




Executive
Perspectives

A close-up photograph of a hand holding a small globe of the Earth. The globe shows blue oceans, white clouds, and brown landmasses. The hand is positioned as if supporting the globe from below. The background is a soft, out-of-focus blue.

The time for climate action is now

April 2021

BCG Executive Perspectives

OBJECTIVES OF THIS DOCUMENT

IT IS CRITICAL TO ACT NOW ON CLIMATE AND SUSTAINABILITY

Climate change is not a future threat we can delay a response to, but a present crisis that requires bold action. As we continue to manage COVID-19 as a society, we cannot afford the consequences of inaction on the environmental crisis. A fundamental shift to prioritize climate and sustainability measures ensures the longer-term viability of the planet and well-being of future generations.

SUCCESS WILL REQUIRE LEADERS AROUND THE WORLD TO COMMIT TO A GREEN FUTURE

Tackling climate change is of strategic importance across the public and private sectors. The upcoming COP26¹ summit will be a critical inflection point in public sector sustainability commitments. The private sector can accelerate climate investments, which are estimated to be even larger than digital transformation investments. BCG has been selected as the official Consultancy Partner at COP26. BCG has also committed \$400M over the next decade to drive climate initiatives while pledging to reach net-zero climate impact by 2030.

1. 26th Conference Of the Parties – United Nations Climate Change Conference



**This edition is
focused on
climate change
mitigation**

Environmental Sustainability Topics

Focus of edition

Climate change mitigation

Future topics

Climate change adaptation

Role of advanced technologies in climate and sustainability

Habitats and biodiversity protection

Circular economy: pollution, waste, and resource management

The time for climate action is now; topics covered in this issue



The planet is in a dire state

- Continuing down the current path is **not an option**
- COVID-19's impact on climate is minor and only temporary
- Large share of emissions today can be reduced with existing technologies
- Estimated **~\$100-150T** investment over next 30 years (**\$3-5T/yr.**) is needed to reach net-zero emissions globally



Climate stakeholders are making progress, but further action needed

- **Governments:** Committing to climate funding; structural changes required
- **Individuals:** Growing awareness of climate impact; opportunity for companies to increase market share and attract talent
- **Investors:** Moving capital to ESG-conscious¹ funds; chance to define financial guidelines for sustainability
- **Corporations:** Facing pressures to move aggressively to net-zero



CEOs must act now to reach net-zero

- **7 actions** CEOs must take on the route to net-zero (e.g., set ambition, immediately focus on quick wins to fund the journey)
- The time for climate action is now – there will be a **sustainability scarcity** soon, creating urgency to capture first-mover advantages
- Countries expected to increase environmental commitments at **COP26**

The planet is in a dire state

+1.1°C

Current global temperature anomaly vs. pre-industrial averages

-68%

Decline in animal population sizes since 1970 according to *WWF Living Planet Report*

8M

People displaced by flooding per year

-25%

Loss in GDP/capita by 2100 on current climate trajectory

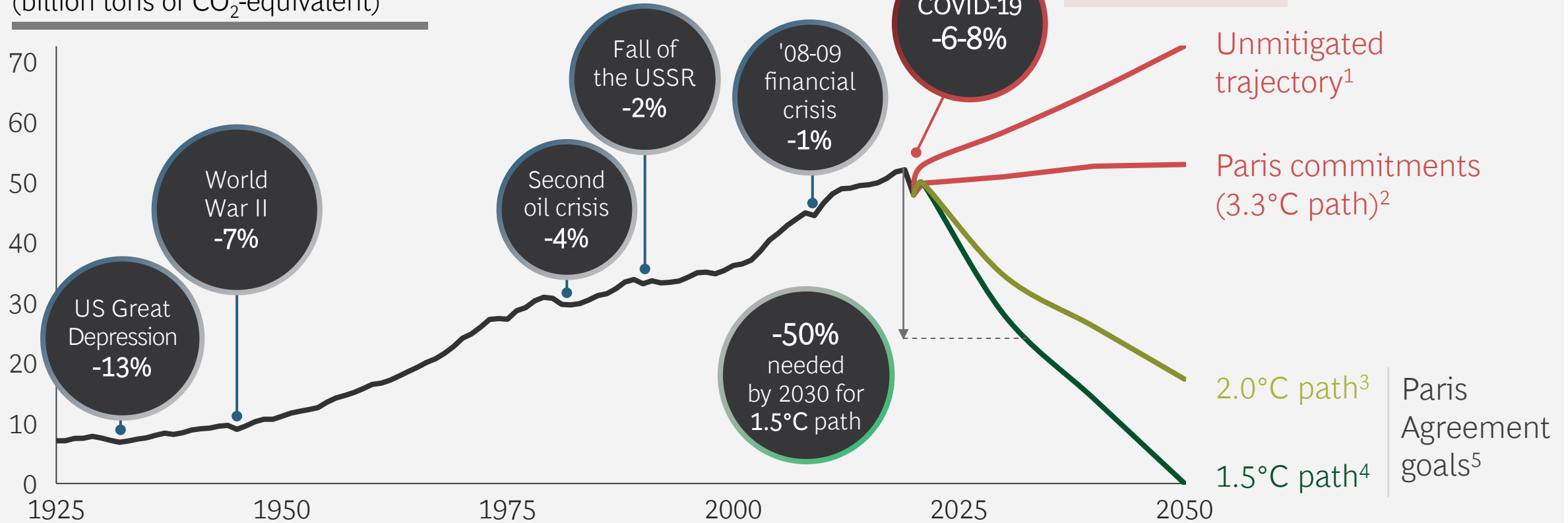
11M

Metric tons of plastic flowing into the ocean every year

Emissions trends and country commitments are far from meeting climate goals for the Paris Agreement

