

**Editorial special issue:**

## **Celebrating a decade of EIST: What's next for transition studies?**

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### **Abstract:**

This editorial introduces a special issue with 27 short viewpoints about future research on transition studies, to commemorate the 10th anniversary of this journal.

### **1. Background and motivation**

This special issue celebrates the 10th anniversary of the journal *Environmental Innovation and Societal Transitions (EIST)*. The first, inaugural issue of EIST appeared in June 2011. It is nice to close this first decade with another special issue, namely one that looks forward to identify desirable and potential developments of the field in the next decade.

We invited contributions to this special issue in March 2021, and received close to a hundred submissions, of which roughly one third were deemed to be of sufficient quality and originality to enter the review process. The final outcome is an issue containing 27 short viewpoints<sup>1</sup>, a collection which can be read in an afternoon. It provides a wide variety of research ideas about overlooked topics, unexplored methods, synergies with other areas, and many other issues. The authors of the contributions come from a variety of cultures, countries and continents – among others, Australia, Brazil, Canada, Chile, China, Colombia, Denmark, Germany, India, Indonesia, The Netherlands, Finland, Norway, Sweden, Switzerland, United Kingdom and USA.

Since the history of EIST was recently covered in another editorial (van den Bergh, 2021), here we restrict ourselves to summarising the viewpoint contributions. They are categorised into eight key themes, together covering a broad spectrum of research on sustainability transitions:

1. Conceptual foundations
2. Agents and behaviour
3. Pleas for integration
4. Politics and law
5. Sectors and projects
6. Digitalization
7. Regions and cities
8. Diversity and justice

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<sup>1</sup> This format was chosen for various reasons: to allow quick access to new ideas; to include a great variety of ideas; and to offer a quick review process, allowing publication in 2021.

Of course, we are aware that some viewpoints might – given their rich content or positioning on the interface of research themes – have been subsumed under another heading. The chosen categorization is the outcome of trading off structure and balance of the eight categories.

Table 1 gives an overview of all contributions. This will hopefully help readers to quickly identify viewpoints which belong to their interest sphere. To aid this goal, viewpoint numbers in the text below match those in the table.

**Table 1. Overview of contributions to the celebratory special issue**

NR	TITLE	AUTHORS
<b>Conceptual foundations</b>		
1	Policy mixes for sustainability transitions must embrace system dynamics	Alkemade & de Coninck
2	From terminating to transforming: The role of phase-out in sustainability transitions	Rinscheid, Rosenbloom, Markard & Turnheim
3	Transition 'backlash': towards explanation, governance and critical understanding	Pel
4	Common-pool resources and governance in sustainability transitions	Antunes Nogueira, Wigger & Jolly
5	The neglected developments that undermine sustainability transitions	Markard, van Lente, Wells & Yap
<b>Agents and behaviour</b>		
6	Psychology: the missing link in transitions research	de Vries, Biely & Chappin
7	From leadership to followership: A suggestion for interdisciplinary theorising of mainstream actor reorientation in sustainability transitions	Geels
8	International organisations in global sustainability transitions	Kranke & Quitsch
<b>Pleas for integration</b>		
9	Research frontiers for multi-system dynamics and deep transitions	Kanger, Schot, Sovacool, van der Vleuten, Ghosh, Keller, Kivimaa, Pahker & Steinmueller.
10	Tackling intersecting climate change and biodiversity emergencies: opportunities for sustainability transitions research	Bush & Doyon
11	Engaging with climate adaptation in transition studies	Kuhl
<b>Politics and law</b>		
12	Remaking political institutions in sustainability transitions	Patterson
13	Elite vs. mass politics of sustainability transitions	Schmid, Beaton, Kern, McCulloch, Sugathan & Urpelainen
14	A Brake or an accelerator? The role of law in sustainability transitions	Soininen, Romppanen, Huhta & Belinskij
15	Examining outlooks on sustainability transitions through computational language analysis	Repo, Matschoss & Mykkänen
<b>Sectors and projects</b>		
16	Strengthen finance in sustainability transitions research	Steffen & Schmidt
17	Beyond food for thought – directing sustainability transitions research to address fundamental change in agri-food systems	Hebinck, Klerkx, Elzen, Kok, König, Schiller, Tschersich, van Mierlo & von Wirth
18	Mining – the dark side of the energy transition	Marín and Goya
19	Megaprojects: Examining their governance and sociotechnical transitions dynamics	Sovacool and Geels
<b>Digitalization</b>		
20	Digitalization as a driver of transformative environmental innovation	Sareen & Haarstad
21	On digitalization and sustainability transitions	Dahl Andersen, Frenken, Galaz, Kern, Klerkx & Mouthaan
<b>Regions and cities</b>		
22	A 'correlative' turn for transition studies on China	Huang, Westman and Castán Broto
23	Advancing urban transitions and transformations research	Torrens, Westman, Wolfram, Castán Broto, Barnes, Egermann, Ehnert, Frantzeskaki, Farné Fratini, Håkansson, Hölscher, Huang, Raven, Sattlegger, Schmidt-Thomé, Smeds, Vogel, Wangel and von Wirth
<b>Diversity and justice</b>		
24	Decolonising transitions in the Global South: Towards more epistemic diversity in transitions research	Ghosh, Ramos-Mejía, Carvalho Machado, Lestari Yuana & Schiller
25	A spatial whole systems justice approach to sustainability transitions	Martiskainen, Jenkins, Bouzarovski, Hopkins, Mattioli & Lacey Barnacle
26	De-centering transitions: Low carbon innovation from the peripheries	Tirado Herrero
27	Diversity in transition: Is transition research diverse (enough)?	Preuß, Galvin, Ghosh & Dütschke

