Transition Templates: Pathways to net zero+

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Frameworks, Methods & Processes

Transition Templates: Pathways to Net Zero+ is a research project that uses systems-level forms of design to envision dramatic reductions in greenhouse gas (GHG) emissions in five sectors of the UK economy. This paper reports on the first year. The five sectors are: 1) Home Energy; 2) AI & Digital; 3) Food; 4) Fashion; and a fifth sector to be confirmed in 2025. They are all approached as socio-technical systems that function as intersecting and interdependent ecosystems across scales and domains. Transition Templates (TT) is based on the premise that energy transitions require coordination across diverse communities, fields, and sectors and that these are difficult to achieve within current business models. We use systemic design and transition design approaches to develop templates to support decarbonisation strategies for socio-technical change in energy systems. We do this with a four-step process using unique TT Ecosystems Frameworks (TT-EF) for each sector. Each TT-EF is used with a TT Four Futures Frameworks (TT-FFF) to envision pathways for decarbonisation and wider regenerative transitions. The work aims to help organisations and institutions direct transitions by envisioning, designing, assessing, and communicating different levels and/or stages of transition. The pathways strategy guides best practice. The Transition Templates method aims to facilitate trans-disciplinary and sector collaborations for energy transitions. This work in progress presentation introduces the initial experimental method that is being adapted, refined, and tested in each sector.

KEYWORDS: net zero, energy transitions, transition design, mapping, futures, climate change,

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Initial Frameworks, Methods, & Processes Report

The Transition Templates: Pathways to Net Zero+ a collaboration with Ben Reason at Livework Studio using systemic and transition design approaches in a service design context to make processes for organisational decarbonisation. The research uses systems-level forms of design to create templates for mapping energy transitions in five sectors of the UK economy. The five sectors under investigation are: 1) Home Energy; 2) AI & Digital; 3) Food; 4) Fashion; and a fifth sector to be confirmed in 2025. We are currently working on the Home Energy and Ai & Digital sectors simultaneously. We use net zero "+" to refer to decarbonisation agendas that also address wider ecological emergencies – beyond the narrow specificity of net-zero. This project considers climate change in the context of other equally severe Earth systems approaching critical thresholds – such as biodiversity loss (Steffen et al. 2018). The focus of the project remains decarbonisation.

The Transition Templates (TT) research uses systemic design (Sevaldson & Jones, 2019) and transition design (Irwin, Tonkinwise & Kossoff, 2015) approaches to develop templates to support institutions and organisations in developing decarbonisation strategies across the five sectors. The templates facilitate energy transitions with new tools, resources, strategies, and classification systems. The work aims to help direct socio-technological transformation with collaborative processes in co-design of institutional and organisational transition strategies. The frameworks and templates are designed to both encourage best practice with strategies that could address the deleterious impact of greenwashing and its impact delaying effective responses to the climate crisis.

With the name and the overall approach, the work draws on the literature and practice in transition design. Transition design develops holistic, ecological, and systemic practices for complex wicked problems (Kossoff & Irwin 2022). Terry Irwin describes transition design as an approach that starts with a step called "Reframing: The Present and Future" (2018, 5) where:

> *"...stakeholders "reframe" the problem in the present and envision a long-term future in which it has been resolved... stakeholder groups collaborate to visually map the*

wicked problem, identifying as many relationships within it as possible. This process is intended to:

1. Enable stakeholders to achieve a shared definition of the problem;

2. Provide stakeholders with an understanding and appreciation of the complexities of the problem;

3. Develop an appreciation of the limited perspective and knowledge base of each stakeholder group (i.e. no single stakeholder group can solve the problem);

4. Enable stakeholders to adopt collaborative (as opposed to confrontational) postures which aid in transcending differences;

5. Position stakeholder workshop participants as representatives (within their wider community group) of a diversity of stakeholder perspectives;

6. Create a visual artefact (problem map) that can be continually updated and validated through qualitative research and informal feedback, to serve as a rallying point for community education, action and awareness."

