Oslo, 24.11.2021

To: The Norwegian Government, Minister of Climate and Environment Espen Barth Eide

Copy: Energy and Environment Committee of the Norwegian Parliament

Subject: The need for development of a sustainable policy for negative emissions

The Glasgow Climate Pact, signed at the COP26 climate summit, supports the Paris Agreement's goal of limiting global warming to 1.5 degrees. The IPCC's special report on 1.5 degrees is clear about the need for "negative emissions." Without active removal of CO_2 from the atmosphere, the 1.5-degree target will not be reached.

In Norway, greenhouse gas emissions must be reduced as far as possible. In addition, there will be a need to compensate for the remaining emissions and reverse historical emissions with technical solutions that remove CO_2 from the atmosphere, so-called negative emissions. Norway has clean energy and good storage locations for CO_2, which constitutes natural advantages for generating negative emissions.

The consortium behind this appeal includes environmental organisations, technology suppliers for carbon capture, transport and storage, direct air capture project developers and biogenic CO_2 emission sources.

We ask the Government to start work on the following five points:

1) Introduce a system with separate targets and accounting for negative emissions, in addition to targets and accounting for emission reductions.

2) Set up a clear definition and criteria for negative emissions.

What are negative emissions?

Negative emissions, also known as "carbon removal" and "CO_2 removal", can compensate for emissions from sectors that are difficult to decarbonize, such as agriculture, and enable us to achieve net zero emissions after 2050. Negative emissions can also reverse historical emissions by removing CO_2 from the atmosphere, through technical solutions by storing CO_2 outside the atmosphere, for example deep underground in suitable geological formations.

Technical solutions for negative emissions include capture and storage of CO_2 from biogenic sources (Bio-CCS), based on sustainable bio-based raw materials and direct capture of CO_2 from air with permanent storage (DACCS).

A waste incineration plant can use CCS to achieve a combination of reduced CO_2 emissions and negative emissions. Since CO_2 captured is a combination of fossil and biogenic CO_2, the potential for negative emissions is only related to the proportion that is biogenic CO_2.

A DACCS plant can generate negative emissions by extracting CO_2 directly from the atmosphere and storing it permanently, thus reducing the amount of CO_2 in the atmosphere.

3) Initiate a public discussion on how negative emissions can best be included in Norwegian climate policy.

4) Cooperate actively with the EU level for a sustainable and effective policy for negative emissions.

5) Enable and facilitate conditions for realising negative emissions.

Introduce a system with separate targets and accounting for negative emissions, as well as targets and accounting for emission reductions

To achieve net zero greenhouse gas emissions in 2050 and limit global warming to 1.5 °C, we need rapid and drastic cuts in emissions. In addition, we need negative emissions to compensate for emissions from sectors where zero emissions are difficult, such as agriculture.

This means that we must increase our ambitions to reduce current greenhouse gas emissions, as well as remove CO_2 that is already concentrated in the atmosphere. This should be done in line with a long-term policy for carbon capture and storage infrastructure in Norway. This will enable us to be more ambitious in efforts to mitigate climate change today, generate jobs and growth and tackle any remaining emissions in 2050.

In climate policy, it is particularly important to distinguish between "reduction of CO_2 emissions" and negative emissions. In most scenarios in the UN Intergovernmental Panel on Climate Change's special report "Global Warming of 1.5°C," several billion tons of CO_2 must be removed from the atmosphere to stabilize the concentration of greenhouse gases in the atmosphere if we are to stop global warming at 1.5 °C.

Already in the period up to 2030-2040, we must step up negative emissions. Emission reductions are the first priority, but negative emissions are still necessary because emission reductions alone are not sufficient to avoid irreversible climate change. There is urgent to develop technology, industrialisation and scale up of negative emissions.

The extent of negative emissions needed will depend on how much and when we manage to reduce emissions. This means that although priority is given to reducing greenhouse gas emissions, this should not prevent the introduction of negative emissions.

