

A systematic literature review on factors influencing transition projects

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Developmental Paper

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Abstract

Sustainability transition is a paramount and urgent matter and require significant effort to address. Transition projects are currently recognised as the deliverer of large-scale systematic change such as sustainability transitions, thus paramount to the acceleration of this process. However, these transition projects are influenced by factors that either hinder or enable their effectiveness delivering to the transition process. Therefore, research is needed to find what the factors are and how they affect transition projects in sustainability transitions. This study employs systematic literature review as a method to address the problem. As a developmental paper, this paper does not present the full results, however, provide some insights on current progress and researcher's initial observation and initial themes from the existing dataset.

1. Introduction

Since the industrial revolution, the global average temperature has risen ever closer towards the 2°C threshold that the Paris Agreement aims to remain ‘well below’ (IPCC, 2023; Bevacqua et al., 2025). With the window of opportunity to limit climate change’s worst effects rapidly closing towards 2030 (UNEP, 2022), there is an urgent need for changing existing production and consumption systems to a more sustainable manner (Sovacool et al., 2025). Such process is referred to as sustainability transitions.

The study of sustainability transitions has gained prominence within academia (Smith et al., 2010; Köhler et al., 2019). However, as Markard et al. (2012) defined, sustainability transitions are a long-term, multi-dimensional, and fundamental transformation process. Therefore, in response to urgent climatic change, transition scholars have increasingly focused on the concept of ‘acceleration’ (Frantzeskaki et al., 2017; Gorissen et al., 2018; Gliedt et al., 2018; Svejvig et al., 2019; Doyon and Moore, 2019; Markard et al., 2020; Yang et al., 2020; Malhotra and Schmidt, 2020; Geels et al., 2021; Geels and Ayoub, 2023; Sovacool et al., 2023; Sovacool et al., 2025). Such an acceleration is already in presence and can be exemplified by the mass diffusion of Electric Vehicles (EV), Solar-PV, and wind turbines (Yang et al., 2020; Geels, 2024; Sovacool et al., 2025).

Building on (Silvius et al., 2014; Huemann and Silvius, 2017; Sabini et al., 2019) this study focuses on ‘transition projects’ for accelerating sustainability transitions. Transition projects are characterised by delivering sustainable products/deliverables aiming at transitioning socio-technical systems with their collective efforts (i.e., sustainable outcomes; characterised by people using sustainable energy produced by solar projects rather than fossil)(Lenfle and Söderlund, 2022; Terenzi et al., 2024; Geels and Locatelli, 2024). These deliverables can be both ‘tangible’ and ‘intangible’ in the forms of technologies, enabling conditions for sustainability, change behaviours, and produce new knowledges (Terenzi et al., 2024). Given

that transition projects can also be organised in programmes and portfolios (Terenzi et al., 2024; Geels and Locatelli, 2024), therefore they are also included in the scope of transition projects in this study.

It is important to note that themselves do not change the systems as ‘projects’ but by benefit realisation via their deliverable’s long-term sustainable outcomes (Terenzi et al., 2024). These outcomes can be affected by factors that acts either as a barrier or enabler, that effectively influence transition projects’ effectiveness on delivering their long-term sustainable outcomes.

P AP (PPAP), with the sustainable deliverables being Solar photovoltaic systems, that has an aim to transition rural impoverished households to use sustainable energy and with fed-in tariffs to subsidise villagers (D’Agostino et al., 2011; Geall et al., 2018; Wu et al., 2018; Han et al., 2020). At the project level, the panels were installed and delivering both energy and trade-in tariffs to villagers. However, even with these outputs, the outcomes of these projects are either hindered by user-practices (D’Agostino et al., 2011; Geall et al., 2018), or institutional corruption (Wu et al., 2018). These factors are not within the managerial reach of the project, however affecting the project outcomes that hinders sustainability transitions.

It is not an isolated case, other instances where a due to political and governance factors, instead of providing sustainable outcomes and outputs, they end-up (Barragan-Contreras, 2022). These kinds of problem are especially paramount as sustainability transitions is delivered via transition projects, and if not addressed, as a collective effort, they will ultimately hinder sustainability transition and its acceleration.

To address these problems, this study of systematic literature review is to find what the factors are and how they affect transition projects in sustainability transitions.

