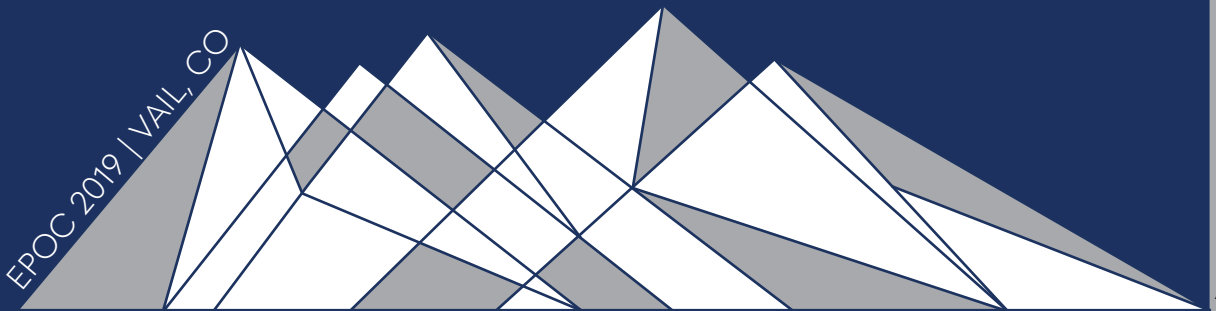
17th Annual
Engineering
Project
Organization
Conference

Working Paper Proceedings

Project Intermediation: The Critical Role of Negotiating Socio-Technical Regimes and Technological Niches to Achieve Climate Change Policies

Kate Gasparro; Stanford University, USA
Vedran Zerjav; University College London, UK
Effie Konstantinou; University College London, UK

Proceedings Editors
Paul Chinowsky, University of Colorado Boulder and John Taylor, Georgia Tech



Project Intermediation: The Critical Role of Negotiating Socio-Technical Regimes and Technological Niches to Achieve Climate Change Policies

Abstract

This paper uses the socio-technical transitions model to understand the characteristics of the evolving, interdisciplinary, and externalized context of climate change. Specifically, we (1) identify the elements of the multi-level perspective that exist under new climate change policies and trends and (2) conceptualized how this multi-level perspective will result in emerging project practices. Together, these two areas of insights help us create a preliminary framework to better understand and identify specific contextual characteristics that might influence the use and adoption of project practices. This conceptual framework leads us to a key insight: the role of projects in a socio-technical transitions context. Unlike projects that are delivered within a closed-system environment, these projects are supported and affected by established institutional and policy measures. The preliminary conceptual framework emphasizes project intermediaries and how they choose project practices that translate policies into climate change outcomes. From this framework, we lay forth propositions that will inform and be tested in subsequent empirical case studies, where we plan to further explore project intermediation, focusing on the empirical setting of climate change infrastructure.

Introduction

Climate change is an all-pervasive component of most existing Grand Challenges frameworks (World Economic Forum, 2017). And, central to the climate change mitigation and adaptation debates are infrastructure projects because of their wide-reaching climate externalities (both positive and negative) (The New Climate Economy, 2016). As a reflection of this, the United Nations, World Bank, International Finance Corporation, other multilateral development and lending organizations have established frameworks to support investment in infrastructure projects with climate change adaptation and mitigation objectives. While these infrastructure projects are important for achieving climate change goals laid out in the Paris Agreement, there has been a lack of understanding around how these projects are being managed to achieve better climate change outcomes. The long-term goal of our work is to identify project practices currently being used and those that should be used to support better climate change outcomes. This work will generate a preliminary conceptual framework so that we understand the evolving context of climate change policies and initiatives, so that we may identify the most critical project practices for delivering climate change outcomes.

Implementing Climate Change Policies through Infrastructure

Infrastructure projects play a critical role in climate change trends by perpetuating, mitigating, and adapting to changing environmental conditions. For example, building construction and subsequent energy consumption accounts for nearly 47% of greenhouse gas emissions (Oxford Programme for the Future of Cities, 2010). Additionally, renewable energy infrastructure can replace oil and gas infrastructure, lowering greenhouse gas emissions. And, smaller initiatives, including new bike share systems, transit fuel agreements, and solar retrofits, can result in net greenhouse gas reductions. Together, these projects utilize emerging technologies to achieve positive climate change objectives. In doing so, they become tools for policy implementation

(Brunet & Aubry, 2016). Under new and expanding international, national, and regional policies, there are now more infrastructure projects with climate change objectives. Realizing these objectives has been made possible by an increasing amount of resources and attention from diverse stakeholders. This new context plays a critical role in determining which projects and what outcomes to pursue. But, at a project level, there is still a lack of understanding around which project practices are most critical for achieving positive climate change outcomes.

This paper addresses this concern in two parts. The first part defines the new context in which infrastructure projects and their objectives are being selected in the name of positive climate change outcomes. To do this, we draw on socio-technical transitions to conceptualize how policy decisions influence projects and how projects might form around technology innovation to deliver climate change outcomes. As part of this context overview, we discuss engagement with stakeholders present in socio-technical transitions regime and landscape, and how they interact within and between policies and innovations. The second part looks specifically at which project practices are and should be used to achieve positive climate change outcomes within these projects. In particular, we identify potential shifts to project practices that should be considered for projects, and their technology innovations, given the climate change context.

