

## A perspective from NTRANS:

# A new context for energy transitions: an interdisciplinary research and practice challenge

The world has changed dramatically since FME NTRANS started four years ago. These changes impact and are impacted by energy and climate transitions. This brief NTRANS note discusses the changes in terms of four elements that constitutes a new context for energy and climate transitions and an interdisciplinary research and practice challenge that NTRANS will face head-on over the next four years.

## The starting point of NTRANS: a new phase of energy and sustainability transitions

One of the core arguments for starting FME NTRANS in 2019 was that energy and climate transitions had entered a new phase. The two decades prior saw a strong focus on realizing the early-phase diffusion of energy production technologies (e.g., Wind, PV), and emerging shifts towards electrification, e.g., within transport. By 2019, developments that had so far only been envisioned had begun to materialize: solar and wind power had become large global industries, and the rapid maturation and growth in renewables resulted in a strong focus on complementary technologies such as batteries and smart grids, combined with a strong push towards finding flexible solutions for both electricity production and demand. Electrification within land and maritime transport contributed to this development, which resulted in a push to understand the relationship between sectors

such as energy and transportation. Since 2019, the world has changed. We live in a new geopolitical reality and experience an escalating poly-crisis. Net-zero has become a dominant logic of transitions, changing both policy making and innovation. Finally, we experience an energy crisis and a potential Norwegian energy deficit. These themes form an important backdrop for FME NTRANS' work towards 2027.

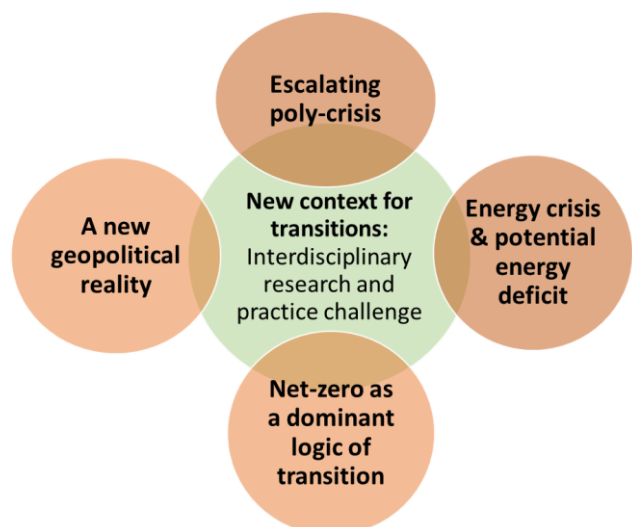


FIGURE 1: A NEW CONTEXT FOR TRANSITIONS. FOUR KEY THEMES

## Polycrisis escalation: Climate change, nature crisis and socio-economic inequalities

Over the last years we have seen tangible impacts of climate change in unprecedented ways. Heatwaves across Europe, associated droughts and forest fires have become more common, as have reports of high temperatures in the arctic, resulting in reduced ice-levels and thawing permafrost. In Norway, we have seen floods, landslides, and related events with high impacts on Norwegian society. Meanwhile, the political pressure to address the biodiversity crisis has increased significantly. The UN COP15 deal for nature was signed in 2022, signaling a stronger global commitment to nature preservation. These developments have unfolded in parallel with inflation rates rising, debts tightening and growth rates reducing, in effect increasing the division between the world's richest and the world's poorest. We are also experiencing these effects in Norway. In sum, we are up against what has popularly been dubbed a poly-crisis, and the effects of these have intensified since 2019. In the Norwegian context these developments have resulted in a series of aspects that are important to transition researchers and practitioners:

- A public and political debate where conflict lines between nature conservation and climate change mitigation have become clearer. This includes a splintering in the interests within the environmental movement, where climate and environment are increasingly pit against each other as competing interests.
- A political climate where it seems difficult to realize many ordinary land-based utility scale renewable energy projects e.g.,

within wind or solar power due to strong societal contestation.

- A much stronger emphasis amongst key actors that renewable energy is a scarce resource, and a socio-political backlash against current transition trajectories.
- The rise of popular movements that strongly oppose current trajectories. Examples of these are Motvind and Industri- og Næringspartiet.
- An increased focus on climate adaption alongside mitigation. This includes an increased focus on the resilience of infrastructures such as those that provide energy.
- An increased understanding that we live in an era characterized by strong risks, especially affecting sectors such as finance and insurance. Meanwhile, there is an investment deficit in renewables. There is a strong need to understand how rules of the game are changing, and how that affects transitions.

