

REPORT

BRIDGING THE AMBITION GAP:

**A framework for scaling
corporate funds for carbon
removal and wider climate
action**

November 2022

Authors: **Robert Höglund** and
Eli Mitchell-Larson

Bridging the Ambition Gap:

A framework for scaling corporate funds for carbon removal and wider climate action

Authors: Robert Höglund, (Marginal Carbon), and Eli Mitchell-Larson, (Carbon Gap).

Published by Carbon Gap.

Summary

This report presents a conceptual framework for defining and quantifying the ambition gap between companies' **'ability to pay'** for external climate solutions like carbon removal and their willingness to do so.

The ability to pay for external climate projects is dependent both on corporate **profits per ton emitted**, and the **internal investment needs** a company has to reduce their own emissions. This ability to pay **differs wildly between industries**, and is highest among low emitters, illustrating the **limitations of relying on the polluter pays principle** when looking at how to finance carbon removal.

To illuminate the power of this conceptual framing, we analyse a sample of the world's largest companies and show that a majority of them can pay a high price on carbon without it resulting in a large dent in profits.

The report also covers how companies can determine a level of climate support and how they practically can support carbon removal. At the end of the report, we give eight recommendations for how to bridge the ambition gap and unleash billions of dollars of additional climate financing per year.

Key findings include:

- **Low-emitting industries can contribute the most money**

- The vast majority of global profits are generated by a small cohort of companies with relatively low emissions, many with profits per ton emitted in the \$10k-100k range.

In our dataset 85% of profits come from companies with less than 15% of emissions. High-profit companies should contribute far more to climate action, taking full responsibility for their emissions.

- **The potential for impact is large** – over 27 billion USD could be generated in climate finance yearly if just 141 high-profit companies spent 100 USD per ton they emit, representing a small percentage of profits. This is two to three more than total spend on global climate philanthropy annually, but less than 1 percent of what is estimated to be needed to finance the global green transition.

- **Companies' willingness to pay is far less than their ability to contribute** – very few companies are currently spending sums above single digit USD per ton of CO₂, typically representing less than 0,1% of their profits. This corporate "ambition gap" must be closed through a combination of policy change, voluntary guidance, and peer pressure to change norms within industry.

- **Those who pollute the most can afford to pay the least** – A small percentage of heavy-emitting companies (utilities, air travel, cement, etc.) comprise the majority of emissions, but generate profits of less than \$100 / tCO₂ of emissions. Their ability to procure large amounts of higher-durability carbon removal is limited. Policymakers must change the economic logic surrounding such products. At the same time, a modest contribution from this cohort in \$ / tCO₂ terms could move the needle, and virtually all companies in the sample have sufficient profits to compensate for 10% of their emissions at a price of \$100 / tCO₂.

- **Internal climate investment needs differ** – Companies that can reduce their own emissions through investment or purchase decisions should do so as a first priority. Typically, companies with high profits and a low emission intensity have fewer such opportunities and could instead spend on external climate projects like carbon removal.



- **Corporates' fair share contribution to climate is context-dependent** – To be able to compare climate

context-dependent – To be able to compare climate efforts, contributions can simultaneously be evaluated as a percentage of revenues, percentage of profits, and absolute dollar amount per ton of CO₂ emitted.

- **Policy must complement voluntary corporate contributions** – Scaling nascent carbon removal

contributions – Scaling nascent carbon removal methods requires policy to complement voluntary action. Early support from corporates has been a boon, but it is not enough.

Introduction

Worldwide, companies are looking for ways to help solve the climate crisis. An often overlooked part of such a solution is carbon dioxide removal (CDR), which comprises a set of natural and engineered methods for directly removing CO₂ from the atmosphere. Alongside dramatic emission cuts, CDR will be needed to deliver a stable climate.¹ Scaling durable removals from just thousands of tons of carbon dioxide today, to *billions* of tons within the span of two decades, is one of the biggest challenges humanity faces. Thankfully, a wide array of potentially scalable removal methods exist currently, and analyses have indicated we'll need that full spectrum rather than relying too heavily on any one method.^{2,3}

Some removal methods are relatively mature and familiar, such as reforestation degraded landscapes. But a subset of carbon removal methods that store carbon in a way that is highly resistant to being re-released, such as in chemically-mineralised forms in geological formations and long-lived building materials, hold great promise but still command high costs. We refer to this critical subset of carbon removal methods that have the potential for very low-risk storage as **"Higher-Durability CDR"**. Demonstrating the potential for scale, and bringing those costs down in the process, is a critical challenge.

Governments have historically been vital to bringing down the cost of expensive climate solutions, as demonstrated by decades of fixed payments for solar and wind.⁴ They will need to play a similar role for carbon removal, as well as providing early-stage funding for research and development, and establishing rules for measuring and certifying high-quality CDR (see Carbon Gap's [**"Guide to Certifying Carbon Removal"**](#)). Incentives such as the US 45Q tax credits, forthcoming UK contracts for difference, and Swedish reverse-auction scheme are just some of the promising initiatives that will provide public incentives to begin scaling higher-durability CDR methods.⁵

Carbon Dioxide Removal Methods

Figure 1: A stylized depiction of some of the carbon removal methods, including the higher durability methods that store carbon in geological formations or long-lived building materials



Illustration: Walker Cahall

Carbon dioxide removal refers to “anthropogenic activities removing CO₂ from the atmosphere and durably storing it in geological, terrestrial, or ocean reservoirs, or in products.”^[1] The climate impact of carbon removal is sometimes called ‘negative emissions’.

In recent years something remarkable has happened: a small cohort of companies has begun kickstarting the creation of a nascent higher-durability CDR industry. These companies are already playing an important and catalytic role in accelerating carbon removal, independently of or in partnership with governments. These early supporters of carbon removal are operating in a way akin to philanthropy, focusing on the positive long-term impacts that early support provides rather than on strictly meeting climate commitments or making green claims. This type of unconditional support, focused on accelerating new methods, has been pivotal for early-stage CDR companies. How much faster could the sector scale up, and how much faster could costs drop, if many more companies got involved?

This question triggers three key considerations. First, there is uncertainty around how this can or should happen. The vast majority of funding that the average company puts into activities conducted by third-parties (“external climate projects”), currently goes toward carbon credits which finance *avoided emissions* projects.⁶ Even though interest in nascent carbon removal methods is rising, many

companies perceive the cost as prohibitively expensive, since they are anchored on purchasing a number of credits equal to their emissions so they can claim carbon compensation. At the same time, there is little guidance from trusted, third-party actors suggesting how companies can responsibly buy carbon removal credits. The Science Based Targets initiative's Net-Zero Standard, for example, stipulates that companies need to reduce emissions by 90% before they can use carbon removals to claim net zero emissions. Since such large emission reductions will take one to two decades for most large companies, there is little incentive to purchase removals today.

