

# Carbon Dioxide Removal and the Journey to Net Zero → *A Call to Action for Business*





# Foreword

The World Business Council for Sustainable Development (WBCSD) has a long-term vision of 9+ billion people living well, within planetary boundaries, by mid-century (WBCSD, 2023). Living well means that everyone's dignity and rights are respected, basic needs are met, and equal opportunities are available for all. Living within planetary boundaries means that global warming is stabilized at no more than +1.5°C, and nature is protected, restored and treated sustainably. Delivering this vision is akin to completing a complex jigsaw puzzle. Each piece, representing a different system transformation, is essential to create the full picture. Carbon dioxide removal (CDR) is one of those critical pieces.

Now imagine reaching the final stages of a large puzzle only to discover pieces are missing. This is the stark reality we will face if we fail to grow the CDR industry to a climatically relevant scale. The Intergovernmental Panel on Climate Change (IPCC) estimates that we need durable CDR on the megaton scale by 2030 growing to gigaton scale by 2050 to limit global warming to +1.5°C (IPCC, 2023). Why? Because despite our best efforts in reducing emissions there will continue to be residual amounts of carbon dioxide emissions left unmitigated.

Building the industry to such a scale will take public and private sector buyers to purchase CDR credits, but the market today lacks sufficient buyers. By acting now and signaling demand for CDR, businesses can ensure this vital piece is in place when we need it most.

This call to action for business explains both the need for urgency and the business value in acting now. 16 organizations, including nine WBCSD members, have shared their latest thinking around CDR and the journey to net zero. These insights are presented as case studies covering the what, the why and the how of CDR within these organizations. While these organizations sit across various sectors, including energy, shipping and retail, one commonality is that they are aligned with science and understand the need for CDR to neutralize unabated emissions before they can reach net zero emissions.

Designing and implementing a corporate CDR strategy takes time. Uncertainty around the level of residual CO<sub>2</sub> emissions by the target net zero year or challenges in understanding which suite of CDR technologies best align with the core business are just two reasons that uptake is delayed in practice. With these concerns in mind remember that the **perfect is the enemy of the good** – don't let these unknowns stop progress. This call to action offers two key recommendations to support the development of a CDR strategy within your organization:

1. Companies benefit from a steady CDR ramp-up towards net zero to help scale up the industry and to ensure that they secure access to sufficient future capacity across a portfolio of CDR technologies to meet their net zero targets.
2. Companies benefit from implementation in sequential waves to take credible action today, while considering that residual CO<sub>2</sub> emissions at net zero may not yet be fully clear.

**CDR is a nascent industry that needs your support.** I hope that you will answer this call to action to advance your CDR strategies and mobilize capital to purchase small and growing amounts of carbon dioxide removal credits today.



**Nancy Gillis**

Senior Director, Industrial Transformation Pathway, WBCSD

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# 01. Introduction

In today's business landscape, addressing climate change is not just a matter of corporate responsibility; it is a strategic imperative. As governments, investors, consumers, and industry peers increasingly demand and reward sustainable operations, companies must make climate action a core part of their strategy.

**The science is clear:** decarbonizing the economy is essential to limiting global warming. However, emission reductions and avoidance alone cannot get us to net zero and must be complemented by carbon dioxide removal (CDR) to address hard-to-abate CO<sub>2</sub> emissions (see glossary for definitions of key terms). It is expected that deployment of durable CDR must grow to the double-digit megaton scale by 2030 to reach the required gigaton scale by 2050 (IPCC, 2023). As companies around the world strive to meet sustainability goals, developing a CDR strategy is critical.

**This call to action for business** explains why CDR is needed, which factors provide a tailwind to the CDR industry and what benefits companies gain from CDR. Lastly, we provide step-by-step guidance on how to get started and key considerations for market participation. The factsheets and quotes within this publication are the result of interviews with 16 organizations across nine industries. These contributions offer insights into the business case for CDRs in multiple sectors.





# 02. Why CDR

**The Earth is warming at unprecedented levels.** In 2023 average temperatures were at +1.48 °C above pre-industrial levels, and this has catastrophic impacts on planet and global health (Copernicus, 2024). As part of the Paris Agreement in 2015, nations agreed to pursue efforts to limit temperature rise to 1.5 °C. Increasingly, scientific consensus converges that 1.5°C is not just a target, it is a physical limit to avoid irreversible changes in the Earth's climate system (IPCC, 2023).

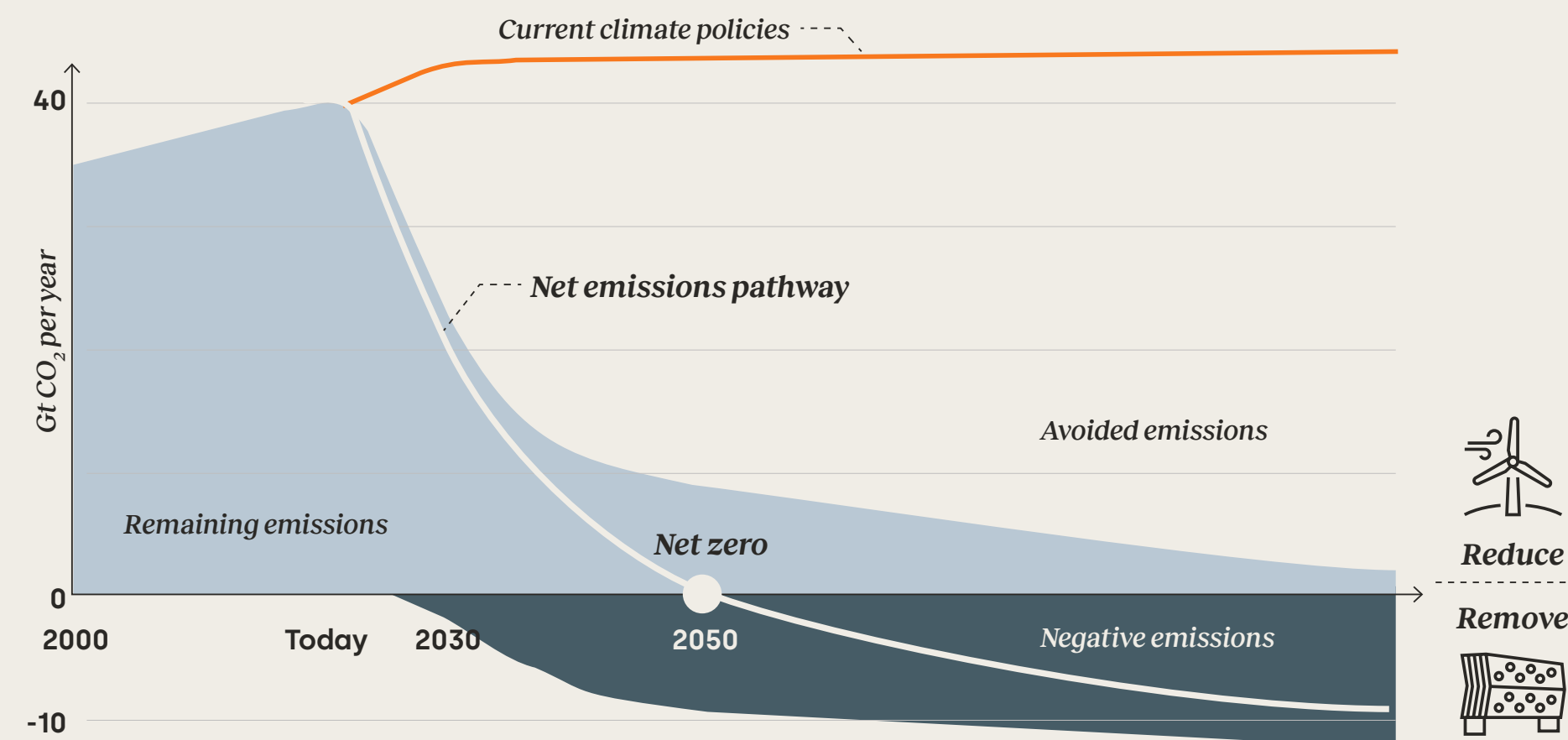
*“Across IPCC modeled pathways Carbon Dioxide Removal (CDR) is needed to compensate to limit global warming to 1.5°C or 2°C.”*



– Kaya Axelsson, Head of Policy and Partnerships, Oxford Net Zero

**Science has the recipe to limit warming, and CDR is a key ingredient** (see exhibit 1). The Intergovernmental Panel on Climate Change estimates that 6-16 Gt CO<sub>2</sub>e of annual CDR supply will be needed to reach net zero by 2050 (IPCC, 2023). Due to the extent of hard-to-abate CO<sub>2</sub> emissions globally, CDR is a must in a global net zero future. **However, high quality, durable CDR today is a nascent industry, and needs to be scaled up by an order of magnitude of >1,000x** akin to the growth of the solar industry between 2000 and 2020 (CDR.fyi, 2024).

**Exhibit 1: The good news: science has the recipe at hand and CDR is a key ingredient** (Adapted from IPCC AR6 WG III (2022))



*“As a technology company driven by an engineering mindset, we recognize that our journey to net zero must be grounded in realistic scenarios and pragmatic solutions that account for financial and economic realities while staying aligned with the latest climate science. Companies like Emerson, who have been actively pursuing internal decarbonization strategies, understand that achieving net zero requires moving beyond an 'either-or' approach to climate mitigation. We must adopt a 'yes, and' mentality, utilizing every available tool in our toolkit to meet our climate objectives. This includes recognizing Carbon Dioxide Removal (CDR) as a necessary element of these strategies.”*



– Mike Train, Chief Sustainability Officer, Emerson

# 03. Why now

There is consensus that **CDR will be heavily supply-constrained by 2030**, and therefore investments are needed today to give demand signals and spur supply. Projections show that by 2030, over 50% of the demand for high quality CDR, driven by sustainability commitments, will be unmet by lagging supply (see exhibit 2). In fact, the supply of novel, durable CDR approaches is already severely constrained today, and will become even more so in the coming years. CDR will remain scarce for the foreseeable future, leading to volatility of price and availability.