(Irwin 2018, 5-6)

In this work, the templates serve as a means of developing a shared understanding of the local decarbonisation problem. Transition design is built on a holistic and ecological worldview (Irwin 2015, 92; Irwin, Kossoff, Tonkenwise, Scupelli 2015, 4) offering systemic strategies to do the complex work of mapping and enacting strategies for climate adaptation and mitigation. Transition Templates brings this transition design "reframing" with an ecological lens approach to energy transitions. The TT process involves a series of templates to help organisations collaboratively map energy transition pathways with this systemic ecological lens in a four step process.

| 1. Understanding & Framing the Data | 2. Envisioning Futures (with the TT-FFF) | 3. Opportunity & Strategy | 4. Adoption & Implementation |

Figure 1. Four Steps in the Transition Templates process for each sector

The TT Four Step Process (see figure 1) starts with Step One: Understanding and Framing the Data. Step Two is Envisioning Futures (with the TT-FFF). Step Three is identifying Opportunities

and Strategy. Finally, Step Four is Adoption and Implementation plans. We reproduce the process for each sector. These four stages are inspired by the processes described in Peter Jones and Kristel Van Ael's
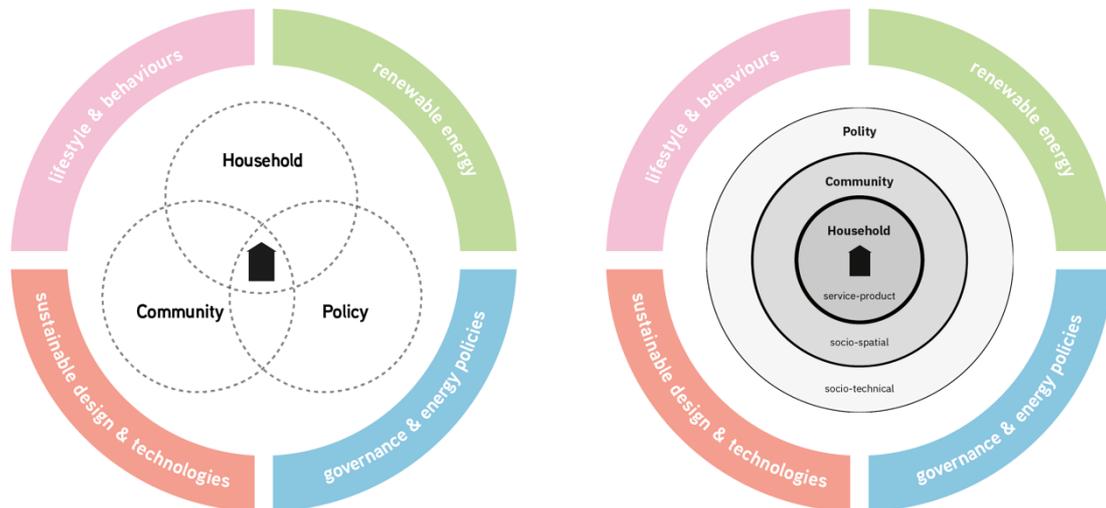

Figure 2. TT Home Energy Ecosystem Framework A (Home TT-EF-A)
Figure 3. TT Home Energy Ecosystem Framework B (Home TT-EF-B)

Design Journeys through Complex Systems: Practice Tools for Systemic Design (2022). Where Jones and Ael propose seven steps, we are testing and revising a simplified four steps approach where some steps have optional "substeps", i.e., multiple templates. The templates create prompts unique to each sector to reflect specific challenges. One framework is a foundation for the project: the TT Ecosystem Frameworks (TT-EF).

TT Ecosystems Frameworks (TT-EF)

Each sector has its own TT Ecosystem Frameworks (TT-EF) to reflect sector specific concerns and encourage systemic approaches to the generation of transition pathways. The outside ring will be loosely based on the PEST analysis model: political, economic, socio-cultural, and technological – interpreted differently for each sector.

For example, the Home Energy rotation focuses on four domains of activity in decarbonising home energy ecosystems: governance and policy; renewable energy generation and supply; sustainable design and technologies; and lifestyle and behaviour. Inside the outside ring are domains of activity. In Framework A, household, community, and policy levels are considered (figure 2 - Home TT-EF-A).

The second version (B) focuses on products-services, spaces, and technological systems (figure 3 - Home TT-EF-B). In this model we draw from Fabrizio Ceschin and İdil Gaziulusoy's Design for Sustainability: A Multi- level Framework from Products to Socio- technical Systems (2020) with their models of levels in systems with scope for interventions. We have created two ecosystem frameworks to investigate how each works as the conceptual basis for the template work in each sector.

