than cost and emission reduction to inform decisions. And two possible specific impacts were also identified: Cambridge interviewees saw its potential in encouraging pro-environmental citizens to appreciate that measures promoting sustainability are funded from the same finite pot as other types of intervention. In West Sussex, meanwhile, one interviewee envisaged a benefit to members in seeing citizens making environmentally-constrained decisions.

Interviewees also perceived considerable risks associated with use of PEB to decide on allocating resources. In a time of austerity, Cambridge officers felt citizens would already be feeling demoralised at the loss of council services and would question the imposition of a further constraint or perhaps lose interest as their first-choice projects became unobtainable. Other officers thought this could lead to regress in public attitudes to sustainability. At worst, citizens may call for the council's emission reduction target to be dropped, which may be welcomed by certain sceptical members. Those reflecting on their experience of participatory budgeting were worried that additional complexity might deter people from participating, particularly given that PB was still a very new practice:

> "On top of understanding the core process about allocating points as they're doing at the moment to different projects, then you're sort of introducing a second front as it were…rather than the issue in itself – some people will understand it and some people won't understand it and some people will partly understand it…but I think the main concern is about introducing it in such a way that it doesn't reduce understanding of the overall PB exercise." *Interviewee 8*

Considerable risks were seen to be attached to the emission numbers in particular. As mentioned above, general understanding might be low, thus increasing the probability that the numbers would be lighted upon by those submitting project proposals as evidence of council interference; they could equally be questioned by members. The response of participants to the emission figures was also questioned. Local people, it was felt, set their own criteria (either implicitly or explicitly) and this may mean that they ignored the climate change impact, particularly where the absolute figures appeared trivial:

> "Those people that wanted [the project] would have voted for it still and those people that didn't want it would have just had one more reason to vote against it." *Interviewee 8*

Concerns were raised about the longer-term consequences of embedding such a process within council decision making. If there were continuity of citizen participation, this may engender resentment on the part of elected members who may feel that they had worked harder to obtain their status and were better qualified than the newcomers. The former council leader foresaw attempts by politicians to colonise the new process:

> "You might get a sense of disempowerment amongst the political representatives as a sort of zero-sum game with the non-political representatives and then the temptation of the political representatives to regain that power by infiltrating the non-political participative process." *Interviewee 26*

And two further concerns were raised about longer-term effects. Citizens, after initial jubilation at having some control over resources, may become disillusioned with the extent of power devolved to them, and demand more. And budget-holders may see expansion as creating unacceptable risks:

> "There is a lot of potential resistance from existing budget holders and so on…the further you go down the road, because people see the risks overwhelming the benefits to it." *Interviewee 8*

Various interviewees raised what they saw as a risk that citizens may make poor decisions, though this was by no means the only opinion voiced on the subject, the most idealistic being that citizens knew their communities best and that the best projects would therefore be chosen if citizens made the decisions. A more pragmatic position was apparent amongst those authorities currently practising PB, whose representatives said they were not always happy with the projects that were funded but that this was a consequence of devolving power and a price therefore worth paying. The most critical view I encountered had citizens as typically ill-informed and therefore something of a liability:

> "The only other aspect that one has to be very careful of before you actually participate in this sort of thing is making sure that whoever is going to be involved in PB is really well informed. There's an awful lot of preconceived ideas that the public have that don't bear up with what we know is happening or what the statistics actually represent to us as happening. So you get these perceived problems that may not be the factual ones." *Interviewee 25*

This was associated with a degree of dismay when I described the events of the first formal trial, in which participants went to some lengths to spend the full financial budget for fear of losing it. Interviewees felt that this displayed an adversarial attitude on the part of citizens towards the council when, in fact, citizens *were* the council. A Bristol interviewee raised a distinct point which was superficially about the weaknesses of the PB model: he worried that choices made on the basis of project price would be unlikely to lead to a set of interventions that, in combination, would form a strategic whole. These more critical views of citizen competence seemed consistent with a presumption in favour of the professional's point of view: that citizens' views were welcome as *contributions* to the planning process but that experienced officers were the individuals best qualified to decide on the most appropriate course of action, that citizens could not be trusted to make sound decisions. This is an important point because it transcends any technical difficulty with the implementation of PEB and would be encountered whatever method of citizen participation were under discussion. Put another way, officers who wished to retain control over decisions would be motivated by this desire to find technical objections to methods designed to transfer power to citizens.

A final area of perceived risk related to the possible consequences of imposing a climate-change policy requirement on PB when the application of the method was still novel. My conversation with the leader of Durham council was telling on this front. In an initial e-mail

explaining why the council would not be using PEB, he had written "there is…a feeling that unfortunately our residents would not consider carbon emissions as of sufficient importance when deciding which projects to support" (Interviewee 8). This remark was consistent with many other interviewees' assertions that citizens might in some way reject the emission constraint. But, when I discussed this further with him, I suggested that his use of the word "unfortunately" indicated a desire on the part of the authority for this position to change. How, then, could residents be encouraged to accord more importance to climate change? He answered: "Well, I guess that's a more general question isn't it?" (Interviewee 8). This statement, combined with various other remarks about the desire to minimise the role of the council in the PB process being run by Durham, demonstrates a discomfort with the notion of introducing policy goals into participatory budgeting. To him, the purpose of PB was to transfer power, and the inclusion by the council of any but the most minimal checks would undermine this transfer. Citizens needed to become more aware of climate change and to respond appropriately to it, but the council's PB process was emphatically not the vehicle for making this happen. This suggests a fundamental tension between transferring power on the one hand, and seeking to promote sustainability (or, for that matter, other policy goals) on the other.

10.6 Discussion of findings

Summary of findings

Interviewees identified a series of legal, financial and procedural constraints that would limit the scope to use PEB. In particular, funds tended to be associated with defined policy areas making it difficult to envisage a choice-making exercise as wide-ranging in policy terms as the one trialled. More significant were the effects of austerity which meant in many cases that climate change had become a low priority. Officers also referred to a tendency to work in silos, which militated against tackling climate change (a cross-cutting issue) effectively.

Those authorities that were addressing climate change were concentrating their efforts on mitigation projects, with a limited resource additionally dedicated to promoting behaviour change amongst citizens. The quantity and quality of information available on the climate change impacts of projects were perceived to be low.

Interviewees saw numerous potential applications for PEB other than for citizens allocating public resources: other constituents might be environmental groups, external stakeholders, senior officers and councillors. And it could be used to support decisions at the appraisal stage or during "optioneering"; aside from decision-making applications, it could have be used as a

market research tool, to test citizens' implicit weightings of financial and climate-change impacts, or as an educational aid.

If used as designed, interviewees were of the opinion that PEB should not be framed as having an environmental focus (lest this deter participants who did not identify themselves as so motivated). In fact, many argued that, if climate change was to feature as a policy constraint, then so should other council priorities, perhaps in the form of a social impact target. Interviewees also thought that PEB should have a local focus, and they on balance argued for using it to select mitigation projects rather than a more general range of interventions.

Interviewees voiced a number of concerns about the use of PEB, one of which was the derivation of emission estimates: they thought that the numbers could become a battle ground and, at worst, that debate concerning their validity would be used as a basis for arguing that emission reduction targets should be scrapped. Another concern, arising amongst authorities conducting PB in some form, was that the addition of an emission constraint would be undesirable: first, it would give the impression that the council was imposing policy decisions upon citizens and, second, it would place a fragile process under unnecessary strain. A final concern, not peculiar to PEB, was that citizens might make ill-informed decisions.

Comparison of findings with the literature

Here I review the extent to which my findings coincide with the academic literatures on a) citizen participation and b) the response of local government to climate change.