Socio-technical Transitions and the New Climate Change Regime

The socio-technical transitions model has been used to understand and conceptualize the shift under which climate change initiatives, projects, and innovations have been realized (Geels, 2011; Geels, Sovacool, Schwanen, & Sorrell, 2017). The goal of this model is to understand how innovations emerge and are then able to scale and become adopted within a given regime. By using a multi-level perspective, proponents of socio-technical transitions suggest that new states emerge when exogenous pressures and interactions align between three analytical levels (Geels & Schot, 2007). Because addressing climate change outcomes relies on the interaction between multiple stakeholders, diverse industries, emerging technologies, numerous resources, and policy action within an evolving context, the socio-technical transitions model was selected as the theoretical framework to advance our argument in this paper. The following paragraphs take a deeper look at the model features and it's application for climate change projects.

The first level, the socio-technical landscape, is the external context and structural trends that often initiate and maintain momentum in the transitions process (Papachristos, 2011). The landscape includes factors that do not change or change slowly, long-term trends, and rapid external shocks (Van Diel and Schot 2005??). In respect to climate change, the long trend of increasing greenhouse gasses and its impact on the environment is the external context that has initiated the transitions process (Papachristos, 2011). In some cases, climate change, as it has contributed to growing and intensifying natural disasters and resource constraints within a short time period, acts as a disruptive landscape change. These landscape conditions and trends comprise the underlying foundation for the two other levels.

As a result of landscape changes, stakeholders take action to address issues and new circumstances that arise. These actions become part of the socio-technical regime, the second level in this model. The socio-technical regime is characterized by existing status quo behaviors

including lock-in relationships, normative rules, routines, institutional arrangements and artifacts. As climate change becomes an ever present force in weather patterns, affecting public health and safety, stakeholders have taken it upon themselves to shift institutional arrangements to address these issues. Specifically, stakeholders have enacted new policies to allocate resources for mitigating and adapting to climate change. Globally, increasing attention on climate change is seeing socio-technical transitions come to life. International climate change policies, like the Kyoto Protocol of 1992 and the 2015 Paris Agreement, outline a clear set of objectives for countries, which have in turn prompted new climate change initiatives and projects. We see this through Bulkeley et al.'s (2014) survey of climate change initiatives. Bulkeley identifies 132 initiatives before the 1992 Kyoto Protocol and 495 initiatives after the Protocol was ratified. These initiatives and projects are the ways in which signatory countries, and their cities realize climate change objectives. And, if we dive deeper, international, as well as national and local, climate change policies become realized through initiatives and projects that encompass the last level of this socio-technical transition model.

The socio-technical transition model focuses its attention at this last level, the technological niche. Many scholars identify new technology innovations and theorize around how the other levels, landscape, and regime, have aligned to allow the emergence of technological innovations. As a type of "incubation room" (Kemp, Schot, & Hoogma, 1998), technological niches allow innovations to thrive before they can be scaled up and implemented into the regime. To understand the transitions of technology innovation from niches into regimes requires a deeper understanding of what occurs when a window of opportunity coincides with dominant design, price and performance improvements, and favorable market conditions (Geels et al., 2017). In regards to climate change, the technological niche can be considered the initiative or project wherein individual technologies, such as biodiesel transit, energy efficient buildings, solar street lamps, and improved waste management, can be developed and implemented prior to entering the regime. These technologies, while possibly developed at much earlier points, would not have scaled at a larger level without a regime shift. As such, the technological niche is where climate change policies are realized.

As shown through the socio-technical transitions model, climate change initiatives do not exist in a silo. And, as a result, climate change projects create outcomes that intend to have expansive social and environmental outcomes. Considering these interdisciplinary and expansive outcomes, it is not surprising that climate change projects often include multiple stakeholders and an influx of resources. Managing stakeholders and resources for each climate change project requires extreme intermediation. Therefore, climate change projects and the realization of positive climate change outcomes is not an organic process. There are key intermediaries, both systemic and project intermediaries, that sit between the regime and innovation niche levels to moderate stakeholder relationships and resource flows to achieve climate change outcomes. Hodson et al. (2013) highlight the role of intermediaries and their ability to mediate (1) production and consumption, (2) priorities and levels of different stakeholders, and (3) realization of a vision and application of stakeholder priorities. The systemic intermediaries as they apply to climate change play a role at the urban level in translating climate change objectives into concrete initiatives, project scope, and resources to achieve climate change outcomes. In particular, these

intermediaries include non-governmental organizations, local government agencies, and energy service companies.

The focus of these intermediaries in an urban environment is important as cities increasingly become loci for realizing climate change initiatives, much more so than their national counterparts. Global cities, which are responsible for a growing percentage of the global GDP, are incentivized to address climate change concerns. Global cities are logistics mavericks, responsible for moving resources and goods around the world, and are able to reasonably scale climate change solutions for their own populations. At the same time, global cities are also often located on sea fronts and susceptible to many climate change effects (Mike Hodson & Marvin, 2010). Even while international agreements often supersede and influence city policies, the withdrawal of nations from these agreements has not precluded cities from moving forward with their own climate change policies. As such, systemic intermediaries are increasingly understood for their role in mediating between the regime and innovation niches by deploying resources, negotiating stakeholder priorities, and enacting local policies (Hamann & April, 2013; Michael Hodson et al., 2013; Mike Hodson & Marvin, 2010; Mignon & Kanda, 2018).