Figures 4. TT AI & Digital Ecosystem Framework A (Digital TT-EF-A).
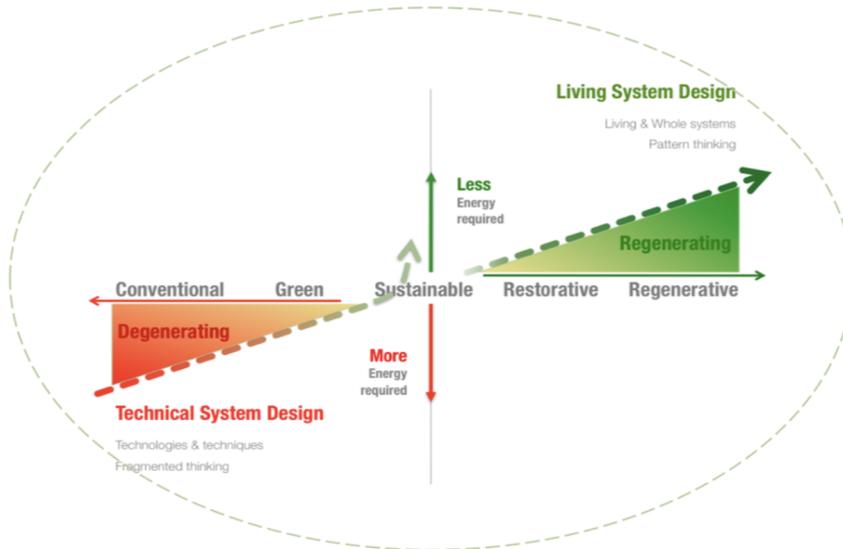*Figures 5. TT AI & Digital Ecosystem Framework B (Digital TT-EF-B).*

Figure 6. Contrast of Technical System Design and Living System Design (Mang & Reed, 2012). Used with permission from Pamela Mang.

The Ai & Digital frameworks focus on four domains of activity: governance and policy; infrastructure and hardware; users and user practices; and applications and software. These domains manifest across user, impacted communities, and industry and advocates (figures 4, TT-EF-A) and products-services, spaces, and technological systems (figure 5, TT-EF-B). The TT Ecosystem Frameworks may still be adapted.

TT Four Futures Framework

Transition design uses a process of envisioning a long-term futures where problems have been resolved to start to generate visions of preferred options in the present. In this project, this process is enacted using the Transition Template Four Futures Framework (TT-FFF). Using ecological design theory, we build on the premise that futures are created by historical activities and contemporary activities, practices, and technologies on a spectrum from extractive and defuturing conventional activities – to increasing commitments to sustainability and regeneration. This vision of transitions to regenerative practice is captured in Pamela Mang and Bill Reeds' influential figure "Contrast of Technical System Design and Living System Design" (Mang & Reed 2012 - see figure 6).
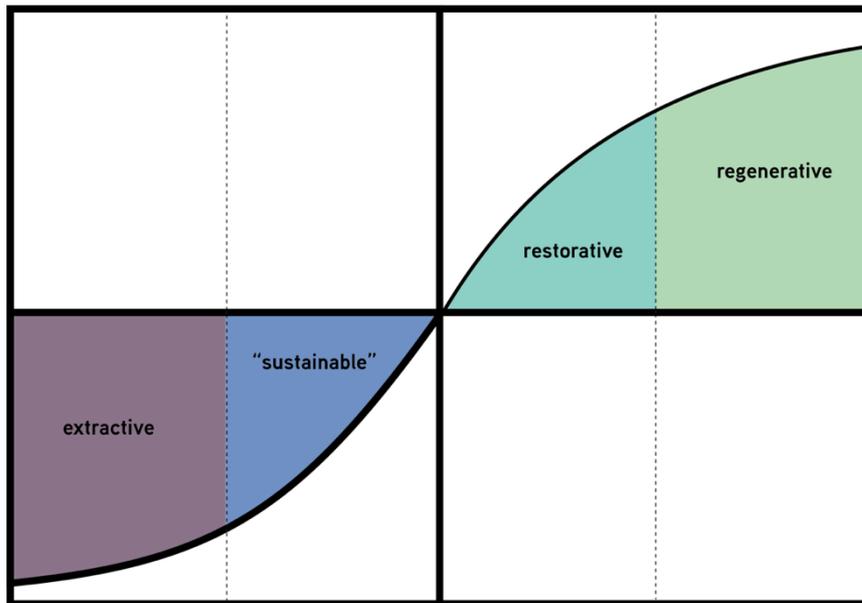
Figure 7. Pathways from Extractive Systems Design - Adapted from Mang & Reed (2012)

