



Introduction to NEGEM Vision: The Demands of NETPs Based on Literature and Results of Questionnaire

*18th December 2020
1st NEGEM vision workshop*

Tiina Koljonen, Kati Koponen, Antti Lehtilä, Elina Mäki, Lassi Similä



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



Literature review on peer review articles and “grey literature”, initial findings

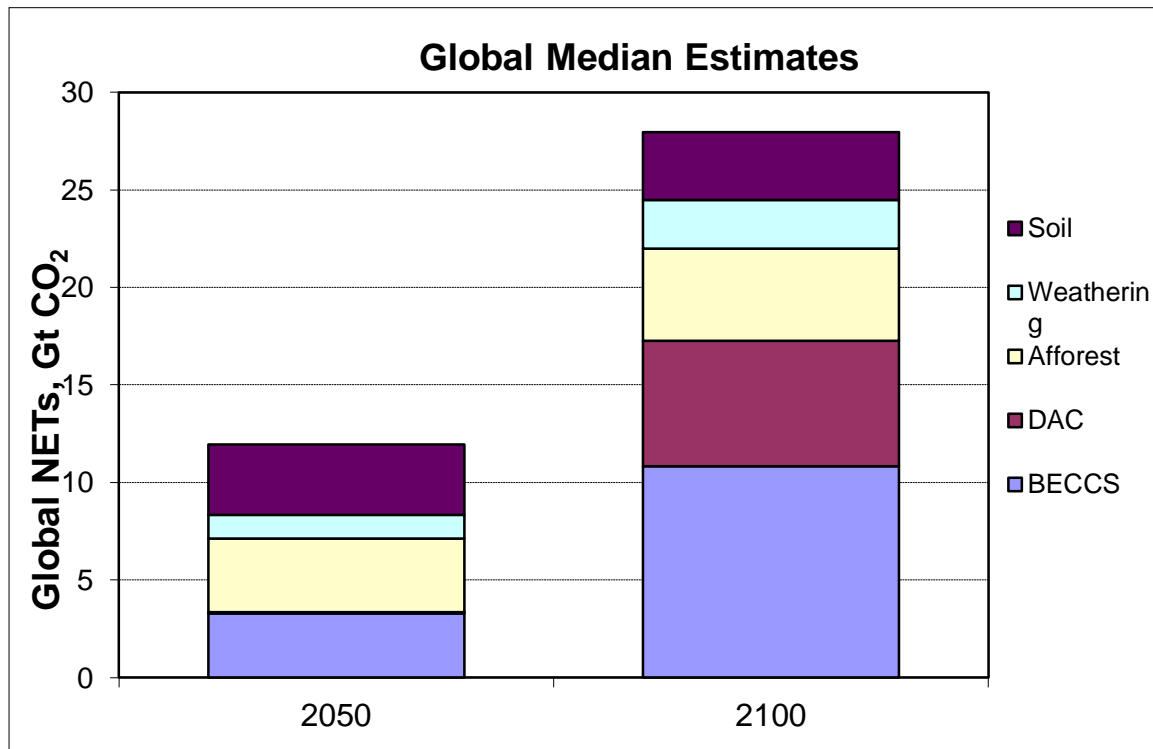


- Reports published after 2018 by European Commission, JRC, IEA, IRENA, EASAC, Shell, BP etc. reviewed.
- IIASA database¹⁾ used mainly for the analysis of peer review articles
- The most common NETPS by 2050 is BECCS in scenario analysis, second most mentioned are DAC, afforestation and soil C
 - Afforestation included to some extent especially in peer review articles
- It is sometimes difficult to separate the LULUCF (Land Use Land Use Change and Forestry) or AFOLU (Agriculture, Forestry and other Land Use) sector development from “additional” negative emission practises
- In some studies, CCU (Carbon Capture and Utilisation) has been considered as negative emissions, without further specifications on the lifetime of the CCU products

¹⁾ Huppmann, Daniel, Kriegler, Elmar, Krey, Volker, Riahi, Keywan, Rogelj, Joeri, Calvin, Katherine, ... Zhang, Runsen. (2019). IAMC 1.5°C Scenario Explorer and Data hosted by IIASA (Version release 2.0) [Data set]. Zenodo. <http://doi.org/10.5281/zenodo.3363345>;
IAMC 1.5°C Scenario Explorer and Data hosted by IIASA, release 2.0 <https://data.ene.iiasa.ac.at/iamc-1.5c-explorer>