Second, there is the real and perceived risk of mitigation deterrence, sometimes framed as a "moral hazard": might the promise of carbon removal becoming more cheaply available in the future reduce ambition and urgency to reduce emissions today? This is certainly a real risk, but one we have no choice but to confront and manage. For example, policies or voluntary guidance can enforce a separation between reductions and removals, defining which emissions must be eliminated and which are appropriate to compensate for with removals. Keeping targets for emission reductions and removals entirely separate is one approach, as seen in the EU's updated climate law.⁷ The risk of mitigation deterrence is real and must be guarded against, but the risk of failing to develop a suite of effective and safe carbon removal methods is potentially far greater: the recent IPCC report has confirmed that without such tools, there are no viable pathways to keep peak warming below 1.5°C, let alone begin eliminating past emissions through net negative emissions. We must therefore find a way to simultaneously accelerate emission reductions *and* invest in the scale-up of effective CDR methods in parallel.¹

Finally, any proposal for companies to support removals must be evaluated within the full set of options they have to accelerate climate solutions. Companies can of course reduce their own emissions, create products and services that enable others to reduce their emissions, and inspire and cajole decision-makers into implementing more ambitious climate policies. Many companies can and should also fund external climate projects. As we will show in this report, the allocation of voluntary climate spending between internal emission reductions and external support for carbon removal can be made in a cohesive way.

The choice of whether to buy carbon removal or support other climate projects, and at what financial level, depends on several characteristics of the company in question:

• **Profits per ton** – How much money do companies make, per ton of CO₂ that they emit?

• **Ability to pay** – How much theoretical financial capability do they have to voluntarily support climate action?

• **Willingness to pay** – How much are they demonstrably willing to contribute? This final factor is influenced by corporate culture, societal context, perceived brand value, and the predicted climate impact of actions taken. In order to close the ambition gap, companies must increase their Willingness to Pay as much as possible.

What they should spend these funds on is an equally important question, and depends on how they value different climate interventions:

• **Internal emissions elimination** – The ability to finance internal emission reductions, i.e. their internal abatement costs.

• **External climate projects** – Which external projects are available to fund, including emission reductions and carbon removal projects?

This report will go through these factors and look into practical ways companies can support carbon removal. This report focuses on the question of when corporates should pay for CDR. However, there is a great need to finance other climate solutions too, such as restoring and protecting nature, paying for decarbonization projects and financing climate grassroots and advocacy organisations. The support given to climate by companies should not be singularly focused on carbon removal.

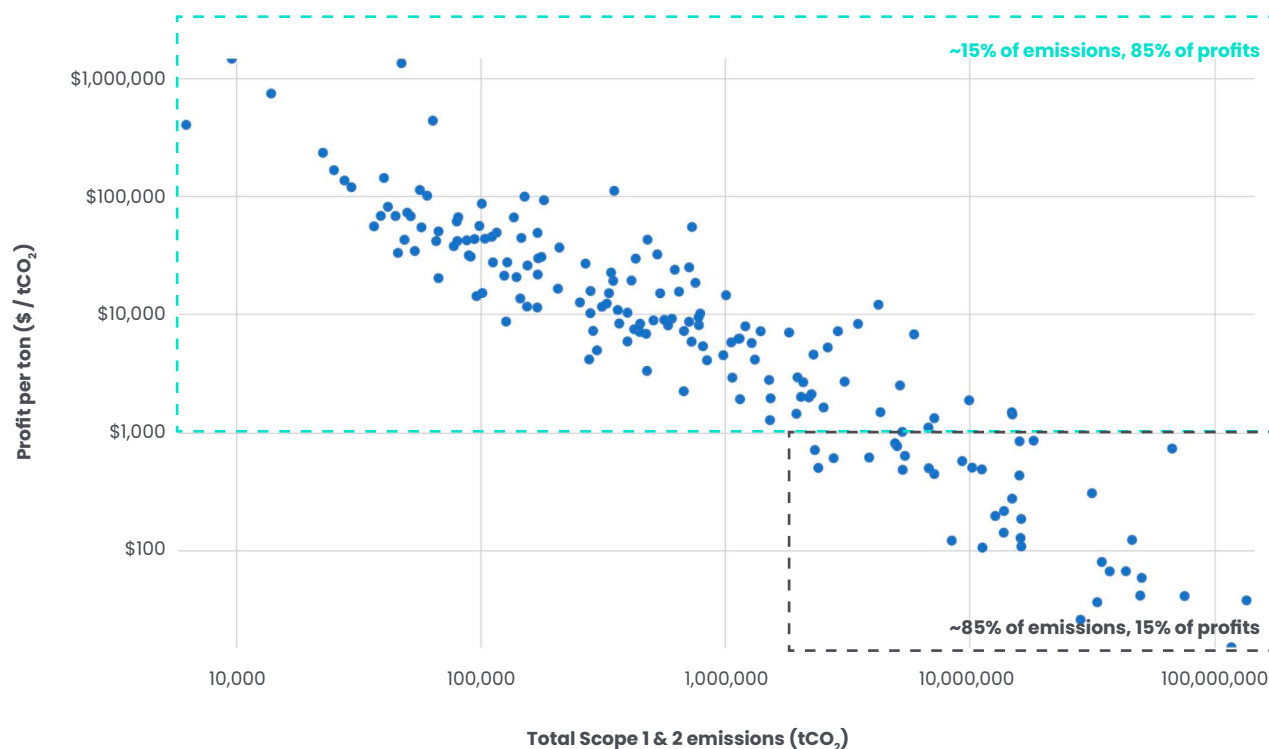
1. Profit per Ton: Corporate potential to pay for climate projects

Different companies have wildly different capabilities to finance climate projects, whether internal abatement or support for external climate projects. To illustrate how this ability to pay differs among companies, we analysed the Forbes 2000 list (2020 version), which ranks the world's biggest companies according to a mix of metrics including market capitalisation. We took the top 250 companies on the list and assembled data on Scope 1, 2 and 3 emissions for each company.^A Out of the 250, 179 (72%) had published data on at least Scope 1 and 2 emissions and 137 (55%) had data on Scope 3 emissions (although many Scope 3 emissions categories are missing; incomplete data means that these values likely underestimate total emissions). Total corporate profits in 2020 for the 179 companies were 1.3 trillion USD, a large share of total global corporate profits.⁸