Transition Templates uses this futuring practice to help organisations redirect activities using the highest leverage point, i.e. the goals or paradigms of the system (Meadows 2008) with the paradigm of regenerative design, i.e. ecologically oriented design futures, as the ultimate goal. Effective responses to climate change depend on participatory and ecological futures-oriented worldviews that prioritise ecological relations. The templates facilitate participation, collaboration, and learning to make these transitions to sustainable and regenerative options more possible. This work draws on this tradition for ecological-relational-participatory-systemic frames of mind and creates processes and resources (i.e. the templates) to help participants map and enact transitions.

The four futures framework is based on regenerative design theory as first described by Pamela Mang and Bill Reed (2012). This vision has subsequently been developed by Daniel Wahl (2016), the RSA (Choukeir 2023), McSweeney et al at Architects Declare (2024), and other leading practitioners in ecological design theory as a model that pushes beyond "sustainability" to approaches designed to "co-exist and co-evolve with natural systems over time" (McSweeney 2024, 8). Following this model, future pathways can be mapped on a scale of degenerating, extractive, and conventional design to regenerating and regenerative design – with sustainable and restorative in the middle (see figures 7).

Frames have a long history in design theory. In designing for sustainable transitions, frames are most helpfully conceptualised in ways that facilitate transitions to adaptive responses to complex ecosocial problems. Victor Margolin emphasises the role of action frames in design for social change as a "source of the values that guide our actions as well as the source of the worldviews that justify our behaviour" (2019, 19). For Margolin, "the current action frame is inadequate" (2019, 24). While Margolin did not propose ecological literacy as a remedy to this inadequacy, the identification of the root problem as erroneous "actions frames" is critical. From an ecological perspective, current action frames are inadequate because of what Gregory Bateson first described as epistemological error (1972), i.e. an error in premises and a "systemic false consciousness in our relation to nature" (Goodbun 2011, 42). The legacy of epistemological error is lethal as these errors are embedded in system structures that drive unsustainable ways of living (Boehnert 2018). Sustainable transitions depend on a reversal of this error. Envisioning futures that go beyond extractive contemporary modes of defuturing design (Fry 2020) and current dominant models of sustainability is a practice that encourages this ecological learning and design practice. With this strategy, the templates capture increasing levels of commitment towards net zero.

The TT-FFF tool is designed to encourage participants and users to envision transitions towards more robust, ambitious, and regenerative net zero+ futures. It helps users identify types and degrees of sustainable transition. The TT-FFF invites comparisons between extractive pathways, i.e. futures that continue to "extract" more economic value from nature (where human and planetary health are sacrificed for economic prosperity for a few) – to the proposed sustainable, restorative, and regenerative alternatives. The TT-FFF invites users to consider pathways and futures in each sector, where futures visions aim for planetary health beyond a reductive commitment to carbon emissions alone. This model can be used as a basis for classification systems and more ambitious transition work for decarbonisation and wider ecological concerns.

Transition Templates Process

1. Understanding and Framing the Data

The TT process starts with data collection and data framing processes. Framing in the systemic design tradition establishes the parameters and direction of travel (Jones and Van

Ael 2022, 41). Jones and Ael's templates are the inspiration for mapping strategies here and in the later visioning, strategy, and implementation stages. This phase is organised with three templates:

- *The TT Landscape Innovation Matrix collects information across system, service, and product levels for materials, society/people, and structures. This tool is based on the Innovation Landscape Matrix (Dewberry, Boehnert & Sinclair 2024).*
- *The TT Networks of Actors starts as a spreadsheet as a collection of the major stakeholders engaged in decarbonisation processes in the home energy sector in the UK. The actors can be visualised according to a Network of Actors template.*
- *The TT Synthesis Map captures the data from 1.1 and 1.2.*

This first stage encourages collaborative framing, sensemaking, and reframing the data as a foundation for co-designing decarbonisation pathways in the next steps.

