



Benelux Business  
Roundtable



# Memorandum on Cross- border Hydrogen and CCS Value Chains

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# Memorandum on Cross-border Hydrogen and CCS Value Chains

The Benelux Business Roundtable (BBR) and its industry members call on **Benelux and EU policymakers to urgently take action to accelerate the development of cross-border hydrogen and carbon capture and storage (CCS) value chains** in the Benelux region. Adopting a value chain approach is crucial to ensure economies of scale through shared infrastructure, justifying strategic investments in the region, which are **essential for meeting climate goals and safeguarding prosperity in the region and the EU**. Thanks to its strategic position and as one of Europe's main industrial hubs, the Benelux is well placed to lead the way on hydrogen and CCS, but to be successful the BBR calls for three major changes in the field: (1) provide strong and harmonized public support to make hydrogen and CCS projects viable, (2) coordinate and support / de-risk the deployment of cross-border infrastructure, and (3) harmonize the policy and regulatory landscape at the regional and EU level. Taking swift and decisive action on a unified Benelux scale, bringing together public and private actors, will foster cross-border collaboration, unlock investments to maintain high-quality jobs, and pave the way to a resilient, low-carbon future.

## Vision

**European industry is under significant pressure**, demonstrated by production contracting by 10-15% since 2021,<sup>1</sup> and **navigates a very challenging landscape** defined by high energy prices, a complex regulatory framework, ambitious sustainability goals, insufficient public support and shifting geopolitical dynamics. The Antwerp Declaration<sup>2</sup> is an urgent call to strengthen the business case for investments in Europe by ensuring clarity, predictability, and confidence in Europe and its industrial policy. The Clean Industrial Deal – aimed at driving European industry towards greater competitiveness and decarbonization – has been elevated as a **key priority for the upcoming EU institutional cycle** and is expected to be unveiled within the first 100 days of the new Commission's mandate.<sup>3</sup>

In this context, the Draghi report,<sup>4</sup> which will serve as important guidance, emphasizes the need for a balanced approach that integrates **renewable and low-carbon technologies** like hydrogen, derived molecules, and CCS, while accelerating the development of these value chains and supporting infrastructure – a message echoed by the Oslo Declaration.<sup>5</sup> The Clean Industrial Deal would require the mobilization of 800 EUR billion<sup>1</sup> per year of public and private investments. The design of supporting mechanisms should be technology neutral, **enabling a more cost-effective transition**. This development has already been underscored by more recent policy initiatives such as the Net Zero Industry Act (NZIA), Industrial Carbon Management Strategy and the draft delegated act for low-carbon hydrogen and fuels.

The **Benelux region is ideally positioned to spearhead** the development of much-needed hydrogen and CCS value chains. Since its establishment in 1958, the Benelux has consistently addressed regional challenges through collaboration, fostering growth and setting a powerful example for the rest of Europe. As one of Europe's most prosperous areas, the Benelux is **home to vital industrial clusters and major ports** that produce high-value products and serve as key hubs for the flow of energy, feedstock,

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<sup>1</sup> [The future of European competitiveness](#), September 2024.

<sup>2</sup> [Antwerp Declaration](#), signed by more than 1200 organizations, spanning 25 sectors, February 2024.

<sup>3</sup> EU Council's Strategic Agenda 2024-2029, June 2024; New Political Guidelines for the European Commission 2024-2029, July 2024.

<sup>4</sup> [The future of European competitiveness](#), September 2024.

<sup>5</sup> [Oslo Declaration](#), June 2024.

and goods, interconnected with Germany, France, and the rest of Europe, contributing significantly to employment and welfare in the region.<sup>6</sup>

The Benelux's **strategic location near the North Sea and surrounding countries** (such as the UK, Norway, and Denmark), offers significant potential for renewable energy generation, natural gas, and CO<sub>2</sub> storage. Potential international partnerships with resource-rich countries to supply sustainable molecules for energy and feedstock to its ports' terminals would further solidify its role as a leader in the clean energy transition. This geographic advantage and dense industrial activity facilitate economies of scale, allowing for more efficient cross-border value chain development. With established industrial value chains (steel, chemicals, refineries, cement & lime, etc.) supported by a highly skilled workforce, renowned educational & research institutions, existing infrastructure and cutting-edge innovations, the region is exceptionally well-equipped to lead Europe's clean industrial transition and to **future-proof existing and novel strategic industrial activities**.

