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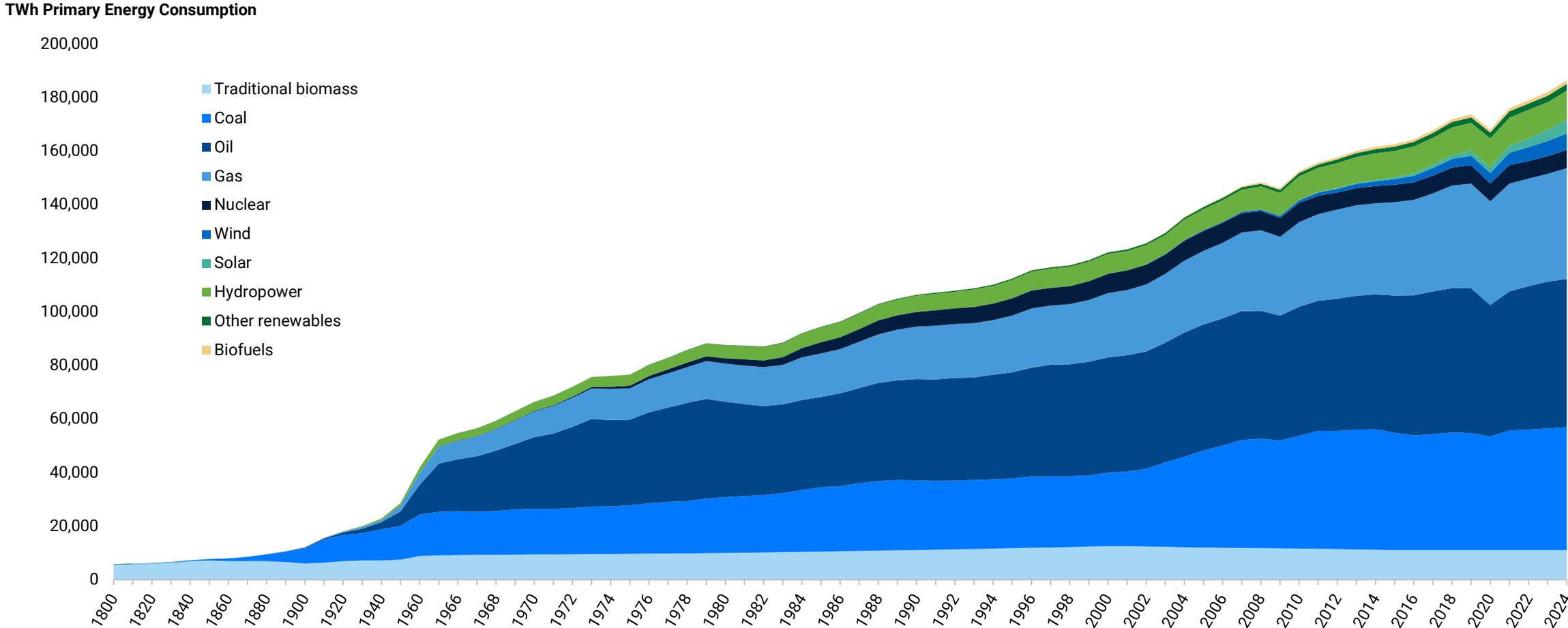


# Realism & Pragmatism: A Roadmap for Japan's Energy Transition



# Global Energy Demand is Growing & has Been Met Largely via Fossil Fuels

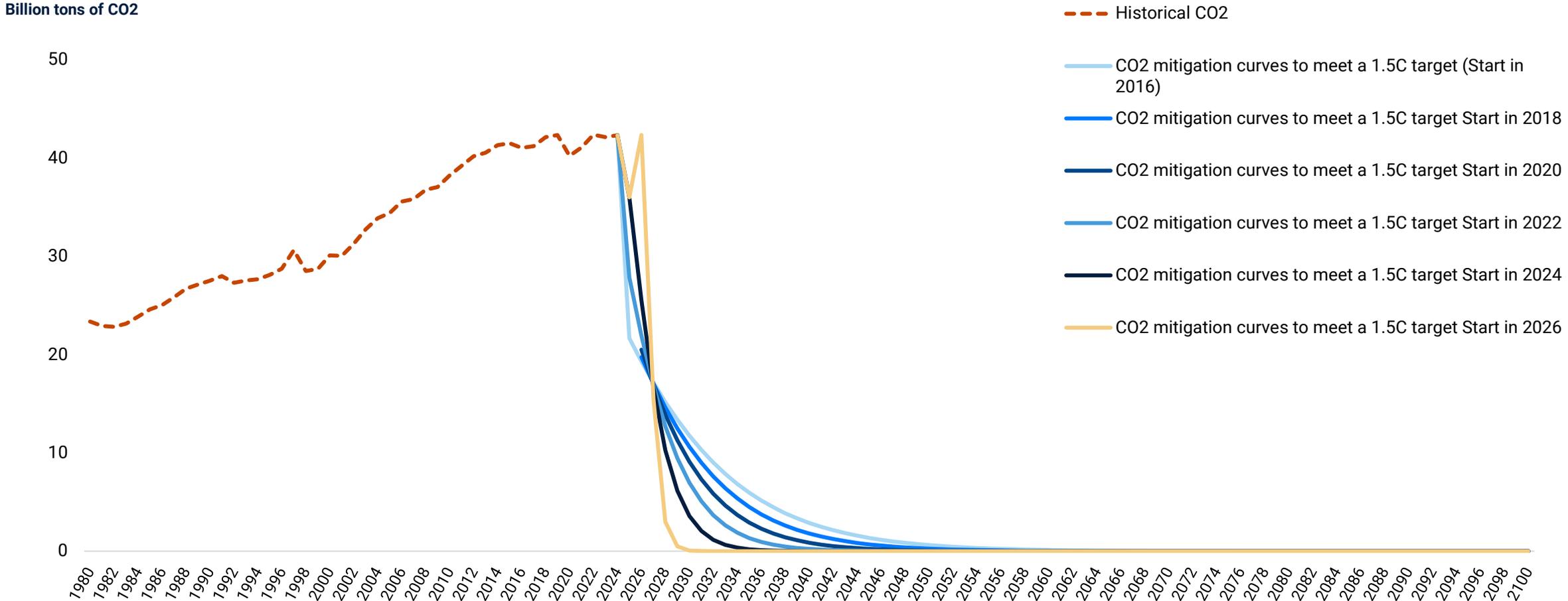
80% of primary energy demand is currently met by fossil fuels vs 86% in 2015



Source: Jefferies, Energy Institute – Statistical Review of World Energy (2025)

# Emissions Growth has Slowed – Yet Still not Enough

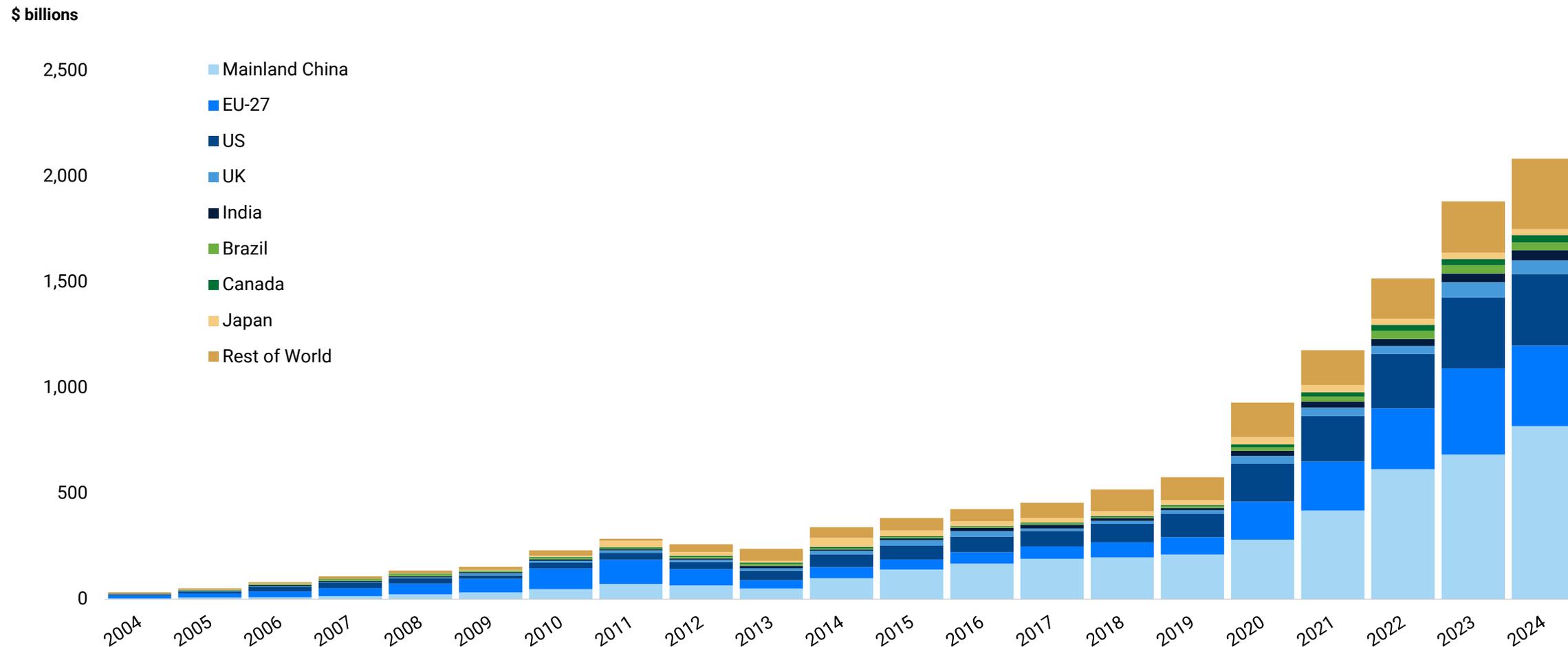
Emissions mitigation scenarios to keep average temperature rise below 1.5°C were never realistic



