International Journal of Project Management 41 (2023) 102456

Contents lists available at ScienceDirect

International Journal of Project Management

journal homepage: www.elsevier.com/locate/ijproman

Projecting for sustainability transitions

1. Introduction

The Paris COP 21 Agreement of 2015 mandated the global community of nations to act to "hold the increase in global average temperature to well below 2 °C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5 °C". Amongst many other things, this mandate involves transitions in the socio-technical systems that underpin our economies and societies away from reliance on fossil sources of energy towards reliance on non-fossil sources of energy (renewables plus nuclear) so as to achieve a net zero carbon economy by 2050.

While there are very many aspects to this extraordinary transition, a very important one is the additional investment in capital assets that will be required to create new sources of carbon-free energy and mobility. One calculation (McKinsey, 2022) suggests that a 60% increase in investment "physical assets" over and above current (2020) levels of investment will be required to achieve net zero, and that a further 17.5% of current levels of investment will need to be diverted from high-carbon emissions to low-carbon emissions asset investments. These investments will be delivered by projects of varying scales to build offshore wind farms, urban tram systems, carbon capture and storage systems, electricity grid extensions and upgrades (including smart grids), energy storage projects (to address intermittency problems related to renewable energy), district heating systems, and hydrogen production and use (e.g., in heavy industry). On a different scale, there is also the massive challenge of millions of micro-projects for upgrading the heating systems of homes and the associated thermal performance (Geels & Turnheim, 2022).

A socio-technical system can be defined as the system of interacting elements needed to fulfil a societal function (Geels, 2004) such as energy, transportation, communication, and shelter. They consist of techno-economic elements; the institutional regime; socio-cultural elements; and relevant actors (Geels & Turnheim, 2022). Sociotechnical systems sit within an exogenous context, or "landscape" which exerts pressures for change such as war or global warming, but are also changed through "niche innovations" breaking through into the socio-technical system. Sociotechnical system change transition is therefore a multi-level process (Geels, 2002), as shown in Fig. 1.

The central premise of this special collection is that the physical assets and capital goods underpinning socio-technical system transitions are delivered principally through projects, which are time-limited organizational structures that mobilise people and resources to build or reconfigure a particular technology or infrastructure (Winch, 2022). For instance, the transition of the socio-technical regime for water transportation during the 19th century (Geels, 2002) from (renewable-powered) sailing to (fossil-powered) steam required *inter alia*:

- The building of larger ships in steel to fully take advantage of the much greater motive power offered by steam;
- The construction of much larger docks to accommodate those ships;
- Countless technology development projects to refine the performance of ships and docks;
- The construction of coaling stations around the world.

In this special collection, we focus on the capital goods rather than consumer goods sector. Essentially, the capital goods sector produces complex products and systems (Hobday, 1998, 2000) which are typically combined into systems of systems (CDBB, 2020) to provide delivery of infrastructure services to economy and society to support "human flourishing". Examples of complex products and systems include nuclear and wind power plants, tramway systems, and aircraft; examples of systems of systems include smart eco-cities, carbon capture and storage systems, and intermodal transportation networks.

The special collection is motivated by the diagnosis that transition scholars have paid limited attention to role of projects (except for pilot projects and experiments in early niche development phases), whereas project scholars have paid limited attention to wider sectoral or regime level transitions. For instance, recent authoritative reviews of sustainability transitions research (Köhler et al., 2019; van den Bergh, Kivimaa, Raven, Rohracher, & Truffer, 2021) say little about projects as an aspect of bringing about socio-technical system transitions. There is a valuable body of work on the role of experimental, pilot, and demonstration projects in the emergence of radical innovations in sheltered niches (Ehnert, 2022; Schot & Geels, 2008), but this work assumes that subsequent diffusion happens through market-based processes rather than capital projects (Mirzania, Balta-Ozkan, & Marais, 2020). While that assumption mostly holds for volume produced products like electric vehicles, it does not hold for capital goods which spread through projects and programmes, and even electric vehicles require projects for the roll-out of distributed charging networks.

From the projects perspective, relatively little attention has been paid to grand challenges such as sustainability and climate change (Ika & Munro, 2022; Morris, 2017). There is relevant research on sustainability aspects *of* projects (Huemann & Silvius, 2017; Sabini, Muzio, & Alderman, 2019; Sabini & Silvius, 2023), but noticeably less research on sustainability transitions *by* projects, i.e. how projects can be organised and managed to contribute to bigger systemic transitions. For instance, how nuclear power stations are built makes a large difference to their potential contribution to net zero in comparison to other non-fossil (and indeed, fossil) fuels (Nian, Mignacca, & Locatelli, 2022).