Based on existing studies<sup>7</sup> and an assessment of the most mature projects,<sup>8</sup> we estimate the **abatement potential** for the Benelux region for 2030 to be very significant, namely at least 25 Mt of CO<sub>2</sub>/year, excluding transit from the hinterland, corresponding to more than 25% of current ETS1 emissions, covering large industrial installations and power plants.<sup>9</sup>

In short, given its strategic situation and capabilities, the Benelux region is uniquely positioned to take advantage of and serve as a model for cross-border collaboration on hydrogen and CCS initiatives. However, with EU 2030 decarbonization targets around the corner and industrial players deciding on where to locate long-term investments, **urgency is key**. Projects in hydrogen and CCS value chains must take Final Investment Decision (FID) by 2025 to stay on track and meet these ambitious goals. **We must therefore take swift, proactive, and decisive action now**.

## Recommendations

Despite its strategic advantages, industries in this region are currently faced with significant barriers that prevent them from fully realizing their decarbonization potential. As outlined in the diagram below, these barriers can be grouped into three critical categories: financial and risk management challenges, regulatory roadblocks, and operational constraints.

To unlock the region's potential, it is imperative that we address these challenges head-on. While many issues demand urgent attention, the **three targeted solutions presented below have been identified as the most immediate and high-impact actions** necessary to break through current bottlenecks. By implementing these measures, the Benelux region can not only accelerate its own path to decarbonization but also set a precedent for transformative progress across Europe. Immediate policy action is essential to capitalize on this opportunity and drive meaningful change.

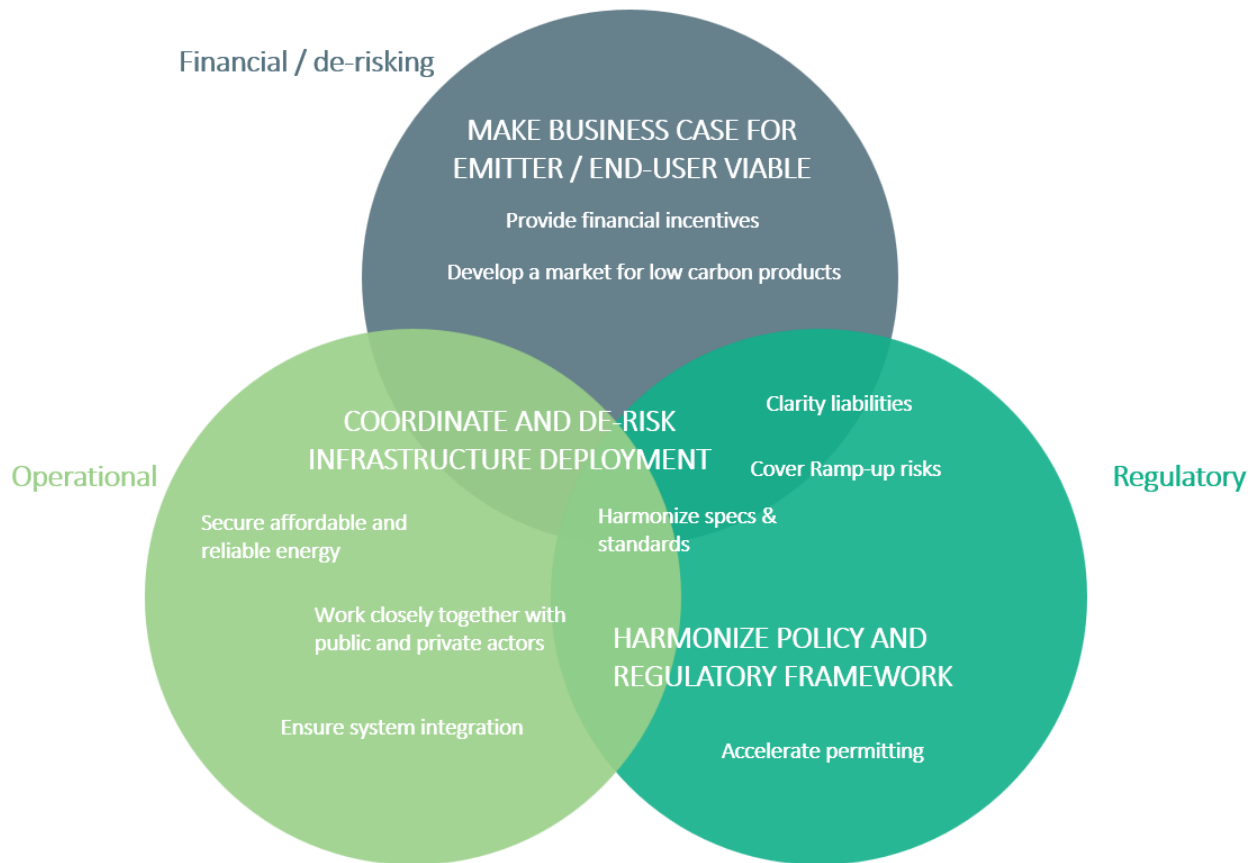
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<sup>6</sup> The Gross Value Added (GVA) by the Energy Intensive Industry (EII) in the Benelux is 58 bEUR or 3,7% of total GVA, direct employment corresponds to around 500.000 people. These figures do not include indirect and induced effects which, for the steel industry example, are estimated at 6x for GVA and 8x for employment in the Benelux. Eurostat, 2023; Oxford economics, July 2019.