2. Theoretical Underpinning

This study employs the Multi-Level Perspective (MLP) as its primary analytical framework for understanding sustainability transitions (Köhler et al., 2019; Geels, 2019; Geels, 2024; Terenzi et al., 2024; Geels and Locatelli, 2024). It is especially suitable for this study as a flexible theory that is tested in various empirical studies and disciplines (Geels, 2024). Notably, a recent study by Geels and Locatelli (2024) have allocated the roles to five types of transition project in different analytical levels of MLP (Exploratory, Deployment, Incremental improvement, Reorientation, Decommissioning), which provided foundations for understanding the role of transition projects contributing to sustainability transitions. As a process theory, MLP conceptualises sustainability transition through the interaction between radical niche-innovations and the incumbent path-dependent systems under the influence of exogenous landscape developments. It is presented in three analytical levels (Niche, Regime, Landscape) and four progressing phases (Experimentation, Stabilisation, Diffusion, Reconfiguration)(Geels, 2002; Geels, 2004; Geels, 2010; Geels, 2019; Geels, 2024; Geels and Locatelli, 2024): Niche level represents a protected space for radical innovations to experiment and stabilise, away from the market pressure the military(Geels, 2002); The regime level represents the incumbent locked-in socio-technical system that are formulated by regime actors (Policy, User/Market preference, Industry, Science, Culture, Technology), where matured radical innovation tries to diffuse into and reconfigure. Lastly, the landscape is represented by the exogenous developments such as climate change or political shifts influencing the transition process.

3. Methodology

Research Question: *What are the factors and how they affect transition projects in sustainability transitions*

This study adopts a systematic literature review (SLR) approach based on PRISMA methodology (Moher et al., 2009). In light of the robust nature of SLRs, the researcher acknowledges that even though transition projects are a relatively new phrase referring to projects that delivers sustainable capital goods aiming at transitioning socio-technical systems with their collective efforts (Geels and Locatelli, 2024), there are already a large quantity and variety of empirical research on such projects (Terenzi et al., 2024). In addition to projects studies, transition studies also utilise empirical case-studies as one of the main methods to analyse transition processes (Sovacool et al., 2018). Therefore, the PhD researcher could gain insights from their cases, and identify the factors present in their studies.

Scopus by ELSEVIER is the abstract and citation database chosen for the SLR. Scopus is among the world's largest abstract and citation database, with extensive high-quality peer-reviewed journals across relevant disciplines that includes high-quality journals relevant to sustainability transitions and project management. The initial search string returned 2,148 results without filtering (Scopus). The researcher also tested the same search string with Web of Science TS function and returned 1,689 articles, and with 86% of duplicated results compared with Scopus database. The researcher then conducted title and abstract screening after the filters being applied (Table 2.3a), in which, Scopus returned all relevant socio-technical systems that is crucial to sustainability transitions (i.e., transport, energy, agro-food, building, industry)(IPCC, 2023b; IPCC, 2023a), and all types of transition projects (i.e., exploratory, deployment, incremental-improvement, reorientation, and decommissioning projects). Therefore, given this SLR is to find influencing factors with empirical case-studies

of transition projects, Web of Science is therefore deemed not necessary by the PhD researcher as the results from Scopus already presents data saturation.

The literature search was designed to be thorough, transparent, and replicable. Thus, the PhD researcher developed a structured query combining keywords related to sustainability transitions and projects (Table 3a). The keyword string is developed based on recent systematic literature reviews in similar disciplines, and the inclusion of common keywords in transition literatures. Since most empirical studies on sustainability transitions employ historical case-study method (Sorrell, 2018; Sovacool et al., 2018; Köhler et al., 2019), another keyword string was introduced to include only those articles featuring “case-studies” and its synonyms to narrow down the search, yielding 2,148 results. Subsequently, to ensure the quality of sources, non-English peer-reviewed articles and those falling outside relevant subject areas were excluded using Scopus filters (Table 3a). Furthermore, the PhD researcher exclude engineering related articles by looking at the most relevant articles in engineering (with other filters applied). These articles are too broad or too narrow that focuses on the technology rather at a project level, that includes modelling, policy, risk, cost, design, innovation, and feasibility studies, hence excluded by the PhD researcher. Therefore, after applying the criteria, the search left 656 articles for manual title and abstract screening.

Finally, articles that fall outside the scope was discarded, and the PhD researcher has done a second screening backwards to ensure nothing is being left out, resulting in 230 articles for full-text screening and left with 100 articles for final analysis.