## 2. Viewpoints in the special issue

### 2.1 Conceptual foundations

Five contributions address fundamental methodological and conceptual-theoretical aspects of sustainability or societal transitions in general. Floor Alkemade and Heleen de Coninck present a viewpoint titled *Policy mixes for sustainability transitions must embrace system dynamics* (1). It argues that increasing the policy impact of sustainability transitions research requires a focus on the interactions and feedbacks within and between systems. Insight is needed into how this contributes or hampers the speed of sustainability transitions. Since existing approaches neglect these issues, they tend to overestimate policy leverage. Sustainability transition studies is well positioned to address this research gap, giving attention to three research foci: identification of intervention points that set in motion reinforcing feedbacks or reduce negative interactions; using a systems perspective to understand how trade-offs between different processes can be reduced and co-benefits stimulated; and gathering empirical insights from the sustainability transitions research on how policy can trigger self-reinforcing dynamics.

Another fundamental issue is addressed by Adrian Rinscheid, Daniel Rosenbloom, Jochen Markard, and Bruno Turnheim in *From terminating to transforming: The role of phase-out in sustainability transitions* (2). They argue that phase-out tends to be narrowly focused on substitution, underexposes the bi-directional relationship between phase-outs and innovation, and pays insufficient attention to political challenges. The authors identify three avenues to obtain a deeper insight into these issues. First, a focus on reconfiguration of entire regimes may help to clarify the multiple mechanisms underlying phase-outs. Second, deepening insights on the timing and interaction between phase-out and innovation may unveil the potential of phase-outs to accelerate transitions. Finally, engaging with issues of power, political legitimacy, and equity will mitigate political challenges associated with phase-out.

A third contribution in this subtheme is *Transition 'backlash': Towards explanation, governance and critical understanding* (3). In it, Bonno Pel proposes that transitions research examines so-called “backlashes” in transitions, meaning transition trajectories that, after initial diffusion, stagnate and subsequently relapse in terms of intended system change. Due to preoccupations with desirable transitions and virtuous S-curves, this phenomenon is neglected. A middle-range theory is needed to identify the underlying conditions and social mechanisms, allowing a critical reflection on ‘system change’ and time assumptions. This could inform governance strategies to anticipate, avoid, dampen or cope with a potential backlash. Insights from “stability-oriented strands” of social theory might be helpful, such as critical analyses of institutional contradictions, cognitive dissonance and behavioural reactance.