This diagnosis means that there is an important opportunity through this call to enable cross-fertilization between the innovation/transition studies and project studies communities that has been limited to date (Davies, Manning, & Söderlund, 2018). One potential "meta-theory" for

https://doi.org/10.1016/j.ijproman.2023.102456
0263-7863

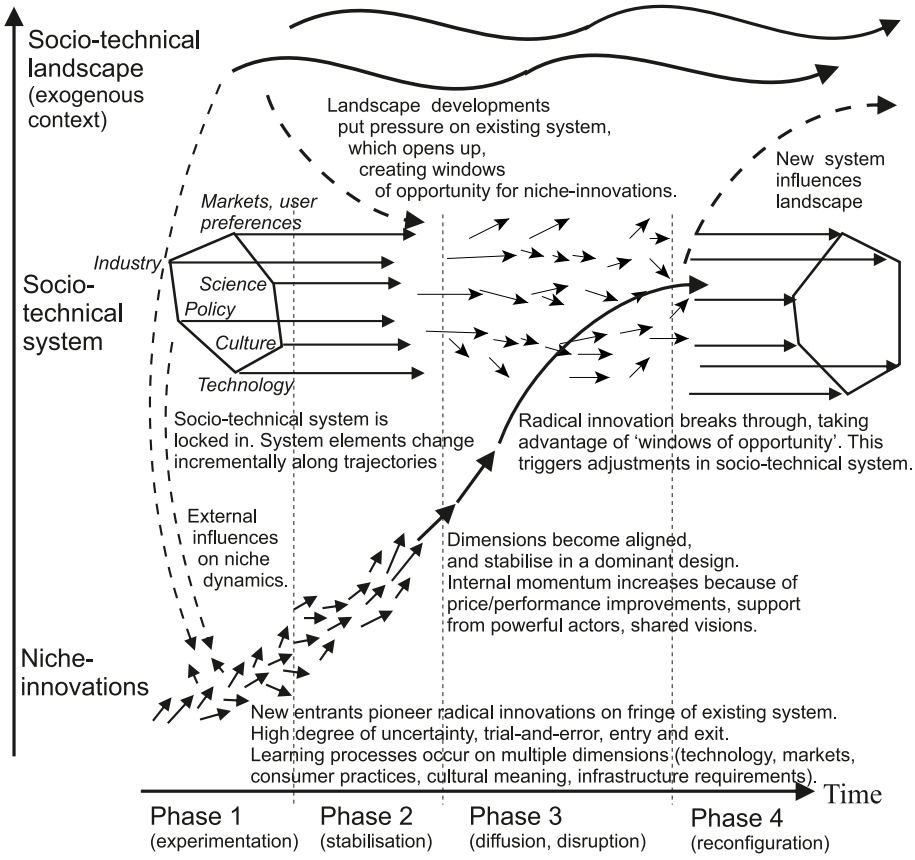

Fig. 1. Multi-Level Perspective on socio-technical transitions (Geels & Turnheim, 2022: 11).

this cross-fertilization is the multi-level perspective in sustainability transition research, and emergent multi-level perspectives on project organizing (Daniel, 2022; Daniel & Daniel, 2023). Project studies scholars also propose portfolio and programme perspectives (Winch, Maytorena-Sanchez, & Sergeeva, 2022) as useful ways of thinking about the role of projects in large-scale change processes (Ika & Munro, 2022; Morris, 2017; Winch et al., 2021), but conceptual and empirical elaboration remains to be done.

The aim of this special collection is to facilitate this desirable cross-fertilization and to develop a research agenda on *projecting for sustainability transitions*, where "projecting" is defined (Defoe, 1697; Winch & Sergeeva, 2022) as the organizational capability to shape and deliver the complex products and systems required for sustainability transitions and then combine them into systems of systems. Submissions should, therefore, show how projects of different sizes and complexity enable shifts in any of the socio-technical systems that underpin contemporary economy and society, with attention paid to both the project and the socio-technical system levels of analysis.