By acting now, companies can help scale up the industry, lock in supply at reasonable prices and gain preferential access to future CDR volumes during periods of constrained supply.

*“Scaling the Carbon Dioxide Removal (CDR) market is essential for H&M Group and the global economy to achieve net zero in the coming decades. The numerous offtake agreements we have entered to date are an important step forward, and we hope they will encourage further growth in the CDR market by signaling clear demand and attracting investment. We call on all other companies with net-zero targets to act now and start building a portfolio of durable CDR in parallel to demonstrating steep GHG emission reductions.”*



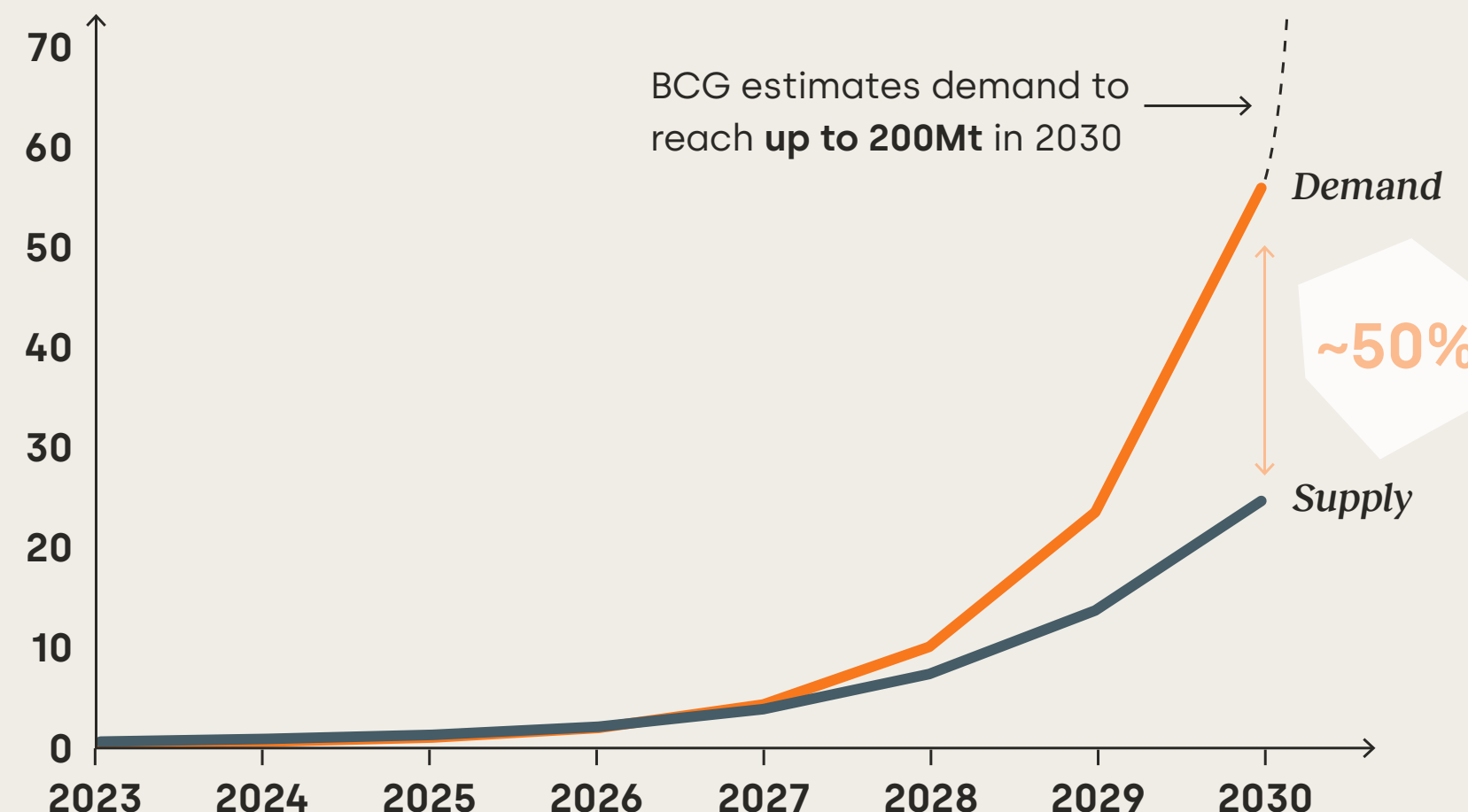
– Leyla Ertur, Sustainability Director, H&M Group

## Exhibit 2: CDR will remain heavily supply-constrained

Sources: (BCG, 2024), (McKinsey & Co, 2024), (MSCI, 2020), (SBTi, 2024), Climeworks analysis

### Total projected CDR demand vs. supply

In Mt CO<sub>2</sub> per year



Why now  
continued

**Policy makers are setting out to stimulate demand and climate policy is becoming increasingly clear.** We see strong developments both in the voluntary carbon market (e.g., SBTi, GHG Protocol) and on a regulatory level (e.g., in the U.S. with the Inflation Reduction Act (IRA) and in the EU and Japan) integrating CDR into their central frameworks and policy instruments (see details in *exhibit 3*). The policy signals demonstrate that the CDR market is maturing. These advancing policies are focusing on the durability of CDR together with robust measurement, reporting and verification (MRV) requirements. The mentioned developments make a focus on quality in CDR a no-regret move.

*"To build on the billions of dollars DOE is putting to work on CDR science and innovation, it is essential we catalyze CDR credit demand to build a strong industry. We are proud to have recently joined the White House and other partner agencies to release voluntary carbon markets principles that emphasize the transformational power of credits to finance carbon dioxide removal. Now we must put those principles in action with our purchasing program, which continues to grow and recently announced its first 24 semifinalists. Looking ahead, the new Voluntary Carbon Dioxide Removal Challenge will call on other organizations to purchase small and growing amounts of CDR credits."*

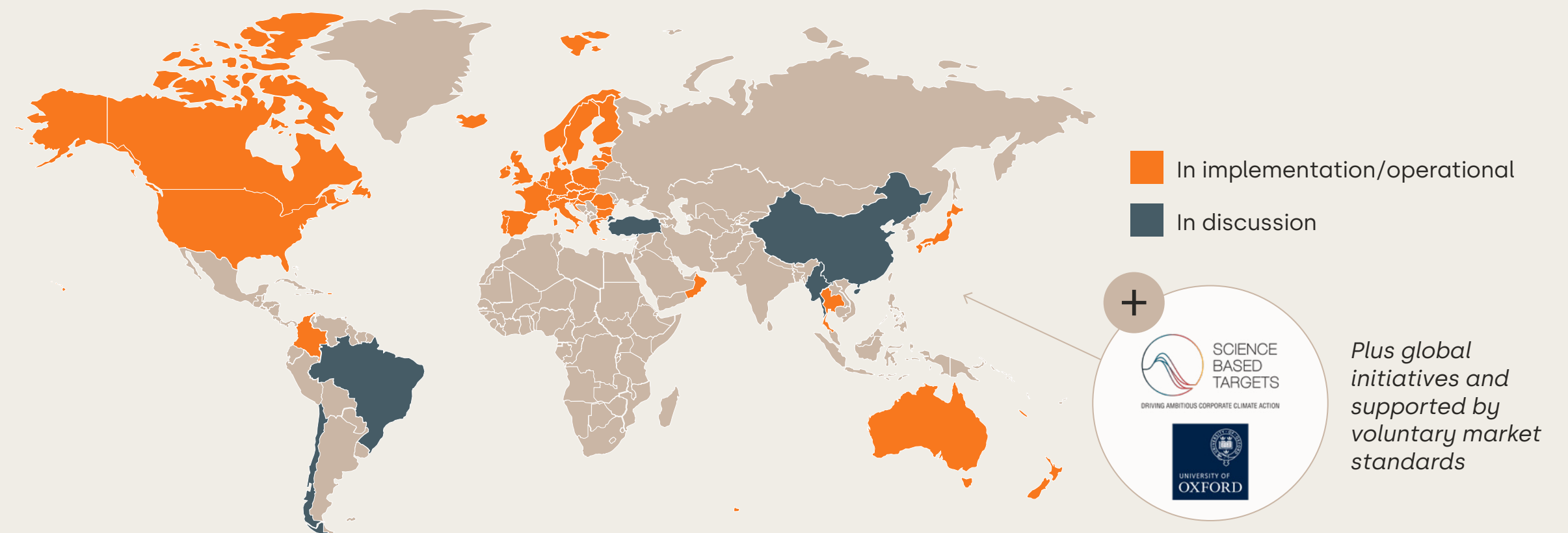


– Noah Deich, Senior Advisor, U.S. Department of Energy

### Exhibit 3: CDR has entered the global policy stage

Sources: (SBTi, 2024), (U.S. Government, 2022), (Oxford Net Zero, 2024), (European Commission, 2023), (S&P Global, 2024), Climeworks analysis

#### Policies supporting the use of durable CDR



#### Examples U.S.:

1. **Inflation Reduction Act**, includes significant Section 45Q tax credits for some CDR
2. **CDR Purchase Pilot Prize**, a government procurement program for CDR
3. **Voluntary CDR Purchase Challenge**, a government-led initiative calling on private companies to purchase high quality CDR

#### Examples Japan:

1. **J-Credit Scheme**, certifies emissions removals, is expanding to certify CDR project types
2. **Japan's GX-ETS**, the national Emission Trading System will integrate national & intl. CDR projects