## The energy crisis and a potential Norwegian energy deficit

During 2022, Europe and Norway experienced an energy crisis. Increased economic activity following the COVID pandemic combined with reduced supplies of Russian gas to Europe, the shutdown of nuclear power plants in Germany and low increase in the production of renewable energy in Europe have dramatically increased the prices of both CO<sub>2</sub> and energy. Norway has been exposed to the fluctuations of the European markets. On the one hand, this has had strong effects for households, industry and commercial actors as increased energy prices have dramatically increased the costs of living and doing business. On the other hand, this has coincided with projections stating that

Norway may experience a power deficit soon if new production of electricity is not dramatically ramped up quickly. Given the social and political contestation of new renewables described in the last section, this is a massive challenge. A series of phenomena related to this have emerged in Norway:

- An increased focus on social and economic inequalities associated with access to energy and energy prices. Energy poverty has been a long-standing challenge in parts of Europe and has now emerged as an increasing problem also in Norway.
- A much stronger public focus on Norway's integration in European energy markets through cables, and large controversies over if one should increase or decrease the capacity of such linkages.
- A strong political focus on increasing renewable energy production. Paradoxically, this increased political push seems difficult to translate into new projects in the current socio-political climate.
- A new political interest in doing active priorities with respect to providing access to electricity.
- An increased awareness in the public concerning energy issues and electricity prices. This includes an increased focus on the differences in prices across price areas.
- The rise of a discursive coalition of actors that are advancing and gaining popular momentum for the idea of nuclear power as a solution to current challenges.
- A rise in the popularity and prevalence of alternative scenarios, e.g., those rooted in ideas of de-growth, post growth and sufficiency. Such discourses have so far not been translated into strong policy-programs, and there is a need for both research, innovation, and funding in this direction.

## Net-zero as a dominant logic of transition

Since 2019, the notion of net-zero has become dominant for how actors' reason with respect to energy transitions. Moving from a situation where actors seek reductions of emissions, to a situation where reaching zero is the goal, has strong implications for energy transitions. Reaching zero in hard-to-abate sectors such as industry and petroleum in the Norwegian context is a de-facto push for further electrification, which will require a massive ramp-up of electricity production and distribution grids, as well as carbon capture and storage at unprecedented scale. Such electrification endeavors also represent unprecedented challenges for sector and systems integration and coordination. Net-zero, then, represents an up-scaling of the challenges discussed over the last two paragraphs. In the Norwegian context the following are examples of situations and dynamics that are changing the energy transitions research landscape:

- The recent decision to electrify the LNG facility at Melkøya has resulted in massive controversy. The plan includes a strong push for onshore renewable energy production and the expansion of transmission lines through Finmark. Conflicts with local stakeholders including the indigenous Sami are likely. Further, the plan brings controversy over the access to electricity to the forefront of discussions, as much industry is already queuing for electricity in the North of Norway.
- Plans to electrify and integrate activities across the Norwegian continental shelf with the land-based energy system will require enormous amounts of electricity. There are plans for offshore wind, but substantial expansions are also needed

onshore. Conflicts with nature and societal interests are likely.

- Net-zero requires unprecedented tempo in the pace of transition, innovation and decision making across societal domains. How does this affect society' capacity to make decisions in a democratic way?

## A new geopolitical reality

Back in 2019 it was beginning to become clear that the era of western-driven globalization anchored in free-market liberalism was coming to an end. China and the US was involved in a trade-war, while populism and nationalism was on the rise in several countries, with Brexit being the most visible example. Since then, Russia's war on the Ukraine have exacerbated the situation. All of this has resulted in a series of considerations that are important for Norwegian discussions about transitions:

- The challenges of global value chains: Actors are increasingly skeptical about global value chains that rely heavily on e.g., Chinese resources. This is resulting in a push for new extractive industries, e.g., within mining in Norway. It is also feeding into important alternative discourses such as those promoting sufficiency.
- Russia's weaponization of gas has also heavily impacted the discourse in Norway and other European countries, where access to resources and national/regional security of supply has been put much higher on the agenda.
- Several countries are working to re-shore industries and bring green industries "home". A prominent example is the Inflation reduction act in the USA, which is now challenging the framework conditions e.g., for new green industries in Norway.
- In Norway, the new geopolitical situation feeds into discussions and strategic

considerations both with respect to the development of the electricity system, the integration of the electricity system and grid into wider European systems, as well as about how to maneuver with respect to petroleum and other industrial sectors. Combined with the boost that the petroleum industry received as part of the tax-reliefs during the Covid-pandemic, it seems likely that Norway's incentives to gradually transition away from being an oil-driven economy are decreasing.

## The way forward for FME NTRANS

This note has described four broad themes that we in FME NTRANS think will shape the energy and climate transition over the coming years. These four themes represent a fundamental and massively interdisciplinary research challenge, that no single discipline can address alone. In NTRANS we are well equipped to mobilize across disciplines both to analyze these challenges, and to give strategic advice for how to move forward. We look forward to continuing our work on this over the next four years.

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