^A The dataset is made publicly available here <https://tinyurl.com/3hasmy5d>

Profit per ton of CO₂ (Scope 1 & 2)

Figure 2: This graph shines a spotlight on the top 179 companies from the Forbes 2000 list that had Scope 1-2 emissions data (2020 data). The horizontal axis shows tons of CO₂ emitted (Scope 1-2). The vertical axis shows profit in dollars per ton^B emitted (log scale).^C



Most analyses of corporate emissions look at “Emissions Intensity”: how much CO₂ is emitted for each unit of revenue or profit generated? We found it useful to turn this metric on its head, and instead ask “how much profit is generated for each ton of CO₂ emitted?” Expressing corporate **“Profit per Ton”** in \$/tCO₂ terms allows us to directly compare these values against the costs of various carbon projects (including both internal emissions elimination projects, and external climate projects, including carbon removals), which are all typically expressed using this same \$/tCO₂ common language.

As expected, we found a very strong relationship between the size of emissions and profit per ton. A small cohort of companies with relatively low emissions makes huge profits per ton they emit. These companies are most typically in the finance, insurance, and technology industries. The opposite applies to companies with large emissions. Those with the highest emission and lowest profits per ton are typically utilities (electricity and heating providers) or other industrial firms (e.g., chemicals, cement, etc.).

78% of companies in the sample had profits exceeding \$1,000/tCO₂ of Scope 1-2 emissions in 2020, representing around 15% of emissions and 85% of profits in the dataset. If these 141 companies implemented an internal carbon fee of 100 USD applied against their Scope 1-2 emissions, that would generate more than 15 billion USD in climate finance, seven times more than the voluntary carbon market in 2021.^D This would cost on average 1.49% of company profits (median 0.6%) or 0.16% of revenue (median 0.08%).

Only 10 companies in the sample have a profit of less than \$100/tCO₂. However, they represent over 50% of the Scope 1-2 emissions in the data set. This group is overwhelmingly composed of utility companies, with the others being chemical, cement and construction companies. This group should arguably focus on eliminating emissions, especially “low-hanging fruit” such as energy efficiency and switching to lower-carbon fuels. However, if these companies would contribute 0.1% of their revenue or 1% of their profits toward funding external climate projects, that would equal 407 or 253 million USD, respectively. These substantial sums nevertheless represent less than one dollar per ton of CO₂

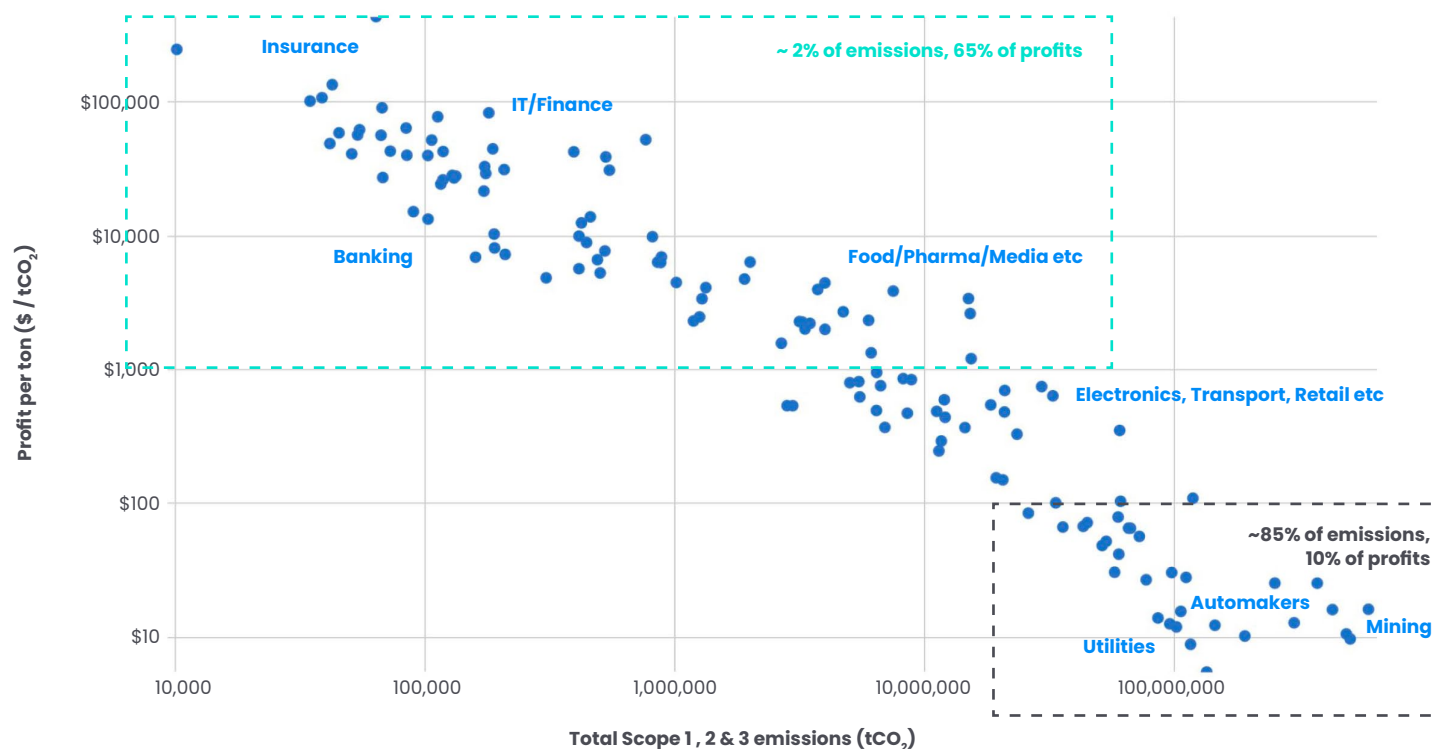
^B This report makes frequent mention of “profit, or dollars per ton”, meaning company revenue or profit divided by emissions in Scope 1-2 or Scope 1-3.