The viewpoint *Common-pool resources and governance in sustainability transitions* (4) by Leticia Antunes Nogueira, Karin Andrea Wigger, and Suyash Jolly suggests that common-pool resources (CPRs) are critical for sustainability transitions as they affect both unsustainable practices and sustainable solutions. The viewpoint gives attention to interactions between CPRs and markets/firms as well as state/governments during transition paths. The authors argue that new perspectives to transitions studies include how CPRs help advance the integration between ecological and socio-technical systems; affect entrepreneurial activity and innovation processes; and may add new insights about the directionality of transitions. The viewpoint further advocates building bridges with new institutional economics and social practice theory.

Finally, another basic angle is offered by the viewpoint *The neglected developments that undermine sustainability transitions* (5), by Jochen Markard, Harro van Lente, Peter Wells and Xiao-Shan Yap, which focuses on developments that undermine sustainability transitions. This involves unsustainable shifts and deterioration of critical context systems. The first includes new products and industries that exacerbate existing challenges. The second covers policy making, finance, education or independent journalism, which arguably can critically affect the emergence or success of transitions. In addition, the potential role of shifting policies from repair approaches to precautionary transition policies is discussed.

### 2.2 Agents and behaviour

Three contributions address the role of behaviour and specific agents. The viewpoint *Psychology: the missing link in transitions research* (6) by Gerdien de Vries, Katharina Biely and Emile

Chappin, is motivated by the observation that psychological research is underdeveloped in transition literature. To improve both sustainability and realism of transitions, transitions research needs to embrace relevant perspectives, theories, and methods from psychology. The authors propose an integrative research approach that covers the individual, group, and system levels. They argue in favour of interdisciplinary research teams for more effective analysis of sustainability transition actors and processes, as well as translation to practical and policy lessons.

In the viewpoint *From leadership to followership: A suggestion for interdisciplinary theorising of mainstream actor reorientation in sustainability transitions* (7), Frank Geels advises to give attention to mainstream actor reorientation in the diffusion phase of sustainability transitions. To this end, he proposes an integrative three-level typology of seminal social science theories, which distinguishes different depths of reorientation and associated processes. He argues that higher-level reorientation is more transformative but also rarer and more difficult to achieve.

A third contribution in this category is *International organisations in global sustainability transitions* (8) by Matthias Kranke and Svenja Quitsch. It identifies two neglected parallels between scholarship on international organisations (IOs) and sustainability transitions research and suggests that IO studies can help sustainability transitions research by elaborating on IOs as global sustainability actors. IO research offers a fuller understanding of the transnational dynamics of incumbency but also a more nuanced insight into the roles of non-incumbent actors. Integrating insights across fields will provide useful insights about how transnational actors shape processes of transformative global change.

### 2.3 Pleas for integration

Three viewpoints propose more integrative research, in distinct ways. A first contribution in this vein is *Research frontiers for multi-system dynamics and deep transitions* (9) by Laur Kanger, Johan Schot, Benjamin Sovacool, Erik van der Vleuten, Bipashyee Ghosh, Margit Keller, Paula Kivimaa, Anna-Kati Pahker, and Edward Steinmueller. It finds that transitions research has been dominated by studies on single systems. The authors argue that expanding the scope to Deep Transitions involving interactions between a broad array of socio-technical systems opens up new research directions in three important domains: areas of intervention; transition justice; and accelerating actors. Two core research questions are formulated for each of these, associated with future multi-system research, target couplings and the landscape, specifying transformative outcomes, balancing injustices from destabilization, creation of multi-system links, and paying more attention to system entanglers and landscape-makers.