#### Examples Europe:

1. **Proposed EU 2040 targets** set a separate CDR volume target
2. **EU regulation** is requiring companies to increase disclosures on CDR and defining how they can use CDR to meet climate targets (EU CSRD, Green Claims Directive)
3. **EU CRCF** is establishing a framework for certifying high quality CDR
4. **Both the EU and the UK** are exploring inclusion of CDR in their Emission Trading Systems (ETS's)
5. **Governments** (e.g., Denmark, Sweden) are setting up systems for **large public procurement of CDR**



Why now  
continued

Companies benefit from high quality CDR also beyond regulatory developments. There is a company-specific positive business case along six dimensions for investing in high quality CDR today (see *exhibit 4*):

- **Manage costs** – Engaging in CDR early helps secure favorable commercial terms and better financing terms overall, reducing debt and equity financing costs for companies due to improved Environmental, Social and Governance (ESG) ratings
- **Secure supply** – Locking in high quality supply and gaining preferential access to future volumes helps companies secure the CDR required to meet their net zero goals long-term
- **Maximize co-benefits** – Investing in a portfolio of high quality CDR projects across nature based and technology based solutions allows to maximize co-benefits due to stronger, and more balanced social, environmental and economical contributions
- **Drive business opportunities** – Engaging in investments and partnerships in CDR allows companies to help shape this emerging industry, which in turn can open new business opportunities
- **Mitigate risks** – Futureproofing against liability associated with purchasing low quality offsets, by investing into a diversified CDR portfolio mitigating project- and technology-specific risks
- **Enhance reputation** – By communicating about CDR partnerships, companies can demonstrate tangible climate action towards customers and employees bolstering their reputation, reducing among others customer churn, hiring costs and employee turnover

*"At Cisco, we strive to be a leader in the low-carbon transition. Carbon dioxide removal (CDR) can play an important role in reaching our net zero greenhouse gas (GHG) emissions goal validated by the Science-Based Targets initiative (SBTi). Under our SBTi net zero goal, our primary focus is on reducing absolute Scope 1, 2, and 3 emissions by 90% by 2040, compared to a baseline of Cisco's fiscal year (FY) 2019. But, we recognize that certain sectors are harder to decarbonize. In this case, CDR can help neutralize residual emissions and address past emissions. In addition, investing in CDR can help drive other co-benefits, including ecosystem regeneration and economic benefits, like new industry and job creation. Making early investments in CDR technologies and projects can help develop the market to create future availability of high-quality, verifiable offsets that can support future demand on the global pathway towards net zero. We believe patient capital in CDR is needed today to advance a regenerative, inclusive future for all."*



– Mary de Wysocki, Chief Sustainability Officer, Cisco

#### Exhibit 4: 6 key benefits of investing in CDR

Sources: (WEF, 2023), (MSCI, 2020), (BCG, 2024), (WBCSD, 2024), Climeworks analysis





Why now  
continued

*“Businesses who stay at the forefront of the fast-evolving CDR industry generate commercial opportunities for themselves. By engaging actively with different CDR players, BCG has continued to build its own CDR expertise and thought leadership. This helps us walk the talk and serve our climate and sustainability clients in a credible, effective way”*



– Cornelius Pieper, Global topic leader Climate & Sustainability, Managing Director & Senior Partner, BCG

**Many companies have realized the importance of CDR and are acting.**

In addition to decarbonizing their operations and value chain, CDR has become core to their sustainability and net zero strategy. For this reason, they have made significant investments into high quality CDR to date (see exhibit 5).

*“In line with the WorldGBC's Net Zero Carbon Buildings Commitment on embodied carbon emissions, Majid Al Futtaim has been working towards ambitious goals, bridging gaps by turning obstacles into solutions that not only serve our sustainability agenda but also influence our partners to follow suit. Our journey to net positive demands bold commitments, resolute action, and unwavering courage and accountability.”*



– Ahmed Galal Ismail, CEO, Majid Al Futtaim

### Exhibit 5: There is significant engagement in the CDR market

Sources: (CDR.fyi, 2024), Climeworks analysis



**15+**

**innovators**

have purchased significant volumes of high-quality CDR (>50kt)



**~300**

**top sustainability performers**

have made some purchase of high-quality CDR



**1000+**

**sustainability leaders**

are planning to buy CDR in the next ~18 months

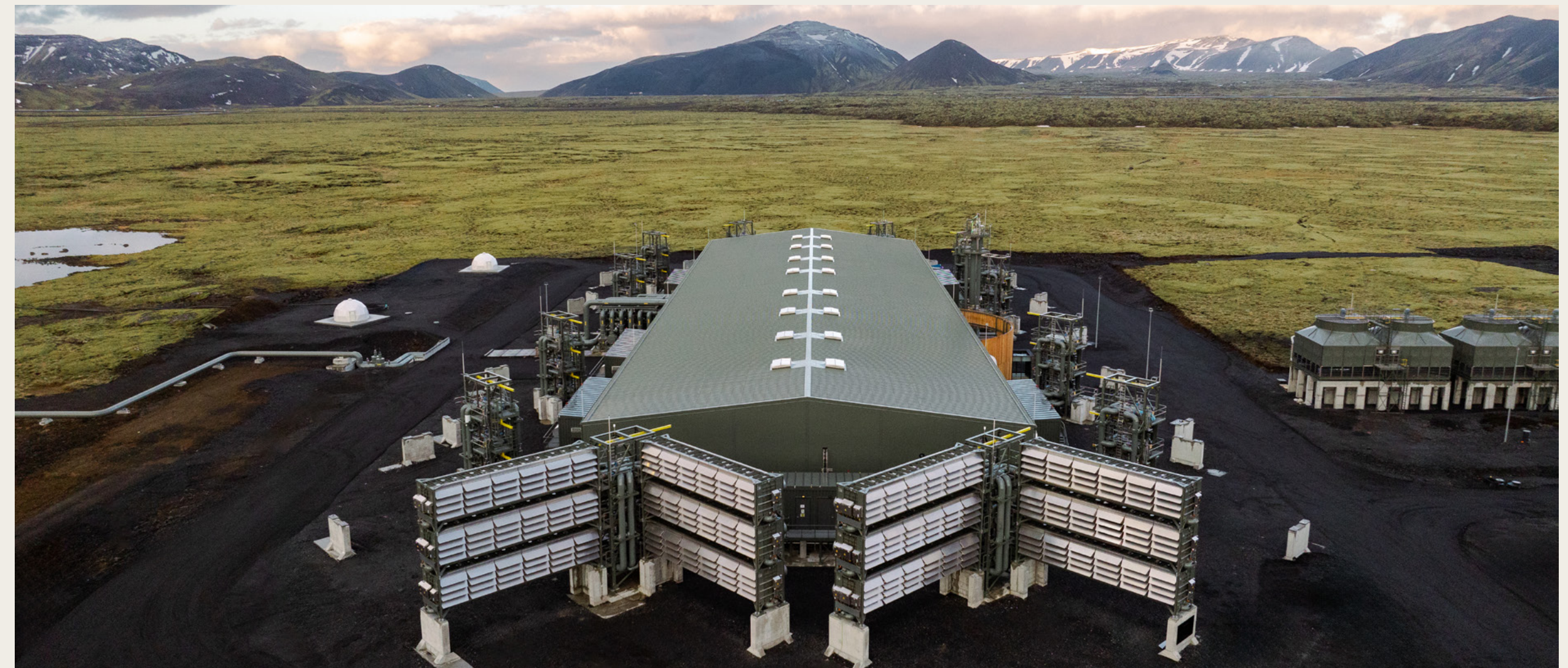


Photo credit: Climeworks



# 04. Call to action

**Now is the time** for your company to substantiate its sustainability commitments and level up its climate action. Now is the time to raise the share of CDRs to 40% by 2030 and 80% by 2040 in your offsetting portfolios, in line with the Oxford Principles for Net Zero (Oxford Net Zero, 2024). Now is the time to make a true and credible commitment to the climate that involves increasingly investing in high quality, durable CDRs.

*“As the urgency to address climate change intensifies, the role of CDR technologies has become increasingly critical. The Stanford Sustainability Accelerator is working to deploy cost-effective CDR solutions at the gigaton scale through our Greenhouse Gas Removal (GHG-R) Flagship Destination.*

*The Accelerator is assembling a broad portfolio of cutting-edge CDR technologies, frameworks, and policies led by exceptional teams of faculty and students. Together, we are pushing the boundaries of what's possible in carbon dioxide removal. We invite partners to join us in accelerating the development and deployment of these transformative CDR initiatives. Together, we can unlock the immense potential of CDR to mitigate climate change and create a more sustainable future for all.”*



– Jeffrey Brown, Managing Director Sustainability Accelerator, Stanford Doerr School of Sustainability

Companies can take the first step by **understanding their CDR** needs in line with their net zero targets. Next, companies can derive a **needs-based CDR strategy** which has **a positive business case for them**. Early cross-functional engagement between sustainability and finance teams is advised to enable a **smooth sign-off** process.

**Key considerations for a successful CDR strategy** include the importance of focusing on high quality removals as well as selecting the right CDR technologies and suppliers for their individual company circumstances (see *exhibit 6*). The best way to comply with these guidance principles is to build a diversified, science-based CDR portfolio to maximize impact and minimize risk. For additional practical guidance refer to WBCSD **“How-to guide to voluntary carbon credit portfolio design”** (WBCSD, 2024). An alternative to building a portfolio in-house is to utilize buyers' alliances. A buyers' alliance aggregates CDR demand across multiple businesses and offers an entry point to the market for businesses ready to commit capital to CDR purchases.

