

# CARBON STORAGE AS AN ISSUE OF CORPORATE RESPONSIBILITY

*A Justice Perspective on the  
Carbon Takeback Obligation*

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## About us

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. Read more about the Carbon Balance Initiative [here](#).

## About this brief

This brief aims to explain the underlying energy justice and corporate accountability principles of the Carbon Takeback Obligation, and their role in creation of CCS and CDR policy. This brief addresses calls by advocates to shift attention upstream to focus on supply-side climate policy possibilities.

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# Introduction

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**This brief outlines the principles of energy justice and corporate accountability underpinning carbon storage mandate policies, particularly the Carbon Takeback Obligation (CTBO)**<sup>1</sup>. It addresses calls by climate advocates to shift attention to the supply-side of climate policy and hold producers accountable for their emissions<sup>2</sup>.

**It is well-recognised that, alongside deep and rapid emission reductions, some carbon capture and storage (CCS) and carbon dioxide removals (CDR) will be needed to reach our Paris Agreement commitments.**

The CTBO proposes that the deployment and costs of carbon capture and storage infrastructure should be borne by the biggest polluters: the fossil fuel industry. Fossil fuel producers would be mandated to store an increasing percentage of their CO<sub>2</sub> emissions. This would increase from being required to store a small percentage of their CO<sub>2</sub> emissions to being required to store 100% of the emissions embedded in their products by 2050. This mandate complements rapid emission reduction measures, so as emissions fall, storage increases to balance any residual emissions to ensure geological net zero by mid-century. The CTBO makes CCS and CDR an issue of corporate responsibility rather than a public good to be provided by the government.

**The CTBO would act as a condition of operation for existing oil and gas extraction licences.** Fossil fuel companies are often seen as best placed to deploy necessary storage infrastructure due to their large profit margins, technological expertise in the sub-surface and, most importantly, their significant role in causing climate change.

**The CTBO shifts the policy focus upstream,** which is essential for a Just Energy Transition, reorientating attention and accountability to those most responsible for energy injustices and delays in the energy transition<sup>3,4</sup>. The fossil fuel industry has financially benefited from climate destruction, increased human health

and biodiversity costs of continued production, even after they were made aware of its detrimental effects<sup>5,6,7</sup>. Meanwhile, the industry has received substantial public subsidies while raising energy prices during the ongoing cost of living crisis. Private financing of crucial climate measures like carbon storage through frameworks such as a CTBO free up government funds to be directed towards other mitigation measures such as biodiversity conservation, energy transition and nature restoration, while drawing on the unique position of fossil fuel companies who have the funds, expertise, and resources to roll-out carbon storage facilities. By complementing existing mitigation policies, a CTBO aims to make fossil fuel production and use increasingly uncompetitive.

**The CTBO is not compatible with business as usual, and cannot be used to endorse new fossil fuel production licenses.** It must include a binding sunset clause to ensure it mitigates the harms of ongoing oil and gas projects. It should only be applied to existing oil and gas contracts and residual emissions\*. This is grounded in the science and technological feasibility, which shows it is not climate compatible to continue our current levels of fossil fuel production and use – the only solution is to reduce and phase-out fossil fuels. The CTBO serves as an active fossil fuel phase-out plan, working alongside existing mitigation policies, to make fossil fuels increasingly uncompetitive compared to declining costs of renewable energy.

**The CTBO is a supply-side mitigation measure** – focusing on reducing the amount of fossil fuels that are available on the market, in contrast to most existing policies (e.g. a carbon price) which are designed to curb fossil fuel use by penalising demand. The CTBO will raise the price of extracting fossil fuels, preventing the industry from masking the social cost behind public subsidies. It is designed to work in

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\* Residual emissions can be defined as the remaining portion of greenhouse emissions in a certain entity (e.g. company, sector, nationally, globally) after all feasible mitigation measures have been implemented. It should be noted that this is not yet a specific or quantified concept, with universal guidelines remaining a point of controversy.

tandem with our other climate efforts to curb usage and increase renewable energy use, while mandating fossil fuel producers to pay for the technology they created the need for.