<sup>7</sup> Planbureau voor leefomgeving, Klimaat- en Energieverkenning, October 2024; FPS Public Health, Food Chain Safety and Environment of Belgium, Scenarios for a climate neutral Belgium by 2050, 2021; EnergyVille, PATHS 2050, 2024; VLAIO, Naar een koolstofcirculaire en CO<sub>2</sub>-arme Vlaamse industrie, 2020.

<sup>8</sup> IEA CCUS project database, November 2024; Deloitte Analysis, 2024.

<sup>9</sup> [Verified ETS1 emissions](#) in Benelux: 91,8 Mt CO<sub>2</sub>eq (2023); Emissions in industry and power sector including non-ETS installations correspond to approximately 138 Mt CO<sub>2</sub>eq (2022), [CBS](#), [Klimaat.be](#).



## 1. Provide strong and harmonized public support to make hydrogen and CCS projects viable

In the current stage, many clean energy technologies are not yet competitive with their traditional equivalents. The two main financial challenges facing the development of hydrogen and CCS projects in the Benelux are: (1) the value gap between the end-user / emitter’s willingness to pay and the levelized costs of these technologies (primarily driven by the ETS price) and (2) the absence of a level playing field within the Benelux, across the EU, and on a global scale, which hinders widespread adoption and delays projects from reaching FID. To facilitate the pick-up and rollout of hydrogen and CCS, transitional market mechanisms are essential. These mechanisms should support first-mover and early-follower projects to progress through cost learning curves, achieve economies of scale, and reach the critical break-even point needed for a mature and self-sustaining market.

