CarMa Research Proposal 2022-4

Carbon Dioxide Removal (CDR) or Negative Emissions Technology (NETs) in compliance with carbon markets

Id. card:

Project Type: Post-doctoral project proposed to CarMa Chair

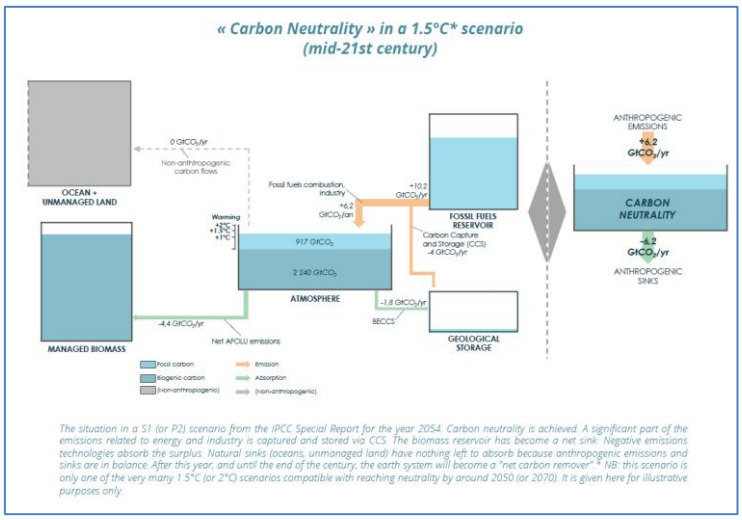
Duration: 18 months, starting on Nov. 2022 (or as soon as possible)

Ideal profile for the candidate: PhD technology energy systems, carbon finance

Supervisor: Paula Coussy

Background

The concept of negative emissions has attracted attention since its first inclusion in the IPCC Fourth Assessment Report. The ambition of the Paris climate agreement may already be unachievable without negative emissions and almost all modelling scenarios limiting global warming to 1.5°C rely on removing CO_2 from the atmosphere. Some of the technologies designed as Negatives Emissions Technologies (NETs) are based on natural processes, others on human engineering (BECCS, DACS). Negative emission technologies are embedded in complex energy systems. It is therefore important to measure the permanent removal of GHGs from the atmosphere and **recognise the economic and regulatory basis of NET CO_2 offsetting.**



Source: Carbone 4 NZI guidelines - 2020

NETs have financial, environmental and social costs and benefits; therefore, it is important that they are recognised/accepted in carbon markets in order to encourage their development.

How would be NET's Monitoring Reporting and Validation recognised in the existing markets and in the EU ETS?

Scope of work:

1. Identify in the literature existing **methodology(ies) to identify real "negative emissions**", i.e. physical net negative emissions. What guidelines/rules exist or are in preparation for defining physical negative net emissions? How these guidelines deal at the global and industrial levels, i.e Scope 1, 2 and 3? How the temporality of negative emissions (i.e. short life GHG-based products) are considered? A "decision three" model would be useful to identify negative emissions pathways.
2. In parallel, an inventory of the different **existing carbon offset markets** and the associated carbon offset demand and supply will be assessed in order to put these new NETs in perspective. Who are/will the bidders - applicants for carbon offsets? What are the price ranges of these carbon offsetting credits in the different markets? Related to the main **eligibility criteria** of existing carbon offset labels (VERRA, Gold Standard, etc.). What is the actual status of negative emissions under these various existing schemes and the current reasons/factors for their lack of recognition? what are the opportunities for these negative emissions to participate in carbon offsetting markets?
3. What could be the **Monitoring, Reporting and Validation obligations** (methodologies, additionality, risk...) for these NET reductions in the different carbon labels? Some schemes exist already and can be explored, analysed and compared:
    - *Greenhouse gas Protocol Guidance on carbon removals and land use, WRI, wbcsd,*
    - *ISO 14064 Carbon removal,*
    - *international accounting rules* (i.e. 2006 IPCC Guidelines for National Greenhouse Gas Inventories);
    - *project-based scheme accounting rules*, for example, the Kyoto Protocol's clean development mechanism (CDM);
    - *regional, national and sub-national accounting rules*, that account for greenhouse gas emissions in various jurisdictions, such as, cap-and-trade based emissions trading schemes and mandatory emission reporting programmes, (e.g. the European Union's Emissions Trading Scheme (EU ETS); the US Environmental Protection Agency's Greenhouse Gas Reporting Program); *etc.*
    - *Other schemes*

Source: Carbone 4 NZI guidelines - 2020

4. Inclusion of Negative Emissions Technologies (NETs) **into the EU ETS**. According to Rickels and al (2020), the European Commission already announced in 2020 its intention to examine the development of a legal framework for the certification of CO_2 removal options based on a robust and transparent carbon accounting. What could be future integration options of NETs into the EU ETS? How the quantity and price control may be considered?
5. **Governance** aspects of NETs (accounting, rewarding): the importance to have a standardized framework for accounting and rewarding. Need of policies, measures and rules that adequately recognize, attribute and reward negative emissions. An uncertainty of the policy incentives in the implementation of NETs is hampering their development.
6. What could be the future benefits and issues of Negative Emissions Trading in the European Union.

Bibliography:

- The Future of (Negative) Emissions Trading in the European Union, KIEL Working paper, Sept. 2020, Wilfried Rickels and al.
- Net Zero Initiative, A Framework for collective carbon neutrality, Carbon 4, Net Zero Initiative, 2020
- GHG Protocol, Carbon Removals and Land Sector Initiative, Project Overview, Updated March 2020
- Domestic carbon standards in Europe December 2019 Overview and perspectives, I4CE, Gabriella Cevallos | Julia Grimault | Valentin Bellassen
- Emily Cox & Neil Robert Edwards (2019) Beyond carbon pricing: policy levers for negative emissions technologies, Climate Policy, 19:9, 1144-1156,
- Carbon Credits in California's Climate Programs Sonia Yeh Department of Space, Earth and Environment Chalmers University of Technology, Sweden Incentivising Carbon Dioxide Removal Technologies, ERCST, September 24th, 2019

Funding :

This doctoral project benefits from a generous research funding provided by the Chair Carbon Management (CarMa) at IFP School. The selected candidate will thus be fully integrated in the Chair and will contribute to the Chair's activities. That insertion will also provide the candidate with a host of opportunities (e.g., an insertion within the Chair's international research network and the opportunity to visit to eminent research institutions during the doctoral project).

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