## Exhibit 6: Key considerations for a successful CDR strategy

- ✓ Include true removals (shift away from avoidance offsets following Oxford Offsetting Principles)
- ✓ Tend towards long durability CDR to align with nature of emissions (fossil/biogenic)
- ✓ Diversify CDR technologies, select based on company's strategic priorities
- ✓ Source from high quality suppliers only to ensure trust that removal has happened (1t=1t)

*Mitsubishi Corporation together with South Pole has established NextGen CDR Facility (NextGen) to scale up CDR technologies and catalyze the market for high-quality carbon dioxide removals. By bringing together high integrity buyers and sellers of high quality certified CDRs, NextGen is helping to create the conditions the market needs to scale: making CDRs accessible with reasonable target price and enabling risk diversification for corporate buyers through a portfolio approach with multiple technologies, and providing access to deep market expertise.”*



– Megan Kemp, Head of CDR, NextGen CDR



A call to action  
continued

As is understandable, many companies do not feel comfortable defining a full CDR strategy and portfolio from the get-go. This is because they are either unsure about their level of residual emissions at net zero or they do not know which technologies will work for them in the long-term. For these reasons this report leaves business leaders with **two key recommendations for their CDR strategy**:

1. Companies benefit from **a steady CDR ramp-up towards net zero** (see *exhibit 7*) to help scale up industry capacity and to ensure that they secure access to sufficient future CDR capacity across different CDR technologies to meet their net zero targets
2. Companies benefit from **implementation in sequential waves** (see *exhibit 8*) to take credible action today, while considering that residual emissions at net zero may not yet be fully clear

What is clear is that making a small investment in CDR today is a no-regret move to then learn and refine the approach for the years to come. CDR is here to stay.

*"Investing in carbon dioxide removal now is a strategic necessity as we see escalating social costs of climate change threaten to undermine economic performance. Purchasing CDR today is one of the highest-impact uses of funds, with every dollar invested now delivering far greater returns by avoiding future costs, creating jobs and long-term value, and thus gaining competitive advantage"*

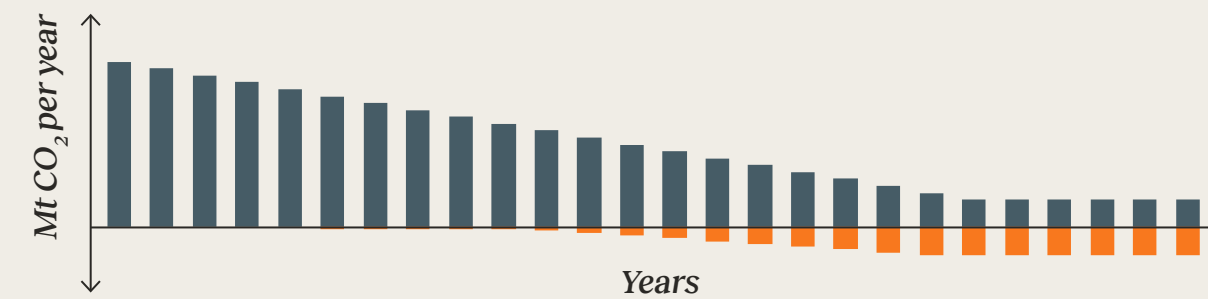


– Christoph Gebald, Co-CEO and co-founder,  
Climeworks

### Exhibit 7: Typical emissions reduction timeline and CDR ramp-up

#### Recommendation #1: don't wait until it's too late!

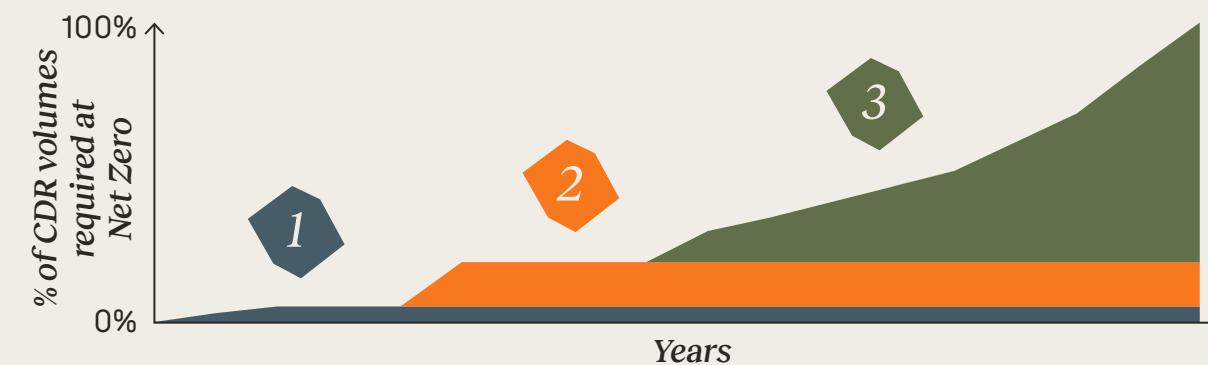
Build in a **steady CDR ramp-up** towards net zero to **scale up capacity** and **secure access** to future supply



### Exhibit 8: Typical CDR ramp-up

#### Recommendation #2: implement CDR ramp-up in sequential waves

Slicing the ramp-up into **"waves"** helps to **secure volumes** while **residual emissions** at net zero are **not yet fully clear**



e.g., wave 1 in 2025 to cover 5% of est. 2040 need, wave 2 in 2028 to cover 10-20%, wave 3 in 2032 towards net zero





# 05. Glossary

## Carbon dioxide removal (CDR)

Anthropogenic activities that remove CO<sub>2</sub> from the atmosphere and durably store it in geological, terrestrial or ocean reservoirs or products (e.g., Direct Air Capture and Storage). Companies can support these measures directly through developing projects, or through the retirement of carbon removal credits from inside or outside their value chain.

## Emission avoidance

Measures companies or organizations take to prevent GHG emissions that may have occurred from occurring (e.g., avoided deforestation or renewable energy projects). Companies can support these measures directly through developing projects, or through the retirement of emission avoidance credits from inside or outside their value chain.

## Emission reductions

Measures companies or organizations take to decrease the amount of GHG emissions that are occurring (e.g., landfill gas capture). Companies can support these measures directly through developing projects, or through the retirement of emission reduction credits from inside or outside their value chain.

## Net zero

State at which anthropogenic GHG emissions into the atmosphere balance globally with anthropogenic removals over a specified period or scope. Companies set net zero emissions targets to achieve net zero emissions.

## Neutralization

Measures companies take to remove carbon from the atmosphere and permanently store it to counterbalance the impact of CO<sub>2</sub> emissions that remain unabated at and after the Science Based Targets initiative (SBTi)-aligned net-zero emissions target date. Companies can implement CDR within or beyond their value chain to neutralize residual CO<sub>2</sub> emissions.

## Residual emissions

Emissions that are not possible to eliminate despite implementing all available mitigation measures contemplated in pathways that limit warming to 1.5°C with no or limited overshoot. In the context of science-based targets, residual emissions refer to the company's scope 1, scope 2 and scope 3 emissions that remain once it has achieved its long-term emissions reduction target.



# 06. Company factsheets



# Ahold Delhaize: *the WHAT, WHY, and HOW*



## What

### What is your net zero target?

#### Scope 1&2 (2018 baseline):

- 50% reduction by 2030
- net-zero by 2040:
- at least 90% reduction
- up to 10% removals

#### Scope 3:

- We commit to reduce absolute scope 3 FLAG GHG emissions by 30.3% (or 4.7 MtCO<sub>2</sub>e) by 2030 from a 2020 baseline (of 15.5 MtCO<sub>2</sub>e).
- We commit to reduce absolute scope 3 Energy and Industrial GHG emissions by 42.0% (or 12.4MtCO<sub>2</sub>e) by 2030 from a 2020 baseline (of 29.5MtCO<sub>2</sub>e).
- Net-zero by 2050, which corresponds to approximately 83% reduction compared to our 2020 baseline.

### What is your CDR strategy?

Scope 1 and 2: Our primary focus is reduction of emissions in our own operations and value chain. In the short term, we do not plan to procure significant volumes of removals. In the mid- to long term we aim to enter offtake agreements to incentivize development and secure the supply that we need towards our net-zero target year. We will use high-permanence (tech-based) removals for our fossil-based emissions

residuals. For our refrigerant-based emissions residuals, we plan to use lower-permanence (nature-based) removals. We are awaiting the development of science-based guidance for refrigerant neutralization – selecting the right approach for refrigerant residuals is one of our current challenges.

So far we have not made purchases of CDR. We have had discussions with providers of both nature-based and technology-based solutions and we have visited a Climeworks site. These discussion and available guidance (e.g. from SBTi) are helping us to define our strategy.

Scope 3: We are current developing our strategy for scope 3 removals. At this time, we will focus on in-value chain removals and reductions for FLAG-based emissions residuals. We have not yet considered an approach for fossil-based emissions residuals.

Our net-zero strategies for scope 1, 2, and 3 are SBTi-aligned and as such we will use only CDR to neutralize residual emission. We will not use avoidance credits to claim net zero.

## Why

### Why is CDR important for your net zero strategy?

Our transition plans show that it is unlikely that we can reduce our scope 1, 2, and 3 emissions to absolute zero by the target years. As such, we will have residual emissions and CDR is required to neutralize these.

### Why is it important to act now on CDR?

We can show leadership by incentivizing the development of IPCC-recognized technologies, which are crucial for meeting global climate targets.

We can secure supply and hedge price through offtake agreements.

The SBTi net-zero standard requires companies to demonstrate the integrity of commitments to neutralize unabated emissions at net-zero.

### What are the key arguments of your business case for CDR?

Risk mitigation, we want to ensure that we will reach net zero by the target year.

We can demonstrate to stakeholders that we take our climate commitments seriously.