^C A similar analysis was made by Keeton Ross, introducing the concept of the “Pragmatic Abatement Cost Curve”) <https://tinyurl.com/485demy6>

^D Ecosystem marketplace estimates the size of the voluntary carbon market to be 2 billion for 2021, a 400% increase since 2020 <https://tinyurl.com/5yn7rtsn>

Profit per ton of CO₂ (Scope 1, 2 & 3)

Figure 3: This graph shows the same analysis as Figure 2, also using 2020 data, but also including Scope 3 emissions. For some companies, like automakers and mining companies, the largest emissions come from the Scope 3 “use of sold products” category.



emitted. It is noteworthy that virtually all companies could afford to purchase carbon removal representing 10 percent of their emissions today at a cost of 100 USD per ton.

If we extend the analysis to include Scope 3 emissions, Profit per Ton of course drops, and only 78 companies in the sample have a Profit per Ton greater than \$1,000/tCO₂. If they paid \$100/tCO₂ of Scope 3 emissions (on top of the \$100/tCO₂ they were already paying for Scope 1-2 emissions), an additional 12 billion USD could be generated for climate finance. This is despite their combined emissions only being 2% of the total Scope 3 emissions in the sample. This would cost the companies on average an additional 1.57% of profits (median 0.75%) or 0.3% of revenue. These companies are mainly in banking, finance, insurance, pharmaceuticals and software & services.

In total, over 27 billion USD could be generated in climate finance yearly if just the 141 companies with the highest profits spent 100 USD per ton they emit. This is 2-3 more than total spend on global climate philanthropy annually, but less than 1 percent of what is estimated to be needed to finance the global green transition.^E

Note that paying for climate projects can be seen as a cost that companies' should take regardless if they have profits to do so or not. Some companies, especially venture-backed ones are, for example, buying carbon credits or financing climate solutions even when unprofitable. Some companies not yet making any profit whatsoever (for example those reinvesting all profits into growth) would have no problem paying a high-carbon price.

1.2 Key insights from the analysis

- Many companies, especially in industries such as banking, insurance and software, generate enormous Profits per Ton and could conceivably contribute large sums per ton of CO₂ emissions toward climate projects, including toward both elimination of their own emissions and the purchase of very high-quality carbon removal credits. Realising this potential financial resource for climate action can be done in many ways, including through a voluntarily implemented high internal carbon price or government intervention through pricing emissions. The funds raised can go to support a mixture of carbon removal and other effective climate solutions.

^E ClimateWorks estimates total climate philanthropy at \$7.5-\$12.5 billion in 2021, and cites estimates that project the need for investments for the global green transition of \$4 trillion to \$9 trillion per year to support a global green transition. ClimateWorks. Funding trends 2022: Climate change mitigation philanthropy (2022). <https://tinyurl.com/bdek9w78>



• **A minority of companies produce a substantial majority of emissions.**

This group has much lower Profits per Ton emitted, and could usually not afford to pay a high carbon price per ton. However, a small share of these companies' revenue or profits would generate large amounts of money for carbon removal and climate projects, provided it could be pooled rather than applied one-for-one against a ton of emissions. This group is overwhelmingly composed of utility, oil & gas, chemicals, materials and construction companies.

• **Companies with high Profit per Ton have the luxury, and arguably the obligation, of rapidly eliminating their remaining emissions,**

while also taking the responsibility for their emissions by funding high-cost, higher-durability carbon removal or other climate solutions. Even though total emissions are relatively small, funds generated by this cohort of companies can generate large amounts of money that would be catalytic toward scaling higher-durability carbon removal and other climate solutions.

• **Companies with low Profit per Ton will struggle to afford carbon credits that could legitimately compensate for their emissions,**

but setting aside a modest percentage of those profits across these heavy-emitting sectors still represents a massive pooled potential contribution toward climate action.

2. Ability Pay: How much could companies contribute to climate?

We've framed corporate voluntary climate action in very simple terms – how much profit is generated for each ton of CO₂ emitted? (**Profit per Ton.**) However, only a portion of profits can be allocated toward climate action. Each industry has its own norms and requirements as to how much profit is distributed to shareholders as dividends, and how much must be made available for reinvestment into the business. Taxes and fiduciary and statutory requirements also affect these decisions. Whatever is left after such theoretically unavoidable allocations are made is the theoretical **Ability to Pay** for voluntary corporate action toward climate and other global challenges. Figure 4 shows how this Ability to Pay (2) is a subset of total profits (1).

Increasing the Ability to Pay for climate action may require policy intervention, such as changes to the tax code, or it could result from a change in leadership or corporate structure, such as re-incorporation as a B Corp with a lessened fiduciary responsibility to distribute profits to shareholders, or ownership by entities dedicated to the public good. Novo Nordisk is one such example, since it is controlled and partially owned by a philanthropic foundation which allocates the entirety of its share of profits to the public good (in this case, life sciences research rather than climate).

Of this theoretical maximum Ability to Pay, companies only opt to use some fraction of those funds to take action on climate. This is their demonstrated **Willingness to Pay** for climate action, which we analyse numerically in Section 3 below. We call the gap between a company's **Willingness to Pay**, and their theoretical **Ability to Pay**, the **Ambition Gap**. If we can close the Ambition Gap, we can unlock even more funds to support urgent climate action.

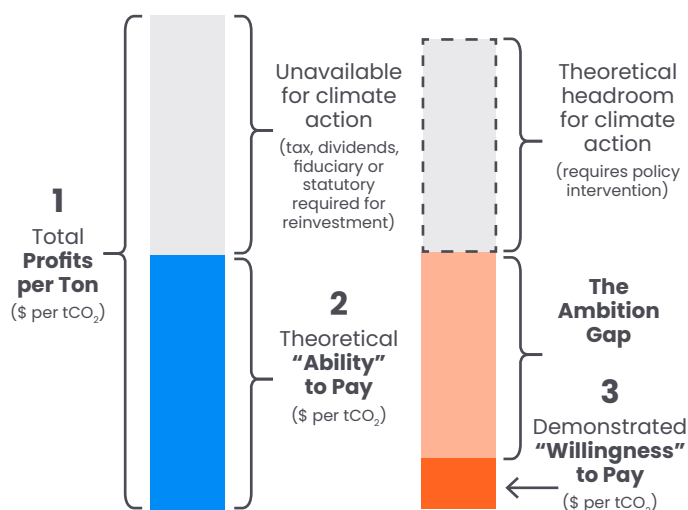
The Mechanics Behind the Ambition Gap

What internal factors affect the size of the Ambition Gap, and how might we begin to close it?

