

STRN Newsletter



Newsletter 31 – March 2019

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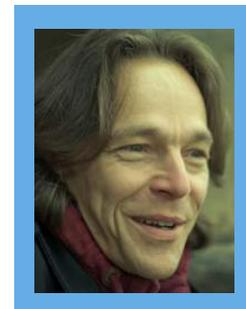
About

The STRN newsletter is
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March, June, September &
December

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Editorial

by Jochen Markard, ETH Zurich
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For weeks, teenagers from all over Europe (and beyond) have skipped school and protested in the streets for stringent climate protection. Lately, more and more people of all ages are joining the movement, scientists write petitions, and policy makers begin to respond. Will this become the societal support needed to decisively accelerate sustainability transitions?

The UK, once heavily dependent on coal, has almost completed its coal phase-out, while a government-appointed commission in Germany recently announced a political consensus with the same intention: to end coal-fired power generation. And just a few days ago, the director of Shell's new energies unit announced that they want to become the world's largest power producer by 2030, claiming that electricity is "by far the easiest way to decarbonize energy usage".

It is great to see so many positive signs. It seems that the low-carbon transition in electricity is actually taking off.

At the same time, progress is much slower in other fields such as transportation or food. Public transit, for example, continues to be neglected in many places in North-America and elsewhere. Not to speak of other environmental sustainability challenges such as deforestation, biodiversity, overfishing, circular economy or (plastic) waste.

In transitions research, we often look at positive examples, at promising innovations and systems like energy, which are already changing. While this perspective is important, we might miss out on studying (and learning from) negative developments, e.g. sectors that are still locked-in, green policies being scrapped or unsustainable practices gaining ground.

Another challenge is about the variety of sustainability goals and trade-offs between these goals. Climate change often seems to be dominating the discourse (and our studies) but it is just one out of 17 SDGs. Also, different goals might be conflicting, a topic that has not received much attention in transition research so far.

These are just two examples, where our research could broaden in the future. More are listed in the recently published STRN research agenda document, and also these are by no means exhaustive.

This is something I personally like about our field. Sustainability issues are not only important to work on, but they are constantly changing and challenging us to broadening our perspectives, addressing e.g. acceleration (this year's conference theme!), transition dynamics across sectors, whole systems change, decline and resistance, new innovation policy approaches and governance models, legitimacy, user practices, justice etc.

Another highlight is the commitment and high motivation in our community. People organize the many different events, webinars, workshops, and sessions that bring us together and improve our work. I am particularly impressed by the drive of the NEST community and also by this year's IST organizing committee, which is working very hard to make the first North-American transitions conference a success!

Given the continuing inspiration, dedication and support by so many, I am happy and excited to serve our network as the new chairperson. I am equally happy that Lea Fünfschilling has joined us as a new board member.

You might have realized that the STRN newsletter has a new look and some new kind of content. While the established categories (news, events, publications etc.) are still there, we also want to experiment with new features such as debates, short reports or viewpoints. So, if you have ideas or topics you would like to contribute, you are very welcome!

One possibility for debate is the [STRN research agenda](#), which is a viewpoint to which some of us but not all have contributed and which has not gone through formal peer review. It will certainly benefit from further discussion. Also, the editors of EIST are looking forward to receive commentaries on this.

For the newsletter, I would like to see a rotating editorial, so that there is also an opportunity for other board and steering group members to share their perspectives. Moreover, we plan a web-based upload for STRN publications to ease the process and perhaps group them into larger topics so that they become more accessible.

I hope you enjoy reading this newsletter and I am looking forward to your feedback.

Volume 30 (March 2018) has just been published.

It is a Special Issue on "[Low-carbon China: Emerging phenomena and implications for innovation governance](#)",

edited by Adrian Ely, Sam Geall and Yixin Dai.

It contains the following contributions:

- Low-carbon China: Emerging phenomena and implications for innovation governance – Introduction to the special issue, by Adrian Ely, Sam Geall and Yixin Dai
- Comparing the innovation strategies of Chinese and European wind turbine firms through a patent lens, by Meijuan Pan, Yuan Zhou and Dillon K. Zhou
- Where is the politics? E-bike mobility in urban China and civilizational government, by Dennis Zuev, David Tyfield and John Urry
- Agri-food transitions and the “green public sphere” in China, by Sam Geall and Adrian Ely
- Policy instrument designed to gain transition legitimacy: A case of Chinese nuclear development, by Yixin Dai
- Adaptive policy innovations and the construction of emission trading schemes in China: Taking stock and looking forward, by Wei Shen and Yao Wang,

As always, we look forward to receive your submissions and comments. Please don't forget to read, and if relevant cite, EIST.

Jeroen van den Bergh, Editor-in-Chief

Launch of new Thematic group on Urban Transitions and Transformations

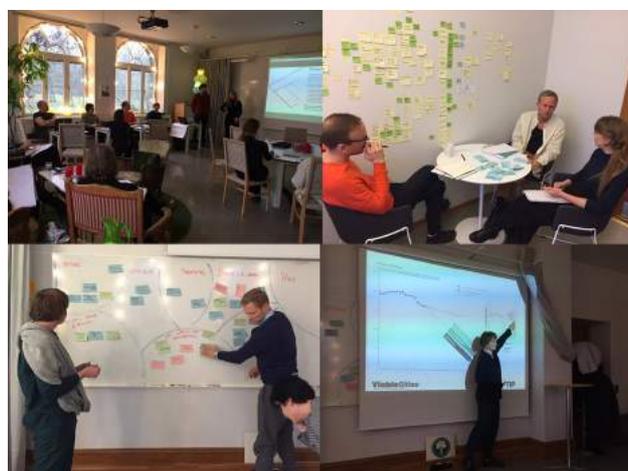
A new thematic group on urban transitions and transformations (UTT) formally kicked off last November. Since then, we have been busy preparing the ground for wider involvement, collaboration and joint activities.

In January we realized a first 2-day transdisciplinary workshop to further develop our ideas. We are currently preparing three dialogue sessions for the IST 2019 conference: Taking stock on UTT; Pathways and barriers for accelerating UTT, and Co-production for UTT. We are also preparing a position paper that will be presented at IST.

If you are working on the urban dimension of sustainability transitions and would like to engage in further shaping the activities of our group, let us know! We are specifically looking for people who can contribute to any of the following:

- Develop group communications (web-based)
- Organize regular webinars for exchange
- Prepare an event (any place) or project
- Develop outreach messages and channels

For general enquiries and suggestions, please contact: urban.transitions.strn@gmail.com (Marc Wolfram) To join the group mailing list, please email: urban-transitions-strn+subscribe@groups.io (administrators: Emilia Smeds and Jonas Torrens).



Pictures: Nina Vogel

STRN Events

Upcoming Events

IST 2019 Conference, 23-26 June, Ottawa

There was a remarkable response to the call for submissions for IST 2019, with over 470 abstracts submitted for consideration as part of this special 10th anniversary event. Decision notices have now been issued and the organizers are developing a stimulating program engaging with the conference theme of 'accelerating sustainability transitions' as well as other topics central to transitions research.



Conference activities will kick off on June 23rd with a late afternoon session for newcomers to sustainability transitions (space is limited, so please register if you are interested), immediately followed by an evening Welcome Reception. Conference sessions will begin the morning of June 24th and will continue daily until the conference closes mid-afternoon on June 26th. The conference's Opening Reception will be held on the evening of June 24th, and the Conference Dinner will take place on the evening of June 25th.

As Ottawa is a very attractive tourist destination in the summer, we encourage everyone to [register](#) (the deadline for presenters is April 10th) and make their [travel plans](#) as soon as possible. While you are here, consider visiting the [National Gallery of Canada](#) (to see Canadian and Indigenous art that you will not see anywhere else), touring the [Rideau Canal](#) (a UNESCO World Heritage site), and perhaps staying for major international music festivals in [Ottawa](#) and [Montreal](#).

We look forward to welcoming you to Ottawa in June!

Daniel Rosenbloom,
on behalf of the IST Organizing Committee

NEST 2019 Conference

The 4th Network of Early Career Researchers in Sustainability Transitions ([NEST](#)) Conference will be held on **4-5 April, 2019 in Lisbon**.

We have received a record number of 120 applications and are happy to welcome 80 talented early career researchers in Portugal next month.

Under the theme
"Transitions to where? Shared values and visions for sustainability transitions"
we will have paper sessions as well as creative workshops and discussion formats on *where* we want to go with sustainability transitions.

Coordinators: Ines Cosme (University Nova de Lisboa), Alexandra Polido (University of Aveiro), Adriaan van der Loos (Utrecht University) and Verena Hermelingmeier (Wuppertal University).

Past Events

NEST/STRN Winter school

The first NEST Winter school on **Methodologies in sustainability transitions research** was a great success. It was held at Fraunhofer ISI, **Karlsruhe** from 11th-15th March 2019. The Winter school was an introduction to methods and methodological issues in sustainability transitions research for PhD students and early career researchers that attracted around 25 participants.

Topics covered included:

- the nature of sustainability transitions,
- what are the methodological issues – epistemological and ontological,
- qualitative methods, quantitative methods and modelling, mixed methods.

Transdisciplinarity in transitions research and the positioning/roles of researchers were addressed and interactions with stakeholders considered. Issues of transformations in the 'Global south' were discussed.

Coordinators: Jonathan Köhler (ISI), Lea Fünfschilling (CIRCLE), Julia Wittmayer (DRIFT), Georg Holtz (Wuppertal Institute), Bonno Pel (UL Brussels), Anton Sentic (NEST), Kristina Hojcková (NEST)



Participants and instructors at the winter school

Other News

Inter-Network Dialogue

The Inter-Network Dialogue is a recently established exchange of EU-SPRI, GLOBELIX, TIPC and STRN. At a workshop in February, a priority agenda on Transformative Innovation Policy was developed. Also, there will be a call for papers for the TIPC conference in November.

The workshop took place at Utrecht University's Centre for Global Challenges. Led by the European Forum for Studies of Policies for Research and Innovation (EU-SPRI), the workshop aim was to foster a dialogue between researchers and policy makers interested in future research on transformative change in the arena of Science, Technology and Innovation policy.

In attendance across the two days was a diverse team of members from EU-SPRI, the Global Network for Economics of Learning, Innovation and Competence Building Systems (GLOBELICS), the Transformative Innovation Policy Consortium (TIPC) and STRN.

The first day saw the team break into groups to debate priorities, controversies and perspectives

for the TIP research agenda. Particular topics of discussion included:

- Rationales for TIP
- Conceptual foundations of TIP
- Role of Science, Technology and Innovation
- Design and implementation of TIP

The TIP research agenda represents a radical departure from traditional methods of policy making and knowledge production, and thus needs truly transformative methods that allow for diversity across different contexts. The importance of collaboration and coordination between different actors was stressed as crucial to the success of TIP, as well as the need to apply local, regional and national lenses.

