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# Carbon Neutrality in ASEAN: Background

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# Paris Agreement

## Article 2

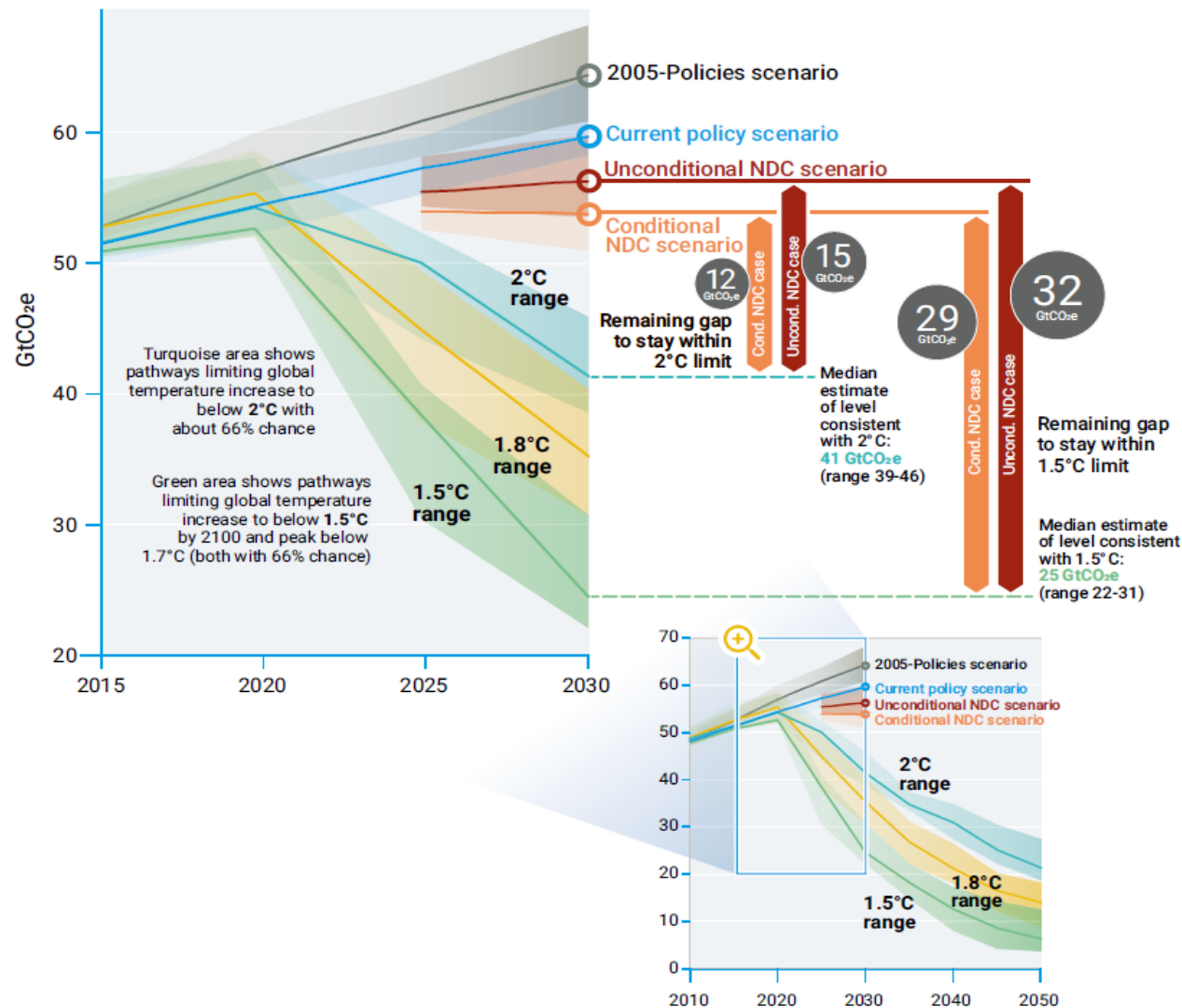
1. This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