Source: Jefferies, Global Carbon Project, IPCC AR6 WG1

# There is Real Progress on the Energy Transition

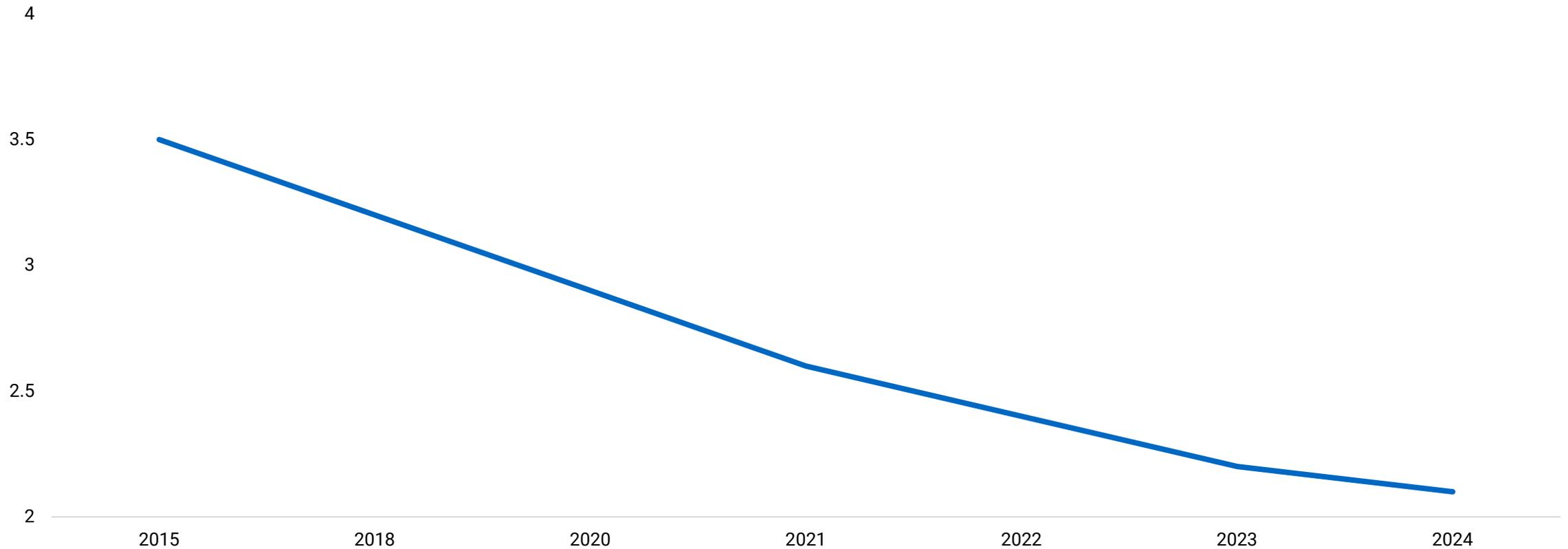
Real economy spend on the energy transition has increased >6x since 2015 (\$0.3trn vs \$2.1trn)



# Policy Action & Tech Progress have Shaved 1.3°C of Warming to 2100

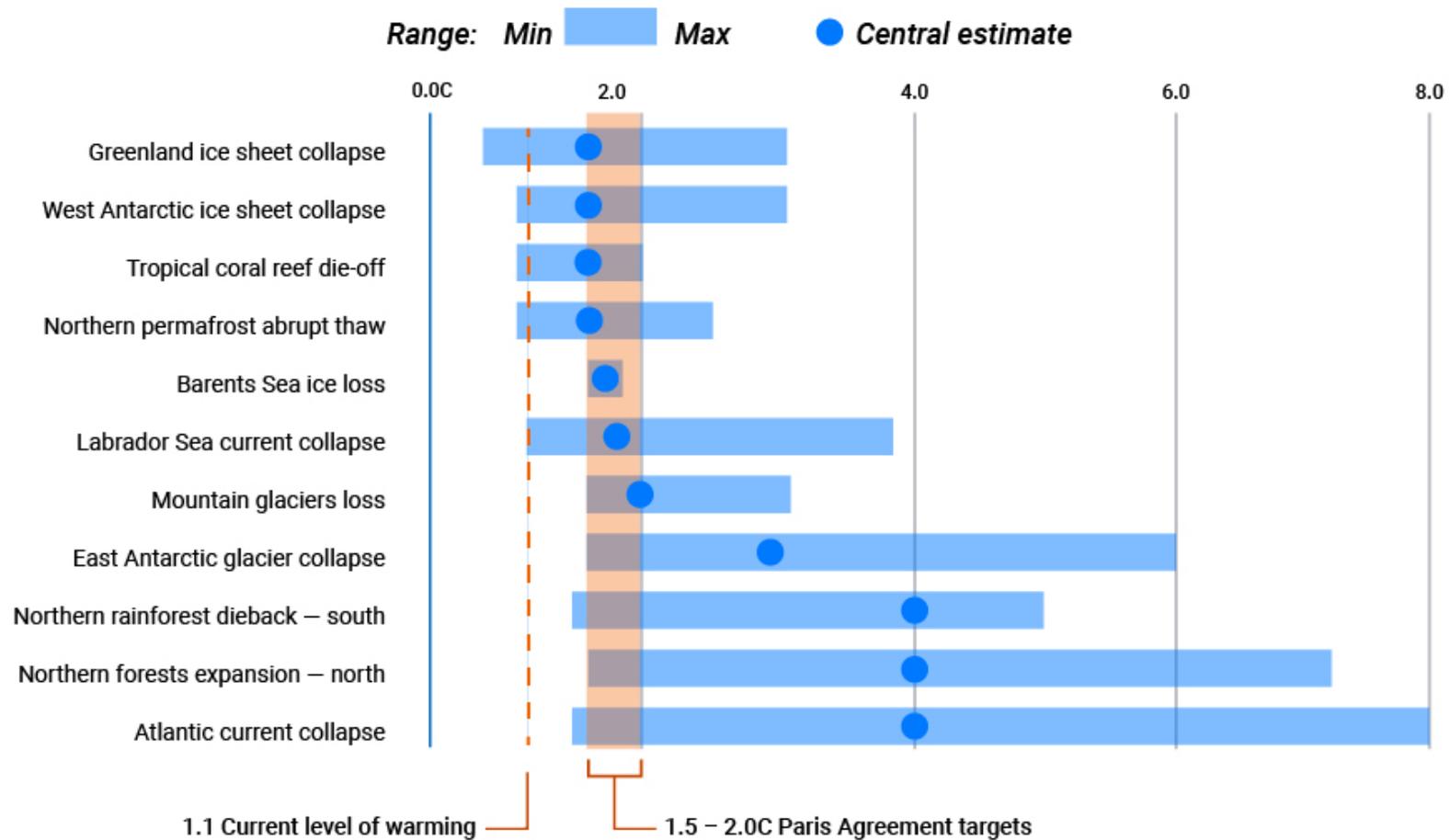
Since 2015, current policies & pledges have reduced projected 2100 warming to c.2.2°C (i.e. < 40Gt CO<sub>2</sub>)

Projected Warming through to 2100 (°C)



