

1 September 2026

2026 Build for NextGen

Energy Transition and the Role of Intelligent Building

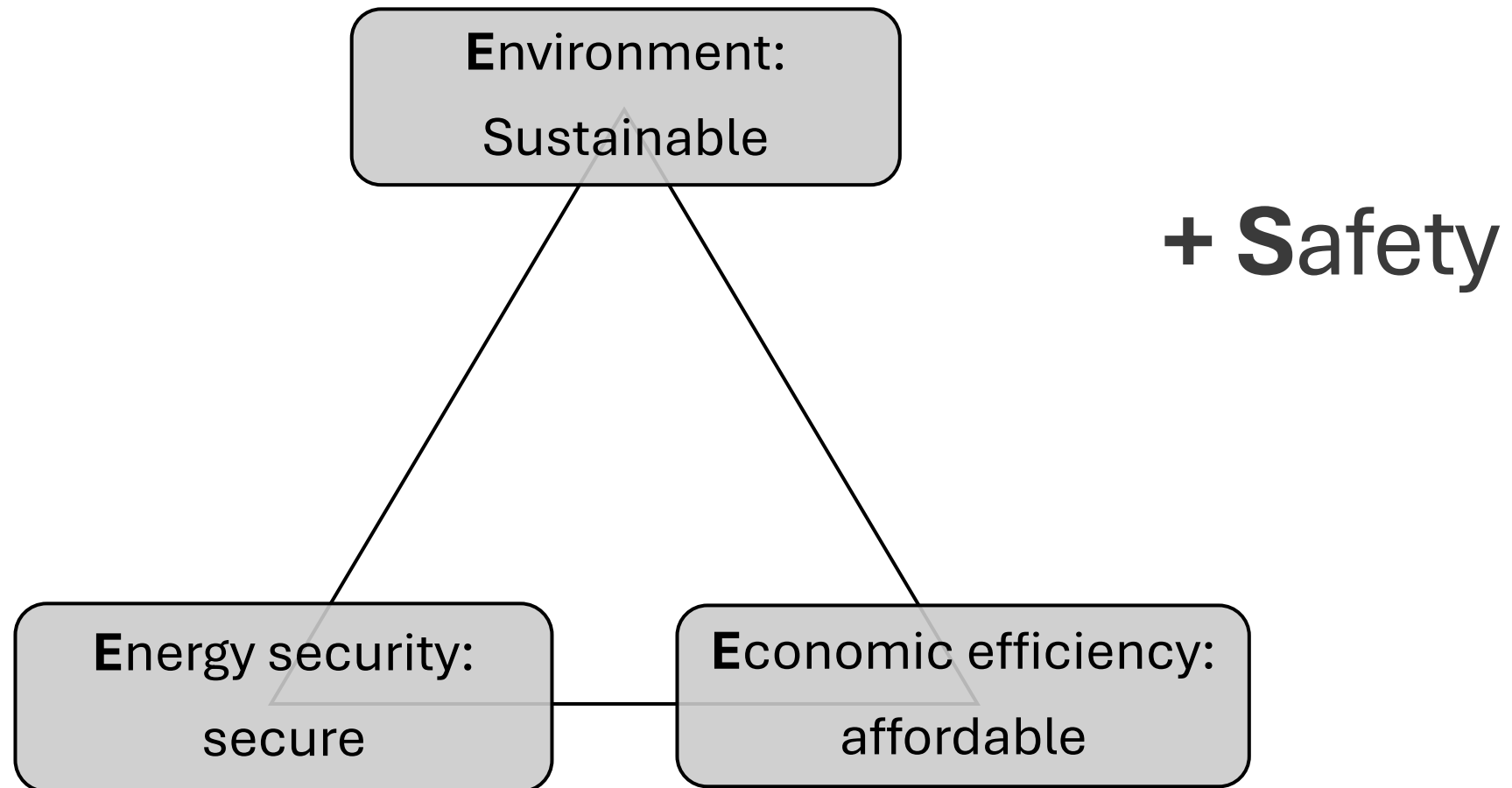
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Today's Agenda

- 0. 3Es (+ S) as Energy Policy Objectives
- 1. Energy Transition: Recent Developments
- 2. The Role of Intelligent Building
- 3. Some Quick Ideas for the Future

0. 3Es (+ S) as Energy Policy Objectives



1. Energy Transition: Recent Developments

Change of the Global Energy Landscape over the Last 10 Years

- Frequent extreme heats, droughts, floods, wildfires, etc
- Drastic decrease of RE cost and rapid deployment of RE
- COP21 and the Paris Accord in 2015
- President Trump withdrew from the PA in 2017
- Leaders Summit on Climate in the US led by President Biden in 2021
- COP26 in Glasgow in 2021
- Covid (2020-2023)
- Russian invasion to Ukraine (2022—)
- Israeli invasion to Gaza in 2023
- “Energy Crisis”
- The Second Trump Administration in 2025
- Iran War and the Blockade of the Strait of Hormuz in 2026

