WHITE PAPER
WHO PAYS FOR NET ZERO?
Holding the oil and gas sector accountable in the EU’s Net Zero Industry Act
September 2023
WHITEx paper

WHO PAYS FOR NET ZERO?

Holding the oil and gas sector accountable in the EU’s Net Zero Industry Act

September 2023

CONTENTS

Executive summary ........................................................................................................................................................................3
CO₂ storage provisions in the Net Zero Industry Act ..................................................................................................................4
The importance of developing permanent CO₂ storage, Article 18 and producer responsibility ..................................................4
10 recommendations to deliver an EU CO₂ storage framework that is fit for purpose .................................................................7

Environmental integrity

1. The EU should align net zero technology policies with durable net zero targets .................................................................7
2. The EU should recognise and mitigate against the risks of over-reliance on net zero technologies ............................8
3. High integrity environmental standards must be maintained across all stages of the storage process .............................8

Strengthening the regulation

4. The EU should establish penalties for non-compliance and avoid delays .........................................................................8
5. The EU should clarify that oil and gas producers must be financially responsible for the storage bill ...............................9
6. The EU should look beyond domestic producers to regulate all suppliers ........................................................................9

Enabling factors

7. The EU should support cross-national cooperation on creating a carbon management network ....................................9
8. The EU should ensure transparency and balanced access to CO₂ storage ........................................................................10
9. The EU should consider developing CO₂ storage capacity abroad ......................................................................................10
10. The EU should establish a centralised registry of CO₂ storage data ................................................................................10
Executive summary

As the climate crisis escalates, the European Commission’s proposed Net Zero Industry Act (NZIA) offers fresh hope and momentum to accelerate EU climate action. The Act is a key deliverable of the Green Deal Industrial Plan and aims to create an enabling framework to accelerate the deployment of net zero technologies, including the development of carbon management infrastructure such as CO₂ storage sites.

The focus of this paper is the newly introduced CO₂ injection capacity provisions proposed under Chapter III of the NZIA (Articles 16, 17, 18). Easily lost in the technical details, these Articles are crucial to the delivery of Europe’s climate neutrality goal and worth civil society scrutiny and support. Together, the Articles set a geological storage capacity target for CO₂ at the EU level for the first time. They also specify new responsibilities for member states and EU-based oil and gas producers to accelerate carbon dioxide storage in this decade. Article 18, in particular, has the potential to set a paradigm-shifting precedent whereby the storage capacity target of oil and gas providers is tied to their production levels, holding them accountable for contributing to “cleaning up” the pollution caused by their products.

The absence of such an obligation in the past is partially why climate change has reached crisis levels, as major polluters have not been mandated to prevent dangerous accumulation of greenhouse gas pollution in the atmosphere.

In this paper, the Carbon Balance Initiative and Carbon Gap explain the importance of the CO₂ injection capacity provisions, voice support for placing new responsibilities on oil and gas producers and offer ten recommendations for how to improve the NZIA Articles so they are fit for purpose. Article 18 and its link to the producer responsibility concept hold pride of place in our analysis. Beyond their focus on NZIA, our recommendations, listed below, are designed to inspire EU co-legislators to strengthen the EU’s carbon storage policy to create an effective, environmentally sound and ambitious framework to support the development of CO₂ storage across the Union.

The ten recommendations are:

**Environmental integrity**
1. The EU should align net zero technology policies with durable net zero targets.
2. The EU should recognise and mitigate against the risks of over-reliance on net zero technologies.
3. High integrity environmental standards must be maintained across all stages of the storage process.

**Strengthening the regulation**
4. The EU should establish penalties for non-compliance and avoid delays.
5. The EU should clarify that oil and gas producers must be financially responsible for the storage bill.
6. The EU should look beyond domestic producers to regulate all suppliers.