## How

### How do you get buy-in within your organization?

The topic is new to our organization. We are combining our strategy proposal with an introduction to the CDR topic. We work closely with the team responsible for financial planning of the scope 1 and 2 reduction strategy. In addition, we keep actions regarding CDR at the global level. Our brands should continue to focus solely on mitigation activities.

### What is a key challenge that you face to executing your CDR strategy?

We aim to apply the 'like-for-like' principle, fossil residuals should be neutralized with high-permanence solutions, short-lived residuals can be neutralized with lower-permanence solutions. A large share of our scope 1 and 2 residual emissions will consist of refrigerants. In a sense they are comparable to methane; a high GWP but short-lived in the atmosphere (decades). We have derived that refrigerants can be neutralized with lower-permanence solutions. We would like to see this confirmed by science-based guidance.



# BCG: *the WHAT, WHY, and HOW*



## What

### What is your net zero target?

- Reduce Scope 1 & 2 by 92% per FTE by 2025 (vs. 2018 levels)
- Reduce Scope 3 business travel emissions by 48.5% per FTE by 2025 (vs. 2018 levels)
- Eliminate 100% of our remaining emissions through high-quality carbon removal solutions

### What is your CDR strategy?

- Remove residual emissions via high-quality, high-impact credits by 2030.
- Diversify our portfolio and support emerging technologies while increasing the percentage of durable carbon removal solutions.
- Foster long-term partnerships with the potential to deliver megaton-scale CDR solutions, as seen in collaborations with Climeworks and other industry leaders

## Why

### Why is CDR important for your net zero strategy?

Buying CDR is a **strategic investment for BCG for the mid and longer term** to:

1. Secure future supply for periods of supply-constraint to ensure BCG can deliver on our ambitious commitments
2. Support the scale-up of the high-quality CDR market overall by providing long-term offtakes
3. Invest early to help accelerate the cost curve for key CDR technologies
4. Engage with and stay at the forefront of emerging CDR industry to continue to serve our clients in the best way on climate and sustainability topics

**Two key considerations** when selecting the right CDR technologies for our portfolio:

- The value is multi-dimensional: Beyond the quality, value also comes from the proven ability to deliver volumes and the long-term scalability of the solution to gigaton scale
- High-quality CDR is still a new industry and requires higher costs until it reaches a certain scale: Firms like BCG can play an instrumental role in bringing those solutions down the cost curve and shaping the market by becoming early offtakers

## How

### How do you get buy-in within your organization?

Climate and sustainability is a priority area for BCG.

We expect to invest \$2 billion by 2030 to reach our climate commitments and also to provide consulting support to society and organizations to address critical climate and sustainability efforts.

We have invested heavily into emission tracking capability on project and employee level and set ambitious climate targets with ongoing engagement throughout the business.

Demonstrating the critical role of CDR in achieving our climate commitments has been essential. This clarity has reinforced its importance within our broader strategy and ensured continued focus and investment across the organization.



# Cisco: *the WHAT, WHY, and HOW*



## What

### What is your net zero target?

Cisco's goal is to reach net zero greenhouse gas (GHG) emissions across our value chain by 2040. This means reducing absolute Scope 1, 2, and 3 emissions by 90% (compared to Cisco's fiscal year (FY) 2019 base year) and neutralizing any remaining emissions by removing an equal amount from the atmosphere. We are proud that Cisco's 2040 net-zero goal was approved by the Science Based Targets initiative (SBTi) in 2022 under its Net-Zero Standard. Our goal to reach net zero by 2040 includes two near-term targets: reduce absolute Scope 1 and Scope 2 emissions by 90% by FY25 (FY19 base year), and reduce absolute Scope 3 emissions from purchased goods and services, upstream transportation and distribution, and use of sold products by 30% by FY30 (FY19 base year).<sup>1</sup> You can read more about our net zero goal in our environmental, social and governance (ESG) [ESG Reporting Hub](#).

### What is your CDR strategy?

As part of our SBTi-validated net zero goal, we may neutralize up to 10% of our Scope 1, 2, and 3 GHG emissions using verified carbon removal offsets. We plan to retire offsets in alignment with our Scope 1 and 2 near-term targets and 2040 net-zero goal. We estimate this to equate to ~24,000 tons of carbon dioxide equivalent (tCO<sub>2</sub>e) emissions in FY25 and could grow to up to ~2.7 million tCO<sub>2</sub>e beginning in 2040. Our first purchase of carbon removal offsets is expected in FY25, in alignment with our FY25 near-term target. We plan to take a portfolio approach and utilize both nature and tech-based removals that align with Core Carbon Principles of the Integrity Council for the Voluntary Carbon Market (ICVCM) and other external standards and that support co-benefits to surrounding communities. We will only purchase offsets from projects that are additional, have long-term permanence, and have undergone third-party validation and verification.

## Why

### Why is CDR important for your net zero strategy?

Our environmental sustainability strategy to connect a regenerative future has three priorities: 1) Transition to clean energy, including our net zero strategy; 2) Evolve to a circular model; and 3) Invest in resilient ecosystems. CDR plays a role in both our climate goals and in investing in resilient ecosystems. Under our SBTi net zero goal, our priority is to reduce absolute Scope 1, 2, and 3 emissions by 90% by 2040 (FY19 base year), but we recognize that certain sectors are harder to decarbonize. In this case, CDR can help neutralize residual emissions and address past emissions. In addition, investing in CDR can help drive other co-benefits, including ecosystem regeneration and economic benefits like new industry and job creation. The latter is important because it aligns with Cisco's purpose to [power an inclusive future for all](#). Focusing our CDR investments on projects that can provide co-benefits to surrounding communities is one way we can further advance our purpose.

### Why is it important to act now on CDR?

The Intergovernmental Panel on Climate Change (IPCC) notes that limiting global warming will require rapid and immediate GHG emissions reductions. Prompt action in the CDR space can aid with required atmospheric carbon reduction. Additional market growth will be required to create the volumes needed for our and our stakeholders' goals. To drive supply, investments are needed to signal demand and create economic models to support a low-carbon transition.

### What are the key arguments of your business case for CDR?

Cisco recognizes the need to develop the market to create future availability of high-quality, verifiable offsets. Investing in technologies and projects ahead of 2040 can provide a host of benefits. It can hedge price and supply volatility for the public and private sectors and support economic alternatives to fossil fuel-based technologies. Projects can also support more collective impact like creating jobs, preparing communities for climate adaptation, and reducing pollution. Investing earlier can lower the total cost of these outcomes and facilitate greater availability of CDR options in the future. Expected future demand for high-quality CDR greatly exceeds current supply, so capital is needed now to help build out the infrastructure to support volume and price requirements. In addition, we continue to see our stakeholders set similar goals and look for support. By advancing our net zero goal, including acting on CDR, we can impact both the top and bottom lines.

<sup>1</sup>The baseline and progress reported for our fiscal 2030 goal includes a subset of Scope 3 Category 1 (purchased goods and services from manufacturing, component, and warehouse suppliers), a subset of Scope 3 Category 4 (upstream transportation and distribution from Cisco purchased air transportation), and all of Scope 3 Category 11 (use of sold products).





## How

### How do you get buy-in within your organization?

We have developed an internal sustainability leadership team that is grounded in business acumen. Our strong governance practices include oversight of Cisco's initiatives, policies, programs, and strategies concerning environmental sustainability and other key corporate social responsibility (CSR) and public policy matters by a dedicated Board committee, the **Environmental, Social and Public Policy (ESPP) Committee**, as more fully set forth in the Committee's Charter. It also includes aligned cross-functional execution of sustainability activities. It is important to drive the same rigor in investing in sustainability as for other business opportunities. By connecting the positive outcomes to the company strategy and customer priorities, we can build a case for investment. In addition, being able to take both a short-term and long-term view in our strategy and communicating investment principles around CDR quality, like permanence and additionality, can help build confidence in key stakeholders. Lastly, it is imperative that we have the collaboration and sponsorship of senior leaders across our internal finance and legal organizations to get buy-in to invest.

### What is a key challenge that you face to executing your CDR strategy?

The CDR market is still nascent. Given the lengthy time horizon of planning for 2040, market availability and price forecasting can be a challenge. There will be unknowns we encounter as the market grows, and patient capital is needed to create the economics for everyone to participate. Our plan is to take a portfolio approach and use project investment and development to drive market demand and hedge availability and cost risks.



# Danone: *the WHAT, WHY, and HOW*



## What

### What is your net zero target?

Danone commits to achieving net-zero emissions by 2050. This commitment includes reducing absolute GHG emissions across Scopes 1, 2, and 3, encompassing emissions from purchased goods and services, fuel and energy-related activities, upstream and downstream transportation and distribution, waste generated in operations, and end-of-life treatment of sold products. Specifically, Danone targets a 90% reduction in these emissions by 2050, using 2020 as the base year. Additionally, Danone aims to reduce absolute Scope 1 and 3 FLAG (Forest, Land, and Agriculture) GHG emissions by 72% within the same timeframe. With 21.9 Mt CO<sub>2</sub>e emissions in the 2020 base year, the residual emissions by 2050 are projected to be 4.6 Mt CO<sub>2</sub>e.

### What is your CDR strategy?

Danone's primary focus is on reducing GHG emissions as much as possible. However, recognizing that some residual emissions will remain, the company plans to address these through carbon dioxide removal (CDR) strategies aligned with the Science Based Targets initiative (SBTi) Net-Zero standards. Danone will utilize permanent removal solutions, drawing on its experience with the Livelihoods Funds<sup>1</sup>, a partnership it has supported since 2011. These efforts will include Danone's own removal projects and the purchase of high-quality carbon removal credits to efficiently and transparently address residual emissions.