It is important to put in place a separate political and legal target for negative emissions. Norway should take the lead in this area and set clear goals and timeframes. A set target for negative emissions will attract investment, projects and technology development.

A policy for negative emissions also requires clear monitoring, reporting and verification systems to guarantee that CO_2 removed from the atmosphere is permanently stored for "eternity". The system should be based on established emission accounting protocols from a life cycle perspective, supplemented by policies to stimulate early-stage technologies, infrastructure for CO_2 transport and development of storage solutions.

Set up a clear definition and criteria for negative emissions

We have to do it right from the start. A definition of negative emissions should also be the same across national borders. This will create confidence and avoid potential loopholes and double-counting of climate action.

A reliable framework for definition, certification, accounting and incentives for negative emissions is required. The framework requires a clear definition and criteria to guarantee real CO_2 removal from the atmosphere. We believe that solutions for negative emissions must therefore be based on four principles [1]:

1) CO_2 is physically removed from the atmosphere.

2) CO_2 is stored permanently.

3) All emissions across the value chain for negative emissions are included in the emission balance.

4) The total amount of CO_2 removed and stored is significantly greater than the total amount of CO_2 emitted into the atmosphere in the process.

Carbon capture and storage alone is thus not sufficient to generate negative emissions. If the carbon originates from fossil sources and CO_2 is stored permanently, close to 0 emissions can be achieved.

However, the process can never achieve negative emissions because principle 1 has not been fulfilled (see Figure 1).

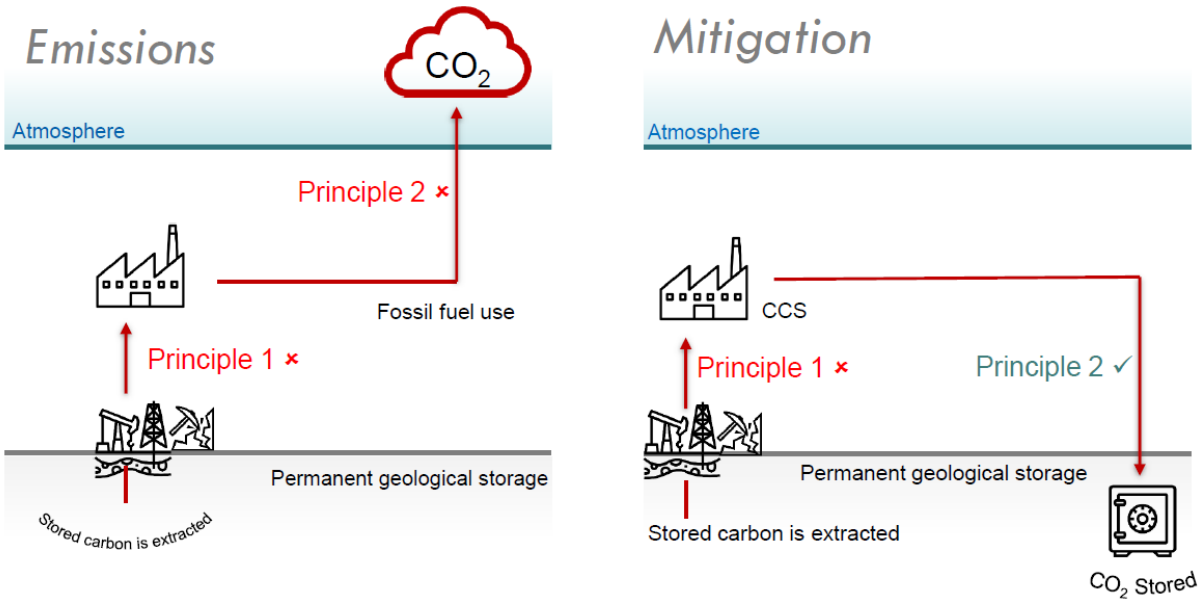

Figure 1: Illustration on the left shows a process where fossil hydrocarbons are used as fuel and CO_2 is released into the atmosphere. Principles 1 and 2 are not met and thus negative emissions are not achieved. The illustration on the right shows a process that uses fossil carbon where CO_2 is stored permanently (CCS), but since carbon is not removed from the atmosphere, principle 1 is not met, thus the process does not produce negative emissions. Source: Zero Emissions Platform.