**The CTBO works towards achieving energy and climate justice.** It should drive energy justice by “fairly disseminating both the benefits and costs of energy services”<sup>8</sup>. The current model nationalises risk and privatises profits, benefitting fossil fuel companies while the public suffer from high energy prices and a worsening climate crisis. It should drive climate justice by aiming to identify the best and least able to pay for expensive climate technologies and ensuring that the burden falls on the correct place on production chain.

**The CTBO is not a panacea for climate change or environmental harm,** nor can it create complete restorative justice for the harm already perpetuated. Instead, it is designed to play a part in ensuring a more equitable distribution of benefits and costs in energy production and climate mitigation.

**This brief covers the CTBO four key lenses:** CCS, CDR and Business-as-usual; Corporate Responsibility and the CTBO; Use of Stranded Infrastructure and Expertise, and the CTBO as a Regulatory Tool. It then proposes five building blocks for implementing a justice centred CTBO.

## CCS, CDR and Business-as-Usual

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**CCS and CDR cannot, and should not, enable us to continue with our current levels of fossil fuel production and use:**

- It *cannot* as it would be technically near impossible to build out enough carbon capture or removal technology with safe storage capacity by 2050. Developing safe storage takes time, and storage must be seen as a limited resource that cannot be wasted on continued emissions that can and must be eliminated.

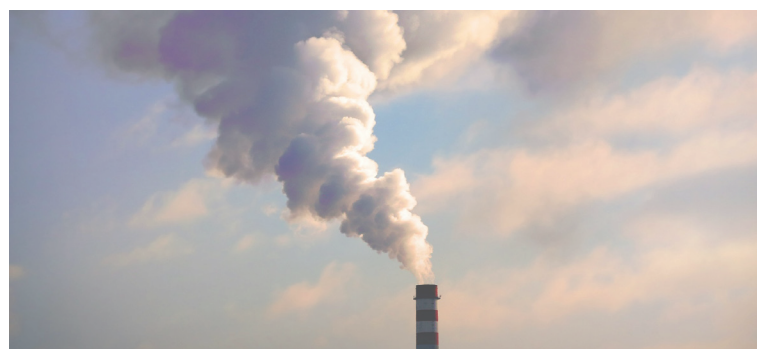
(*cont.*) Further it has been shown that despite the importance of CCS and CDR, stay within the 2°C limit, there can be little variability in how much fossil fuel we produce, it will still require rapid phase-out<sup>9</sup>.

- CCS *should not* allow for business as usual, as current levels of fossil fuel extraction and usage have detrimental effects not only in terms of carbon emissions levels and climate change, but also on the natural environment, biodiversity and human health to name a few. Continuing with current practices perpetuates harmful non-emission impacts, exacerbating ecological degradation and public health risks.

- Business as usual also extends the power dynamics between energy companies and our government and regulatory systems. Well-documented abuses such as ‘capacity holding’ on the electricity market<sup>10</sup>, tax avoidance<sup>11</sup>, profiteering and greenwashing campaigns<sup>12,13</sup> highlights the need for a redesign of our energy systems during the transition towards more sustainable and equitable practises.

- We must redesign our energy systems during the transition to reduce the grip these corporations have over our systems of governance.

To be clear, while climate technology is essential for meeting the Paris Agreement targets according to current scientific models, achieving these goals will be impossible without the rapid reduction and phase-out of fossil fuels. CCS and CDR are only one piece of the net-zero puzzle.



# Corporate Responsibility and the CTBO

CCS and CDR are essential for mitigating climate change, but the responsibility for funding carbon storage should fall on the largest polluters, *who are ultimately responsible for the extraction and marketing of these products*. It is important that CCS and CDR are conceptualised issues of corporate responsibility differing from issues that are paid by the public budget, such as healthcare or education.

As the need for these technologies grows, so too have subsidies made available by governments. For instance, the Inflation Reduction Act in the United States provides direct tax rebates to fossil fuel companies for CCS and certain types of CDR, on top of their existing public subsidies. This is despite the fact that, in 2022, global fossil fuel subsidies amounted to \$7 trillion, accounting for 7.1% of global GDP<sup>14,15,16</sup> – almost double the amount spent on education globally<sup>17</sup>. Therefore, it is essential that the development of necessary CCS and CDR capacity and infrastructure becomes incentivised through mandates, rather

than becoming another large expense that added to the public's climate transition bill.