**Enabling factors**
7. The EU should support cross-national cooperation on creating a carbon management network.
8. The EU should ensure transparency and balanced access to CO₂ storage.
9. The EU should consider developing CO₂ storage capacity abroad.
10. The EU should establish a centralised registry of CO₂ storage data.
**Co₂ storage provisions in the Net Zero Industry Act**

Chapter III of the NZIA (Articles 16 through 18) focuses on building the EU’s Co₂ storage injection capacity. Key measures include:

- A Union-wide target to achieve “an annual injection capacity of at least 50 million tonnes of Co₂” by 2030\(^1\) (Article 16);
- Member state obligations to uphold transparency of Co₂ storage capacity data (Article 17);
- A mandatory contribution to the Union-wide storage target for oil and gas producers, based on their production levels during 2020–2023 (Article 18).

Together, these articles send a clear signal that Co₂ storage is key to achieving Europe’s climate neutrality goal. **Article 18, in particular, has the potential to be a gamechanger in driving climate action.** It constitutes a first-of-its-kind responsibility directly obligating EU-based oil and gas producers to contribute to storage capacity. Its enforcement could kickstart a market for Co₂ storage and ensure that fossil fuel producers, who are current and historic contributors to climate change, are now on the hook for the climate impacts caused by their products.

**The importance of developing permanent Co₂ storage, Article 18 and producer responsibility**

Establishing a system for Europe to manage and store carbon is an urgent imperative. IPCC scenarios compatible with keeping global heating under 1.5°C highlight the need for scaling up permanent Co₂ storage as way to counterbalance residual emissions\(^2\). Similarly, the European Climate Law\(^3\) requires greenhouse gas (GHG) emissions and removals to be balanced within the European Union at the latest by 2050 with the aim to achieve negative emissions thereafter.

The European Commission recognises the current scarcity of operational Co₂ storage sites in Europe as a significant obstacle to both the economic viability of investments in carbon capture and storage (CCS)\(^4\) and the scaling up of necessary carbon dioxide removal (CDR) that will be needed to counterbalance residual emissions by 2050. While the EU Emissions Trading System (ETS) already gives a price incentive for permanent geological storage of fossil Co₂\(^5\), and despite a legal framework for CCS (the “CCS Directive”) already in place, current investments in developing Co₂ storage capacity remain limited.

---


\(^2\) Intergovernmental Panel on Climate Change (IPCC), 2023, Synthesis Report of the IPCC Sixth Assessment Report (AR6) – Summary for Policymakers.


\(^5\) European Commission, Sustainable Carbon Cycles communication (2021)
According to the European Commission⁶, fewer than 2 million tonnes of CO₂ are being stored geologically per year today in the European Economic Area (none of which is in the EU) and only to decarbonise natural gas. This current storage capacity is a stark comparison with the 550 million tonnes of CO₂ that may need to be captured annually by 2050 to meet the net zero objective⁷.

In this context, the implementation of Article 18 is expected to kickstart the development of CO₂ storage across a range of formations suitable for geological storage, such as saline aquifers, basalts, and depleted oil and gas production sites. This storage capacity will be operational for many decades, playing a vital role in delivering European climate neutrality by 2050 and net negative emissions henceforth.

Oil and gas producers must be held accountable for the waste CO₂ generated by their products driving the climate crisis.

When fossil fuels are burned, substantial amounts of the heat-trapping gas CO₂ are released into Earth’s atmosphere. Historically, oil and gas producers have not been held accountable for cleaning up the carbon dioxide embedded in the products they sell despite fossil fuel emissions being the largest contributor to anthropogenic climate change⁶. Governments have every reason to regulate the CO₂ so that the atmosphere does not turn into a tragedy of the commons. Article 18 helps to change this unsustainable dynamic by establishing a first-of-its-kind obligation for the European oil and gas industry⁸ to “clean up” the waste generated by their products. As this responsibility is pro rata, based on their production levels, it implicitly marks the beginning of a type of “extended producer responsibility” and thus has the potential to kickstart a regulatory system that holds oil and gas producers accountable for all their emissions.