We recommend **harmonizing and improving existing Contracts for Difference (CfD) mechanisms across the Benelux** by ranking support to projects in function of their abatement cost (required support in EUR/ton CO<sub>2</sub>). These mechanisms are a proven and **technology-neutral** way to **support investment in renewable and low-carbon technologies**, covering hydrogen, CCS and other decarbonization pathways. CfD programs such as the SDE++ in the Netherlands and the *Transitiecontracten Klimaatsprong* in Flanders have already laid a foundation for incentivizing hydrogen and CCS projects, but additional steps must be achieved:

- **In Belgium**, where the Flemish CfD is just starting up (the initial budget is 70 MEUR<sup>10</sup> vs. 11,5 bEUR for the SDEE++<sup>11</sup>), we recommend **scaling up the pilot project** in line with the mechanism in the Netherlands.<sup>12</sup> The Flemish mechanism could then be replicated across other Belgian regions to streamline support across the country. With significant hard-to-abate emissions, it will be important for the Walloon region to also embark on this initiative. While scaling up the mechanism in Belgium, we recommend providing tailor-made financial **support to front runner projects**. This will help build confidence, kick-off the market and drive further investments on the long run.
- **In the Netherlands**, further improvements include opening the SDE++ mechanism to storage abroad to increase freedom of choice and competition, allowing for adjustments or provision of government guarantee for unexpected cost increases across the value chain (e.g., driven by inflation) and resolving issue of loss of bank guarantee if delays occur elsewhere in the value chain for reasons beyond the end-user's control.

To fund these mechanisms, we recommend **dedicating EU ETS1 auction revenues<sup>13</sup> primarily** to the decarbonization of industry.

Equally important, to complement CfD mechanisms and to avoid relying solely on a subsidy scheme, it is essential to **proactively develop a market for low-carbon products**. Demand creation can be achieved by establishing regulated demand targets to drive adoption, prioritizing low-carbon options in public procurement policies, and increasing public awareness to build acceptance of low-carbon alternatives.

Together, these measures can drive market growth for low-carbon products “made in Benelux / Europe” and create a sustainable foundation for continued low-carbon innovation. Implemented in a harmonized way across the Benelux, the above measures would close the value gap, level out the playing field and stimulate cross-border initiatives.

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<sup>10</sup> [VLAIO](#), November 2024.

<sup>11</sup> [RVO](#), October 2024.

<sup>12</sup> Note that the SDE++ mechanism foresees a limited part of the overall budget for technologies which are less cost-effective on the short term, but which are expected necessary to achieve the energy transition on the long term and of which costs are expected to decrease as they are more widely implemented.

<sup>13</sup> For the Benelux region, ETS1 auction revenues will bring in a significant sum of money for the period 2024-2030: around 13 bEUR at an average carbon price of €90 per ton (a conservative estimate), [Carbon Market Watch](#), August 2024.

By taking these initiatives, Benelux countries could serve as a model for the rest of Europe, demonstrating the feasibility and effectiveness of a comprehensive, multi-national approach. Consequently, in parallel, Benelux governments should push for actions on the EU level to:

- Expand regional mechanisms to an **EU-wide scale CfD mechanism**, open to both renewable and low-carbon technologies and underpinned by a stable and minimalistic State Aid rule framework.
- **Create market pull through EU regulations** for decarbonized, low carbon products.
- Install effective **mechanisms to ensure a global level playing field**, accounting for sector specific market dynamics. Monitor and improve the Carbon Border Adjustment Mechanism (CBAM) design to foster, rather than inhibit, the development of CCS within the EU.

Other recommendations to reinforce the business case:

- Increase success rates of (joint) Innovation Fund (IF) applications via a one-stop support desk by regional/national administrations.
- Ensure reasonable tariffs and terms for transport and storage by applying an open book principle and preventing excessive profits.<sup>14</sup>
- Ensure economies of scale and competition through fair access to cross-border multi-user transport and storage, thus reducing system costs (see Recommendation 2).
- Ensure specifications are not unnecessarily stringent to avoid additional costs (see Recommendation 3).

## 2. Coordinate and support / de-risk the deployment of cross-border infrastructure

Firstly, national and EU governments should develop a **strategic and comprehensive vision** on how national and **cross-border infrastructures** must be planned, financed, and implemented. In this context, coordinated action from interregional governments and the EU is essential to achieve a system-optimal design and realize economies of scale. The BBR recommends that policymakers increase their involvement in cross-border infrastructure planning by bringing together all actors – CO<sub>2</sub> and Hydrogen Network Operators (CNOs and HNOs), storage providers, shippers, terminal operators, ports, and industrial players (emitters and end-users) – to reach a **shared understanding and commitment on the required infrastructure and timeline**. This includes engaging with UK stakeholders to enable access to nearby sinks and reduce costs, while also considering multi-modal routes and exit points, diverse carriers (e.g., H<sub>2</sub> or NH<sub>3</sub>) and varying characteristics (e.g., CO<sub>2</sub> in dense or vapor phase).