2. Envisioning with the TT Four Futures Framework

The second stage uses the TT-FFF to encourage envisioning net zero+ futures. The TT-FFF prompts participants to identify and describe extractive, sustainable, restorative, and regenerative net zero+ futures. The column on the left is the categories from the outer ring of the TT-EF. For example, the Home Energy TT-FFF template below (figure 8) is a matrix with a box for each of the four futures in each category of the home energy TT-EF. Figure 9 does the same for the Ai & Digital sector. An example of a TT-FFF with content can be found in the second RSD13 paper (Boehnert & Alexander 2024). The template prompts participants to consider stages of transition beyond current carbon intensive extractive systems in each of these four categories in the left-hand column.
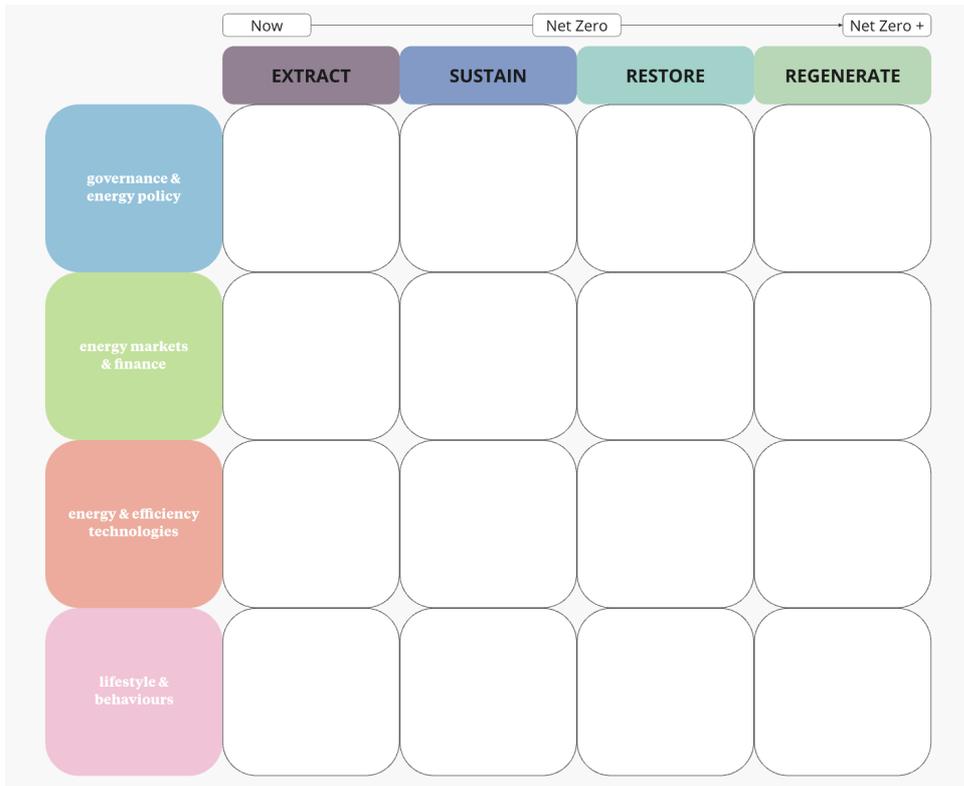
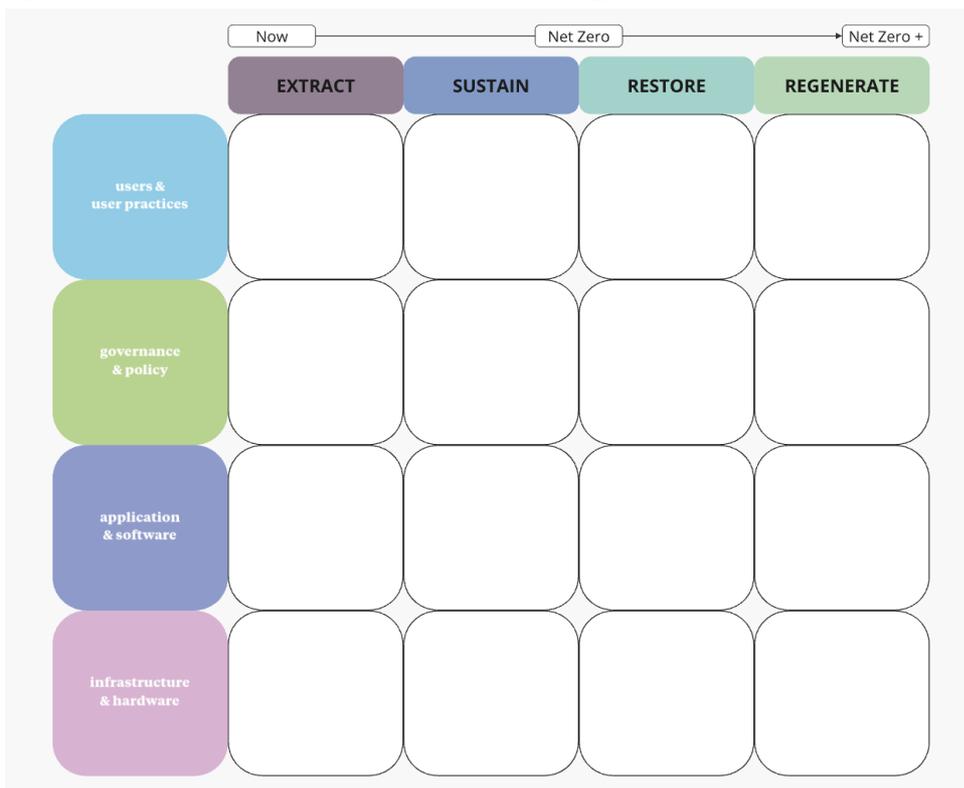*Figure 8. TT Four Futures Framework, TT-FFF Home Energy*