Such views were confirmed when hearing from policy makers on the second day of the workshop, who stressed the need to work both trans-nationally and locally.

The network agreed that the next priority was the creation of a research initiative group with representatives from all networks that will put together a research proposal for potential funders. Furthermore, TIPC will put out a call for papers to further develop understandings of TIP, which will coincide with the next TIPC Conference in November 2019.

Transformative Action Award

The 2019 [Transformative Action Award](#) was launched on March-6. It recognises initiatives and actions that achieve socio-cultural, socio-economic and technological transformation of societies.

The Europe-wide sustainability award, organised by ICLEI, the Basque Country and the City of Aalborg (Denmark) and supported by the European Committee of the Regions (CoR) and the European Investment Bank (EIB), rewards ongoing or concluded Transformative Actions that use the 15 pathways outlined in the Basque Declaration to achieve the socio-cultural, socio-economic and technological transformation of societies. The actions taken reflect local or regional contributions to the implementation of the Sustainable Development Goals and the Paris Climate Agreement.

In addition to joining previous winners Ghent (Belgium) and Nilüfer (Turkey) as recognised leaders of sustainable urban transformation in Europe, the winner of the 2019 award will receive 10,000 EUR to help initiate further transformative actions in their city or region. The winner will also receive free entry and a presentation at the 9th [European Conference on Sustainable Cities & Towns](#) taking place in Mannheim (Germany) from 30 September – 2 October 2020.

Applications to the award are accepted [online](#) and the application deadline is 31 July 2019. For further information, please contact Robert.Morrow@iclei.org

Predatory Publishing

“Publish or perish” – you probably heard it before. And then there is this gloomy feeling about a paper or two stuck in the publication pipeline. Or the looming end of PhD funding, and still no journal article published. How about I get these papers out now? And quickly!

Well, predatory journals may be just what you are looking for: You pay and they publish your paper in no time!

Predatory publishing is an “exploitative ... publishing business model that involves charging publication fees to authors without providing the editorial and publishing services associated with legitimate journals” ([Wikipedia](#)). Note that predatory publishing is also referred to as ‘predatory open access publishing’, even though open access is not a defining characteristic of predatory journals.

Unfortunately, also some transitions research is appearing in journals whose academic credibility is questionable. Some journals, for example, publish some thousand papers a year. This is understandable as the volume of papers is directly proportional to the profits the publisher generates. Multiply thousands of papers with a publication fee of e.g. 1’500€

per article and you get a feel of the business behind this. Academic quality is then of secondary importance, if at all. The academic publishing industry, btw, has one of the highest profit margins (30-50%!) in the world ([Guardian](#)).

A key criterion, whether a journal is of good quality is whether its editors provide a proper peer-review process, or not. An indication for this can be the process time on the front page of each article. For example, a paper that was submitted end of February and was received in a revised version end of March (of the same year!) has most likely not gone through serious consideration by any editor or reviewer. And as a reviewer, be suspicious if your recommendations are repeatedly neglected by the editor(s) without proper explanation.

If you are invited to do a special issue for these journals, check their pipeline. If they have dozens or hundreds (!) of special issues running in parallel, it is likely that something is wrong. The above Wikipedia site lists a range of criteria to identify fraudulent journals. An alternative is to consult the [Norwegian register for scientific journals](#), which provides a simple 3-tier ranking. If in doubt, ask colleagues or search online for the reputation of a journal.

Of course, academics are not just prey as the label of predatory journals suggests.

“[M]any academics know exactly what they’re getting into ... The relationship is less predator and prey ... than a new and ugly symbiosis” ([NY Times](#)).



In a recent [Special Issue](#) in Research Policy on [academic misconduct](#), [Bagues et al.](#) show that re-searchers may actually choose a predatory journal on the assumption that the benefits (one more 'publi-cation') outweigh the losses (possible damage to reputation). Nonetheless, be aware that publishing in one of these journals can seriously threaten your career once its fraudulent nature gets publicly disclosed. It will be increasingly difficult to argue that you have not been aware that such practices existed.

The pressure to publish remains high and navigating the ever-changing landscape of (new and established, legitimate and fraudulent) journals can be tricky. We hope to have raised awareness for one particular type of academic malpractice. Credibility of academic work is already under pressure, so let's do our best to keep our standards at a high level!

Jochen Markard and Bernhard Truffer (C&B)

Carbon pricing – a debate

While some view carbon pricing as the key policy instrument in the ongoing struggle to combat climate change, others are very skeptical given recent experiences. In sustainability transition studies, there has been not much of a debate about carbon pricing, which motivated us to collect and exchange a few arguments. We will take opposing positions: Jeroen van den Bergh will argue in favor of carbon pricing, Jochen Markard will argue against it. This is an exchange of personal viewpoints.

Intro statements

Jeroen: Carbon pricing is the core ingredient to any climate policy package and our single hope to arrive at globally harmonized climate policy ([Baranzini et al. 2017](#)). It will make high-carbon goods and services relatively expensive, reflecting emissions over their complete production and life-cycle. A carbon tax would shift choices by consumers, producers, investors and innovators, in transport, energy/electricity, agriculture and industry to low-carbon inputs, outputs and processes.

This means that it is the most accurate instrument for incentivizing a reduction in CO₂ emissions, as it reaches everyone and every decision in the economy, without discrimination. Because of this, it will also be able to select between 'clean' technologies that are more and less clean: e.g. PV panels produced with different processes or electricity using distinct energy sources. We don't know now which technologies are more low-carbon as production processes are complex and roundabout, involving many intermediate deliveries between firms and sectors. With carbon pricing, the low-carbon options would be selected as they simply

would be cheaper. Existing financial accounting systems of firms will assure this outcome.

Carbon pricing should be implemented as an economy-wide incentive that provides consistent incentives to all firms and households in the economy to reduce emissions. This will also limit rebound and carbon leakage. We should design it such that it includes revenue recycling to compensate any inequitable impacts (see box). Harmonization is needed to overcome national freeriding and concerns about competition and trade. As I will explain further below, no other instrument can reduce freeriding in climate negotiations like carbon pricing. The only alternative we have is weak unilateral policies, even under the Paris Agreement, given that it has not been able to achieve harmonized climate policies between countries.

Jochen: Policy-making, and transitions more broadly, are complex processes, often piecemeal and messy. There are strong conflicts of interest, which result in political compromise, at best. And different targets (carbon reduction, innovation, systems change, equality) might require different policies. Therefore, we should not focus on a single, ideal instrument but on a combination of different policies. Such a 'policy mix' will most likely vary across e.g. countries and sectors because of material, institutional, cultural and political differences. Carbon pricing can be an important element of a climate policy mix but it cannot be the only instrument.

Let me raise two issues, politics and innovation. First, any implementation of (climate) policies will meet resistance, especially if we talk about major policy changes, given the urgency of climate change. Policy-making is affected by business interests and wider societal acceptance. Stringent climate policies require strong societal and industrial support ([Meckling et al. 2015](#)). Such support needs to be build-up over time, e.g. by co-creating new technologies, industries and policies, that mutually reinforce each other and grow stronger over time (as in the case of renewables). If you want to introduce a stringent carbon tax, or any other stringent climate policy, without having low-carbon alternatives available and affordable, resistance will be too high.

Second, innovation and larger socio-technical transitions are crucial. This is why we need policies that foster radical innovation and fundamental

change. While carbon pricing will affect innovation, it is not sufficient. It can trigger incremental innovation (which is important) but we have to go beyond this. We need to create entirely new industries, new business models, new infrastructures, changes in consumption practices etc. One aspect of this systemic change is radical innovation, for which we need R&D support, subsidies or deployment programs.

Debate

Jeroen: Carbon pricing was in the past often criticized for being inequitable. All recent articles on it agree it should be complemented by equitable revenue recycling, for both ethical reasons and political feasibility. In fact, no other instrument allows for such compensation. Technical standards or performance targets/quota don't generate revenues, while subsidies do the opposite as they use revenues. Moreover, adoption subsidies for renewables and electric vehicle are rather inequitable as they fall on relatively well-off households.

Jochen: I agree that, in an ideal world, policies would be just, equitable, inclusive and well balanced. But reality is different. The EU-ETS, for example, does not include transport which may be seen as unfair. Similarly, German feed-in tariffs for solar have preferred homeowners over tenants, which was not fair either. But no policy will ever be perfect. Without these feed-in tariffs, which btw were always criticized by economists as one of the least preferable options, we would still not have solar-PV or wind at competitive prices. Yes, it was costly and yes it was not ideal but it was effective.

Unfortunately, we cannot say the same about the EU-ETS. It has been repeatedly criticized for not being effective. And why so? Well, one of the reasons is that it was initiated and promoted by fossil fuel incumbents and other influential industries. These players still use the instrument to argue against other, complementary policies such as renewable support schemes.

This is, of course, not an argument against carbon pricing as such. But it is important to note that policy processes are complex, imperfect, affected by conflicting interests and often a compromise.

Jeroen: With regard to the German feed-in tariffs, many argue now that if the money would have been used to fund innovation in renewables they

Box: A brief introduction to carbon pricing

Carbon pricing is a policy instrument that puts a price on carbon. Two main forms are carbon taxation and cap-and-trade (i.e. a carbon market), in which emitters have to purchase emission permits. Both of them charge the carbon content, which is key to reducing CO₂ emissions. It makes carbon pricing different from traditional energy and fuel taxes. A carbon price comes down to an indirect tax on CO₂ emissions as fuel content and emissions are proportional. This translates in distinct emission costs for different energy carriers (e.g. oil, gas, coal), as their carbon content varies. As a result, the dirtier fuels are, the more expensive they become.

Another design issue is about how the revenues of carbon pricing are used, e.g. whether they are i) part of a government's general budget, ii) used to subsidize innovation in, or adoption of, low-carbon technologies, or iii) redistributed to all consumers, or iv) reallocated especially to poorer households. The latter two are also known as revenue recycling.

One of the world's largest carbon pricing schemes is the European Emissions Trading Scheme (ETS) that was launched in 2005. It includes all EU member states and covers about 45% of its total greenhouse gas emissions. Large emitters such as coal-fired power plants, cement plants, or pulp and paper mills have to buy certificates for every ton of CO₂ they emit. There is an overall cap on the amount of certificates available per year and this cap decreases over time.

See [World Bank](#) for an overview of carbon pricing schemes.

would be cheaper now. Criticism on the EU-ETS overlooks it had to make compromises as it was initiated under a very weak climate deal, namely the Kyoto Protocol. All poor nations were uncommitted by it, so trade and relocation of energy-intensive industry out of the EU area was a serious risk. One should best regard ETS as an institutional innovation and experiment. In this respect it was successful, as also reflected by the clear willingness of the EU to continue with it. ETS prices have been too low, yes, but this was due to the Kyoto Protocol largely, which didn't allow for any stringent climate policies. Since 2018 the ETS carbon price has been on the rise, and currently, it is above 20 €/tCO₂. Meanwhile, carbon pricing (tax or market) is applied in almost 60 regions and countries, which shows it is able to get political support.

