

Welcome to this week's presentation and conversation  
hosted by the  
**Canadian Association for the Club of Rome,**  
a Club dedicated to intelligent debate and action on global issues.

## ***Investing in the Era of Climate Change.***

Our speaker today is Bruce Usher (MBA), a professor at Columbia Business School, where he teaches on the intersection of finance, social, and environmental issues. In 2019, he published *Renewable Energy: A Primer for the Twenty-First Century* (the first in the Earth Institute's sustainability series). He was CEO of EcoSecurities Group PLC (which developed emission reduction projects), and CEO of TreasuryConnect LLC (which provided electronic trading solutions to banks). Professor Usher is an investor, director, and advisor to firms focused on climate change and clean energy. He understands that a climate catastrophe can be avoided with a rapid and sustained investment in companies and projects that reduce greenhouse gas emissions. To the surprise of many, this has already begun--investors are abandoning polluting industries and financing businesses offering climate solutions. Risks, social norms, government policies, and innovation are all behind this shift.

Mr. Usher's presentation will be followed by a conversation, questions, and observations from the participants.

CACOR acknowledges that we all benefit from sharing the traditional territories of local Indigenous peoples (First Nations, Métis, and Inuit in Canada) and their descendants.



2022 May 18

*This is the 100<sup>th</sup> session  
in CACOR's Zoom  
presentation series.*



# Investing in the Era of Climate Change

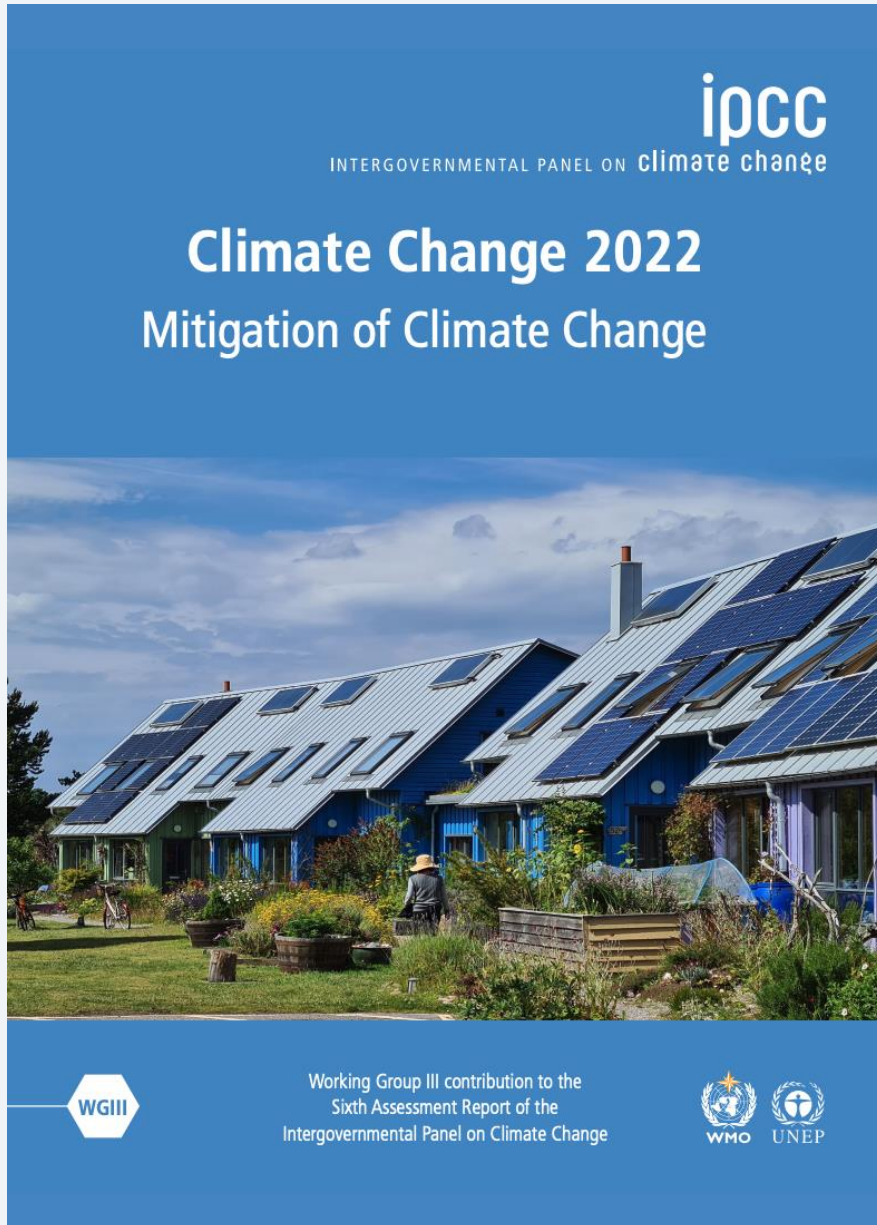
**Bruce Usher**

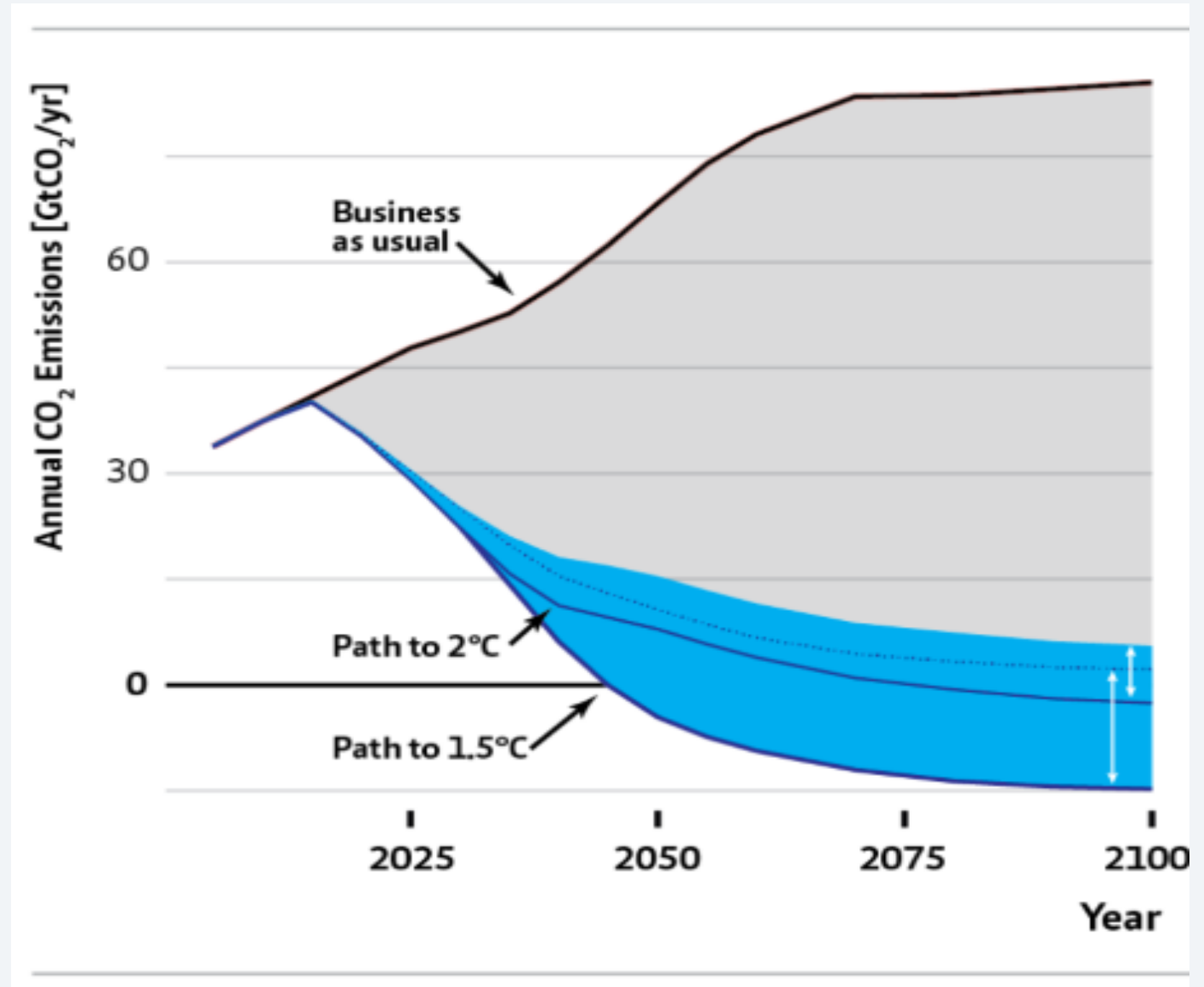
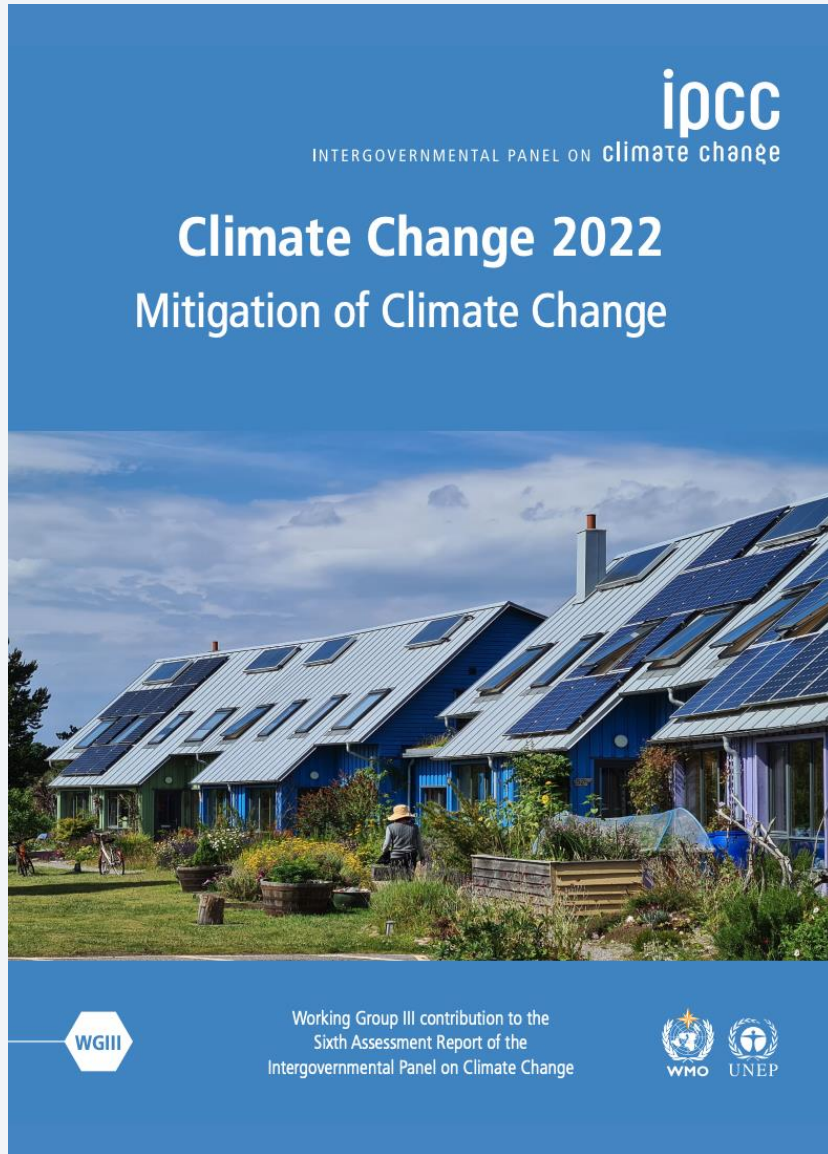
Professor of Practice