As of Mar 31, 2021

Global annual greenhouse gas emissions (billion tons of CO₂-equivalent)



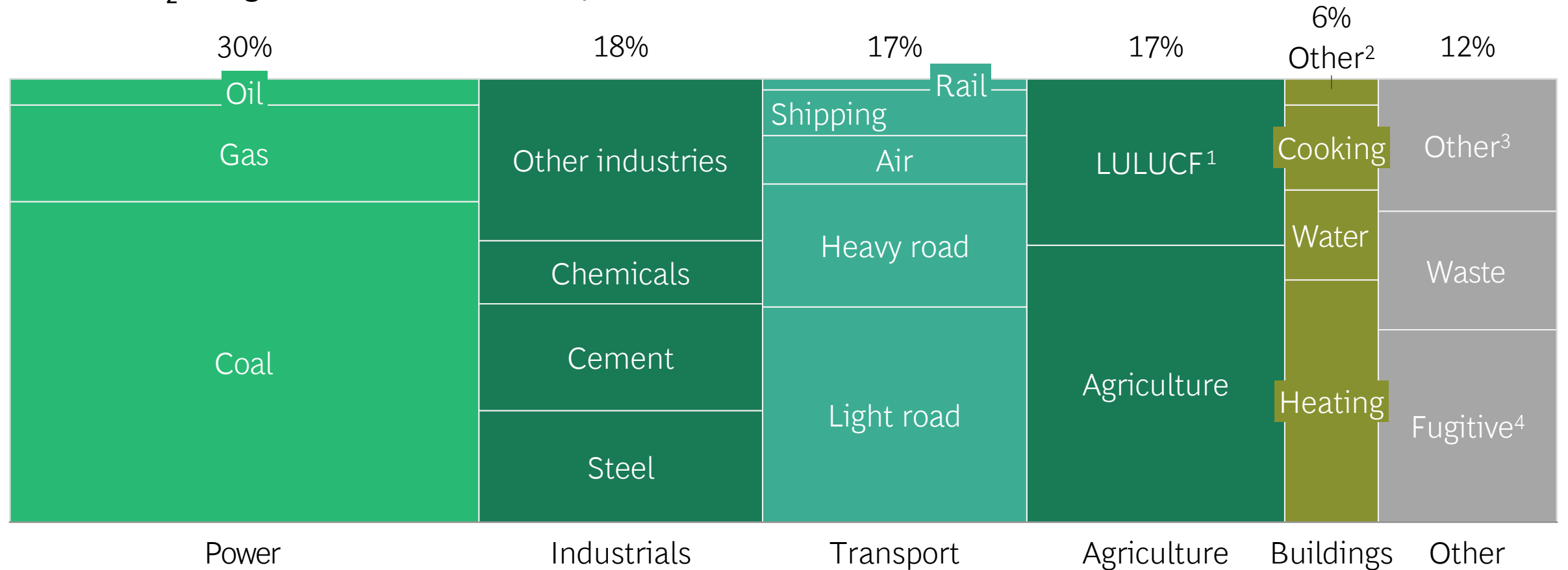
Note: These figures exclude land use, land-use change, and forestry

1. Assumes GHG emissions rebound and grow from 2020 at the same rate as the current policies scenario in UNEP 2019 Gap report to 2050 (1.1% CAGR). 2. Assumes countries decarbonize further at the same annual rate required to achieve their INDCs between 2020 and 2030. 3. Assumes 25% reduction by 2030 and net-zero by 2070. 4. Assumes 45% reduction by 2030 and net-zero by 2050. 5. Paris Agreement goals are to limit global warming to 2.0°C and 1.5°C, while Paris commitments are emission reductions commitments from individual countries

Source: EDGAR 5.0; FAO; PRIMAP-hist v2.1; Global Carbon Project; IPCC; UNEP Emissions Gap Report, WRI; Climate Interactive; BCG analysis

Power, industrials, transport, and agriculture sectors emit >80% of total greenhouse gases

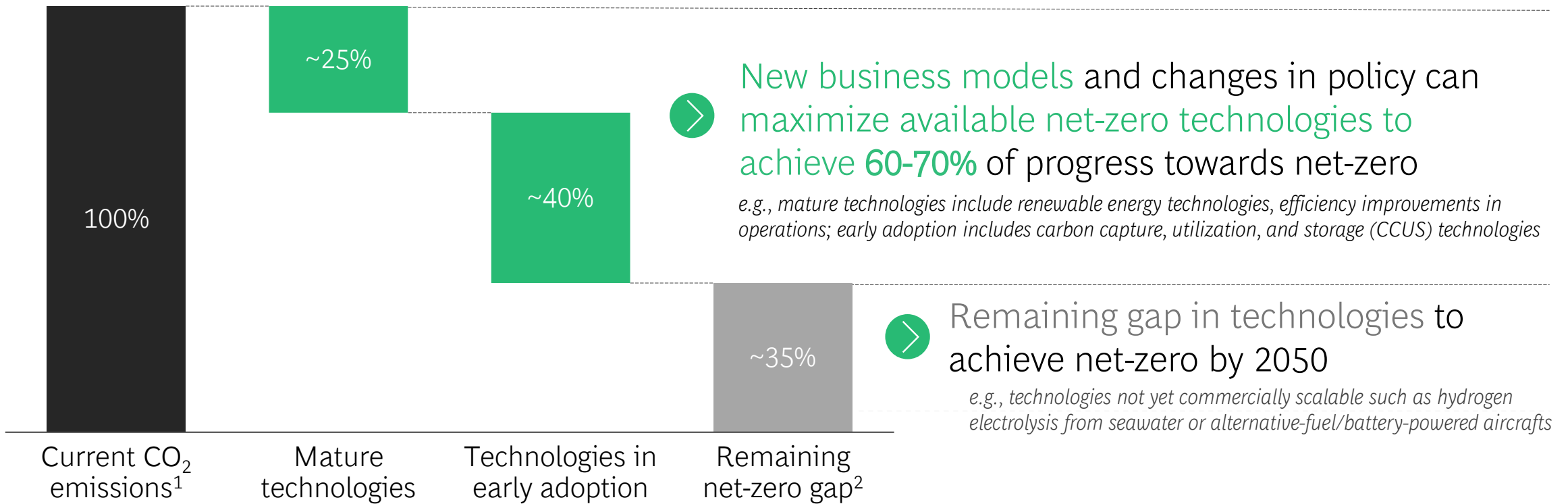
~53 Gt CO₂e of global GHG emissions, 2019