The viewpoint *Tackling intersecting climate change and biodiversity emergencies: Opportunities for sustainability transitions research* (10) by Judy Bush and Andréanne Doyon suggest that climate change and biodiversity conservation are framed as intersecting emergencies that transitions research must tackle. This is illustrated by a recent joint statement in this vein by intergovernmental panels on biodiversity loss (IPBES) and climate change (IPCC). The authors claim that transdisciplinarity is required to address climate change and biodiversity jointly. This deserves according to the authors a more important role for knowledge co-production and the perspectives or even participation of indigenous peoples. This will contribute to a relevant complex-systems approach that embeds deep knowledge, experience, and stewardship.

In a viewpoint titled *Engaging with climate adaptation in transition studies* (11), Laura Kuhl suggests that transition studies have much to offer to the study of climate adaptation. She thinks the process of adapting to climate impacts is well-suited to the analytical frameworks developed in transitions studies, and sketches key areas for research: the normative and directed nature of adaptation, cross-scalar politics associated with transformation, and the role of the private sector in adaptation. Similarly, adaptation research can inform the understanding of the role of disturbance and disasters in transitions, and contribute to studying vulnerabilities, inequality and uneven impacts of transitions. Synergies between mitigation and adaptation, insights into the relationship between transitions and transformation, and just transitions are further areas for potentially successful integration.

### 2.4 Politics and law

Four contributions address political and policy issues. A broad perspective is offered by James Patterson in *Remaking political institutions in sustainability transitions* (12). It sees as a key challenge for studies of sustainability transitions to understand how existing political institutions have to be adapted or change. This involves giving attention to the politics of novelty, uptake, dismantling, stability, and interplay across regimes. It requires or even enables building new bridges between transition studies and broader political and policy sciences focused on similar challenges of fostering major societal change.

A more particular angle is chosen in *Elite vs. mass politics of sustainability transitions* (13) by Nicolas Schmid, Christopher Beaton, Florian Kern, Neil McCulloch, Anish Sugathan and Johannes Urpelainen. This viewpoint contends that certain key questions on transition politics deserve more attention in research. Transition politics are decomposed into the classic categories of interests, ideas, institutions, as well as elite and mass politics. Using this framework, a brief review of existing transitions literature on politics is offered. It finds that few studies deal with interests and ideas in mass politics, and that research is biased toward energy transitions in Europe and North America. The authors map areas for future research with the aim to achieve a better understanding of varieties of transition politics.

A novel opening is made in a viewpoint titled *A Brake or an accelerator? The role of law in sustainability transitions* (14) by Niko Soinen, Seita Romppanen, Kaisa Huhta and Antti Belinskij. This viewpoint argues that legal arrangements are key to rapid sustainability transitions, but existing arrangements may also substantially hinder transitions. In previous transitions research, treatments of law tended to be instrumental in nature rather than recognizing it as a force in a complex system that both supports and hinders sustainability transitions. The authors perceive a need for bridging the gap between legal and transitions research, proposing a framework that distinguishes between accelerating, braking and steering roles that the law may play in transitions.

A technical method relevant to assessing political debate is discussed in the viewpoint *Examining outlooks on sustainability transitions through computational language analysis* (15). In it, Petteri Repo, Kaisa Matschoss and Juri Mykkänen explain how advances in computational text analysis allow for analysing novel data in a way that is relevant to transition studies. They illustrate this through an application of the specific technique of topic modelling to plenary talks related to energy in the Finnish parliament during 2008–2020. It clarifies diverging perspectives, such as by right-wing populists and the greens, on outlooks for energy transitions. The authors further sketch how computational text analysis might contribute to transition studies through better considering complexity in sustainability transitions in terms of strategies, position statements, roadmaps and online discussions from a great variety of actors such as companies, industries, policymakers and citizens. This could clarify, among others, how transitions progress geographically, which institutional logic is at stake, or how insights are integrated across disciplines.

## 2.5 Sectors and projects

Four viewpoints zoom in on sectors or projects. The first, titled *Strengthen finance in sustainability transitions research* (16) by Bjarne Steffen and Tobias Schmidt, underpins the need for a better understanding of the financial system's role in transitions. Especially more research is needed to examine the middle-range between specific case studies of individual financing challenges and broad analyses of the financial system as a whole. Much can be learned from the quickly expanding research on sustainable finance. This allows assessing how to overcome hurdles that the financial system poses for socio-technical transitions, and to use the acceleration potential of re-directing financial capital.