Elizabeth B. Strickler '86 and Mark T. Gallogly '86 Faculty Director

The Tamer Center for Social Enterprise

Columbia Business School







# 1. Manifestation of Physical Risks

Insurers, facing huge losses, have been pulling back from fire-prone areas across California. “The marketplace has largely collapsed.”

The New York Times



## 2. Innovation

Tesla's all-electric Model S is "the best-performing car that Consumer Reports has ever tested."



## 3. Evolving Social Norms

“I want you to act as if our house is on fire, because it is.”

Greta Thunberg, Climate Activist

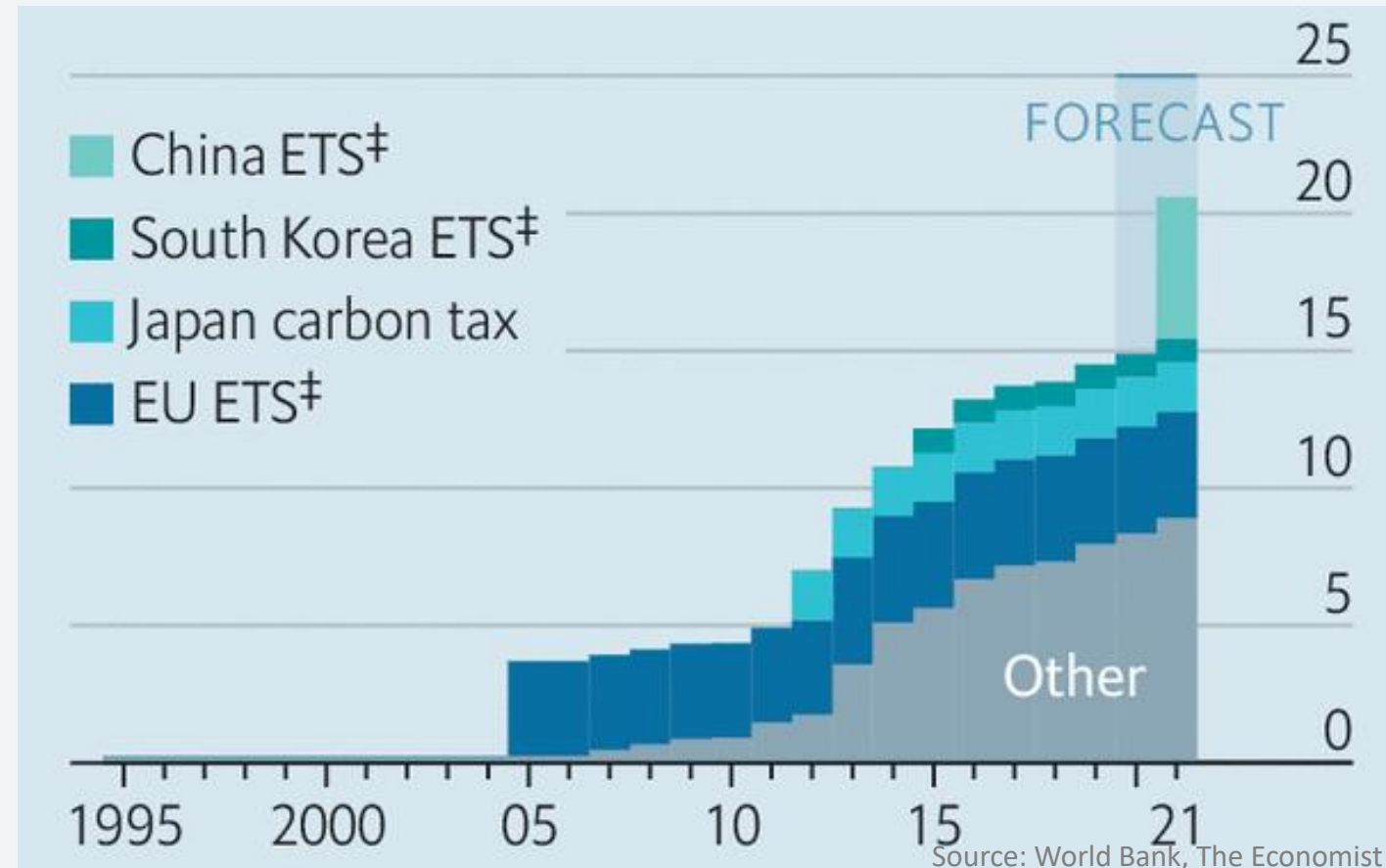




## 4. Government Action

“Carbon prices now apply to over a fifth of global greenhouse gases.”

The World Bank, May 2021



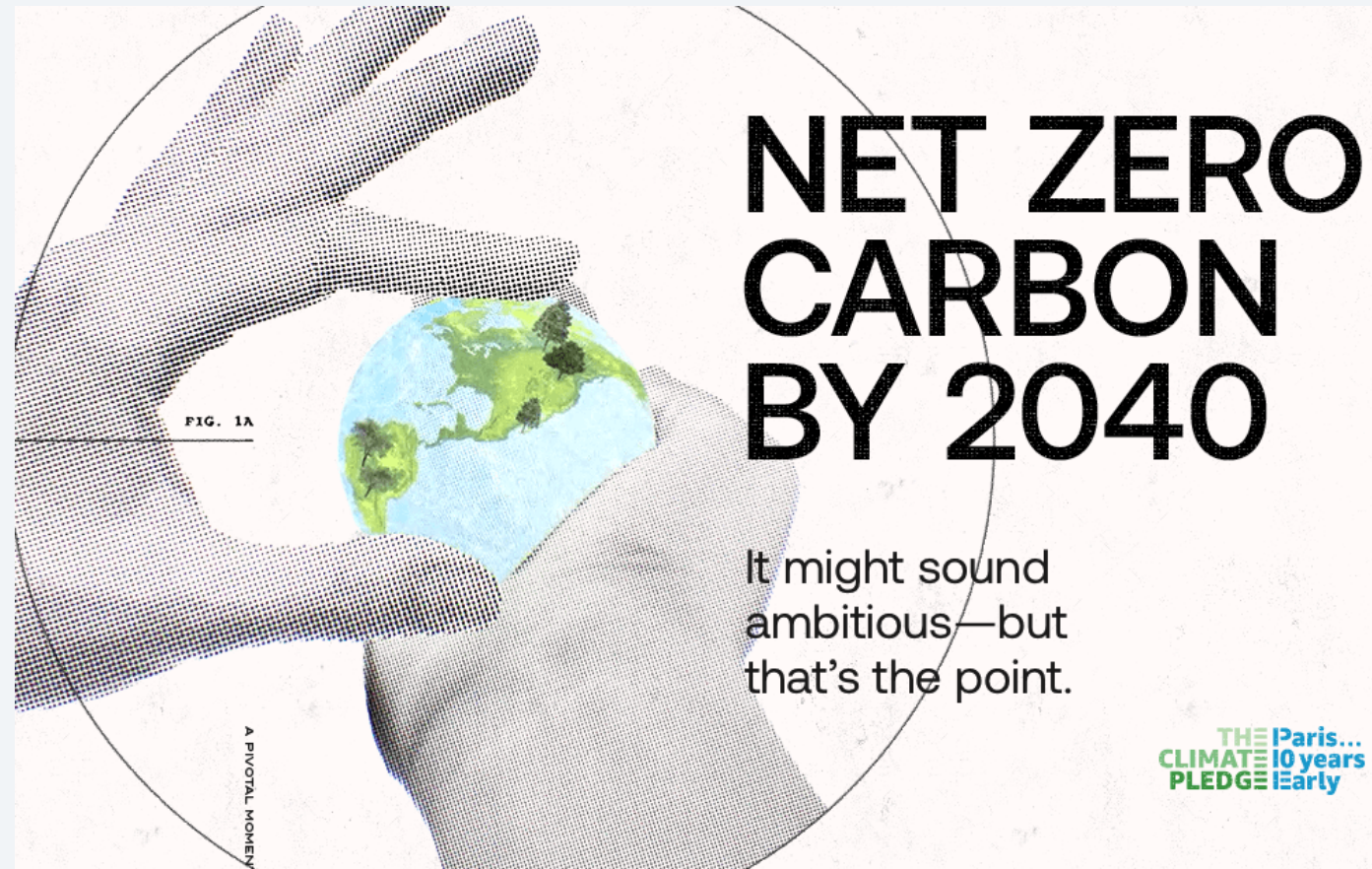
Source: World Bank, The Economist



## 5. Net Zero Pledges

“If a company with as much physical infrastructure as Amazon—which delivers more than 10 billion items a year—can meet the Paris Agreement 10 years early, then any company can.”