Pioneered by the European Union in the early 1990s, extended producer responsibility (EPR) frameworks are well-established in existing European legislation. Most member states use these policies for waste tyre management, regulating manufacturers to take care of both the physical removal and associated costs of “cleaning up” the end-of-product waste⁹. Other examples include regulation on electrical and electronic equipment, the heat-trapping gas CO₂ are released into Earth’s atmosphere. Historically, oil and gas producers have not been held accountable for cleaning up the carbon dioxide embedded in the products they sell despite fossil fuel emissions being the largest contributor to anthropogenic climate change⁶. Governments have every reason to regulate the CO₂ so that the atmosphere does not turn into a tragedy of the commons. Article 18 helps to change this unsustainable dynamic by establishing a first-of-its-kind obligation for the European oil and gas industry⁸ to “clean up” the waste generated by their products. As this responsibility is pro rata, based on their production levels, it implicitly marks the beginning of a type of “extended producer responsibility” and thus has the potential to kickstart a regulatory system that holds oil and gas producers accountable for all their emissions.

Pioneered by the European Union in the early 1990s, extended producer responsibility (EPR) frameworks are well-established in existing European legislation. Most member states use these policies for waste tyre management, regulating manufacturers to take care of both the physical removal and associated costs of “cleaning up” the end-of-product waste⁹. Other examples include regulation on electrical and electronic equipment.

What makes a strong extended producer responsibility policy?¹²

1. The waste product targeted by the EPR policy should be clearly defined. In the case of oil and gas producers, the waste product is CO₂ pollution, which is generated through fossil fuel use.

2. The responsibilities of producers of target waste streams should be clearly stated. Categories of responsibility include the financing, organisation and maintenance of the relevant waste management system.

3. All producers should be treated appropriately and affected equally. No producers should be unfairly (dis)advantaged over other (similar) producers because of the EPR policy.

4. The financial cost of complying with the responsibility should be borne by producers. Fulfilling the obligation should rest with those with adequate financial and organisational capacity. The consumers or citizens should not bear the responsibility of compliance and, depending on elasticity of demand, the cost should also ultimately be paid by the producers.

5. A measurable, environmentally effective target should be set and routinely reviewed. The criteria of this target should be transparent, as well as its intended impact.

6. Penalties or other remedying mechanisms for non-compliance should be stated and enforced. Without consequences, producers are not incentivised to fulfil their obligations.

7. The responsible government body should provide sufficient information to all stakeholders. Timely guidance for all actors involved is imperative to a functional EPR framework.

8. Implementation of the EPR policy should be monitored to enable rule enforcement. Monitoring protocols and results should be made transparent to the public.

9. Justice considerations should be mainstreamed throughout EPR policy design and implementation. Principled public engagement, as well as other justice-oriented measures, should be practised.

---

¹⁰ Coal is not included in Article 18. Note that in IPCC pathways limiting warming to 1.5°C there is a 95% reduction in the use of coal in the global energy mix.
¹² Building on the criteria developed by WWF, IEEP “How to Implement Extended Producer Responsibility: A briefing for government and businesses.”
batteries, vehicles, oil waste, medical waste, and plastic bags. However, until now, extended producer responsibility has not been applied to the production of fossil fuel products. Although the cost is likely to be passed on to customers, an extended producer responsibility framework integrates the clean-up cost in a product’s price, incentivising producers to think about ways to make their production processes more environmentally friendly. In this way, such frameworks have the potential to drastically reduce the overall environmental footprint of products from production to end-of-life.

Article 18 has some similarities with this kind of extended producer responsibility framework. Firstly, it marks the first time an EU legislative proposal links oil and gas producers with an obligation to enable permanent storage of CO$_2$ (i.e., the industries’ end-of-product waste). Secondly, Article 18 would allow for the cost of domestic oil and gas production to better reflect its true climate impact through the additional costs of storage site development.

Beyond issues of responsibility, there are other reasons why fossil fuel producers are the appropriate actors to spearhead CO$_2$ storage development. With record-high profits from 2022, the industry has enough financial resources to provide sufficient CO$_2$ storage capacity in the region. Furthermore, oil and gas producers have decades of experience in CCS. For example, Norway has been operating the world’s largest offshore CO$_2$ storage site at the Sleipner field in the North Sea since 1996, and a suite of European companies and research institutes have years of experience designing and operating offshore and subsurface infrastructure. Leveraging such expertise, business models, and workforce will be instrumental to advancing CO$_2$ infrastructure development within Europe, while working toward international climate goals.
10 recommendations to deliver an EU CO₂ storage framework that is fit for purpose

