Benelux Business Roundtable

Graanmarkt 2, 2000 Antwerp
Belgium

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THE CASE FOR CCUS IN THE BENELUX

INTRODUCTION

The EC has increased its 2030 target for CO2 emission reduction with the EP aiming even higher. The increased target will lead to intense discussion between member states in the months to come on technical feasibility, social consequences and funding.

These discussions also concern the business community if it is to develop, co-finance, execute and manage industrial clean energy transition projects through cross sector and cross border collaboration between companies.

The BBR supports the EU's ambition to reach climate neutrality by 2050. However, this target is only achievable if very substantial progress is made in this decade. It should be noted that industry has already made significant contributions to reducing the EUs greenhouse gas emissions (GHG) with 23% between 1990 – 2018, and will be called upon to accelerate these efforts in the coming decade.

THE GREEN DEAL PILLARS

When considering the transition strategy for our industries towards a climate friendly production embedded within society, the Green deal identifies the following core pathways:

1. Continuous improvement of existing processes via **Energy efficiency**,
2. **Electrification** through the substantial increase of the share of renewable energies in our power supply and
3. Developing breakthrough technologies for low emission manufacturing via R&D and Innovation priorities and supported by Electrification and **Sustainable molecules**.
4. **CCUS**: capture and store CO2 for re-use or sequestration.

Energy efficiency is an important element to reduce GHG emissions, the energy intensive industry already increased their efficiency considerably and will continue the make efforts for further improvements. However energy efficiency will not be sufficient to reach climate neutrality by 2050. To further reduce emissions industry will need to implement new low carbon technologies. The new low carbon technologies require more energy and could lead to less energy efficiency performance. Demand reduction for the end product in industrial processes might remove the need for some classes of product all together.
Electrification, supported by the rapid scale up of climate neutral electricity to both displace existing fossil fuel power generation and power the electrification of transportation and many

other aspects of our lives. This will require an unprecedented and sustained ramp up of production across Europe and is suitable for some, but not all, industrial processes. There is currently significant debate about whether green energy ramp up will be able to satisfy the carbon neutral ambition of Europe and whether the cost of this transition will represent the best value for money for all. For industry to reach climate neutrality the production and import of abundant low carbon energy at competitive prices will be key.

Sustainable molecules could cover many things, amongst these are Biofuels, Biomaterials and Biomethane. Advanced biofuels and materials made by feedstocks grown or emitted in Europe or imported from elsewhere, can be a more direct replacement of fossil fuels.

Combined with CCUS, Biofuels, Biomaterials and Biomethane may deliver negative emissions, which will likely be needed at scale to achieve a 1.5 degree pathway (Paris Agreement), though significant additional regulatory work will be required before these technologies can come to market at scale.

Hydrogen, made entirely from renewables (Green Hydrogen), or using electrolyzed water with low carbon power (low carbon Hydrogen) or made from natural gas with Carbon Capture and Utilisation or Storage (CCUS) to prevent the release of CO2 into the atmosphere (Blue Hydrogen) or by the pyrolysis of methane without the production of CO2 (Turquoise Hydrogen), is a candidate for several other major industrial uses. It relies on either the same climate neutral electricity ramp up as electrification (for green), or significant CCUS (for blue) to support its full deployment.

CCUS. Even a fully integrated energy system cannot completely eliminate CO2 emissions from all parts of the economy. The other option for industry is CCUS which can be used for a wide range of industrial uses, particularly in hard to abate sectors, to capture carbon before it is released into the atmosphere or directly from the atmosphere and then transported for geological storage, or re-used and converted into feedstock for other processes or product manufacture. The storage and usage technology is mature today and is particularly relevant for regions with ready access to offshore or far shore CO2 storage and existing industrial infrastructure.

USE AND DEVELOPMENT OF THESE PILLARS OVER TIME

Given the scale of the challenge facing Europe and the world, it is certain that all of these technologies will be needed, though exactly which technology will be best for every application is not resolved for all uses and will depend on economical parameters (energy costs, business case, infrastructure costs, …).
It is widely acknowledged that CCUS whereby CO2 emissions are captured for permanent (sequestration) or temporary storage (for recycling) or immediately used for production of low carbon energy, fuels and feedstock or materials, is **indispensable to reach the 2050**

target (IEA, EC, IPCC, UK CCC) and requires regulatory, rather than technological unlocking to enable the transportation, usage and storage, as well as business models to fund the capture. Furthermore, it is also likely to become a cost efficient abatement option, particularly for industries that produce very pure streams of CO2.

