Societal transformation

Strategic policies are essential to curb climate change

Targeted single-sector policies that result in broad changes across society can help us reach international targets for climate emission cuts.

Such strategic policies should encourage systemic actors such as industry and municipalities to change their ways, and they should aim to foster broad political engagement across society.

Hence, although technological innovation that facilitates a large-scale transition from coal, oil and gas to renewables such as wind, solar and hydropower is required, it will not be enough on its own.

“We must also change the way we use and consume energy,” according to Tomas Moe Skjølsvold, associate professor, Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology (NTNU).

Policies that favour certain industries or even specific companies can result in fertilisation of technology across sectors,Skjølsvold points out.

“Fortunately, many of these changes can actually be quite positive,” he says.

“A transition to new forms of transport and smart ways of consuming energy made from renewables will obviously change our lives, but not necessarily for the worse. It’ll merely be a step towards something else.”

Massive emissions cuts required

The challenge is nevertheless so large that we cannot simply rely on ordinary people to change the way they live.

“In Norway, for instance, the annual carbon dioxide (CO_2) emission per capita is 10 tonnes. We need to reduce this to one or two tonnes per capita by 2050,” according to Kari Espegren, research leader energy systems analysis at the Institute for Energy Technology’s renewable energy systems department.

This will require political engagement at every level, Skjølsvold believes.

“Party politics is obviously important, and when we vote in elections every fourth-year it matters. But politics is enacted in a wide range of spaces; in scientific laboratories, in corporate boardrooms, in municipal meetings and in newspaper stories,” he says.

"It's a virtue of society that we are able to discuss and deliberate technology choices, consider how they will affect our future lives, and think about how to integrate them in society. This points towards a preference for a plurality of options, rather than a single solution."

Technology learning

Consequently, policy makers must become more sophisticated.

"For instance, policies that encourage technology research and development can be complemented by guidelines for public municipalities or other players involved in large-scale procurement, to encourage them to favour companies that offer clean energy services," says Skjølsvold.

Such choices can be impactful, as policies that favour certain industries or even specific companies can result in fertilisation of technology across sectors and cross-industrial uptake. In addition, they can engender enthusiasm at the broad political level.

Norway's decision to offer support for a transition to electromobility is a case in point.

"Demand from electric vehicle drivers has resulted in the emergence of a new charging infrastructure, which has created a new industry that we hadn't planned for," says Espegren.

"Large-scale implementation of new technologies creates a market that encourages mass production, which delivers efficiency improvements and cost reductions. In turn, such technology learning makes new technologies available to more people and to other industries. Hence, as transport is electrified it becomes an increasingly integrated part of the whole energy system."

Thus as a result of the growth in electric vehicle demand, we've seen more people installing solar panels at home. The maritime sector has started implementing similar solutions for boats, ships and ferries. And public perception has changed.

"Norway's electric car policies have been a huge success as stimulators of broader demand for battery electric solutions," says Skjølsvold.

"If you push policies into different parts of the system, whether procurement, energy production, manufacturing, or driver behaviour, you get a domino effect that makes certain industries and energy carriers able to compete with established players. In time, then, such protection mechanisms can be removed."

Broad understanding

Interdisciplinary research can help politicians introduce effective policies, according to Espegren, who employs techno-economic models to understand how economic incentives affect technology developments.

"Behavioural aspects - how people actually feel about or act in different scenarios - is more difficult to include in our analysis, so we collaborate with social scientists to find ways to include such impacts in our modeling work," says Espegren.

Skjølsvold agrees, pointing to the dangers of using narrow measurements to determine whether a policy is a success or not.

"If there's one thing we know about broad societal change it is that it creates conflict. It creates tension. It brings out social, economic and cultural differences. So it is vital that we understand how people will respond."

Our recommendations:

- develop policies that target systemic actors .
- encourage the fertilisation of technologies across sectors.
- inspire broad political engagements.
- seek interdisciplinary insights.

”As transport is electrified it becomes an increasingly integrated part of the whole energy system.”

~ Kari Espegren, research leader, energy systems and analysis, Institute for Energy Technology

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