The CTBO makes CCS and CDR a responsibility of the producer under an Extended Producer Responsibility framework (EPR). This is a system of waste management that is widely used across the world, which places responsibility for what happens to their products after the completion of their lifecycles on the producer. It is seen in areas such as WEEE, where companies are responsible in the EU to collect washing machines after they are broken and safely dispose of them, absolving the washing machine user of that responsibility, as the producer is better placed to know how to treat the waste of this product. The CTBO aims to treat CO<sub>2</sub> as a waste by-product of fossil fuel production which should be subject to similar EPR regulation. Its unabated usage is littering in a shared global atmosphere. The CTBO is based on three core environmental principles.

## BOX 1 | Nascent technology

CCS technology is often referred to as 'nascent' due to not having been used before at the large scale that will be necessary for net zero. There are also concerns about technology failure, as was seen in projects such as Gorgon where CCS promises were made but the capture and storage targets were never met. There are concerns about each aspect of the value chain – capture, transport and storage – as well as carbon leakage. However CCS has been successfully deployed at scale with no problems of leakage for example in Schute Creek Wyoming where the technology is used for enhanced oil recovery, and the Sleipner projects in Norway where 700,000 tonnes of carbon has been safely and permanently stored underground. Such is their success that the North Sea is currently undergoing

the world's biggest commercial CCS project to date (Northern Lights).

Concerns about the scale of roll out of climate technology is a widespread concern, and not one that applies to CCS alone. However, it is important to bear in mind that due to vast experience of use of CCS in non-climate related contexts, there is a degree of expertise that comes in the sector. One of the biggest concerns around CCS technology, its use in enhanced oil recovery, proves an advantage as there is vast experience with oil and gas producers around the world with the technology necessary for the use of CCS towards emission reduction, decoupled from fossil fuel production.

# Principles of Corporate Responsibility

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Through its grounding in EPR, the CTBO is based on three core principles:

## 1 Polluter Pays

The Polluter Pays principle is a cornerstone of climate and environmental policy. First established by the OECD in 1972, it has become fundamental in addressing environmental change and is embedded in numerous regional and international agreements<sup>18</sup>. It is designed to create a legal basis for preventing polluters from reaping benefits from harmful activities without regard for the consequences.

However, this principle is applied selectively. Over half of global industrial emissions since 1988 are attributed to just 25 corporate and state producers, who face little to no responsibility to decarbonise<sup>19</sup>. To fully realise the Polluter Pays principle, it is clear that our current climate policy focus on the demand for fossil fuels must be complemented by mechanisms that act on the supply-side, i.e., targeted regulations on the upstream suppliers of fossil fuels. It is essential to establish a strongly recognised moral and legal responsibility on polluters to prevent further emissions from being released into the atmosphere.

## 2 Ability to Pay

The fossil fuel industry has long argued that they are not the only emitting industry and that responsibility for clean-up should fall on those who use fossil fuel products. However, the CTBO also aligns with the 'Ability to Pay' principle, another key environmental principle which places the onus for carbon clean-up on industries that have accrued profits from polluting activities. This principle balances responsibility with financial ability, and has been referred to as the 'poverty sensitive'<sup>20</sup> version of Polluter Pays. It acknowledges that many developing economies are yet to reach their carbon emission peak and that those with ability to pay should decarbonise faster.

The Ability to Pay principle avoids targeting the current biggest polluter, rather than the biggest historical polluter or the polluters who have caused the most damage on the long-term. For example, it avoids placing a greater burden on the developing economies of the Global South, allowing the Global North avoid financial contribution, as their decarbonising efforts are possible due to benefits from growth based on past emissions. The CTBO aims to ensure that current and past emitters will be held responsible for the creation of CCS and CDR infrastructure.