Some Notable Global Trends in Energy

(1) Decarbonization

(2) Energy security

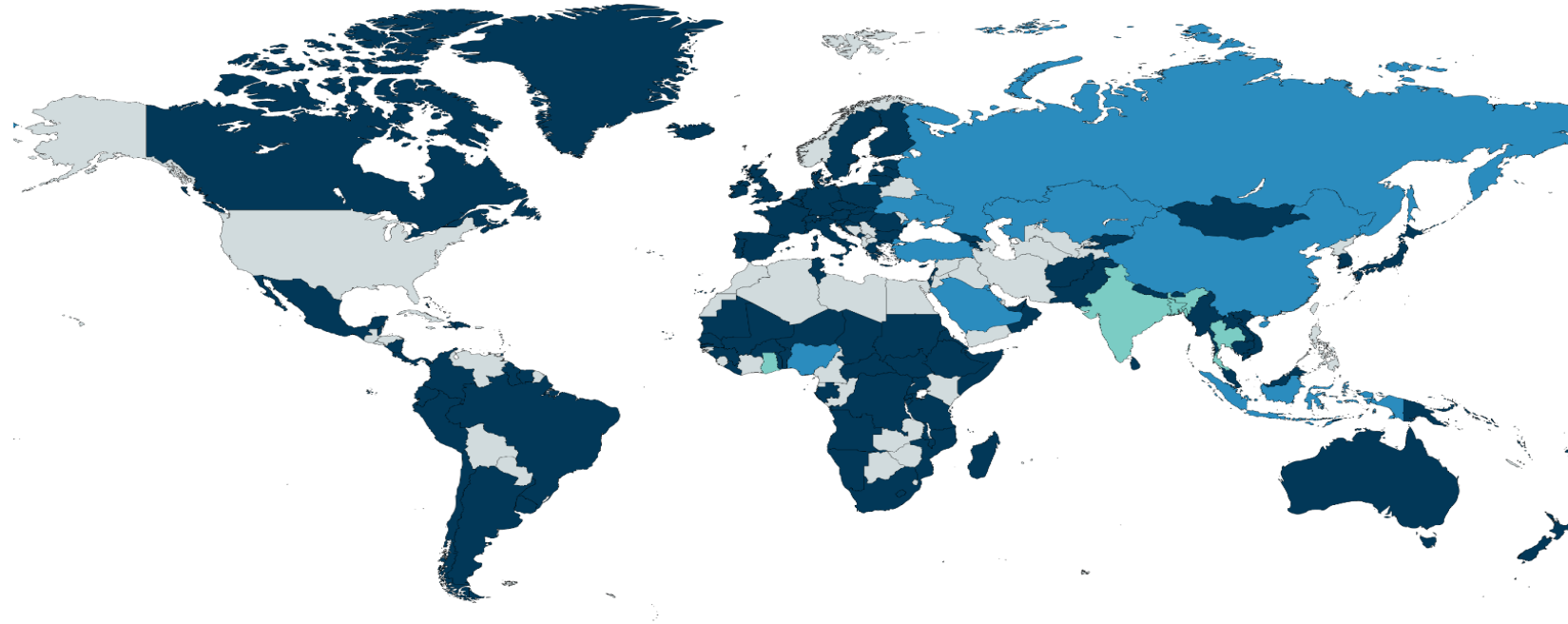
(3) Change in energy geopolitics

(4) AI, technology development and continued inflation

(1) Carbon Neutrality Declarations in the World (METI)

■ 146 countries and economies have declared carbon neutrality including Japan and Taiwan that covers about 70% of the global GDP.

期限付きCNを表明する国（2025年2月13日時点）



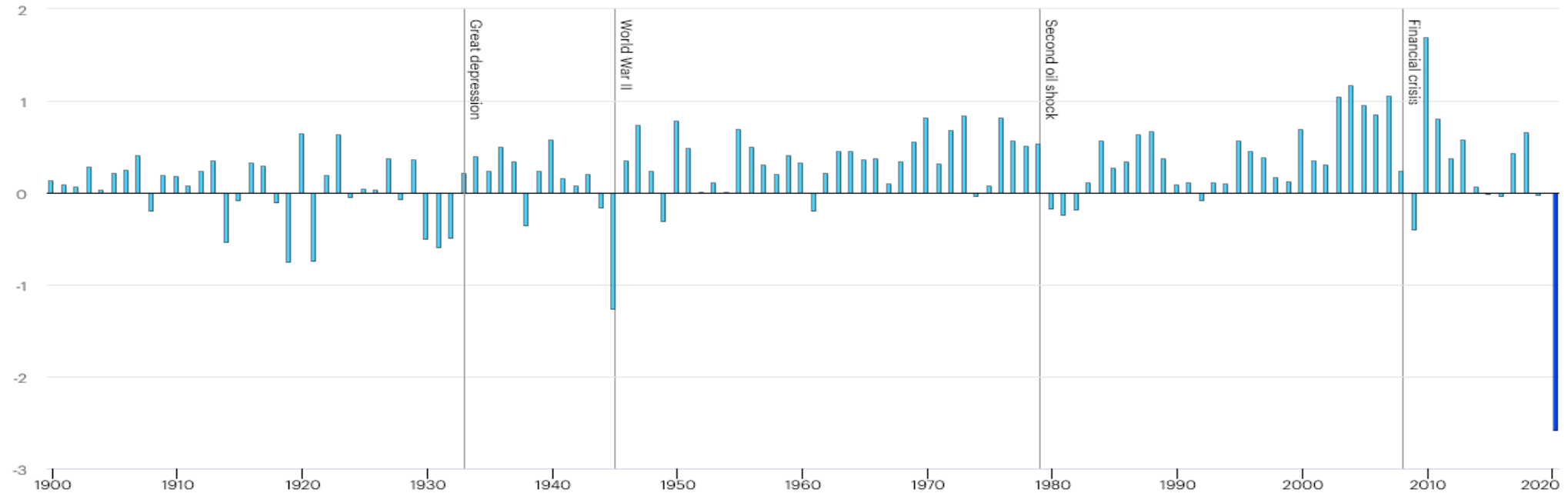
■ 2050年まで ■ 2060年まで ■ 2070年まで

（出典）各国政府HP、UNFCCC NDC Registry、Long term strategies、World Bank database等を基に作成

※国連に提出されている各国の長期戦略や各国のCN宣言に基づき、CNを宣言している国・地域を経済産業省がカウント（2025年2月13日時点）

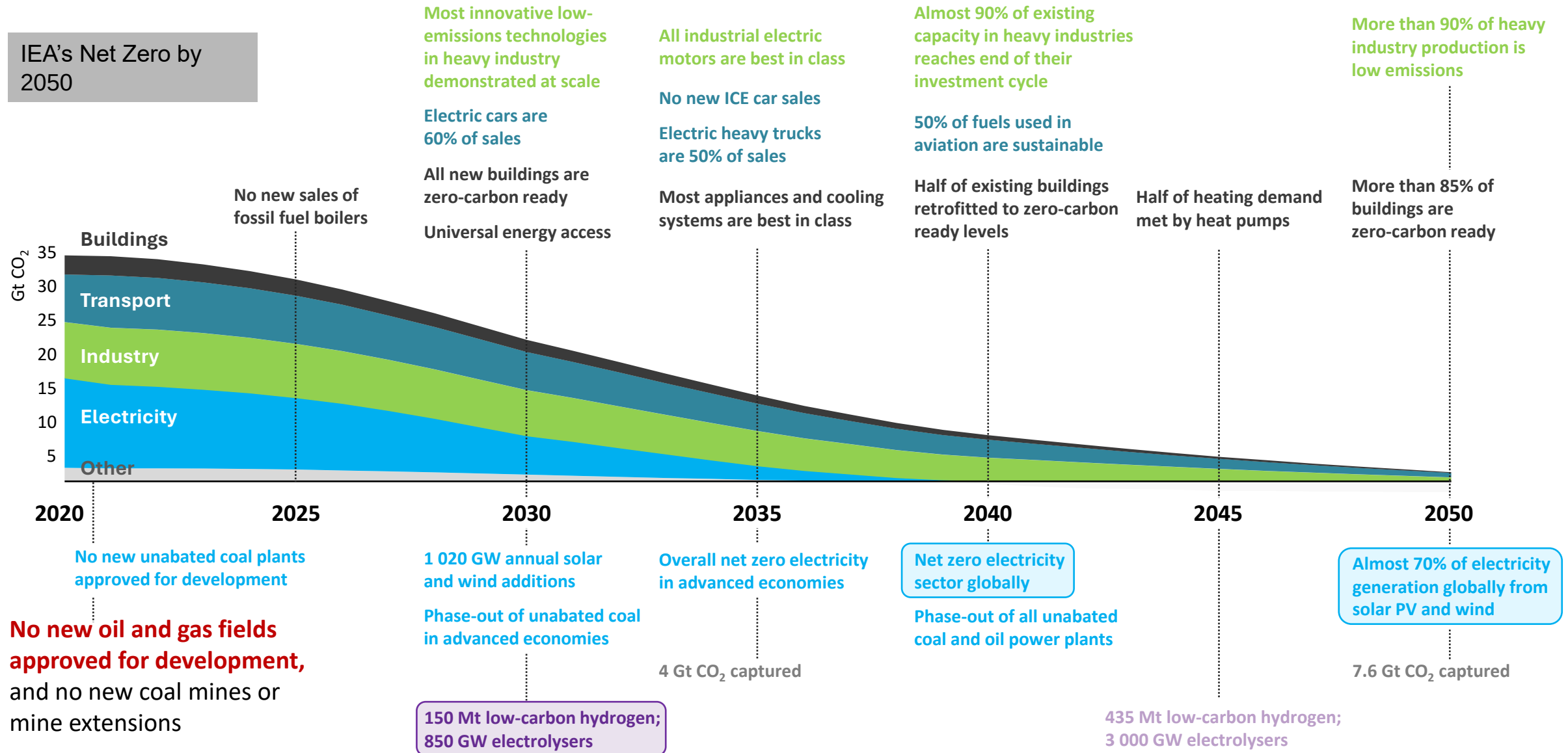
※GDP: World Bank (2025), World Development Indicators (2023).を元にGDPをカウント。2050CNを掲げた米国大統領令（バイデン政権時に制定）をトランプ大統領が2025年1月に撤回する前は、世界のカーボンニュートラル目標を宣言する国・地域の世界全体のGDPに占める割合は、約9割。