I referred in Chapter 3 to the polarised nature of the literature on citizen participation/deliberative democracy, so it is not surprising that my findings accord with the writings of some authors and not others. Interviewees tended meanwhile not to raise the philosophical arguments upon which the literature dwells at length, tending to concentrate on practicalities, but this is understandable.

The comments made regarding elected members' general tendency to resist the devolution of power recall Pateman (1970) and accord with Orr and McAteer's (2004) findings concerning councillors' faith in their own capacities. There is also a good fit between the various remarks expressing doubt about the quality and reliability of citizens' thinking and the findings of various writers (Shafir & LeBoeuf 2002; Marshall & Tse 2010; Bartels 2003) though it is interesting that some of these do not differentiate between types of citizen – council stakeholders would be just as prone to bias and calculation error as ordinary citizens, in fact. With regard to scale, the general view that PEB would work best at the local level coincides with Pateman's (1970) position but the underlying reasoning seems different: whereas Pateman was attempting to deal with the problem of democratic deficit, council stakeholders

appeared to wish, for instrumental reasons, to contain the reach of any decision-making process. And frequently-voiced concerns that an environmentally-framed PB exercise would attract the "already green" are confirmed by several writers (Peters et al. 2010; Pidgeon et al. 2005; Kathlene & Martin 1991).

Turning to process, Christiano (1996) argues that a good democratic mechanism needs to allow participants to contribute to the list of policy options, a view asserted by various of the interviewees. But a topic that did not arise to a great extent in the interviews was deliberation, despite its prominence in the literature. Very little was said at all, in fact, about the interaction of citizens, the impression being that officers and members found that they were typically dealing with citizens on an individual basis. Having said that, various interviewees perceived potential value in forcing citizens to trade off competing demands: though this might take place without discussion or debate, it may nevertheless have some value in terms of fostering a more realistic point of view (or one more sympathetic to the plight of local government). Whilst this recalls writers who argue that deliberation can lead to better decisions (Habermas 1995; Yankelovich 1991), council stakeholders may have been thinking more in instrumental terms about citizens causing them less trouble in future, which accords with the somewhat negative findings in the literature concerning council stakeholders' views of citizen contributions (Orr & McAteer 2004; Klijn & Koppenjan 2000). A slightly more optimistic view about citizen participation was encountered amongst councils that were in the process of running PB, which echoes the enthusiasm detected when Lowndes et al (2001a) were investigating council opinion as well as the assertion of Innes and Booher (2010) concerning the value of local people's expertise. There was a general theme in the interviews of an antagonistic relationship between councils and their citizens (even amongst the councils whose PB activities suggested an attempt to build democracy): citizens were characterised as a liability to be managed or, amongst authorities practising PB, as somewhat random and potentially volatile and therefore requiring careful handling. There was, in summary, none of the idealism about deliberative democracy which I had encountered in the literature.

On the motivation for participatory budgeting, there is an emphasis amongst the remarks of interviewees upon expanding democracy, which coincides with the more radical positions of writers on the subject, eg Wainwright (2009). Local authority stakeholders did not present the exercise as being about improving decisions (Shah 2007b) which may reflect the technocratic position I encountered that the council "knows best". Nor was there mention of building social capital as a goal (SQW et al. 2011). But the reported experience that elected members can feel threatened by PB is consistent with the findings of SQW et al (2011) in the context of PB specifically, as well as more general analysis of councillor views of devolving power mentioned above.

Turning to local government and climate change, there is a high degree of consistency between my findings and what is reported in the literature. A preference amongst participating authorities to avoid setting targets over which one does not have control is identified by Cooper and Pearce (2011), whilst Shaw and Theobald (2011) note the key role played by economic conditions in determining the nature of the discourse on climate change, though they predict spatial variation whereas interviewees were consistent in saying that fuel poverty, energy efficiency etc were the terms currently in use. Perhaps they did not foresee the extent to which austerity would influence the narrative, or did not take into account that even wealthy or pro-environmental authorities contain substantial numbers of people struggling financially.

Sustainability officers' accounts of their situation accord with Bulkeley's (2010) diagnosis of silo working, as well as the associated findings of Evans and Theobald (2003) and Jonas et al (2004) concerning limited penetration beyond the explicitly environmental areas of government. And a general theme of internal focus (upon estate and operations emissions in particular) is also identified by Bulkeley (2010). As for the world outside the council building, interviewees articulated a range of citizen types, from the disengaged to the highly informed, as Shaw and Theobald (2011) found. And the mention by several interviewees of the prominent role played by local environmental groups is redolent of the discussion of multi-level governance raised by several writers, including Bulkeley and Moser (2007).

Interviewees often referred to a lack of funds and staff (Betsill & Bulkeley 2007) though it would have been remarkable if they had not, given prevailing circumstances. They also frequently mentioned limited political support (UK House of Commons Environmental Audit Committee 2008). Meanwhile, the fact that Camden and Bristol stand out from my sample as persevering on climate change is consistent with Shaw and Theobald's (2011) prediction that a hardy few would resist the trend of retrenchment. On the practical front, complaints about quality of data recall Fleming and Webber (2004), it being notable that the passing of nearly a decade since they were writing appears not to have made much difference. The same authors identify the complexity of funding paths, another theme that arose in the interviews.

In summary, adopting the optimistic views found in the citizen participation literature might have led me to expect a reasonably warm reception of PEB by the most pro-environmental councils whose stakeholders I interviewed. The fact that PEB was seen as too challenging by all authorities sampled suggests that the more sceptical writers on citizen participation grasp the subject more accurately. But the limited acknowledgement in this literature of the importance of context (identified in Chapter 3) is thrown into relief by the particular case of PEB: an already contentious topic (climate change mitigation), made more contentious by the

economic climate, undoubtedly renders more challenging the task of creating successful models of citizen participation. The obvious alternative explanation is that the combination of local authorities' general difficulties in confronting climate change with their prevailing financial situation was sufficient to trump desires to devolve power to citizens, however strong. In fact, the answer lies between the two points: local authorities are less enthusiastic about citizen participation than they might be; they also struggle with climate change for reasons that are well established in the literature. PEB asks them to make concessions on both fronts and this makes the resistance encountered unsurprising.

Discussion

A pithy summary of my interviews with local authority representatives is that they felt they could not use PEB in its current form: the reasons given ranged from the political (climate change currently being a low priority), to the philosophical (participatory budgeting being thought unsuited to imposing policy priorities upon citizens) to the practical (it being difficult and resource-intensive to deliver). This raises several questions as to the reasons for these responses and whether a change in the political and/or economic climate would alter respondents' positions since some of the objections appeared more contingent than others. The initial "no" was, though, followed by a host of interesting ideas concerning the use of aspects of the method or of an adapted version of it, indicating that it may have a relatively wide application, considerably beyond my original conceptualisation.

Reflecting on the examples presented in Figure 10.1, there is a pronounced tendency for the alternative applications of PEB suggested to lie further down Arnstein's ladder (1969) than the one tested. Educational and market research applications might even be argued not to have a place on the ladder at all. Another recurring message from interviews was that the tool would have to be used within a single budgeting area and various respondents indicated an assumption that, to the extent that PEB had a use, it should support the development of mitigation strategies. These findings are not surprising given, first, that citizen power (as Arnstein has it) is both a rarity in the UK and a source of controversy and, second, that many of my interviews took place with council stakeholders whose preoccupation is with taking advantage of immediate opportunities for emission reductions, rather than the longer-term business of preparing citizens and the council for the major reductions which will be necessary to meet the requirements of the Climate Change Act.