### *The financial ability of the fossil fuel sector*

In recent years, fossil fuel companies have reported record profits amidst an energy and cost-of-living crisis<sup>21,22</sup>. By way of example, the five largest oil and gas companies made an unprecedented \$111 billion in 2023, more than 150 times the budget pledged to climate vulnerable countries at last year's COP28<sup>23</sup>. And in the UK, the amount spent by consumers on gas profits and royalties in 2022 is enough to capture and store all of the carbon dioxide produced by fossil fuels in the country, with profit remaining<sup>24</sup>.

These record profits were achieved while continuing to receive direct energy subsidies<sup>25</sup>. Furthermore, as argued in IMF analysis, the biggest subsidy received by the industry is their licence to pollute for free, with implicit subsidies including health impacts and environmental damage costs amounting to \$5.9 trillion in 2020 – or \$11 million a minute<sup>26</sup>.

Current corporate culture and fossil fuel production management have made it clear that concern for public harm, in the form of climate change and environmental destruction, comes second to the pursuit of profit. As 2050 approaches and climate regulations tighten, fossil fuel companies are likely to invest more in renewable energy and begin decarbonisation if it drives future profits. However, these companies should also be accountable to pay for the infrastructure needed to mitigate the

consequences of their profit-making activities. This aligns with a well established argument that companies should be held more accountable to the public due to the influence of their activities on public life<sup>27</sup>. Nowhere is this lack of accountability more clearly displayed than in the context of fossil fuel companies, where production of energy has been privatised, with great potential for harm. It has been noted this lack of focus on waste management and de-commission is a “significant stain on the energy sector....the stark reality is that the taxpayer will end up paying for the clean-up as well as suffering the effects of environmental pollution”<sup>28</sup>. Strong regulation of companies that control essential commodities like energy is essential to prevent these companies from exerting an inordinate amount of power over decision-making entities while privatising profits and imposing the costs and negative effects of climate change on the public and society’s most vulnerable.

### 3 Use of Stranded Infrastructure and Expertise

The CTBO aims to repurpose ageing fossil fuel infrastructure and relevant expertise towards emission reduction purposes. A common location for carbon storage, both from CCS and CDR methods, is in depleted oil and gas fields. Fossil fuel producers possess vast technical experience in sub-surface technology and are well placed to scale up carbon storage capacity, particularly compared with other heavy-emitting industries. While this knowledge

has been used to extract more oil and gas through enhanced oil recovery (see **Box 2**), the knowledge gained about the CO<sub>2</sub> capture, transport, and storage should and can be redirected for pure emission reduction purposes<sup>29</sup>. A strong CTBO is a key policy in enabling this shift, obligating a re-allocation of finance and infrastructure.

In addition to infrastructure knowledge, there are a wealth of workers in the fossil fuel industry with relevant skills for CCS and CDR deployment. This would allow fossil fuel-dependent communities to reapply their skills and ‘ready-made job opportunities’ that would arise with the creation of a CCS industry<sup>30,31</sup>. It has been shown that the CCS industry is most likely to succeed in areas with well-developed oil and gas sectors, supporting the proposition that CCS could ensure that fossil fuel dependent communities are not left behind<sup>32</sup>.

It has been noted that there can be a contradiction between the aims of the energy and climate justice movements. Climate justice focuses on the impacts felt by current and past generations of fossil fuel production and use, whilst energy justice focuses on “those currently without access to reliable energy supplies and living in energy poverty and to those whose livelihoods are affected and dependent on a fossil fuel economy”<sup>33</sup>. The CTBO tries to balance these conflicting goals, by ensuring that fossil fuel workers can continue to utilise their skills and existing infrastructure towards decarbonisation.

#### BOX 2 | Enhanced Oil Recovery

A major criticism of CCS is that the technology has mainly used by fossil fuel companies in a process called ‘Enhanced Oil Recovery’ (EOR) due to the economic incentives involved. This involves injecting carbon into an active oil site, which forces oil out of the rock, allowing for greater yield from a site and results in the carbon’s permanent storage in the rock of the drilling site.

Although policies, such as the recent US Inflation Reduction Act, offer tax subsidies for CCS used for EOR, the CTBO does not advocate for use of EOR or any other form of oil production. This is a policy intended to reduce reliance on and contribute to phase out of fossil fuel usage – it cannot be used towards greater production.