Global Energy Related CO2 Emissions 1900-2020 (IEA)



IEA's "Net Zero by 2050" (IEA)

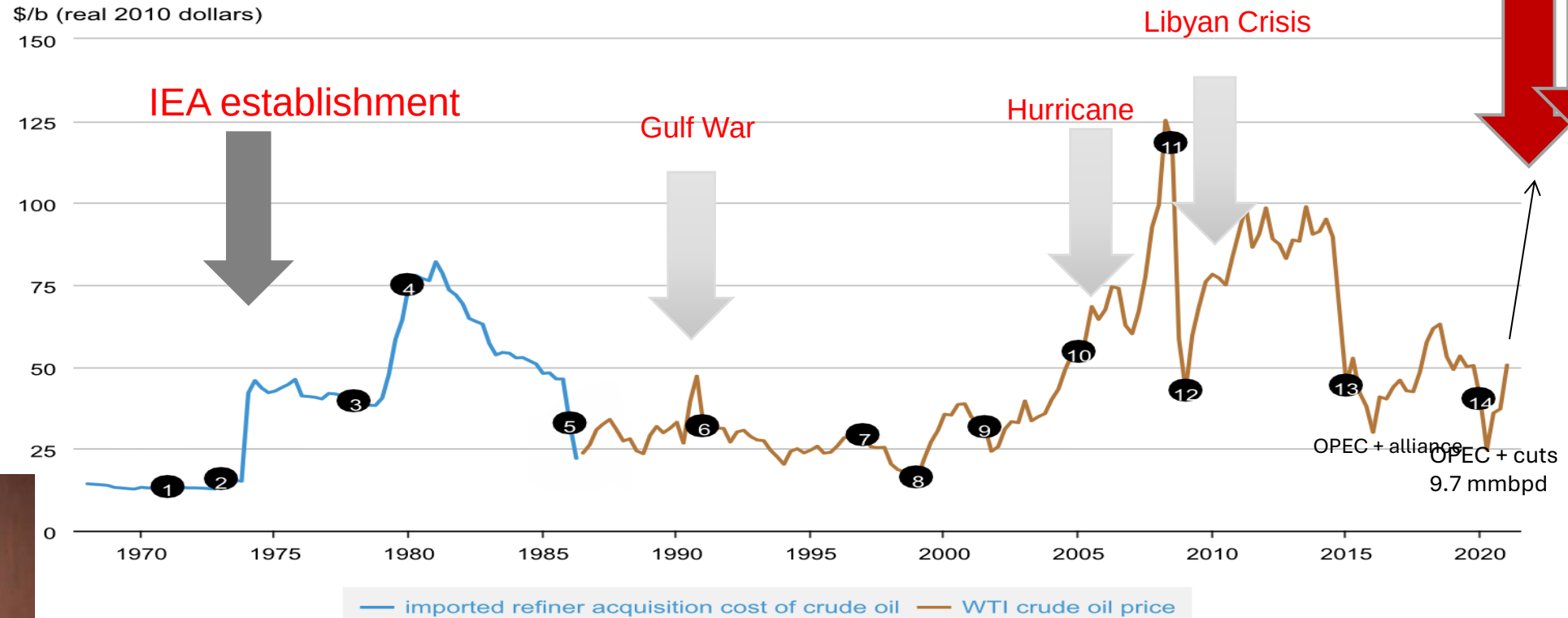
IEA's Net Zero by 2050



Net Zero by 2050 sets near-term milestones to get on track for long-term targets. (Back-casting)

(2) “Energy Crisis” caused by Russian Invasion to Ukraine

Ukraine I & II



Source: U.S. Energy Information Administration, Refinitiv

Dr. Fatih Birol, Executive Director of IEA, says that we are in the middle of the “first truly global energy crisis”.