While there is a burgeoning field of literature that details the role of systemic intermediaries for climate change socio-technical transitions, there is limited understanding of project intermediaries who serve as the link between the socio-technical regime and the technological niche. Whereas systemic intermediaries serve as a similar link and reside in the regime, project intermediaries reside at the project scale, catering to the technological niche. Whilst there is literature on the intermediaries (organizations such as NGOs and ESCOs), we posit that the role of projects in a socio-technical transition model is not only to execute (get things done by generating outputs) but also to perform the key role of intermediation between multiple socio-technical levels. In other words, rather than focusing on intermediaries as organizational entities, we focus on intermediation as an activity and, particularly, how it is embodied within policy projects and the Grand Challenges context.

As projects become an increasingly prominent way of realizing climate change policies, it is important to understand how project decision makers (including project managers and other key stakeholders) select practices for project delivery to achieve positive climate change outcomes. Therefore, we are interested in how project intermediation (primarily, though the decisions of key project actors, including project managers) occurs in the midst of these transitions to deliver projects, and consequently technologies, that will achieve climate change objectives. And, this is where project studies should be brought to play to understand extant project practices.

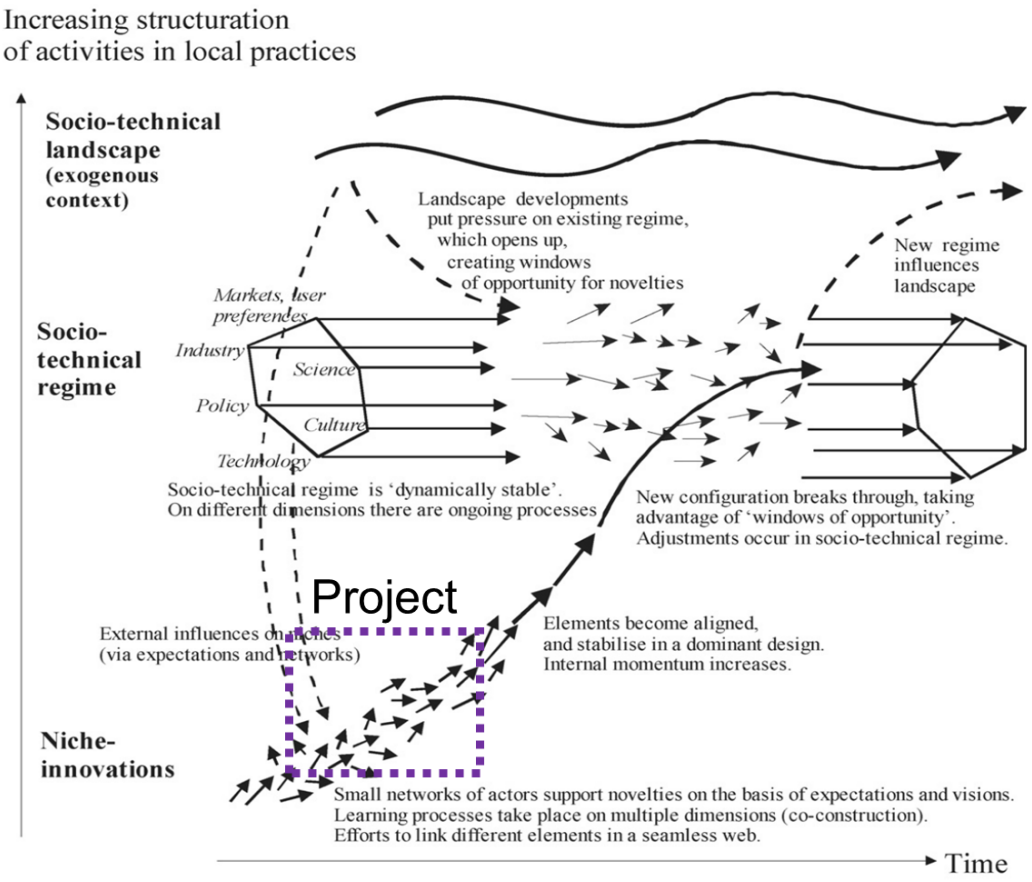


Fig. 1. Multi-level perspective on transitions (adapted from Geels, 2002, p. 1263).

Figure 1: Project intermediation in socio-technical regimes (adapted from Geels 2002)

Project Intermediaries and Realizing Positive Climate Change Outcomes

The notable absence of references to project practices in climate change and policy implementation literature indicates that projects are either taken for granted or wholly neglected. This is due, in part, to the fact that project management, has mainly been applied within a closed-system environment. This is conducive to conventional project management execution frameworks; however, it stands in contrast to climate change objectives. Climate change objectives seek to affect social and environmental conditions beyond typical project cost, schedule, and quality outcomes. As more infrastructure projects are pursued as part of a new climate change regime, it is no longer possible to keep projects and their practices within a closed-system environment. Instead, we must understand how project decisions drive practices, within an expansive context, to achieve positive climate change outcomes. Further, we, as project scholars, should embrace interdisciplinary literature, including literature on socio-technical transition models, to generate novel understanding of project practices within an evolving regime and landscape to reap positive social and environmental impacts.