# The CTBO as a Regulatory Tool

The CTBO functions as a supply-side policy, meaning it places responsibility at the top of the energy value chain. Under the CTBO, fossil fuel producers are mandated to store an increasing percentage of the CO<sub>2</sub> emissions embedded in their products, linking any continued production to storage. This requirement starts with storing a small percentage, e.g. 5%, and gradually increases to 100%, or above (with the potential for a net-negative obligation)<sup>34</sup> by 2050 to reach geological net zero.

The CTBO could function as an active fossil fuel phase-out plan, making fossil fuel use significantly more expensive and thus less competitive compared to the continually decreasing prices of renewable energy. It necessitates a dramatic decrease in fossil fuel production for the reasons outlined above, including that it is simply not feasible to store all the CO<sub>2</sub> at our current emission levels. There are five key building blocks foundational of an energy justice-centred carbon takeback obligation.

## Building Block 1: Shifting Responsibility from Taxpayer to Producer

Most existing climate policies, such as carbon taxes and cap-and-trade systems, place a financial burden on those who demand and use fossil fuels. End consumers are not demanding fossil fuels per se, but rather energy in general. Furthermore, evidence shows that improperly distributed carbon taxes can exacerbate energy poverty, directly increasing the bills of those who are already struggling to afford them<sup>37,38,39</sup>. These policies can penalise those who have few alternative choices, while allowing fossil fuel companies to reap the benefits.

The CTBO aims to distribute the economic responsibility of the energy transition across the entire value chain, placing the greatest burden at the top with the fossil fuel producers – those most responsible for climate change, and in the best financial position to shoulder

the burden. While various policy design options exist for a CTBO in practise, it is important to learn from previous policies, such as carbon taxation, to avoid the “equity–efficiency” trade-off<sup>35</sup>. The implementation of the CTBO must include guardrails to ensure that heaviest burden is placed at the top of the production chain, with the cost burden diminishing by the time it reaches the end consumer. How consumers are best protected from high costs (e.g. with an energy price cap) depend on the time and place of CTBO implementation, including the elasticity of the energy market at the time\*\*.

The concept of placing the burden for waste disposal on producers is well-recognised through Extended Producer Responsibility (EPR) schemes in various sectors, such as textiles, plastics and electronic waste<sup>36</sup>. The success of EPR schemes lies in making those with the best knowledge, liability and financial responsible for the clean-up. This strategy has yielded lower levels of waste, usage, and production in the respective regulated sectors. Applying this logic to the energy sector ensures that those with the greatest impact bear the greatest responsibility for clean-up.

\*\* Options to mitigate the costs being passed directly onto the consumer include:

- Energy price caps, in the form of profits caps ; subsidies for green energy usage and availability
- Low-income energy tax credits
- Targeted assistance programs





## Building Block 2: CTBO's Role in Phasing Out Fossil Fuels

The CTBO aims to support the transition away from fossil fuel dependence towards cleaner and more equitable energy systems. It is designed to complement existing mitigation and demand-side policies, such as an Emission Trading System (ETS).

The CTBO is not a perpetual licence for fossil fuel production. Therefore, it should be subject to a sunset clause, for the duration of already existing oil and gas licences, rather than justifying the creation of new ones. The policy must be accompanied by a much more ambitious fossil-fuel phase-out strategy and only allow for residual production with a strict definition of hard-to-abate emissions. The CTBO must be utilised as a tool for redistributing the costs of carbon clean-up, not a permit for business-as-usual. The CTBO is also designed to impose strict penalties on companies that fail to meet their carbon storage targets.

Companies that do not store sufficient levels or fail to permanently and safely store carbon can be penalised, either through licence revocation and/or high financial penalties. This mechanism is designed to prevent production in cases of technical failure, such as the Gorgon case in Australia where Chevron was granted a license to extract LNG under the premise that they store upwards of 80% of their emitted carbon emissions<sup>40</sup>. However, despite storing less than 60% due to technical issues around storage, they continue to produce without facing repercussions<sup>41</sup>. Under a strong CTBO regulation, such companies would not be permitted to continue operations unless they could meet their carbon storage obligations. If they are unable to do so, either financially or logistically, they would lose their licence to produce.