# The Urgency of the Transition is Real

The risk of tipping points is rising rapidly as warming increases



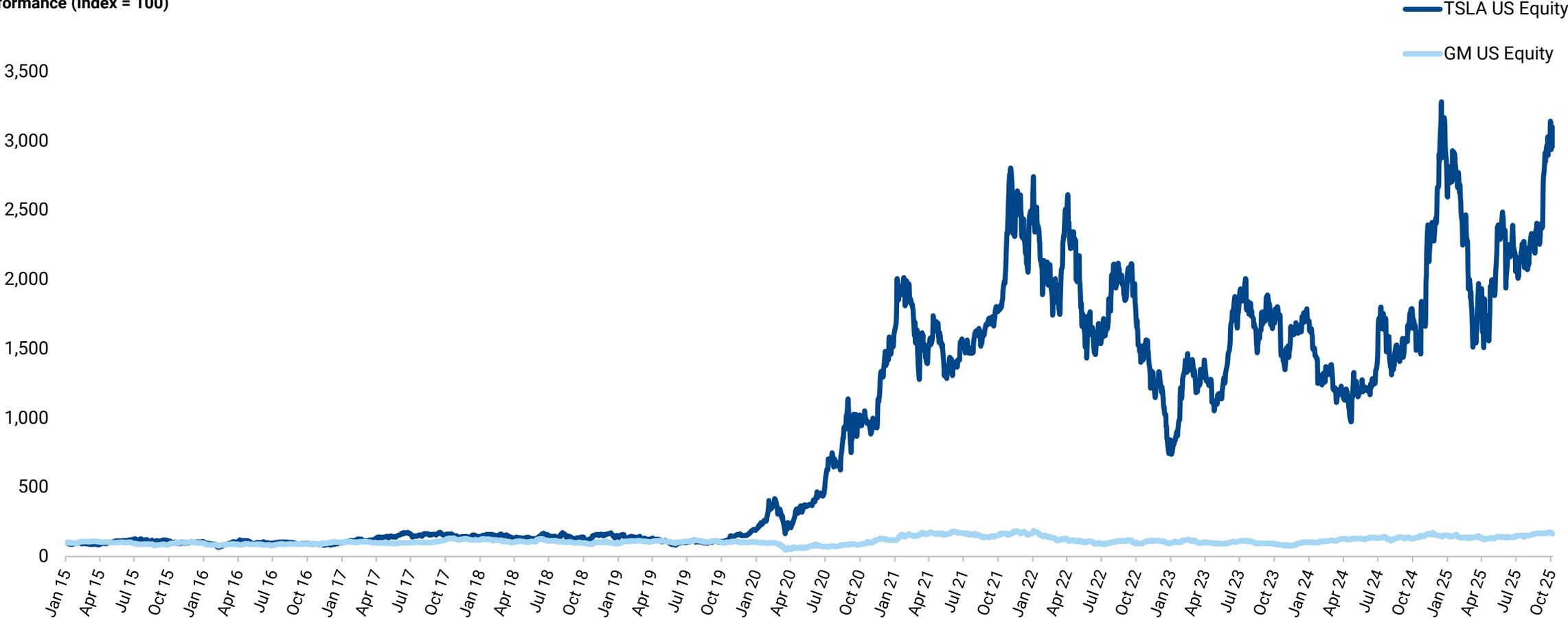
# A Pragmatic View of The Energy Transition



# 1) Make Economic Value Creation Your North Star

Tesla (TSLA) has outperformed its peers significantly, with a focus on value creation

Performance (Index = 100)

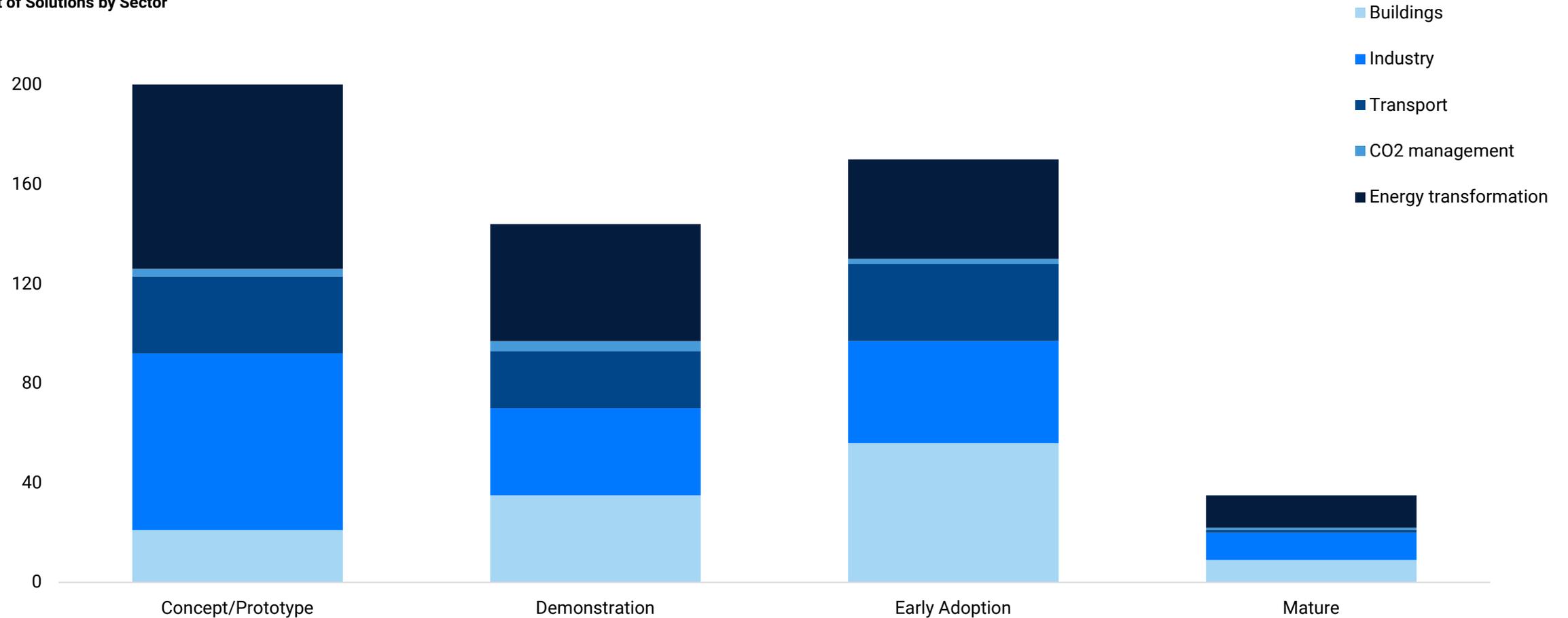


Source: Jefferies, BloombergLP

## 2) Invest in Innovation & Breakthrough Technologies

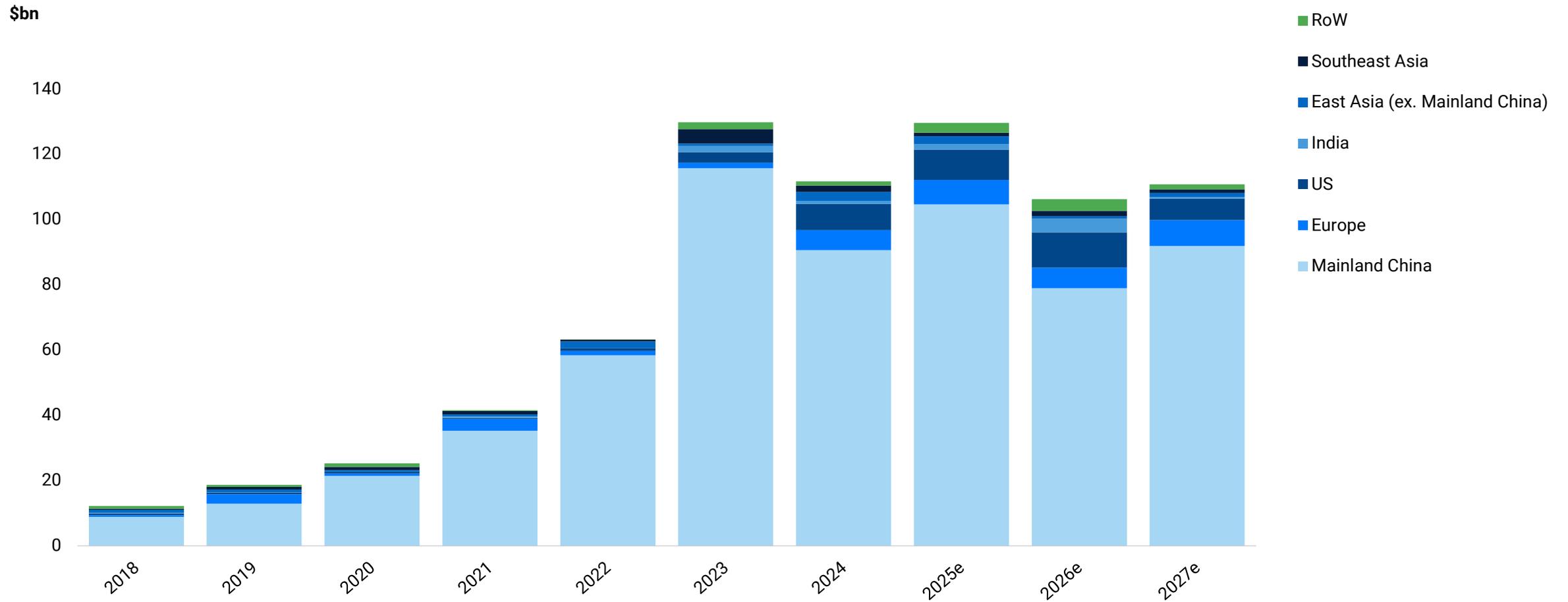
c. 35% of emissions reductions required in the IEA's 2050 NZE Scenario are from solutions in prototype or demo phase