Figure 2 shows three examples that generates negative emissions, where all four principles for negative emissions are met. Combustion of biomass in a waste incineration plant with carbon capture and storage will have the potential for negative emissions. So has hydrogen production using biogas with capture and storage of CO_2. When biogenic sources are used, it must be confirmed that the biomass comes from sustainable sources in order to maintain biodiversity. At the same time, it must be taken into account that biomass in e.g. waste incineration plants has a very complex origin, without this being an obstacle to capture and store these emissions.

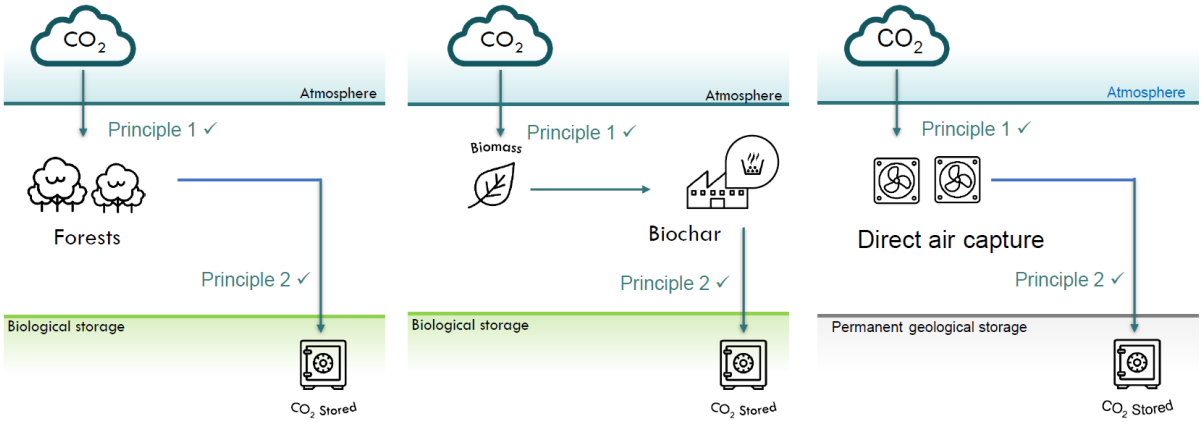

Figure 2: The illustration on the left shows a process where CO_2 is removed from the atmosphere when recording in biomass and then entered into a process, such as a waste incineration plant, where CO_2 is stored permanently. The illustration in the middle shows a process in which carbon in the form of biochar is stored permanently. The illustration on the right shows CO_2 captured directly from air and stored in geological formations. All processes have the potential to meet all four principles and create negative emissions. Source: Zero Emissions Platform.

Initiate a public discussion on how negative emissions can best be included in Norwegian climate policy

We need to start this debate today to create the framework for policymaking to realize negative emissions in Norway on a large scale. This debate should look at the distinctive scientific benefits of negative emissions, the technological maturity, policy and incentive needs, such as support schemes at Enova and CLIMIT as well as commercial opportunities and market mechanisms.

Norway should, to the best of our ability, develop a separate definition and policy instrument package for negative emissions and influence that the discussion at EU level meets the above mentioned principles. Norway should not work with this in isolation, but cooperate with countries that have progressed further in developing policies for negative emissions, such as Sweden. We recommend taking an active role in cooperation with Sweden on how to jointly lift this debate at the EU level, and not wait until the EU has solved its regulatory challenges in the field.

Actively cooperate with the EU for a sustainable and effective policy for negative emissions

We urge the Government to take an active role in policymaking in the EU, work towards a common international definition of negative emissions, and advocate that the policy for negative emissions at EU level be formulated with a clear distinction between negative emissions, emission avoidance and emission reductions.

We also urge the Government to take action and take an active role where Norway is a pioneer for negative emissions. Norway can have a significant impact on EU policy if Norway define their own criteria for negative emissions already now.