- a. Holding the increase in the global average temperature to well below 2 ° C above preindustrial levels and pursuing efforts to limit the temperature increase to 1.5 ° C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

## Article 4




1. In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.

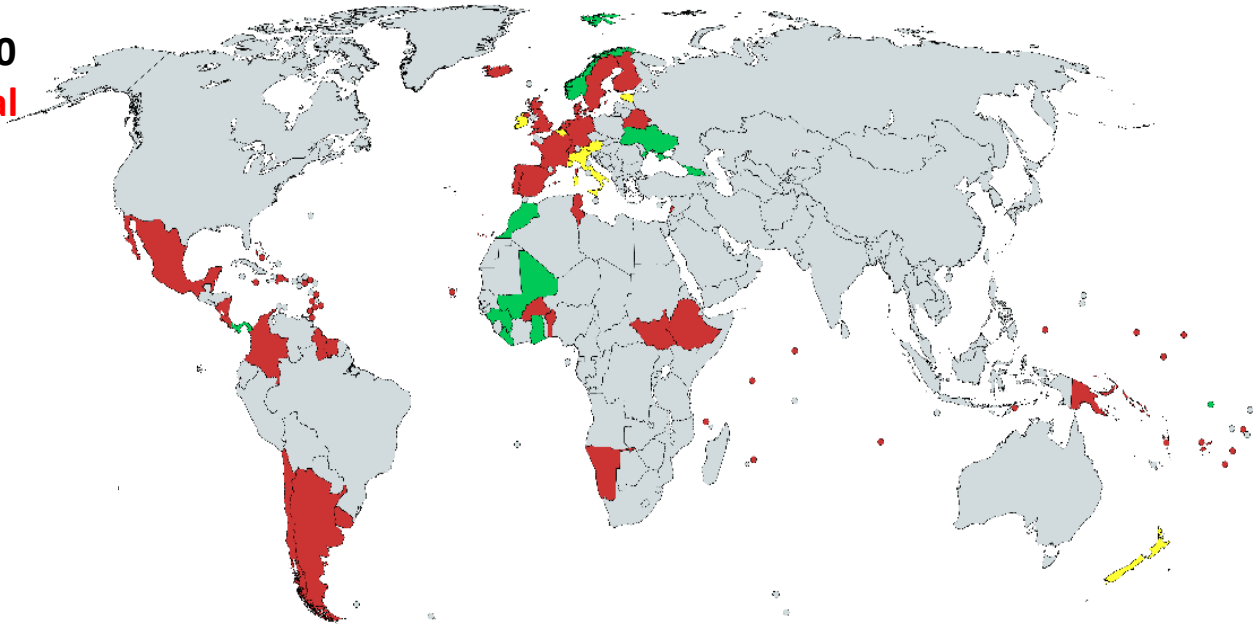
# Huge Gap between Ambition and 1.5-2.0 Pathway



# UN Climate Action Summit (Sept 2019)



-  Agree carbon neutral by 2050  
(66 countries: **10.4% of global emissions**)
-  Agree raising 2020 NDC  
(70 countries: **13.0% of global emissions**)
-  Agree both