Figure 9. TT Four Futures Framework, TT-FFF Ai & Digital

3. Opportunities and Strategies

The third stage identifies opportunities and develops strategies to navigate obstacles to net zero+. Whereas the second stage imagines future worlds, stage three responds to current conditions and explores opportunities for strategic action. As the work becomes more concrete, we encounter the unavoidable politics of net-zero+ transitions. These obstacles include political and economic structures that systemically derail decarbonisation, powerful institutions and actors who resist decarbonisation alongside ideologies and associated social practices and technologies that accelerate extractive, carbon intensive activities. We reflect on obstacles by mobilising political theorist David's Chandler's theory of Anthropocene ontopolitics. The conditions of the Anthropocene demand both new theories of action and modes of governance using mapping, sensing, and hacking as approaches to "adapt and respond, rather than control and direct" (Chandler 2018, 21). Anthropocene ontopolitics replaces the dysfunctional politics of modernity with practices that can also function as responsive strategies addressing ecological crises in a design context (Boehnert 2022, Reason 2023). Chandler's description of mapping, sensing, and hacking informed our work in this step:

- **Mapping** *reveals multi-dimensional contextual information in complex systems facilitating navigation and planning in complex systems. This project is an example of mapping in response to ecological crises.*
- **Sensing** *monitors variables to catch emergent phenomena – creating greater capacities to adapt and respond to uncertainty.*
- *Finally, within systems that have been designed to depend on carbon based energy used,* **hacking** *may have potential for changing trajectories.*

The work in progress explores how these modes can be mobilised for adaptive strategies for Net Zero+. The templates are still in the early phases of development.

4. Adoption and Implementation

The final stage is the most practical and still in the exploratory phases. At this point we consider the adoption and implementation of specific interventions for broader net-zero+ agendas . In the Adoption Curve Timeline Template participants identify and explore levers of change. This work focuses attention on how specific groups see interventions as

desirable. The proposed adoptive curve timeline considers the current situation and devises strategies for transition in the short, mid-, and long term. The method makes space to consider the motivation for distinct groups of people to engage with new ideas, social practices, and technologies for decarbonisation in each of the four domains of activity. The template could be used for each type of intervention, product, or service to navigate adoption cycles.

Conclusion

The Transition Template (TT) project brings the qualities of systemic design and transition design to support organisations addressing net-zero+ transitions. It prompts the co-creation of new strategies, learning resources, and classification systems. It draws on existing theories, frameworks, practices, and methods in futures, ecological necessity, and design transitions. The project has emergent outcomes including work in addressing learning challenges associated with energy transitions. The method supports sector specific energy and ecological literacies as a necessary basis for decarbonisation activities.

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