Past literature around project practices, has sought to understand which practices are most conducive given a project's characteristics. This requires us to understand (1) the characteristics that define a project, (2) project success outcomes of interest, and (3) practices available for delivering a project. When we consider projects as the organizing space for technology innovations, we begin to see how the regime (primarily, shifting policies and resources for climate change) influences project characteristics and project success outcomes. What remains unclear is how project practices are chosen and employed to achieve success outcomes for climate change projects.

In theory, we all accept that projects and their management have strategic implications for a wider range of project stakeholders (including the wider public and society). But, in practice, project management is still seen as execution management with little, if any, involvement of Grand Challenges contexts. Historically, notable projects, such as the Manhattan and Apollo projects, were managed and studied within a closed-system environment (Davies, 2017; Morris, 2013). As part of this closed-system environment approach, project managers did not have to characterize their projects within a greater context. Therefore, project outcomes could adhere to the iron triangle of maximizing for cost, schedule, and quality. When project managers selected practices, they could establish a work plan and expectations without considering factors beyond the boundary of the project. With this mentality, any deviation from the baseline case was dealt with as a singular case and a project practices continued to remain the same. But, as technologies evolved and projects sought to address externalities, this Project Management 1.0 approach became obsolete.

As project management moves toward Project Management 2.0 principals, project practices must be contextualized (Levitt, 2011). In fact, recent research has shown the shortcomings of engineering-based and static 'system of systems' approaches when dealing with emergent changes in infrastructure project development (Zerjav, 2015). Not only should project practices move beyond the closed-system environment, they need to help transform infrastructure projects into long-term operational outcomes, addressing project implications for society (Zerjav, Edkins, & Davies, 2018), including policy. This draws direct parallels to the socio-technical transitions model and multi-level perspectives. Within a climate change regime, projects must rely on effective international, interdisciplinary, cross-sectoral and inter-organizational collaboration.

In these project collaborations, the level of professionalism with which a project is designed and executed becomes a key factor. Firstly, it contributes to the development and delivery of best practices. Professionalism in project management, and in management more broadly, is an underdeveloped area (Muzio, 2011; Muzio, Hodgson, Faulconbridge, Beaverstock, & Hall, 2011). Even though professional bodies are the key means of social organization of project practitioners in a community (Dingwall, 2014), they do not control entry to the profession of project management, as for example is the case of the General Medical Council for doctors. As such the skills and competencies, the ethics that guide the practices of project practitioners are not stipulated by a professional body. In most cases, in practice, project management skills and competencies are designed and delivered by project-based organizations (Noordegraaf, 2011, 2015, 2016) which rely on a level of project management competence, or by project management

consultancies which support project-based organizations. There is guidance for project management professionals to choose project practices within a closed-system environment, as outlined in the Project Management Book of Knowledge. But, the professional body of knowledge has not adapted given the new socio-technical regime. This means that the project manager and key stakeholders lack support that other professionals enjoy once they are registered by their respective professional bodies (Paton, Hodgson, & Muzio, 2013). The project management professional can turn to his/her organization only for what is often unvetted support, advice and insight into existing and new practices (Hodgson, 2002, 2005), whilst, for example, medical professionals would also have access to a broader support infrastructure which brings together academia, professional bodies and other organizations as point of reference for the medical practitioner. As the socio-technical regime transitions, the absence of professional support can be a detriment for project delivery. This issue is exacerbated by the interdisciplinary nature of Grand Challenges, such as climate change. Professionals who work on climate change projects require systemic skill development, but there is no institution which can act on behalf of or across particular industries to support climate change work. Skills and practices that are identified as necessary at the industry or national (regime) level have no way of being institutionalized in national curricula and the efforts of organizations to build project management capabilities (Konstantinou, 2015). This issue is highlighted as the project context evolves.

In recent years, project scholars have sought to address evolving context by (1) characterizing projects within their social, economic, environmental, and geographic contexts, (2) identifying project success outcomes beyond project cost, schedule and quality, and (3) allowing project managers to adapt and customize project practices that are well aligned with their projects and expected outcomes. A few project scholars are attempting to understand project practices within a socio-technical transition in an attempt to move beyond closed-system environments (Gil, Miozzo, & Massini, 2012). Project management in response and parallel to socio-technical transitions has sought to identify project level conditions and practices that are well aligned for innovation to occur (Gil et al., 2012). In these innovation cases, project managers must think beyond their schedule, cost, and quality constraints and build in capabilities that allow technologies to be selected and developed within a project's context. Project managers must put concerted effort into building this capability because of the number of stakeholders involved and the need to negotiate their differences.

Project characteristics which encompass the scale, technology, complexity, are important to understand because they allude to constraints and the available project practices that project managers may use. In 1998, Shenhar (1998) used a two-dimensional axis to define projects. The first axis considers the projects level of technological certainty, while the second axis reflects the project's complexity. As one of the first scholars to do this, Shenhar's approach reflected a closed-system environment, where project managers were not concerned with externalities of the project. In a subsequent iteration of categorizing projects, Martinsuo (2013) defined projects by looking at their organizational complexity, degree of innovativeness, contextual dynamics and organizational governance type, and managerial context. Understanding the state of technology is essential for determining which project practices to deploy, but what is lacking in these

frameworks is the extent to which a policy or externalized outcomes are integrated in how a project is categorized and the project practices that are best aligned with these outcomes.