Table 3a: Literature review query

Scopus search string 10 th Jan 2025: 2,148 Results	(TITLE-ABS-KEY("project*" OR "program*" OR "portfolio*") AND TITLE-ABS-KEY("sustainability transition*" OR "socio-technical transition*" OR "sustainability transformation*" OR "system innovation*" OR "low-carbon transition*" OR "green transformation*" OR "eco-innovation transition*" OR "transition to sustainability" OR "sustainable system transformation*" OR "energy transition*" OR "Net-zero" OR "Netzero" OR "decarboni*") AND TITLE-ABS-KEY("case stud*" OR "case-based" OR "field stud*" OR "empirical case*"))
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Scopus search string 10 th Jan 2025: 656 Results (after exclusion criteria filter)	(TITLE-ABS-KEY("project*" OR "program*" OR "portfolio*") AND TITLE-ABS-KEY("sustainability transition*" OR "socio-technical transition*" OR "sustainability transformation*" OR "system innovation*" OR "low-carbon transition*" OR "green transformation*" OR "eco-innovation transition*" OR "transition to sustainability" OR "sustainable system transformation*" OR "energy transition*" OR "Net-zero" OR "Netzero" OR "decarboni*")) AND (LIMIT-TO (DOCTYPE,"ar") OR LIMIT-TO (DOCTYPE,"re")) AND (LIMIT-TO (LANGUAGE,"English")) AND (LIMIT-TO (SRCTYPE,"j")) AND (EXCLUDE (SUBJAREA,"ENGI") OR EXCLUDE (SUBJAREA,"MATH") OR EXCLUDE (SUBJAREA,"COMP") OR EXCLUDE (SUBJAREA,"CENG") OR EXCLUDE (SUBJAREA,"PHYS") OR EXCLUDE (SUBJAREA,"MATE") OR EXCLUDE (SUBJAREA,"MEDI") OR EXCLUDE (SUBJAREA,"CHEM") OR EXCLUDE (SUBJAREA,"AGRI") OR EXCLUDE (SUBJAREA,"BIOC") OR EXCLUDE (SUBJAREA,"PSYC") OR EXCLUDE (SUBJAREA,"NURS") OR EXCLUDE (SUBJAREA,"IMMU") OR EXCLUDE (SUBJAREA,"HEAL") OR EXCLUDE (SUBJAREA,"PHAR") OR EXCLUDE (SUBJAREA,"VETE") OR EXCLUDE (SUBJAREA,"DENT") OR EXCLUDE (SUBJAREA,"NEUR"))
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Table 3b: Provisional inclusion and exclusion criteria

Inclusion	Exclusion
-Articles that are a real-life ‘transition project’ that presents characteristics defined under the 5 types (Terenzi et al., 2024; Geels and Locatelli, 2024)	-Articles that did not include real empirical project (i.e. assumption, prediction, or feasibility study) -Unrelated subjects: Engineering, Mathematics, Computer Science, Chemical Engineering, Physics and Astronomy, Biochemistry, Psychology, Nursing, Immunology, Health Professions, Pharmacology, Veterinary, Dentistry, Neuroscience.