2. The call for papers

On this theoretical basis, we are calling for *empirical, conceptual, and authoritative review* papers that report and analyse some aspect of social-technical regime transition relevant to the sustainability agenda. Questions might include:

- How are projects, portfolios and programmes aimed at achieving transitions in socio-technical regimes best organized? For instance, the smart meter roll-out modular programme in the UK has been less than impressive (Geels, Sareen, Hook, & Sovacool, 2021). Are there examples of where transition has been enabled by the success of transition projects, or threatened by their failure such as in nuclear power (Lovering, Yip, & Nordhaus, 2016)?
- What is the role of institutional projects (Tukiainen & Granqvist, 2016; Winch & Maytorena-Sanchez, 2020) in achieving socio-technical transitions?
- What is the role of project organizing concepts such as stakeholder management and project governance in how strategic niche projects can be managed to relate the global to the local (Geels & Raven, 2006) and does their project management make a difference to whether they break through to shift the socio-technical system? How is learning from niche projects captured (Turnheim & Sovacool, 2020) given the inherent difficulties of learning from projects (Davies & Brady, 2000)?
- How do narratives of sustainability shape project narratives and counter-narratives (Ninan & Sergeeva, 2022; Sergeeva, 2022; Sergeeva & Winch, 2020), and relate to landscape level narratives in multi-national fora (Mische, 2014)? For instance, the debate around nuclear power is an important area of contestation.
- How do imaginaries (Augustine, Soderstrom, Milner, & Weber, 2019) of future possibilities such as geotechnical engineering and nuclear fusion shape sustainability-orientated research and development (R&D) projects? Further, how do these imaginaries relate to action in the present?
- How does advocacy of particular sustainability transition pathways relate to normative calls for a mission-oriented capitalism (Mazzucato, 2021) to address grand challenges? Might this advocacy lead to strategic misrepresentation (Flyvbjerg, Bruzelius, & Rothengatter, 2003) of the potential of particular projects to achieve desirable outcomes and hence the inevitable project escalation (Winch, 2013)?
- What is the role of megaprojects in achieving sustainability transitions (Geels, Iskandarova, & Sovacool, 2023; Gregory, 2020; Sovacool & Geels, 2021)? Are they too unwieldy, and can their mission be

achieved through greater modularity (Flyvbjerg, 2021)? How can the lessons of megaproject research more generally (Denicol, Davies, & Krystallis, 2020; Flyvbjerg et al., 2003; Merrow, 2011) be applied to sustainability transition megaprojects?

- Socio-technical transitions inevitably involve the decommissioning of existing productive assets such as oil production platforms and coal-fired power stations, and some third industrial revolution non-fossil energy assets such as nuclear power stations are reaching the end of their productive life (Invernizzi et al., 2020). How can such asset decommissioning projects best be organized and remediation of polluted land achieved?
- How does the digital transformation associated with the fourth industrial revolution (Schwab, 2018) embodied in Project Management 4.0 (Winch, Brunet, & Cao, 2023) contribute to achieving sustainability transitions?
- What are the particular challenges of relatively micro projects that intervene in complex socio-cultural systems such as housing (Tjørring & Gausset, 2019)?

Papers may draw on any of the onto-epistemological approaches deployed within project studies and socio-technical transition studies, and approach their topic from any disciplinary base. Within that, historical and institutional studies would be particularly welcome due to their rarity in project studies. Papers that focus on policy will need to show clearly how policy initiatives (or the lack of them!) shape project organizing.

3. The call process

The development of this Special Collection will go through a multi-stage process. The first stage will be a launch through a webinar of a call for abstracts (1000 words) which will be reviewed and down-selected for transition to the next stage. This will consist of the submission of a draft paper which will be peer reviewed by other submitting authors in an on-line paper development workshop (PDW). We will also consider organizing a sub-track in the Project Organizing SIG for EURAM 2024 in Bath, UK but attendance at this will not be an obligatory requirement for inclusion in the special collection. Following submission of final papers, they will then be peer reviewed through the normal IJPM process.

We anticipate the following timeline:

1) Launch April, 2023;
2) Abstract deadline, 31st August 2023;
3) Draft paper deadline, 31st March 2024;
4) EURAM, Bath, 24th-28th June 2024 (paper deadline mid-January 2024);
5) Online PDW May/June 2024;
6) Full paper deadline, 30th September 2024;
7) Publication of Collection, during 2025. Please note that papers will be published as they are accepted (currently IJPM production is around 2 weeks) so authors may wish to submit in advance of the timeline above.

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