Jeff Bezos, Amazon



## Investor Reaction

“In the near future – and sooner than most anticipate – there will be a significant reallocation of capital.”

Larry Fink, CEO, BlackRock  
2020 Letter to CEOs



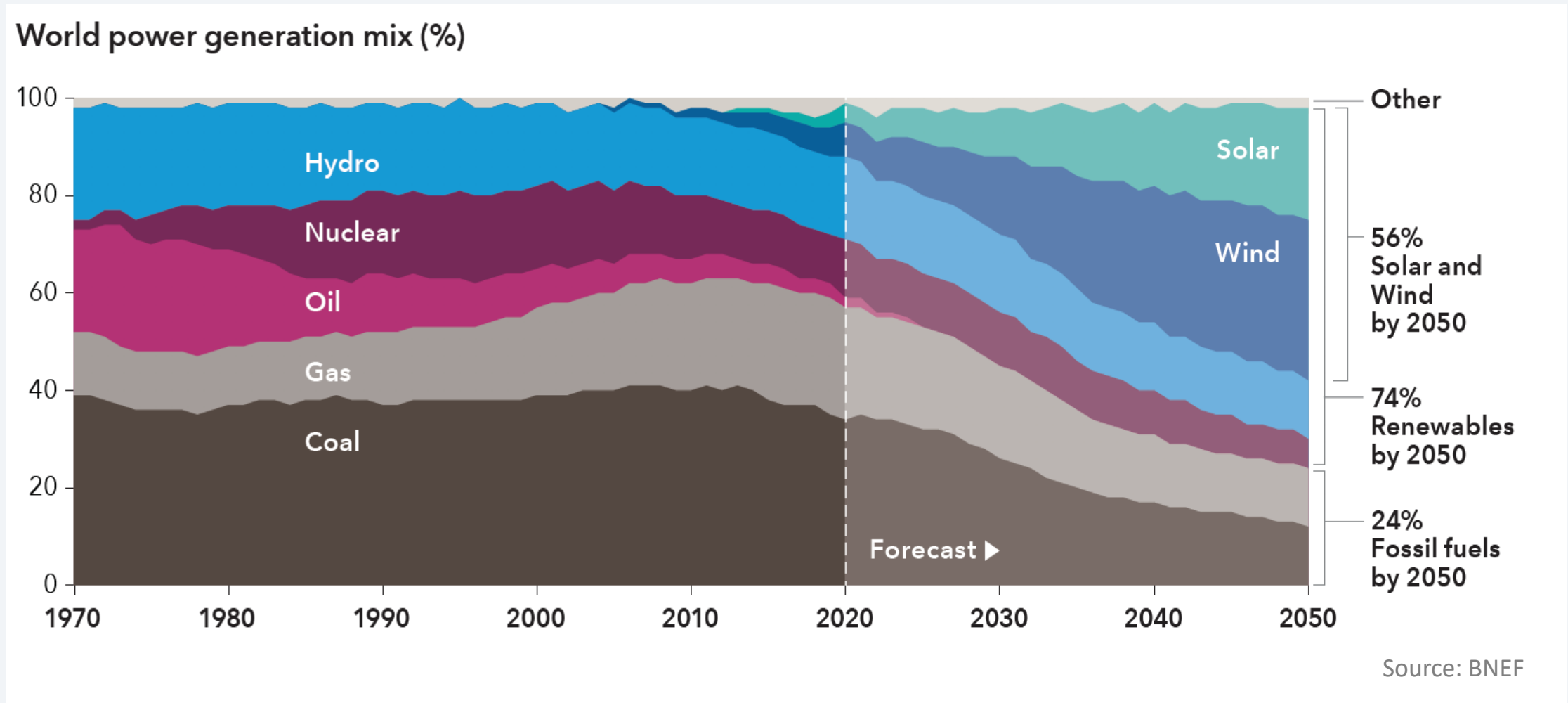


## Climate Solutions



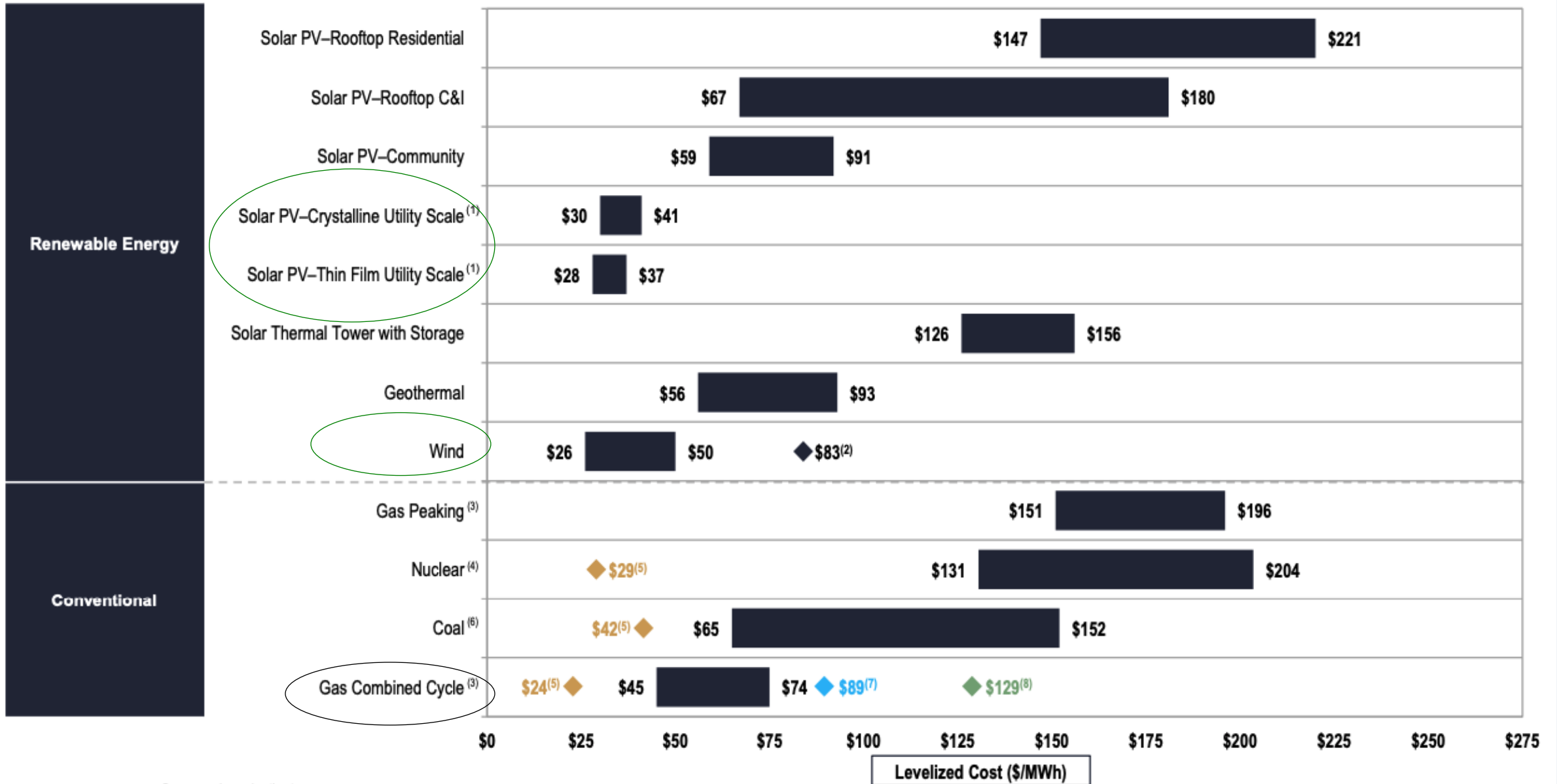
# Climate Solutions

## 1. Renewable Wind and Solar





# Levelized Cost of Energy Comparison—Unsubsidized Analysis



Source: Lazard estimates.