1. LULUCF: land use, land-use change, and forestry. 2. Other building emissions, e.g., appliances, lighting, space cooling. 3. Other industries, e.g., aluminum, pulp and paper. 4. Fugitive gases split between power and industry but exact split not available
 Source: CAIT; IEA; World Energy Outlook; GHG Protocol; BCG analysis

Existing technologies can reduce ~65% of emissions needed for net-zero goal

Technology gap in net-zero emissions



1. Excludes other GHG emissions (e.g., methane, nitrous oxide). 2. Includes technologies in demonstration and large prototype as well as technologies still in development.

Source: IEA Sep 2020: Global energy sector CO₂ emissions reductions by current technology maturity category in the Sustainable Development Scenario relative to the Stated Policies Scenario, 2019-2070, GFMA; BCG analysis.

Key climate stakeholders | Positive momentum, but concrete action required to meet global climate goals

Governments

Committing to climate ambitions and allocating funding, but structural changes are still required

Individuals

Growing awareness of climate impact presents opportunity for companies to increase market share and attract talent

Investors

Moving capital to ESG-conscious funds, with chance to define financial and operational guidelines for sustainability

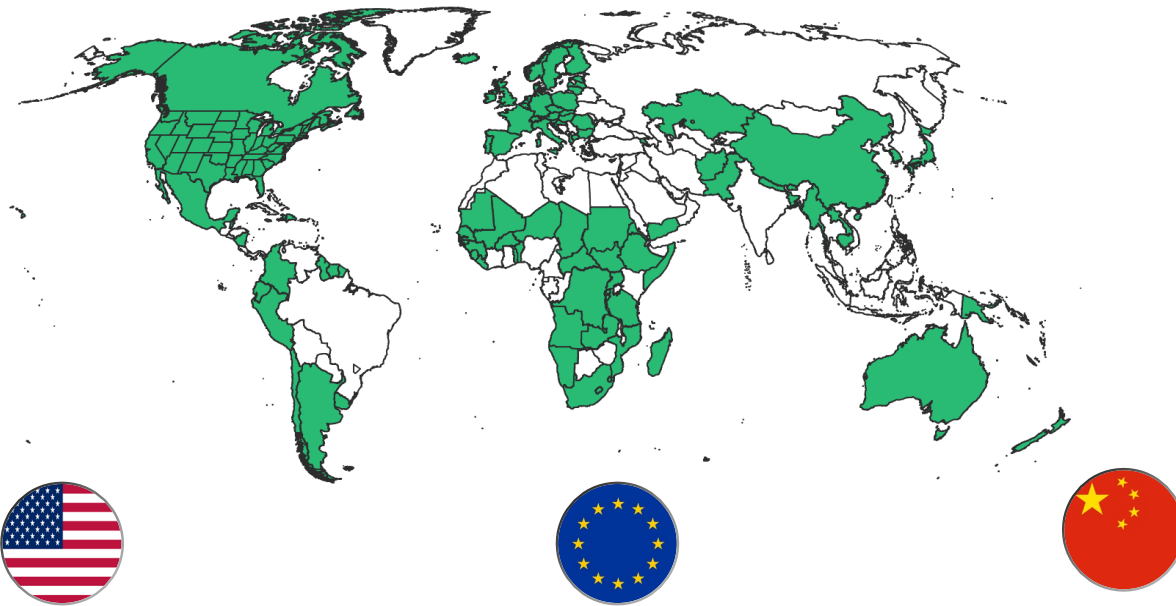
Corporations

Facing higher green demands and calls for commitments to move aggressively to net-zero

Despite this progress, the world is not on track to meet Paris Agreement commitments, setting the need for government commitments during COP26 and for other stakeholder pledges

Committing to climate ambitions and allocating funding, but structural changes are still required

~60-65% of global GHG emissions are generated in countries where authorities have set, or proposed to set, targets to bring carbon emissions to **net-zero** by around mid-century



Pres. Biden invited 40 world leaders to a climate summit on Earth Day (4/22). The U.S. will announce a 2030 emissions target before the summit

The EU aims to be climate neutral in 2050 and the European Green Deal is their plan to make the EU's economy sustainable

“We aim to have CO₂ emissions peak before 2030 and achieve carbon neutrality before 2060”
Pres. Xi Jinping at 75th UNGA

~\$1.8T of \$14.9T global pandemic stimulus¹ has been committed to action against impacts of pollution

Critical to use stimulus, along with policy, to create permanent structural changes in private / public sectors

1. G20 countries

Source: United Nations; COP25; White House; CAIT from WRI and Eurostat; ECIU; Reuters; Vivid Economics "Greenness of Stimulus Index" report (Feb 21 2021); BCG analysis