Count of Solutions by Sector



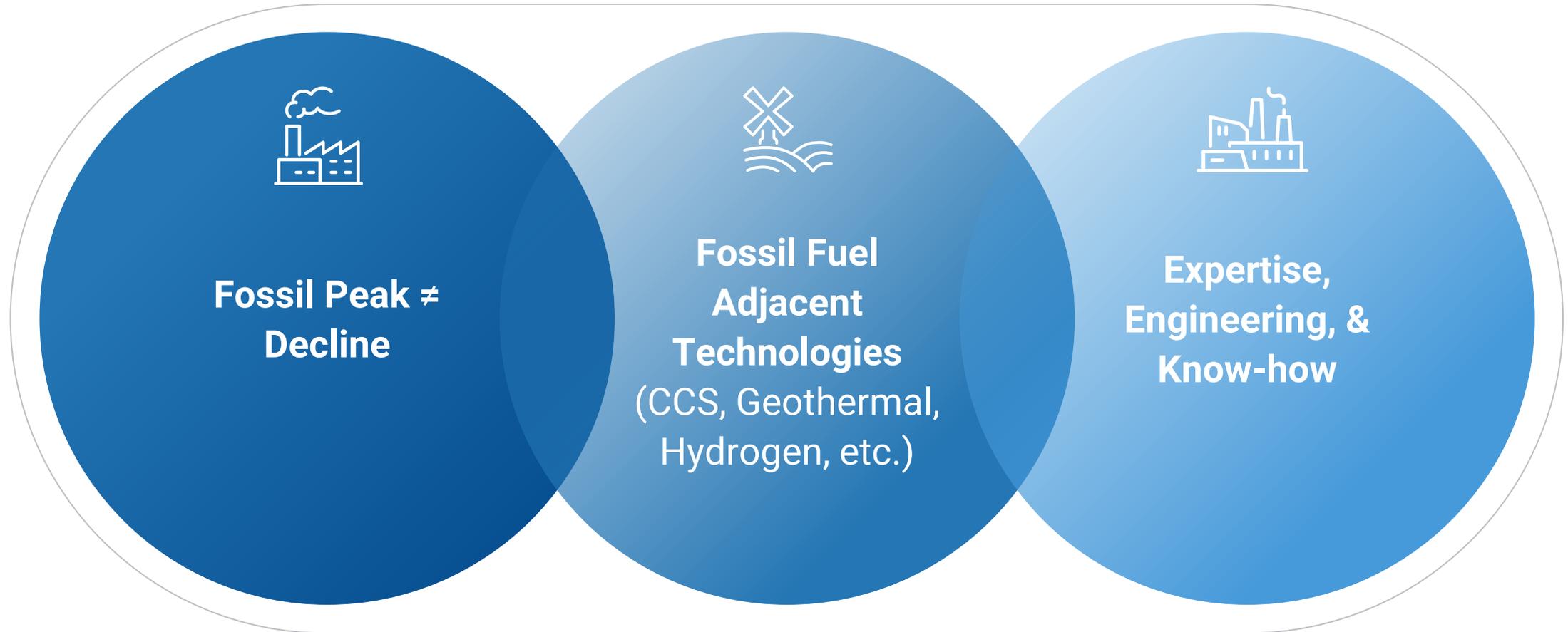
# 3) Embrace Collaboration

## China Will Dominate Clean-Tech Manufacturing for Years to Come



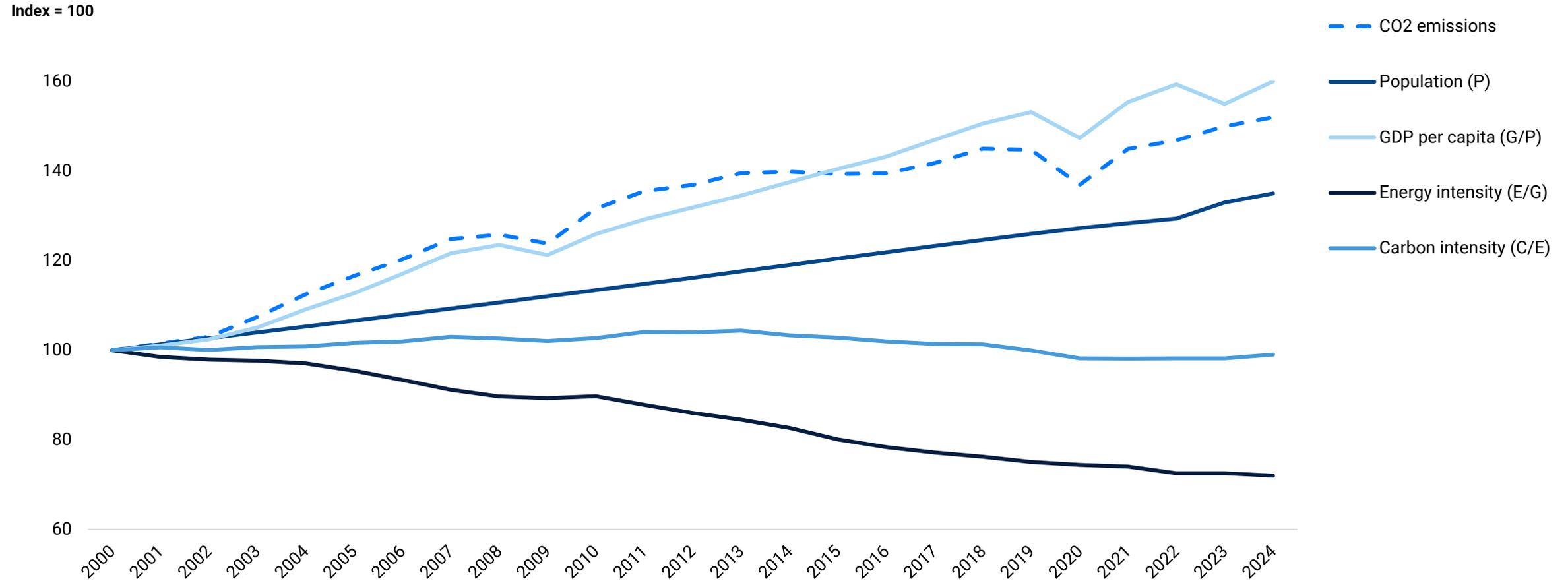
## 4) Right Size Fossil Fuels – Infrastructure & Expertise

Companies, Capital & Professions Across the Fossil Fuels Stack Shouldn't be Discounted