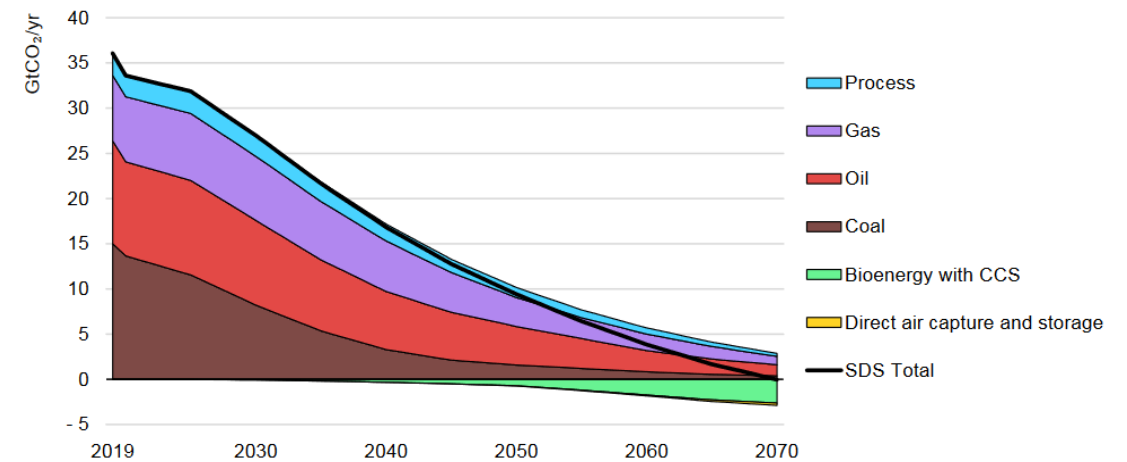
The scale of the NETPS global exploitation vary considerably between peer review assessments and “grey literature”

- By 2050-2070 0,3 – 3 Gt Globally in “grey literature”, which can be compared with BECCS in peer review assessments
- In “grey literature” the definition of the climate target is not always very clear, anyway



Data source: Huppmann, Daniel, Kriegler, Elmar, Krey, Volker, Riahi, Keywan, Rogelj, Joeri, Calvin, Katherine, ... Zhang, Runsen. (2019). IAMC 1.5°C Scenario Explorer and Data hosted by IIASA (Version release 2.0) [Data set]. IAMC 1.5°C Scenario Explorer and Data hosted by IIASA, release 2.0 <https://data.ene.iiasa.ac.at/iamc-1.5c-explorer>

Figure 2.1 Global energy sector CO₂ emissions by fuel and technology in the Sustainable Development Scenario, 2019-70



IEA 2020. All rights reserved.

Notes: CCS = carbon capture and storage. SDS= Sustainable Development Scenario.