In more recent studies, scholars have attempted to identify and examine project success outcomes beyond a closed-system environment. For example, Papke-Shields et al. (2010) identify six types of project success: cost target, time target, technical specification, quality requirements, client satisfaction, and business objectives (profitability and market share). With climate change projects, it becomes even more important to identify external outcomes. An additional level of complexity arises when project managers' expected outcomes, increased profit or timely delivery as part of a firmwide approach, come into conflict with expected project outcomes.

The bridging components that tie project characteristics to project success are the project practices. The PMBOK, as a guiding document for project managers, sets out practices that continue to be touted as important in achieving project success. These practices have been organized into nine knowledge areas described in the PMBOK, ranging from integration, human resources, communication, risk, etc. (Besner & Hobbs, 2008; Papke-Shields et al., 2010). PMBOK considers, to a limiting extent, how project managers should adapt practices, there is limited understanding of how projects that seek to achieve externalized social and environmental success should select project practices. A key part of integrating social and environmental success is capturing context at the front-end of projects through process, optimization, and strategic considerations is important to project success or failure (Edkins, Geraldi, Morris, & Smith, 2013).

Project managers, who we consider as key actors in project intermediation activity, sit in the midst of this project framework, mediating between project characteristics and outcomes. Previous literature has disregarded project intermediation because of its arguably limited influence within the socio-technical transition (Mike Hodson & Marvin, 2010). This is because extant studies make the assumption that the selection of the project and its technology is the extent to which climate change is considered in these projects. In this paper, we argue for the contrary position- that project intermediaries have a significant (although at times indirect) influence on the socio-technical transition. Project intermediaries have a close reciprocal relationship with systemic intermediaries. But, whereas systemic intermediaries bridge the regime and the niche from the regime's vantage point, project intermediaries bridge the regime and niche from the project's (and hence the niche's) vantage point. Project practices selected by project intermediaries are affected by decisions made at the regime level, and these project practices in turn, affect the regime level. With this in mind, we seek to understand how project intermediation affects project practices in climate change projects as compared to other projects, that are often managed within a closed-system environment.

Project Intermediaries and Project Practices in a Climate Change Regime

The intersection of project studies and socio-technical transitions as it applies to climate change has not been theorized. If we look to project studies, project practices are evolving to influence projects. If we look to socio-technical transitions, climate change policies are emerging to

influence projects. The ways in which both approaches address projects do not help us fully understand which project practices are most suitable for climate change projects. In some ways, project practices become part of the meso level, a direct result of regime conditions, that allow climate change projects, and their technologies, to emerge as technological niches (Pahl-Wostl, 2007). At the same time, the technological niche defines the types of project strategies that can be used throughout project delivery. As a result, project decisions are caught between a rock and a hard place. On one hand, the purpose of projects is to get things done. But, understanding which things need to get done is an effort that entails engaging with a variety of stakeholders, especially those in the regime space. While conventional wisdom has it that project managers have free range to decide which practices will be most effective for project delivery; we suggest that the complexity of climate change objectives implies a different (i.e. intermediary) mode of engagement that is needed to bridge the regime and the technological niche.