The Choke Point: the Strait of Hormuz blockage mean 16 mbd loss



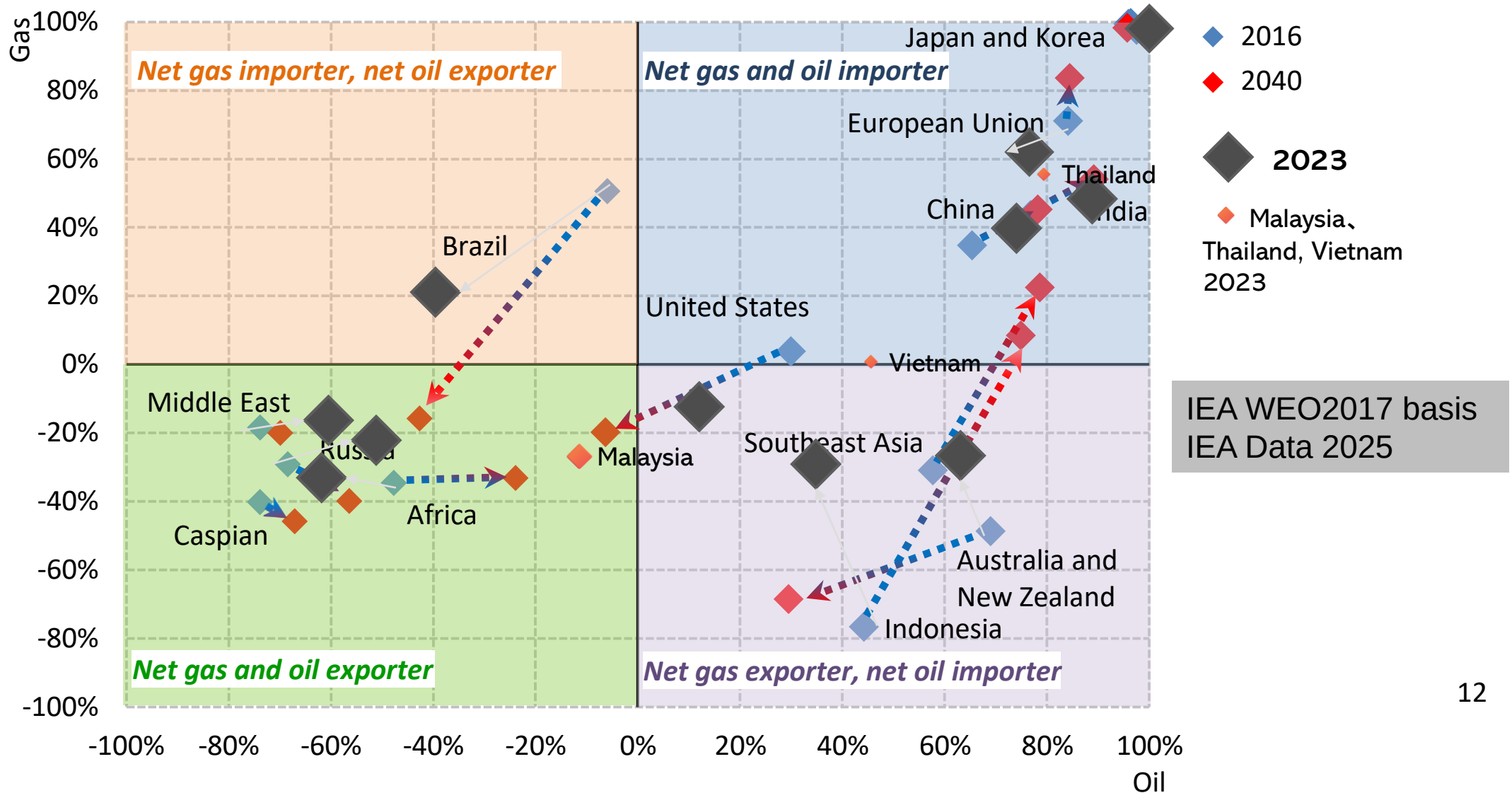
- ・石油通行量: 1700万B/D超
(世界の石油生産の約2割)
(日本の石油輸入の85%)
- ・LNG通行量: 8260万トン超
(世界のLNG生産の約3割)
(日本のLNG輸入の18%)

※日本は2010年、貿易統計より
イラン、イラク、バーレーン、サウジ、クウェート、
カタール、UAEからの輸入分を「ホルムズ通過」
と仮定

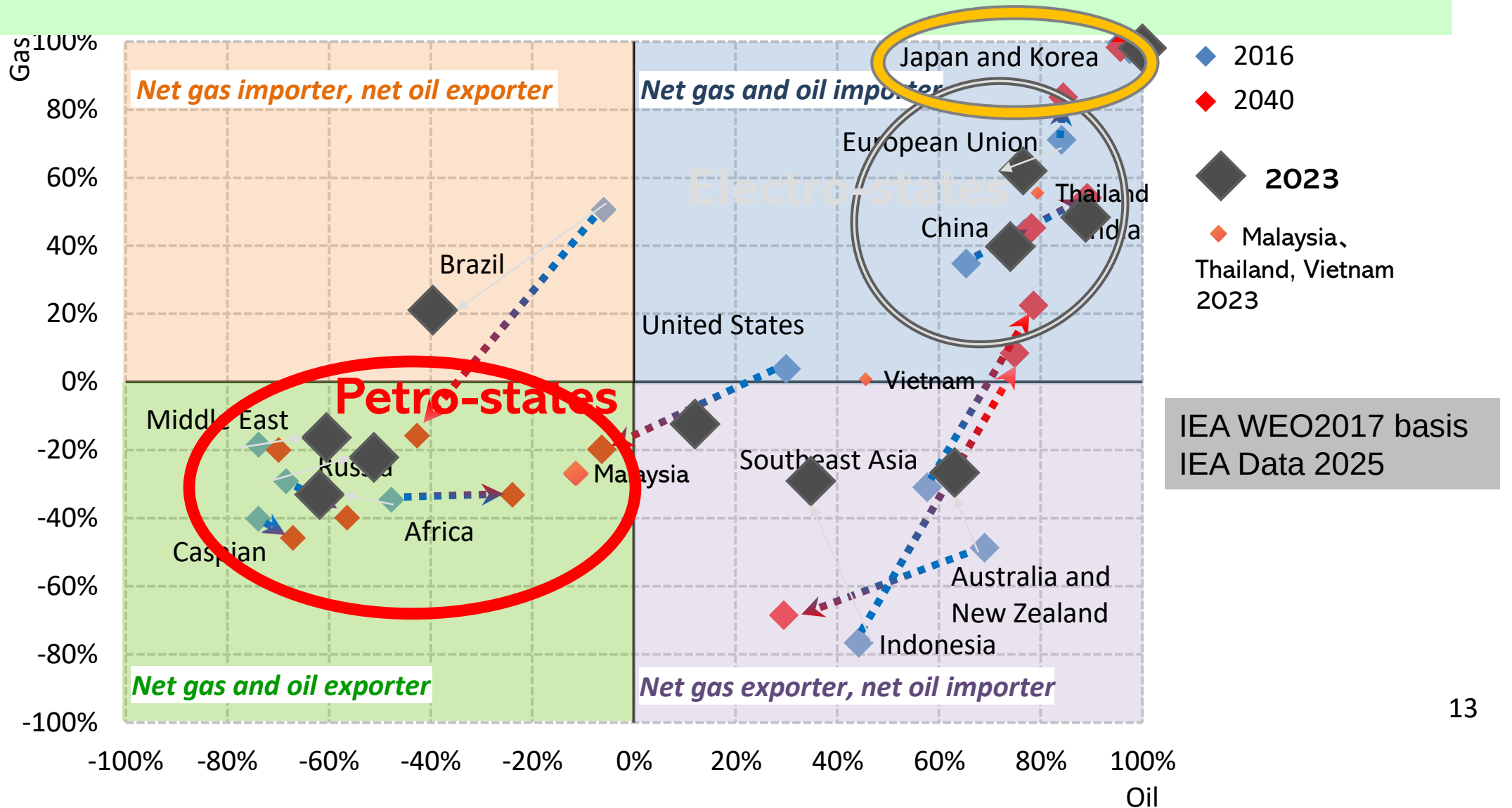
- ・ペルシャ湾向けおよびインド洋向け、双方に幅2マイルの通行路
- ・間に幅2マイルの緩衝帯