Growing awareness of climate impact presents opportunity for companies to increase market share and attract talent

Individuals

>70%

of people are **more aware now** than before COVID-19 that the **climate is threatened by human activity** and that in turn humans can be threatened by the degradation of the environment¹

Sustainable purchases

~20%

of consumers say they would be willing to pay a 10%+ premium for sustainable goods

Employee decisions

~40%

of Millennials state that sustainability was a consideration in their job choice

Companies can activate consumer sentiment through sustainable products / services to grow market share and activate employee sentiment by building a reputation for sustainability to attract talent

1. "In light of the COVID-19 outbreak, I am now more aware of the fact that humans can be threatened by the degradation of the environment" and "In light of the COVID-19 outbreak, I am now more aware of how the climate is threatened by human activity". Respectively 72% and 70% agreement on these two statements

Moving capital to ESG-conscious funds, with chance to define financial and operational guidelines for sustainability

Investors

Investors are increasingly incorporating ESG metrics into decision-making



33%

of global AUM¹ is in funds that consider ESG metrics during investment process

Green bond market grows significantly



57%

CAGR of global green bond market ('15 to '19), resulting in a total green bond & green loan issuance of \$257.7B

Repercussions for corporate leadership from investors



53

voting actions taken by BlackRock in 2020 against companies that fail to meet sustainability standards

Opportunity for investors to standardize definitions of sustainable instruments / funds and set emissions disclosure / reduction requirements for their portfolio companies

1. AUM = assets under management

Sources: GSI Review 2018; UBS "What's on Investors' Minds / 2018 Volume 2"; Climate Bonds "2019 Green Bond Market Summary"; gofossilfree.org; BCG; Simfund; Broadridge; GBI

Facing higher green demands and calls for commitments to move aggressively to net-zero

Corporations

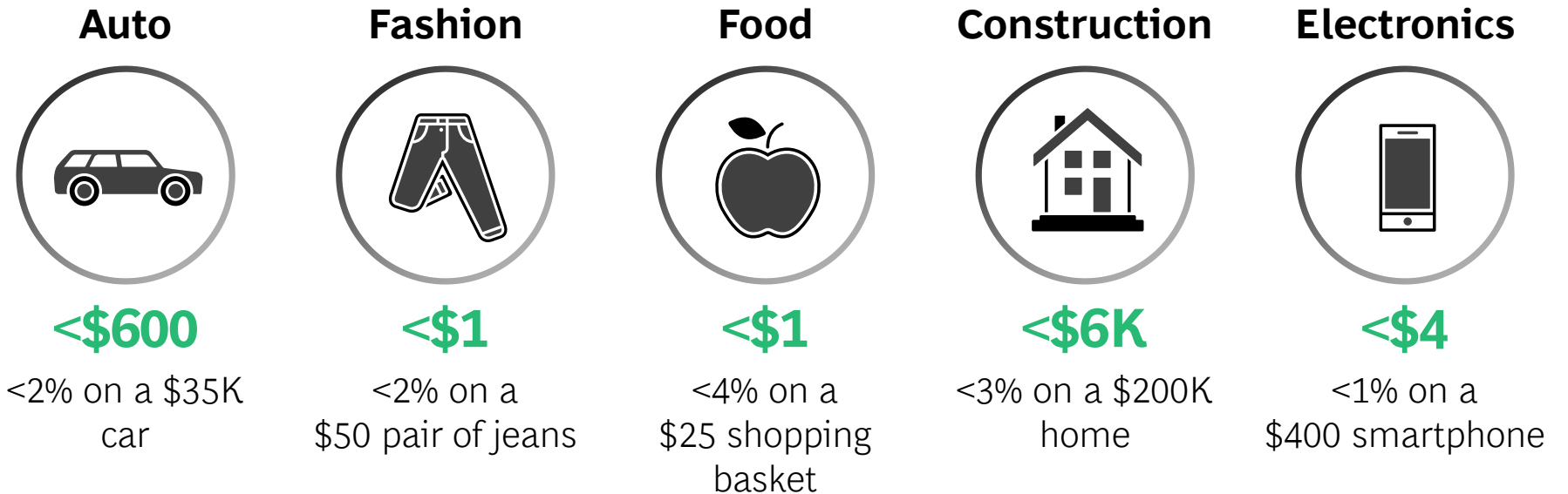
87%

of the public want corporations to integrate **environmental considerations** into products / services and operations

1,675

companies signed up for Race to Zero, committing to set targets to **reach net-zero by 2050**


Average increase in **cost** for products with **net-zero** supply chains



Decarbonization is much less expensive for companies at end of any given value chain because raw inputs only account for a small % of total value

Steady progress in climate fight, but urgency remains

As of 02 April 2021



March 31, 2021

CBS NEWS

In a first-of-its-kind study, NASA measures direct evidence humans are causing climate change



April 2, 2021

REUTERS

Putin, Saudi crown prince discuss climate change, green energy



April 1, 2021

CNBC

U.S. and China are turning their attention to climate change as the next path to commercial supremacy



April 2, 2021

The Guardian

Rapid global heating is hurting farm productivity, study finds



March 31, 2021

The Washington Post

White House unveils \$2 trillion infrastructure and climate plan



March 25, 2021

WSJ

Oil industry's top lobbying group backs climate action plan



March 30, 2021

Bloomberg

'Big storage' is the next big technology in the climate fight



January 26, 2021

FORTUNE

BlackRock's Larry Fink to CEOs: Get serious on net-zero targets, or else

7 actions CEOs must take on the route to net-zero

1. | Set the overall ambition and low-carbon strategy, then measure and disclose
2. | Immediately implement quick wins to fund the journey
3. | Collaborate in ecosystems to address more costly levers
4. | Capture new, low-carbon business opportunities
5. | Align investment agendas with climate-conscious investors
6. | Enable your organization with low-carbon governance
7. | Do no harm and advocate for policy support

Set the overall ambition & low-carbon strategy, then measure & disclose

1



Net-zero means **reducing and neutralizing emissions** that are produced.¹ To do so, CEOs and their boards need to create **transparency**, set an ESG **strategy**, and commit to concrete **targets**.