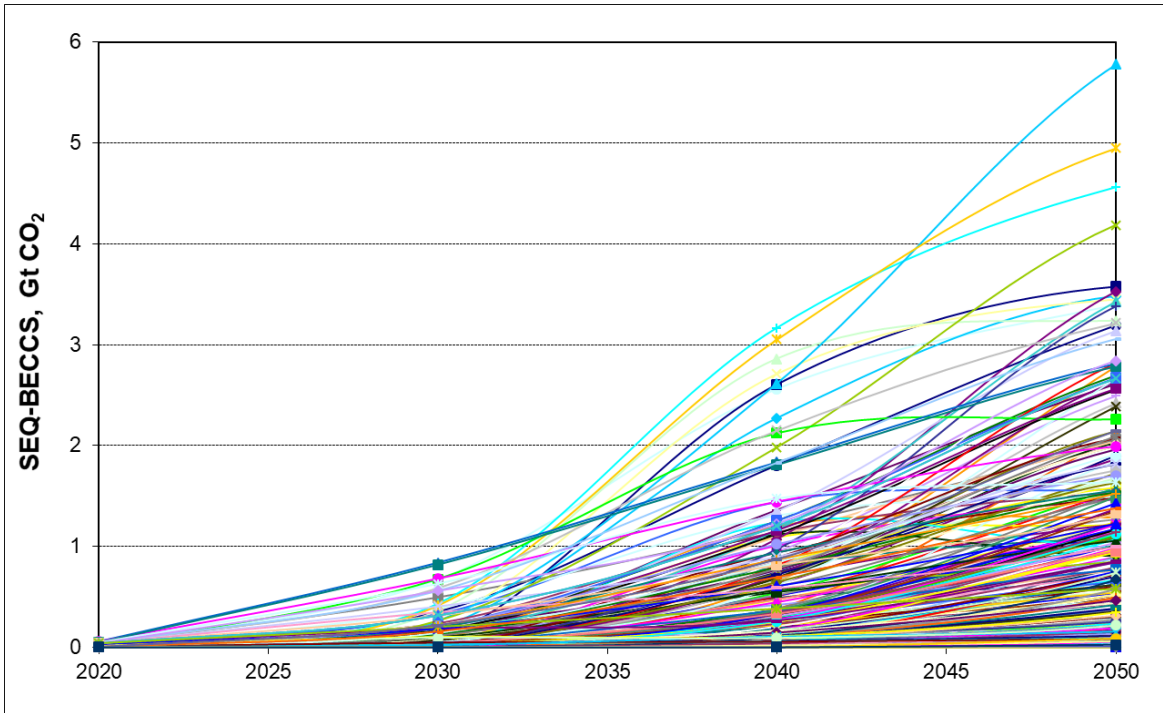
In the Sustainable Development Scenario, CO₂ emissions from fossil fuel combustion and industrial processes drop to 3 Gt in 2070; they are offset by negative emissions technologies, resulting in net-zero emissions.

Source: IEA/OECD, Energy Technology Perspectives 2020.

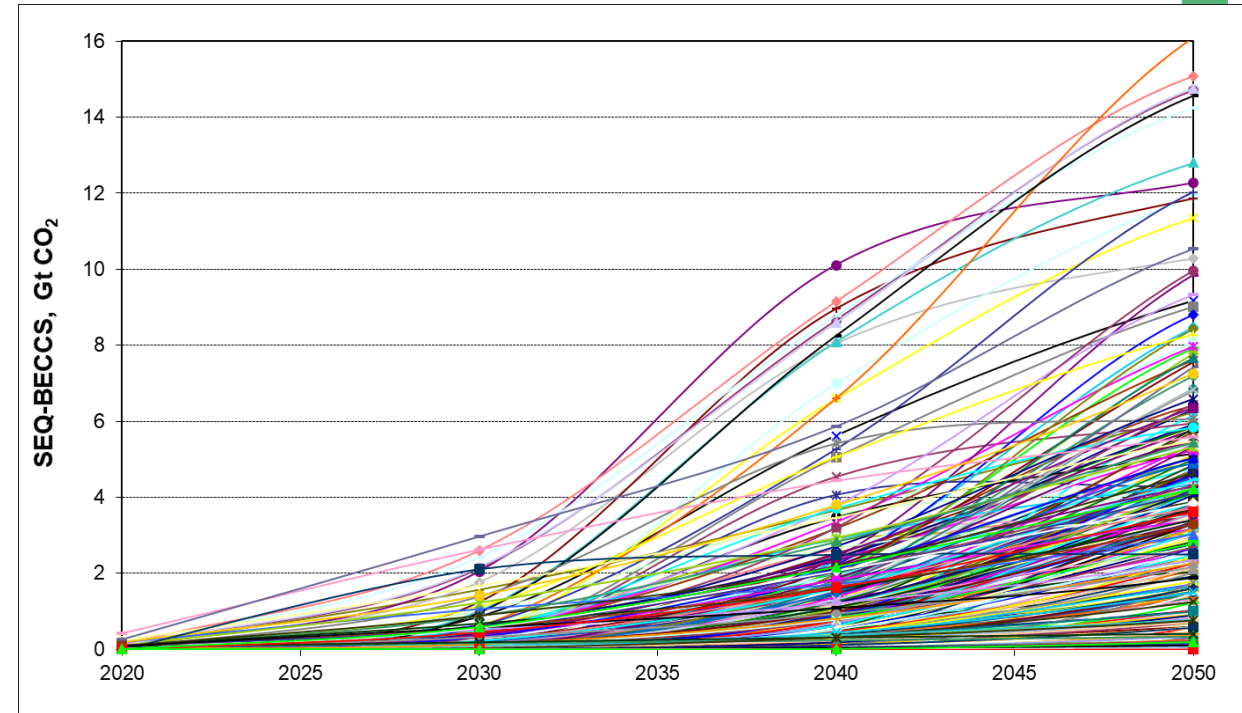
Example: Demand of BECCS to reach the mitigation targets of Paris Agreement – HIGH UNCERTAINTY