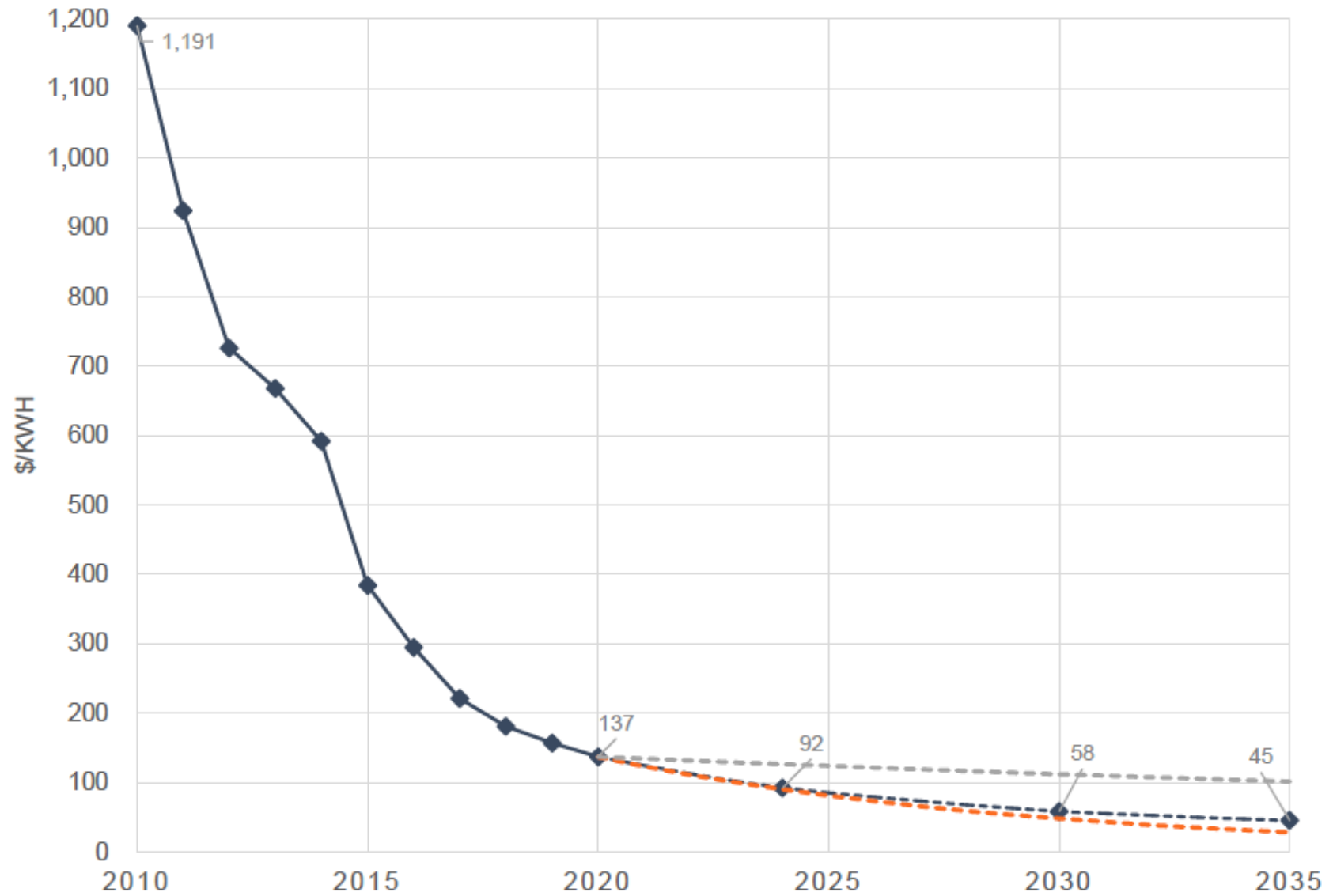
## 2. Energy Storage



“The Nobel Prize in Chemistry 2019 is awarded...for contributions to the development of the lithium-ion battery... makes a fossil fuel-free world possible.”