(3) Energy Independence of the Countries in 2023



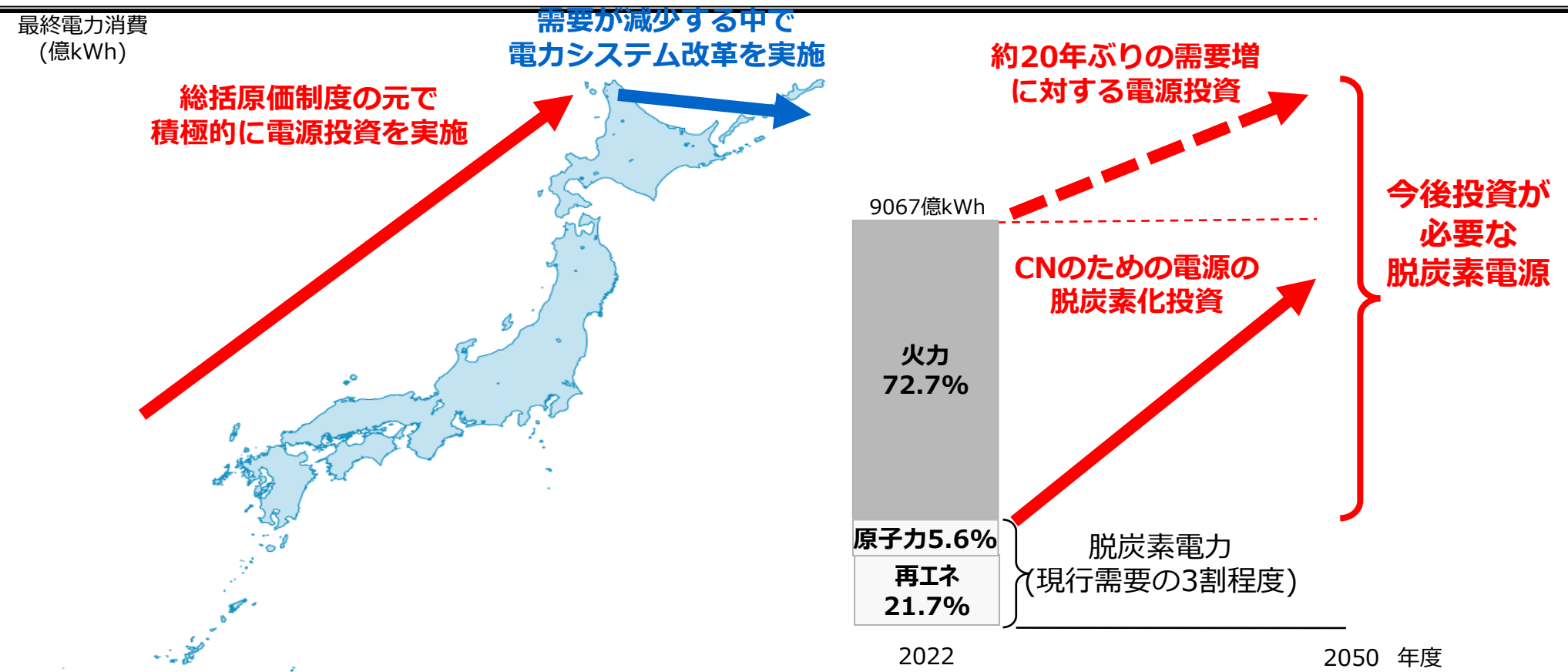
Petrostates vs Electrostates ?



(4) Importance of Investment on Decarbonized Power Sources in Japan (METI)

- The electricity demand will increase for the first time in 20 years because of the demand from data centers and semiconductor manufacturers. 2050CNに向けた脱炭素化とあいまって、大規模な電源投資が必要な時代に突入。これまでの電力システム改革時には必ずしも想定されていなかった状況変化が生じている。
- Japan need to strengthen its supply capacity of decarbonized electricity to ensure the stable supply of electricity in the era of decarbonization.

※電力広域的運営推進機関は、2024年度から29年度にかけて電力需要が年率0.6%程度で増加する見通しを公表（2024年1月）。





World Energy Outlook 2025

Excerpted

Keisuke SADAMORI, Director, Energy Markets and Security

Graduate School of Public Policy, the University of Tokyo, 22 December 2025

International
Energy Agency

Each WEO scenario maps out a distinct energy future

Exploratory Scenarios

The **Current Policies Scenario**

Anchored in enacted laws and measures

The **Stated Policies Scenario**

A dynamic reading of today's policy settings

Normative Scenarios

The **ACCESS Scenario**

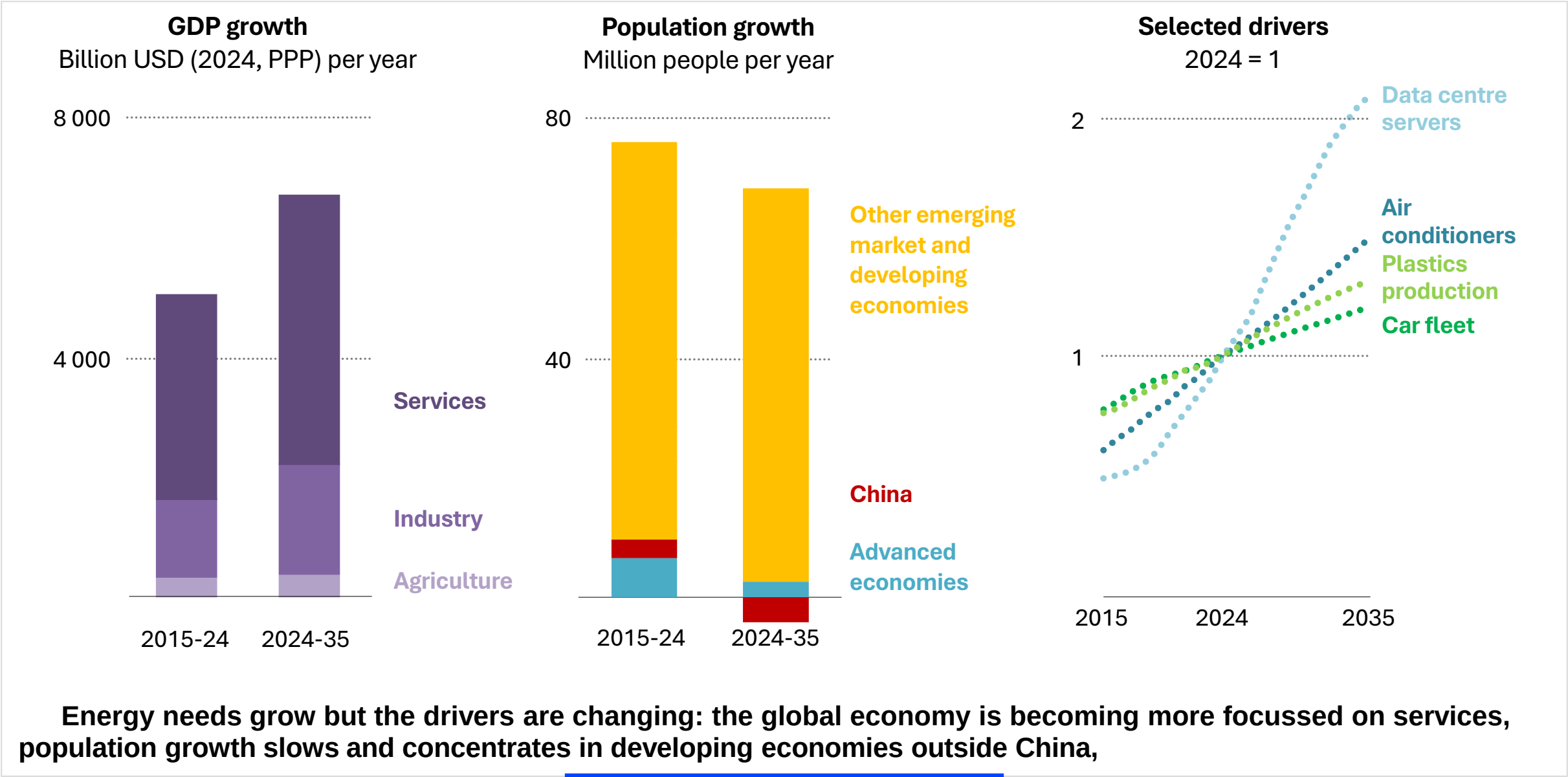
A roadmap for universal energy access to electricity and clean cooking