# Announcement of Carbon Neutrality Goals (20 Jan 2021)

Countries having announced carbon neutrality by 2050

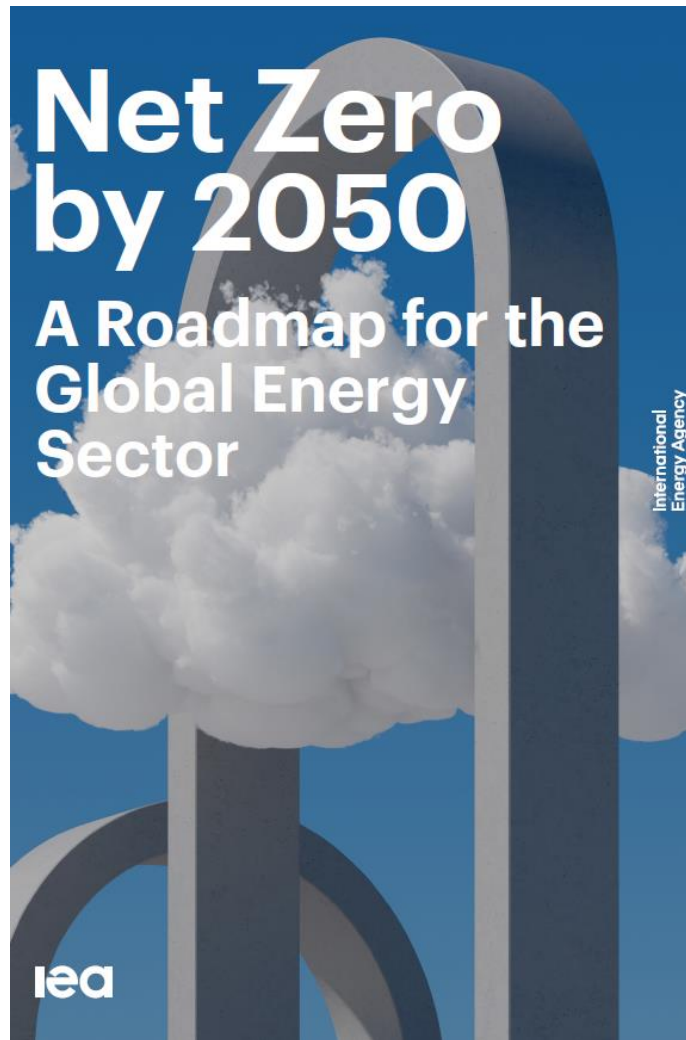
**124 Countries & 1 region**  
**37.7% of global CO2 emissions**