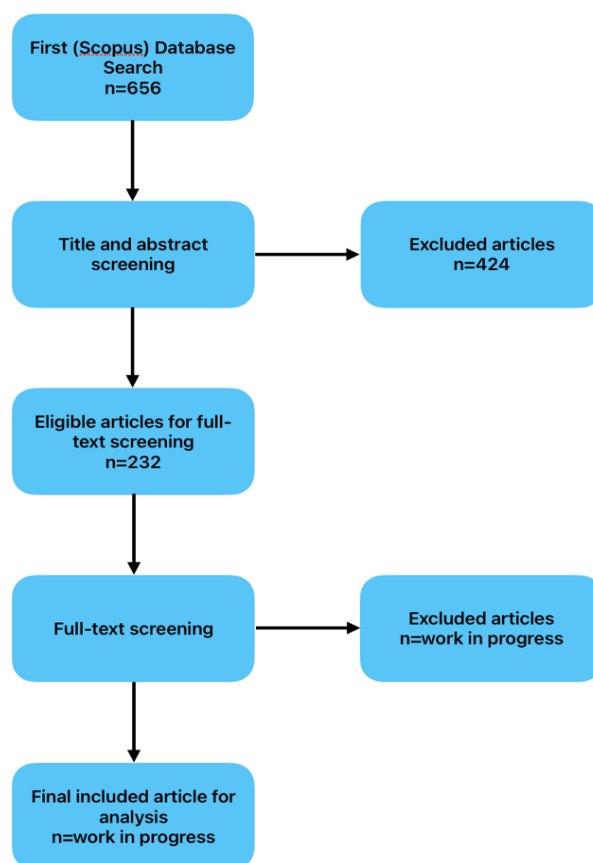


Figure 3 PRISMA Flowchart

4. Preliminary results

4.1 Data distribution

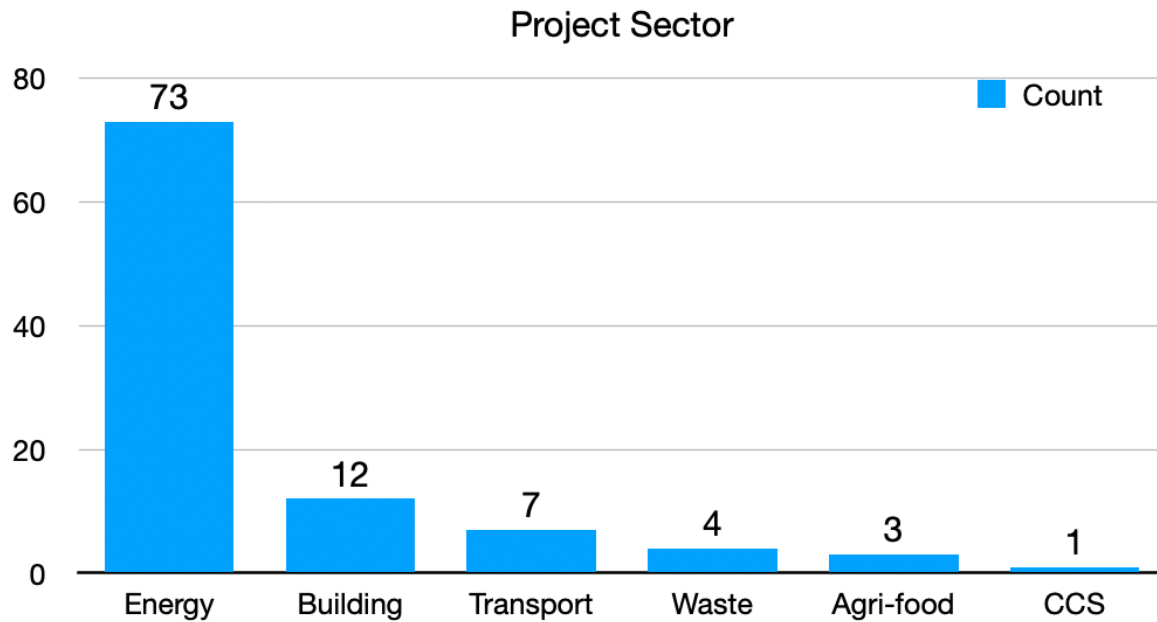


Figure 4.1a

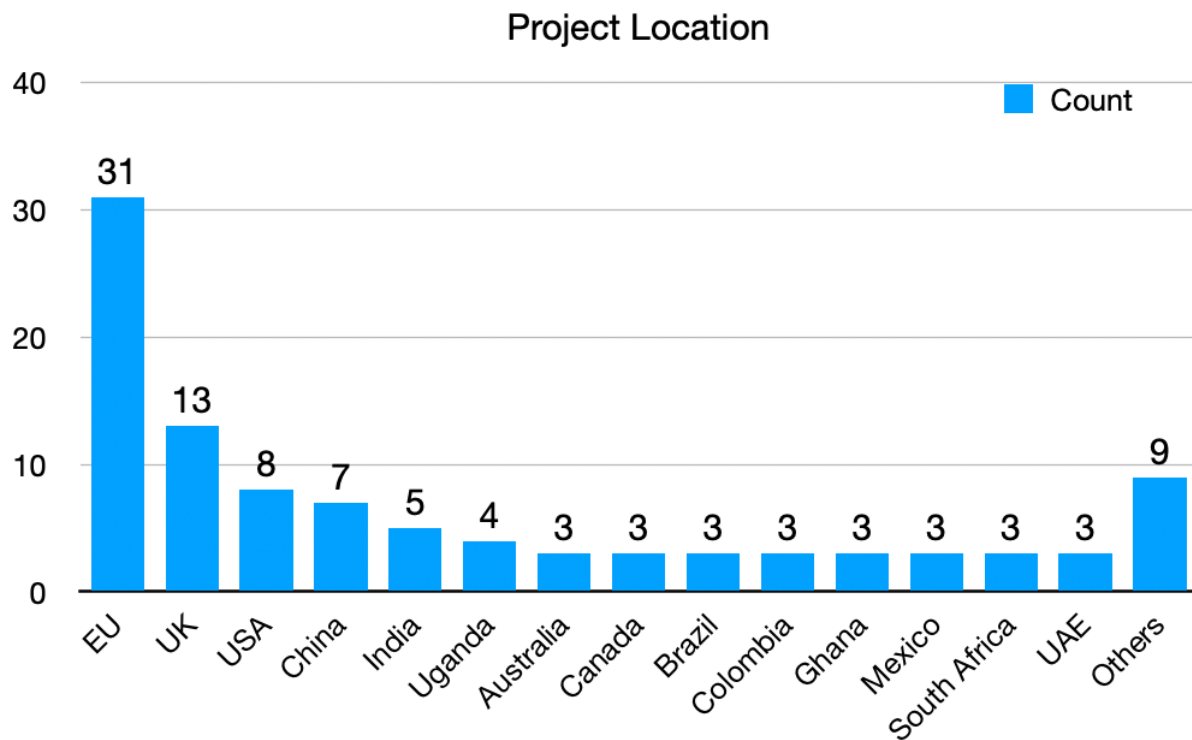


Figure 4.1b

4.2 Data distribution

Theme	Keywords
Financial / Economic	“high capital cost”, “withdrawal of subsidy”, “maintenance cost”
Spatial / Local factors	“site constraints”, “relocation protests”, “urban gentrification”, “knowledge and experience”
Technological / Infrastructure	“grid bottlenecks”, “obsolete equipment”, “technical uncertainty”, “technical complexity”
Social / Cultural factors	“community resistance”, “conflicting values”, “loss of place identity”
Policy / Governance	“regulatory delays”, “policy reversal”, “insufficient national strategy”

Table 4.2a Barriers Identified with themes

Theme	Keywords
Financial / Economic	“low-interest loans”, “investment incentives”, “fed-in tariffs”, “technology price drops”, “volatile fuel prices”
Spatial / Local factors	“strong city-level leadership”, “place-based identity”, “regional partnerships”, “Local events (e.g., EURO 2012)”, “local benefits”
Technological / Infrastructure	“mature heat-pump tech”, “available grid capacity”
Social / Cultural factors	“public engagement”, “citizen co-ownership”, “local acceptance”
Policy / Governance	“political support”, “subsidy scheme”, “mandated renewable targets”, “government intermediaries”

Table 4.2b Enablers identified with themes

4.3 Data distribution

This section is set to explain the initial patterns and observations the PhD researcher found through the dataset.

4.3.1 Financial and Economic

This theme is composed with keywords that directly related to transition project’s front and mid-life cycle. It presents a strong focus on the way that the project is initiated and maintained (i.e., subsidies). While these factors support the project on delivering sustainable outcome either at the front or the mid-life period. Still the results present with ‘concerns’

regarding the longevity of such support where the support itself (i.e., subsidies, technological support) become a barrier.