The **Net Zero Emissions by 2050 Scenario**

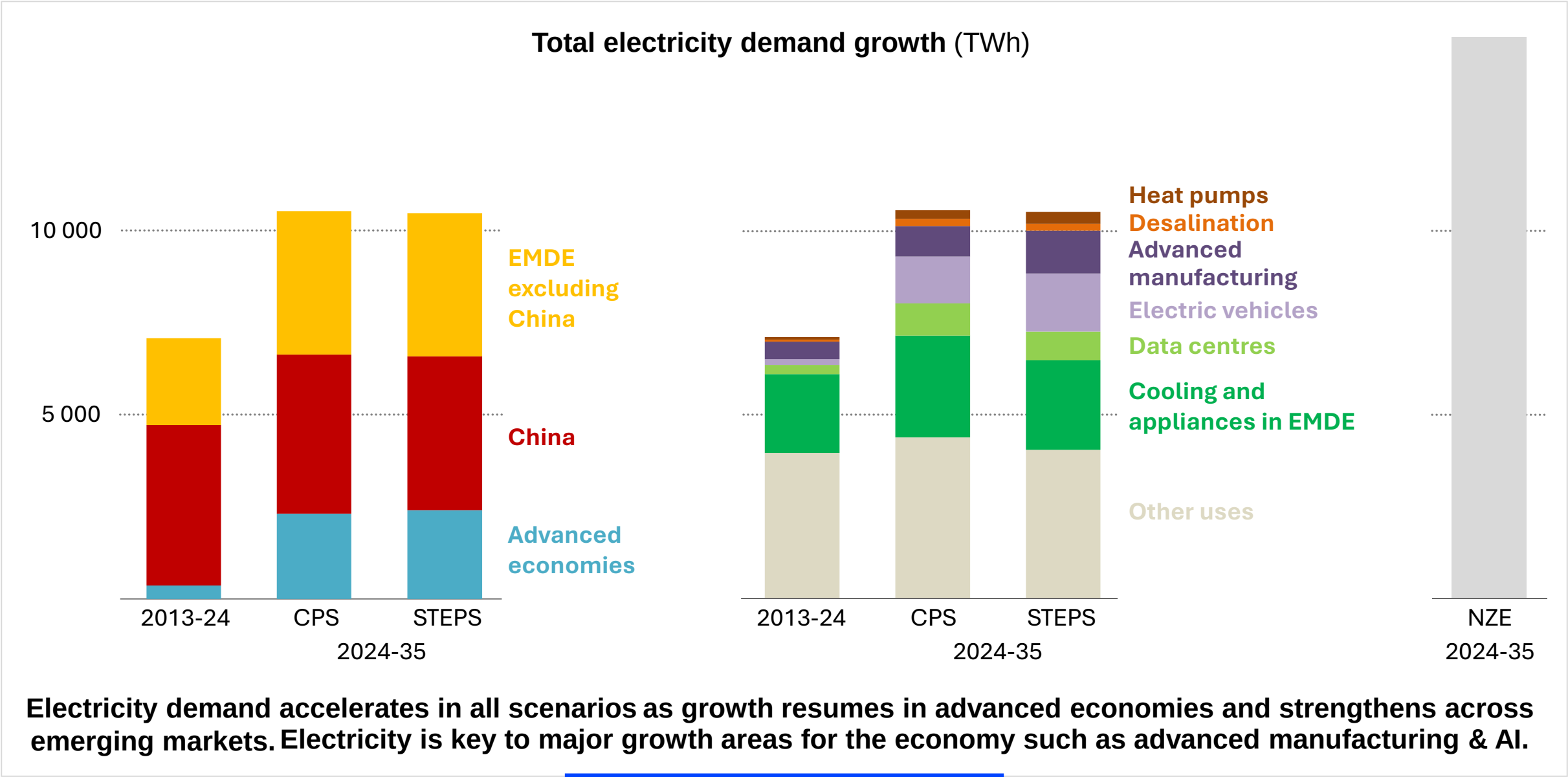
A global pathway to limit warming to 1.5°C

All scenarios use the latest data on energy supply and demand, markets, projects and technology costs. Exploratory scenarios set starting conditions and see where they lead; normative scenarios work towards specific outcomes.

New players set the trends as energy needs rise



The Age of Electricity is here



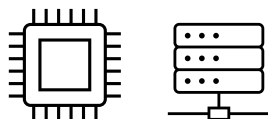
Critical minerals: high concentration raises supply risks