- 1. Internal capacity & understanding** – A company may not have dedicated resources and staff time to fully understand its emissions and how much it would cost to eliminate them (for example, expressed as a marginal abatement cost curve). Data quality may be poor, hindering such analysis.
- Government policy can require increased disclosure, pushing companies to increase their knowledge and capabilities (e.g., the UK has **made net zero transition plans** <https://tinyurl.com/49h3db8n> mandatory for all listed companies by 2023).

Corporate Capacity for Climate Action

Figure 4: This abstract representation of corporate capacity for climate action highlights the Ambition Gap between what companies could contribute, and what they end up contributing. Total profits per ton of CO₂ vary widely by industry as shown in Figure 3. The percentage of these profits allocated toward climate action (demonstrated willingness to pay) also varies widely, as explored briefly in Section 4.



2. Cultural barriers & inertia – Each industry has its own norms, culture, and degree of resistance to change, as does each individual company within that industry. Long-held views on and scepticism toward the value of climate action may create internal resistance.

- Use policy, voluntary guidance, peer pressure, and activism to combat and reverse internal resistance. In large multinational companies, internal factions may form with widely different views on the value of climate action. Organised support for internal actions that agitate internally for higher Willingness to Pay could help close the Ambition Gap. For example, Amazon employees have self-organised and instigated both internal and **public protests to urge faster climate action**. <https://tinyurl.com/5n77jmsy>

3. Corporate governance – Board members may be unengaged, unaware, or otherwise unwilling to prioritise action on climate.

- Philanthropically – and corporate-funded efforts can help educate and activate board directors toward more ambitious climate action. Examples include **The Deloitte Academy** www.deloitteacademy.co.uk and **Chapter Zero**. <https://chapterzero.org.uk>

4. Competing priorities – We are concerned in this report with support for climate action, and carbon removals more specifically. However, many companies may prioritise other global challenges such as human health or biodiversity loss. Their finite Willingness to Pay will be under pressure to support multiple causes, perhaps focusing on those issues which align most closely with their core industry (e.g., labour standards and non-toxic materials for the textile industry).

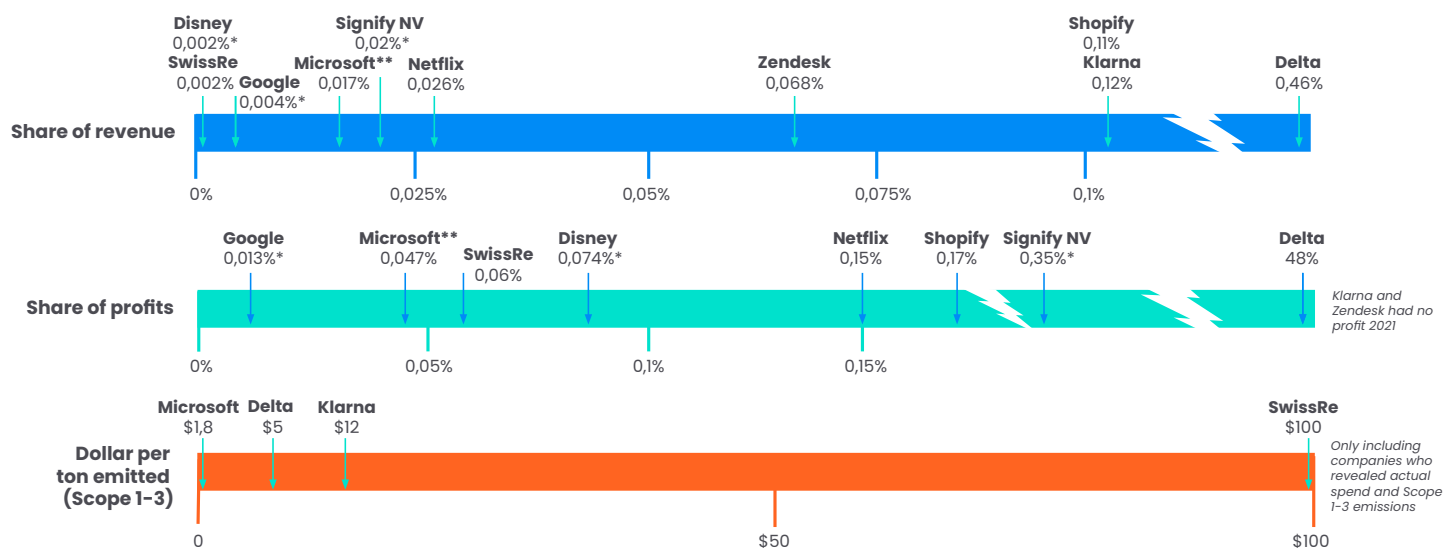
- Allow for a diversity of approach to defining which sustainability criteria are most important to each industry, but provide consistent guidance on how to effectively address CO₂ emissions specifically.

3. Willingness to Pay: Companies taking action on climate

To understand how close we are to closing the Ambition Gap, we need to evaluate how much companies are actually paying for climate action: their demonstrated Willingness to Pay (“3” in Figure 4). Most companies do not disclose how much they spend on external climate projects. We have only been able to find a few that do.

Three Perspectives on Corporate Capability for Climate Spending

Figure 5: A sample of companies’ spending on carbon removal, carbon credits and other climate projects. Three different perspectives for comparing corporate climate spending are shown, including as a share of revenue, as a share of profits and on a per ton CO₂ emitted basis (2021 data).



More disclose how many carbon credits they purchased, which makes it possible to estimate an approximate spend. The graph (Figure 5) on the last page shows a sample of companies' spending, their demonstrated Willingness to Pay on climate^G divided by profits and revenue, and the cost per ton paid where it is available. For most companies, our estimate of the amount that is voluntarily spent on climate action is based on purchases of emission reduction carbon credits, but carbon removal purchases and support to other external climate projects are also included when available.

In this small sample, we can see that the big buyers of carbon credits like Microsoft, Google and Disney are spending less than 0.02% of revenue and 0.1% of profits on purchasing credits. This is astonishingly low, and certainly suggests that there is a lot of headroom for more voluntary (or government-mandated) spending on climate projects.