<sup>14</sup> Aligned with EU's commitment to fair competition and cost-efficient energy transitions, as set forward by the EU Hydrogen and Decarbonised Gas Market Package, and of particular consideration for also the non-regulated parts of the value chain.

Beyond the need for coordinated strategic planning, infrastructure development is also hindered by financial hurdles. During early-stage underutilization and without government intervention, cross-border infrastructure could face prohibitively high tariffs. The BBR therefore asks national governments to provide robust financial backing, including **government protection and adequate subsidy schemes**, thus ensuring **affordable tariffs** right from the start.

National authorities should **align on the distribution of financial support and backing**, accounting for the benefits and the risks for each geography. In parallel, the EU can facilitate by designating cross-border projects as Project of Common Interest (PCI) and enhancing support via the Connecting Europe Facility (CEF) mechanism, particularly for North Sea infrastructure that serves end-users across multiple member states.

Finally, securing **sustainable, affordable, and reliable low carbon electricity** for the Benelux region is key for direct electrification needs, but also to support CCS and the production of renewable hydrogen. The above initiatives on cross-border infrastructure should link with the development of renewable energy in the North Sea and be **integrated into a system-wide, long-term approach**.<sup>13</sup>

Other recommendations to ensure rapid rollout of cross-border infrastructure:

- Ratify Article 6 amendment of the London Protocol<sup>16</sup> and establish bilateral and multilateral agreements to enable seamless cross-border CO<sub>2</sub> transport, including provisions for transport between EU Member states and the UK (e.g., alignment between UK and EU ETS) to create a European internal market.
- Implement targeted measures focused on managing operational risks in infrastructure. An EU shared risk management fund or insurance pool should be established to address the potential for storage leaks during CCS (and hydrogen) development and operation phases. This would alleviate financial and liability concerns for companies involved.
- Develop an EU Energy Strategy to bring down high energy costs – a major competitive disadvantage for European energy-intensive industrial players in global markets – and to establish a level playing field within Europe. Attention should be placed on, for example, taxes and levies, grid fees, and value of flexibility.
- Support innovation – in system integration, business model development and CCU applications, for example – to build a forward-looking ecosystem that creates momentum and a continuous feedback loop with pilot projects.

<sup>15</sup> [Masterplan – How Benelux's industry and power sector can become carbon neutral by 2050](#), BBR, 2021; Consideration should also be given to environmental impact, circularity, water usage, PFAS, and other factors to ensure they are adequately addressed and are not preventing projects from moving ahead.

<sup>16</sup> The objective of the London Protocol is to promote the effective control of all sources of marine pollution, including CO<sub>2</sub>. Initially Article 6 of the London Protocol prohibited the cross-border transport of CO<sub>2</sub> with the purpose of permanent CO<sub>2</sub> storage. In 2009, Norway proposed an Article 6 amendment allowing CO<sub>2</sub> export for CCS. In 2019, an additional resolution was adopted allowing two or more countries to export CO<sub>2</sub> if certain conditions are met, including the requirement that those countries have ratified the Article 6 amendment and entered into a bilateral agreement.

### 3. Harmonize the policy and regulatory landscape at the regional and EU level

At the **regional level**, internal inconsistencies and misalignment between regulatory frameworks create significant obstacles to cross-border collaboration within the Benelux. Given that transpositions and regulatory frameworks across the region are still emerging, there is a unique opportunity to **proactively harmonize regulations** as they take shape. From an early-mover investor's perspective, gaining regulatory visibility is of utmost urgency to reach 2030 targets.