OECD-BECCS



Global BECCS (global mean 2050 3.3 Gt CO2)

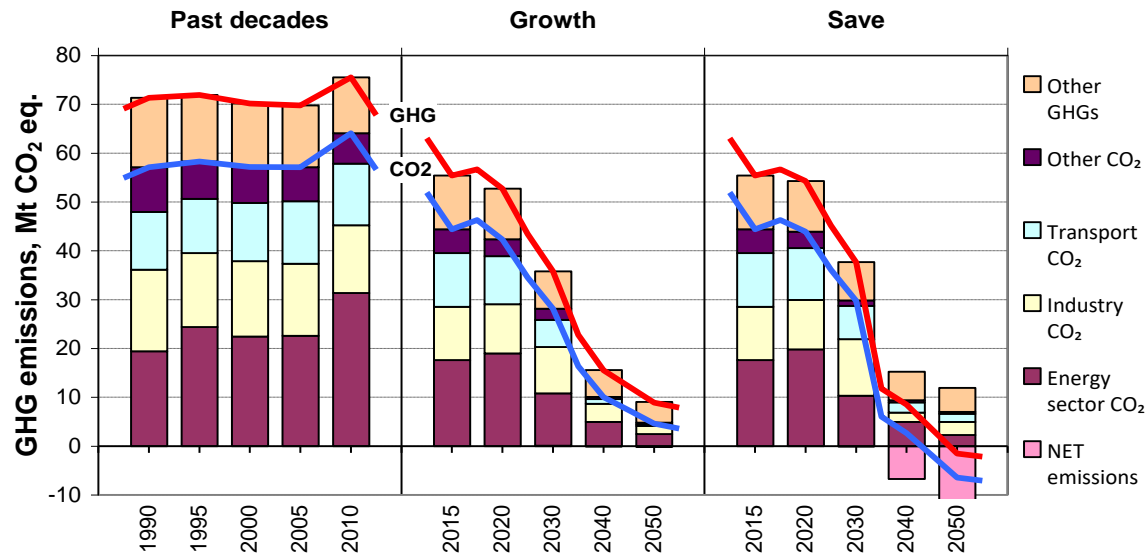


Data source: Huppmann, Daniel, Kriegler, Elmar, Krey, Volker, Riahi, Keywan, Rogelj, Joeri, Calvin, Katherine, ... Zhang, Runsen. (2019). IAMC 1.5°C Scenario Explorer and Data hosted by IIASA (Version release 2.0) [Data set]. Zenodo. <http://doi.org/10.5281/zenodo.3363345>; IAMC 1.5°C Scenario Explorer and Data hosted by IIASA, release 2.0 <https://data.ene.iiasa.ac.at/iamc-1.5c-explorer>

For Europe the amount of NETPs is typically between 50 and 300 Mt CO₂ in 2050-2070