Some buyers of durable carbon removal, like Klarna, Shopify and Zendesk, are ahead of the norm and spend a larger share of revenue (share of profit would be infinite for Klarna and Zendesk as they are not profitable at the time). In this sample and according to these metrics, Delta airlines is the most ambitious, spending almost 0.5% of revenue and 50% of profits.^{G,H}

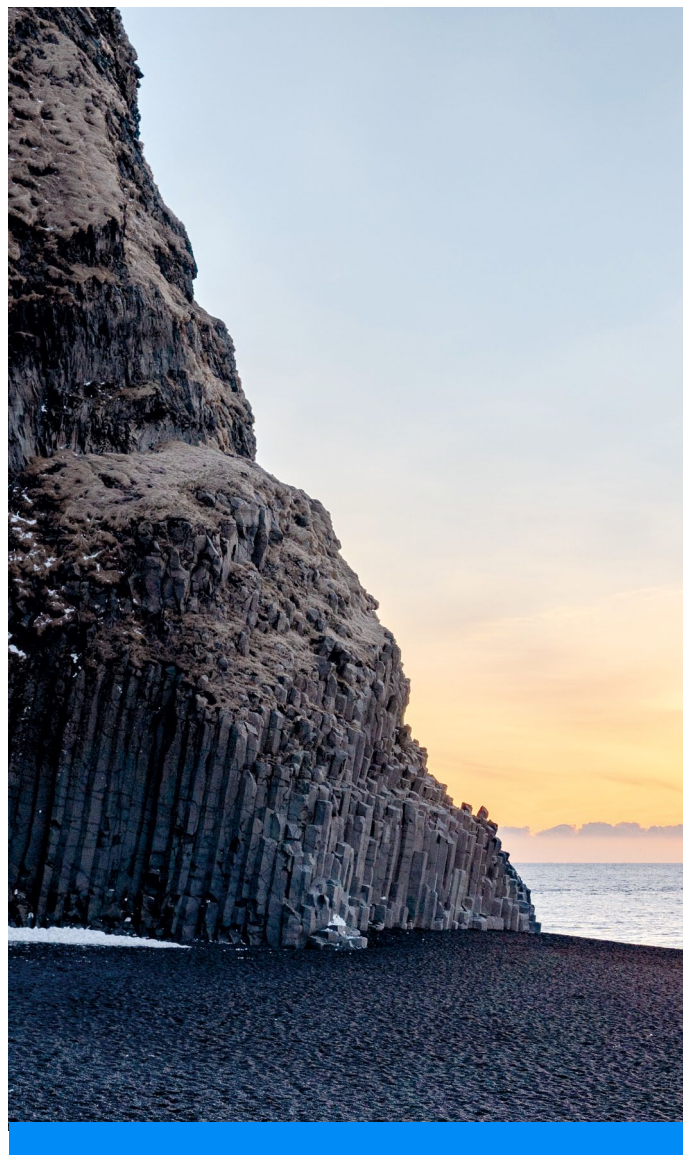
Ambition can be viewed differently depending on what lens is used. For example, SwissRe looks like the most ambitious company in this group when looking at the internal carbon fee of 100 USD per ton they have implemented. However, their total spend on external climate projects is just 0.002% of revenue or 0.06% of profits. In contrast, Delta Airlines spent just 5 dollars per ton of CO₂ emitted but is the leader in the sample when looking at the share of revenue or profits. One could argue that SwissRe is taking full responsibility for its emissions by pricing them at 100 USD (with a plan to increase this to 200 USD), and that Delta is not. Conversely, Delta could claim that in terms of its relative contribution, it is doing more proportionally to contribute to climate action than others like SwissRe.

One way of comparing ambitions is to say that companies should either implement an internal carbon fee that covers the cost of removing their emissions or, if that is unaffordable, spend a reasonable share of their profits or revenue on climate.

We now have a cohesive framework for understanding corporate spending on climate. By reframing profits in dollars per ton of CO₂ terms, it becomes easy to contextualise how expensive or cheap various climate solutions – whether internal emission reductions or contributions to external removal projects – really are. By comparing the Ability to Pay against the demonstrated Willingness to Pay, we get a sense of the Ambition Gap we

still need to close by encouraging more generous corporate spending, and simultaneously advancing policies that make aggressive climate action the economically logical choice. Finally, by examining actual corporate spending on climate projects through multiple lenses – both \$/tCO₂ terms and as a share of revenue and profits – we can understand how companies stack up in terms of ambition, and what further action is reasonable for us to expect and demand.

Equally important to measuring and increasing how much corporate spending flows into climate action is deciding how that money should be most impactfully spent. In the next sections, we lay out what companies should consider when deciding where their support should go – first vis-à-vis elimination of emissions internally, and second toward carbon removal.



^G Note that 2021 was a year with exceptionally low revenue and profit for Delta. Revenue in 2021 were 63% of those in 2019 and profits only 5.8%.

^H The quality of the credits purchased can also be questioned (see article linked on the credits bought by Delta), but that is a discussion separate from the financial level of support.
<https://tinyurl.com/2nz9cv6x>

4. Supporting internal emission reductions

Every company interested in taking action on climate should start by asking: how much does it cost me to eliminate my own emissions? By assembling the full set of abatement opportunities in terms of their relative size and cost in \$/tCO₂ terms, the company can construct an internal marginal abatement cost curve. This is the most important tool for assessing how funds available for climate action should be spent. In principle, these funds should be spent on the cheapest abatement opportunities first.

If companies can reduce their own emissions by making investment or purchase decisions, they should in most cases prioritise that. Many companies have ample opportunities to do so. Companies can make many relatively straightforward choices, such as replacing a fleet of internal combustion vehicles with electric ones, switching gas boilers to electric heat pumps, or investing in energy-saving measures. Higher on the marginal abatement cost curve will be highly capital-intensive measures such as steel manufacturers building completely new production processes from the ground up to enable the manufacture of zero or low-carbon steel.

Some companies have limited opportunities to pay to reduce their own emissions. For example, companies for whom most of their emissions are Scope 3 may have limited alternative suppliers or materials options. Nevertheless, opportunities to eliminate emissions for free or at very low cost also exist, such as replacing physical meetings with digital ones (which also creates a cost saving). There is likely a high correlation between high Scope 1 and 2 emissions and the potential to make investments into reducing your own emissions. The companies that lack clear options to use money to reduce their own emissions should allocate more of their Willingness to Pay toward external climate projects.

A problem in achieving emission reductions is the lack of good data. For example, the way company Scope 3 emissions are measured today is such that many attempts to reduce emissions will not be counted or register in estimates. Today there is very little information on different products' carbon intensity. Instead, calculations are based on average intensities multiplied by a company's total spend on a category. Things like replacing flights with video conferences are very straightforward, but it is difficult to, for example, switch a supplier of office furniture to one with lower emissions with any degree of certainty or validation. In most cases, the data just isn't there. And even if that office furniture supplier did have the data to back up their lower emissions, the official methods companies use to

track their Scope 3 emissions haven't been revised to detect that change.