4

Key questions all CEOs must answer this year to achieve net-zero:

- 1 What does my **market** look like in a net-zero world?
- 2 What is my **business model** for succeeding in that market?
- 3 What changes should I make now to **prepare** for success?
- 4 What supporting **conditions** will I also need and how do I go about winning them?

Looking ahead

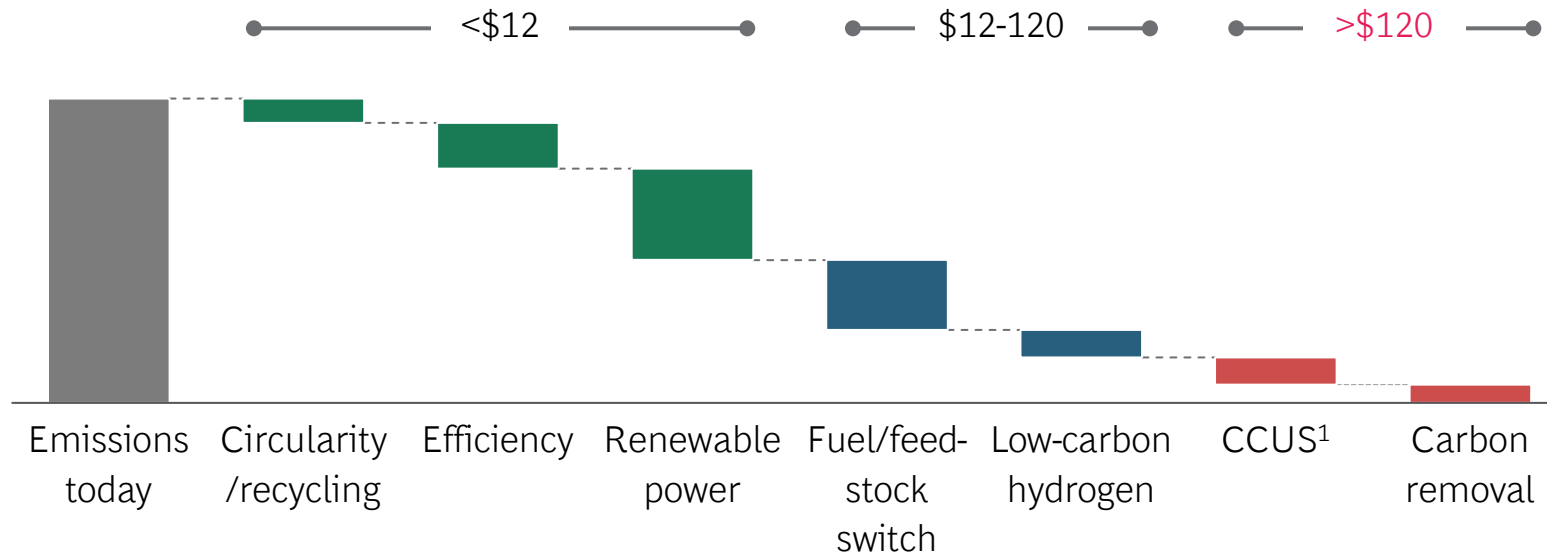
Best practices for companies to implement immediately:

- Understand and educate on climate **science**, climate **risks**, and business **implications**
- **Publicly report** on emissions baseline² and progress
- Set ambitious short- and longer-term **reductions targets** (i.e., via Science-Based Targets initiative)
- Adjust business strategy to **adapt to climate change effects** and **mitigate emissions** for lasting differentiation in a net-zero world
- Execs can **lead by example** to change the company culture

1. The EU and SBTi are targeting net-zero greenhouse gases by 2050. 2. Using Taskforce on Climate-related Financial Disclosures (TCFD) guidelines Source: BCG analysis; European Union; Science-Based Targets; BCG and World Economic Forum's "Aligning to Net Zero" article (March 2021)

Immediately implement quick wins to fund the journey

Key emissions reduction levers and typical abatement costs (per ton of CO₂ equivalent)



Initial 30-40% of emissions reduction can be achieved through low-cost or mature technologies, typically generating savings²

Looking ahead

While some levers are less costly, it is still important to anticipate common challenges when reducing emissions:

- Lack of **transparency**
- Challenges in **executing** changes
- **Limited support** from broader ecosystem (e.g., customers, government)