# 5) Focus on Energy Efficiency

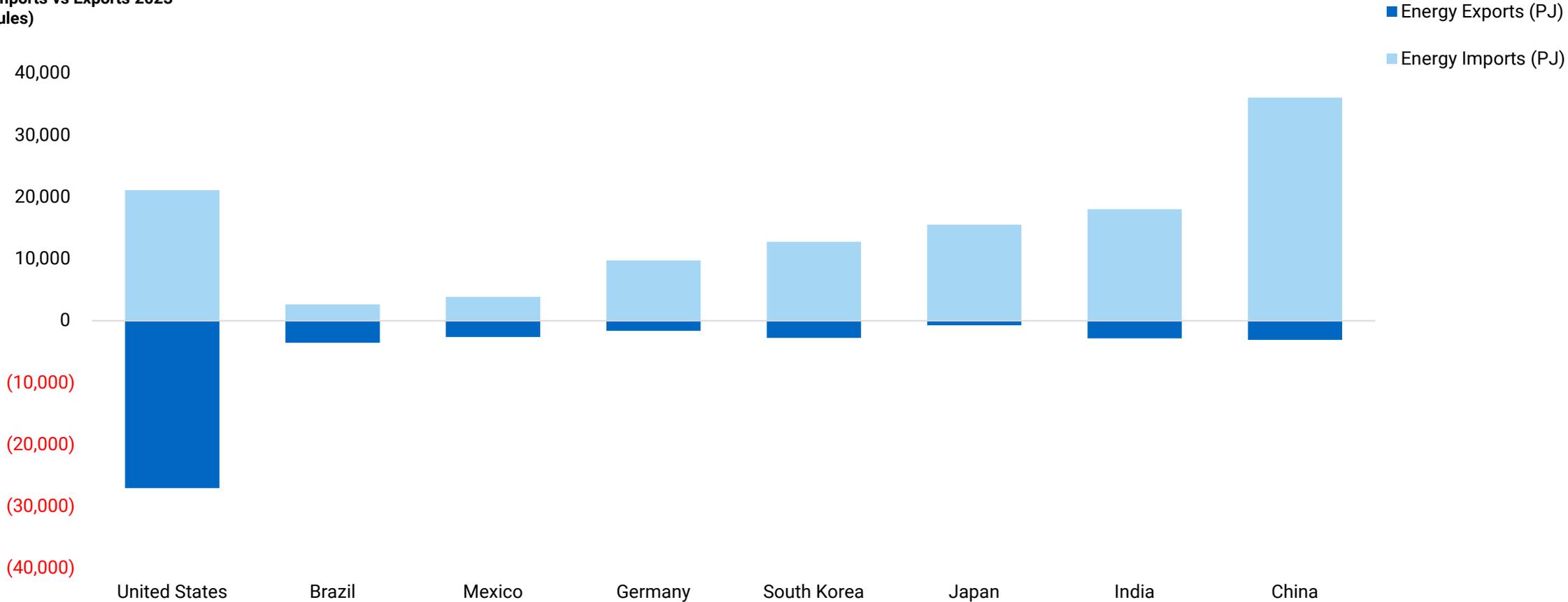
## Decomposing CO2 Reductions Show's the Role of Energy Efficiency



# 6) Frame Energy Transition as Energy Security

Transition can reduce reliance and dependency of energy imports

Energy Imports vs Exports 2023  
(Peta Joules)



Source: Jefferies, IEA Global Energy Balances

# Agenda for the Day

8:00 AM – 8:15 AM

## **Welcome Remarks**

Toru Nakashima, President & Group Chief Executive Officer, Sumitomo Mitsui Financial Group  
John Huwiler, Vice Chairman, Mergers & Acquisitions, Jefferies

8:15 AM – 8:50 AM

## **Setting the Stage – The State of the Energy Transition and What Comes Next**

Aniket Shah, Global Head Washington, Sustainability & Transition Strategy, Jefferies  
Masa Takanashi, Group Chief Sustainability Officer, Sumitomo Mitsui Financial Group

9:00 AM – 9:50 AM

## **Energy Transition Allocation – The View from Asset Allocators**

Debanik Basu, Head of Sustainable Investing for APAC at APG  
Glen Yelton, Global Head of ESG, Invesco  
Helga Birgden, Global Chair on Sustainable Investment, Mercer  
*Moderated by: Aniket Shah*

10:00 AM – 10:50 AM

## **Lessons From Portfolio Managers – A Guide for Japanese Corporates to Attract Public Equity Capital**

Masanori Mizuno, Head of ESG, Global Equity at Sumitomo Mitsui DS Asset Management  
Rolando Morillo, Portfolio Manager for Climate Solutions Strategy, Rockefeller Asset Management  
Thomas Kamei, Portfolio Manager of Tailwinds Fund, Morgan Stanley  
Will Pomroy, Head of Impact Engagement, Federated Hermes  
*Moderated by: Aniket Shah*

11:00 AM – 11:45 AM

## **Navigating Corporate Governance & Investor Activism Amidst the Energy Transition**

Eva Zlotnicka, Co-Founder of Inclusive Capital & Current Venture Partner Bay Bridge Ventures  
Nicholas Benes, Chief Executive Officer of The Board Director Training Institute of Japan  
Zuhair Khan, Senior Portfolio Manager, UBP Investments Co. Ltd.  
*Moderated by: Aniket Shah*

12:00 PM – 13:00 PM

## **Lunch - How Does the Macro Picture Impact Infrastructure Investment**

David Zervos, Chief Strategist, Jefferies

13:00 PM – 13:50 PM

## **US, Europe & China: How Have US, European & Chinese Companies Monetized the Energy Transition**

Emi Iwasaka, SMBC Nikko  
Ahmed Farman, Senior Vice President, Research Analyst, Jefferies  
Johnson Wan, Head of APAC Industrial, Mobility and New Energy Research, Jefferies  
Julien Dumoulin-Smith, Head of US Utilities and Clean Tech Research, Jefferies  
Lloyd Byrne, Head of US Energy Research, Jefferies  
*Moderated by: Charles Boakye*

14:00 PM – 14:50 PM

## **Corporate Panel**

Shuichiro Kawamura, President, Energy & Environment Investment  
Wataru Sato, Head of CCUS & Subsurface Energy Business Unit, Energy Innovation Initiative SBU,  
Sumitomo Corporation  
Takuto Kawamura, Executive Officer, Head of the Global Investor Relations Group, Financial Strategy and Planning Division, JERA  
*Moderated by: Kenji Irie*

15:00 PM – 15:50 PM

## **Corporate Green Financing, Fundraising and M&A to Accelerate the Energy Transition**

David Dolezal, Global Head of Energy Transition Investment Banking, Jefferies  
Emmanuel Lagarrigue, Global Co-Head of the firm's Climate strategy, KKR  
Jimmy Chuang, Chief Financial Officer of Twelve  
Tracy Wolstencroft, Senior Advisor of TPG  
*Moderated by: Kenji Irie*

# Appendix – JEFs Work on Japan’s Green Transformation (GX) Plan



# Our Work on Japan's GX

## Global | Sustainability & Transition Strategy

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### Move Over, IRA—Japan's \$1T Green Transformation Policy May Steal the Spotlight

After publishing [Japan's \\$1 Trillion Climate Policy—10 Reasons to Dig Deeper](#), we analyze the major components of Japan's GX plan: 1) targets include altered power mix by 2030, with ~60% from renewables and nuclear; 2) ¥20T of transition sovereign bonds set to catalyze investment in EVs, renewables, grid; 3) carbon levy on fossil fuel importers in FY2028; 4) emissions trading system becomes mandatory in FY2026; and 5) research-first approach to climate policy.

Japan's GX Plan aims to catalyze \$1T in private and public investment, including an upfront \$144B investment via Transition Sovereign Bonds. **5 Components of the Plan:**

## Global | Sustainability & Transition Strategy

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### Recap: The Architects of Japan's Energy Transition Strategy

Japan is actively advancing climate and energy transition efforts, led by the Ministry of Economy, Trade, and Industry (METI). We hosted Takako Onitsuka, Director of the Environmental Finance Office in METI's GX Policy Group, to delve into Japan's GX 2040 Vision, 7th Strategic Energy Plan, Green Transformation (GX) Policy, and Nationally Determined Contribution (NDC).

## Global | Sustainability & Transition Strategy

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### Recap: Japan's "Carrot and Stick" Approach to Climate Policy

We hosted Hideki Takada, Director of Japan's GX (Green Transformation) Acceleration Agency, which aims to accelerate 130 trillion JPY (\$860 billion) in private investment over the next 10 years to decarbonize Japan's economy. To do this, Japan has learned from other jurisdictions to implement carrot and stick approach. This includes 1) provisions of financial supports such as credit guarantees and equity investments, and 2) a national ETS and carbon pricing.

## Global | Sustainability & Transition Strategy

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### Climate Bonds Initiative CEO on Japan's GX Bonds | Recap

We hosted Sean Kidney, CEO of Climate Bonds Initiative (CBI), to go deeper into Japan's sovereign climate transition bonds. Key takes: 1) don't be concerned with "transition" label of Japan's \$144 sovereign transition bonds; 2) inaugural GX bonds traded at modest greenium, but later tranches have slightly underperformed; 3) Investors want Japan to emphasize a consistent program with enhanced transparency, and align with international standards.

**As of December 31st 2024, cumulative volume for Green Bonds, Social & Sustainability Bonds, and Sustainability-Linked Bonds (GSS+) in alignment with Climate Bonds Methodologies (aligned) stood at USD \$5.7tn.** This includes \$1.1tn from 2024 alone, with Green bonds the largest segment at \$669.7bn. Green bonds have historically performed better than vanilla bonds; it's unusual to get a GSS+ bond without a higher subscription rate, and it has shown signs of superior liquidity characteristics. China is the largest green bond market in the world.