A perhaps more productive way of looking at the potential policy applications of PEB is to concentrate on the core of the method, in which the financial and climate change impacts of local authority interventions are juxtaposed in a comparable, quantitative form. Bristol interviewees saw value in this information, arguing that it would help to inform the subtler

decisions for which marginal abatement cost curves are too blunt an instrument. The outstanding question is whether these two dimensions will be considered overly narrow given the numerous other concerns of the typical authority. This is a point returned to in Chapter 11.

Chapter 11 A good idea at the wrong time?

I start this chapter by looking at each of the research questions in turn, assessing the extent to which my findings enable conclusions to be drawn. I then turn to some related themes that have arisen during the project:

- The legitimacy of participatory emissions budgeting
- Money and carbon
- Timing

I conclude by identifying the limitations of this research and their possible impact before exploring areas for future research.

Summary and progress with research questions

Research Question 1 asked if it is technically feasible to create a variant of participatory budgeting that meaningfully includes climate change impacts. The answer is a qualified "yes", in that it has proved possible to construct a choice-making exercise consistent with participatory budgeting in which participants are presented with options and invited to make selections with reference to their financial and emission impacts. It can be argued that the method developed does include climate change impacts "meaningfully" in that the choices open to participants were considerably limited by the inclusion of a greenhouse gas constraint.

There are two issues that qualify the answer to this question, both relating to the estimation of emissions. As reported in Chapter 8, attempting to estimate project emissions proved very challenging. This is very largely because of a lack of obvious points at which to truncate the chain of consequences. The literature on this aspect of greenhouse gas accounting has not yet acknowledged this challenge but it seems inevitable that it will. Not that this problem is peculiar to estimating greenhouse gas emissions; the estimation task just accentuates a problem that attends policy analysis in general. And anyone interested in policy impact should, by rights, wish to understand the likely indirect impacts of interventions they are considering. So, if PEB is going to be considered unworkable because of this truncation problem, this would appear to have far-reaching ramifications for public policy. It is surely more pragmatic to say that the emission estimates developed as part of PEB are bound to have a subjective component. And, for as long as PEB is conducted with projects that do not have massive emission impacts, this may be an acceptable situation. A secondary consideration is the resource implications of estimating emissions: various local authority stakeholders indicated that, whilst these may not threaten PEB's feasibility, they certainly put its viability in

doubt. This is a significant factor but one which may ease as a) the repertoire of projects for which estimates already exist increases and b) the need to reduce emissions becomes more pressing and, as a result, resources to support the process are released.

The second issue relates to the distinct treatment of finance and emissions, discussed in Chapter 6. Whether the differences explained there undermine the technical feasibility of PEB is more a matter of opinion than the truncation issue, though the distinct approaches to money and greenhouse gas certainly mean that they perform in quite different ways in PEB. It could be argued that to apply the principles for dealing with finance to emissions would place in doubt whether climate change was featuring *meaningfully* in PEB. Equally, to apply a 100-year finance horizon may imply that the resulting exercise would no longer deserve the title "budgeting". On balance, it seems that PEB as defined in this project is *technically* feasible in spite of the tension between financial and emission impacts.

Research Question 2 complements the first question in addressing more the *operational* feasibility of PEB, by asking how participants arrive at their decisions. Any answer offered to this question needs to be qualified, given the small number of pilots/trials conducted and their artificial nature. Setting these aside for now, it can be said that participants arrive at their decisions through debate which in many respects displays the characteristics of deliberation as it is described in the literature. There have been consistent themes of participants showing one another respect, of listening to each other and of arriving at decisions consensually or through majority voting, having first agreed consensually to adopt this approach. This again supports the views of those writers who advocate deliberation as a cornerstone of citizen participation. But it is not inconsistent with the views of critics who would see behind these consensual behaviours evidence of dominance and preference adjustment. Perhaps of greater importance for this project is that, on each occasion, participants have arrived at a choice set that complies with the constraints imposed, taking approximately the amount of time allocated to the exercise. That they have tended to complain along the way is a significant associated finding. As for drawing more general conclusions, the limitations of the approach taken to testing PEB in this project have already been discussed and will be returned to later in this chapter. A genuine application of PEB involving real resources may not go as smoothly: in addition to the possibility that the emission constraint would be rejected is the prospect that vested interests would be more apparent (as argued by a Bristol City Council interviewee) with possibly detrimental consequences for the deliberative process.

Research Question 3 asks what the opinions of participants are concerning PEB and the experience of taking part in it. It is not necessary to revisit the findings of Chapters 8 and 9 in detail here but a summary is in order. Participants were generally positive about taking part

and considered the exercise interesting, stimulating and even enjoyable in some cases, though some struggled with the quantitative aspect. Their views of PEB as an initiative were more mixed: though they tended to welcome the opportunity to make decisions about the allocation of resources, they were not generally enthusiastic about having to comply with an emission constraint and many questioned the legitimacy of its inclusion. For some this was because of doubts concerning the reality of climate change; for others, it sprang from scepticism about the usefulness of unilateral action to reduce emissions or about the relative importance of the projects' emissions compared with major mitigation initiatives; a third group objected in principle to the imposition of a policy priority upon a choice-making exercise which they felt should be unfettered. The consistency of the views expressed across the pilots/trials suggests that a similar pattern would be found if a larger number of PEB events was held. As for whether the views encountered were a function of the artificial nature of the pilots/trials, it is possible that participants would be more accepting of an emission constraint if real money were at stake but it seems likelier that their objections would be more passionate as they saw the constraint preventing them from choosing their favoured projects.

Research Question 4 asks what effect, if any, PEB has upon participants' attitudes towards local government in the context of climate change. Again, the small samples mean that this question can only be answered provisionally but the follow-up interviews conducted with participants in the formal trials provide some evidence of softening of attitudes towards decision makers in general, though not necessarily with respect to climate change in particular; instead, PEB seems to have given them a poignant taste of the difficult business of trading off priorities. But these shifts need to be seen against a background of more general criticism of local government and its representatives: the extensive discussion during the trials concerning the need to spend every penny available helps to accentuate the combination of distrust and contempt that certain participants felt for their councils. The question can be asked from a more hypothetical standpoint in light of the evidence that "classical" PB can improve relations between citizens and local government. A genuine application of PEB would probably bring citizens into contact with local authority representatives and this may help to break down barriers, but ranged against this is the possibility that the use of an emission constraint would exacerbate negative feelings that existed prior to the event for reasons explained above. One interpretation is that citizen attitudes to climate change are not yet at a stage where the inclusion of an emission constraint would be seen as a legitimate act on the part of a council. This can be contrasted with the use of a financial constraint which was accepted almost without comment by participants as a necessary evil.

Chapter 10 explores in detail the topic addressed by Research Question 5: what role(s), if any, could PEB play for English local authorities, and why? In summary, local authority

representatives were nervous of using PEB to allocate resources to projects but saw the method having possible applications in education, market research, appraisal and "optioneering". A range of reasons was given for this tentative position, stretching from the philosophical (relating to the proper role of citizens in public decisions) to the practical (such as the currently low priority accorded to climate change). These themes will be discussed at greater length below so are not elaborated further here. But one general point can be made: the development of PEB was predicated on the idea that one controversial set of methods – citizen participation – could, in the right circumstances, help local authorities to tackle a highly contentious issue – climate change. That PEB was found not to achieve this may reflect deficiencies in its design and/or execution but it seems likely that the difficulty is also a product of the fact that two areas which local authorities find difficult will not, when combined, cancel each other out. The lesson may be that local authorities, rather than combining citizen participation and climate change policy in the hope of some breakthrough, would do better to tackle them individually, addressing the challenges they pose in order to make progress. More specifically, local authorities should start with the internal barriers to progress on climate change before attempting to bring citizens into the planning process.