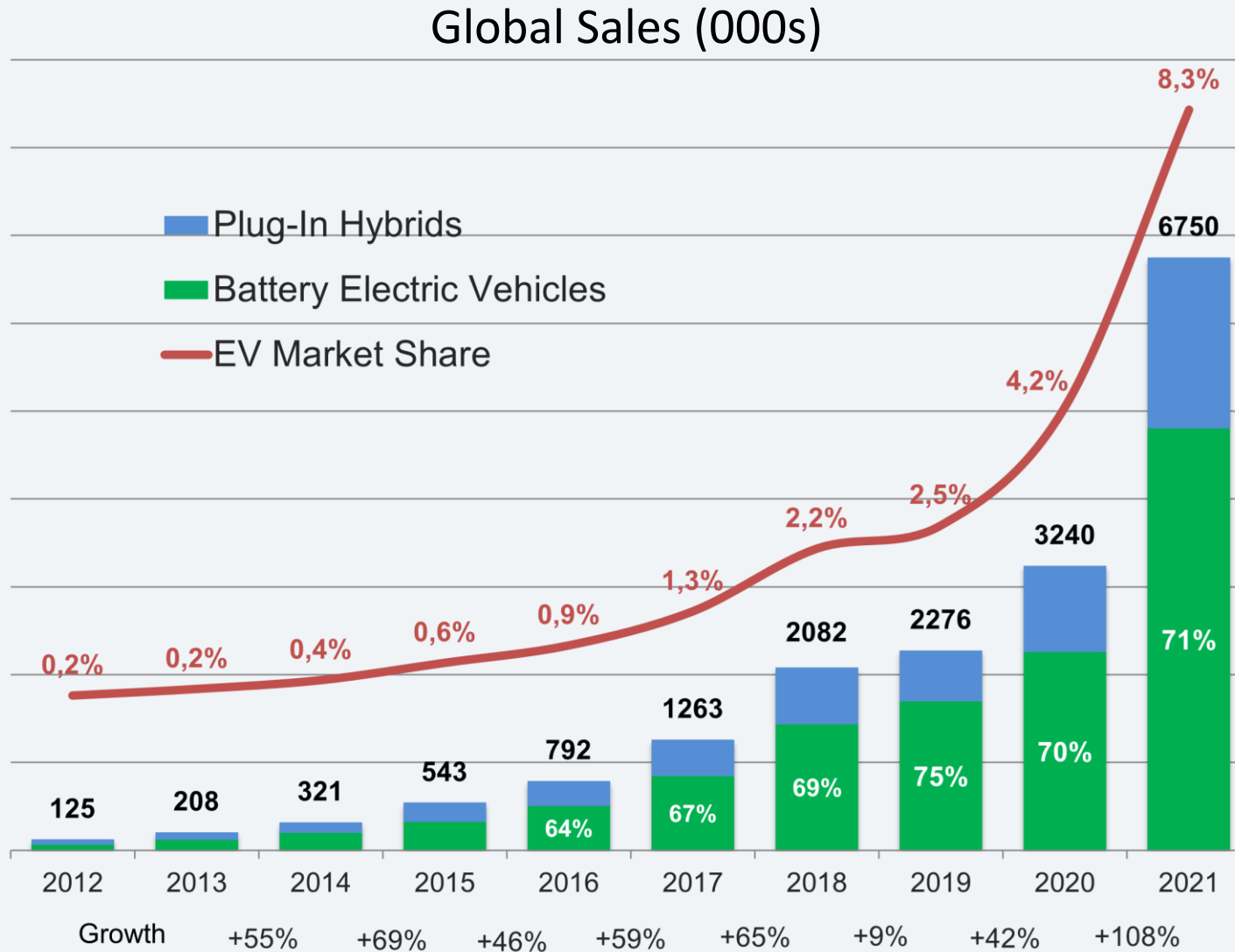
Nobel Prize Committee

# Lithium-ion battery price outlook



Source: BNEF 2020 Lithium-Ion Battery Cost Survey, RBC Capital Markets estimates

## 3. Electric Vehicles

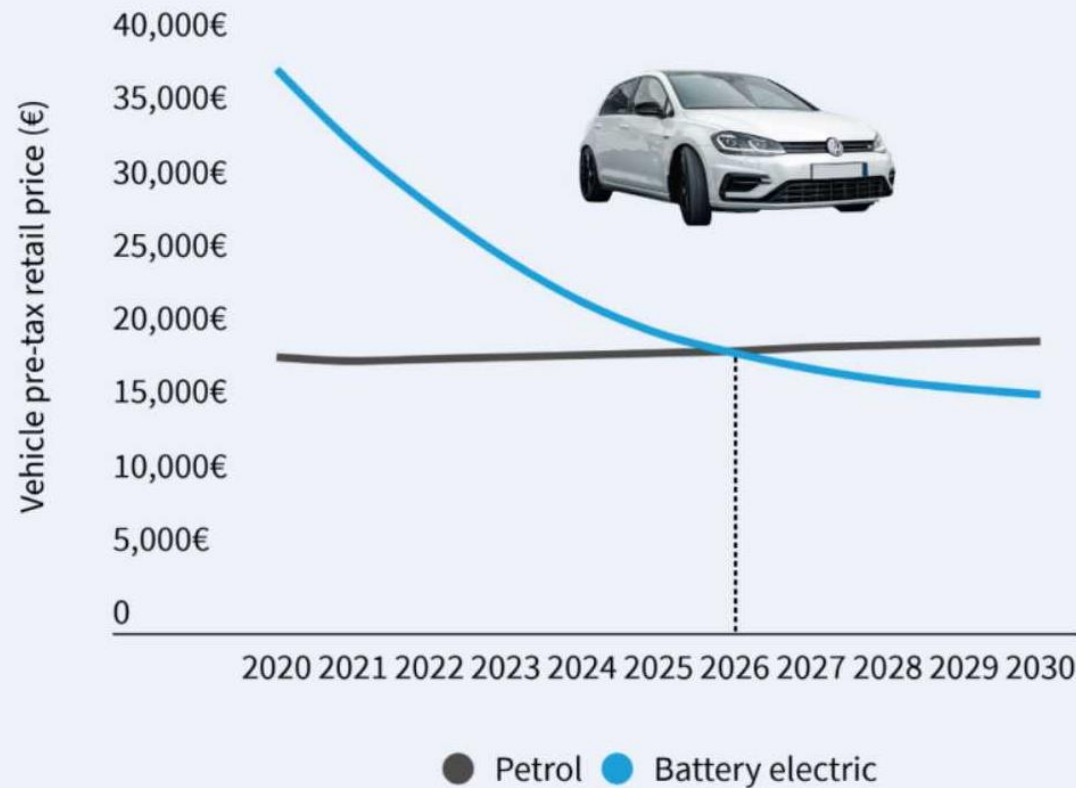


Source: EV Volumes



## 3. Electric Vehicles

**EVs will be cheaper than fossil-fuel vehicles in Europe by 2025-2027**



**Main cost drivers:**

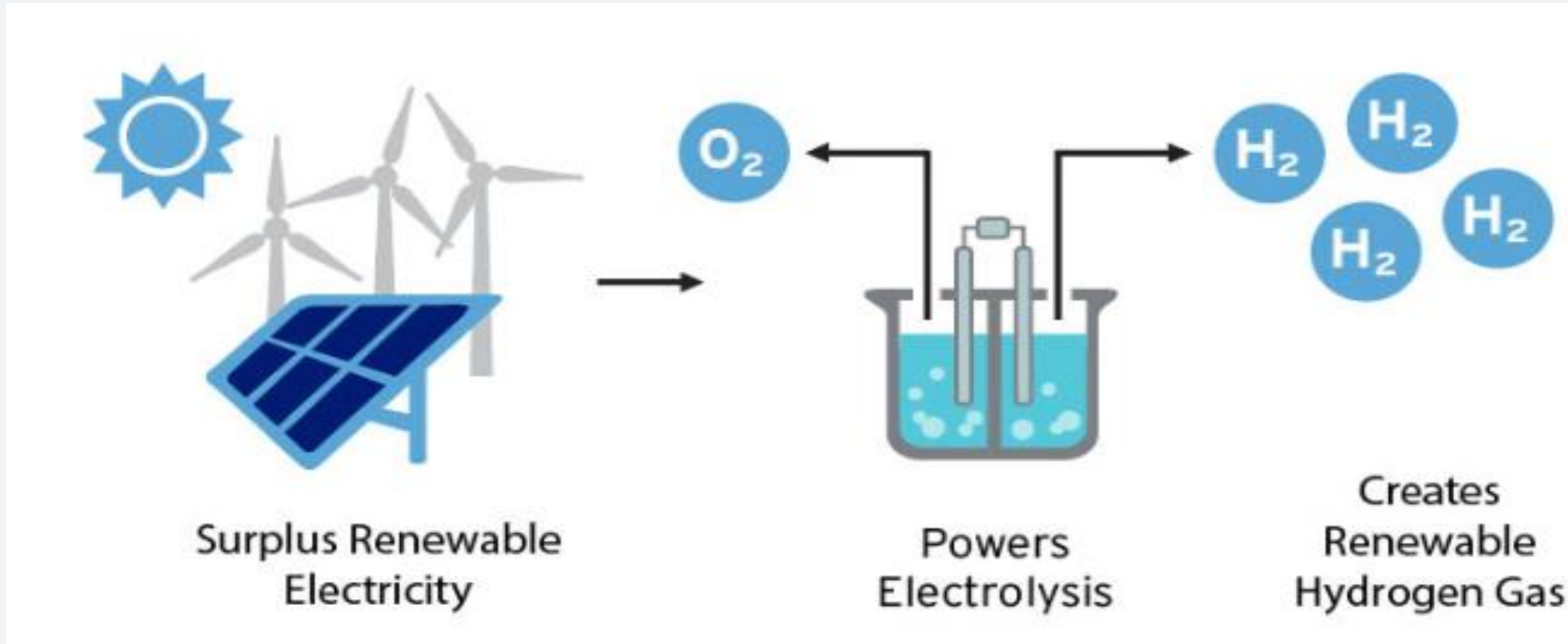


Battery cost decrease



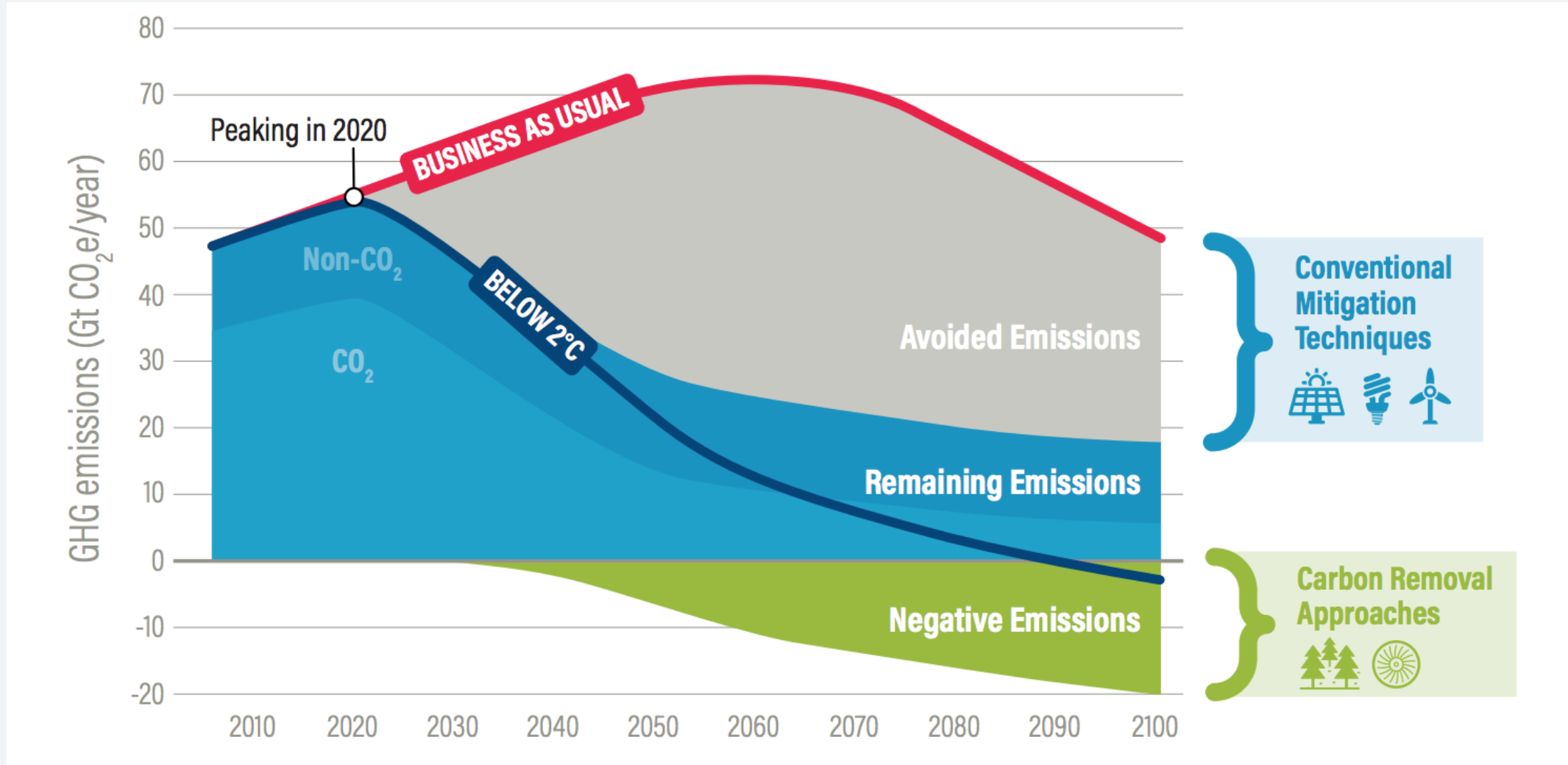
Electric vehicles  
dedicated production lines