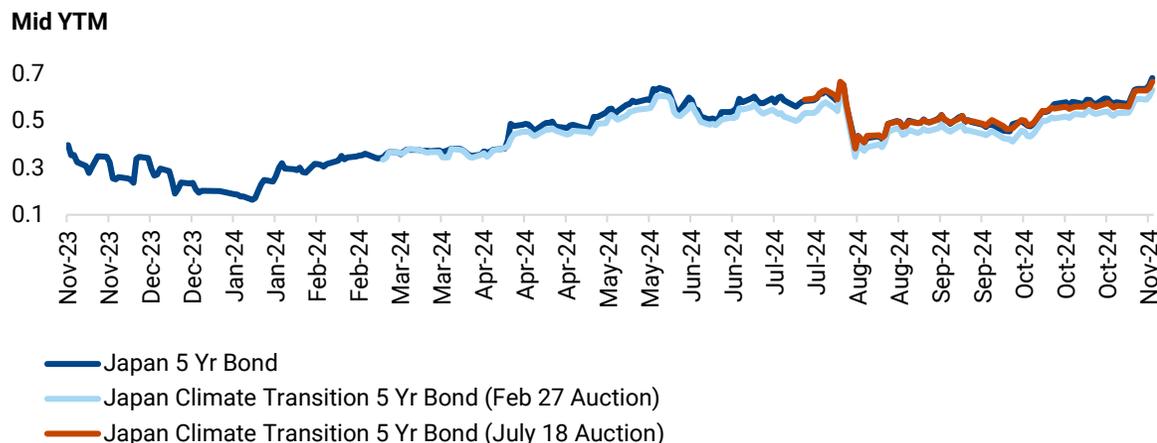
**Japan's GX Policy includes the issuance of \$144 Billion of GX Transition Bonds—the world's first sovereign transition bonds.** In 2022, Japan's Ministry of Economy, Trade, and Industry (METI) announced transition principles and developed a national green transformation

# Japan Issues the World's First Sovereign Transition Bonds

## 6 Sovereign Transition Bond Auctions So Far

SECURITY	ISSUE DATE	COMPETITIVE BIDS (BILLION YEN)	BIDS ACCEPTED (BILLION YEN)
10-Year Climate Transition	2/15/2024	2321.2	799.5
5-Year Climate Transition	2/28/2024	2714.5	799.8
10-Year Climate Transition	5/29/2024	1100.7	349.6
5-Year Climate Transition	7/19/2024	1411.7	349.6
10-Year Climate Transition* (Re-opened)	10/23/2024	1160	350
5-Year Climate Transition	1/30/2025	1116.4	349.8

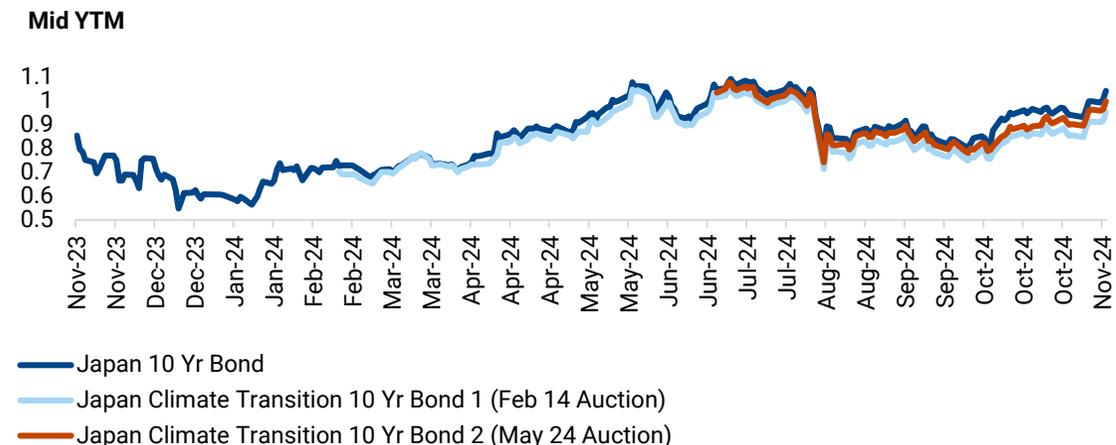
## 5 Year: Regular Sovereign vs. Transition Sovereign



## Overview of proposed tax credits in strategic sectors

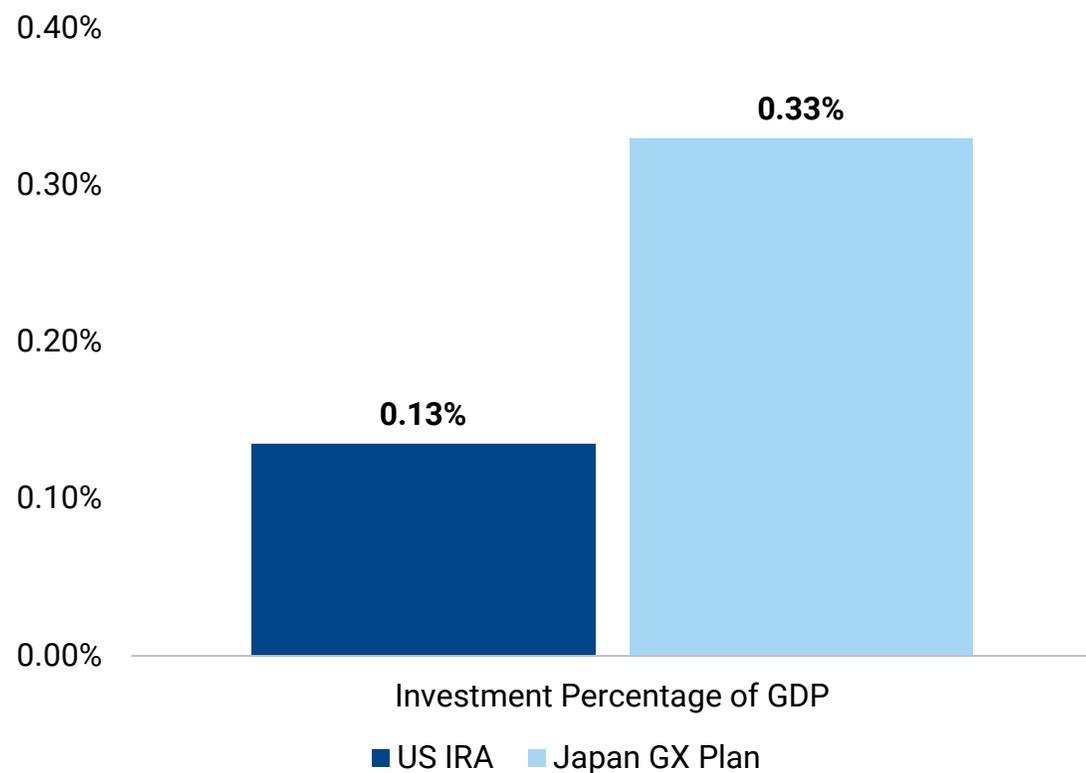
STRATEGIC SECTORS	PROPOSED TAX CREDIT	
EVs	EVs and FCVs	400,000 yen/vehicle
	Light EVs and PHEVs	200,000 yen/vehicle
Green Steel		20,000 yen/vehicle
Green Chemicals		50,000 yen/vehicle
SAF		30,000 yen/vehicle