Jochen: I agree. The EU-ETS was introduced in a specific context at a specific time. It was indeed an experiment, from which we can learn. However, there is another problem I see. Carbon pricing has the ambition to be inclusive, i.e. all countries and industries should be included to avoid so-called carbon leakage. However, this ambition, which I understand and support, comes with the complication that (almost) every nation and stakeholder has to be on board. This is not only very unlikely but also bears the risk that we can only reach the lowest common denominator when it comes to policy design features.

Jeroen: Yes, if one has ad hoc and unilateral policies for industry, agriculture, transport or buildings, then two problems arise: one will reduce emissions in some places against higher costs in others, which in the end comes down to a higher cost for society. Reducing this cost through an economy-wide carbon price will also increase political feasibility for making policy stricter over time. In addition, equal incentives mean rebound and leakage are discouraged, between sectors and countries. Other policies, even if well-intended, will rebound and leak away to a larger extent. Unilateral policies without harmonization will add to both problems. So there is really no alternative to working towards global harmonization of policies to set the stage for more stringent national policies.

Jochen: I agree that international collaboration and multi-lateral policies are a worthwhile goal but they may take too long.

Jeroen: Of course, harmonizing carbon prices worldwide will take much time and political effort. But my prediction is that if we do not go down this path, then we will not solve climate change as we will get stuck into well-intended but weak unilateral policies. I can sketch a feasible scenario that ends in harmonization. It starts with negotiating a carbon tax among countries as this would automatically reduce freeriding since country negotiators would understand the tax would apply equally to all countries. Of course, fossil-fuel supplying countries will not come on board easily, and so far, they have resisted a good deal. Hence, the way forward is not a full participatory agreement but a 'climate club' of ambitious countries with a uniform carbon price and border carbon tariff, which can put pressure on non-members to join and thus expand over time. Focusing negotiations on technical standards is



less effective. Consider car fuel efficiency standards – countries with important car industries will resist. Target negotiation, as underlying the Paris Agreement, also invites for selfishness and freeriding. This explains why the Paris outcome includes rather weak pledges that are insufficient to stay within 2°C warming. So only negotiating a carbon tax offers a realistic chance to achieve policy harmonization among countries, necessary for strengthening such policy worldwide. This is a unique and underappreciated advantage of carbon pricing, notably a tax.

Jochen: Speaking about resistance: An important precondition for ambitious transition policy is to strengthen those interests (firms, businesses, consumers) who benefit from the transition. In a first step, 'niche actors' need to be empowered. This can be achieved with targeted subsidies and deployment policies. Renewables policies are a success case in this regard.

Jeroen: RES policies have gone up and down – witness Spain – while what we need is continuity, certainty and global consistency for steady investments. This is where the EU-ETS has been very successful. A higher carbon price would do miracles for the diffusion of renewable and electric vehicles. It requires harmonization beyond the EU-ETS though, i.e. a truly global coordination of policies. If we don't achieve this, we can really forget about solving climate change. There is no way that spontaneous bottom-up processes will decarbonize the economy sufficiently rapidly to stay within 2°C. Maybe if we would have 100 years, but we have only a few decades.

Jochen: Of course, a higher and steady carbon price would be great. But we have witnessed ups and downs in EU-ETS prices as well. I also see the

benefit of involving as many countries and sectors as possible. But I am skeptical we will succeed here. On the contrary, there is a clear risk that we continue negotiating for too long. The fact is that unilateral policies (by no means spontaneous) have made renewables cheap. This is why I argue in favor of (innovation) policies that generate novel solutions in addition to putting a price on carbon. Shifts in prices can only trigger incremental innovation in existing industries. But we cannot miss out on radical innovation. Again, we would not have competitive PV, wind or electric vehicles today if we had just relied on carbon pricing.

Final statements

Jeroen: I agree we need complementary policy instruments in a policy mix: next to carbon pricing certainly also innovation subsidies and information provision (about climate change, low-carbon options and need for particular policies). I am less convinced about adoption subsidies as they are costly and overlap with the incentive effect of carbon prices. And I think it is overlooked by many transition researchers that carbon pricing, or more generally environmentally corrected prices, will affect the speed and direction of innovation. Many private innovators are driven by expectations about costs and prices, and thus the impact of carbon pricing, as these determine future profit opportunities of innovations. The opinion that a carbon price only affects incremental innovations is debatable, but not uncommon in transition studies. Indeed, model studies indicate that a sufficiently high carbon price is able to enforce any change needed. The message is that the effective carbon price can be lower in the presence of good innovation policies. But don't get me wrong, I am in favor of intelligent innovation policy.

Jochen: It has become clear that there are many subtle aspects to carbon pricing. Transitions research could pay more attention to, and learn from, the debate on carbon pricing. Given 'our' experience with the innovation dimension of policies, the relevance of industry and market creation, as well as politics and the formation of coalitions, there is certainly much we can contribute. Also, the interaction of e.g. carbon pricing and innovation policies, together with ongoing changes in policies and policy mixes as transitions progress, deserve our attention.

Publications

PhD theses

Wang, D. (2018)

China's Energy Transition: Performance, Possibilities and Pathways.

University of Western Australia

[link](#)

This research analyses China's energy transition in terms of its performance, possible energy mix and transition pathways. The research investigates the relationship between energy transition and economic growth; examines the extent to which modern energy can substitute for traditional energy; and identifies the drivers of energy transition. The findings suggest that China's transition to cleaner energy is accelerating. This is due to growth raising the capital intensity of the Chinese economy which increases substitutability between fuels and reduces prices of modern fuels.

Books

Upham, P., Bögel, P., Johansen, K. (2019)

Energy Transitions and Social Psychology: a sociotechnical perspective.

Routledge Studies in Energy Transitions

[link](#)

This book makes a case for viewing 'sustainable behaviour' in its wider sociotechnical context and illustrates how social psychological and sociotechnical transitions perspectives may be theoretically connected. To do this, the book advocates the use of the more 'social' of social psychology concepts, to facilitate conceptual connections with the collective terms used in the sociotechnical sustainability transitions literature. The book also shows how an extended approach to structuration can be applied to coherently connect a series of multi-perspectival studies with different ontologies. In so doing, the book advocates an interdisciplinary approach to the energy social sciences when thinking about policy for new sociotechnical pathways. To date, the literatures of social psychology and sociotechnical sustainability transitions have been little connected, for many reasons, but this book is intended to begin this process.

Ulsrud, K., Muchunku, C., Palit, D., Kirubi, G. (2019)

Solar Energy, Mini-grids and Sustainable Electricity Access. Practical Experiences, Lessons and Solutions from Senegal.

Routledge

This book presents new research on solar mini-grids and the factors on different levels that influence the fulfillment of goals like equitable and affordable electricity access, economic sustainability and replication. Drawing on a detailed analysis of solar mini-grid projects in Senegal, the book provides insights into energy provision and accessibility relevant to sub-Saharan Africa, and the Global South more generally. Importantly, this monograph situates mini-grids in rural villages within the context of the broader dynamics of power relations and national- and international-level factors, including emerging system innovation and socio-technical transitions to green technologies. The book illustrates typical challenges and potential solutions for practitioners, policymakers, donors, investors and international agencies. It demonstrates the decisive roles of suitable policies and regulations for private-sector-led mini-grids, and shows the difficulties, dilemmas and conflicting actor interests involved in creating new policies and regulations that must differ significantly from those that are designed as part of an established, centralized electricity regime. Written by both academics and technology practitioners, this book might be of interest to those researching and working on energy policy, energy provision and access, solar power and renewable energy, and sustainable development more generally.

van den Bergh, J.C.J.M. (2018)

Human Evolution beyond Biology and Culture: Evolutionary Social, Environmental and Policy Sciences.

Cambridge University Press

Both natural and cultural selection played an important role in shaping human evolution. Since cultural change can itself be regarded as evolutionary, a process of gene-culture coevolution is operative. The study of human evolution - in past, present and future - is therefore not restricted to biology. An inclusive comprehension of human evolution relies on integrating insights about cultural, economic and technological evolution with relevant elements of evolutionary biology. In addition, proximate causes and effects of cultures need to be added to the picture - issues which are at the forefront of social sciences like anthropology, economics, geography and innovation studies. This book highlights discussions on the many topics to which such generalised evolutionary thought has been applied: the arts, the brain, climate change, cooking, criminality, environmental problems, futurism, gender issues, group processes, humour, industrial dynamics, institutions, languages, medicine, music, psychology, public policy, religion, sex, sociality and sports. Part VI (chapters 13-16) on evolutionary environmental and policy sciences deals also with major sustainability transitions, whereas major transitions in biology receive attention in chapter 3.

Brauch, H.G., Oswald Spring, U., Collins, A., Serrano Oswald, S.E. (2019)

Climate Change, Disasters, Sustainability Transition and Peace in the Anthropocene.

Springer International Publishing

[link](#)

This book provides insight into Anthropocene-related studies by IPRA's Ecology and Peace Commission. The first three chapters discuss the linkage between disasters and conflict risk reduction, responses to socio-environmental disasters in high-intensity conflict scenarios and the fragile state of disaster response with a special focus on aid-state-society relations in post-conflict settings. The two following chapters analyse climate-smart agriculture and a sustainable food system for a sustainable-engendered peace and the ethnology of select indigenous cultural resources for climate change adaptation focusing on the responses of the Abagusii in Kenya. A specific case study focuses on social representations and the family as a social institution in transition in Mexico, while the last chapter deals with sustainable peace through sustainability transition as transformative science concluding with a peace ecology perspective for the Anthropocene.

Papers

Hölscher, K., Frantzeskaki, F., McPhearson, T., Loorbach, D. (2019)

Tales of transforming cities: Transformative climate governance capacities in New York City, U.S. and Rotterdam, Netherlands.

Journal of Environmental Management, 231, 843-857

[link](#)

Climate change actions in cities worldwide are driving deep changes in urban governance. We ask whether new capacities for transformative climate governance are emerging in two cities that have experimented with urban climate governance: Rotterdam, the Netherlands, and New York City (NYC), United States. Transformative climate governance creates the conditions for developing integrated and innovative climate mitigation and adaptation policies and interventions that respond to and shape urban transformation dynamics and contribute to sustainability and resilience. The comparison of capacities for transformative climate governance in Rotterdam and NYC offers insights into the emerging features of urban climate governance vis-à-vis existing urban governance regimes: how urban climate governance is driven and delivered, what new governance conditions emerge, and whether these conditions enable transformative climate governance. In both cities, an integrated, experimental and inclusive approach to climate governance is emerging, which crosses multiple policy sectors and domains (e.g. transport, energy, health, justice), involves a variety of actors and facilitates innovative solutions. Envisioning, long-term goal and knowledge integration, experimentation and tapping into coalitions for change help to provide the basis (including guiding principles, urgency,

actor networks, innovative solutions) for transformative climate governance. However, these transformative approaches tend to be still subordinate to business-as-usual interests and policy and planning approaches, which favour isolated, incremental and short-term responses. The challenge for strengthening transformative climate governance will be to develop rigorous institutional and organisational conditions that decisively stipulate a prioritisation of climate change across scales and sectors, provide action mandates and enable wider coordination, collaboration and learning.