## Why

### Why is CDR important for your net zero strategy?

Even with significant reductions in emissions, it is scientifically acknowledged that some residual emissions will persist. For Danone, reaching net-zero by 2050 will require addressing these residual emissions. Carbon dioxide removal (CDR) is essential for this, as it allows for the permanent removal of an equivalent volume of carbon from the atmosphere, ensuring that Danone achieves their Net-Zero target. CDR is, therefore, a critical component of Danone's long-term climate strategy.

### Why is it important to act now on CDR?

While reducing GHG emissions within Danone's value chain is the first priority, scientific recommendations also emphasize the importance of mitigating emissions beyond the company's value chain to contribute to global decarbonization during the transition period. Recognizing this, Danone is committed not only to reducing emissions within its own operations but also to taking proactive steps to mitigate emissions beyond its immediate value chain. This is why Danone has been partnering with the Livelihoods Funds since 2011.

### What are the key arguments of your business case for CDR?

Climate change represents one of the most significant threats to the food industry, particularly due to its heavy reliance on upstream agriculture. As a leading player in the food sector, Danone recognizes its critical role in addressing the climate crisis and is committed to driving an industry-wide transition to a low-carbon economy. The profound and systemic nature of climate change demands equally profound and systemic action plans, making CDR a strategic investment that is fully integrated into Danone's financial equation. Investing in CDR is not just about mitigating risk; it is a strategic necessity to ensure long-term business resilience, sustainability, and leadership in a rapidly changing global market. This business case for CDR is bolstered by the clear alignment between climate action and Danone's long-term value creation strategy, ensuring that these investments are seen as essential to both the company's sustainability goals and its financial health.

<sup>1</sup>The Livelihoods Funds support rural communities by promoting sustainable agricultural practices that improve livelihoods and protect the environment, focusing on long-term, large-scale projects that address poverty, climate change, and ecosystem restoration.



## How

### How do you get buy-in within your organization?

Ensuring that the climate agenda is embedded in Danone's day-to-day governance and processes is a key enabler to reach its ambition in an efficient way. This is why Danone's governance allows for each function and level to take responsibility of climate action within its remit of competence, with key governance bodies facilitating alignment towards the same objectives and priorities, and incentive schemes linking business and climate performance.

Climate is not treated as a stand-alone initiative, it is embedded within Danone's overall governance up to the Executive Committee, as well as the CSR Committee of the Board and the Board of Directors itself.

### What is a key challenge that you face to executing your CDR strategy?

A key challenge in executing CDR strategies is the scalability and reliability of CDR technologies and projects. While there is significant potential in these approaches, many CDR methods are still in early stages of development or have limited capacity to be implemented at the scale required to meet companies' Net-Zero targets. Ensuring that the technologies and projects used for carbon removal are not only effective but also economically viable and environmentally sustainable presents a complex challenge. Overcoming these challenges requires continuous innovation, collaboration with stakeholders across the value chain, and a strong commitment to integrating cutting-edge solutions into the company's broader sustainability efforts. As such, Danone actively engages with start-ups and growing technologies to identify viable solutions for Danone's sustainability strategy.



# Emerson: *the WHAT, WHY, and HOW*



## What

### What is your net zero target?

Emerson established a voluntary target to reach net zero GHG emissions across Scopes 1, 2 and 3, by 2045 compared to a 2021 base year. This requires an absolute reduction of GHG emissions of at least 90%, with high-quality carbon neutralization measures for any residual emissions that cannot be abated, aligning our approach with ambitious climate science standards.

By 2030, Emerson is committed to a 90% reduction in greenhouse gas (GHG) emissions across Scopes 1 and 2, alongside a 25% reduction in Scope 3 emissions across our value chain, both compared to 2021. These near-term 2030 emissions targets were approved by the Science Based Targets initiative (SBTi) in 2022.

### What is your CDR strategy?

An important component of achieving Emerson's net zero targets is the implementation of high-quality emission neutralization tactics. For such commitments to make a meaningful impact at scale, we support the principle that the offsetting of GHG emissions should not be prioritized over mitigation efforts. Neutralization activities should only be implemented to remove residual emissions that organizations cannot otherwise reduce.

Emerson's neutralization strategy is informed by industry best practices such as the Oxford Principles for Net Zero Aligned Carbon Offsetting, with the aim that the carbon removal solutions we expect to rely on to meet our net zero targets are not only high quality but also additional, measurable, verifiable and characterized by a low risk of reversal. We will regularly review our carbon removal approaches, adapting these strategies as necessary to maintain alignment with evolving scientific understanding and regulatory frameworks.

Emerson products are also currently used by industry leading providers of technology-based offsets, and we remain focused on supporting the wider deployment of industrial-scale neutralization solutions.

## Why

### Why is CDR important for your net zero strategy?

Carbon dioxide removal (CDR) is a necessary element within any net zero strategy as it provides a pathway to address residual emissions that remain, after all feasible reduction measures have been implemented. Despite our efforts to reduce emissions across Scopes 1, 2, and 3, and the continued progress made to date, certain emissions sources are inherently difficult to eliminate completely. CDR offers a scientifically validated option to neutralize these emissions, making it possible to further our efforts to meet our net zero commitments and maintain alignment with the latest climate science.

### Why is it important to act now on CDR?

The urgency of acting now on carbon dioxide removal (CDR) stems from the need to limit global temperature rise to 1.5°C, as outlined in the Paris Agreement. Delaying CDR implementation could result in the need for more drastic measures in the future, potentially leading to higher costs and increased reliance on unproven technologies.

To effectively support the growth of the CDR industry and help de-risk investments, we believe that CDR should be integrated in climate strategies early on. This is key to help advance the much-needed technological innovations, accelerate the deployment of scalable solutions and help guarantee long-term demand.

In Emerson, our advanced automation and instrumentation technology are enablers for scaling these technologies in a cost-effective, safe, reliable, and energy-efficient manner. With our global reach and extensive industry experience, Emerson plays an important role in helping smaller CDR startups scale their operations, driving the industry forward and helping ensure that high-quality CDR solutions are available at the scale required to meet global climate targets.

### What are the key arguments of your business case for CDR?

The business case for CDR within Emerson is supported by a strategic alignment with global climate goals and the increasing demand from stakeholders for responsible environmental stewardship. Investing in CDR positions Emerson as a leader in sustainability, enhancing our competitive advantage and ensuring compliance with future regulatory requirements. Moreover, the potential long-term cost savings from early adoption of CDR technologies, combined with the mitigation of climate-related risks, can help justify these investments. We emphasize that these actions ultimately support long-term value creation.



## How

### How do you get buy-in within your organization?

Achieving buy-in for CDR within Emerson involves a comprehensive approach that includes clear communication of the long-term benefits (such as establishing access to supply and bringing Emerson's technical knowledge to help scale up the industry more cost-effectively), alignment with corporate climate goals, and a strong business case supported by data. Key stakeholders include senior leadership, sustainability teams, and finance departments. In addition, the Board of Directors has its Technology and Environmental Sustainability Committee which enhances the Board's oversight of issues such as innovation and the Company's environmental sustainability policies and programs. We engage these groups through regular updates on progress and plans.

### What is a key challenge that you face to executing your CDR strategy?

One of the key challenges in executing a CDR strategy is the selection and scaling of high-quality, permanent, and verifiable carbon removal solutions. The current market for CDR technologies is still maturing, with varying levels of efficacy and risk. To address this, Emerson's neutralization strategy is informed by expert organizations and thought leaders, such as the Oxford Principles for Net Zero Aligned Carbon Offsetting. We also partner with industry leaders and invest in pilot projects to test and validate emerging CDR technologies. Continuous monitoring and adaptation of our strategy will help us to remain aligned with best practices and evolving scientific insights.

Another significant challenge is the allocation of resources to longer-term CDR technologies while simultaneously prioritizing shorter-term reduction measures and medium-term capital investments in low-carbon technologies and projects for internal mitigation. Balancing these immediate and future needs requires careful strategic planning and resource management. To do this, Emerson engages external experts and industry groups to monitor and learn about future technologies and explores the implementation of pilot case studies whilst investing in the deployment of available decarbonization solutions.

# Equinor: *the WHAT, WHY, and HOW*



## What

### What is your net zero target?

Equinor has a net-zero target for 2050. This is for all Scopes.

We have staged targets at 2030 and 2035. In 2030 we aim to halve our Scope and 2 emissions against a base year of 2015 – the same year as Paris.

Residual emissions at 2050 have not yet been communicated – there is a significant uncertainty space which relies on multiple factors within Equinor's control, but even more so within society as a whole.

At 2030 we calculate 10% of our reduction ambition can be covered by retirement of carbon credits - this equates to an absolute number of just under 1 million tonnes per annum.

### What is your CDR strategy?

Equinor has ambitions as a CDR project developer with selected partners as well as engaging in the proto -CDR market to make purchases.

As a company which has world leading competence and ambitions in permanent geological storage, we are well placed to work with others to deliver BECCS and Direct Air Capture (DAC) projects. Equinor has also recently acquired early-stage intellectual property to develop DAC solutions in house.

We have recently made our first 3rd party purchase of durable CDR in an agreement which covers hundreds of thousands of tonnes of permanently removed CO<sub>2</sub> over a decade.

## Why

### Why is CDR important for your net zero strategy?

Any net zero strategy will require carbon markets to facilitate – there is no “net” without them. Equinor supports both the mitigation hierarchy and the Oxford Principles whereby we will as a first priority look to avoid and reduce emissions related to our operations, where there remains unavoidable/unabated emissions an increasing percentage of the compensation credits which we retire for the purposes of our climate ambitions will be of a durable nature.

### Why is it important to act now on CDR?

There are two key reasons why we believe it is important to act now.

Durable CDR projects for example BECCS and DACs deployed at scale are significant industrial projects with an execution timeline to match. In order to be able to deliver durable CDR solutions at scale in the 2030s investment and engineering have to start now.