## 4. Green Hydrogen

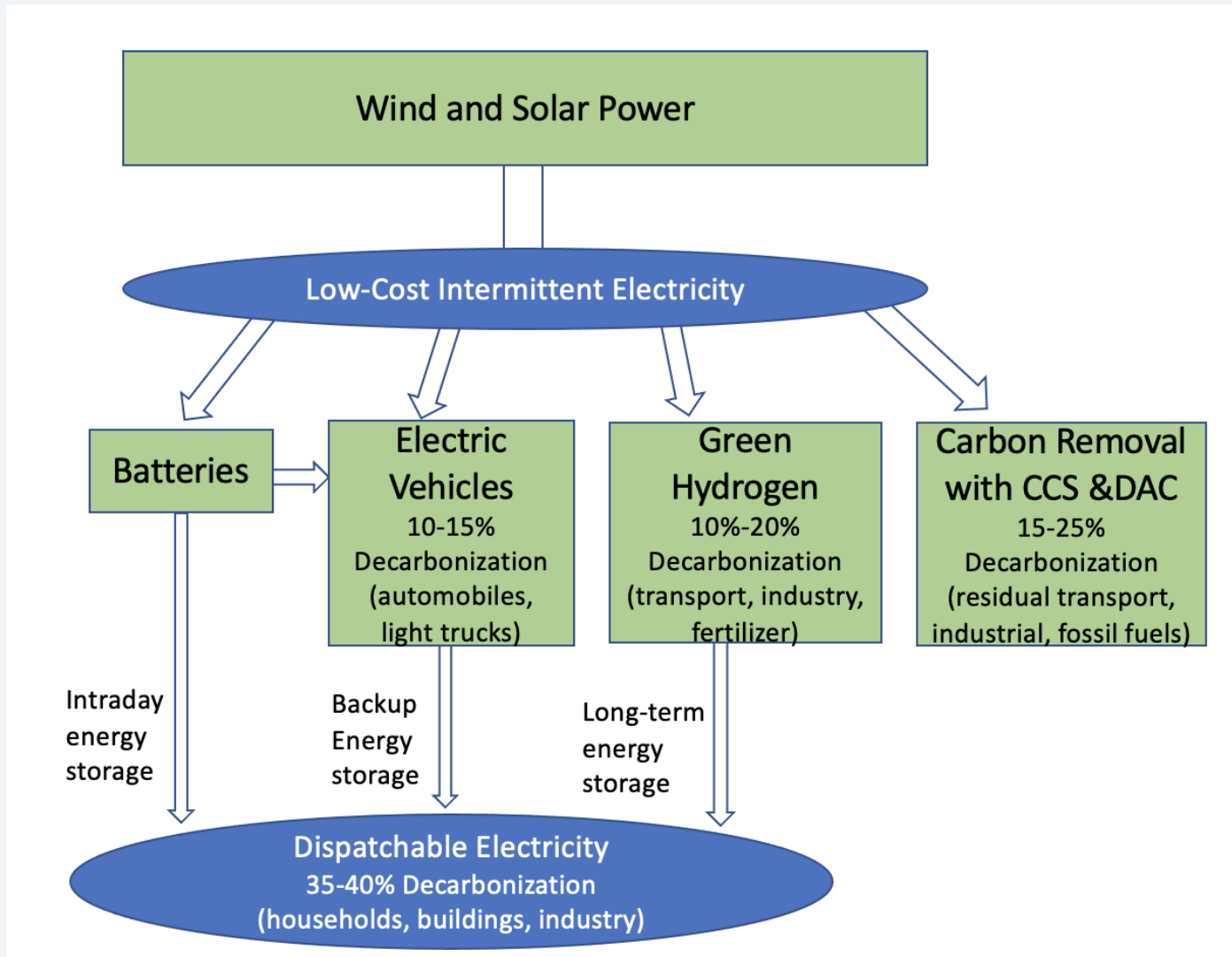


“Green hydrogen, the ultimate de-carbonization solution, benefiting from the growth and cost deflation of renewable power and electrolysis technologies.” Goldman Sachs, March 2022

## 5. Carbon Removal Technologies

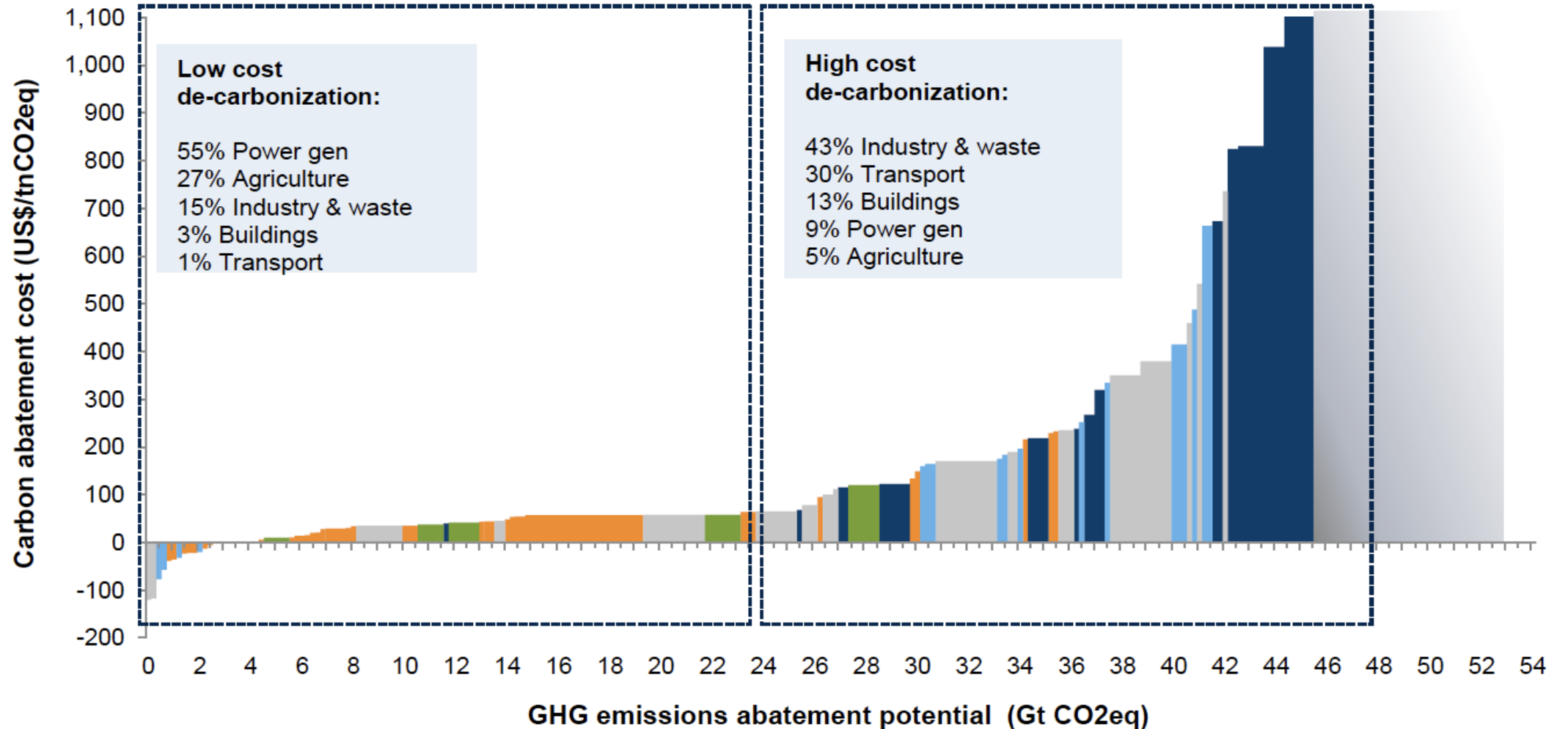


## Better Together: Climate Solutions are Connected

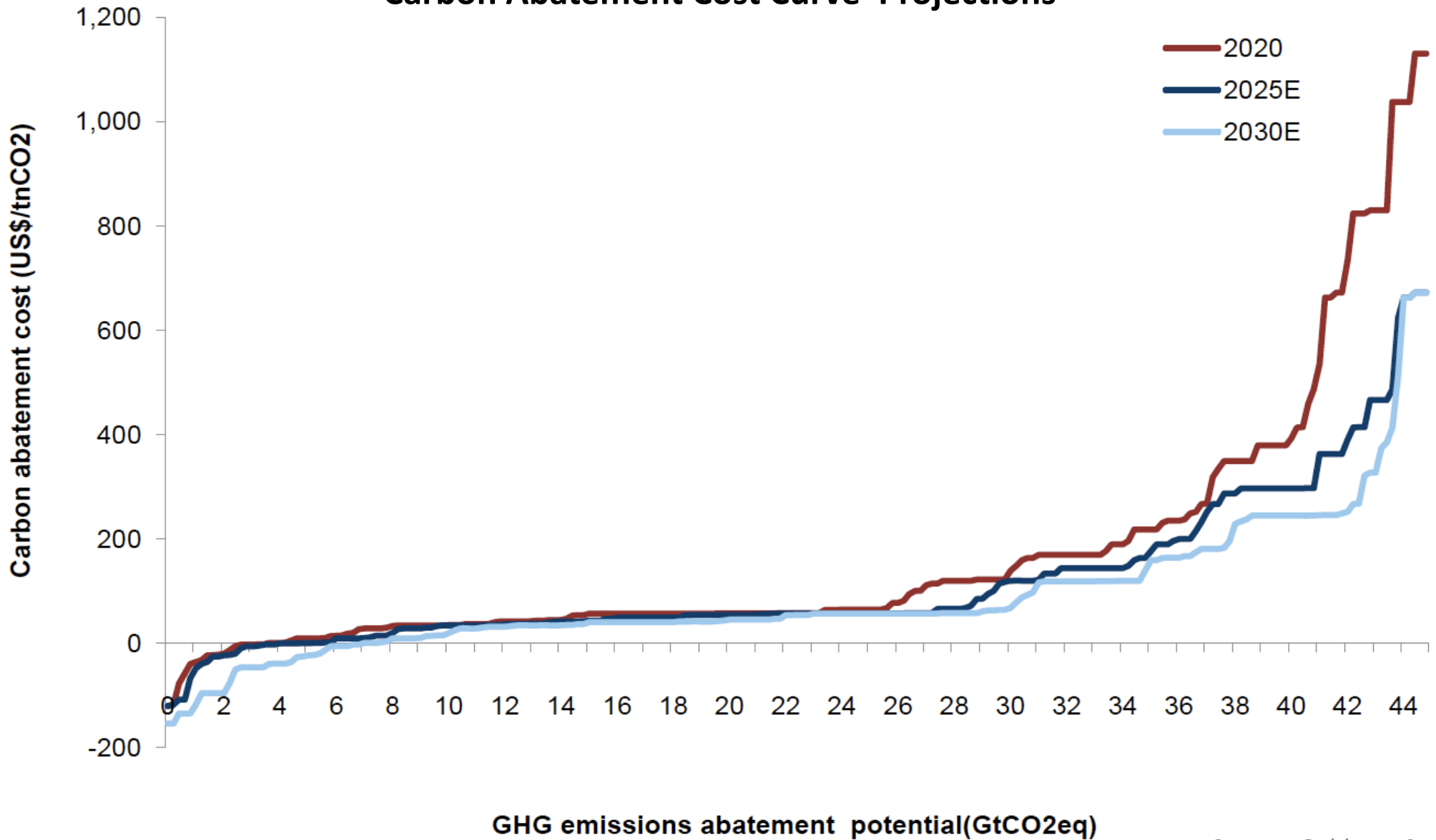




## Carbon Abatement Cost Curve



## Carbon Abatement Cost Curve Projections



“\$100-150 trillion of investment is needed in the coming three decades to help protect the planet through financing the decarbonization transition.”