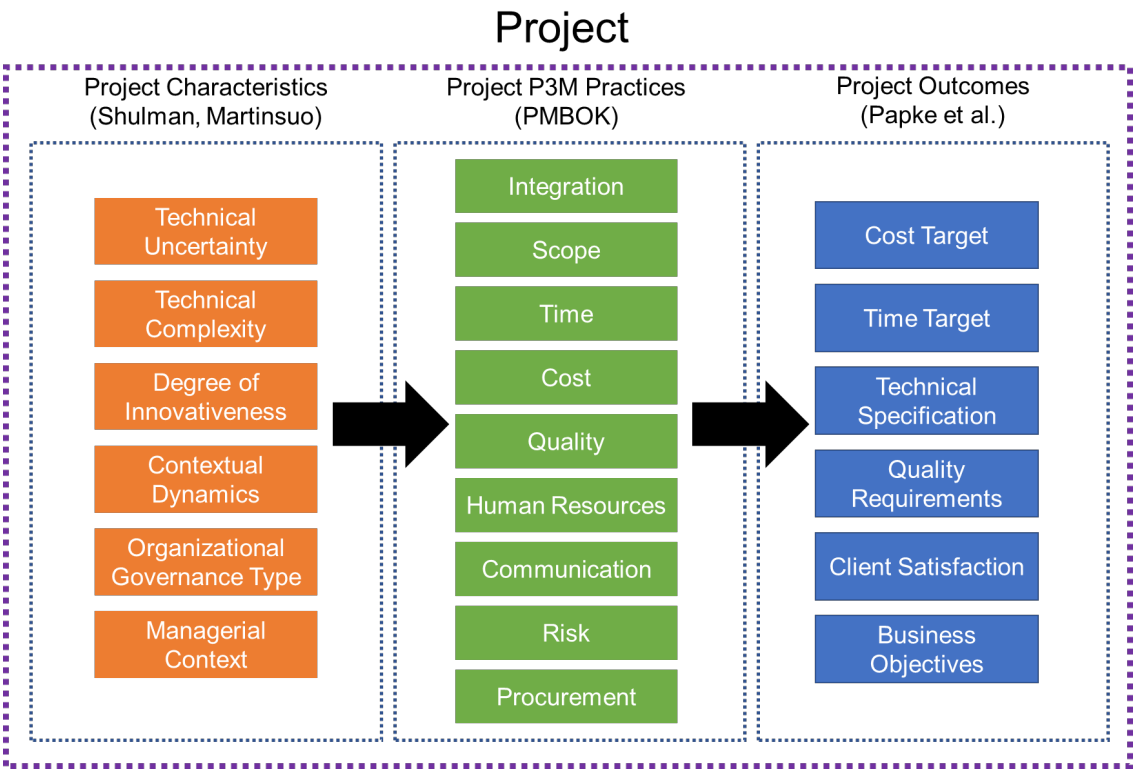


Figure 2: Project management process

Based on project studies, project practices emerge in response to project characteristics and expected outcomes. Project managers, as they take on intermediary roles, select practices that will complement policy, project selection, and local governance. When this is successful, projects have a higher chance of achieving positive climate change outcomes. We plan to conceptualize changes to project practices as part of a multi-level transition, determined by the timing and nature of multi-level interactions (Geels & Schot, 2007). We build on the how project scholars have characterized projects based on uncertainty and complexity. To consider the new regime under climate change policies and the resources available for climate change projects, we must consider new ways to define project characteristics. These characteristics would capture the need to address external project outcomes. As a result of new project characteristics and outcomes that

interact within an open system environment, we set forth propositions for how project stakeholders select project practices and deliver positive climate change outcomes.

We refine the research question as follows: Within the context of a new socio-technical regime, how do project intermediaries translate policy into positive climate change outcomes using specific project practices?

In this preliminary work, we suggest the following propositions to answer this research question. Those propositions should be validated and refined through future empirical work.

Proposition 1: Project managers become true project intermediaries, proactive in early project decisions at the regime level.

Past socio-technical transitions literature has not focused on project intermediaries (Mike Hodson & Marvin, 2010) because of the perceived limited interactions that project intermediaries undertake within the regime space. Typically, project managers are confined to making decisions related to the project and technological niche. In this case, they play a reactive role in deciding how a project will be implemented. But, with climate change projects and the need to consider an open system environment, project managers play a much more integrated role in the policies, project selection, and project scoping tasks. We propose that this occurs because project managers understand technology options and can provide a realistic perspective for how to achieve low carbon outcomes, not just in the final project, but throughout the project delivery process. This translates into more resources (especially time) during the project scoping phase.

Proposition 2: Project management spends more time with diverse stakeholders, communicating and negotiating project scope

Because the climate change agenda, such as many other Grand Challenges, hopes to affect a local and global environment, there are many stakeholders involved. At the socio-technical regime, these stakeholders interact to set new policies and deliver resources. Projects, as the realization of climate change objectives, are the recipients of these policies and resources which makes them focal points for stakeholder engagement and debate. As resources are funneled to these projects, project management are responsible for understanding the regulations regarding these resources. For example, budget allocation at the regime level that is dedicated to use of renewable energy sources. Through this process, project managers are interacting with diverse stakeholders, with varying priorities and backgrounds, to achieve positive climate change outcomes. This proposition translates into more dedicated resources for stakeholder management and communication.

Proposition 3: Project management must negotiate the "size" of the technological niche to accommodate for project uncertainties and risks

Typical technological niches require the right resources and "size" such that project managers can buffer against uncertainty and project risk. In the case of climate change projects, the size of the technological niche, or in this case the resources dedicated to the innovation, need to be defined early enough in the project and account for uncertainty. This is similar to other technological niches and depending upon the number of innovations and the relationship between

these innovations, the time to manage the uncertainty of these innovations in a project is critical (Gil et al., 2012). The project manager must be able to resolve supply chain, design decision, and prototyping issues that may arise during project delivery.

Finally, it should be said that climate change projects exist in a socio-technical regime that is different from conventional innovation regimes. Climate change, because of its externalized outcomes, similar to many of the Grand Challenges, involves diverse stakeholders and resources. When compared with other projects without climate change objectives, climate change projects may reveal use of different project practices. But, we may find that project managers, in an attempt to reduce uncertainty will consciously choose to package climate change projects as any other type of project. What this would mean is that project characteristics and outcomes specific to climate change will be packaged as typical project characteristics and outcomes. This would make it easier for project managers to select P3M practices as if the project could be managed within a closed-system environment.

Conclusion

We use the socio-technical transitions model to make sense of continuing practices evolution in light of new climate change policies and trends. The significance of this research is that it will help identify project practices that can aid in the design and execution of infrastructure projects with climate change objectives. As we move forward, we propose that the role of projects in this setting goes beyond the implementation/development and strategy execution. Project intermediations realize the role of the project as a form of intermediation between the regime and the technological niche. Thus, project managers are in a position to reconcile tensions between the technological niche, the socio-technical regime, and the landscape. This translates into an alignment of interests and actions amongst a variety of stakeholders and the project organization.