Secondly, we believe that for durable CDR, the current Voluntary Carbon Market (VCM) is an important early funding mechanism, and a precursor to various compliance markets in some geographies around the world. As an early mover, we want to help shape the market.

### What are the key arguments of your business case for CDR?

Equinor has a compelling value proposition as a provider of key components in the CDR value chain.

Equinor and its customers are exposed to compliance markets where CDR will have a role. Investment in CDR is needed to enable effective management of that exposure and provide solutions for other market participants.

CDR will be a needed solution into the second half of the century and CDR project development represents a sustainable business opportunity.



## How

### How do you get buy-in within your organization?

We see the key stakeholders within executive leadership across the Corporate Sustainability and CFO functions primarily. Within our organization these are the units which set the strategic direction for the decarbonization pathways and control the corporate business planning. We have found that these are equally important stakeholders. Use of carbon markets can be a complex undertaking with many uncertainties remaining around use of i.e. CDR credits and the VCM, we have found the sustainability function to be more aware of this, whilst the CFO function is of course looking to balance current costs and investments with potential future climate related risks and liabilities. CDR is a topic however which has become more of an informed topic at the executive level over the past 2 years.

### What is a key challenge that you face to executing your CDR strategy?

For a company in already covered by many environmental mechanisms (CO2 taxes, compliance markets etc) and which has an ability to invest significant capital in following the mitigation hierarchy – it can be a challenge without clear regulatory reporting guidance on the use of CDR. A constant discussion “is this an extra cost?” as opposed to is “this an early investment?”.

We see fledgling policy proposals to support the sell/supply side of durable CDR, and this is positive and required clarity for the buy/demand side would also be appreciated.

# Majid Al Futtaim: *the WHAT, WHY, and HOW*

## What

### What is your net zero target?

At Majid Al Futtaim, we are fully committed to achieving net zero carbon across our operations by 2050. This ambitious target aligns with both global climate action goals and the UAE government's sustainability strategy. It includes Scope 1, Scope 2, and selected Scope 3 emissions, with a strong focus on reducing energy consumption, increasing renewable energy use, and enhancing sustainable building practices.

Our net zero journey is integral to our broader sustainability strategy, Dare Today, Change Tomorrow, which underpins our commitment to long-term climate resilience. We are investing in advanced technologies, improving energy efficiency, electrifying assets, and adopting green building certifications to drive down our carbon footprint. Through these efforts, we aim to lead the way in sustainability and contribute meaningfully to a more sustainable future.

### Net Zero by 2050

2035 SCOPE 1 AND 2 SBTS:

- Our Properties business: -87.8% kgCO<sub>2</sub>e/m<sup>2</sup> by 2035
- Our Retail, Entertainment and Lifestyle businesses: -40% kgCO<sub>2</sub>e by 2035

We are developing a net zero pathway to determine the residual emissions that will shape our carbon removal strategy by 2040.

### What is your CDR strategy?

Reducing the embodied carbon is integral to all our new development projects. Where we cannot achieve our emission goals through reduction measures, we deploy carbon removal strategies.

Since 2021, as part of Our Sustainable Building Policy, we mandate that all new owned development projects conduct an assessment using Majid Al Futtaim's Embodied Carbon Tool during the design phase. This ensures a 20% reduction in embodied carbon compared to the baseline for that asset type. New assets and fit-outs achieve this by sourcing local materials with high recycled content and low carbon intensity. This approach is a gradual approach to align with the World Green Building Council's (WorldGBC) targets to reduce embodied carbon by 40% by 2030.

We invested in the Delta Blue Carbon Project, certified by the Verra Carbon Standard, to offset embodied carbon reduction shortfalls at City Centre Almaza and City Centre Al Zahia in 2022. This project, which has one of the highest-quality carbon credits available at the time, involves planting mangroves and supporting forest-dependent communities in Pakistan's Sindh Province. The project is expected to sequester approximately 142 million tonnes of CO<sub>2</sub>e over its 60-year lifetime, while protecting the biodiversity of the Indus Eco Region's 247,000 hectares of mangroves. Additionally, it will improve the livelihoods of nearly 43,000 people, many of whom live below the poverty line with limited access to clean drinking water and basic healthcare.

## Why

### Why is CDR important for your net zero strategy?

CDR will play a key role in our net zero strategy, though we are still in the process of developing a comprehensive approach for it. Majid Al Futtaim's sustainability report highlights our ambitious emission reduction goals across Scope 1, 2, and 3, but we recognise that some residual emissions will remain by 2040. As we refine our strategy, CDR will become crucial in addressing these unavoidable emissions.

As a sustainability pioneer within the MENA region, Majid Al Futtaim has been involved in Dubai's Voluntary Carbon Credit Trading Platform in 2023. This initiative, led by the Dubai Financial Market (DFM), aims to raise awareness of climate change and provide an accessible entry point for entities new to carbon markets, helping to lay the groundwork for future compliance markets. The platform positions Dubai and the UAE as a global hub for climate action, reinforcing the UAE's commitment to mitigating climate change. Majid Al Futtaim aims to support this initiative as a signal of private sector demand for the UAE Voluntary Carbon Market. Currently, our carbon removal projects are implemented on a case-by-case basis. Reducing embodied carbon is a key focus for all our new development projects. When we cannot meet our emission reduction goals, we turn to carbon removal solutions.

### Why is it important to act now on CDR?

**Climate Risk Mitigation and Adaptation:** Escalating physical risks associated with climate change, including extreme weather events and rising sea levels. Immediate action on CDR not only mitigates these risks but also enhances adaptation strategies, helping organisations adjust and respond effectively to ongoing and future climate impacts.

**Regulatory Compliance:** Global regulations are becoming stricter with more ambitious climate targets. Acting now on CDR ensures compliance with these evolving regulations and avoids potential penalties, positioning companies favourably in the face of both current and anticipated regulatory frameworks.

**Supply Chain Resilience:** Taking immediate action on CDR is vital for bolstering supply chain resilience against climate change. Climate-related disruptions can hinder operations and inflate costs. By adopting CDR strategies, we can reduce our carbon footprint and enhance sustainability, ultimately strengthening the reliability of our supply chains in a volatile climate.



## Why

### What are the key arguments of your business case for CDR?

**Regulatory Changes:** With the anticipated rise of carbon taxes and pricing mechanisms, integrating CDR early helps us stay ahead of evolving regulations. By preparing for future compliance, we safeguard the business against potential financial penalties.

**Climate Risk:** Our assets are increasingly exposed to physical risks associated with climate change, assessed through the updated Representative Concentration Pathways (RCPs). By proactively addressing these risks through CDR, we enhance our climate resilience and mitigate long-term financial impacts.

**Reputational Risk:** Committing to net zero by 2050 bolsters our brand reputation, aligns with investor expectations, and exceeds the sustainability demands of customers, particularly Gen Z, who prioritise environmentally responsible practices.

**Financial Risk:** Failing to act on CDR could devalue our assets due to increased exposure to climate risks. Additionally, maintaining access to sustainability-linked loans and green sukuk requires credible climate action, with CDR being a key component of our strategy.

## How

### How do you get buy-in within your organization?

To secure buy-in within our organisation, it is essential to engage the Chief Executive Officer in conversations regarding our climate change targets, as their leadership significantly enhances the organisation's commitment to sustainability. Additionally, the integration of the sustainability department under the Chief Financial Officer at Majid Al Futtaim amplifies the prominence of our climate objectives, ensuring they possess the requisite authority and influence across the business. This strategic alignment of leadership roles facilitates a cohesive approach to sustainability and underscores our dedication to achieving our climate goals. Key stakeholders in this process include executive management, departmental heads, and cross-functional teams, all of whom play a vital role in driving our sustainability initiatives forward.

### What is a key challenge that you face to executing your CDR strategy?

**Challenge:**

1. The location of the carbon credits is not aligned with our operational areas.
2. The harsh climate conditions make it challenging to initiate nature-based solutions for generating carbon credits.

**Solution:** We seek validated high-quality projects within the region or closer that deliver environmental, economic, and social benefits, while continually exploring business development opportunities locally.

**Challenge:** Budget constraints limit our ability to pursue these initiatives.

**Solution:** Internal carbon pricing has been established, but no new assets have been available for implementation thus far. Our pricing model, based on \$/t CO<sub>2</sub>e, was developed following an in-depth study of international best practices. For any new asset that fails to account for its embodied carbon during construction, an internal carbon price will be imposed and directed towards funding carbon removal projects.

**Challenge:** Limited knowledge of carbon credits and the reputational risk of greenwashing associated with their purchase, often intensified by articles.

**Solution:** Raise internal and external awareness and establish stringent validation criteria and certification processes for carbon credits.

# Mitsui O.S.K. Lines: *the WHAT, WHY, and HOW*



## What

### What is your net zero target?

- With the concerted effort throughout the Group, achieve net zero GHG emissions by 2050.
- All of Scope 1, 2, and 3 covered (MOL + consolidated subsidiaries)

### What is your CDR strategy?

- Direct involvement in CDR and Utilizing CDR for the neutralization of residual emission at the net zero target year. We have set our net-zero target year as 2050, and we forecast that less than 10% of the emissions from our baseline year of 2019, which had approximately 15 million tons of emissions, will remain as residual emissions. To ensure the net zero emissions goal and considering the limited remaining carbon budget, we have an interim milestone contributing to the removal of accumulative 2.2 million tons of CO<sub>2</sub> by 2030.
- For 2.2 million tons, we take a portfolio approach across Nature based solutions and Technology based solutions considering several aspects such as like-for-like concept for durability. In terms of acquiring knowledge and getting more deeper thought about strategy, participating in buyer consortium scheme such as NextGen CDF Facility and discussing with buyer peers is fruitful.