## 10 Year: Regular Sovereign vs. Transition Sovereign

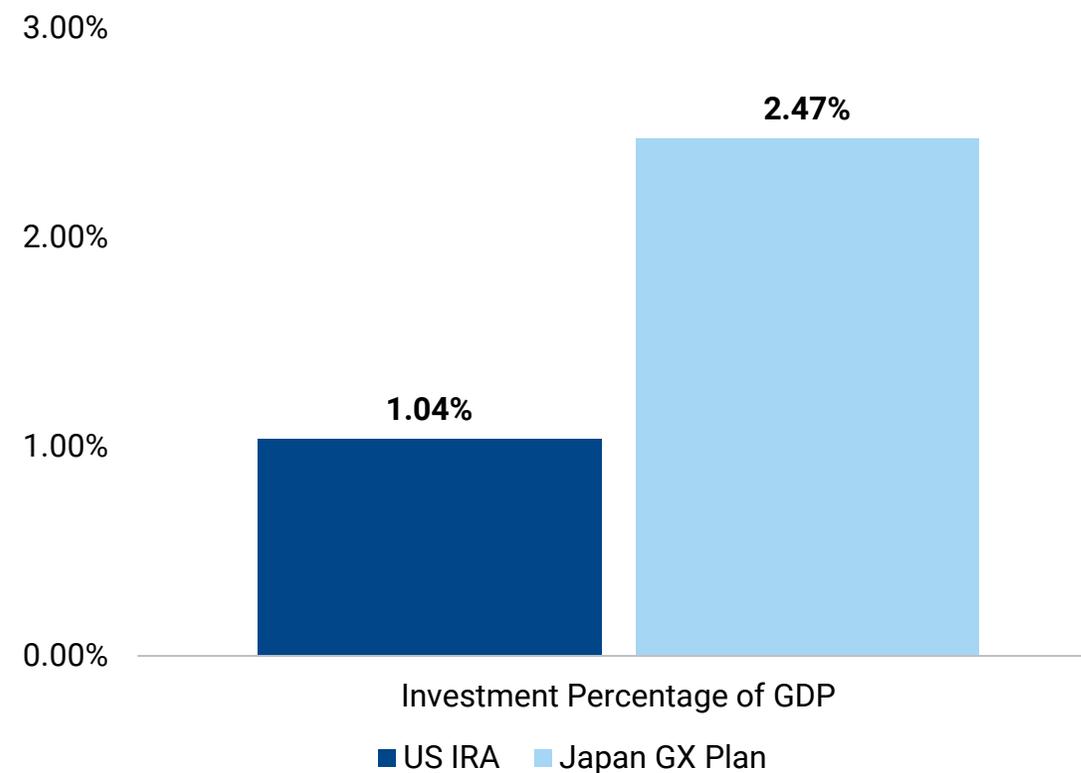


# Japan's GX Plan in Perspective

## Annual Public Investment as a Percentage of GDP



## Annual Public & Private Investment as a Percentage of GDP



# Japan's GX Plan Targets, by Sector

## ENERGY

- To reach 36-38% of renewable energy in the country's power mix by 2030
- To install 10GW of Offshore Wind Power and 104-118GW Solar Power by 2030
- To restart nuclear power and aim for 20-22% of country's power mix by 2030
- To establish success cases of starting 2025, and to achieve lowered costs by 2030 (hydrogen: 30yen/Nm<sup>3</sup>; ammonia/ hydrogen co-firing by 2024, so as to support development of supply chain ammonia: 10~20yen/Nm<sup>3</sup>-H<sub>2</sub>)
- To build CCUS value chain and capture 120-240 million tonnes of CO<sub>2</sub> by 2050

## TRANSPORT

- To achieve 100% EVs and HEVs by 2035 for new private car sales
- To achieve 20~30% EVs in commercial vehicle sales by 2030
- Enhance charging infrastructure by rolling out 150,000 EV chargers (incl. 30,000 fast chargers) and 1,000 hydrogen stations by 2030
- CO<sub>2</sub> emissions cut by 1.8 million tonnes in shipping industry by 2030 through introduction of ammonia/ hydrogen-fueled ships
- Carbon neutral fuels for shipping and aviation sectors by 2050

## BUILT ENVIRONMENT

- New houses and buildings to be zero emission by 2030
- Promoting LCCM (Life Cycle Carbon Minus) and ZEH/ZEB (net-zero energy houses/ buildings) with the aim of absorbing 5.6 million tons of CO<sub>2</sub> by 2030

## INDUSTRY

- To expand supply of green steel to 10 million tonnes by 2030
- 30% CO<sub>2</sub> emission cut in steel industry from 2013 levels by 2030
- To expand supply of carbon neutral cement to 2 million tonnes by 2030

## FINANCE

- Regulatory and policy guidance to scale up blended finance (covering green, transition and innovation investments)
- Promote climate-related disclosure based on ISSB and TCFD recommendations
- JCM Global Match to promote matchmaking for decarbonization projects

# What ¥150T of Public and Private Investment Could Look Like

CATEGORY	SUB-SECTOR	PUBLIC AND PRIVATE INVESTMENT		
		YEN, TRILLIONS	USD, BILLIONS	PERCENTAGE OF TOTAL
Manufacturing	Steel	¥3	\$20	2%
	Chemicals	¥3	\$20	2%
	Paper and Pulp	¥1	\$7	1%
	Cement	¥1	\$7	1%
Transportation	Electric Vehicles	<b>¥31</b>	<b>\$202</b>	<b>24%</b>
	Automobile Infrastructure	¥1	\$9	1%
	Automobile Manufacturing	¥1	\$7	1%
	Batteries	¥7	\$46	5%
	Next-generation Aircraft	¥4	\$26	3%
	SAF	¥1	\$7	1%
	Ships	¥3	\$20	2%
Life-related	Houses/Buildings	<b>¥14</b>	<b>\$91</b>	<b>11%</b>
	ReSource Circulation	¥2	\$13	2%
	Semiconductor	¥12	\$78	9%
Energy	Hydrogen and its Derivatives	¥7	\$46	5%
	Next-generation renewable energy	<b>¥20</b>	<b>\$130</b>	<b>16%</b>
	Next-generation network (grid and balancing power)	<b>¥11</b>	<b>\$72</b>	<b>9%</b>
	Nuclear Power	¥1	\$7	1%
	CCS	¥4	\$26	3%
<b>Total</b>		<b>¥127+</b>	<b>\$828+</b>	<b>100%</b>

# Tools within Japan's GX Plan

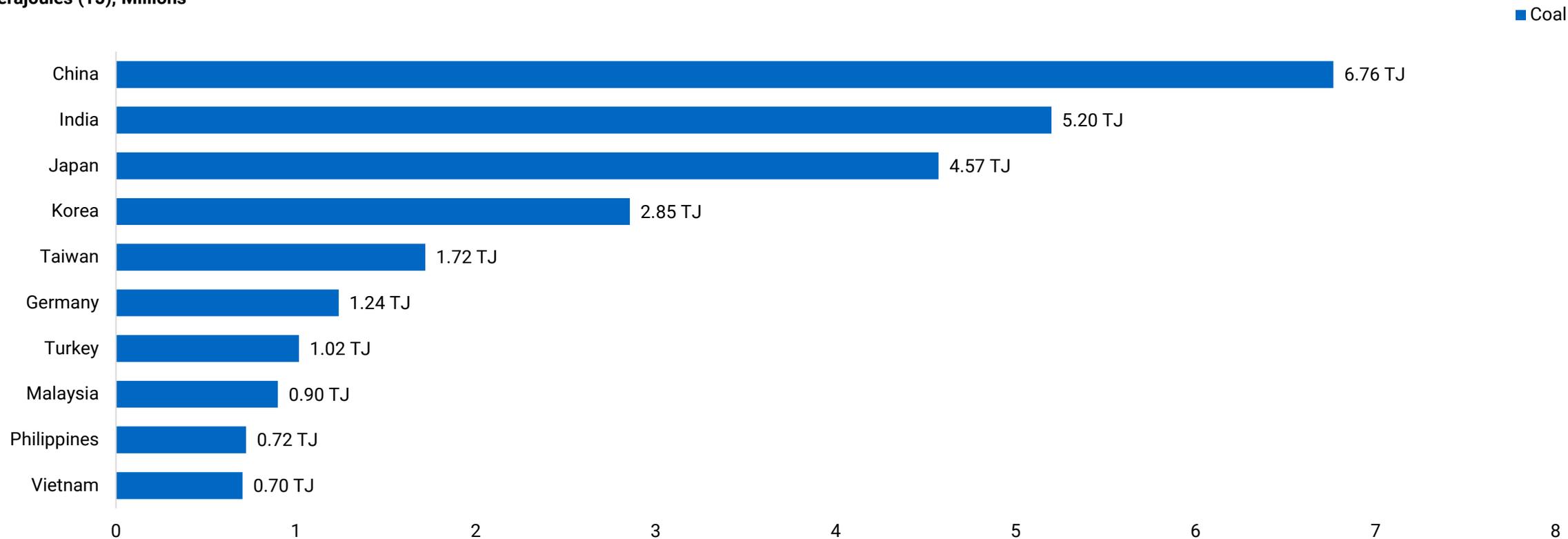


# A Carbon Levy on Fossil Fuel Imports in FY2028

Starting in FY2028 via the GX Promotion Act, Japan plans to impose a carbon levy on fossil fuel importers, which will gradually increase over time. The funds collected from the carbon levy are then allocated to repay the principal and interest of the GX Transition Bonds.