Created with mapchart.net

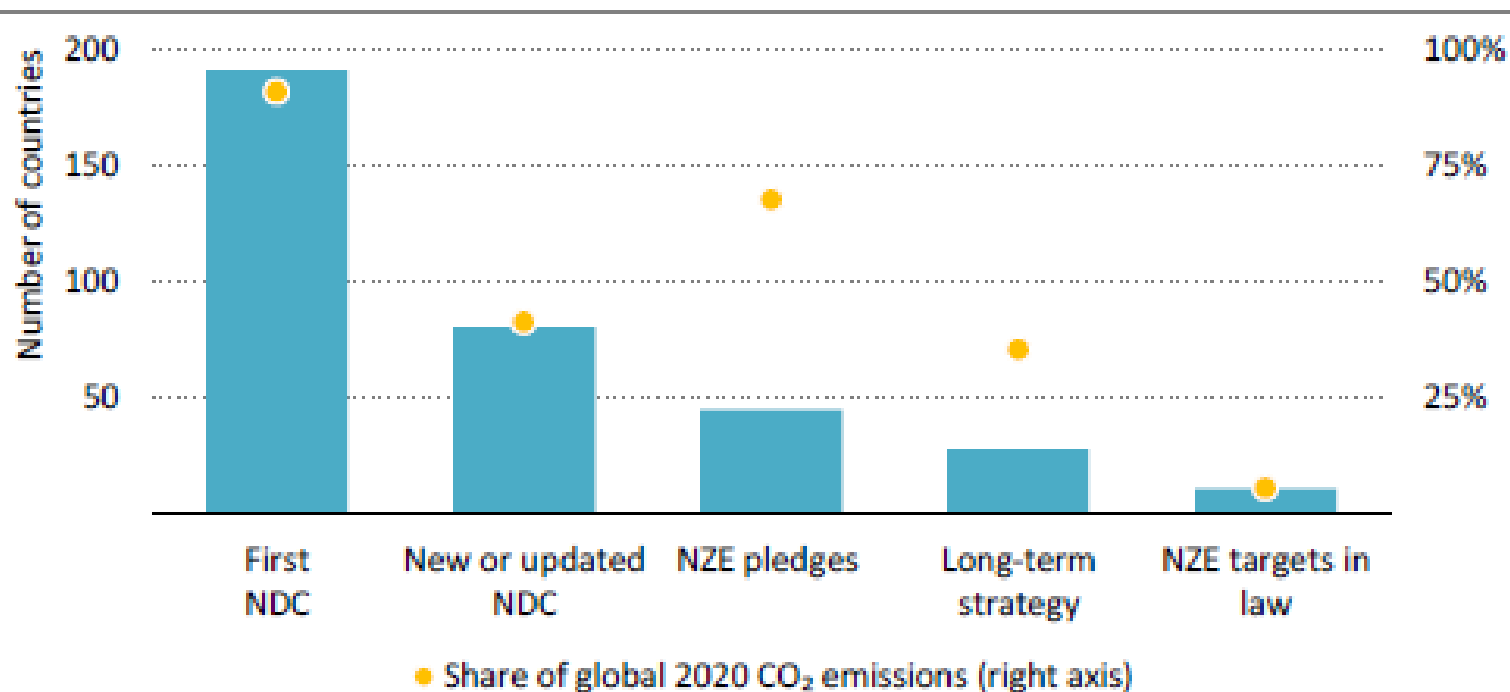


# IEA “Net Zero by 2050” (18 May 2021)



# Net Zero Emissions Pledges

**Figure 1.1** ▶ Number of countries with NDCs, long-term strategies and net zero pledges, and their shares of 2020 global CO<sub>2</sub> emissions

