Q&A: Studying the capture and storage of carbon dioxide during waste incineration

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The capture and storage of CO_2, also known as CCS, from our waste is essential because this refuse is responsible for a large proportion or our cities' greenhouse gas emissions. Moreover, the technology represents a relatively inexpensive abatement cost.

In order to achieve the targets set out in the Paris Agreement, aiming to

keep global warming to within 1.5 degrees higher than pre-industrial levels, it will not be sufficient simply to reduce emissions. We must also actively remove CO_2 from the atmosphere and establish a balance between emissions and removal.

Not all industries will be able to achieve net zero emissions by 2050. The agricultural sector is a good example. But if we are to achieve total net zero emissions during the next 30 years, we have to capture one CO_2 molecule and remove it from the atmosphere for every molecule we release. With between 50 and 70 percent biological material currently being processed in energy recycling plants employing waste incineration, this will make a considerable difference to our carbon accounting.

What does 'climate-positive' mean?

Let's say that you throw away a set of IKEA's Ivar storage shelves and it ends up in an incineration plant. The shelves contain CO_2 extracted from the air by the wood while the tree was living. So, in principle, if we incinerate this wood the entire cycle is carbon neutral. The same amount of the gas is released on incineration as was originally taken up. But if we capture and remove the CO_2 during incineration, we also extract some CO_2 from the cycle and make a positive contribution to the carbon budget.

Of course there will be hurdles to negotiate, but these are also created by humans. How we calculate and reward climate-positive approaches is currently unclear, not least within the EU. I have been in Brussels for some years now, and the debate continues to rage about how fast it is possible to store the CO_2 locked in biological material. It is argued that this will take longer than the 30-year perspective leading up to 2050.

"During the next 30 years, we have to capture one CO_2 molecule and remove it from the atmosphere for every molecule we release."

There is some misunderstanding, and a constructive dialog is being launched on this topic as a basis for the formulation of regulations governing sustainable investment. Or "sustainable taxonomy" as it is referred to in EU jargon.

But we mustn't let such things prevent us from taking action. There is no doubt that climate-positive systems have to be implemented if we are to achieve carbon neutrality. Globally, we have to remove between five and ten billion tons net of greenhouse gasses from the atmosphere by 2050. In Norway, the figures are about the same, but here at home we're talking millions, not billions of tons. Our ability to achieve this will depend on the measures that we implement and which of these has the greatest impact.

And we have to bear in mind that such measures involve technologies that must be applied in addition to, and not simply replace, other initiatives such as electrification and lifestyle changes.

What does Brussels have to say about CCS?

Brussels views CCS as a necessary measure. There is no doubt that it is essential if we are to achieve the decarbonisation of industry and the transport sector, to provide heat and power, and to open the door to the use of hydrogen, which can also be generated from biomass using CCS. But we need countries that can lead the way, with vision that extends beyond the end of their noses. In my view, our towns and cities must be closely linked to the Norwegian full-scale project. And why not establish links to other urban initiatives taking place across Europe? We all know that passivity is much more expensive for society than taking proactive steps.

We must link CCS to wealth generation

The smart things to do are to develop a CO_2 transport infrastructure across national boundaries and link CCS to wealth generation and climate-positive initiatives. In this regard, our waste materials are very well suited to such concepts, and it is quite simply amazing to see that others as well as Norway are taking up the challenge. This is not a race to be first to the finishing line considering that we need a few thousand full-scale plants in operation if we are to meet the targets set out in the Paris Agreement.

As President of the European Energy Research Alliance (EERA). I have been observing the ups and downs of the CCS debate. The challenge of climate change and the overriding political ambition within the EU to achieve net zero emissions by 2050 demand that we implement all the measures we can lay our hands on. I often say that the most expensive climate change mitigation measures are the ones we don't implement. We all know that passivity is much more expensive for society than taking proactive steps.

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The significance of CCS cannot be overestimated

Research shows that we need systems to address greenhouse gas emissions in all industrial sectors. We need zero emissions electrons, zero emissions molecules and CCS. And these will all be linked together by energy—one of contemporary society's most important prerequisites.

The significance of having or not having implemented a full-scale CCS project in Norway cannot be overestimated.

I want to see a joint effort in the field of CCS based on the full-scale

project, involving our towns and cities and the industrial and waste management sectors, and I want it to be closely linked to similar initiatives being carried out in Europe. I receive calls from Austria, wondering when they can deliver CO_2 to Equinor's transport and storage project Northern Lights.

In a broader context, CCS is all about the future of the Norwegian welfare system

It is no less than considering the benefits of having a car—with or without roads to drive it on. Our towns and cities can make all the difference. In this respect, the assessments being made by the Norwegian Environment Agency's Klimakur ("Climate Cure") project investigating emissions mitigation measures will be well worth following up. We must lose no time in focusing our ambitions.

In Brussels, we are sick and tired of hearing about ambitions linked to CCS. We want to see action and genuine investment in real projects. In a broader context, CCS is all about the future of the Norwegian welfare system. The debate about jobs and towns and cities is welcome—but now we really have to take action!

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