Share of top refining country for energy-related strategic minerals, 2024

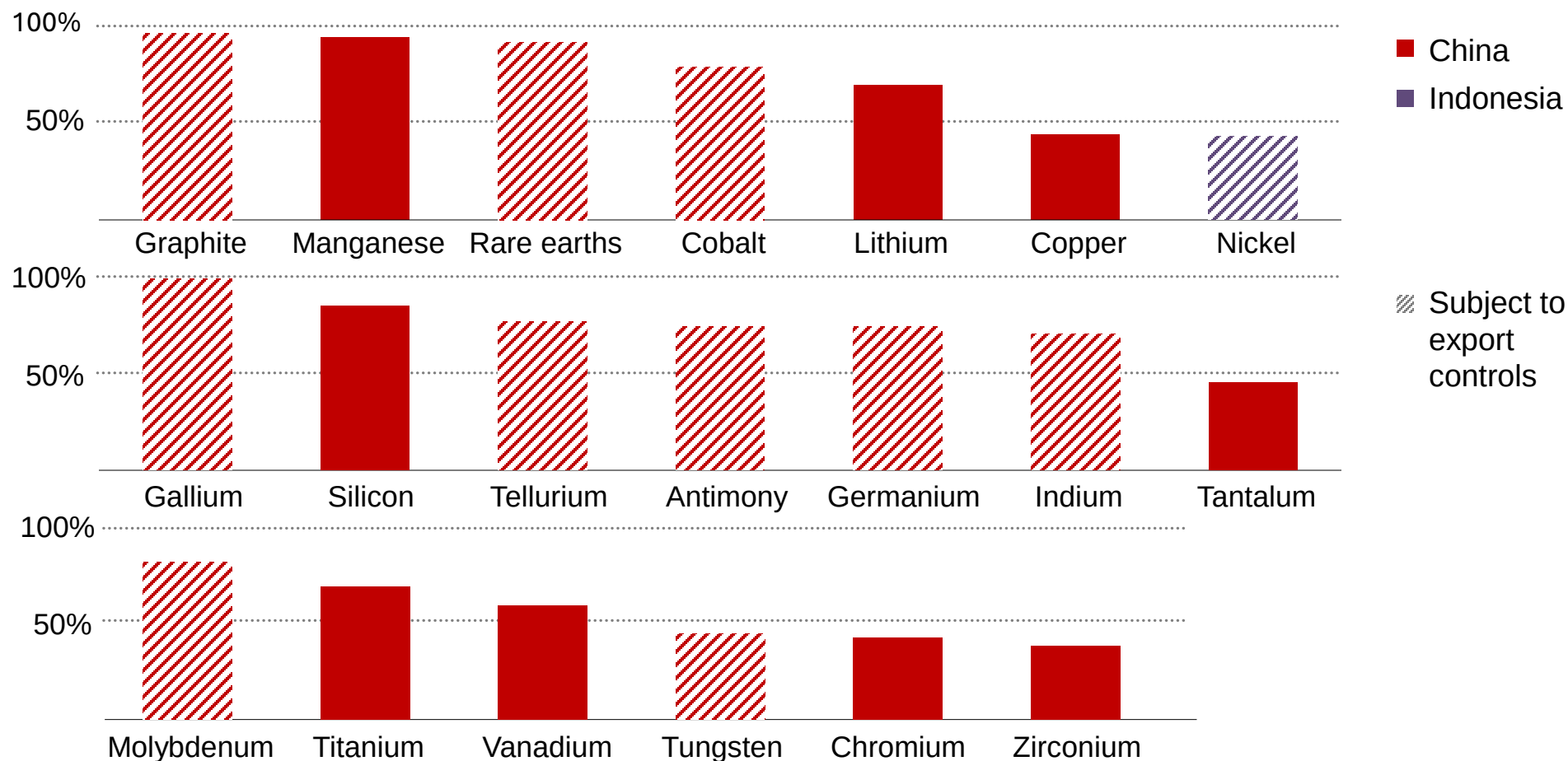
Batteries, grids, renewables



AI, data centres, high-techs



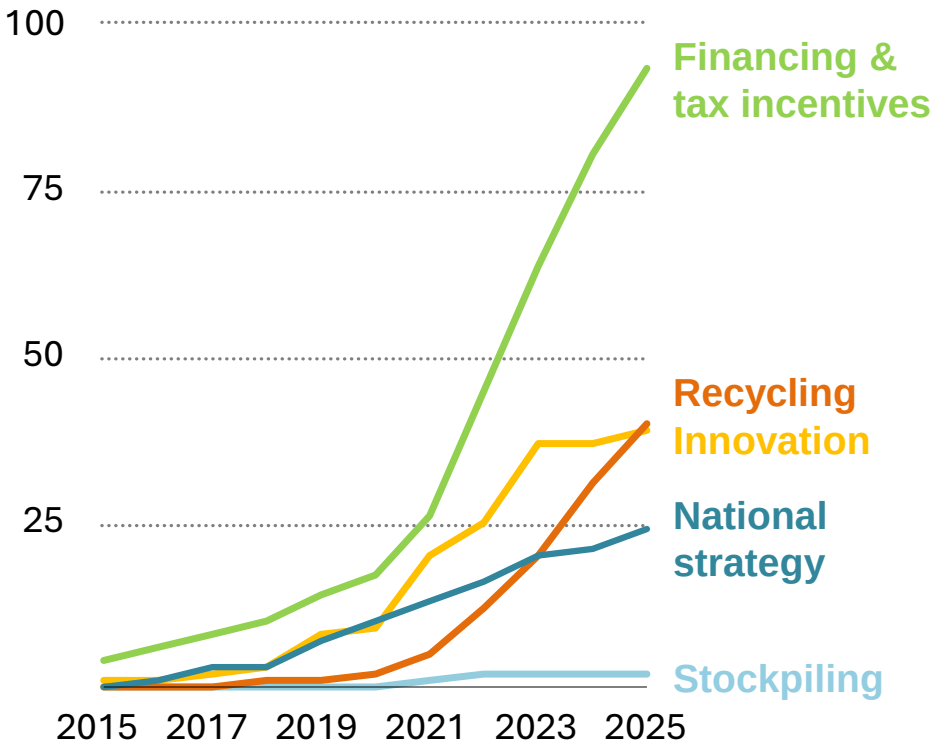
Aerospace, industry, defence



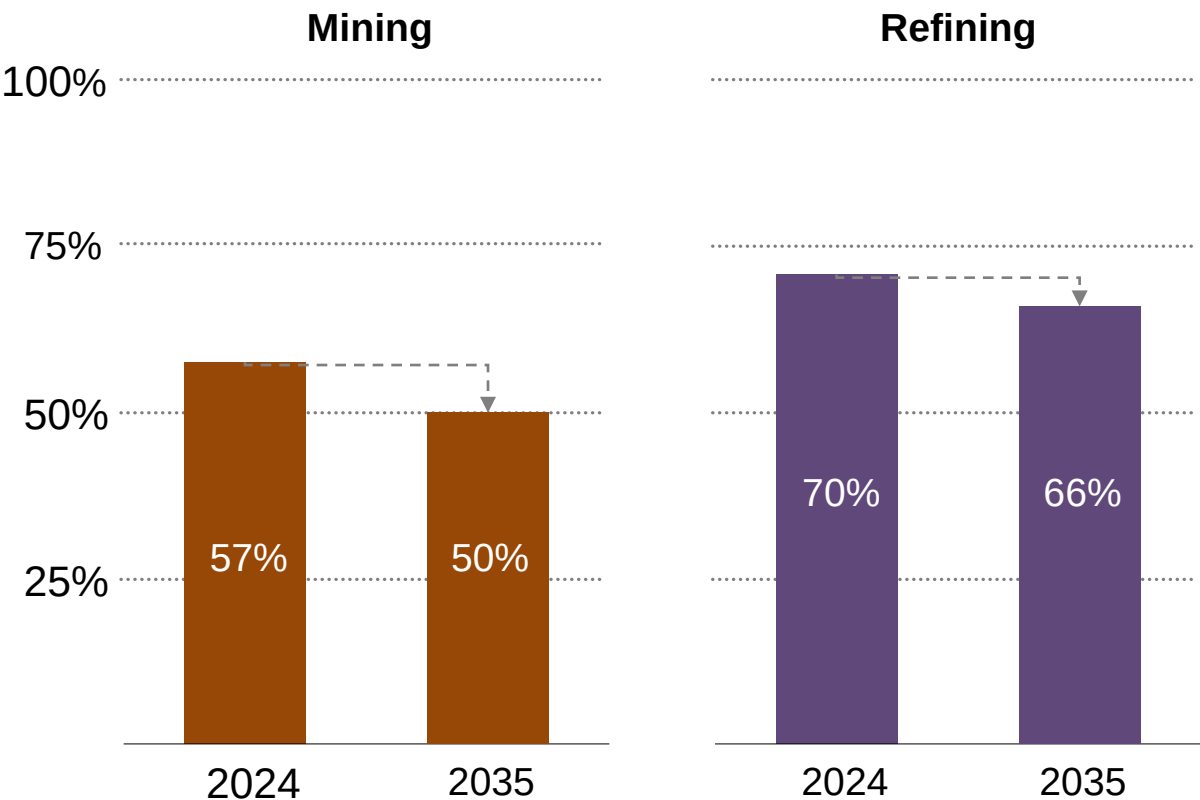
Critical minerals are vital not only for energy security but also for broader economic resilience, but the remarkably high level of market concentration leaves global supply chains vulnerable to disruptions