Next, the viewpoint *Beyond food for thought – directing sustainability transitions research to address fundamental change in agri-food systems* (17), by Aniek Hebinck, Laurens Klerkx, Boelie Elzen, Kristiaan Kok, Bettina König, Katharina Schiller, Julia Tschersich, Barbara van Mierlo and Timo von Wirth, is motivated by current agricultural and food systems causing significant resource, environmental and social impact. Not surprisingly, integrated studies of agri-food systems transformation is an emerging transition topic. The viewpoint outlines four avenues for research: cross-scale dynamics between coupled systems; social justice, equity & inclusion;

sustainability transitions in low- and middle-income countries; and cross-sectoral governance and system integration.

The viewpoint *Mining – the dark side of the energy transition* (18) by Anabel Marín and Daniel Goya contends that the energy transition will considerably increase demand for minerals. While this might create economic opportunities for low-income countries with relevant mineral resources, it can also cause or worsen local social and environmental problems associated with mining activities. The authors propose that researchers of energy transitions give more attention to this topic by including mining aspects into their studies and briefly mention possible starting points to move in this direction. This devotes attention to just transition, phasing-out industries, dematerializing growth, transformative potential of local conflicts, and the role of global companies.

A project rather than sector focus is taken in *Megaprojects: Examining their governance and sociotechnical transitions dynamics* (19) by Benjamin Sovacool and Frank Geels. This viewpoint argues that megaprojects deserve more attention as they may be critical to the success of transitions but are often troubled by poor performance. The authors present a table with examples of megaprojects that goes back almost 5000 years and propose a future research agenda composed of five directions: experimentation and learning to manage uncertainties, coevolution of local and global social networks and megaproject development, the role of visions, promises, expectations, and commitment through sunk costs, non-linearities due to technical setbacks and cost escalation, and challenges for policy and politics given the combination of lobby pressure and project complexity and uncertainty.

## 2.6 Digitalization

Two contributions deal with the multifaceted role of digitalization in sustainability transitions. The first, titled *Digitalization as a driver of transformative environmental innovation* (20), by Siddharth Sareen and Håvard Haarstad, focuses on digitalization as a phenomenon that goes beyond the role of a landscape factor as it is place-based and decentralized, present in virtually all production and consumption activities. It changes the dynamics of many activities and systems, potentially accelerating low-carbon transitions. At the same time, its ubiquity contributes to more energy use and, indirectly, emissions. A neglected role is how digitalization alters interactions, coordination and boundaries between economic sectors. The authors argue that transition researchers must engage more with the broad spectrum of digitalization to get a better grip on how it can contribute to achieving just, low-carbon transitions.

The second contribution is titled *On digitalization and sustainability transitions* (21), written by Allan Dahl Andersen, Koen Frenken, Victor Galaz, Florian Kern, Laurens Klerkx and Matthijs Moutaers. It notes that researchers so far have devoted little attention to the role of digitalization in sustainability transitions. It also warns that digitalization may consolidate unsustainable incumbents instead of fostering a transition. Several suggestions are offered for work along this line: examining how digitalization changes social practices, community digital platforms and peer-to-peer interactions; the role of the big tech companies, big data and online targeted advertising; and the expansion of platform companies into traditional sectors like energy and food. The authors also warn for negative effects and invite research on this, such as related to the digital regime tending to be short on inclusive practices, democratic governance and environmental regulation.