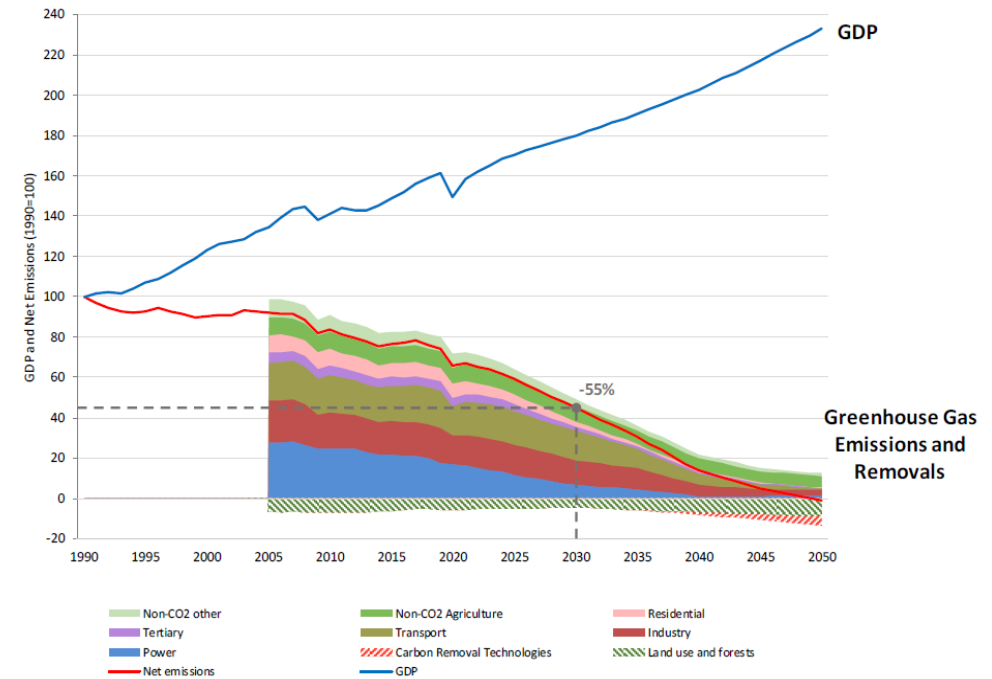
- However, in some EU MS the potential of NETPs could be considerable

Example from Finland, where the potential of NETPs could be above 10 Mt CO₂ by 2050



Source: Lehtilä & Koljonen (2020), VTT.