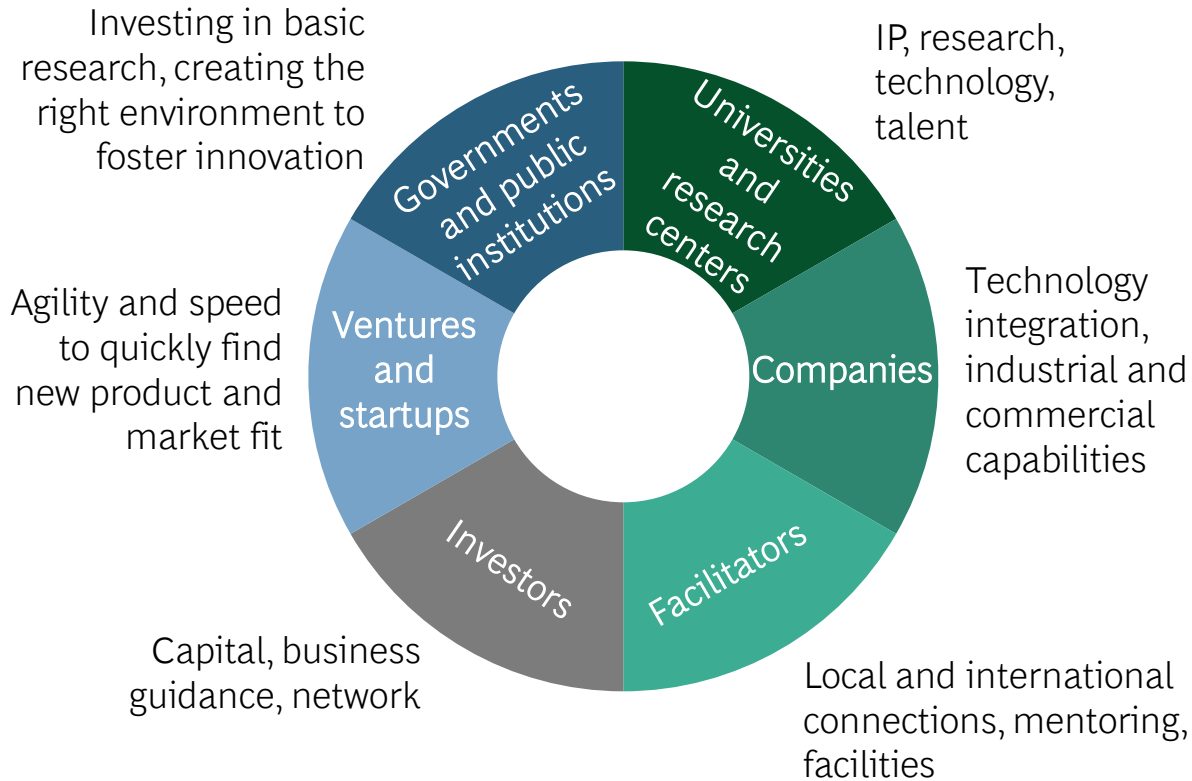
Value-generating initiatives for CEOs:

- 1 Create **transparency** in emissions baseline and improvements
- 2 **Optimize** for CO₂ in products and progress
- 3 **Engage** suppliers on emissions
- 4 **Push** ecosystems and partners
- 5 **Enable** organization through governance and incentives

1. Carbon capture, utilization, and storage. 2. Based on BCG case experience
Source: BCG and World Economic Forum "Net-Zero Challenge: The Supply Chain Opportunity" report (Jan 2021); BCG analysis

Collaborate in ecosystems to address more costly levers

Ecosystems **accelerate** the speed / scale of change and overcome barriers via **collaboration** and **risk-sharing**



Priorities for various organizations within these ecosystems include:

- **Governments:** Enable and incentivize climate innovation
- **Investors:** Focus on how to contribute to financing the transition to new tech and business models
- **Companies:** Assess global needs, strengths and capabilities, and potential impact

Example

Companies pursuing costly innovation solutions will not succeed in a vacuum

Broad and deep ecosystems are crucial for the sustainable application of advanced technologies

For example, the energy sector will play **a critical role in decarbonization** of other industries through levers such as alternative fuels and management of CCUS¹

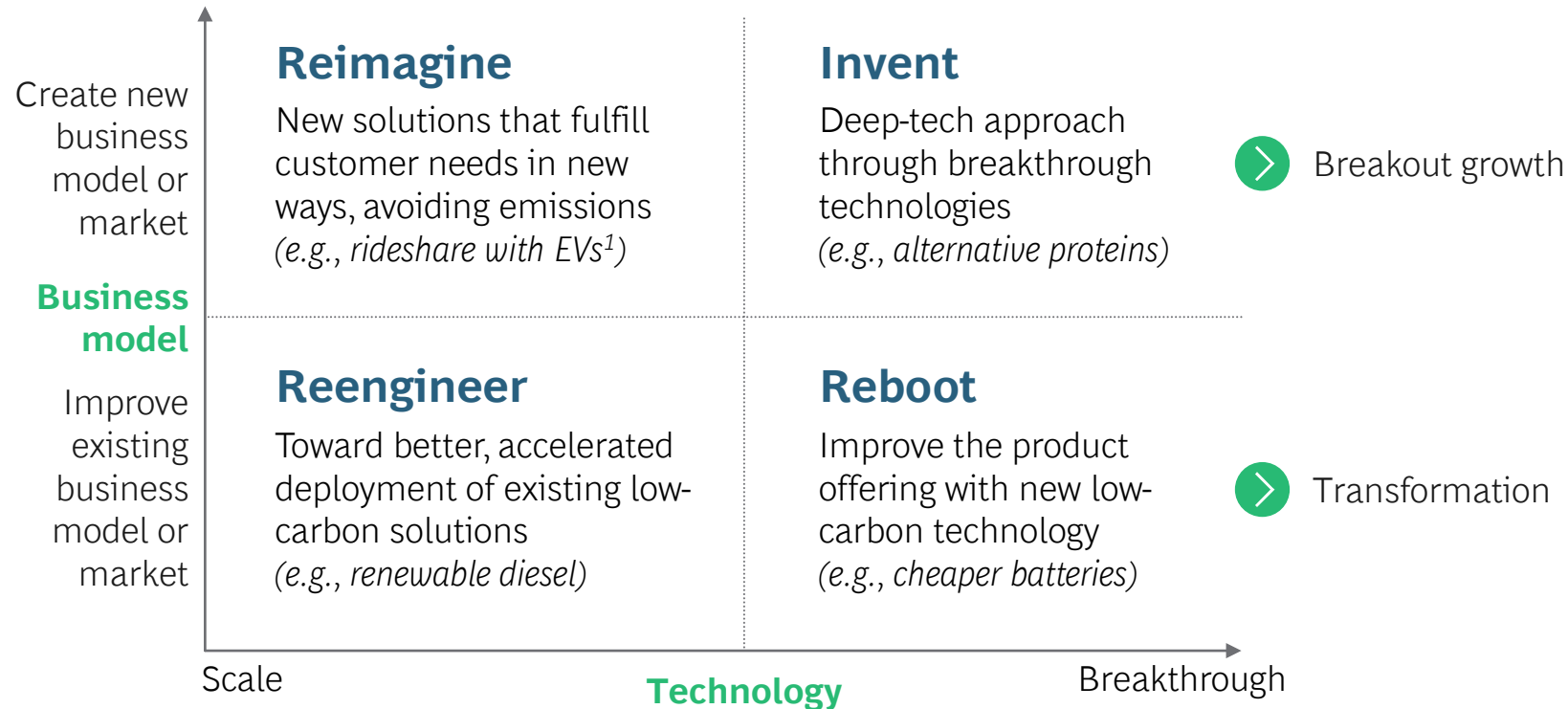
Traditional boundaries will be stretched: Leading firms will need to traverse across sectors (e.g., battery storage and mining) through **cross-sector** collaborations, M&A, and/or investments (e.g., metals, transportation)