Even when there are plenty of opportunities to pay for internal emission reductions for a company, some money should arguably still go into carbon removal. Large investments in carbon removal today are a prerequisite for removal capacity reaching an impactful scale by mid-century, and corporate commitments are already proving a powerful way to increase this funding. Companies can start with small contributions and slowly scale up.

5. Support to carbon removals and wider climate action

In deciding how much money to voluntarily put toward climate action, should companies think in terms of how many tons of CO₂ they emit, or how much profit they generate as compared to other industries? Should they be narrowly focused on compensating for their emissions, or instead pool their funds toward the most impactful projects possible? The conventional thinking, and much of the voluntary corporate guidance available, puts pressure on firms to think in \$ per ton of CO₂ terms (\$ / tCO₂). In other words, if the portion of a company's profits that it is willing to contribute toward climate action is \$X/tCO₂ emitted, Sustainability Officers or CFOs expect that for each \$X they spend on voluntary climate action, a climate benefit of 1 tCO₂ or more should be generated. For companies with a far higher ability to pay, for example \$100-\$1,000 / tCO₂, this logic bears out since there exist high-certainty means of removing and durably storing carbon for price in that range. But for companies with far lower ability to pay, the focus on matching their emissions with compensatory projects is flawed, and leads them inevitably toward very low-cost, often low-quality avoided emission carbon credits.

There are however more ways to determine the level of external climate spend. As described in the analysis of the Ability and Willingness to Pay, companies have options for how they generate and allocate funds for external climate projects. There are three primary approaches:¹

a) Ton based – Buy a number of carbon credits equal to total company emissions, “ton for ton”. This approach is often used to enable the company to make a compensation claim, such as “carbon neutral” or “net zero”.

b) Price based – Implement an internal income carbon fee per ton emitted, “dollar for ton”. Note that this involves actually raising and spending this money, not simply charging it in internal accounting (which would be a carbon “shadow price” where no money is generated).

¹ As described by the firm SYSTEMIQ in a report done for the SBTi. Unpublished report, see the approach presented at 26.30 in this webinar www.youtube.com/watch?v=CBVeMnLZO88



c) Relative percentage – Set aside a fixed share of profit or revenue for climate projects (i.e. spend 1% of profits or 0.1% of revenue on climate).^J

Using only one of these approaches to compare companies' efforts would be unfair since it would ignore companies' different capabilities. Some can afford to implement a high carbon tax; others simply can't but can still contribute a higher share of profits and revenue than the company that has a high carbon tax.

Ways to practically support CDR

If a company wants to use a portion of the money it has raised—its Willingness to Pay for climate action—toward removing carbon from the air, what options does it have?

A liquid carbon removal market, in which companies buy carbon removal credits from marketplaces is still nascent. On the buy side, corporates see a supply-constraint—far too little capacity to produce carbon removal credits at the scale needed. On the supply side, carbon removal providers are ready to build projects, but lack financing to do so, which can only come when they have surefire offtake agreements to sell all of their carbon credits.

Only a small number of tons have been durably removed to date^K, and most of the associated carbon credits have already been purchased. But for most projects, the most catalytic action is for corporates to commit to buy future tons. Here are some ways that companies are supporting carbon removal.

• Ex Post Purchase – Purchase carbon removal credits on an “ex-post” basis. That is, the carbon has already been removed and certified before, after which payment is made for the delivery of the carbon credits. The majority of traditional carbon credits are purchased on an ex-post basis (as demonstrated by a trend toward a higher average age of retired credits).⁶ The supply of such credits is currently minimal for high-durability carbon removal.

• Upfront Pre-Purchase – Make pre-purchases of carbon removal where a bulk payment is made upfront, on the promise of later delivery. Stripe, Klarna, and Shopify have pursued this approach. This gives carbon removal providers cash upfront to build the project and perform the removal, but puts the risk of non-delivery on the buyer. This is an effective option for buyers that primarily care about advancing the carbon removal field rather than receiving a set number of tons. However, it could be seen as capital-inefficient. Many carbon removal project types (e.g., direct air capture, point source capture of biogenic emissions, etc.) are prime candidates for “project finance”.

• Carbon Offtake Agreements – Enter into offtake agreements, where buyers enter a legal agreement promising to purchase a set of carbon removal credits at a specific price when these tons have been removed. This leaves the carbon removal company to find other ways to finance the project, for example, through debt, using the pre-purchase agreements as security.

• Corporate R&D Philanthropy – Companies can also give out grants for research and development of carbon removal. Stripe has pursued this path, on top of making pre-purchases. Microsoft is another example, evidenced by a \$100 million donation to the Breakthrough Energy Catalyst to be used for grants and other support for climate solutions, including direct air capture.

• Equity Investment – Making equity investments and putting capital into carbon removal companies is another way of supporting the sector. Some companies may both purchase carbon credits from a company, and make an equity investment in that same company (e.g., Microsoft both investing and purchasing from Climeworks, or a large mining company investing in a company with the technology to remove carbon using their mine tailings).

Other climate solutions are just as important to fund

Carbon removal is one of the solutions needed to reach global climate targets, but other solutions must be funded too. For example, nature restoration and protection, decarbonisation projects and organisations pushing for more ambitious climate policies. Companies supporting climate projects should not limit themselves to just supporting carbon removal but look at how they can maximise their positive impact on climate through their financial support.

Carbon removal and net zero targets

Any company with a net zero target is implicitly planning to use carbon removal, it is just a question of how much and when.

The Science Based Targets initiative (SBTi) has issued a Net Zero Standard under which companies first need to reduce their total emissions by around 90% before they can purchase permanent carbon removal to compensate for the residual 10%.

The UN-led Race to Zero demands that signatories to the initiative reduce emissions by 50% by 2030, and that the removals used to compensate for remaining emissions be kept “like for like”, meaning very high-durability carbon removal is used to compensate for fossil CO₂ emissions, and removals with a higher risk of reversal are used to compensate for biogenic CO₂ emissions, a concept referred to as “durable net zero”.⁹

^J See www.cdr.fyi for estimates.

It is not feasible for more than a tiny fraction of companies to reach net zero with permanent carbon removal today. The supply of such credits is many orders of magnitude too small. It is also questionable if the CDR market is ready to be quickly scaled up. We are still exploring which CDR methods are feasible to use, and there are many scientific uncertainties left to be solved around the permanence and ecological safety of many methods, as well as figuring out the optimal role they should play in the wider transition.