Environmental integrity

1. The EU should align net zero technology policies with durable net zero targets

Achieving net zero CO₂ emissions entails achieving a durable balance between carbon flowing into the atmosphere and carbon going back out of it. Graphically, this flow can be shown as a balance between the three “spheres” of the carbon cycle influenced by human activity, whereby carbon going into the atmosphere is balanced by carbon going into the biosphere (plants and biologically active soils) and the geosphere (rocks, sediments and fossil fuels). To achieve this balance, the production and use of fossil fuels should be curtailed as fast as possible. Furthermore, any ongoing (residual) carbon dioxide emissions in 2050 should be compensated by permanent CO₂ storage. This concept adheres to the “like-for-like” principle, whereby a durable net zero can only be reached if CO₂ emissions from the geosphere are compensated with geological CO₂ storage (Figure 2).

The current target for CO₂ storage capacity in the NZIA is a start, but it is not enough to align with these principles of durable net zero. To achieve this target, the EU’s upcoming net zero policies need to indicate that 100% of remaining carbon dioxide emissions will be permanently stored in geological formations by the time of net zero. Moreover, the total CO₂ storage developed needs to be linked to the volume of fossil fuels still produced, rather than establishing a quantity tonnage target. This link would ensure that the geosphere is balanced by the time of net zero (achieving geological net zero). Maintaining this balance requires monitoring and reporting on the fraction (or percentage) of emissions that are geologically stored compared to all CO₂ extracted and imported CO₂ in the jurisdiction of the European Union. This principle implies that any credible storage target after 2030 should be expressed in terms of production, rising to 100% of any extracted CO₂ being stored by 2050.

The carbon flows necessary to reach durable net zero

Figure 2: Durable Net Zero

---

14 Fankhauser et al., 2022, Nature Climate Change, 12, 15-21
16 We note that other non-CO₂ emissions should be discussed in relation to durable net zero, e.g., N₂O, CH₄.
2. The EU should recognise and mitigate against the risks of over-reliance on net zero technologies

Safe and permanent geological storage remains integral to all credible 2050 net zero scenarios. This principle should be applied to a variety of use cases - CCS, for example, is currently one of the only cost-effective means of reducing emissions from hard-to-abate industrial processes, such as cement production. Geological storage is also often the last stage of carbon dioxide removal (CDR), which will be essential to counterbalance EU residual emissions in 2050 as well as having the potential to address Europe’s historical emissions. However, the need to scale up CCS and CDR capacity must be contextualised within the broader imperative to rapidly shift toward renewable energy and substantially reduce overall fossil fuel use. It is of critical importance that the obligation to develop storage sites does not serve as a justification for business-as-usual fossil fuel use.

We acknowledge that there are risks both ways: the risk of not building sufficient storage capacity and the risk of delayed action and over-reliance on CCS. We need to account for these uncertainties. European policymakers should detail these risks and implement necessary precautionary measures.

3. High integrity environmental standards must be maintained across all stages of the storage process

The environmental impact of all stages of carbon storage must be thoroughly considered in cost-benefit analyses and deployment decisions. There are already robust protocols in place to determine safety levels of potential storage sites, such as Directive 2009/31/EC, which requires member states to select storage sites that have undergone comprehensive three-dimensional modelling and risk assessment, demonstrating minimal risk of leakage and negligible environmental impact. These robust standards should apply throughout the entire process, including to development, capture, transport and storage. Furthermore, it is important that the responsibility for monitoring and reporting on injection sites, including quantities, properties, and composition of CO₂ streams, should not rest solely with the storage site operator. Ultimately, the EU should ensure that the objectives of emissions reductions and environmental protection are not compromised and that regulations are put in place for clear restrictions of storage sites.

4. The EU should establish penalties for non-compliance and avoid delays

As with any obligation, there is a real risk that companies will fail to comply with the regulation. Through amendments to the NZIA Article 18, the EU must clarify which actions will be taken if oil and gas producers do not meet their pro rata share of the obligation. We recommend a penalty amount larger than the cost of storage (including the build-up of the storage site, and any extra costs to reach operational status) to avoid perverse incentives for inaction.