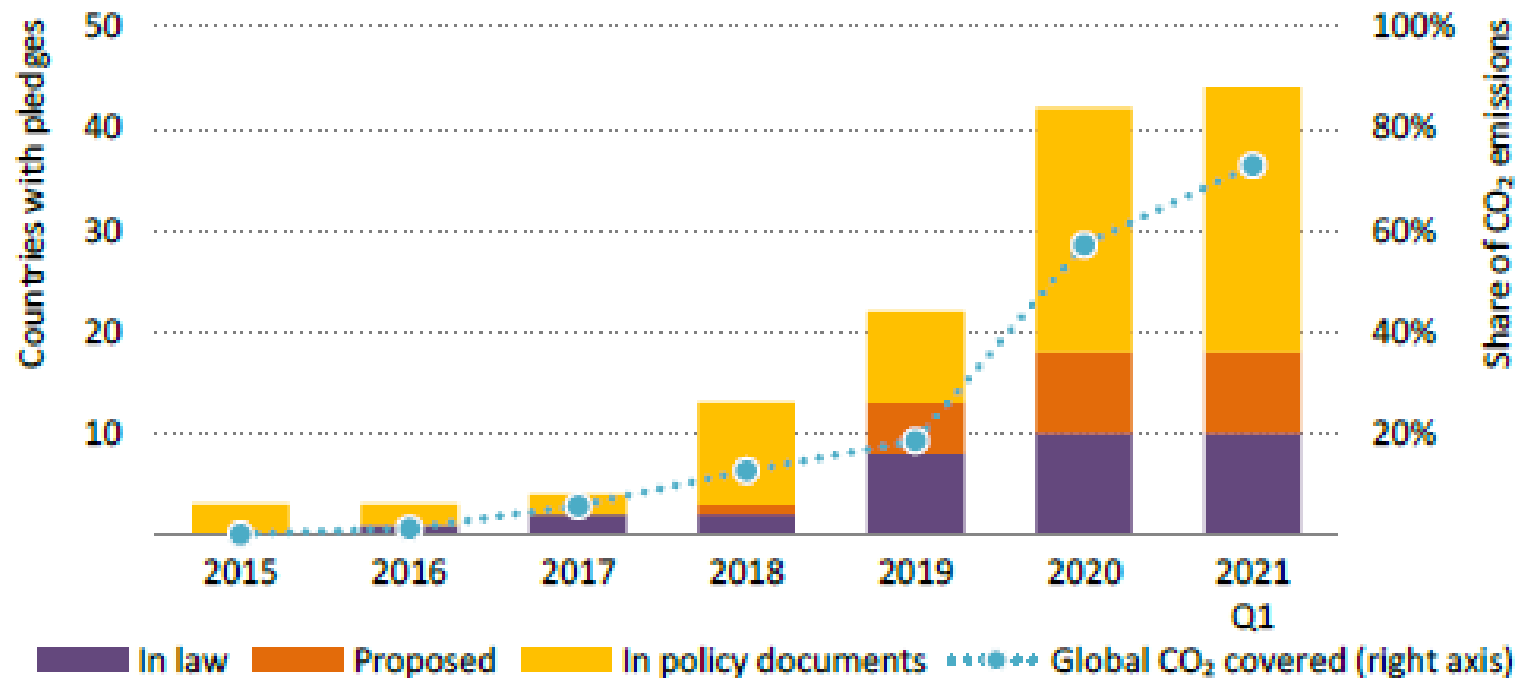


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*Around 40% of countries that have ratified the Paris Agreement have updated their NDCs, but net zero pledges cover around 70% of global CO<sub>2</sub> emissions*

# Net Zero Emissions Pledges

**Figure 1.2** ▶ Number of national net zero pledges and share of global CO<sub>2</sub> emissions covered



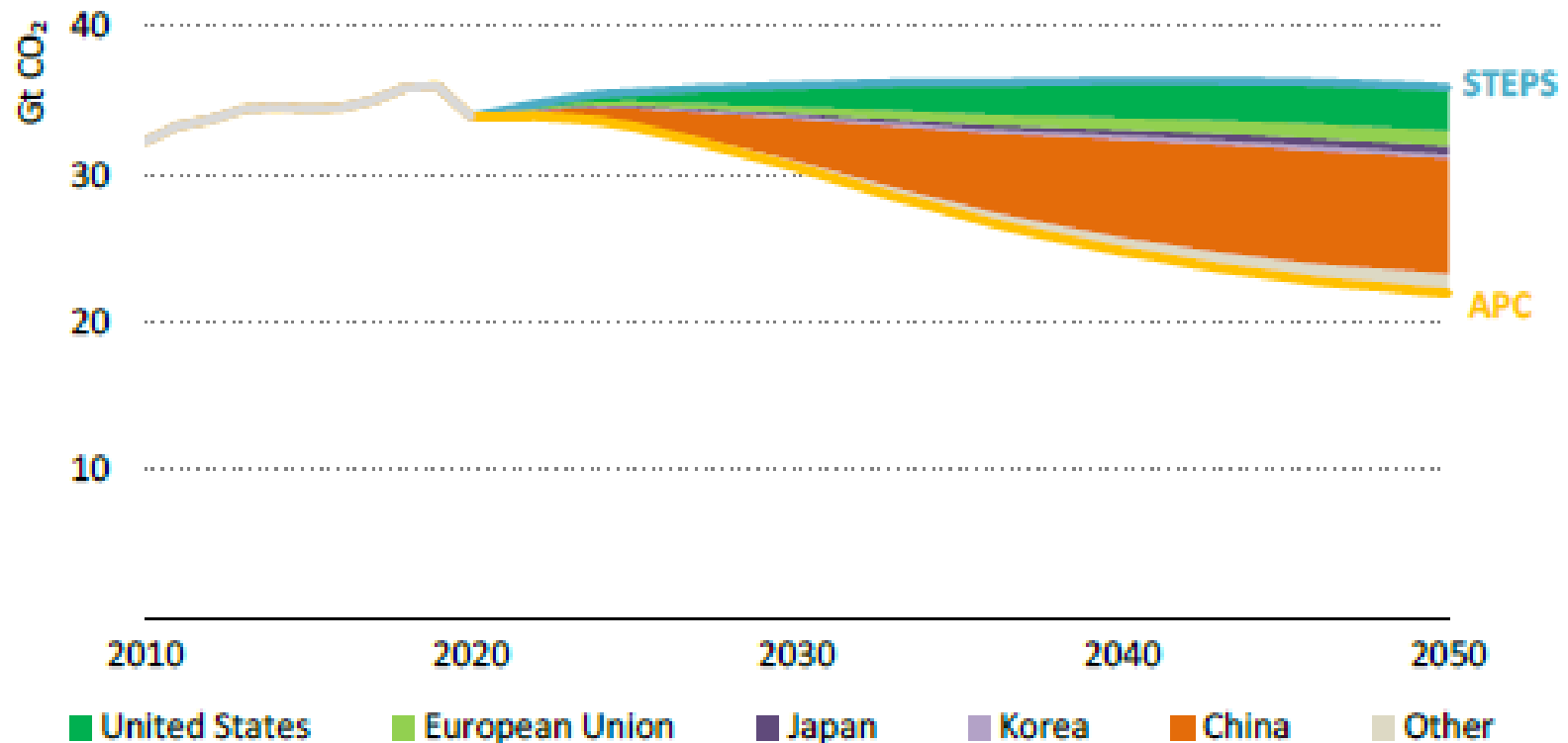
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*There has been a significant acceleration in net-zero emissions pledges announced by governments, with an increasing number enshrined in law*