Rosenbloom, D., Meadowcroft, J., Cashore, B. (2019)

Stability and climate policy? Harnessing insights on path dependence, policy feedback, and transition pathways.

Energy Research & Social Science, 50, 168–178

[link](#)

Instilling climate policy with stability has emerged as a central concern in both the academic literature and societal discourse around climate change. Societal actors have called for stable climate policy to enable low-carbon investment; decisionmakers have sought to provide credible signals; and scholars have developed insights to inform “stickier” instrument design. However, given the sources of instability confronting climate policy and the transformative changes entailed by decarbonization, this paper argues that climate policy stability may not only be unattainable but also undesirable. Instead of striving for stability as an overriding feature of climate policy, we suggest attending to a broader aim: stabilizing the overarching orientation of climate policy as a transition towards a low greenhouse gas emission economy. We review the complementary concepts of path dependence, policy feedback, and transition pathways to distill strategies that may help in addressing this aim.

Frantzeskaki, N., Hölscher, K., Holman, I.P., Pedde, S., Jaeger, J., Kok, K., Harrison, P.A. (2019)

Transition pathways to sustainability in greater than 2°C climate futures of Europe.

Regional Environmental Change

[link](#)

The complex challenges arising from climate change that exceeds the +2 °C target (termed ‘high-end climate change’) in Europe require new integrative responses to support transformations to a more sustainable future. We present a novel methodology that combines transition management and high-end climate and socioeconomic change scenarios to identify pathways and move Europe closer to sustainability. Eighteen pathways have been co-created with stakeholders through a participatory process. The pathways support Europe in moving towards a desirable future vision, through top-down and bottom-up actions that lower

greenhouse gas emissions, reduce impacts of and vulnerabilities to climate and socioeconomic changes and enhance well-being. Analysis shows that the pathways that are robust to future scenario uncertainty are those that shift Europe towards sustainable lifestyles, support and strengthen good governance for sustainability and promote adaptive resource management for water, agriculture and energy. The methodology can support the design of the urgent actions needed to meet the requirements of the Paris Agreement and to transform Europe, in preparation for an uncertain future.

Isoaho, K., Karhunmaa, K. (2019)

A critical review of discursive approaches in energy transitions.

Energy Policy, 128, 930-942

[link](#)

This article critically reviews the use of discursive approaches in studies of sustainable energy transitions. The review is motivated by calls to further incorporate social scientific methodologies into energy research and assess their contribution to policy. We strive to answer three questions: (1) which discursive approaches have been used to study sustainable energy transitions; (2) what thematic topics and issue areas have been covered and (3) what is the added value of discursive research designs? Our analysis is based on a review of 77 articles from the years 2004–2016. Our findings show that discursive approaches were mostly used to analyse institutional change and policy strategies at the national level and to examine energy choices through political ideology and the perceptions of publics. Nuclear power received most coverage, while renewable energy technologies were mainly studied through conflicts and opposition. We demonstrate discursive research designs to examine four distinct policy areas and discuss the added value of these approaches for energy policy and research. Discursive methodologies enable scholars to enrich policy discussions through accounting for transitions as complex and dynamic processes of change.

McMeekin, A., Geels, F.W. and Hodgson, M. (2019)

Mapping the winds of whole system reconfiguration: Analysing low-carbon transformations across production, distribution and consumption in the UK electricity system (1990–2016).

Research Policy, 48, 5, 1216-1231

A founding assumption and aim of the sociotechnical approach to sustainability transitions was the need to develop frameworks to understand major systemic changes that would be required across the entire chain of production, distribution and consumption. However, most studies have so far focused on partial aspects of the entire chain, often a single, radical technology innovation. Therefore, since the founding ambition remains largely unrealized, the paper aims to contribute to transition scholarship by developing an approach for

'whole-system' analysis. As a second contribution, we argue that this broader unit of analysis calls for greater attention to the architecture of the system in terms of how constituent elements are linked to one another. To elaborate this point, we develop a reconfiguration approach, based on conceptual extensions to the multi-level perspective, analysing both techno-economic developments and socio-institutional developments. This approach draws attention to the multiplicity and interdependencies of change processes that constitute transitions, including incremental change, component substitution, symbiotic add-ons, knock-on effects and changes to the system architecture. A third contribution is to make an empirical whole-system analysis of the low-carbon reconfiguration of the UK electricity system between 1990 and 2016. This is important and timely, because it allows socio-technical transition approaches to 'speak' at the same empirical whole-system level that dominates current long-term, low-carbon (modelling) analysis and associated political and public debate. This consequently enables a demonstration of the added value of the whole-system reconfiguration approach. Our findings show that early reconfiguration of the UK electricity system was dominated by modular changes within the generation and consumption subsystems; and more recently, how these earlier changes have triggered a new focus on the whole system architecture, anticipating deeper changes to the linkages between the generation, network and consumption subsystems.

Schröder, P., Vergragt, P., Brown, H., Dendler, L., Gorenflo, N., Matus, K., Quist, J., Rupprecht, C., Tukker, A., Wennersten, R. (2019)

Advancing sustainable consumption and production in cities - A transdisciplinary research and engagement framework to address consumption-based emissions and impacts.

Journal of Cleaner Production, 213, 114-125

[link](#)

Urban consumption patterns and lifestyles are increasingly important for the sustainability of cities today and in the future. However, considerations of consumption issues, social norms, behaviour and lifestyles within current urban sustainability research and practices are limited. Much untapped potential for the reduction of the environmental footprint of cities exists in combined production and consumption-based approaches, particularly in the "demand" areas of mobility, housing, food, and waste. To change unsustainable consumption and production patterns in cities, research needs to be transdisciplinary, actively involving stakeholders through co-creation processes. This paper builds on the premise that the perspectives and approaches of Sustainable Consumption and Production (SCP) for cities require the involvement of non-traditional stakeholders that are generally not included in urban planning processes such as social change initiatives, citizen groups and informal sector representatives. We present a transdisciplinary research and engagement

framework to understand and advance the transition to sustainable SCP patterns and lifestyles in cities. This transdisciplinary approach to SCP transformations in cities combines co-creation, participatory visioning processes and back-casting methods, participatory urban governance and institutional change, and higher-order learning from small-scale community initiatives. We illustrate our conceptual framework through three empirical case studies in cities which take an integrative approach to lowering ecological footprints and carbon emissions.

van Mierlo, B. (2019).

Users Empowered in Smart Grid Development? Assumptions and Up-To-Date Knowledge.

Applied Sciences, 9(5), 815

Active involvement of users in smart grids is often seen as key to beneficial development of smart grids. In this paper, we investigate the diverse assumptions about how and why users should be active and to what extent these assumptions are supported by experiences in practice. We present the findings of a systematic literature review on four distinctive forms of user involvement in actual smart grid projects: demand shifting, energy saving, co-design, and co-provision. The state-of-the-art knowledge reflects the preoccupation with demand shifting in the actual smart grid development. Little is known about the other user roles. More diversity in types of projects regarding user roles would improve the knowledge base for important decisions defining the future of smart grids.

Fazey, I., Schöpke, N., Caniglia, G., Patterson, J., Hultman, J., Van Mierlo, B., Säwe, F., Wiek, A., Wittmayer, J., Aldunce, P. (2018)

Ten essentials for action-oriented and second order energy transitions, transformations and climate change research.

Energy Research & Social Science, 40, 54-70

The most critical question for climate research is no longer about the problem, but about how to facilitate the transformative changes necessary to avoid catastrophic climate-induced change. Addressing this question, however, will require massive upscaling of research that can rapidly enhance learning about transformations. Ten essentials for guiding action-oriented transformation and energy research are therefore presented, framed in relation to second-order science. They include: (1) Focus on transformations to low-carbon, resilient living; (2) Focus on solution processes; (3) Focus on 'how to' practical knowledge; (4) Approach research as occurring from within the system being intervened; (5) Work with normative aspects; (6) Seek to transcend current thinking; (7) Take a multi-faceted approach to understand and shape change; (8) Acknowledge the value of alternative roles of researchers; (9) Encourage second-order experimentation; and (10) Be reflexive. Joint application of the essentials would create highly

adaptive, reflexive, collaborative and impact-oriented research able to enhance capacity to respond to the climate challenge. At present, however, the practice of such approaches is limited and constrained by dominance of other approaches. For wider transformations to low carbon living and energy systems to occur, transformations will therefore also be needed in the way in which knowledge is produced and used.

Roberts, C. and Geels, F.W. (2019)
Conditions for politically accelerated transitions: Historical institutionalism, the multi-level perspective, and two historical case studies in transport and agriculture.

Technological Forecasting and Social Change, 140, 221-240

This article investigates the conditions under which policymakers are likely to decisively accelerate sociotechnical transitions. We develop a conceptual framework that combines insights from historical institutionalism and the Multi-Level Perspective to better understand the political dimension in transitions, focusing particularly on the mechanisms of political defection from incumbent regime to niche-innovation. We distinguish two ideal-type patterns, one where external (landscape) shocks create a 'critical juncture' and one where gradual feedbacks change the balance of power between niche-innovation and regime. We also identify more proximate conditions such as external pressures on policymakers (from business interests, mass publics, and technologies) and policy-internal developments (changes in problem definitions and access to institutional arrangements). We apply this framework to two historical case studies in which UK policymakers deliberately accelerated transitions: the transition from rail to road transport (1920–1970); and the transition from traditional mixed agriculture to specialised wheat agriculture (1920–1970). We analyse the conditions for major policy change in each case and draw more general conclusions. We also discuss implications for contemporary low-carbon transitions, observing that while some favourable conditions are in place, they do not yet meet all the prerequisites for political acceleration.

Roberts, C., Geels, F.W. (2019)
Conditions and intervention strategies for the deliberate acceleration of socio-technical transitions: Lessons from a comparative multi-level analysis of two historical case studies in Dutch and Danish heating.

Technology Analysis & Strategic Management, in press

[link](#)

Policy-oriented transition frameworks such as Strategic Niche Management, Transition Management, and Technological Innovation Systems offer limited analytical

traction on deliberately accelerated socio-technical transitions. Using the Multi-Level Perspective as guiding framework, we therefore inductively explore the political acceleration of socio-technical transitions by investigating two deliberately accelerated heating transitions: the transition from coal and oil to natural gas in the Netherlands (1948–1973), and the transition from oil to district heating in Denmark (1945–1990), to draw lessons about the conditions and intervention strategies that facilitate rapid socio-technical change. We find that both cases were characterised by weakened regimes, stabilised niche-innovations, focusing events, and consensus between policymakers and business actors. User resistance was also low in both cases, partly because of public policies. Different focusing events in each case produced problem-driven versus opportunity-driven transition pathways; the former destabilised existing regimes but generated future-oriented uncertainty, while the latter facilitated rapid closure.

