A risky path to meeting climate targets for Stockholm

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The Swedish capital Stockholm aims to capture more carbon dioxide than is emitted by 2030. Therefore, the city is investing in new technology at a combined heat and power plant. But it is a strategy that

has been adopted without sufficient discussion of the risks, say researchers at Linköping university, Sweden.

"Stockholm has a very ambitious climate policy. But there's also been a kind of resignation. This new technology has appeared to offer the promise of a solution. And that's perhaps why there's been no critical discussion at all," says researcher Alexander Olsson at the Department of Thematic Studies—Environmental Change at Linköping University.

The energy utility Stockholm Exergi is investing in new technology to capture carbon dioxide from the combined heat and power plant Värtaverket. Potentially, 800,000 tons could be removed per year and stored in the bedrock.

Since the heat and power plant is fired by biofuel, this would mean that carbon dioxide is removed from circulation. These so-called negative emissions can then be offset against other emissions that politicians deem impossible to remove. The end result would be that Stockholm's net emissions would be zero or even negative. But there are many uncertainties.

Together with colleagues at the Department of Thematic Studies—Environmental Change, Olsson has interviewed thirteen politicians and officials in Stockholm to hear their reasoning about the opportunities and risks. They have also analyzed debates held in the municipal council from 2015 to 2023. Their conclusions are presented in an article published in *Energy Research & Social Science*.

One thing is clear, according to the researchers. Neither in interviews nor in the debate transcripts is there any serious questioning of the path set out to meet the climate targets, which are to a large extent based on substantial negative emissions at Värtaverket. There seems to be a lack of an alternative plan.

"This means that Stockholm's climate targets are entirely dependent on this facility and the ability to store carbon dioxide. There is no plan B. It's a very, very risky portfolio, to put it in financial terms," says Olsson.

According to the researchers, the local decision-makers feel that much of climate policy and emissions is beyond their scope of influence. The thought of being able to make large amounts of carbon dioxide disappear through their own decisions thus appeals to the decision-makers. The opportunity to be at the forefront of technology and to be a role model for other cities is also appealing.

It is then tempting to ignore the fact that the technology may not work as intended or that implementation may be delayed. There are no ready-made solutions for how the carbon dioxide is to be transported and disposed of, or answers as to how large quantities can be taken care of.

In addition, there are major environmental risks associated with the planned interim storage of carbon dioxide at the port of Värtahamnen. Almost none of this is mentioned in the interviews or in the debates.

In the light of the promise offered by the new technology, alternative measures risk appearing less important. For example, the researchers note that Stockholm's previous initiative to use biochar to store carbon dioxide has been diminished.

There is also a risk that the discussion about which emissions can be influenced locally will be forgotten. For example, Stockholm wants to build a new plant for waste incineration. This would lead to increased carbon dioxide emissions, but it is not identified as a problem by the interviewed decision-makers, which may be due to the high hopes placed on capture at Värtaverket. It is easy to sit back, because the problem seems to be solved.

The researchers' advice is to set separate targets for how much carbon dioxide is to be captured and how much emissions are to be reduced from waste incineration and traffic. They say that this would make clearer which measures work and which do not.

The targets should also be complemented by a risk analysis that looks at the likelihood that a measure will be successful. This would bring to light the need for alternative methods.

"We don't think things improve by not being critical. We believe that criticism is an important part of a democratic process, and that decisions will be better if there's a broader debate," says Olsson.

More information: Alexander Olsson et al, Forerunner city or net-zero opportunist? Carbon dioxide removal in Stockholm, residual emissions and risks of mitigation deterrence, *Energy Research & Social Science* (2024). DOI: 10.1016/j.erss.2024.103567

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