

## Radical technology

# Rapid societal changes require better coordination of energy and industrial policies

Norway's desire to become a low-emissions society by 2050 is entirely dependent on the conditions for the development of so-called "radical technology", which will lead to major and rapid societal changes.

Such changes are necessary both in the production and consumption of energy to ensure the ambitions of the energy transition are met, according to Associate Professor Øyvind Bjørgum, Department of Industrial Economics and Technology Management, NTNU, the Norwegian University of Science and Technology.

"But it takes a long time to commercialise new technologies that will compete with oil and hydropower; technologies that have been established for 100 years, which are supported by existing infrastructure and can be used everywhere, says Bjørgum.

"To reduce emissions of greenhouse gases, it is therefore very important that much of the technology currently being developed or currently being researched is commercialised and reaches the market on a large scale quite quickly," he says.



Renewable energy can bolster Norwegian companies, as it offers significant export potential

Radical technologies, such as nanotechnology or advanced solar panels, took decades to develop. Naturally, it is difficult for new technology to compete on price, not least during this development phase.

For Norway, with its hydropower and wind power resources, the challenge is not on the production side, but on the consumer side.

”Both in industry and in the transport sector, renewable energy requires support to ensure it replaces the current use of fossil fuels,” says Bjørgum.

This can be done by stimulating the consumer side, for example by building up demand for electric cars and ferries, carbon neutral housing, and renewable energy in industry.

Such measures can affect which technologies will dominate in the period up to 2050, and this can be done strategically.

”It is therefore important to co-ordinate energy policy and industrial policy, and in Norway this should be a priority,” says Bjørgum.

Historically, we have not had an energy policy requirement for renewable energy, as we have been self sufficient with our own hydropower, he explains.

”But if we see this in industrial policy terms, it is clear that renewable energy can bolster Norwegian companies, as it offers significant export potential. Hence, it might be attractive to invest strategically in building a home- or test-market for new renewable energy sources,” according to Bjørgum.

If Norwegian companies have the opportunity to test full-scale solutions at home, then it can stimulate the development and commercialisation of green technology solutions in Norway.

“With regards to electric cars and transport, Norway is the world’s largest market relative to the size of its population, and in the maritime sector, battery packs are installed in almost all new ferries,” Bjørgum says.

”We are also seeing increasing appetite for environmentally friendly solutions in other maritime segments, and here we have actually attracted startup companies from abroad. Norway is where you’ve got to be if you want to supply battery packs to ships,” he says.

The combination of a home market and a solution-focused business community in Norway can over time contribute to the energy transition globally.

Professor Roger Sørheim, Department of Industrial Economics and Technology Management, NTNU, believes it is important that we think big and consider international opportunities.

“The production and consumption of energy within Norway is one thing, but as a nation we also want to become even better at creating new technology and becoming a supplier of technology to facilitate the energy transition. We want to contribute both commercially and take responsibility as a country,” he says.

“We have an international mindset, because if we as a country can manage to lead from the front in terms of new technology and create technology companies in Norway, we can contribute to the value creation in Norway whilst at the same time assist in the efforts to reach international climate goals.

*”It is important to co-ordinate energy policy and industrial policy.”*

~ Øyvind Bjørgum, Department of Industrial Economics and  
Technology Management, NTNU

**Our recommendations:**

- support the commercialisation of new technology.
- stimulate the consumer side in the economy.
- align energy and industrial policies more closely, in terms of facilitating the development of new technologies.
- help establish a home market, to facilitate the development of products and services for international markets.
- take responsibility, also outside Norway's borders.

*"We want to contribute both commercially and take responsibility as a country."*

~ Professor Roger Sørheim, Department of Industrial Economics and Technology Management, NTNU

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