## Why

### Why is CDR important for your net zero strategy?

The shipping industry is considered as a hard to abate sector and complete decarbonization by 2050 is challenging. CDR is essential to achieve the net-zero target.

### Why is it important to act now on CDR?

To meet the required amount of CDR needed in the future, CDR needs to scale. But CDR cannot scale and will not be available when we need them if everyone just waits for its price to drop down. With an awareness of such challenges, we will act as a first mover and contribute to innovation and cost reduction of underfunded elements of nascent solutions.

### What are the key arguments of your business case for CDR?

To show how involvement in CDR can positively impact a company is the key argument. Companies will be able to get more actively involved in CDR if an international common understanding, regulations and/or guidelines are formed that efforts towards CDR have a positive impact on companies, in addition to contributing to environmental aspect.

## How

### How do you get buy-in within your organization?

Early adoption of CDR can provide us with a competitive edge. It positions us as a leader in sustainability and can enhance our reputation among customers, investors, and other stakeholders. Understanding of management committee and creating a whole environmental vision including CDR towards net zero are important to dedicate a certain budget to CDR activities.

### What is a key challenge that you face to executing your CDR strategy?

Internal discussion of the "key arguments" is always required due to the absence of clear guidance. Creating our own pathway with a whole environmental vision is required and showing a reasonable CDR strategy including implementation plan with a view to dealing with future risks like shortage of CDR supply and with expanding both new and conventional related business opportunities is essential.



# SAP: *the WHAT, WHY, and HOW*



## What

### What is your net zero target?

- Net zero across our entire value chain by 2030.
- Including all relevant absolute GHG emissions of scope 1,2 and 3 by 90% from 6,9 million to ~690k tons.
- Neutralizing max. 10% residual emissions with high-quality carbon removals, aligning with SBTis.
- Engaging in continuous investment for carbon removals of 10% of the 2023 baseline (690 kt CO<sub>2</sub>e) yearly for 2030ff.

### What is your CDR strategy?

- SAP's current strategy entails aligning CDR needs according to our net zero targets. It starts with a small initial investment to learn and refine for future steps.
- In addition to high-quality, nature-based solutions, such as reforestation, SAP is willing to invest in technical removals to neutralize residual emissions and achieve an amount of 690 kt CO<sub>2</sub>e by 2030.
- Our work with CDR companies consists of auditing potential CDR investments and collaborating on additional software and innovation opportunities.

## Why

### Why is CDR important for your net zero strategy?

- SAP's strategic net zero program is a key element in its approach to sustainability to create positive impact within planetary boundaries, remain competitive amid growing expectations, and improve operational efficiency through process optimization.
- CDRs are important steps in our net zero 2030 journey to neutralize residual emissions that cannot be avoided and reduced.
- CDRs help us stay ahead of planetary, regulatory, and competitive requirements by continuously evaluating opportunities to reduce emissions.
- SAP can take advantage of the growing market for carbon capture and storage to learn for future activity.

### Why is it important to act now on CDR?

- The market for CDRs (esp. technical) is limited and demand is rising; it is beneficial to start early getting access to ensure significant shares.
- In addition to experience with nature-based removals, SAP wants to gain experience with technical removals in early stages for ease with future activities.
- Only a fundamental shift in business will allow us to achieve our global climate goals. It is in our favor to take advantage of all immediate possibilities to reduce emissions.

### What are the key arguments of your business case for CDR?

- Engaging early on in CDR reinforces SAP's thought leadership and early exploration in key climate activities.
- Co-Innovation: Combines the power of knowledge and expertise in sustainability to innovate for the benefit of our customers
- Solidifies SAP's ability to deliver on its net zero strategy.



## How

### How do you get buy-in within your organization?

- Buy-in is achieved by early involvement of different stakeholders (CEO, CFO, CSO) and transparent communication of the pros and cons of investments and the impact created.
- We have board-level sponsorship of the Sustainability line of business.
- Sustainability is a core staple of our corporate strategy remains at the base of key decision-making.

### What is a key challenge that you face to executing your CDR strategy?

- Prices for technical CDRs are comparably high per ton of CO<sub>2</sub> and scalability is still an issue for vendors and partners
- We are shaping attractive limited off-take agreements that will be financially viable to get started.



# U.S. Department of Energy: *the WHAT, WHY, and HOW*



## What

### What is your net zero target?

DOE's target is to reach net zero emissions for the Agency by 2050, including a 65% reduction in scope 1 and 2 GHG emissions by 2030, as outlined in Executive Order 14057 and the accompanying Federal Sustainability Plan. This includes achieving 100% carbon pollution-free electricity by 2035, 100% zero-emission vehicle acquisitions by 2035, net-zero emissions buildings by 2045, and net-zero emissions procurement by 2050.

The Biden-Harris Administration has also set economy-wide net-zero target for 2050. The Administration's climate modeling to support this target anticipates residual emissions to be between 5-20% of current emissions.

### What is your CDR strategy?

DOE's overarching carbon dioxide removal strategy is defined by the Carbon Negative Shot™, which emphasizes technological innovation and scale up. DOE has an annual budget of ~\$100 million for CDR research and development towards 4 main goals of the Carbon Negative Shot: 1) less than \$100/net metric ton CO<sub>2</sub>e for both capture and storage; 2) robust accounting of full lifecycle emissions; 3) high-quality, durable storage with costs demonstrated for MRV for at least 100 years; and 4) gigaton scale. DOE also has \$3.6B in funding from the Bipartisan Infrastructure Law for direct air capture innovation, and ~\$10M in additional funding for carbon management deployment from the BIL. With BIL funding, DOE is pioneering a \$35M program to purchase CDR credits and has \$20M in FY24 base appropriations funding from Congress to run a second round of the purchase effort. In parallel, DOE has launched a [Voluntary CDR Purchasing Challenge](#) to encourage private CDR credit purchases.

DOE does not have specific volume targets for CDR credit purchases. Instead, DOE is focused on maximizing innovation and learning from our CDR purchases to drive down costs and make CDR credit purchasing as accessible as possible for the private sector and other governments in the future.

## Why

### Why is CDR important for your net zero strategy?

The U.S. Government has identified large-scale CDR as essential to achieving a net-zero emissions economy. DOE's strategy in purchasing credits is rooted in catalyzing innovation and benefitting the overall market by establishing purchasing norms for buyers, lending credibility to selected suppliers, providing funding to projects, and supporting the development of a robust VCM.

### Why is it important to act now on CDR?

To achieve the scale necessary for our climate goals, CDR activity must rapidly grow by several orders of magnitude. From decades of experience scaling and commercializing other technologies, DOE knows that large-scale deployment does not happen overnight. Innovators need capital and revenue today, and voluntary CDR credit purchases can be a powerful tool to support carbon removal developers. Developing projects at successively larger scales enables the field to learn in a cost-effective way.

### What are the key arguments of your business case for CDR?

CDR credit purchases contribute directly to DOE's operational net-zero goals and furthermore have strong strategic alignment with the technological innovation goals of the Carbon Negative Shot. The Administration and a bipartisan set of Congressional policymakers have made it clear that small and growing investments in CDR today are critical for meeting our climate goals in the future.



## How

### How do you get buy-in within your organization?

DOE's purchasing authority is set by Congress. Strong buy-in was achieved by designing a purchasing program that emphasizes technological innovation, market growth, workforce development, and other benefits beyond the tons retired.

### What is a key challenge that you face to executing your CDR strategy?

A key challenge is inspiring other public and private sector buyers to join in purchasing CDR credits. Much more demand is needed to elevate CDR to climatically relevant scale, but the market today lacks sufficient buyers. Many of the potential buyers for CDR credits are concerned by cost premiums, inconsistent MRV, and a lack of clear regulatory or voluntary mandate. Our Voluntary CDR Purchasing Challenge, launching in the coming months, encourages private sector buyers to purchase CDR and receive DOE recognition. As part of this Challenge, we will be preparing resources that can assist buyers in navigating the complex ecosystem of CDR purchasing.



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# Acknowledgements

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## About WBCSD

The World Business Council for Sustainable Development (WBCSD) is a global community of over 225 of the world's leading businesses driving systems transformation for a better world in which 9+ billion people can live well, within planetary boundaries, by mid-century. Together, we transform the systems we work in to limit the impact of the climate crisis, restore nature and tackle inequality.

We accelerate value chain transformation across key sectors and reshape the financial system to reward sustainable leadership and action through a lower cost of capital. Through the exchange of best practices, improving performance, accessing education, forming partnerships, and shaping the policy agenda, we drive progress in businesses and sharpen the accountability of their performance.

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## About Climeworks

Climeworks is the global leader in carbon removal and empowers its clients worldwide to advance their net-zero roadmaps and fight global warming.

The company develops and operates Direct Air Capture (DAC) plants to remove CO<sub>2</sub> from the atmosphere on a gigaton scale by 2050. It runs the world's two largest operational DAC plants in Iceland, powered exclusively by renewable energy. By partnering with storage specialists such as Carbfix, Climeworks ensures the permanent removal of captured CO<sub>2</sub>, safely stored underground for thousands of years. Its carbon removal via Direct Air Capture is verified and certified by independent third parties DNV and Puro.Earth, ensuring utmost transparency. In 2024, its Orca plant became the first DAC facility to earn a AAA rating from BeZero Carbon.

In addition to innovating and scaling DAC technology, Climeworks offers curated portfolios of high-quality carbon removal solutions, combining best-in-class engineered and nature-based approaches. Its diverse and expanding customer base includes multinational corporations such as Microsoft, Boston Consulting Group, J.P. Morgan Chase & Co., and SWISS, placing Climeworks at the forefront of driving corporate sustainability worldwide.

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