Kiefer, C.P., Carrillo-Hermosilla, J., del Río, P. (2019)

Building a taxonomy of eco-innovation types in firms: A quantitative perspective.

Resources, Conservation & Recycling, in press

Eco-innovations, or innovations that reduce the environmental impacts of production and consumption activities, are considered crucial for sustainability transitions and a key element of a Circular Economy. Although previous contributions have acknowledged the existence of different types of eco-innovations (e.g., product vs. service or incremental vs. radical), a precise conceptualization of eco-innovation types, which takes into account its multifaceted character, is missing. Yet such a conceptualization is crucial in order to understand how eco-innovations contribute to a sustainable transition, how policy makers can promote different eco-innovation types, and how business practitioners can develop eco-innovations. This article covers this gap in the literature. Its aim is twofold: 1) to develop a quantitative method to categorise different eco-innovation types in a particular setting, taking into account their distinct features and dimensions; 2) to apply this method in a given sector and country, building a taxonomy of eco-innovation types. It draws on a survey of 197 Spanish industrial small and medium size enterprises (SMEs) which developed or adopted an eco-innovation between 2012 and 2013. The statistical analyses reveal the existence of a taxonomy of five eco-innovation types: systemic, externally driven, continuous improvement, radical (technology-push initiated) and eco-efficient. They differ in their techno-economic configurations, contribution to environmental sustainability and corporate goals and required changes in the firms. Specific policy and managerial implications are deduced.

Lindberg, M. B., (2019)
The EU Emissions Trading System and Rene-

wable Energy Policies: Friends or Foes in the European Policy Mix?

Politics and Governance, 4(1), in press

The EU's energy transition has advanced rapidly during the last decade, with important implications for the policy landscape. Scholars have characterized the Emissions Trading System (ETS) and the Renewable Energy Directive as the most important policies for reducing greenhouse gas emissions in the electricity sector. However, since the early 2010ies, non-governmental and industry actors have debated about whether renewable energy support and targets are compatible with the ETS. In this paper, I systematically assess policy preferences of five groups of non-governmental actors with respect to the role of the ETS versus renewable energy policies in three policy processes. For most actor groups, preferences remain stable across the policy processes. In the electricity industry group, preferences vary across processes. During the ETS-reform, this actor group argues that the ETS should be the main climate policy, whereas in the Clean Energy Package-process, almost half of the utilities endorse continued renewable energy support. This represents a shift in argumentation line and policy position: From asserting that renewable energy policies 'destroy' the ETS, towards a position which recognizes the value of having both the ETS and renewable energy policies as complementary instruments in the policy mix. The findings point to increasing support for RE policies, which is important for policy makers and scholars involved in designing and implementing the EU's decarbonization policies.

Sovacool, B.K., Lipson, M., Chard, R. (2019)

Temporality, vulnerability, and energy justice in household low carbon innovations.

Energy Policy, 128, 495-504

[link](#)

Decarbonisation and innovation will change the affordability of different domestic energy services. This has the potential to alleviate vulnerability to fuel poverty, but it could create new injustices unless the risks are preempted and actively mitigated. In this paper, we ask: In what ways can emerging low-carbon innovations at the household scale complement, and complicate, achieving energy justice objectives? Drawing from four empirical case studies in the United Kingdom, the paper highlights different risks that come from different types of innovation required to tackle different decarbonisation challenges. More specifically, it assesses four particular household innovations—energy service contracts, electric vehicles, solar photovoltaic (PV) panels, and low carbon heating—selected for their fit with a typology of incremental vs. radical technology and modest vs. substantial changes in user practices. It shows how in each case, such innovations come with a collection of opportunities but also threats. In doing so, the paper seeks to unveil the “political economy” of low-carbon innovations, identifying particular tensions alongside who wins and who loses, as well as the scope and

temporality of those consequences.

Lazarevic, D., Kautto, P., Antikainen, R. (2019) Finland's wood-frame multi-storey construction innovation system: Analysing motors of creative destruction.

Forest Policy and Economics, in press

Wood-frame multi-storey construction (WMC) is enjoying a period of increasing popularity in the public domain, with 'timber towers' and 'wooden skyscrapers' being labelled as potential game changers. Yet, whilst WMC is growing in some European cities, it still remains a curiosity. The emergence of WMC is the result of decades of science, technology and innovation policy and entrepreneurial experimentation. The aim of this paper is to analyse the emergence and evolution of the Finnish WMC from a technological innovation system perspective; paying attention to niche creation and regime destabilisation functions and motors of creative destruction. We analyse two distinct periods of activity in WMC innovation. Both were stimulated by government interventions looking to encourage value-added activity for the forestry sector in light of external pressures. Our analysis of WMC innovation systems functions highlights the importance of creative destruction in the science and technology push motor of innovation, especially where niche WMC technologies are competing against the incumbent concrete frame construction system.

Newig, J., Derwort, P., Jager, N.W. (2019)

Sustainability through institutional failure and decline? Archetypes of productive pathways.

Ecology and Society, 24 (1), 18

Although current literature on sustainability governance and institutions is preoccupied with innovation, novelty, success, and “best practice,” there is an emergent tendency to consider decline and failure as opportunities and leverage points to work toward and to achieve sustainability. However, although failure, crisis, and decay have been treated extensively, the link toward their productive potential has remained underdeveloped in the literature. Using a systems perspective, we described five archetypical pathways through which crisis, failure, deliberate destabilization, and active management of decline may facilitate sustainability transformation through adaptation, learning, providing windows of opportunity, and informed choices regarding stability versus change. We sought to provide a basis for further conceptual and empirical inquiry by formulating archetypical pathways that link aspects of failure to productive functions in the sense of sustainability. We started out by describing five archetypical pathways and their conceptual underpinnings from a number of different literatures, including evolutionary economics, ecology, and institutional change. The pathways related to (1) crises triggering institutional adaptations toward sustainability, (2) systematic learning from failure and breakdown, (3) the purposeful destabilization of

unsustainable institutions, (4) making a virtue of inevitable decline, and (5) active and reflective decision making in the face of decline instead of leaving it to chance. These archetypical pathways were illustrated by a number of sustainability-related empirical case studies. In developing these archetypes, we have sought to move forward the debate on sustainability transformation and harness the potential of hitherto overlooked institutional dynamics.

Barrie, J., Zawdie, G., Joao, E. (2019)
Assessing the role of triple helix system intermediaries in nurturing an industrial biotechnology innovation network.

Journal of Cleaner Production, 214 (2019), 20-9-223

The rate of transition to a circular economy would largely be influenced by how successfully sustainable niche innovation can be developed and adopted. This paper measures and evaluates the effectiveness of employing a triple helix-based system intermediary as a policy tool for nurturing a niche innovation network in line with circular economy transition. This was achieved through a complete social network analysis of a national industrial biotechnology innovation network, in which the organization functioning as network manager was innovatively structured as a triple helix-based system intermediary. Through unique access to the entire national industrial biotechnology niche network, a large set of primary data was collected on 13 types of relational ties related to innovation between all 64 public sector, industry and academic niche network member organizations. The impact of the triple helix-based system intermediary on the level of cohesion, presence of cohesive subgroups and centralisation of the niche network was empirically measured. As such, the effectiveness of the intermediary in undertaking key nurturing activities of building the network, facilitating shared learning and raising expectations were evaluated. This allowed for the most comprehensive empirical study to date on a niche innovation network and the role of system intermediaries in circular economy transition. The results of the analysis demonstrate the profound nurturing effect that the introduction of a triple helix-based system intermediary has had on the network. In particular, the results appear to confirm the effectiveness of the intermediary with regards to increasing knowledge and resource flows amongst triple helix institutions as well as between regime and niche actors.

Gaitán-Cremaschi, D., Klerkx, L., Duncan, J., Trienekens, J.H., Huenchuleo, C., Dogliotti, S., Contesse, M.E. and Rossing, W. A. H. (2019)

Characterizing diversity of food systems in view of sustainability transitions. A review.

Agronomy for Sustainable Development, 39, 1

[link](#)

Dominant food systems are configured from the

productivist paradigm, which focuses on producing large amounts of inexpensive and standardized foods. Although these food systems continue being supported worldwide, they are no longer considered fit-for-purpose as they have been proven unsustainable in environmental and social terms. A large body of scientific literature argues that a transition from the dominant food systems to alternative ones built around the wider principles of sustainable production and rural development is needed. Promoting such a sustainability transition would benefit from a diagnosis of food system types to identify those systems that may harbor promising characteristics for a transition to sustainable food systems. While research on food system transitions abounds, an operational approach to characterize the diversity of food systems taking a system perspective is still lacking. In this paper we review the literature on how transitions to sustainable food systems may play out and present a framework based on the Multi-Level Perspective on Socio-Technical Transitions, which builds upon conceptual developments from social and natural science disciplines. The objectives of the framework are to (i) characterize the diversity of existing food systems at a certain geographical scale based on a set of structural characteristics and (ii) classify the food systems in terms of their support by mainstream practices, i.e., dominant food systems connected to regimes; deviate radically from them, niche food systems such as those based on grassroots innovation; or share elements of dominant and niche food systems, i.e., hybrid food systems. An example is given of application of our framework to vegetable food systems with a focus on production, distribution, and consumption of low-or-no pesticide vegetables in Chile. Drawing on this illustrative example we reflect on usefulness, shortcomings, and further development and use of the diagnostic framework.

Kloppenborg, S., Boekelo, M. (2019)

Digital platforms and the future of energy provisioning: Promises and perils for the next phase of the energy transition.

Energy Research & Social Science, 49, 68-73, 2214-6296

[link](#)

In this Perspective paper we call for attention to the rise of digital platforms in the energy field. The smart grid has laid the ground for – and is increasingly swept up by – attempts to apply the economic, social and technological model of the platform to energy provisioning. The emergent energy platforms offer decentralised, digitally enabled exchanges of energy from distributed resources. They can record flows of energy to administer connections of exchange between household users, develop algorithms to steer the flow of energy from and to household batteries, and enable crowdsourced investments into (small-scale) renewable energy production. We draw up a first typology based on platforms' physical integration into the energy infrastructure as well as users' scope for action. To map

out the possible implications of these developments, we draw on the burgeoning, interdisciplinary field of platform studies to show how logics of platformization will drive changes to the energy system. We identify the marketization of new domains and activities, the formation of new collectivities and the creation of digital environments that afford new types of engagement with energy assets and other users of the grid. Our main concern is that uncertainties produced by these platforms and their tendency to privatise energy provisioning may slow down the transition towards sustainable energy systems. We therefore call upon energy social scientists to not only examine these developments but use these insights to also participate in the responsible design of the energy grids of the future.