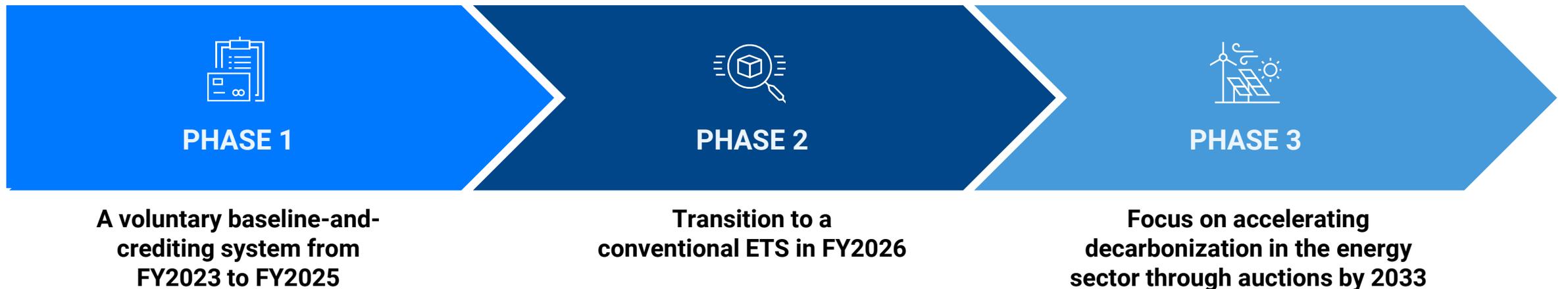
## Japan accounts for 14% of the world's coal imports, at 4.57 million TJ

Terajoules (TJ), Millions



# The GX-ETS Becomes Mandatory in FY2026

**Japan's national Emission Trading System (ETS) was introduced in FY2023, starting with voluntary participation by the "GX-League".** The GX League is a group of 747 companies, accounting for >50% of Japan's GHG emissions, making significant efforts to reduce emissions. This first phase will last up to the end of FY2025, and will become a mandatory ETS from 2026 onwards.



# Nuclear Target is 20% of Energy Mix in 2040

Companies with Exposure: Kyushu Electric Power Company (9508 JP), Shikoku Electric Power Company (9507 JP), Kansai Electric Power Company (9503 JP); Tohoku Electric Power Company (9506 JP), Chugoku Electric Power Company (9504 JP)

## Nuclear Reactors in Commercial Operation in Japan

### Kansai Electric 9503 JP

- Takahama 1 - PWR
- Takahama 2 - PWR
- Takahama 3 - PWR
- Takahama 4 - PWR
- Ohi 3 - PWR
- Ohi 4 - PWR
- Mihama 3 - PWR

### Kyushu Electric 9508 JP

- Genkai 3 - PWR
- Genkai 4 - PWR
- Sendai 1 - PWR
- Sendai 2 - PWR

### Shikoku Electric 9507 JP

- Ikata 3 - PWR

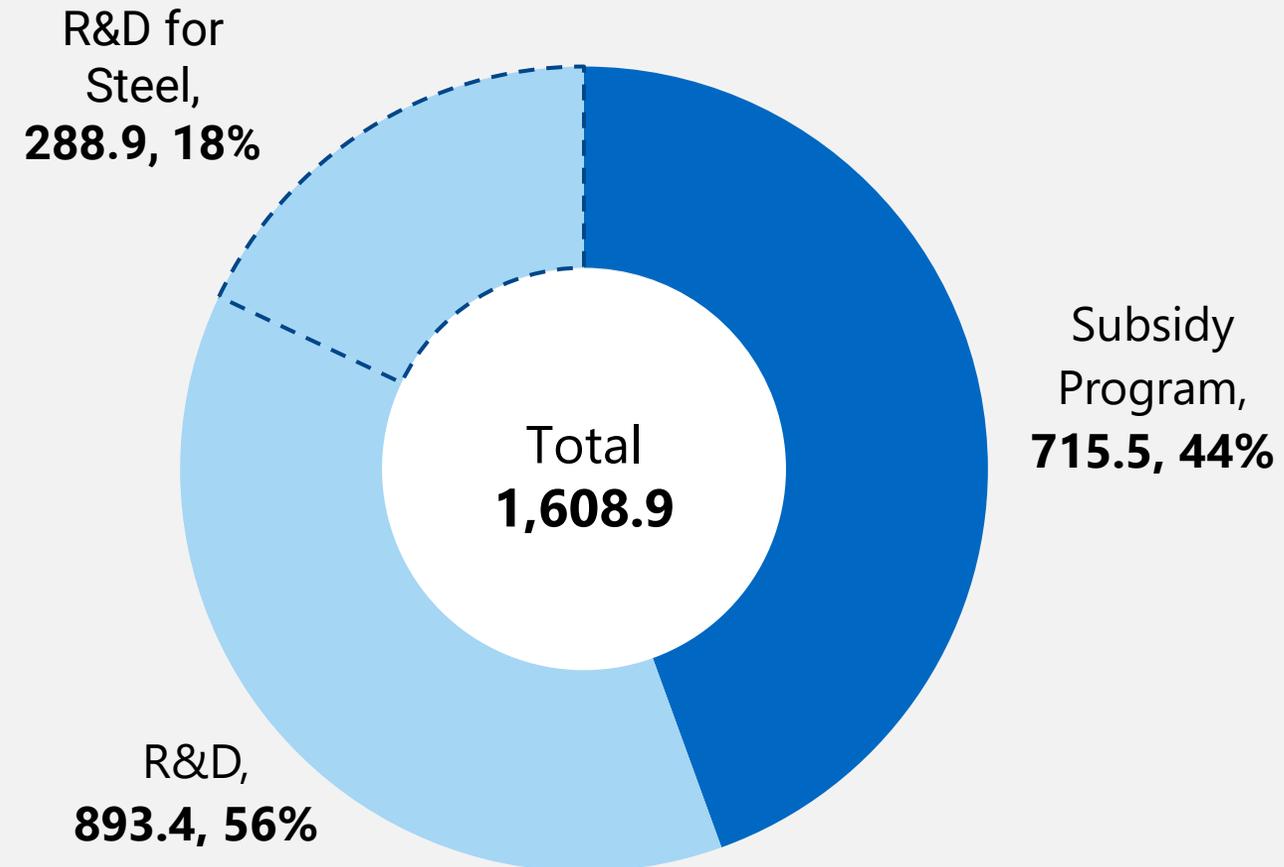
### Tohoku Electric 9506 JP

- Onagawa 2 - BWR

### Chugoku Electric 9504 JP

- Shimane 2 - BWR

# More R&D than Subsidies



# Climate Tech in Japan

## Climate Tech Companies in Japan

NAME	OVERVIEW	TOTAL FUNDING
Spiber	Plant based protein polymers	\$748,086,647
Astroscale	On-orbit servicing for sustainable space	\$388,200,000
SkyDrive	eVTOL developer	\$257,892,309
Kyoto Fusioneering	Nuclear fusion equipment	\$100,950,768
PowerX	Energy storage solutions	\$96,089,681
Terra Drone	Aerial drone services	\$94,274,575
APB Corporation	All-polymer battery manufacturer	\$81,137,895
Loop	Solar installation and renewables development	\$80,687,830
DAIZ	Plant-based meat	\$76,408,834
Luup	E-scooters and e-bikes	\$56,105,030
Tsubame BHB	Ammonia synthesis technology	\$35,146,950
EneCoat	Develops perovskite solar cells	\$34,806,850
Sharing Energy	Distributed solar energy	\$25,866,000
Helical Fusion	Helical fusion reactors	\$19,200,000
Asuene	Cloud solution for carbon emission visualisation	\$18,592,002
Integriculture	Cell based meat	\$17,142,327
EX-Fusion	Laser compression fusion energy	\$13,524,823
Degas	Agri-fintech for farmers	\$9,127,580
EF Polymer	Biowaste upcycling	\$4,472,852
Azul Energy	Innovative air battery technology	\$3,200,000
elleThermo	Low-energy thermoelectric materials	\$2,502,900
Beff	Virtual battery factory development	\$1,360,900
Joycle	Small-scale upcycling plant provider	\$1,193,995
JEPLAN	Recycled clothing logistics	\$900,111

## Climate Tech Investors in Japan

NAME	DEAL INVESTED COUNT	DEAL INVESTED LEAD COUNT
Mitsui & Co.	28	12
Mitsubishi Corporation	27	5
MUFG Bank	25	6
ITOCHU Corporation	16	10
Marubeni	13	3
SoftBank	12	4
Sumitomo Mitsui Banking Corporation	12	0
Mizuho Bank	12	3
Nomura	11	5
Energy & Environment Investment	11	1
Asahi Kasei	10	2
ENEOS Innovation Partners	10	1
Japan Energy Fund	10	0
ENEOS	9	4
Mitsubishi Heavy Industries	9	2
Sumitomo Corporation	9	2
Beyond Next Ventures	9	2
JAFCO	8	1
Honda Motor Company	8	2
SBI Investment	7	1
ANRI	7	5
Sony Innovation Fund	6	0
SMBC Venture Capital	6	1
Spiral Capital	6	5
Mitsubishi HC Capital	6	1

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