Instead of focusing on purchasing enough credits to make a net zero claim today, corporate support for carbon removal should mainly focus on helping accelerate new solutions, get more shots on goal and grow the sector in the most effective way.

There is also a need for institutions like the SBTi to provide **clear guidance on how and why companies should contribute to external climate action** (what the SBTi calls beyond value chain mitigation), including providing benchmarks. Thankfully the SBTi has started working on the topic.^L

6. Discussion

Companies need to move urgently to allocate funds toward both internal abatement and the financing of external climate projects, including those that remove carbon from the air. Only a small percentage of companies are buying high-quality carbon removal credits. Those that do are typically only spending a fraction of one percent of profits, which is very low relative to their capabilities. Very few companies are coming close to levels of climate support that could reasonably be said to close the Ambition Gap between what companies are theoretically capable of contributing, (their Ability to Pay) and what they actually contribute, (their Willingness to Pay).

How much companies should spend on climate action is a normative question, but some quantitative guidelines can be used to establish a reasonable range. We have presented a framework for how companies should make such decisions, and in so doing have revealed that current levels of voluntary action are likely far below what companies are comfortably capable of taking.

The bar should be raised. There is significant headroom in how aggressive a company could be without undermining profitability, and we encourage high-ambition corporates to embark on an “arms race” to outdo one another. We suspect we are nowhere near the high water mark for corporate climate action. At the same time, there should be an understanding and recognition that different companies have vastly different capabilities, and should be compared using multiple metrics. This includes simultaneously

disclosing their climate spending both as a percentage of profits and revenue, as well as in \$/tCO₂ terms.

Virtually every stakeholder has the ability to increase impact in this area. Corporate leaders and board directors can push for a higher climate spending, put pressure on suppliers, and go above and beyond disclosure requirements to be as transparent as possible. Employees and customers can likewise call for increased climate ambition and transparency, not only in setting emission reduction targets and taking action on them but also in financing external climate projects. Policymakers can increase public support for these same activities, increase disclosure requirements, establish standards and certification guidelines, and police the green claims made by companies on the basis of their actions.

^L <https://tinyurl.com/4z2nwzk3>

7. Recommendations

- Policy to drive the scale-up of carbon removal, and to mandate corporate contributions toward climate action, is lagging behind and needs to be urgently accelerated. In the meantime, **voluntary corporate action can help kickstart action.**
- Companies should **learn what their internal costs of abatement are,** and use this cost curve to make decisions about which emissions to eliminate and when.
- Companies that can **reduce their own emissions** through investment or purchase decisions should do so as a first priority.
- **Companies should** set an internal carbon fee, set aside a fixed share of profits or revenue, or implement other mechanisms to **generate funds used to support external climate solutions.** The level of the funds generated will differ between sectors and companies depending on the Ability to Pay. Companies with high profits per ton emitted should implement an ambitious carbon fee that covers the future cost of removing the carbon.
- Companies should **disclose their total spend** on internal and external climate projects including what projects were supported.
- Companies with limited possibilities to **pay to reduce their own emissions,** or where the emissions reductions would be extremely expensive, **should put income from their internal carbon fee into external climate projects** like carbon removal.
- All companies, even those prioritising internal abatement, could **still contribute some money into carbon removal** starting now so that affordable solutions will be available at scale in time.
- Governments should see the private sector as an innovation-driving force when it comes to carbon removal, helping pilot new solutions and providing the first revenue for new carbon removal companies. Governments must, however, **not count on the private sector to be able to deliver the bulk of removals that are needed by mid-century on its own volition.** Policy is needed to make removing carbon the economically logical action for companies with expensive-to-abate emissions, enforcing the rapid transition toward net zero. In other words, the corporate ambition gap is unlikely to close on its own. Governments must also urgently increase research and development funding for promising new removal methods, and implement carbon removal deployment incentives, carbon removal procurement, and CO₂ transport and storage infrastructure support to ensure the sector can grow and deliver real, scaled climate benefits.



References

1. Shukla, P. R. et al. *Summary for Policymakers In: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.*
www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SPM.pdf (2022).
2. Fuss, S. et al. Negative emissions—Part 2: Costs, potentials and side effects. *Environ. Res. Lett.* 13, 063002 (2018).
3. Energy Transitions Commission. *Mind the Gap: How Carbon Dioxide Removals Must Complement Deep Decarbonisation to Keep 1.5C Alive.*
<https://tinyurl.com/bdfw9mb4> (2022).
4. Nemet, G. *How Solar Energy Became Cheap: A Model for Low-Carbon Innovation.* (Routledge, 2019).
5. Schenuit, F. et al. Carbon Dioxide Removal Policy in the Making: Assessing Developments in 9 OECD Cases. *Front. Clim.* 3, 638805 (2021).
6. Macfarlane, M. Assessing the State of the Voluntary Carbon Market in 2022. <https://tinyurl.com/5n6zp4fh> (2022).
7. Council of the European Union. Proposal for a Regulation of the European Parliament and of the Council establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law). 2020/0036(COD) (2021).
8. It is hard to get data on total global corporate profits, this report puts it at 9.8% of world GDP in 2013, the same percentage in 2020 would have meant 8,3 trillion USD. <https://tinyurl.com/yc7zbwsp>
9. Fankhauser, S. et al. The meaning of net zero and how to get it right. *Nat. Clim. Change* 12, 15–21 (2022).

Carbon Gap

Carbon Gap is a climate not-for-profit focused on eliminating the carbon dioxide that's already heating up the planet. We exist to drive essential climate action by helping Europe become a leader in carbon removal, working with scientists, NGOs, governments, and businesses to unlock the support for a full spectrum of safe and scalable carbon removal techniques, storing carbon safely in trees, soils, oceans, rocks, and the built environment.

We are **independent** – funded exclusively by climate philanthropy, **inclusive** – open to all safe methods for taking carbon from the air and storing it responsibly, and **planet-first** – advancing the carbon removal that the planet needs to restore our atmosphere.

Get in touch

 <https://www.linkedin.com/company/carbongap/>

 <https://twitter.com/carbongap>

 contact@carbongap.org

 www.carbongap.org

Carbon Gap is a registered charity (charity number 1200562) and a private company limited by guarantee (company number 13557860), registered in England and Wales. Registered office address: 71-75 Shelton Street, Covent Garden, London, WC2H 9JQ, United Kingdom. EU Transparency Register: 159208346089-06