**“Companies would not be permitted to continue operations unless they could meet their carbon storage obligations”**

## Building Block 3: Strong Guardrails and Growing Corporate Mandates

While science underscores the necessity of CCS and CDR in achieving net zero targets, concerns exist about their potential misuse to delay mitigation measures. It is well-recognised that carbon removals cannot fully offset emissions and that each unit of CO<sub>2</sub> released causes irreversible harm to the planet. A significant challenge in all of climate policy is a continued reliance on market-based, voluntary emission reduction initiatives without a strengthening of the regulatory framework between fossil fuel companies and lawmakers, resulting in a lack of binding legal mandates.

The CTBO builds on existing supply-side climate policy initiatives, such as global EPR schemes, the proposed Waste Prevention, Production subject to Royalties and Resource Conservation rule in the US, and the EU's Net Zero Industry Act (NZIA), which requires oil and gas producers to contribute towards the Union's carbon injection capacity<sup>42</sup>. There is a growing understanding of the need to bridge the gap between market-based and demand-side climate efforts with mandates and supply-side policy, and the CTBO is a key tool in this effort.

### BOX 3 | Energy Justice

According to Jenkins, McCauley, Heffron, Stephan, and Rehner (2016) energy justice “aims to provide all individuals, across all areas, with safe, affordable, and sustainable energy. It seeks to identify and rectify the inequities present in the distribution of energy's benefits and burdens, and ensure that no group bears a disproportionate share of the negative environmental or social consequences”.<sup>43</sup>

This applies across production, consumption, and energy policy.

## Building Block 4: Backstopping Energy Politics

The primary focus of any climate policy is to ensure adherence to the Paris Agreement of the limiting global warming to within the 1.5–2°C range. A CTBO acknowledges the fragility of the systems designed to reach net zero within private, political and geopolitical contexts. Countries' short-term fears around energy security often take precedence over the climate transition, as seen when EU countries reopened coal mines following Russia's invasion of Ukraine<sup>44,45</sup>. As fossil fuel use and emissions are yet to peak globally, and climate targets are frequently missed, robust backstops are essential to ensure that net zero is reached regardless of geopolitical and national circumstances.

**“The CTBO is not intended to absolve fossil fuel extraction companies of responsibility”**

**“It is designed as a critical first step towards establishing producer accountability”**



## Building Block 5: Historical Responsibility and Net-Negative Potential

The potential for CCS and CDR to achieve net-negative emissions is often discussed in the context of historical responsibility: those who have benefited from excessive carbon emissions bear a responsibility to those who suffer the climate consequences, as codified in the Paris Agreement. One of the goals of the CTBO is to create permanent, safe geological carbon storage infrastructure, which can be utilised post-net-zero to recapture and store carbon from the atmosphere, helping reach a net-negative future. This also ensures there is a purpose for infrastructure built after the sunset clause of the policy expires.

The CTBO is not intended to absolve fossil fuel extraction companies of responsibility, or justify continued existence of the systems that have enabled them. It cannot fully deliver restorative justice for the harm caused to communities and ecosystems, nor remedy the damage done through decades of greenwashing and misinformation campaigns. Instead, it is designed as a critical first step towards establishing producer accountability.

### BOX 4 | Net-Negative Emissions

Emissions as far back as the Industrial Revolution still exist in our atmosphere and continue to cause harm. Net-negative refers to the possibility that, even after achieving net zero (where the amount of CO<sub>2</sub> emitted is balanced by the amount removed, following the like-for-like principle), the concentration of CO<sub>2</sub> in the atmosphere needs to be reduced further to account for historical overshoot. This can be

accomplished using carbon dioxide removal technologies to actively remove more CO<sub>2</sub> than is emitted into the atmosphere, effectively reducing the overall levels of greenhouse gases. A state of net-negative emissions could address the lingering impact of historical and ongoing emissions, reverse the worst impacts of global warming and create a durable carbon balance in the earth system.

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