Hudson, M. (2019)

What does Canute want? The “Monash Forum” and the Australian Climate Deadlock.

Energy Research & Social Science, 49, 126-133, 2214-6296

[link](#)

The speed of sustainability socio-technical transitions is dependent upon many factors. One of these is the amount, skill and success of political incumbent resistance. Australia has been a spectacular example of this resistance – politically, economically and culturally. This article contextualizes the recent effort of a collection of federal MPs, grandly if inaccurately named the ‘Monash Forum’, who advocated for the state-funded construction of a new coal-fired power station. If successful, such a move would consolidate the victories already achieved in slowing the socio-technical transition away from centralized fossil fuel-based electricity generation towards a more decentralized and diverse range of renewable energy generation, storage and supply. The Forum can be used as an object that is ‘good to think with’ as a prism that lets us see the trajectories of politics, economics and culture. The article offers eight ways that the Monash Forum can be considered, within the broader scope of Australia’s climate deadlock.

Steinbacher, K., Röhrkasten, S. (2019)

An outlook on Germany’s international energy transition policy in the years to come: Solid foundations and new challenges.

Energy Research & Social Science, 49, 204-208, 2214-6296

[link](#)

Germany’s ambition to promote sustainable energy globally, on the basis of its own “Energiewende,” has led to the development of a multi-faceted international energy transition policy with various activities and an agenda to promote renewables and energy efficiency abroad. While domestic energy policy developments in Germany have received substantial attention in research and public debate, this is still less true for the country’s

international energy transition policy. With the new German government’s program now having taken shape and implementation starting, it is time to assess the foundations and likely direction of and the most relevant challenges for Germany’s efforts to promote sustainable energy internationally. This perspective article takes a look at the aspects shaping Germany’s outreach to partner countries outside the EU to promote sustainable energy and addresses open questions related to its agenda. Germany’s international energy transition policy builds on a longstanding track record, but in order to maintain credibility and visibility in leadership for sustainable energy, two key challenges remain: setbacks in domestic climate mitigation efforts are putting into question claims for climate leadership and struggles to expand the Energiewende beyond the electricity sector require a new spin to international collaboration efforts, more and more directed toward bidirectional exchange and mutual learning.

Haunstrup Christensen, T., Rommes, E. (2019)

Don’t blame the youth: The social-institutional and material embeddedness of young people’s energy-intensive use of information and communication technology.

Energy Research & Social Science, 49, 82-90, 2214-6296

[link](#)

The intensive use of information and communication technology (ICT) results in increasing levels of consumption of energy and materials. The use of ICT is widespread among young people, and this paper investigates the everyday practices related to their use of ICT (mainly smart phones and laptops). Based on qualitative studies in the Netherlands and Denmark, we find that energy-intensive use of ICT is encouraged through mutually reinforcing social norms, social-institutional embeddedness and scripts regarding their everyday practices. In addition to a lack of awareness of the environmental impact of ICT, this explains why young people in general find it hard to imagine using ICT less to save energy. It is discussed how the material design (scripts) of ICT, e.g. visual/audio message notifications, supports increased use, but also sometimes are opposed by young people through counter script strategies. More generally, young people often have experiences of (social media) communication as being burdensome due to its extent and social expectations of always being accessible. Future policies should target the social-institutional and material context, instead of the individual user, if the aim is to reduce energy consumption from ICT use. The paper combines a practice theoretical approach with STS concepts that foreground the role of materials in shaping practices.

Mutter, A. (2019)

Mobilizing sociotechnical imaginaries of fossil-free futures – Electricity and biogas in public

transport in Linköping, Sweden.

Energy Research & Social Science, 49, 1-9, 2214-6296

[link](#)

In response to concerns about climate change and fossil fuel reliance, Swedish national policy has set the ambitious goal of a fossil fuel independent transport fleet by 2030, opening up a widespread debate on renewable fuel choice. Across sectors and regions, this debate inspires competing visions for how this transition can be achieved. Using sociotechnical imaginaries for a theoretical background, this paper will examine two competing visions in the case of urban public transport in Linköping, Sweden. While the biogas sociotechnical imaginary is based on the socio-material reality of the existing local infrastructure system, the electricity imaginary is gaining widespread support including from national and international interests. Using interviews with fourteen key actors and document analysis, this paper seeks to understand how local actors understand biogas and electric buses as competing technologies and how they mobilize these antagonistic imaginaries in their own visions of the future. Most often, actors mobilize both the biogas and the electric imaginary alongside each other, suggesting an attempt at reconciling them at the local level. This reconciliation sheds light on the challenge of applying national imaginaries to local cases and indicates that the complexity of multi-level systems must be considered in large scale sustainability transitions.

Hansen, P., Liu, X., Morrison, G.M. (2019)

Agent-based modelling and socio-technical energy transitions: A systematic literature review.

Energy Research & Social Science, 49, 41-52, 2214-6296

[link](#)

Agent-based modelling has the potential to provide insight into complex energy transition dynamics. Despite a recent emphasis of research on agent-based modelling and on energy transitions, an overview of how the methodology may be of value to understanding transition processes is still missing from the literature. This systematic review evaluates the potential of agent-based modelling to understanding energy transitions from a social-scientific perspective, based on a set of 62 articles. Six topic areas were identified, addressing different components of the energy system: Electricity Market, Consumption Dynamics/ Consumer Behaviour, Policy and Planning, New Technologies/ Innovation, Energy System, Transitions. Distribution of articles across topic areas was indicative of a continuing interest in electricity market related enquiries, and an increasing number of studies in the realm of policy and planning. Based on the relevance of energy transition specific complexities to the choice of ABM as a methodology, four complexity categories (1–4) were identified. Indicating the degree of association between the

complexity of energy transitions and ABM's ability to address these, the categorisation revealed that 35 of the 62 studies directly linked the choice of ABM to energy transition complexities (complexity category 1) or were set in the context of energy transitions (complexity category 2). The review further showed that the greatest potential contribution of ABM to energy transition studies lies in its practical application to decision-making in policy and planning. More interdisciplinary collaboration in model development is recommended to address the discrepancy between the relevance of social factors to modelling energy transitions and the ability of the social sciences to make effective use of ABM.

Marquardt, J., Delina, L.L. (2019)

Reimagining energy futures: Contributions from community sustainable energy transitions in Thailand and the Philippines.

Energy Research & Social Science, 49, 91-102, 2214-6296

[link](#)

This article counters conventional discourses where sustainable energy transitions in the Global South have been broadly linked to top-down policy frameworks, large-scale installations, and donor-driven interventions. It does so by highlighting the roles played by and the potentials of bottom-up, small-scale, and community-driven initiatives in shaping energy transitions in these locations. We shed light on two of these initiatives: a rural, community-based renewable energy project in Thailand, and a community-led social movement that prevented the construction of a coal-fired power plant in the Philippines. Both cases demonstrate how community mobilizations help facilitate sustainable energy transitions in the Global South, despite their many social, political and economic constraints. The analysis draws from concepts of local activism and community engagement on energy transitions, marrying the social movement concept of prefigurative activism with the concept of sociotechnical imaginaries in science and technology studies. This article highlights that valuable insights can be generated from rural- and community-driven renewable energy initiatives and their power to reimagine the futures of energy systems in the Global South.

Trencher, G., van der Heijden, J. (2019)

Contradictory but also complementary: National and local imaginaries in Japan and Fukushima around transitions to hydrogen and renewables.

Energy Research & Social Science, 49, 209-218, 2214-6296

[link](#)

Scholarship is devoting increasing attention to the important role that socio-technical imaginaries play in materialising desirable energy futures by inspiring and propelling technological innovation strategies, mobile-

sing stakeholders and resources, and justifying necessary policy introductions and transformations of socio-economic systems. This article contributes to this emerging scholarship by exploring two relevant cases and their interactions: Japan's national imaginary around a transition to a hydrogen society and Fukushima Prefecture's local imaginary around a post-nuclear disaster transition to a society powered 100% by both renewables and hydrogen. As we demonstrate, while the process of interaction and appropriation of the national-level hydrogen imaginary to the Fukushima context triggered contestations, friction and contradictions, we also identify positive outcomes. That is, the process of convergence encountered concurrence in stakeholder communities and complemented existing efforts to achieve a renewable energy future that is unique to this particular geography. By also exploring positive outcomes, this study moves beyond existent scholarship—which has focused on negative consequences such as tensions and contestations—to propose a nuanced appreciation of the mixed outcomes that might ensure the convergence of diverging imaginaries from differing geographical scales.

Malakar, Y., Herington, M.J., Sharma, V. (2019)
The temporalities of energy justice: Examining India's energy policy paradox using non-western philosophy.
Energy Research & Social Science, 49, 16-25,
2214-6296

[link](#)

Energy justice is an emerging concept that informs policymakers on the just distribution of, and access to energy services. However, research on how policy grounded in energy justice may facilitate greater inter-generational equity is few and far between. Additionally, energy justice as a decision-making framework has mostly been based in western thought, through its application in developed country contexts. The value of non-Western philosophies in advancing the energy justice literature has received little attention. In this paper, we address these gaps by drawing upon Amartya Sen's interpretation of the Hindu Bhagavad Gita, using this to conceptualise a temporal energy justice decision-making framework that builds on the Gita's time-based notions of 'duty-focused' and 'consequence-sensitive' decision outcomes. We apply this framework to study India's energy landscape and underlying tensions, largely emanating from a steadfast policy focus on alleviating energy poverty in the short-term whilst also committing to a low carbon energy transition for the future. We advocate for the need to move beyond this dichotomous focus on duty versus consequence, and pursue a policy position reflected in the understanding of realised justice – an inclusive and comprehensive account of just outcomes from both an intra- and inter-generational perspective.

Mahzouni, A. (2019)

The role of institutional entrepreneurship in emerging energy communities: The town of St. Peter in Germany.

Journal of Renewable & Sustainable Energy Reviews, in press

This paper provides insights from the extant literature on institutional entrepreneurship in emerging fields which could enable us to understand how the innovative idea of 'energy community' arose, became new practices, and has been institutionalized over time. In August 2008, the people of St. Peter, a Black Forest rural town in Germany, decided to build their own energy co-operative for the operation of the biomass District Heating Plant (DHP). The key driving forces for this comprised a wide range of sustainability-related discourses, such as climate protection, energy supply security, and regional economic development. The biomass DHP, as an environmentally-friendly heating system, has become a taken-for-granted practice and has been presented as an 'inspirational' example to other communities in the region. The main contribution of this study is to develop and use a multi-level analytical framework to elucidate the process of legitimation and sense-making of the notion of the energy community St. Peter. The key conclusions are that institutional entrepreneurs are dispersed across space, social status, sector, and governance levels; their agency is distributed among multiple levels of action and multiple stages of development; and they use a range of social skills to justify their action for institutional change. Therefore, community-based initiatives should draw on multiple discourses that address both individual interests (stable prices and supply security) and collective concerns (environmental protection). In this way, wide public support for transforming existing energy practices into more renewable ones can be achieved.