The legitimacy of participatory emissions budgeting

There is a paradox at the heart of participatory budgeting (PB): the government body, in ceding power to citizens, is at the same time defining the rules by which that power is ceded, thereby retaining power. Participatory budgeting is emphatically not the handing of the state to the citizenry; it is, instead, the creation of a limited space within government's jurisdiction over which citizens are given (nearly) unlimited control. And, for many, the paradox is tolerable. In fact, the experience of having some power may be so unfamiliar that citizens at first feel jubilant. This jubilation may enable citizens to overlook or forgive the constraints that have been put in place. Does this make participants in PB contented slaves?

Perhaps the most interesting finding concerning PEB is that it suggests not. The reaction of participants to the imposition of an emission constraint indicates that citizens can detect an unacceptable encroachment on their autonomy. This is perhaps because the emission constraint is explicit. The myriad projects that are not on offer in the exercise are hidden from view, as is the large proportion of the council's spending budget that falls outside the decision-making exercise. Perhaps, if the unavailable projects were displayed or a budget pie chart shown, there would be dismay similar to that witnessed during the trials.

Councils that initiate PB know that they are walking a tightrope, that the jubilation could turn to anger at any moment as participants realise how meagre a quantity of power has been made theirs. Hence the nervousness about the idea of an emission constraint (or any other,

for that matter): it merely increases the probability that the jubilation will be short lived. Amongst authorities whose motivation is to devolve power, this seems a reasonable worry: in their eyes, something young and fragile is growing and it needs the greatest care at the beginning of its life. The position is less legitimate amongst more cynical councils in which there is a general, unstated goal of retaining control of significant decisions. They perhaps want citizens to be contented slaves, and resist actions that might prompt a moment of insight.

And yet this type of council is arguably the right organisation to implement PEB: for now, until such time as carbon is considered a scarce resource (see below), the decision to include an emission constraint is at odds with a spirit of widening democracy. It is more the province of authorities whose leaders are confident about the direction that needs to be taken, for such leaders will not want to involve citizens in determining strategy but may instead feel that their task is to bring citizens along. Here the paradox is more pronounced: the council is giving power away whilst intending to retain it. It can achieve this by surrendering an amount of power so small as to make no practical difference to the overall balance.

But these authorities are equally unwilling to apply an emission constraint, though for more prosaic reasons: climate change is an inconvenience at a time when there are more pressing matters to attend to. Or they are mindful of a number of policy priorities of which climate change is only one, such that to give it preferential treatment might upset the delicate balance across departments.

Is PEB then, at bottom, a swindle? Does it, by placing limitations upon the decisions of citizens, in effect deprive them of the power it has promised them? This brings us back to the original paradox. If PEB is a swindle, then participatory budgeting (PB) is a swindle, just a subtler one. I would suggest a different answer: PEB, like PB, is a proposition. Citizens are free to take it up or reject it as they see fit. It is possible to criticise it for failing to live up to democratic ideals but this is true of all forms of citizen participation. If participatory budgeting is characterised as a step on the path towards citizen power, then it is inevitable that existing governance structures will define it; the question is of degree. And the issue of degree arose in a slightly different setting at the end of §3.1 when I asserted that, in the absence of resolution to the general debate concerning the desirability of citizen participation, "the questions then become a) what the relationship is between initial conditions, method and outcome; and b) how, in normative terms, to derive the greatest value from the participation process".

With respect to the first of these questions, the pilots/trials have helped to show that, where initial conditions include a typical attitude to climate change amongst participants, the use of a

method that imposes an emission constraint will quite likely produce the desired output (a compliant set of choices) but at the possible cost of an outcome – resentment or rejection of the exercise – that undermines the endeavour. Whether this needs to be the case is discussed further below. The answer to the second question depends on a definition of value that has been deliberately avoided up to now, in order not to prejudge the views of potential sponsor authorities. In Figure 10.1 four types of motivation for using PEB were presented: widening democracy/empowerment; improving decisions; attitude change; and understanding citizens. Maximising value will mean different things depending on which of these motivations presides, as discussed below.

The level of the constraint

In the first pilot, the emission constraints did not "bite" and there was no complaint about their inclusion. In the two formal trials, the constraint decidedly "bit" and complaint was widespread. A correlation between constraint level and degree of discontent therefore seems plausible. More specifically, the extent of complaint is likely to be a function of three variables: the participant's view of government in general, her view of the usefulness of seeking emission reductions through the exercise; and the extent to which the constraint prevents her from choosing her preferred projects. Only the last of these lies within the power of the person designing the exercise. I raised in Chapter 7 the notion that a target-based constraint may be perceived as more taxing than a budget-based constraint. For now, I shall assume that, if the two types of constraint result in the same number of feasible project combinations, they should be considered equivalent.

If the designer chooses to relax the constraint, then there may be less dismay amongst participants. But, if the constraint does not bite, what will the exercise have achieved? If the authority is seeking to widen democracy or to empower, then it probably does not matter. This type of authority would probably be aiming to derive the constraint exogenously (as discussed in §7.4) which could easily mean that it did not significantly affect the participants' range of choice. The same may be true of authorities looking to improve decisions: again, whether or not the constraint significantly restricted available choices would be less important than that the constraint properly represent the policy background, in particular any adopted reduction targets.

The third and fourth categories of motivation included in Figure 10.1 are arguably different from the first two. Authorities seeking to foster attitude change would not expect to achieve much if the emission constraint did not have a substantive effect on the set of possible choices; to a lesser extent, a local authority looking to understand its citizens would need the constraint to have an impact in order to be able to gauge participants' responses. But how

much of an effect is wanted? The potential danger of frustrating participants by making the constraint too limiting has been identified in Chapter 7 and this is arguably what happened in the formal trials. As pointed out in §8.2.7, participants had approximately 7,000 combinations available to them with both constraints in place in contrast with over a million beforehand. An emission constraint that reduced less dramatically the number of combinations available under a financial constraint alone might strike a better balance.

Money and carbon

Earlier on (Chapter 6), differences between money and greenhouse gas were identified as part of a discussion of their distinct treatment within PEB. Granted, the two will not become equivalent – money will remain a medium of exchange and greenhouse gas will continue to be an output – but they may well converge with time. At present, climate change is leading various actors to look for ways of reducing emissions and they are doing this through mechanisms such as marginal abatement cost curves (MACCs) which are used to identify the most promising of the measures available. What is not yet happening is the routine estimation of emissions associated with all organisations and activities but this seems likely to come once MACCs have done their work and the easiest options have been exhausted. At this point, price and carbon may begin to play quite similar roles. In passing, the methodological novelty associated with estimating emissions attributable to projects may also by this time have worn off.

The implication for PEB could be significant. At the moment, the inclusion of an emission constraint is looked on by local authorities as an arbitrary act: one could equally reasonably ask citizens to comply with a constraint relating to equalities, say. This means that climate change features as just one of many policy priorities and establishes a difference in nature between the financial constraint and the emission constraint: whereas the financial constraint is a practical necessity, the emission constraint is almost a whim. If/when carbon comes to be looked on as a scarce resource, which is to say if a given organisation can emit a given amount and no more[34], the impression is that its status in the calculation will change. And it seems likely that citizens will go from viewing an emission constraint with distrust to accepting it almost without question as they do a financial constraint. In, this sense, PEB may be ahead of its time. Time features again below, in the context of bad timing.

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[34] This is to be contrasted with an emission-trading scenario in which it is possible, albeit expensive, for an organisation to obtain a budget extension.