Recent analysis by McKinsey, suggests indeed that to achieve the 2030 and 2050 targets, **up to 18% of EU industrial emissions** would economically be most efficiently abated by CCUS, with this number potentially rising if Blue Hydrogen is also deployed at scale to decarbonize other uses. This would make CCUS the single largest contributor to a climate neutral industry in Europe, including the Benelux region.

All climate neutral technologies will have challenges to reach significant scale by 2030 to meet the target, and all will need to play a part. CCUS is no different. A major project to deploy a CCUS network would likely take at least between 5 – 10 years, so companies need to start now, to have assets online as of mid-2020s and a scaled industry by 2030 and beyond. For CCUS to hit this timeline a major advantage is that:

- it is not dependent on other technology scale ups e.g., renewables or electrolysis
- it relies on mature technologies which are well understood today and for many applications
- it is likely to be the cheapest form of mitigating GHG emissions.

If other technologies, particularly Hydrogen, are prioritized and scaled faster, they will likely also need to utilize CCUS to produce enough Low Carbon and Blue Hydrogen to meet 2030 demand.

CCS should therefore be the **highest short term and CCU a short and medium priority** while other long term technologies are developed such as electrolysis, moving from grey to blue to green, electrification of industrial processes etc…

WHAT IS NEEDED?

Key ingredients for a successful CCUS are:

- Cross-border and cross-sector collaboration
- Open access transport infrastructure (pipelines, shipping and trucking)
- Scale

CCUS AND THE BENELUX

The Benelux region has a large industrial emissions footprint, clustered together and often close to the North Sea, supporting large numbers of jobs and making a significant contribution

to national GDP. The region has a lot to gain from a well-executed clean energy transition (but also the most to lose in case of failure) and thus the development of ambitious, large scale CCUS projects. Given that it will take time to build the business models, companies and governments should look to all forms of potential funding for these projects, particularly the European Resilience and Recovery Fund (RRF), for which countries will submit their final plans in April 2021.

At national level we see indeed the creation of cross sector collaboration to develop (open access)CO2 transportation infrastructure, **the necessary first step leading to CO2 capturing**. Cross border and cross sector projects are however increasingly necessary to reach scale.

The Benelux region is the best region in Europe for development of a CO2 transportation infrastructure provided cross sector collaboration and scaling is promoted and facilitated.
It has:

- Ready access to the North Sea.
- The largest port infrastructure in Europe for **export of CO2** to permanent or temporary off shore and far shore storage and **import and throughput of climate neutral energy carriers.**
- The largest (petro)chemical cluster in the EU and important steel manufacturing sites.
- State of the art maritime and logistical knowledge and experience.
- The largest public and private pipeline infrastructure network in EU.
- A geographical location to become an energy hub for Europe.
- An industrial community largely supportive to contribute to the Paris Agreement and the EU Green Deal.

The advantages of a coordinated Benelux approach are manyfold:

- Large scale projects with significant CO2 emission reduction capacity will be looked upon favorably by the EC for public funding through the various EU funding sources.
- Open up (for Belgium and Luxembourg) and increase (for the Netherlands) off shore and far shore storage capacity.
- Stimulating the Benelux market takeoff of green CCU fuels and materials.
- Sets the stage for further collaboration on the energy transition within the Benelux.
- Develop connections to NRW and Northern France to further enhance the role of Benelux as CO2 and energy hub for Europe.

It will require:

1. Harmonization of rules and regulations for cross border transport operational and safety measures, CO2 reduction score card.

2. Similar financial incentives for reducing emissions and early CCUS projects (see Porthos Rotterdam project).
3. Joint applications for public funding.
4. Boost innovation to reduce costs and ensure that critical emerging technologies become commercial, including in sectors where emissions are hard to abate.

A well-executed CCUS approach for the whole Benelux region will unlock the tremendous potential of the entire Benelux region to become a lighthouse for the clean energy transition.

The above position is supported by:
Essenscia: the Federation of the Belgian Chemical industry
Antwerp@C: a consortium of large chemical and energy companies around the Port of Antwerp aiming to reduce CO2 emissions
Carbon Connect Delta: a Smart Delta Resources project of chemical, energy and steel companies around North Sea Port aiming to reduce CO2 emissions.
North-C-Methanol: a consortium of 10 large industrial and public parties around North Sea Port aiming to reduce CO2 emissions.

Yours sincerely,

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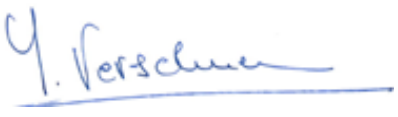

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