Meelen, T., Frenken, K., Hobrink, S. (2019) **Weak spots for car-sharing in The Netherlands? The geography of socio-technical regimes and the adoption of niche innovations.**

Energy Research & Social Science, 52, 132-143

[link](#)

A geographical analysis of sustainability transitions allows one to better understand the emergence and upscaling of sustainable innovations. We first theorize about the spatial heterogeneity of regime, niche and landscape within the Multi-Level Perspective and then apply our framework to car-sharing adoption across all Dutch neighbourhoods. We distinguish between business-to-consumer and peer-to-peer car-sharing, which differ in terms of business model and greenhouse gas reducing impacts. For these two innovations, we demonstrate how the relation between niche innovation and the socio-technical regime of private car ownership affects adoption patterns. Our study can be read as a plea for full-fledged geographical analysis of sustainability transitions equally emphasizing the spatial hetero-

geneity of niche, regime and landscape.

Polzin, F., Egli, F., Steffen, B. and Schmidt, T.S. (2019)

How do policies mobilize private finance for renewable energy? - A systematic review with an investor perspective.

Applied Energy, 236, 1249-1268

With the urgency of climate change, and billions spent globally on renewable energy (RE) support policies, it is crucial to understand which policies are effective. Substantial scholarly research on RE deployment policies has been carried out over the last two decades, resulting in inconclusive findings regarding the effectiveness of mobilizing private finance. Here, we take a novel perspective and review 96 empirical studies concerning the impact of policies on two key investor decision metrics: investment risk and investment return. Only if both metrics correspond to the investors' expectations are they willing to engage in RE projects. First, our rigorous literature review shows that effective policies address risk and return simultaneously. Second, we find that generic instrument design features, such as credibility and predictability (continuous evaluation and monitoring), considerably impact investment risk. A more focused analysis of the specific design elements of feed-in tariffs, auctions and renewable portfolio standards reveals that these instruments are most effective when they are designed in such a way that they reduce RE project risk while increasing return. We distil important implications for policymakers who aim to foster renewable energy and clean technologies more broadly.

Hyysalo, S., Lukkarinen, J., Kivimaa, P., Lovio, R., Temmes, R., Hilden, M., Marttila, T., Auvinen, K., Perikangas, S., Peljo, J., Rask, M., Savolainen, K., Hakkarainen, L., Matschoss, K., Huomo, T., Berg, A., Panssar, M. (2019)

Developing policy pathways for sustainability transitions: transition arena adaptation to mid-range planning in Finnish energy policy.

Sustainability, 11, 603

Sustainability transitions require new policy pathways that significantly reduce the environmental impacts caused by, for example, energy production, mobility and food production. Transition management (TM) is one of the approaches aiming at the creation of new ways to govern transitions. It uses transitions arenas (TA) as a key process and platform where new policy pathways are created in collaboration with multiple (frontrunner) stakeholders. TM's ambitious and demanding agenda is not easy to implement. There is a continued need for testing and developing new ways of carrying out its key processes. We redesigned the TA process in the context of energy system change in Finland by 2030, focusing on interim goals, mid-range change pathways and developing a new notation system that allows participants to directly create the pathways. The

resulting renewed TA process results in more specific and detailed mid-range pathways that provide more concreteness to how to implement long-term transition goals. It helps to bridge long-term national visions/strategies and low carbon experiments that are already running. The Finnish TA work created eight ambitious change pathways, pointing towards new and revised policy goals for Finland and identifying specific policy actions. Evaluation of the TA, 6–9 months after its completion underscores that an effective TA needs to be embedded by design in the particular political context that it seeks to influence. It is too early to say to what degree the pathways will be followed in practice but there are positive signs already.

Martiskainen, M., Kivimaa, P. (2019)

Role of knowledge and policies as drivers for low-energy housing: Case studies from the United Kingdom.

Journal of Cleaner Production, 215, 1402-1414

Addressing housing-related energy consumption and emissions is a challenge in many countries. Low-energy housing, e.g. whole house retrofits and zero-energy new houses, is still rare in the United Kingdom, yet very much required to reduce emissions. This paper contributes to research on low-energy housing by adding new empirical material through analysing how specific drivers linked to knowledge, public policy and intermediary actors can influence successful projects. Based on in-depth case study research of both existing and new built low-energy housing projects in Brighton, United Kingdom (UK), we show that in addition to motivations to improve existing housing conditions, knowledge and available skills of householders and project participants, and both local and national policies, drive such projects. We also find that intermediaries inspire projects, connect different actors and facilitate learning between projects. Intermediaries are important for advancing projects through local actors and knowledge-networks, especially at a time when national policy support for low-energy housing remains limited and a wider transition to low-energy housing is not complete.

Gaitán-Cremaschi, D., Klerkx, L., Duncan, J., Trienekens, J.H., Huenchuleo, C., Dogliotti, S., Contesse, M.E., Rossing, W. A. H. (2019)

Characterizing diversity of food systems in view of sustainability transitions. A review.

Agronomy for Sustainable Development, 39, 1

[link](#)

Dominant food systems are configured from the productivist paradigm, which focuses on producing large amounts of inexpensive and standardized foods. Although these food systems continue being supported worldwide, they are no longer considered fit-for-purpose as they have been proven unsustainable in environmental and social terms. A large body of scientific literature argues that a transition from the

dominant food systems to alternative ones built around the wider principles of sustainable production and rural development is needed. Promoting such a sustainability transition would benefit from a diagnosis of food system types to identify those systems that may harbor promising characteristics for a transition to sustainable food systems. While research on food system transitions abounds, an operational approach to characterize the diversity of food systems taking a system perspective is still lacking. In this paper we review the literature on how transitions to sustainable food systems may play out and present a framework based on the Multi-Level Perspective on Socio-Technical Transitions, which builds upon conceptual developments from social and natural science disciplines. The objectives of the framework are to (i) characterize the diversity of existing food systems at a certain geographical scale based on a set of structural characteristics and (ii) classify the food systems in terms of their support by mainstream practices, i.e., dominant food systems connected to regimes; deviate radically from them, niche food systems such as those based on grassroots innovation; or share elements of dominant and niche food systems, i.e., hybrid food systems. An example is given of application of our framework to vegetable food systems with a focus on production, distribution, and consumption of low-or-no pesticide vegetables in Chile. Drawing on this illustrative example we reflect on usefulness, shortcomings, and further development and use of the diagnostic framework.

Bui, S., Costa, I., De Schutter, O., Dedeurwaerdere, T., Hudon, M., and Feyereisen, M. (2019)

Systemic ethics and inclusive governance: two key prerequisites for sustainability transitions of agri-food systems.

Agriculture and Human Values, 1-12

Food retailers are powerful actors of the agro-industrial food system. They exert strong lock-in effects that hinder transitions towards more sustainable agri-food systems. Indeed, their marketing practices generally result in excluding the most sustainable food products, such as local, low-input, small-scale farmers' products. Recently in Belgium, several initiatives have been created to enable the introduction of local products on supermarket shelves. In this article, we study three of those initiatives to analyse if the development of local sourcing in supermarkets opens up an opportunity for a transition towards more sustainable agri-food systems. We conceptualise transitions as a shift in governance and ethical values and adopt a pragmatist approach of ethics combined with the systemic perspective of transition studies, to evaluate the impact of these initiatives. Our analysis shows that they mainly contribute to the reproduction of the incumbent agri-food system. It also highlights that first, to be a driver for sustainability transitions, food ethics need to be systemic i.e. relate to a systemic understanding of problems and perspective

of sustainability, including social justice. And second, it highlights that governance arrangements involving not only representative organisations of the various agri-food and non-agricultural actors, but also actors upholding ethical values that are currently missing in conventional supply chains and representing excluded and marginalised interests, favour the uptake of such systemic ethics by incumbent actors. Hence, systemic ethics and inclusive governance are key features for initiatives to contribute to a sustainability transition.

Rossi, A., Bui, S., Marsden, T. (2019)

Redefining power relations in agrifood systems.
Journal of Rural Studies

Reconfiguration of power relations is crucial to transformations in agro-food systems. In this paper, we propose a conceptual basis for understanding this relation, building on the approaches of transition studies and other strands of studies to power. We explore the conditions for profound reconfigurations to occur by analysing three cases, concerning participatory plant breeding in Italy, public food procurement in France and diversification of agro-food chains in Wales. We highlight the critical importance of creating enabling relational environments, where power reconfiguration can occur. Within this new configuration, new, diverse sources of power are mobilized and new practices and institutions are co-constructed and legitimised, establishing the conditions for new socio-technical trajectories to emerge and for further transformative potential to develop. Our results show that a more variegated and nuanced configuration of power relations is needed. Transformations of agro-food systems depend on the variety of interactions that, in a multi-scale and dynamic dimension and through the play of the different forms of power, may develop among what are traditionally considered as "powerless" and "powerful" players of the agro-food sectors. Understanding these processes and the implications that they show in terms of governance is critical.

Rosenbloom, D., Meadowcroft, J., Sheppard, S., Burch, S., Williams, S. (2018)

Transition experiments: Opening up low-carbon transition pathways for Canada through innovation and learning.

Canadian Public Policy, 44, 368–383

[link](#)

Canada is embarking on a low-carbon energy transition that will involve the diffusion of innovations and the reconfiguration of energy systems. This article examines the potential contribution that transition experiments can make to this process. Transition experiments can be understood as deliberate interventions that test novel configurations of social and technical elements that could lead to substantial low-carbon change. The analysis suggests that transition experiments can provide four primary benefits that might be leveraged to

open low-carbon pathways for Canada: learning, capacity building, de-risking, and public education and engagement.

Blankesteyn, M. (2019)

From Measuring to Removing to Recovering Phosphorus: Challenges for Science-Based Innovation.

Science of the Total Environment, 666, 801-811

[link](#)

The research question of this paper is: Which lessons for enabling a full scale recovery of phosphorus from waste water can be drawn from 1. an analysis of paradigmatic changes in scientific knowledge on P? In what way can these lessons inform scientists and (innovation) policy makers to stimulate a transition towards full scale P recovery from waste water? The paper draws upon a longitudinal case study of water management in the Netherlands and how it has dealt in science and policy with P, since approximately 1960 until now. It discusses and analyzes paradigm shifts in science and changes in the underlying organization of R&D on P. It ends with additional lessons on the most optimal organization of research and innovation infrastructures for the full-scale recovery of P. 2. an analysis of the changes in the organization of R&D for phosphorus (P). Challenges relate to 1. the lack of a market for recovered phosphate in Europe, 2. the lack of experience of water managers in commercializing their findings and products 3. the lack of democratic legitimacy of regional water authorities 4. limitations put on the activities of water managers due to legislation and regulatory frameworks.