Timing

An economic downturn is not an ideal point at which to trial a form of citizen participation which takes account of a policy issue that seems to many local authorities less pressing than more immediate concerns, particularly if it is a form of citizen participation which is generally thought of in terms of distributing new money, when money is in very short supply. As an illustration, the method I had been developing came to the attention of an experienced PB practitioner with strong links to the Green Party in Brighton. He was keen to see it used there and pursued senior figures in Brighton and Hove Council (which is led by the Green Party) with some persistence but was unable to persuade them to meet for a discussion. His lack of success may reflect fundamental flaws in the method of the sort discussed earlier. But the explanation provided to him by his correspondents was that it was "primarily to do with resources" (Jones 2013). That the presiding Green Party in what is arguably England's most pro-environmental local authority area would not even discuss PEB appears to provide strong support for the notion that it has come at the wrong time.

The poor timing relates not just to austerity but to the prevailing narrative concerning localism and the transfer of power to neighbourhoods. PEB may seem too much a tool of the local authority (recalling discussions above about real or illusory transfers of power) at a time when the centre claims it would rather see citizens determining the mechanisms by which decisions are made. This raises the possibility that discussions with the more environmentally-inclined of the Neighbourhood Plan Committees would be a fruitful avenue for seeking an opportunity to carry out a live trial of PEB (see discussion of future application below).

Limitations of this project

The limitations of this research project have been mentioned already in terms of the number of pilots/trials conducted and their nature. It is appropriate to list formally here the significant ways in which resource constraints and other restrictions may have impinged upon the capacity of the project to provide answers to the research questions.

First and most important is the modest scale of this investigation, conducted with limited funds by a sole researcher. This ruled out the execution of a number of trials great enough to enable inferences to be drawn concerning the typical patterns of participants' preferences and their decision-making methods. It also prevented the use of a much larger portfolio of project options and the development of a larger range of approaches to setting constraints, both of which would probably have provided useful findings concerning the interaction between the content/structure of PEB and participant response.

A second important factor is the lack of variation in the decision-making tool. Chapter 3 mentions several methods that bear comparison with PEB as developed in this project; had it

been possible to adapt one with a positive track-record, this may have helped to resolve any concerns that resistance from participants and local authority stakeholders arose from avoidable weaknesses in the workings and appearance of the PEB prototype. In the event, the particular requirements for PEB were such as to make it more straightforward to start with a blank canvas than to attempt to convert an existing decision-making tool. As a consequence, PEB was less visually engaging than certain longer-standing products and it is quite possible that its Spartan appearance contributed to its unenthusiastic reception.

It is also significant that the pilots and trials were simulations. Though this approach was probably necessary given the task at hand, it does mean that all findings concerning participants' response must be looked at in light of the facts that they were paid to take part and were making artificial decisions about a fictional location. The lack of a real neighbourhood about which participants were deliberating was compounded by my adoption of projects from a pre-existing list which provided limited background information, making them appear rather sketchy in the minds of participants. And the fact that, with the exception of the first pilot, the pilots/trials were not witnessed first-hand by local authority representatives means that local authority responses to PEB will have been mediated by my representation of it during interviews. Whilst I attempted to be neutral in my explanations, it would be folly to think that I did not colour my description of proceedings to at least some extent.

Other limitations are more procedural: limited resource meant that I relied on luck or the generosity of others in obtaining participants for discussion groups with likely impacts upon the balance achieved; I was unable to secure the participation in follow-up interviews of certain key figures from the trials; as discussed in Chapter 9, the inclusion of geography in the recruitment quotas led to an inconsistency amongst participants' "mental maps" of Anyborough; the questionnaires used as part of the evaluation of the trials will undoubtedly have had weaknesses in terms of validity; and there will have been numerous instances of researcher bias in my analysis and interpretation of both the quantitative and qualitative data I gathered.

Future research/application

The following are possible areas for future research or application which would help to consolidate answers to my research questions or to enhance the usefulness of PEB.

In order to demonstrate more satisfactorily the technical feasibility of PEB, effort could be devoted to estimating the emissions attributable to a wider range of local authority projects of different kinds. This could be expected to demonstrate the extent to which the problems encountered with the 12 projects used in the pilots/trials are intrinsic to the process. With

respect to operational feasibility, meanwhile, it could be instructive to test PEB more extensively, varying the project set and the nature and level of constraints as well as the socio-demographic profile of participants. More detailed surveys could help to establish the extent of any shift in attitude towards local authorities amongst PEB participants. As identified in Chapter 7, a number of design characteristics have not yet been tested. These include varying the types of projects available (by allowing regulatory/charging projects, say) and altering the treatment of financial impacts by capturing costs/benefits over a longer period and/or including impacts experienced by actors other than just the council. Participants could be asked to choose amongst projects according to a sequence of constraints (including one relating to emissions) in order to show any differences in response. Factors relating to the execution of PEB could also be varied: citizens could participate in the development of the list of project options; deliberation could be removed from the method or introduced more formally than at present. And all of the above tests could be observed by local authority representatives in order to enable them to give a more informed and considered view concerning PEB's potential application. Finally, a mechanical form of preference aggregation could be developed to cater for the target-based approach to emission constraint.

All the above, though potentially very interesting, are likely to be less instructive than an authentic trial of PEB, in which the participants' decisions would be acted on. Multiple such trials would enable different marketing approaches to be tested. Also potentially very instructive would be the trial of PEB by bodies other than local authorities, in light of the significant barriers to its use by this sector. Neighbourhood Plan committees have already been mentioned but the suggestions made by local authority stakeholders that PEB be used in an educational setting or given to environmental NGOs could also be followed up.

Looking forward

This thesis started with the vexed relationship between local government and citizens. Participatory budgeting has been thought to assist in the process of reducing the distrust that prevails between the two and PEB was presented as possibly continuing this good work in the context of climate change, an area where local government and citizens alike need to be doing better. The obstacles should not be underestimated: the reasons for the vexed relationship and for the currently weak performance on climate change have been quite well researched and are compelling. The fact that PEB seems not to have made significant inroads is therefore not surprising. The irony is that, were carbon to occupy the status of scarce resource that it will surely attain, PEB would not need to be invented, for it would probably have evolved naturally. The very fact that it had not evolved may help to explain the scepticism with which it was received. Until the policy context develops to the point where PEB seems a more

obviously relevant method, its kernel – the (visual) presentation of quantified emission impacts – may make a useful contribution to the ongoing task of readying government and citizens for the reality of significant emission reductions.

So, is participatory emissions budgeting a good idea at the wrong time? Of course, the answer is not a simple "yes" or "no". PEB has some strengths and, with refinement, some of its weaknesses could probably be designed out. It also presents some challenges at the philosophical level which cannot be designed out and which, for some, make it fundamentally flawed. But, if those challenges are seen as inevitable, they can be put to one side. As for whether it has come at the wrong time, this is easier to answer: it has. But the implication is that PEB may seem more relevant and palatable at some point in the future.

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Appendix A Findings from discussion groups in Haringey and Tamworth, September 2011

This note describes the significant points that arose during discussions held with citizens in Haringey and Tamworth in September 2011 as part of the early development of the PEB concept. The process is described in Chapter 8.