4.3.2 Spatial and Local

This theme is the result of geographical and local factors, such as the geolocation of the project (e.g., near geo-thermal site as an enabler, or far as a barrier). Other local factors are larger local events such as EURO 2012 (a kind of large international football event) enabling the project to renovate surrounding areas as a political gesture. The notable barrier is urban gentrification, whereas sustainability renovation or projects that helps the locals are deemed as gentrification and provoke dissatisfaction and inequality among the local surrounding areas near the project.

4.3.3 Technological and Infrastructural

This theme is very straightforward, as barriers being focused on technological aspects (e.g., technological uncertainty (Terenzi et al., 2024)) and existing infrastructure (e.g., lack of grid connection).

4.3.4 Social and Cultural

The social cultural theme is composed with acceptance or resistance between the project and the local communities. This theme of local cultural factors differs from the previous local events theme as it is the direct results of local society rather than larger events led resistance or enabling factor. This can be the local co-ownership of projects that enabled the successful implementation and operation of projects, or locals share the different value of sustainability with the project owners or implementers.

4.3.5 Policy and Governance

The policy and governance theme are the largest theme based on the results. This is due to a number of transition projects are the direct results of certain enabling policies that allowed the project to happen and supports (i.e., subsidies). However, such policies can also be barriers such as policy complexity leading to projects being cancelled due to complex policies that could lead to severe project delays, or lack of governance causing enabling policies being used by “greenwashing” that harms local benefits over project owners, as expressed by cases in Mexico and USA.

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