In this paper we highlight two conceptual shifts occurring. First, project scholars are beginning to contextualize projects outside of the closed-system environment. Second, countries and cities are implementing more climate change initiatives and projects in response to recent policy developments. These transitions, that are taking place at the societal and technological spheres need to be understood and aligned in a way that achieves what is typically known as project success. Based on this evolving context, we propose a conceptual framework for differentiating and evaluating project practices for projects that aim to achieving policy outcomes. We do this by using the setting of infrastructure projects with climate change objectives.

Our contribution to knowledge is that we illustrate and explore the role of the project within the transition process. The project sits between the socio-technical regime and the technological niche, a location that emphasises the important role of project intermediaries. In a climate change policy implementation context, we believe there is a different dynamism from multi-level transitions conventional concepts. Specifically, we suggest that the process is not strictly linear, moving from technological niches (and their mutual interactions) into the regime and then finally landscape. Instead, the process is recursive between the regime and niche levels. We therefore also contribute to the socio-technical transitions literature by exploring the translation process within which regime constructs transform and permeate the technological niche. We explore this

process in the setting of climate change infrastructure; a setting representative of grand challenges-driven policy implementation projects. In turn, the conceptual framework suggests that project management assumes more of an intermediary role, by becoming a collaborative player in establishing the rules of project selection and external stakeholder management rather than a reactive and execution-focused player.

Recognizing the strong intermediary dimension of projects is not only a new way of understanding projects in context. It is also a new way of understanding professionalism- an already underestimated and underdeveloped area in project management. Based on a strong utilitarian, executional approach that sees professionalism primarily in relation to the competencies that are required to manage projects within the iron triangle, the intermediary dimension of projects suggests that professionalism needs to be understood and developed more as a mindset and not only as a skill set. The fundamental difference between these two, yet inextricably related areas, is that a mindset refers to the priorities and guiding principles - or the ethics - behind the role, whereas a skill set refers to the competencies needed to execute the role once this has been defined and conceptualized along a set of ethical and other principles. So, pointing to the intermediary nature of projects opens up the discussion of the ethics behind the project itself - as an accelerating and intertwined parameter of the social context - and the ethics behind the role of the project manager who selects which project practices will influence, guide and more a project forward while recognizing that its impact on the environment will be to intermediate between stakeholders, agents and institutionalized structures and/or regimes. This is no simple matter!

When the intermediary nature of projects is recognized and placed under the researcher's microscope, the nature of prioritization shifts from being a managerial task to a formative task. The project and its manager are no longer delivering and executing, but they are actively and purposefully serving as intermediaries within this new socio-technical regime. In effect, project management chooses project practices that play critical roles in shaping policy initiatives, impacting the environment, and attracting talented, entrepreneurial, and agential mindsets.

Citations

Besner, C., & Hobbs, B. (2008). Discriminating Contexts and Project Management Best Practices on Innovative and Noninnovative Projects. *Project Management Journal*, *39*, 123–134. https://doi.org/10.1002/pmj

Brunet, M., & Aubry, M. (2016). The three dimensions of a governance framework for major public projects. *International Journal of Project Management*, *34*(8), 1596–1607. https://doi.org/10.1016/j.ijproman.2016.09.004

Bulkeley, H., Castán Broto, V., & Maassen, A. (2014). Low-carbon Transitions and the Reconfiguration of Urban Infrastructure. *Urban Studies*, *51*(7), 1471–1486. https://doi.org/10.1177/0042098013500089

Davies, A. (2017). *Projects: A Very Short Introduction*. London Oxford University Press.

Edkins, A., Geraldi, J., Morris, P., & Smith, A. (2013). Exploring the front-end of project management. *Engineering Project Organization Journal*, *3*(2), 71–85. https://doi.org/10.1080/21573727.2013.775942

Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental Innovation and Societal Transitions*, *1*, 24–40. https://doi.org/10.1016/j.eist.2011.02.002