Amongst participants there was a tendency to be suspicious of consultation processes they had experienced. One theme was a perceived lack of clarity and/or desire for feedback to participants. As conversation turned to participatory budgeting (PB), there was some enthusiasm for the notion of wholly controlling the destination of resources, in contrast with the sense of not knowing what effect citizen participation had in other examples. PB has been used in both Tamworth and Haringey so participants were able to refer to practical examples, though not all had participated actively. There was in general guarded enthusiasm for the PB processes that had taken place locally. In Tamworth in particular, participants felt the process had been good for bringing people together in a small community who might not otherwise have become involved in any form of civic participation. They also saw some benefits in learning how municipal budgets work. But they raised some concerns:

- Knowledge of the decision-making events was not as widespread as it might have been, with one participant suggesting that a concerted door-knocking exercise would have been desirable.
- The allocation system, where each voter was able to distribute a nominal sum across candidate projects, was thought to have confused some voters.
- Certain projects benefitted from there being a ready pool of voters (either because they naturally felt kinship with the project or because their vote had been actively canvassed by the project's sponsors) and therefore had what could be seen as an unfair advantage.
- Though the application form for Tamworth's PB programme was relatively straightforward, it nonetheless excluded some potential bidders.

The Haringey interviewee expressed a concern similar to one of those raised in Tamworth, that those choosing to attend a voting event would not necessarily be representative of the wider community and may be present in order to support a pet project.

With respect to the **example invitations** (Appendix F), there was a variety of responses and no single candidate emerged as more popular than others.

The discussion of **example project lists** (Appendix F) demonstrated a shared preference for a local focus, for several reasons:

- If local, projects would be likelier not to be "core" to the council's activities such that essential services would not be at risk if a given project did not receive sufficient support.
- On a similar note, the Haringey interviewee was concerned that certain worthy, council-wide projects would suffer in a PB exercise because they would not be perceived as desirable by voters in comparison with other more immediately attractive projects. A local focus would imply that "core" projects were not at risk.
- The more local the focus, it was argued, the more homogeneous the community in question, thereby making it easier to select projects that met its principal needs as well as lessening the pressure upon voters to consider a diverse set of needs when selecting projects.
- A local focus was felt likely to engender a stronger desire to participate – with respect to a council-wide event "you'd think 'other people will go so I won't bother'" (Tamworth participant).
- Local projects would be easier to deliver because of their modest scale and therefore would present lower risks.

The introduction of the topic of climate change elicited a range of responses amongst Tamworth participants who tended to be sceptical about whether climate change was occurring at all and whether humans were to blame. One participant cited the degree of disagreement amongst experts reported in the media as grounds for not knowing whom to believe. This starting position influenced participants' reactions to the subsequent tasks and is returned to below.

When participants were shown the presentation options for project attributes, there was some confusion amongst Tamworth participants in response to the idea that the emissions values could be positive (net increase in emissions) or negative (net decrease) and a degree of explanation was required.

There was general enthusiasm for the use of points rather than native units.

> "You're dealing with a lower number [using points] which makes it simpler anyway. It's more practical for everybody." (Tamworth participant)

As to whether this would mean voters lost touch with the quantities represented, most participants felt at ease.

> "So long as you've got the comparison there, that's what the cost is real money and that's what it's converting to I don't think anyone would complain if they dealt in that." (Tamworth participant)

There was, however, some concern:

> "The simplicity that this gives also means that it can become slightly abstract from what you're talking about." (Haringey interviewee)

When greenhouse gas emissions were presented in two categories, this prompted a mixed response. The Tamworth participants were at first bemused but appeared content with the distinction between the two categories once it had been explained. Subsequent remarks revealed a view that dealing with climate change was the job of government (ie that it should not be a consideration for citizens choosing projects) but this appeared a general view rather than one aimed specifically at the council's own emissions, say. The Haringey interviewee was comfortable with the idea of looking at emissions from two perspectives, saying in response to the suggestion that the council might be expected to sort out its own emissions, "no because I can see how they [council-level emissions] impact on these [community-level emissions]". In addition, when presented with the hypothetical scenario of a project that offered a considerable emissions saving at the community level but at the expense of a significant increase in council emissions, leading the council to rule it out, the interviewee answered:

> "Well I wouldn't blame the council, I'd say that the system for imposing those thresholds was wrong and I could see why they'd make that decision." (Haringey interviewee)

Discussion of options 'A+2' and 'C+2' (which allow the number of units of a given project to be specific, see Table 8.1 & Appendix F) indicated some appetite for being able to set the quantity of a given project rather than being forced to choose between simply having a project at the stipulated size and not having it at all, though the Haringey interviewee suggested that this could encourage horse-trading between factions, without taking a view as to whether this would be a problem. The support for enabling the setting of volume also led to the observation that, as well as there being a practical maximum, there might also be a pragmatic minimum:

> "But also you kind of have to think what if the things that need doing, you can't just have one of them you need [a minimum of…]" (Tamworth participant)

The presentation of multiple "budgets" prompted some concern on the part of Tamworth participants:

> "So which one are we saying you've got to get to a hundred? The total financial cost, or the gas costs?" (Tamworth participant)
>
> "In terms of meeting the needs of our area based on climate change or based on everything?" (Tamworth participant)

There was also some evidence that scaling two sets of greenhouse gas emissions (measured using the same native units) to fit a budget of 100 points created scope for misunderstanding, as one "community" point would probably represent a different quantity of greenhouse gas than one "council" point.

As participants were asked to make project selections (using presentation option 'C+2' in each case[35]), this proceeded reasonably smoothly. In Tamworth, four projects were chosen (two or three units of each), leading to the exhaustion of the financial budget. The associated discussion implied that participants saw this as an implicit goal – to spend less than what was available would be a lost opportunity. The Haringey interviewee was left with 6 finance points, having made three project selections and explained that they had seen the financial budget as the deciding one since it was possible for it only to reduce, whereas the greenhouse gas emissions totals could go up or down depending on the choices made.

Observations concerning the selection process included a feeling that some automation would be necessary, or at least that any facilitator should do the calculations. The mathematical burden might otherwise be excessive. A connected concern was that participants might conclude they had made poor decisions which they would like to reverse and that there should be scope to "wipe out" a given decision. A reason for this was that the first choice might be made almost casually, after which a statement of remaining budget would be expected to focus participants' attention on making the best choices from that point on.

Once choices had been made, participants were asked to reflect on the experience. Most were content with the mechanics of working with the budgets.

> "It was very straightforward and it's quite appealing…you go along as a citizen and you hear and then you have a judgement…it's quite a clear task whereas I think sometimes consultation can be so nebulous that it's not really that clear what you're there to do." (Haringey interviewee)

The following specific issues were raised about the process.

- Because the financial budget was spent rather more quickly than the emissions budgets, it was suggested that the educational impact of the process might have been negatively affected; being forced to make more difficult emissions decisions might be beneficial.
- On the basis of using a process which allowed the determination of quantity, the Haringey interviewee felt that it would be necessary to choose the project first and then the quantity, rather than attempt to agree on both simultaneously.

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35 This option included both council-level and community-wide greenhouse gas emissions, with all impacts presented in the form of points (not absolute quantities); it was possible to specify the number of units of a given project.

In general discussion, other topics arose concerning the working of the decision-making method. On the basis that the project list would have to be fixed in advance of the voting event, could citizens be involved in its definition, in order not to be presented with projects that they felt were insufficiently relevant or wide-ranging? An additional "long-listing" meeting before the voting event was felt excessively demanding so perhaps on-line discussion could be used as a means of generating a list of candidate projects. With respect to providing information concerning the project options to voters, the Haringey interviewee expressed concern about the idea of each project having a champion speaking on its behalf, for fear that the more eloquent or charismatic speakers would have undue sway. But imposing the task of justifying each of the projects upon a single facilitator was felt an unfair burden, so the provision of written information may be the best compromise. Where group discussion was used to consider the merits of projects and work towards decisions, there was the risk that some voices would dominate whilst others would be drowned out. Active facilitation was seen as a way of promoting a balance of contributions. The Haringey interviewee favoured deliberation as a means of getting participants to reflect on the options and their merits so as to avoid reflex voting but argued against requiring participants to reach consensus concerning their selections.