Figure 20: A pathway to climate neutrality



Source: EC 2020. <https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>

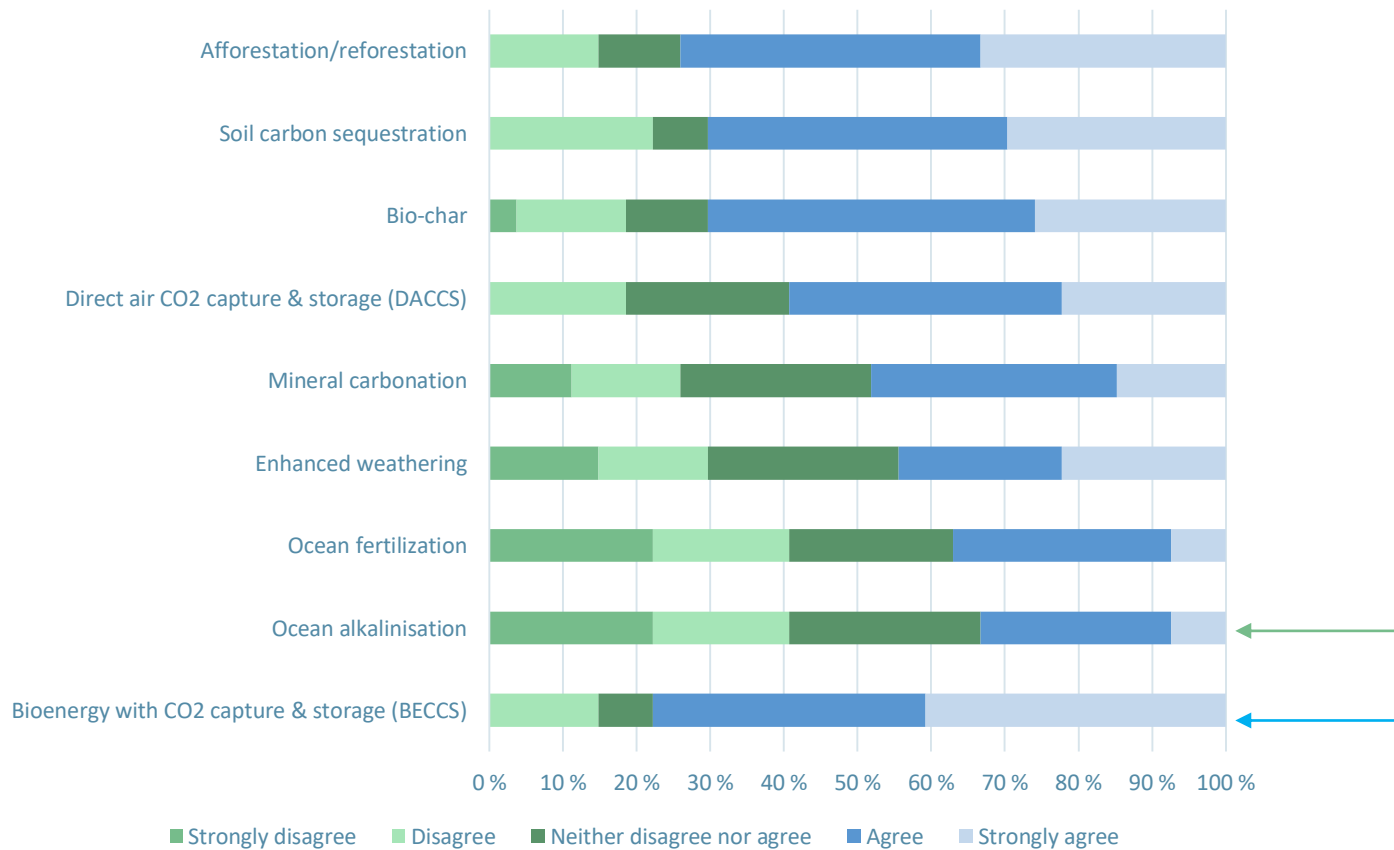


RESULTS OF THE NEGEM VISION WORKSHOP BACKGROUND QUESTIONNAIRE



Awareness on different NETPs

3. I am sufficiently informed to discuss the role of following Negative emission technologies and practices (NETPs) in achieving climate neutrality in European and global context.



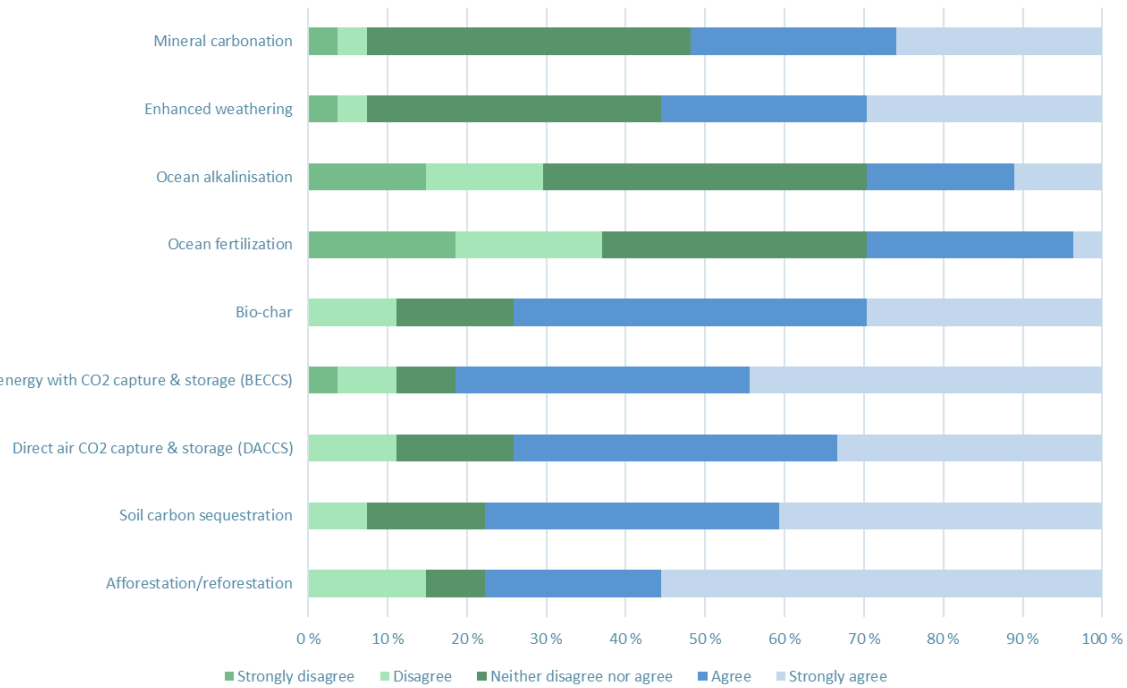
- Distributed through the targeted workshop participants in parallel with the invitation
- This presentation is presented on data available on Thursday morning with 27 answers (today 32 answers)
- 63% of the answers from Europe
- Distribution of stakeholder groups: research, 41%; industry: 29 %; public sector: 4%; non-governmental organisation: 11%; other: 15%