Geels, F. W., & Schot, J. (2007). Typology of sociotechnial transition pathways. *Reserach Policy*, *36*, 399–417. https://doi.org/10.1016/j.respol.2007.01.003
Geels, F. W., Sovacool, B. K., Schwanen, T., & Sorrell, S. (2017). Accelerating innovation is as important as climate policy. *Science*, *357*(6357), 1242–1244. https://doi.org/10.1126/science.aao3760
Gil, N., Miozzo, M., & Massini, S. (2012). The innovation potential of new infrastructure development: An empirical study of Heathrow airport's T5 project. *Research Policy*, *41*(2), 452–466. https://doi.org/10.1016/j.respol.2011.10.011
Hamann, R., & April, K. (2013). On the role and capabilities of collaborative intermediary organisations in urban sustainability transitions. *Journal of Cleaner Production*, *50*, 12–21. https://doi.org/10.1016/j.jclepro.2012.11.017
Hodgson, D. (2002). Disciplining the Professional: The Case of Project Management. *Journal of Management Studies*, *39*(6). Retrieved from https://onlinelibrary.wiley.com/doi/pdf/10.1111/1467-6486.00312
Hodgson, D. (2005). "Putting on a Professional Performance": Performativity, Subversion and Project Management. https://doi.org/10.1177/1350508405048576
Hodson, M., & Marvin, S. (2010). Can cities shape socio-technical transitions and how would we know if they were? *Research Policy*, *39*(4), 477–485. https://doi.org/10.1016/j.respol.2010.01.020
Hodson, M., Marvin, S., & Bulkeley, H. (2013). The Intermediary Organisation of Low Carbon Cities: A Comparative Analysis of Transitions in Greater London and Greater Manchester. *Urban Studies*, *50*(7), 1403–1422. https://doi.org/10.1177/0042098013480967
Kemp, R., Schot, J., & Hoogma, R. (1998). Regime shifts to sustainability through processes of niche formation: The approach of strategic niche management. *Technology Analysis & Strategic Management* , *10*(2), 175–198. https://doi.org/10.1080/09537329808524310
Konstantinou, E. (2015). Professionalism in Project Management: Redefining the Role of the Project Practitioner. *Project Management Journal*, *46*(2), 21–35. https://doi.org/10.1002/pmj.21481
Levitt, R. E. (2011). Toward Project Management 2.0. In *Engineering Project Organization Journal* (pp. 1–21). Retrieved from papers3://publication/uuid/6F6C2895-F3F6-4251-A1F1-A9839FF5D612
Martinsuo, M. (2013). Project portfolio management in practice and in context. *International Journal of Project Management*, *31*(6), 794–803. https://doi.org/10.1016/j.ijproman.2012.10.013
Mignon, I., & Kanda, W. (2018). A typology of intermediary organizations and their impact on sustainability transition policies. *Environmental Innovation and Societal Transitions*, *29*(June), 100–113. https://doi.org/10.1016/j.eist.2018.07.001
Morris, P. W. (2013). *Reconstructing project management*. John Wiley & Sons.
Muzio, D. (2011). Introduction: Professions and organizations-a conceptual framework. *Current Sociology*, *59*(4), 389–405. https://doi.org/10.1177/0011392111402584
Muzio, D., Hodgson, D., Faulconbridge, J., Beaverstock, J., & Hall, S. (2011). Towards corporate professionalization: The case of project management, management consultancy and executive search. *Current Sociology*, *59*(4), 443–464. https://doi.org/10.1177/0011392111402587
Noordegraaf, M. (2011). Risky Business: How Professionals and Professional Fields (Must) Deal with Organizational Issues. *Organization Studies*, *32*(10), 1349–1371. https://doi.org/10.1177/0170840611416748
Noordegraaf, M. (2015). Hybrid Professionalism and Beyond: (New) Forms of Public Professionalism in Changing Organizational and Societal Contexts. *Journal of Professions and Organizations*, 1–20. https://doi.org/10.1093/jpo/jov002
Noordegraaf, M. (2016). Reconfiguring Professional Work: Changing Forms of Professionalism

in Public Services. *Administration & Society*, *48*(7), 783–810. https://doi.org/10.1177/0095399713509242

Oxford Programme for the Future of Cities. (2010). A Low-Carbon Economy: New Business Models in the Built Environment – Oxford Programme for the Future of Cities. Retrieved March 15, 2019, from http://www.futureofcities.ox.ac.uk/research/a-low-carbon-economy-new-business-models-in-the-built-environment/

Pahl-Wostl, C. (2007). Transitions towards adaptive management of water facing climate and global change. *Integrated Assessment of Water Resources and Global Change: A North-South Analysis*, 49–62. https://doi.org/10.1007/978-1-4020-5591-1-4

Papachristos, G. (2011). A system dynamics model of socio-technical regime transitions. *Environmental Innovation and Societal Transitions*, *1*(2), 202–233. https://doi.org/10.1016/j.eist.2011.10.001

Papke-Shields, K. E., Beise, C., & Quan, J. (2010). Do project managers practice what they preach, and does it matter to project success? *International Journal of Project Management*, *28*(7), 650–662. https://doi.org/10.1016/j.ijproman.2009.11.002

Paton, S., Hodgson, D., & Muzio, D. (2013). *The price of corporate professionalisation: analysing the corporate capture of professions in the UK*. Retrieved from https://onlinelibrary.wiley.com/doi/pdf/10.1111/ntwe.12014

Shenhar, A. J. (1998). From Theory to Practice: Toward a Typology of Project-Management Styles. *IEEE Transations of Engineering Management*, *45*(1), 33–48.

The New Climate Economy. (2016). *The Sustainable Infrastructure Imperative: Financing for Better Growth and Development*. Retrieved from https://www.un.org/pga/71/wp-content/uploads/sites/40/2017/02/New-Climate-Economy-Report-2016-Executive-Summary.pdf

World Economic Forum. (2017). *The Global Risks Report 2017 - 12th Edition*. Retrieved from http://wef.ch/risks2017

Zerjav, V. (2015). Design boundary dynamics in infrastructure projects: Issues of resource allocation, path dependency and problem-solving. *JPMA*, *33*, 1768–1779. https://doi.org/10.1016/j.ijproman.2015.09.009

Zerjav, V., Edkins, A., & Davies, A. (2018). Project capabilities for operational outcomes in inter-organisational settings: The case of London Heathrow Terminal 2. *International Journal of Project Management*, *36*(3), 444–459. https://doi.org/10.1016/j.ijproman.2018.01.004