Diversification efforts need to look beyond mining

Number of announced critical mineral policies
(since 2015)

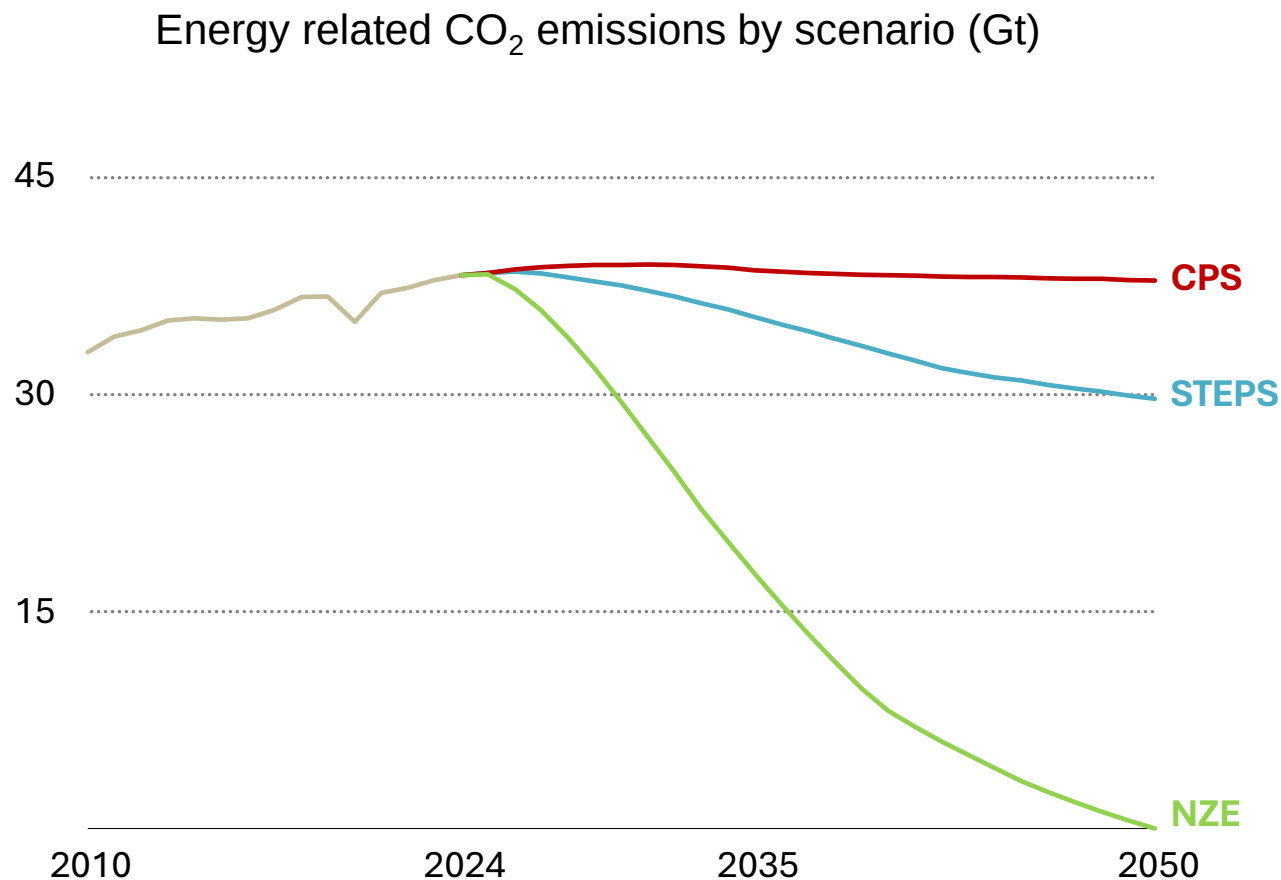


Average share of top producing country
for key energy minerals



Governments have woken up to the risks of high concentration, but accelerated efforts are needed to underpin more resilient and diversified supply chains, especially in processing and refining

Diverging futures for global emissions and climate change

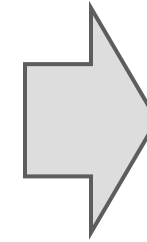


All scenarios exceed 1.5 °C of warming on a regular basis by 2030; tried and tested technologies & policies are available to accelerate transitions, but returning below 1.5 °C will now also require large-scale carbon removal

Implications

➤ Need to reduce reliance on fossil fuel imports

➤ Lower trust on reliability of fuel supplies

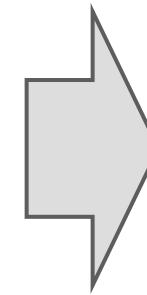


Energy Security

➤ Momentum behind **multilateral cooperation**

➤ Age of electricity

➤ Security of energy transitions

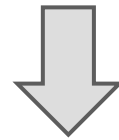


**Innovative
measures with AI,
e.g. demand side
measures**

2. The Role of Intelligent Building

How Intelligent Building Contributes to the Energy Transition

- Building as an important growing sector in terms of energy demand in the era of electricity
- Contribution to the Energy Transition:
 1. Demand side including **Energy efficiency** increase, especially in cooling and heating, lighting and cooking
 2. Building as a hub of electricity both on demand and supply side in a power system, where AI, EVs, PV and heat pumps play significant roles



3Es

4. Some Quick Ideas for the Future

- The Role of Technology and Innovation
- Energy Efficiency and Demand side Measures
- International Collaboration
- The role of public policy

Thank you