The aim of the Paris Agreement is to "achieve a balance between man-made emissions and negative greenhouse gas emissions in the second half of this century". This is recognised in draft EU Climate Law. The EU is already taking steps in this direction, and countries such as Sweden, the US and Switzerland have begun to develop a dedicated policy for negative emissions [2]. Norway can do the same, in addition to taking a leading role in the development of common CO_2 transport and storage infrastructure for the whole of Europe.

Sweden currently has over 30 million tonnes of CO_2 emissions of biological origin annually, while Finland has over 40 million tonnes. None of these countries currently have a mature storage facility for CO_2 they can potentially capture. Norway have good storage locations for CO_2, and should therefore work with Sweden and Finland to realise the large-scale potential for negative emissions.

Enable and facilitate conditions for realising negative emissions

There is great potential for the development of industry for negative emissions in Norway and the Nordic countries. We have an exceptionally good starting point with a fully renewable power sector. We have world-class carbon capture technology and competence and we currently have the unique project Longship. With the right policies and incentives, Norway can leverage their industrial expertise to develop an industry and market for negative emissions, create new jobs, attract investment and enable negative emissions elsewhere in the world, without delaying or compromising emissions reductions.

Today, there is no economic incentive to capture and store CO_2 from biological or atmospheric origin. There is no carbon tax or cap-and-trade for this type of emissions, nor is there any economic benefit from capturing and storing it. This is an obvious weakness in climate policy. The climate effect of preventing these emissions is as strong as capturing and storing CO_2 of fossil origin. We believe that a

framework must be created with instruments that together strengthen the possibilities for negative emissions to also trigger large-scale capture and storage of CO_2 from biological and atmospheric origin.

Negative emissions are not recognised in the EU ETS, but interest is growing, for example in the voluntary carbon market [3]. When a robust accounting and verification framework is in place in the EU, stored CO_2 credits can play a key role in creating a market for negative emissions.

It is important that a market and support schemes are established with strict criteria, where it is avoided that negative emissions gain low confidence and trust, as we have seen emissions trading in the voluntary market suffer from.

There are many unproductive ways to produce CO_2. It must therefore be ensured that a market for negative emissions does not provide perverse incentives to burn biomass unnecessarily.

Conclusion

The time has now come to develop a solid framework and invest in processes for negative emissions. We ask the Government to introduce the concept of negative emissions in upcoming climate and CCS policy discussions and political debates.

It is likely that negative emissions will be limited by supply rather than demand. We must as quickly as possible develop a portfolio of projects and an associated framework in order for negative emissions to perform the role that is planned. This must be taken into account when the climate agreement with the EU is extended to comply with the new EU target for 2030 of a 55% reduction in greenhouse gas emissions on the road to net zero in 2050.

There is a window of opportunity to invest in a more proactive position, while at the same time Norway must contribute to ensuring that negative emission targets do not compromise the goal of reducing fossil CO_2. Norway, with Longship, CCS expertise, nature-given advantages and renewable power resources, has a unique opportunity to take the leader's jersey in the field of negative emissions. This can be done by setting national targets for negative emissions, as well as developing instruments for negative emissions. We encourage you to seize this opportunity.

We would like to discuss these issues more thoroughly with you and will support you in your work.

This proposal is supported by the following organizations:

BELLONA

st1

CCUS NORGE

climeworks

Z·E·G

carbonREMOVAL

AKER CARBON CAPTURE

GreenCap SOLUTIONS

Northern Lights

I·V·A·R

Forus Energigjenvinning

Lyse

[1] Tanzer & Ramírez, 'When are negative emissions?', 2019

[2] See the EU's efforts to develop an EU-wide system for certification of negative emissions by the end of 2022, as well as the Horizon 2020 project "NEGEM" which seeks to quantify and assess the feasibility and realistic potential for negative emissions.

[3] The World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) are developing new guidelines for the Greenhouse Gas Protocol on how the private sector should account for negative emissions.