Long term prospects of NETPs – no major differences between global and EU levels



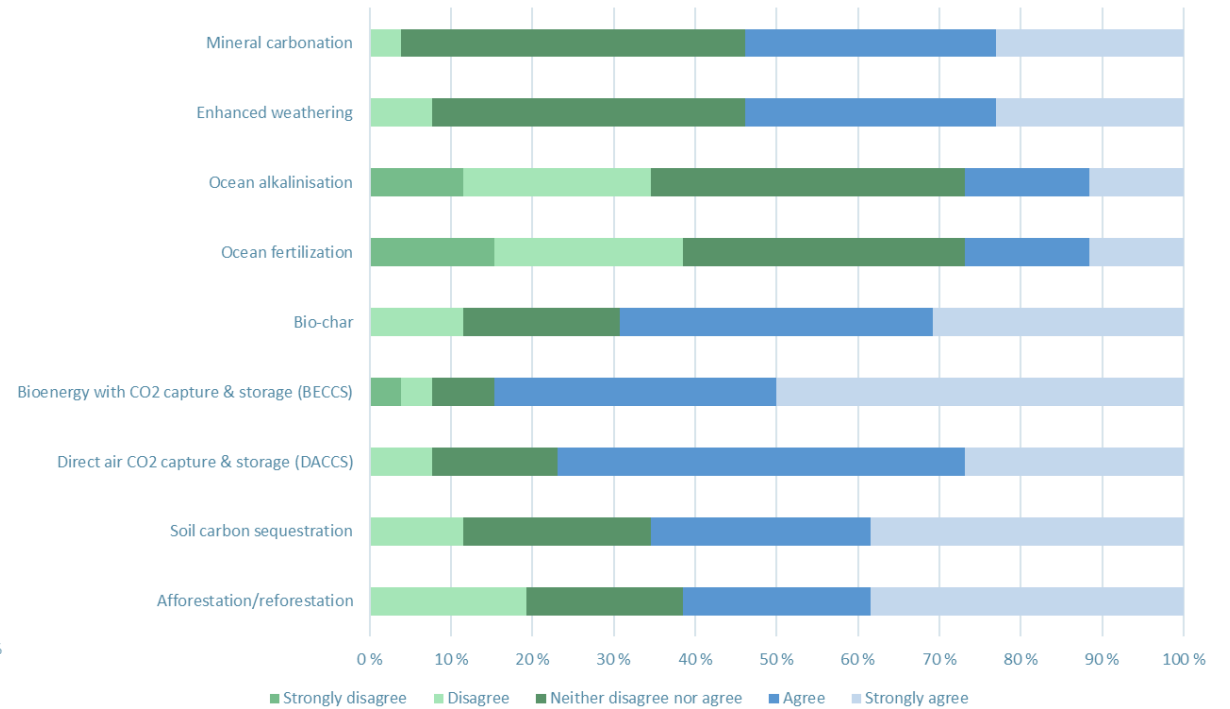
Global context

6. The following NETPs are promising options to significantly contribute in achieving climate neutrality in global context in a period up to 2050 and beyond.



European context

7. The following NETPs are promising options to significantly contribute in achieving climate neutrality in European context in a period up to 2050 and beyond.



Discussion – Question 1



NETPs are seen as complementary measures to GHG emission reductions - but how would you define its role with some extra words (both medium and long term could be considered)

Discussion – Question 2



Some highlight the urgency of climate change mitigation, justifying fast deployment of NETPS - what is your opinion? If you think that fast deployment is justified, what needs to be done?

Next steps

- Results of the 1st workshop on the NEGEM Vision will be analysed together with the results of the background questionnaire
 - Any comments or feedback is welcomed also after the workshop
- Literature review on the role of NETPs in different scenario assessments to be completed in January 2021 (includes also the results of the 1st vision workshop)
 - Vision work will continue throughout NEGEM project
- Second Vision workshop will be organised by the end of the year 2023, when the NEGEM analysis on realistic potentials of NETPS are available





Thank you!

Contact: tiina.koljonen@vtt.fi

Tel. +358 50 35995949

Project Partners



@NEGEMProject
info@negemproject.eu
www.negemproject.eu