

Regional cures for planetary fever

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There is still hope for the climate, even if a world-wide climate accord proves to be unattainable. A new report shows that regional measures can hold the global rise in temperature within the two-degree limit.

"A number of analyses have already shown that the rise in temperature can be kept to within two degrees through a global quota market. This could be the parachute that the Earth so urgently requires, but we are still far from reaching the agreement that is needed for it to be implemented," says Bjørn Bakken of SINTEF – the largest independent research organisation in Scandinavia.

The SINTEF scientist has been leading an international project whose members have performed a computer simulation that asks what would happen if individual countries agreed to take measures within their own region, adopting the European Union's climate and energy strategy as a template?

Their simulation showed that the two-degrees goal could be reached using this climate cure, but that it would cost about 15 – 20 per cent more than a well-functioning global carbon market.

Adapted to local preferences

"What distinguishes regional climate strategies from global quota trading?"

"The European Union's strategy is a good example of a climate-relevant

strategy with multiple objectives of security of supply and competitiveness. For example, European politicians have required that European countries should prioritise the incorporation of a large proportion of renewables into their energy mix, even though the usual assumption is that a combination of nuclear power and carbon capture and storage (CCS) would be the cheapest option in a 100-year perspective."

"In a purely global quota market, the cheapest alternatives are always the first to be implemented. However, I am convinced that it would be easier for nations to agree on a set of climate strategies that are adapted to the wishes and local conditions of the regions where they are to be deployed."

More than just climate

"Is it the share of renewables alone that would make the regional option more expensive than a global quota system?"

"It would make a significant contribution. Furthermore, the European Union is in favour of putting more resources into energy conservation than the main players would have done in a pure quota-based regime. This is because the European Union's strategy is not merely a matter of climate, but also of energy security and industrial development, and this in turn is a result of conscious political choices."

Bottom-up approach

Bakken hopes that the results of the estimates can be used to further develop effective climate and energy strategies that are designed at grass-roots level. He emphasises that the project has taken the European Union's regional strategy purely as an example.

"Our message is not that the European Union's goals will have to be copied for regional climate strategies to be realised. What the project has demonstrated first and foremost is that there is more than one potential route to reaching the two-degree target. A world that is striving to reach agreement on a global accord could probably achieve a great deal by letting large countries and regions develop individually adapted regional climate-relevant strategies instead."

American data model

Most of the calculations in the project were performed in the USA with the aid of a numerical model that is used by the UN's Intergovernmental Panel on Climate Change (IPCC) and the US authorities. The model is owned by the one of the project partners, the Joint Global Change Research Institute.

In parallel, SINTEF and NTNU have used their own models to estimate the effects of choice of climate strategy on the need for new electricity generating capacity and new power grids in Europe.

More distribution grids

"Nuclear and fossil-fuelled power stations with CCS can be sited close to cities and consumers, and do not require major expansion of the grid. On the other hand, a high proportion of renewables would mean that wind-power would need to be exploited in the North Sea and solar energy around the Mediterranean and in Africa, and that the energy would have to be transported over long distances to consumers. This means that the European Union's combined climate and energy strategy would require more extensive grid development than a global quota system on its own," says Bakken.

Global vs. regional climate measures

- If the rise in global temperatures is to be limited to two degrees in the course of this century, we can permit ourselves to reach a maximum concentration of atmospheric CO₂ equivalents of 450 parts per million (ppm) in 2100, according to calculations made by several climate research groups.
- The Linking Global and Regional Energy Strategies (LinkS) project, which is led by SINTEF, has produced estimates of the CO₂ concentrations that can be achieved by means of individual regional measures, if the world cannot reach agreement regarding a global quota market. The estimates were calculated using the US-owned Global Change Assessment Model (GCAM).
- As an example of its calculation methods, LinkS simulated various regions using copies of the European Union's [climate](#) and [energy strategy](#) for 2020, with various additional restrictions being introduced in the course of this century. North America and other developed countries were granted an extension of 15 years vis-à-vis the European goals, while the extension for poorer regions was 30 – 45 years.
- According to LinkS, the estimates would give a concentration of atmospheric CO₂ equivalents of 514 ppm in 2100, which would keep global warming to within 2.3 degrees Celsius. "If we take the uncertainty in the initial assumptions and the calculations into account, this suggests that meeting the two-degree goal would also be possible without a global quota market," says LinkS project manager Bjørn Bakken.

Provided by SINTEF

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