# STEPS and Announced Pledge Case

**Figure 1.10** ▶ Global energy-related and industrial process CO<sub>2</sub> emissions by scenario and reductions by region, 2010-2050



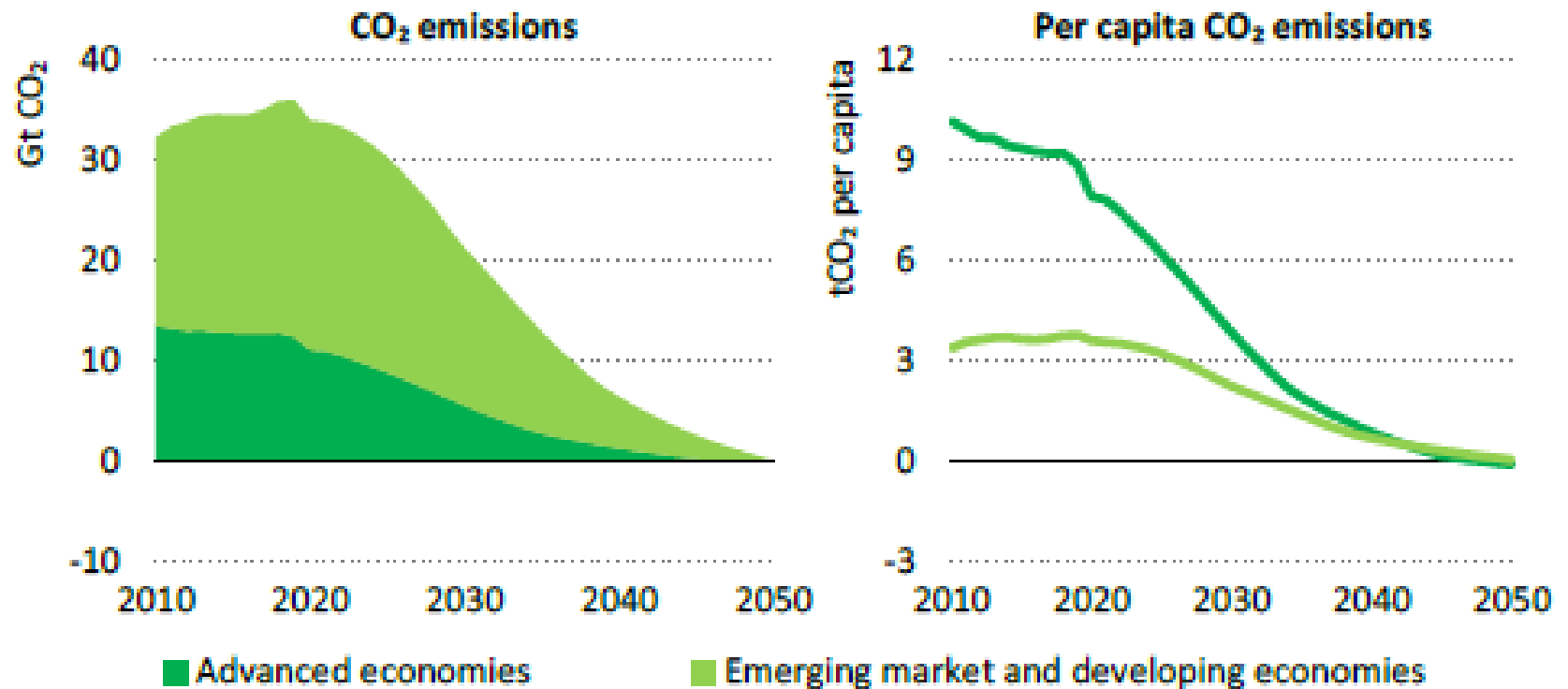
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*Achieving existing net zero pledges would reduce emissions globally to 22 Gt CO<sub>2</sub> in 2050, a major reduction compared with current policies but still far from net-zero emissions*