Jarre, M., Petit-Boix, A., Priefer, C., Meyer, R., Leipold, S. (2019)

Transforming the bio- based sector towards a circular economy - What can we learn from wood cascading? Forest Policy and Economics, in press

[link](#)

The circular economy has become the focus of a recent major EU policy program, which aims at the transformation towards environmentally sustainable modes of production and consumption. This has moved parts of the forest and related bio-based industries to envision their operations in terms of a circular economy. However, the meaning and implementation pathways of the concept often remain vague and ambiguous. At the same time, bio-based industries have a long history of discussing and partly realizing wood cascading. This concept strongly overlaps with circular economy ideas as it describes activities to increase the efficiency of biomass utilization. This article takes stock of wood cascading research and identifies major influencing factors for its realization to provide a comprehensive knowledge base for discussions about the circular economy in forest and related bio-based industries.

Based on a review of peer-reviewed literature, we find substantial knowledge available on the factors influencing the realization of wood cascading. These factors largely resemble what is currently being discussed as barriers and enablers of circular economy. Some crucial influencing factors, like policy limitations, are frequently highlighted but remain barely investigated. In addition, the various influencing factors are interdependent, making a conclusive assessment of the environmental impacts of a change to certain cascading activities extremely challenging. The challenges of quantitative assessments combined with the substantial knowledge gaps on political and socio-economic factors result in certain assumptions and political recommendations that hardly appear to be based on empirical evidence. We therefore suggest scrutinizing these assumptions and filling knowledge gaps, especially related to product design, potentials and limitations of long-lived products, and avoidance of waste generation.

Skeete, J.-P. (2019)

The obscure link between motorsport and energy efficient, low-carbon innovation: Evidence from the UK and European Union.

Journal of Cleaner Production, 214, 674–684

[link](#)

Motor racing conjures many images – fast cars, celebrity drivers, cheering crowds – but few involve environmental benefits/protection. Yet one aspect of the motorsport industry that is rarely discussed is its significant contribution to Energy Efficient and Low-Carbon (ELC) innovation within the automotive sector. This article argues that innovations in motorsport have, perhaps counterintuitively, influenced the development of ELC innovations in the passenger car industry. Historically, motorsport has been credited for many technological innovations that were eventually adapted to road cars, but as technologies matured, the contributions from motorsport lessened. However, post-2008, Federation Internationale de l'Automobile (FIA) motorsport came to the rescue of automakers tasked with rapidly developing ELC technologies in order to meet emissions targets set out by the European Union. With an expertise in rapid prototyping and access to engineers already skilled in electrification, hybridisation and other ELC technologies, the motorsport industry has once again become highly relevant in the knowledge transfer of ELC innovation. By using primary qualitative interview data from industry experts and policymakers, this article explains how innovation derived from motorsport has helped automakers develop ELC solutions that comply with newly implemented EU regulations.

Stephens, J. C. (2019)

Energy Democracy: Redistributing Power to the People Through Renewable Transformation.

Environment: Science and Policy for Sustainable Development, 61(2), 4-13

As the expansion of renewable energy accelerates, the transformative potential of moving away from fossil fuel reliance is becoming increasingly clear. Around the world, individuals, communities, organizations, cities, states, and countries are recognizing that renewable energy offers much more than just reliable clean electricity, pollution reductions, and climate mitigation. In addition to these environmental benefits, the renewable energy revolution also provides potential to transform society by redistributing jobs, wealth, health, and political power more equitably. Energy democracy is a growing social movement that prioritizes this potential for redistributing power to the people through renewable transformation. Energy democracy acknowledges how fossil-fuel-based energy systems and the associated massive corporate profits of large multinational energy companies have perpetuated inequities, exacerbated disparate vulnerabilities, and promoted widespread injustices among and within communities around the world. By highlighting the negative societal impacts of fossil-fuel-based concentration of power and wealth, the principles of energy democracy connect energy system change with an associated transformation toward a more socially just and equal society.

Ribeiro, Barbara (2019)

From Food Consumption to Eating Awareness.

Focus, 15, 1, Article 14

[link](#)

How did we get ourselves into the mess that became our food system, and how can we revitalise the ways we grow, process, distribute and consume our food? This article takes a longitudinal approach to this question to learn about social mechanisms that are beginning to foster more sustainable and inclusive food futures, exploring 'consumer empowerment' as a potential key trigger. A food timeline is presented that coalesces into a scholarly discussion about pathways for reconnecting urban people with food processes to foster more significant systemic change. Planned urban food forestry is explored as a potentially effective mechanism to achieve such reconnection. This article suggests a methodology for mapping focal points to start growing urban food forestry in highly consolidated urban tissues, a participatory approach for designing these sites, and the idea of pre-preparation food units. These units can entail socio-cultural benefits and embody a mechanism for closing the loop of the waste generated by these initiatives. Design concepts for introducing urban food forestry in public spaces in Auckland (New Zealand) demonstrate how inexpensive and feasible they can be while highlighting the complexities of people-place dynamics and local politics. Upscaling planned urban food forestry can activate our cities' public spaces into dynamic knowledge platforms with politics having as much a part of achieving this as the suggested methodology and the rationale for utilising agroforestry technology.

Hess, D.J., Renner, M. (2019)

Conservative Political Parties and Energy Transitions in Europe: Opposition to Climate Mitigation Policies. Renewable and Sustainable Energy Reviews, 104, 419-428

This study reviews conservative political party policy positions in six European countries with high greenhouse-gas emissions (France, Germany, the Netherlands, Poland, Spain, and the U.K.). Using party platform statements from recent election campaigns, the positions of moderate conservative parties are compared with those of far-right political parties to investigate similarities and differences on energy-transition policy. Three areas of policy are considered: climate-change mitigation, fossil-fuel development or sunseting, and renewable energy and energy efficiency development. In the countries examined, moderate conservative parties generally remain committed to climate-mitigation policy and renewable energy and energy efficiency policy, but there are some roll-backs of support, and there is variation in their support for fossil-fuel development. Far-right parties tend to show evidence of rejection of climate science, opposition to decarbonization in general, support for natural gas hydraulic fracturing technologies, support for continued use of coal, and opposition to some types of policy favorable to renewable energy and energy efficiency. However, some far-right parties, notably in France and Spain, share several important positions with the center-right parties. The study cautions against assuming an automatic linkage between far-right parties and opposition to energy-transition policies and against assuming that far-right parties will oppose all types of energy-transition policies.

Hess, D. (2019)

Coalitions, framing, and the politics of energy transitions: Local democracy and community choice in California.

Energy Research and Social Science, 50, 38-50

A significant topic of research in the analysis of the politics of sustainability transitions is the role of coalitions. This study builds on previous research that utilizes discourse coalition and framing theories to develop a method for analyzing coalitions that integrates the analysis of three, inter-related changes: the challenger-incumbent relationship, the internal composition of both types of coalitions, and the choices of frames. The study focuses on community choice aggregation (CCA) in California, which is a decades-long industrial transition movement that has contributed to local, democratic control over electricity in the state. The analysis shows how both the CCA-coalition and the utility coalition underwent changes in composition over time and how the changes were connected with frame innovation, with counterframing, and with different types of policy conflicts. Thus, the study develops a general framework for an integrated analysis of coalitions and

frames that emphasizes the connected changes of coalitions and frames over time. The analysis shows how the changing discourse of energy-transition politics is connected with coalition composition, ongoing experimentation with counterframing, and the evolving challenger-incumbent relationship. For the pro-CCA coalition, frames regarding pricing benefits recede and are replaced with frames involving energy democracy, good government, and job creation.

Sovacool, B.K., Lipson, M., Chard, R. (2019)
Temporality, vulnerability, and energy justice in household low carbon innovations.

Energy Policy, 128, 495-504

[link](#)

Decarbonisation and innovation will change the affordability of different domestic energy services. This has the potential to alleviate vulnerability to fuel poverty, but it could create new injustices unless the risks are preempted and actively mitigated. In this paper, we ask: In what ways can emerging low-carbon innovations at the household scale complement, and complicate, achieving energy justice objectives? Drawing from four empirical case studies in the United Kingdom, the paper highlights different risks that come from different types of innovation required to tackle different decarbonisation challenges. More specifically, it assesses four particular household innovations—energy service contracts, electric vehicles, solar photovoltaic (PV) panels, and low carbon heating—selected for their fit with a typology of incremental vs. radical technology and modest vs. substantial changes in user practices. It shows how in each case, such innovations come with a collection of opportunities but also threats. In doing so, the paper seeks to unveil the “political economy” of low-carbon innovations, identifying particular tensions alongside who wins and who loses, as well as the scope and temporality of those consequences.

Braungardt, S., van den Bergh, J., Dunlop, T. (2019)

Fossil fuel divestment and climate change: Reviewing contested arguments.

Energy Research and Social Science, 50, 191-200

The strategy of fossil fuel divestment has attracted considerable attention in recent years, particularly in the press and social media. Spearheaded as a movement based on ethical principles, divestment has been suggested to play a potential role in shaping public opinion and policymaking on climate change. The growing size of the movement has prompted debate about the extent of its impact on fossil fuel companies and climate change mitigation efforts. This article investigates the potential effectiveness of the divestment movement according to the end goal of climate campaigners – to bring about a complete break from fossil fuels. We collect and qualify the key arguments as found mainly in the informal debate, and to a lesser

extent in the academic literature. This will help readers to make an informed judgement that can contribute to a constructive debate about the effectiveness of divestment. We organize the literature into arguments for and against divestment, and explain how these relate to each other. In addition, we derive suggestions for further research on divestment.

van den Bergh, J.C.J.M. (2019)

Agrowth instead of anti- and pro-growth: Less polarization, more support for sustainability/climate policies.

Journal of Population and Sustainability, 3(1), 53-74

An agrowth strategy, defined as being agnostic and indifferent about GDP growth, is proposed as an alternative to unconditional anti- and pro-growth strategies. It is argued that such a strategy can contribute to reducing scientific and political polarization in the long-standing debate on growth versus the environment. Hence, it can broaden urgently needed support for serious sustainability and climate policies. The exposition includes a novel graphical illustration, a summary of recent surveys of citizens and scientists regarding support for an agrowth position, and a discussion of implications for population growth and policies.

Schlaile, M.P., Urmetzer, S. (2019)

Transitions to Sustainable Development.

Encyclopedia of the UN Sustainable Development Goals: Decent Work and Economic Growth

The overall goal of this encyclopedia entry is to give an overview of current systemic research and governance approaches to societal change towards sustainable development. The entry sheds light on the roots of sustainability transitions research, currently prominent research and governance approaches, and challenges for transitions research(ers).