Consequences for non-compliance should account for any delays in the development of storage sites. The amendment to reduce the injection obligation for specific entities “if infrastructure and capture activities are lacking” attempts to account for this non-compliance but is dangerously ambiguous. This ambiguity should be further clarified to ensure that, on the one hand, member states and other parties facilitate the development of storage capacity,
but, on the other hand, the responsibility of producers to develop this storage capacity in a timely manner is maintained. In particular, a lack of government financial support for capture and storage (e.g., through subsidies) should not be a reason to delay action, given that companies should shoulder their responsibility to develop storage sites based on their production levels.

5. The EU should clarify that oil and gas producers must be financially responsible for the storage bill

As currently written, Article 18 does not adequately address the extent to which oil and gas producers will be financially responsible for meeting their pro rata contributions to the CO₂ storage injection capacity target. A clear allocation of financial responsibilities is needed for the (other) costs associated with building CO₂ storage injection capacity.

In line with what we understand to be the intent of Article 18, namely, to harness funds from the private sector (assets held and profits generated by oil and gas operators) to finance the build out of CO₂ storage infrastructure, we urge the Commission to clarify that oil and gas producers must foot the bill (or at least the lion’s share). This commitment would make the EU the first jurisdiction to move closer towards an extended producer responsibility framework for its oil and gas industry - a global milestone towards holding polluters accountable for the climate crisis.

6. The EU should look beyond domestic producers to regulate all suppliers

The EU remains heavily dependent on fossil fuels and is a net importer of both oil and gas. Data spanning several decades indicate⁵² that the EU’s import dependency for crude oil has consistently exceeded 90%, with major suppliers including Russia, Norway, the United States, Kazakhstan and Libya. This reliance on imports highlights the importance of expanding responsibility for contributing to the CO₂ storage capacity to include all suppliers of fossil fuels, particularly to producers outside the bloc.

In line with achieving durable net zero globally and considering the large share of fossil fuel imports to Europe the EU should consider the total extraction and imports of oil and gas within the EU, and investigate how to structure the obligation in such a way that all oil and gas producers contribute their fair share.

We therefore call on the European Commission to urgently conduct an impact assessment of the effects, advantages, and risks of extending the obligation for pro rata contributions across all suppliers of crude oil and natural gas to the Union. This impact assessment should also evaluate the value of setting an obligation that ensures actual storage over preparation for injection.

Enabling factors

7. The EU should support cross-national cooperation on creating a carbon management network

There is a lack of cross-border cooperation on identifying storage sites and realising infrastructure. Storage sites across the EU are dispersed due to geologic factors and member states’ varying maturities when it comes to handling such sites. To facilitate a cohesive EU-wide build-up of a carbon management network, member state collaboration must be facilitated on a technical level. The reports to be submitted to the Commission monitoring progress toward the CO₂ storage target (NZIA Article 17), the inclusion of CCS and CDR in member states’ National Energy and Climate Plans (NECPs), as well as the idea of a “storage atlas” discussed in the latest EU CCUS Forum⁷³ are several sources of information that can help foster this kind of cooperation. Likewise, the proposed creation of a Net Zero Europe Platform could facilitate cross-border conversations.

The EU should also consider the cross-national transport network of CO₂ that will be needed for the utilisation of CO₂ storage. We welcome MEP Ehler’s initial proposals on CO₂ transport infrastructure⁴ for outlining the need to invest in CO₂ transport infrastructure (including cross-border infrastructure), and for setting a six-month timeline for the Commission and member states to develop a common financing strategy for such infrastructure. For this strategy to be effective, it should be clarified what the financial responsibility of producers will be.

---


⁵³ Rossi, C. Six things we learned at the Commission’s 2022 CCUS Forum. Clean Air Task Force (2020)

8. The EU should ensure transparency and balanced access to CO₂ storage

Many CDR methods store CO₂ geologically, such as direct air capture with carbon storage (DaCCS), bioenergy with carbon capture and storage (BeCCS), and the capture of biogenic carbon from waste and non-energy processes such as waste incineration (so-called Biomass Carbon Removal and Storage) and the permanent storage of mineralised carbon.