1. Carbon capture, utilization, and storage

Source: BCG "The Next Generation of Climate Innovation" article (March 2021); BCG and World Economic Forum "Net-Zero Challenge: The Supply Chain Opportunity" report (Jan 2021); BCG analysis

Capture new, low-carbon business opportunities

Sustainability Innovation Canvas: build on momentum & accelerate innovation



Key takeaways

Companies are not confined to 1 area of innovation – they can and should play in **multiple areas** at once or explore opportunities in the 4 quadrants of the canvas over time

3 lenses for identifying opportunities:

- 1 **Global need:** Find ways to change the competitive environment and drive pressure on the business ecosystem to reduce emissions
- 2 **Strengths and capabilities:** Use company's assets and expertise, along with partnerships
- 3 **Potential for impact:** Look for chances to drive both economic and ESG impact



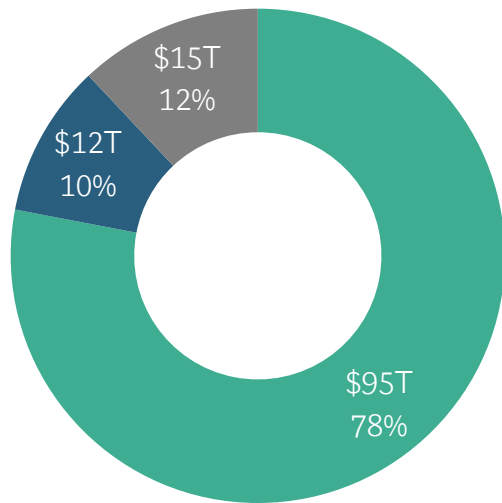
1st-gen "green champion" companies² generate shareholder returns at big tech³ levels (~30% p.a.). AI can also reduce GHG emissions by 2.6-5.3 gigatons, or 5-10% of the total.

1. Electric vehicles. 2. Includes Enel Group, Iberdrola, Neste, NextEra Energy. 3. Companies include Amazon, Apple, Facebook, and Google
Source: BCG "The Next Generation of Climate Innovation" article (March 2021); BCG "Reduce Carbon and Costs with the Power of AI" article (Jan 2021); BCG analysis

Align investment agendas with climate-conscious investors

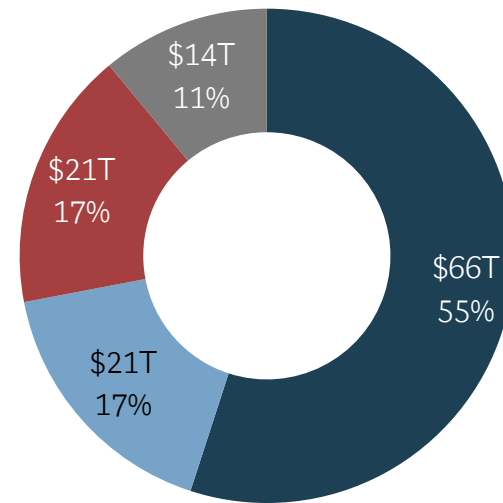
Venture capital investment in climate technology is growing **5X** faster than in other technologies. Companies should **accelerate solutions** in key areas of need.