Source: IEA Net Zero by 2050 A Roadmap for the Global Energy Sector (May 2021)

# Net Zero Emissions 2050 Scenario

**Figure 2.2** ▶ Global net CO<sub>2</sub> emissions in the NZE

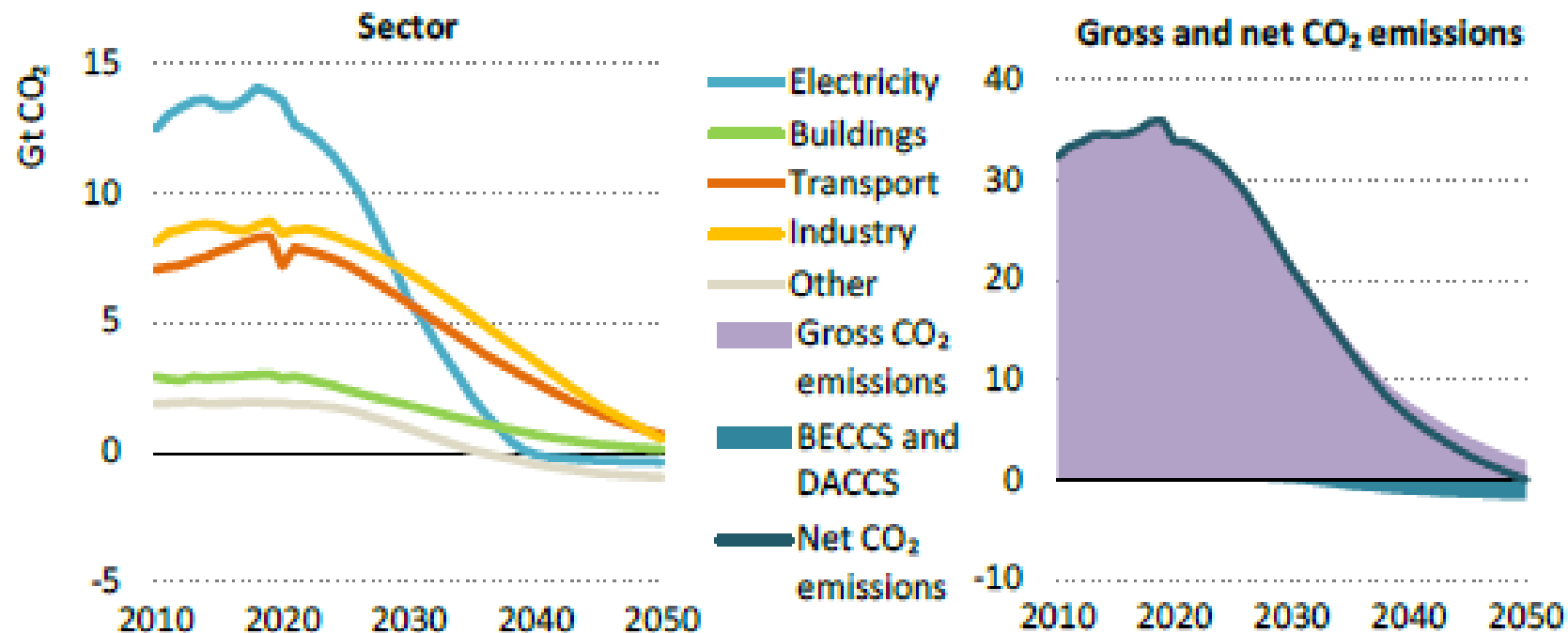


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*CO<sub>2</sub> emissions fall to net zero in advanced economies around 2045 and globally by 2050.  
Per capita emissions globally are similar by the early-2040s.*