Therefore, we welcome clarity in the NZIA proposal that the future EU CO₂ storage network will accommodate CO₂ from both carbon capture and carbon removal activities. Crucially, this limited shared storage capacity must be transparently administered, and care taken that high-value decarbonisation and removal projects are not crowded out by the capture of carbon that could have been avoided in the first place. To mitigate this risk, a comprehensive and coordinated approach to carbon management that considers both CCS and CDR will be essential for ensuring that limited CO₂ storage capacity is used effectively to reach the Union’s climate neutrality targets.

9. The EU should consider developing CO₂ storage capacity abroad

In the NZIA, the Commission specifies that all CO₂ storage sites contributing to the 2030 target must be on EU territory. This requirement includes sites on land as well as within marine regions designated to EU member states on their continental shelf.

Developing storage sites within the EU offers several advantages. By having sufficient storage capacity within its own territory, the EU can maintain control over its carbon management infrastructure and mitigate potential geopolitical risks associated with relying on storage facilities in other countries. Additionally, promoting domestic storage development supports the growth of a thriving CCS and CDR industry within the EU. It encourages investment, job creation, and technological innovation, leading to the emergence of competitive net zero technology sectors.

However, considering how much CCS and durable CDR the EU will need to deploy, the Commission should specify how the development of CO₂ storage sites in non-EU territories could factor into Europe’s long-term climate strategy. Collaborating with other countries and regions to meet the EU’s storage needs has potential benefits, including facilitating knowledge exchange, cost sharing, and access to alternative storage technologies and/or geological formations that may not be readily available within the EU’s borders. This cross-border collaboration on storage sites should be paired with a commensurate increase in the CO₂ storage target ambition.

10. The EU should establish a centralised registry of CO₂ storage data

The EU should establish a publicly available, centralised registry detailing progress on CO₂ storage and capacity across the Union. The stored carbon should be categorised based on the geographical location, operator, capture method and sector. This registry is crucial for enabling regulators and other third parties to effectively monitor compliance and to move towards an open-source, publicly regulated CO₂ infrastructure throughout Europe.

We, therefore, welcome amendments obliging entities to report their progress towards meeting their storage contribution to the Competent Authority of the member states and the Commission, thereby making the reports available to the public. These reports could include information on the operational storage capacity, the quantity of CO₂ stored at each site, and the origin of the stored carbon. Meeting this requirement should not be too challenging for operators, as the 2009 CCS Directive has already established a precedent of reporting on CO₂ source type.

Finally, a centralised EU registry of CO₂ storage data should include a comprehensive database of all available CO₂ storage within the EU territory, encompassing depleted oil and gas reservoirs, deep saline aquifers, and basalt formations. Each storage method has advantages and disadvantages, and it is crucial to have a complete understanding of all geological storage options for informed decision making.

---

References


European Commission, *In-depth analysis in support of the Communication "A Clean Planet for all" (2018).*

European Commission, *Sustainable Carbon Cycles communication (2021).*


Intergovernmental Panel on Climate Change (IPCC) *Special Report on Carbon dioxide Capture and Storage Introduction (2005).*

Intergovernmental Panel on Climate Change (IPCC) *Synthesis Report of the IPCC Sixth Assessment Report (AR6) – Summary for Policymakers (2023).*


Rossi, C. *Six things we learned at the Commission’s 2022 CCUS Forum. Clean Air Task Force (2020).*

About Us

This white paper is a collaboration between Carbon Balance Initiative and Carbon Gap. The paper was published in September 2023. Both organisations published the same version.

Carbon Balance Initiative
Carbon Balance Initiative is an NGO initiative born out of the University of Oxford. We strive to put conditions on fossil fuel extraction to protect the climate from any remaining fossil fuel use. We work with the climate movement, academia and policymakers to achieve 1.5°C, store carbon, and protect nature.
www.carbon-balance.earth

Carbon Gap
Carbon Gap is an independent, philanthropically funded, non-profit organisation focused on responsibly scaling up carbon dioxide removal in Europe, as an important complement to emissions reductions. We work across all carbon removal methods, bringing the best technical expertise to inform European policymaking. Our advocacy efforts are focused in Brussels, with additional staff presence in France and the UK.
www.carbongap.org

Get in touch

https://www.linkedin.com/company/carbongap/
https://twitter.com/carbongap
contact@carbongap.org
www.carbongap.org