The discussion of climate change in Tamworth in particular generated several thoughts. Several participants made statements to the effect that it was government's job to deal with climate change and that it was therefore inappropriate for citizens to be required to make their decisions according to an emission constraint. Connected with this was a view that many citizens would defy a requirement to comply with such a constraint, particularly given a focus upon local priorities.

> "The normal people who you're working for in the community – they don't want to know. To be honest the old people I cook for and everything, they don't want to know about it; it's not happening. All they're bothered about is if they're getting it, they're getting it cheap or reduced and they don't want to know about climate change or what it's going to cost the council; they just want it." (Tamworth participant)

One participant observed that those attending voting events differed in their motivations, some arriving only so as to vote for a given project having been canvassed by one of its sponsors. Such voters, the participant thought, would have no time for the introduction of a climate change constraint:

> "So if you start wrapping things up with climate change and everything else and chucking loads of other… they're just going to tell you to sod off." (Tamworth participant)

An alternative approach, suggested by one participant, would be to deal with climate change in advance by offering only projects that achieved some standard of acceptability in terms of emissions and thereby removing the issue of emissions from the choice process.

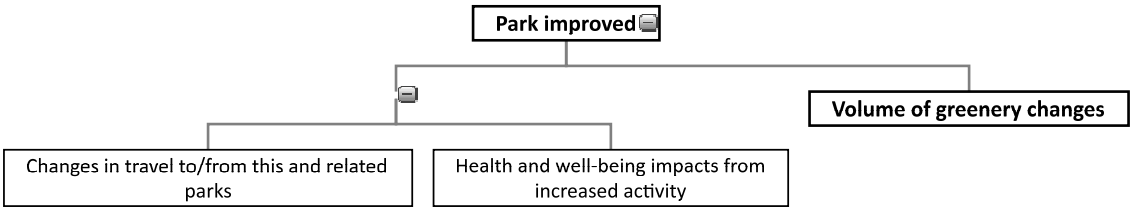
On a more technical note, one participant raised the question of project-related emissions in the context of ambient emissions, wondering how the emissions of a local power station would be taken into account in a voting exercise.

Appendix B Project-level emission estimation

Introduction

This appendix presents a project-by-project summary of the forecast impacts that were used to inform the estimation of community-wide greenhouse gas emission changes compared with business as usual (as described in Chapter 6[36]). For each project, the impact diagram developed to support impact estimation is reproduced. In certain cases, additional notes point out where an impact was originally predicted for a project but either a) no evidence was found to support impact estimation or b) such evidence as was obtained was inconclusive or suggested a nil effect. This appendix should be read in conjunction with Appendix I, the Excel workbook entitled "Formal trials (2012.11) - project emission estimates etc" which is part of the CD-ROM that accompanies the printed element of this thesis. Throughout that workbook are comments that explain the calculations and name the sources of quantities used (which can be found in the list of references above).

Project 1: Park improvement project

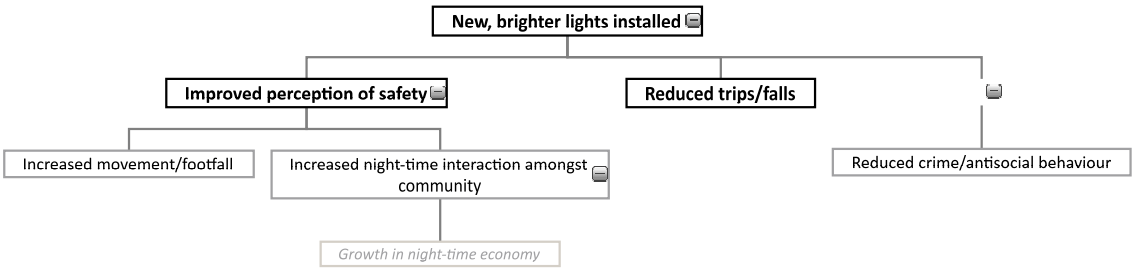


I was unable to find evidence concerning the visitor impacts of park improvements.

The evidence in the literature concerning the health (and therefore longevity) impacts of light exercise (ie that which does not raise the heart rate) is mixed. Fogelholm (2010) led me to settle on a nil effect.

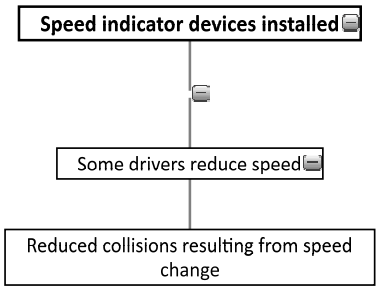
[36] It did not prove necessary to calculate council-level emissions or gross values of community-wide emissions.

Project 2: Better street lighting

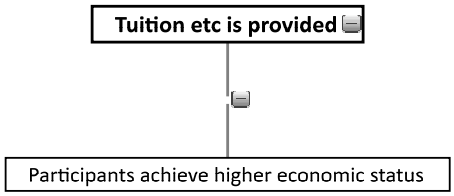


I searched without success for evidence linking lighting level/quality and the incidence of falls. I was similarly unable to obtain evidence to support a quantitative relationship between perception of safety and propensity to go out after dark.

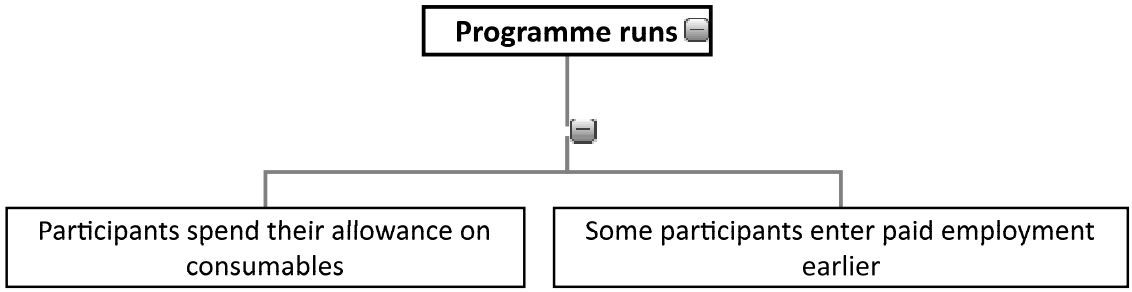
Project 3: Speed indicator devices to encourage slower driving



Project 4: Study support – learning beyond the classroom



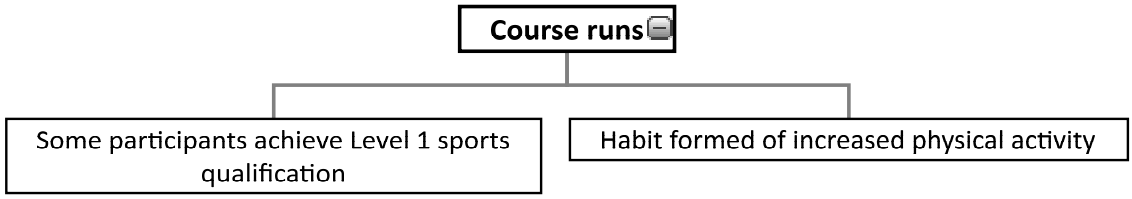
Project 5: Skillsmatch graduate placement programme



I concluded that it would be inconsistent to include the emission impacts arising from participants spending their allowance since, in all other cases, staff employed on projects would earn a wage which they would presumably spend.