Boston Consulting Group, 2021



## Investor Strategies in the Era of Climate Change



## 1. Risk Management



**Acute:** extreme weather

**Chronic:** rising temperatures and oceans

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**Chronic:** rising temperatures and oceans



**Policy:** regulations and litigation

**Technology:** stranded assets, product obsolescence

**Market:** changing consumer behavior

**Reputation:** stakeholder concerns

## 1. Risk Management



**Acute:** extreme weather

**Chronic:** rising temperatures and oceans



**Policy:** regulations and litigation

**Technology:** stranded assets, product obsolescence

**Market:** changing consumer behavior

**Reputation:** stakeholder concerns



“The catastrophic norms of the future are in the tail risks of today.”

Mark Carney,  
Former Governor, Bank of England

## 2. Divestment

“If it’s wrong to wreck the climate, then it’s wrong to profit from that wreckage.”

Bill McKibben

Founder, 350.org

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### 3. ESG Investing



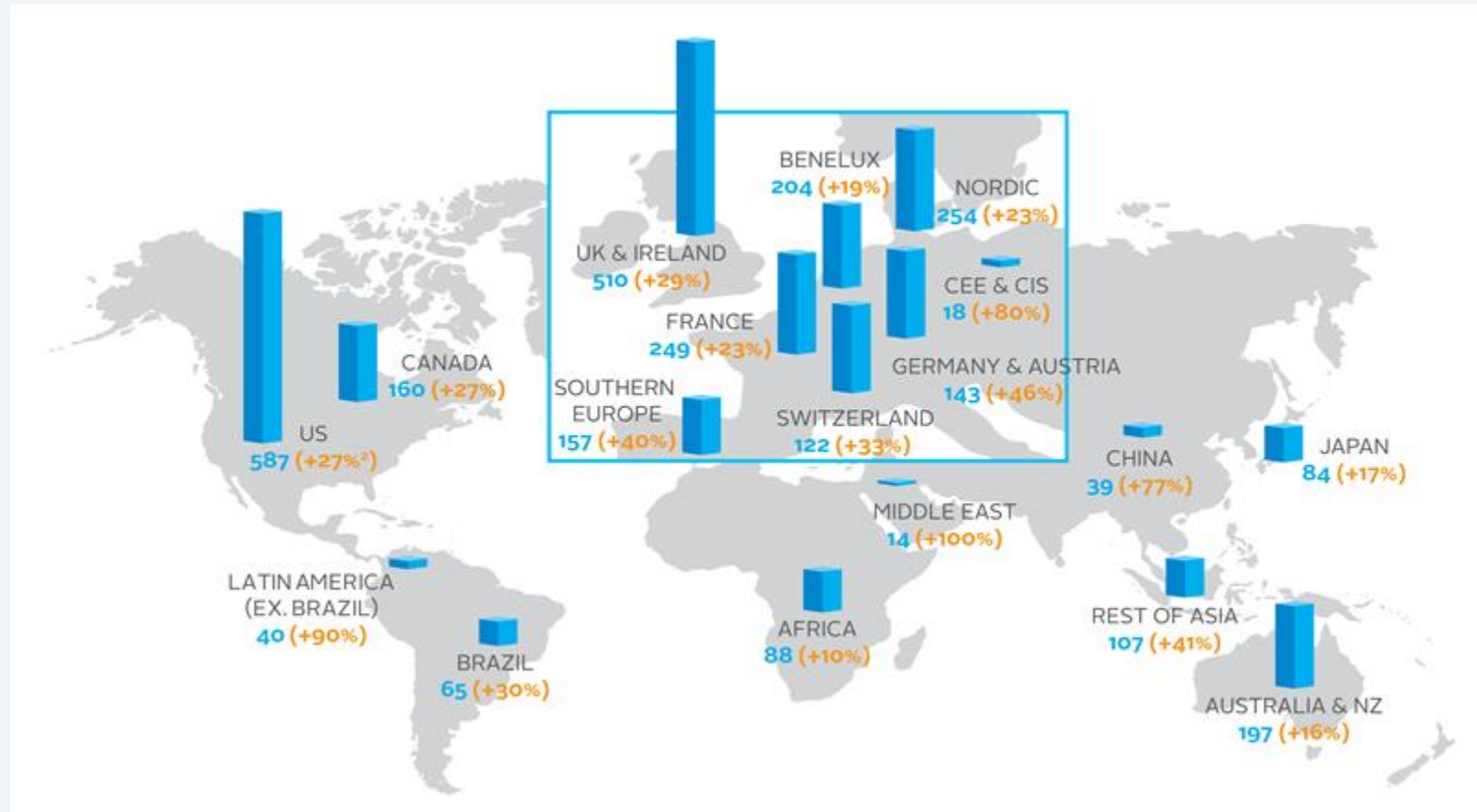
“I propose that you, the business leaders...and we the United Nations initiate a Global Compact of shared values and principles.”

Kofi Annan,  
UN Secretary-General

### 3. ESG Investing

“Environmental, social, and corporate governance (ESG) issues can affect the performance of investment portfolios”

Principles for Responsible Investing (PRI)



>\$100 trillion  
in assets  
under  
management

## 4. Thematic Climate Investing



“Building great companies that also help to solve some of the core challenges of our age is not an oxymoron.”

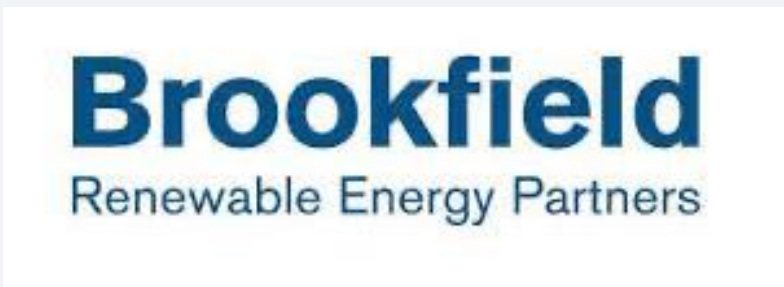
Nancy Pfund, DBL Partners

## 4. Thematic Climate Investing



July 27, 2021

TPG announced \$5.4 billion for "the largest climate-focused fund in the world".



Brookfield announced \$7 billion for its "low-carbon energy transition fund."

## 5. Impact First Investing



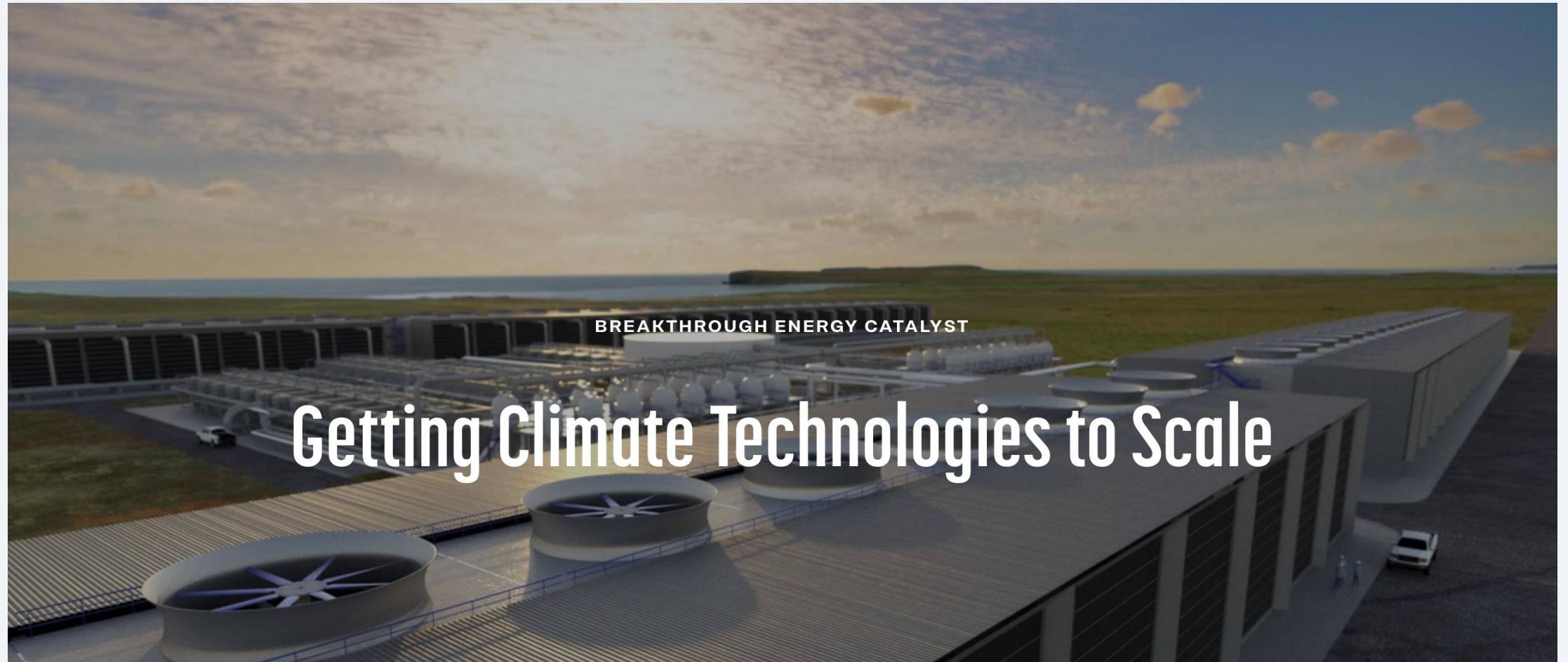
“We are willing to wait a longer time for returns than other funds.”

