The NEGEM project – Assessing the realistic potential of carbon dioxide removal and its contribution to achieving climate neutrality

- **Reducing GHG emissions continues to be the main priority in climate change mitigation, but carbon dioxide removal from the atmosphere (CDR) is increasingly seen as a necessary supplement to traditional emission cuts.**
- **The NEGEM project will quantify the real-world potential for CDR and assess the feasibility of deploying Negative Emission Technologies and Practices on both a European and global scale.**

Helsinki, 1 July 2020
The European Green Deal has set the goal for Europe as an economy and a society to achieve net zero greenhouse gas emissions by 2050 and the Commission's subsequent proposal for the first European Climate Law aims to introduce legally binding targets and ensure that all EU policies contribute and move toward this goal.

Achieving climate neutrality will require the right combination of emission cuts, investments in clean technologies and protection of the natural environment. Although reducing GHG emissions will remain the major policy priority, global long-term scenarios indicate that emission cuts alone may not be sufficient to achieve the climate targets as laid out by the Paris Agreement. Most scenarios compatible with the 1.5°C global warming target foresee the need for CO_2 removal from the atmosphere during the 21st century.

A team of scientists together with climate and policy experts from leading international organizations in 11 countries*, grouped under the new Horizon 2020 project NEGEM, will **quantify and assess the feasibility and the realistic potential of carbon dioxide removal**, as a **supplementary strategy to emission mitigation**.

The project will study **Negative Emission Technologies and Practices** (NETPs), a portfolio of mechanisms to remove CO_2 from the atmosphere and to permanently store it on land, underground, or in the ocean. These can be either based on natural processes, where CO_2 is fixed in the natural environment, or on technologies that capture and store the CO_2 in underground geological formations. Examples of NETPs are enhanced weathering, direct air capture with CO_2 capture and storage (DACCS), ocean alkalinization, ocean fertilization, bioenergy with CO_2 capture and storage (BECCS), biochar, afforestation/reforestation and soil carbon sequestration.

The diversity of these solutions and the large differences in their technological readiness make it difficult to predict their realistic potential given economic, social and environmental uncertainties as well as the unknown of public acceptance and buy-in associated with their large-scale deployment.

How much carbon dioxide removal might be needed depends on how fast and to what extent greenhouse gas emissions decline in the coming decades. The more the emission cuts are delayed, the more carbon removal will be needed during this century to meet the Paris Agreement targets.

Climate physics and macroeconomics are the main basis for creating the standard global greenhouse gas emission scenarios known as Integrated Assessment Models (IAMs), used by the IPCC and other bodies to analyse future greenhouse gas emission trajectories. IAMs have a significant analytical relevance, but they must be complemented by an inter-disciplinary evaluation of environmental sustainability as well as techno-economic and socio-technical aspects in order to successfully develop far-reaching climate policies and governance in a complex global setting.

NEGEM will evaluate the real-word potential of deploying NETPs responsibly at scale, based on crosscutting and integrated analyses of technical, environmental, social and economic aspects to provide an informed assessment of their impact, acceptability and feasibility within planetary boundaries.

The outcome of this assessment will then be used to outline concrete pathways that include the deployment of NETPs under specific conditions and with appropriate governance structures, which can contribute to achieving climate neutrality, as laid out in the Paris Agreement and within the context of key Sustainable Development Goals (SDGs).

“Today NETPs are featured in most assessment models that comply with 1.5°C and 2°C targets, however they are not very well understood,” says Dr Ilkka Hannula, VTT Finland, NEGEM project coordinator. “The lack of quantitative estimation on their real-world potential is currently a problem for assessment bodies and policymakers. The NEGEM project brings together a wide range of highly experienced partners to work on this increasingly important topic.”

Alongside NEGEM, in 2020 the European Commission has also funded two other multi-year research projects on carbon dioxide removal, namely LANDMARC and OceanNETs. The results of these three projects will feed important information to the policy debate over the upcoming EU climate initiatives. Although reducing emissions remains a priority, the focus on net-zero means that carbon dioxide removal will become an increasingly important topic in the EU climate discussion.

About NEGEM

NEGEM – *Quantifying and Deploying Responsible Negative Emissions in Climate Resilient Pathways* is a Research and Innovation Action started on 1 June 2020 that will continue through 31 May 2024.

The project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under Grant Agreement No. 869192.

*Coordinator: VTT Technical Research Centre of Finland
Partners:
Potsdam Institute for Climate Impact Research (Germany); Imperial College of Science Technology and Medicine (United Kingdom); University of Cambridge (United Kingdom); Eidgenoessische Technische Hochschule Zuerich (Switzerland); Bellona Europa (Belgium); ETA Energia Trasporti Agricoltura (Italy); Norwegian Institute for Water Research (Norway); University of Groningen (Netherlands); Institut National des Sciences Appliquées de Toulouse (France); Carbon Market Watch (Belgium); University of Oxford (United Kingdom); Stockholm Exergi AB (Sweden); ST1 OY (Finland); Drax Power Limited (United Kingdom); Sappi Netherlands Services (Netherlands)

Contacts and press enquiries:

Ilkka Hannula (Project Coordinator), VTT Technical Research Centre of Finland Ltd. Ilkka.Hannula@vtt.fi

info@negemproject.eu
www.negemproject.eu
Twitter: @negemproject
LinkedIn: www.linkedin.com/company/negemproject/