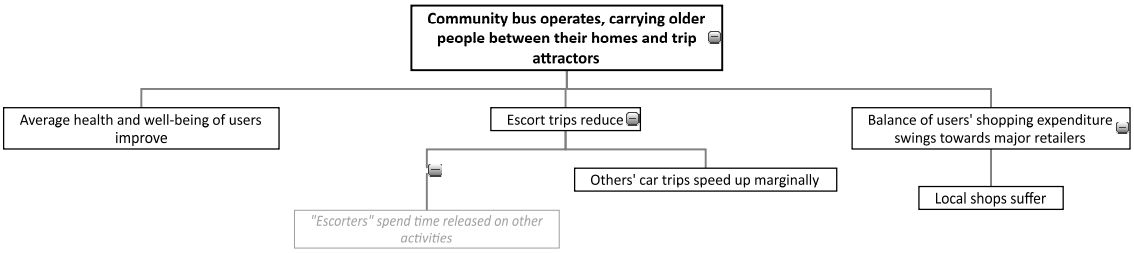
As for the employment impacts of Skillsmatch, Wilton (2012) finds the evidence to be inconclusive.

Project 6: Community football coaching for young people



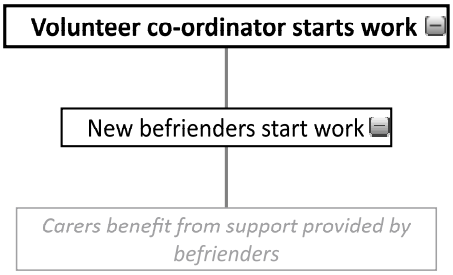
It proved impossible to obtain any evidence concerning the proportion of participants who would obtain a sports qualification and it was unclear what benefit such people would derive from the qualification once obtained. I was also unable to obtain evidence concerning the long-term effects of such coaching schemes upon individuals' exercise habits.

Project 7: Community bus for older people

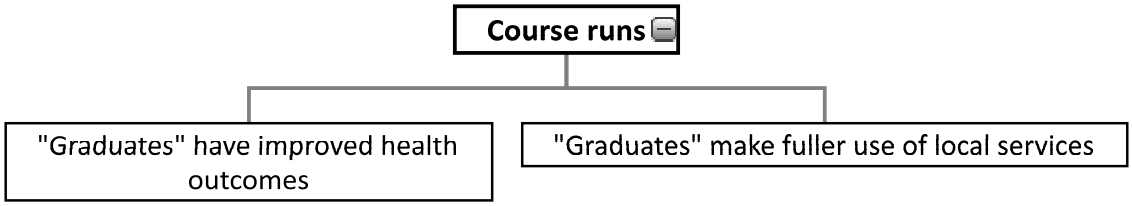


I encountered no quantitative evidence concerning the health/well-being impacts of a service such as a community bus, nor did I find information concerning the likely magnitude of any swing in retail behaviour as a result of visiting large supermarkets.

Project 8: Support for carers

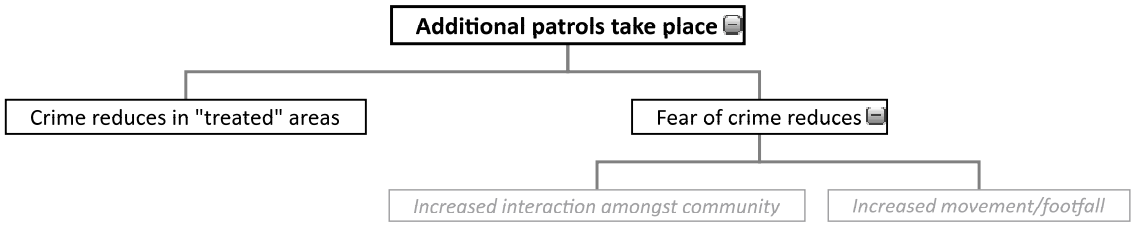


Project 9: Warrior Women personal safety training



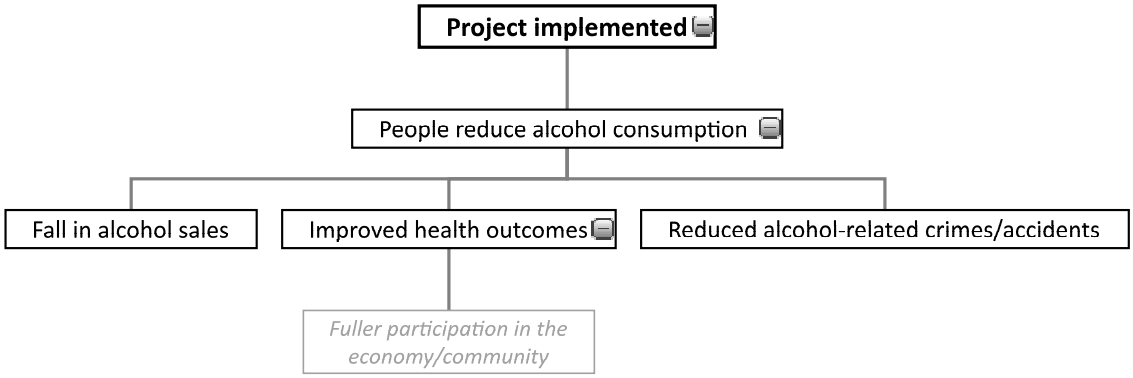
With respect to personal benefits, a review paper (Brecklin 2008) suggests some psychological and behavioural outcomes but none that could be robustly linked with a phenomenon that has a greenhouse gas implication. For example, graduates may behave more confidently (and participate in activities which previously they would have avoided) but it is not possible to make any quantitative inferences.

Project 10: Targeted policing operations



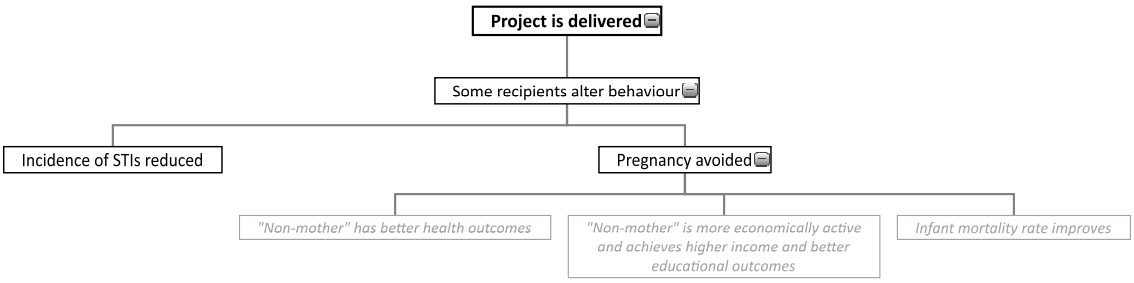
There is believed to be a link between fear of crime and health/well-being but researchers have not succeeded in quantifying it (Lorenc et al. 2012).

Project 11: Reducing alcohol's harm in young people, older people and A&E attendees



The evidence is that projects of this kind are not effective in reducing alcohol consumption (Gorman & Speer 1996; Stigler et al. 2006), thus removing all 1st-order impacts set out in the diagram.

Project 12: Sexual health – under-18 pregnancies



Evidence (Tolli 2012) is that STI infection rates are not affected by projects of this kind.

Appendix C

***You Decide!* Projects**, 28th November 2012 – choice flowchart

Appendix D

***You Decide!* Money**, 28th November 2012 – choice flowchart

Projects		Running total
Added	**Removed**	**Money**
		100
2 x Targeted Policing 1 x Speed Indicator Device 1 x Support for Carers 1 x Park Improvements 2 x Community Bus 1 x Community Football		**-15**
1 x Support for Carers	1 x Targeted Policing	**2**