## 2.7 Regions and cities

Two contributions address the particularities of transitions within certain geographical scopes. The first is titled *A ‘correlative’ turn for transition studies on China* (22) by Ping Huang, Linda Westman and Vanesa Castán Broto. It argues that transition theories insufficiently address the peculiarities and challenges of sustainability transitions in China. Understanding China is, though, essential for arriving at a good perspective on the character of and potential for global transitions. Current transitions theories have a largely western academic tradition, being according to the authors limited to address the context of China. Informed by Chinese epistemologies, this viewpoint calls for a so-called “correlative approach” which emphasizes relations over entities. This involves paying attention to entrepreneurial experimentation in China, and the role of

existing hierarchical structures of *guanxi*, which are proposed as defining a unique strategic spectrum for transition actors.

Of course, this collection cannot omit a contribution on urban issues. It is covered in *Advancing urban transitions and transformations research* (23) by Jonas Torrens, Linda Westman, Marc Wolfram, Vanessa Castán Broto, Jake Barnes, Markus Egermann, Franziska Ehnert, Niki Frantzeskaki, Chiara Farné Fratini, Irene Håkansson, Katharina Hölscher, Ping Huang, Rob Raven, Antonia Sattlegger, Kaisa Schmidt-Thomé, Emilia Smeds, Nina Vogel, Josefin Wangel and Timo von Wirth. The viewpoint argues that urban transition studies combine insights from general sustainability transitions theory with multidisciplinary research on urban change. This encompasses plural analytical and conceptual perspectives, connecting with various communities of practice in urban environments, including mayors, transnational municipal networks, and international organisations.

## 2.8 Diversity and justice

Four contributions are devoted to justice and diversity, from local to global scales. A first viewpoint here is titled *Decolonising transitions in the Global South: Towards more epistemic diversity in transitions research* (24), written by Bipashyee Ghosh, Mónica Ramos-Mejía, Rafael Carvalho Machado, Suci Lestari Yuana and Katharina Schiller. Its core premise is that Western values continue to dominate transitions research and that transitions research need “decolonising”, meaning to embrace the ‘pluriverse’, to address inequality, injustice and unethical transitions. There is a good basis for this given that there is a core body of research on sustainability transitions in the Global South since a decade (witness the thematic STRN group “Transitions in the Global South”). Specific elements of such a research approach include: acknowledging everyday struggles faced in the Global South, explicitly addressing questions of power, informal institutions, inequality and injustice that permeate transitions in the Global South, and integrating participatory research methods that value research ‘subjects’.

Another viewpoint in the category is *A spatial whole systems justice approach to sustainability transitions* (25) by Mari Martiskainen, Kirsten Jenkins, Stefan Bouzarovski, Debbie Hopkins, Giulio Mattioli and Max Lacey Barnacle. It argues that for sustainability transitions to accelerate and become socially accepted a “spatial whole systems justice” approach is needed which assesses and mitigates injustices across the entire chain of global production-consumption systems. This requires combining insights from justice, geography and transition studies. The approach is illustrated using examples from the energy, transport, fashion and food sectors.

A third contribution related to this theme is *De-centering transitions: Low carbon innovation from the peripheries* (26) by Sergio Tirado Herrero. It discusses the potentially elitist character of low carbon transitions, meaning that the benefits are primarily felt by privileged communities. To this end, the author considers recent calls to ‘decentre’ transitions to address relevant social and spatial dynamics of transitions in peripheral regions. The latter are argued to present opportunities for advancing low carbon innovation and achieve deep structural transformations. The risk is, however, that new core-periphery dependencies result which might reinforce the strength of elites.

A final viewpoint in this category is *Diversity in transition: Is transition research diverse (enough)?* (27) by Sabine Preuß, Ray Galvin, Bipashyee Ghosh and Elisabeth Dütschke. It argues that diversity dimensions such as gender and geographical location, as well as their intersections, should be considered to achieve successful and just transitions. The authors discuss why diversity is worth being considered as part of a transitions research agenda and demonstrate the content of diversity in current transitions research. They end by giving recommendations to achieve a diversification of transitions research, notably that social diversity deserves more attention to contribute to just transitions.

We thank the authors for their quick work and constructive responses to suggestions for improvement. We hope that readers will enjoy the viewpoints and be able to draw inspiration from them for their own research as well as for moving the field forward.

## References

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