As part of these frameworks, there is a need for a unified set of **standards and specifications** for infrastructure, equipment, and operational processes. These standards should be developed with a bottom-up approach based on practical industry expertise, scientific data and evidence. Harmonization of **technical guidelines** and **interconnectivity criteria, purity and quality standards** for hydrogen and captured gases, and **tariff conditions** should ensure system integrity, seamless compatibility and driving down costs for efficient and non-discriminatory transport of CO<sub>2</sub>, hydrogen, and derived molecules across borders. Additionally, harmonizing **international certifications** (e.g., providing information on emission intensity) is essential in preventing bottlenecks for the cross-border movement of molecules. The Benelux region is well-positioned to lead by example and should consider pooling regulatory resources to do so. By successfully aligning these standards within its borders and with neighboring countries, the **Benelux can act as a trailblazer for the EU**, creating a cohesive and robust integrated market and infrastructure network.

At the **EU level**, existing policies and regulatory frameworks often lack clarity and harmonization, creating significant barriers for cross-border value chains, causing uncertainty, and increasing costs and delays. To address this, the Benelux governments should advocate for urgent corrective measures in the EU's regulatory frameworks for hydrogen and CO<sub>2</sub>. Legislation should provide companies with the flexibility to pursue their own paths toward sustainability and **incentivize all forms of sustainable solutions including low-carbon hydrogen and CCS** to deepen integration across energy networks and ensure cost effectiveness. We recommend an **early revision of RED III industry** (RFNBO targets for industry), which is currently not technology neutral, primarily incentivizing renewable hydrogen, and limiting options to decarbonize our industry.

Other recommendations to facilitate regulatory progress:

- Clarify liabilities and contracting. Clear regulatory guidelines and contract frameworks are crucial for advancing CCUS and hydrogen projects. We propose developing standards similar to those for the LNG industry, particularly concerning the allocation of risk, which should be distributed fairly across all actors in the value chain.
- Accelerate the permitting process, which remains a critical bottleneck. Administrations should foresee sufficient resources and capabilities to handle permits. Additionally, within the NZIA, hydrogen and CCS value chain projects could be assigned status of Net-Zero Strategic Project (NZSP) to fast-track administrative procedures.
- Create a more adaptable regulatory environment to support the rapid deployment of new low-carbon technologies. We propose creating flexibility and urgency in the approval processes for permits related to the modification of existing industrial processes and the installation of new technologies.



## Our commitment and call to action

Industries in the Benelux region are **deeply committed** to decarbonization and to meeting the EU's ambitious climate goals. The Benelux Business Roundtable recognizes that achieving these targets will require bold and collective action, and its industry members are prepared to step up. Industry in the EU has already reduced its greenhouse gas emissions by about 35% relative to 1990 levels, is leading the way globally and compared to many other sectors. Our objective is to drive solutions that balance economic prosperity with environmental responsibility.

Reaching the full potential of these efforts will only be possible through strengthened public-private partnerships and a clear strategy and strong support from government, as well as sound and transparent communication with the public for broad acceptance. **BBR industry members** are both willing and well-positioned to take a leadership role in decarbonization efforts and serve as a model for the broader EU. We are **fully prepared to co-create solutions with the public sector**, invest in the establishment of future-proof cross-border value chains, and enhance collaboration through cross-sector projects, increased transparency, and joint information-sharing platforms, such as working groups and roundtables. In addition, we are open to further interact with our key knowledge centers in this field.

**The time to act is now.** Without decisive action, essential investments will not happen, and meeting 2030 targets will become impossible. It will erode our industrial activity and consequently the prosperity of the Benelux region. We therefore strongly **urge Benelux policymakers to work closely with stakeholders along the value chain** through a **dedicated cross-border governance structure**, underpinned by a regional strategy, to effectively **implement the proposed recommendations**.

Together, through deeper cooperation and joint initiatives, we can unlock the full potential of the Benelux region and lay the foundation for a resilient and sustainable future.

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*Brussels, 21/11/2024,*



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