Common decarbonization themes across sectors



- Electrification & renewables
- Efficiency & circularity
- Alternative technologies

Majority of investment need is in Asia



- Asia
- North America
- Europe
- Rest of world

Key takeaways

Investors can help guide capital to key growing areas:

Electrification (\$95T)

Largest investment need calls for corresponding switch from fossil-fuel-based power to **renewable power**

Demand from Asia (\$66T)

Driven by scale and pace of growth in Asia's economies. Financial innovation may facilitate **global funding** channels as Asian markets open to foreign investors

Source: BCG and Global Financial Markets Association "Climate Finance Markets and the Real Economy" report (Dec 2020); BCG "The Next Generation of Climate Innovation" article (March 2021)

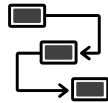
Enable your organization with low-carbon governance

6 elements to consider when rewiring decision-making for low-carbon governance



Steering Model

Ownership of the topic embedded at all levels, from board to business units



➤ *Example on right panel*

Carbon Controlling

Decision-making processes account for climate impact (e.g., internal carbon pricing)



KPIs & Reporting

Report internal and external KPIs integrated into standard reporting process



Performance Management

Link incentives for executives, managers, and employees to climate-related KPIs



Data & Systems

Tools and systems to facilitate monitoring of key KPIs (e.g., energy efficiency performance)



Roles & Responsibilities

Define roles, responsibilities, and team structure to ensure climate plan trickles down across the organization

Example

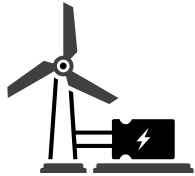
Carbon controlling

Introducing a meaningful **internal carbon price** mechanism and linking **key performance indicators** to decarbonization efforts can be a valuable tool to align internal incentives and fund green projects

Such a tool can be used to help make and evaluate the **costs and risks** of climate-related decisions across CAPEX, OPEX, supplier criteria, R&D, and pricing

Do no harm and advocate for policy support

Do no harm: CEOs should first ensure activities¹ do not undermine climate action
Then, **advocate for regulation** – promote stronger policies and green growth



Scale up of renewable power incentives and more investment in storage / grid reinforcements



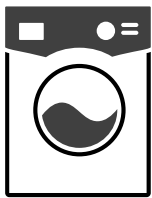
Efficiency incentives for industrial processes and public procurement of green industrial goods (e.g., cement)



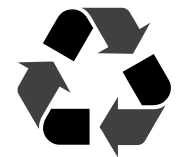
Incentives for EV² ownership and investments in charging infrastructure



Incentives for farmers to move to sustainable agricultural practices



Standards for net-zero buildings and stricter efficiency criteria for household appliances



Investments in waste treatment infrastructure domestically and the right to repair products for increased circularity

Looking ahead

Many countries can benefit from investment in a low-carbon economy. The **global risks of inaction** are escalating for climate and sustainability (e.g., sea level rise, fires, droughts, water shortages)

Making the case for stronger policy support and promoting a message of green growth and jobs provide **reassurance to policy-makers** who look to business leaders to confirm support for national net-zero targets and policy frameworks

1. Including lobbying and association activities. 2. Electric Vehicle
Source: BCG

There will be a sustainability scarcity: opportunity for first-mover advantage

Example actions

Topic	Challenge	➤ Action
Fragmented supply chain	43% of companies experienced supply chain challenges due to scarcity of natural resources in last 2 years	Tailor approach for suppliers based on capabilities; create long-term pricing contracts with new & existing suppliers
Carbon credits	2024 is when demand for carbon offsets projected to begin outpacing supply	Lock in high-quality carbon supply early; rigorously track emissions; consider becoming carbon credit supplier
Recycled plastics	45% of projected 2025 recycled plastic demand not met by current supply ¹	Issue offtake agreements to encourage infrastructure development
Clean hydrogen	100-200x green hydrogen supply growth required to meet 2050 projected demand	Enter developer/technology space; differentiate with integrated systems

1. Based on recycle targets from Ellen Macarthur Foundation progress report - signatories accounted for more than 20% of the plastic packaging market

Source: EIU based on 2016 study; Cairn Energy Research Advisors; *The Global Commitment 2020 Progress Report*, Ellen Macarthur; BCG analysis

Countries are expected to increase environmental commitments at COP26



The UK will be hosting the 26th annual session of COP (United Nations' "Conference of the Parties") in Glasgow. The summit is the **most important** global climate conference since 2015, when countries agreed to global climate actions in Paris

COP26 will take place from **Monday, November 1st – Friday, November 12th, 2021**. Heads of state and climate experts will align on coordinated action to reach net-zero by mid-century

In March 2021, BCG was selected as the Consultancy Partner of COP26



"COP26 represents a pivotal moment in the global drive for businesses, governments, and society to take decisive action, and we are honored to be able to play a role in this."

–Rich Lesser, CEO of BCG

Additional perspectives on climate



(BCG & WEF) Aligning to net-zero: how CEOs can get on board with the transition



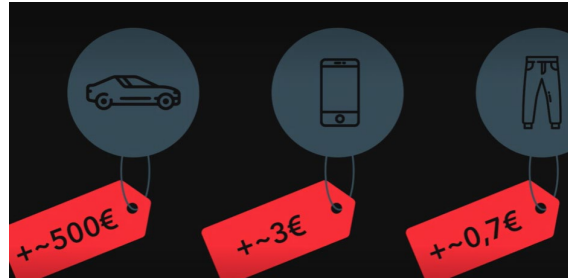
The next generation of climate innovation



Alternative-protein market to reach at least \$290B by 2035



(BCG & WEF) Net-zero challenge: the supply chain opportunity (report summary)



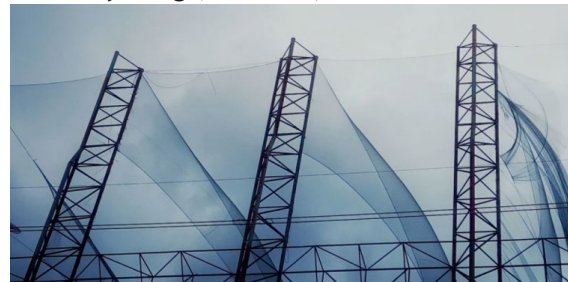
How we can curb climate change by spending 2% more on everything (TED talk)



Spurring economic growth through climate action



(BCG & GFMA) Climate finance markets and the real economy



Reduce carbon and costs with the power of AI



A new course for climate in the US?

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