Bill Gates

Founder, Breakthrough Energy



## 5. Impact First Investing





“With potentially \$3 trillion to \$10 trillion of earnings before interest and taxes up for grabs, decarbonization could present a material economic and humanitarian opportunity.”

Morgan Stanley



Will we avoid  
catastrophic climate change?

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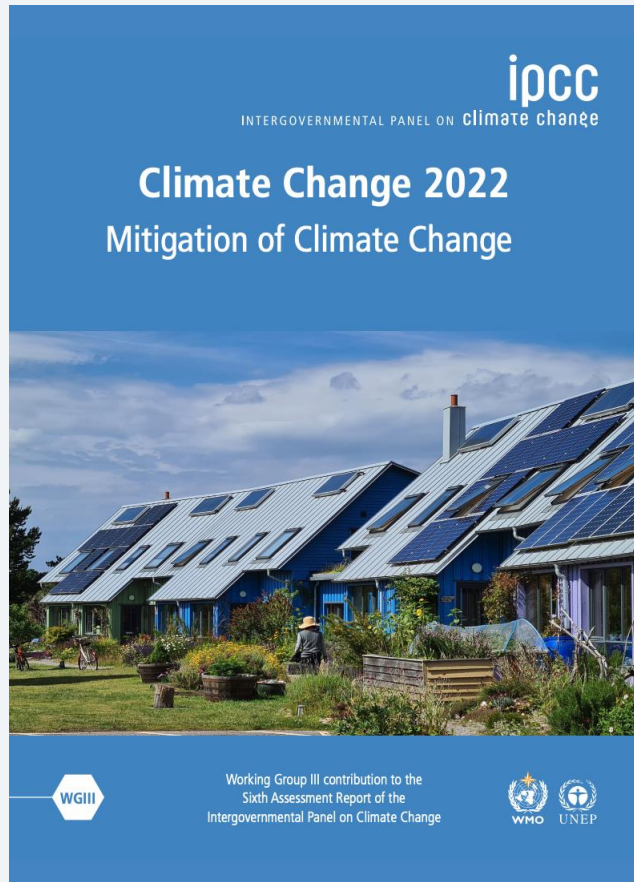
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A: Maybe.

A: Maybe.

It depends on the *timing* of investment.

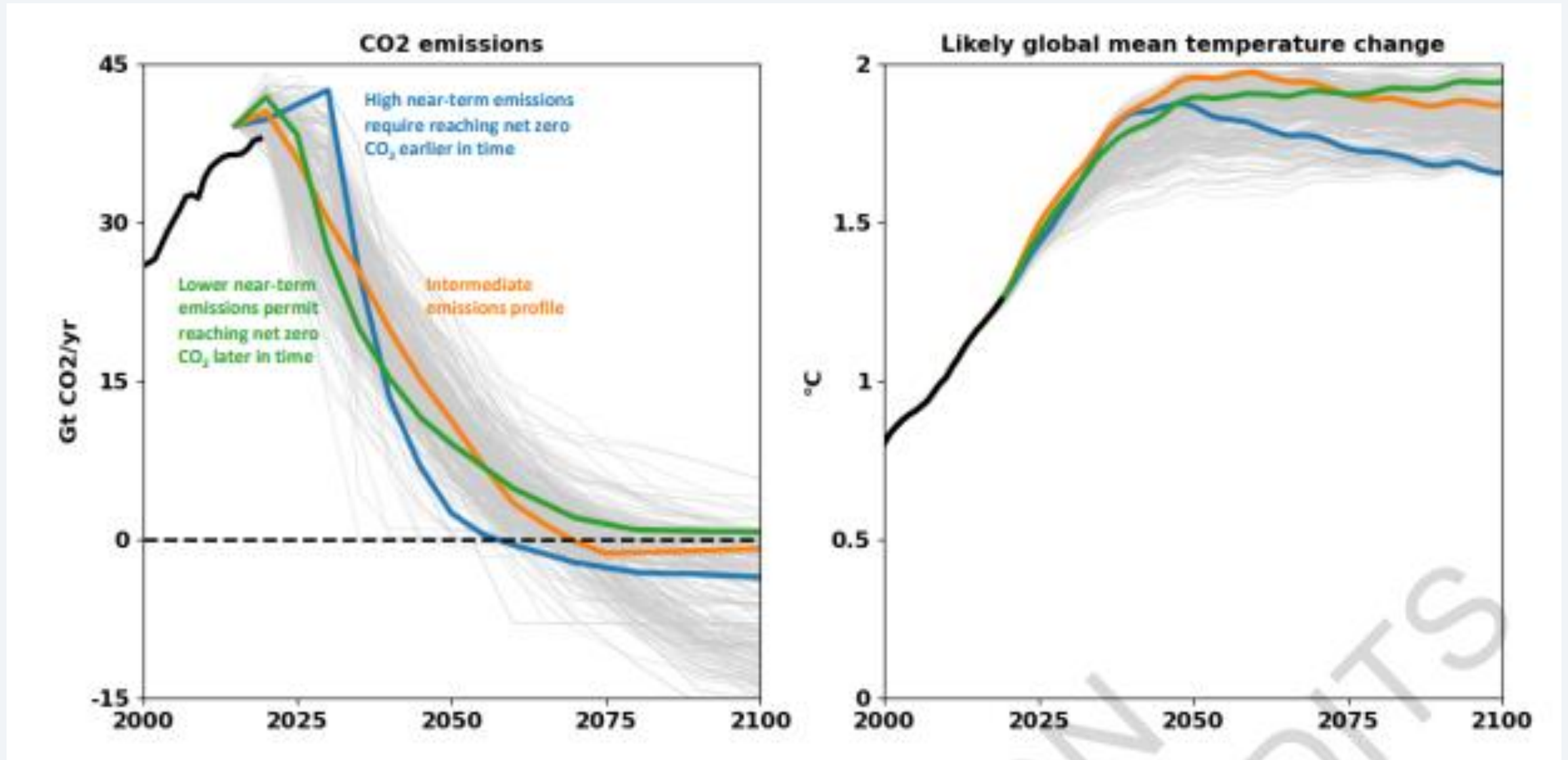
# Will we avoid catastrophic climate change?



**The New York Times**

***Stopping Climate Change Is Doable,  
but Time Is Short, U.N. Panel Warns***

# Will we avoid catastrophic climate change?





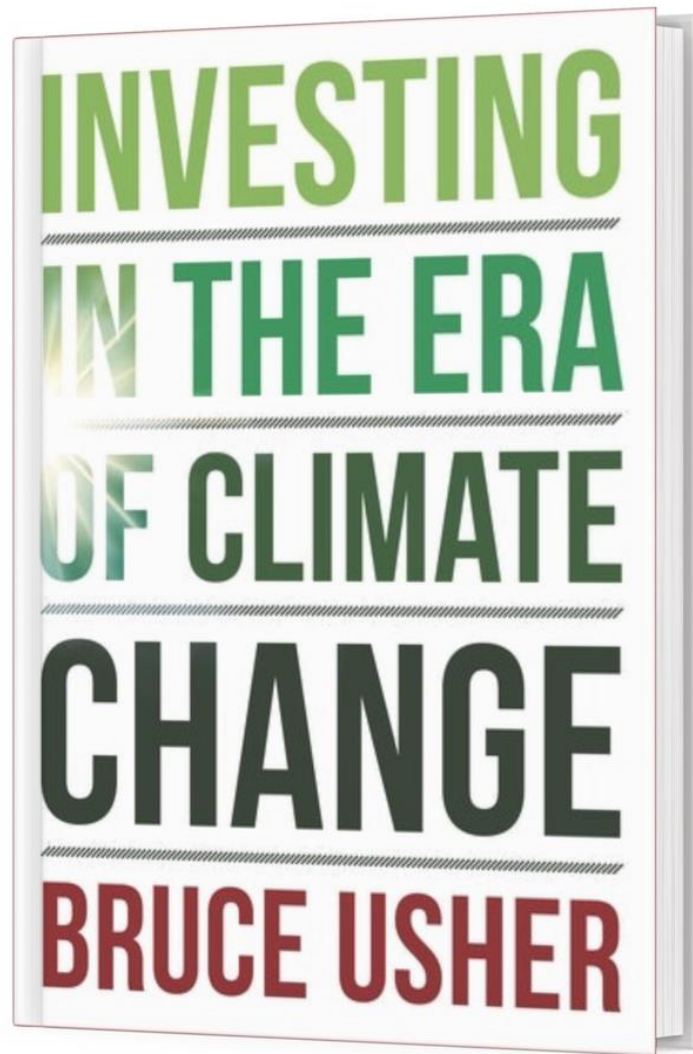
## Closing investment gaps

- financial flows: **3-6x lower** than levels needed **by 2030** to limit warming to below 1.5°C or 2°C
- there is **sufficient global capital** and liquidity to close investment gaps
- challenge of closing gaps is widest for developing countries



### Implications for Investors

- In the future, climate change will impact business globally, much as technology has in the past, creating winners and losers in nearly every sector.
- The low-carbon transition will provide investors with the opportunity and challenge of a lifetime.
- Investors rising to that challenge is critical if we are to avoid catastrophic climate change.



“My hope in writing this book is that every investor—individual and institutional—will recognize the changes that are coming and act, for their benefit and the benefit of all.”



**Columbia University** ✓

@Columbia

“If you were to ask what will transform businesses in the future, I believe it’s going to be climate change.”  
[@Columbia\\_Biz](#) dean Costis Maglaras on why MBA programs are adding more ESG courses.

# Investing in the Era of Climate Change

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Questions?