# Net Zero Emissions 2050 Scenario

**Figure 2.3** ▶ Global net- $\text{CO}_2$  emissions by sector, and gross and net  $\text{CO}_2$  emissions in the NZE

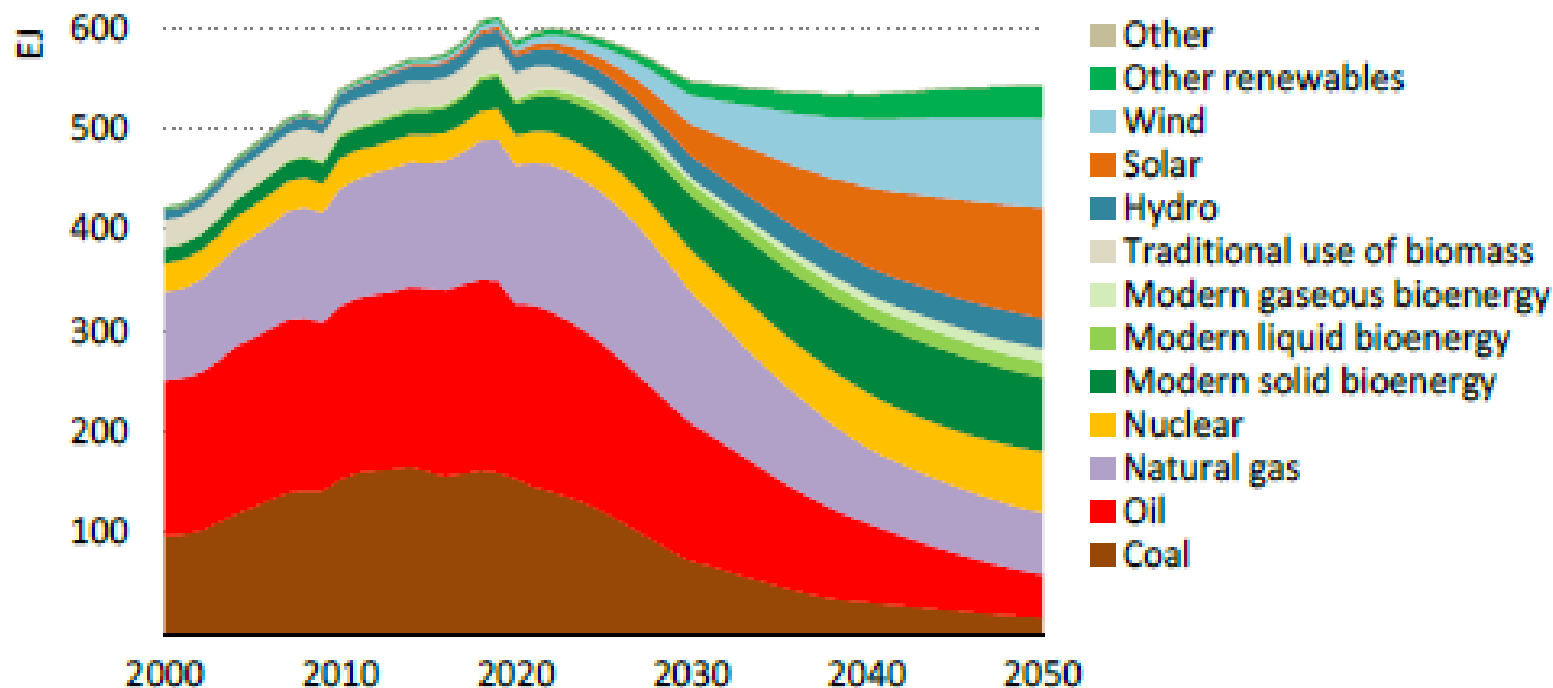


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*Emissions from electricity fall fastest, with declines in industry and transport accelerating in the 2030s. Around 1.9 Gt  $\text{CO}_2$  are removed in 2050 via BECCS and DACCS.*

# Net Zero Emissions 2050 Scenario

**Figure 2.5** ▶ Total energy supply in the NZE

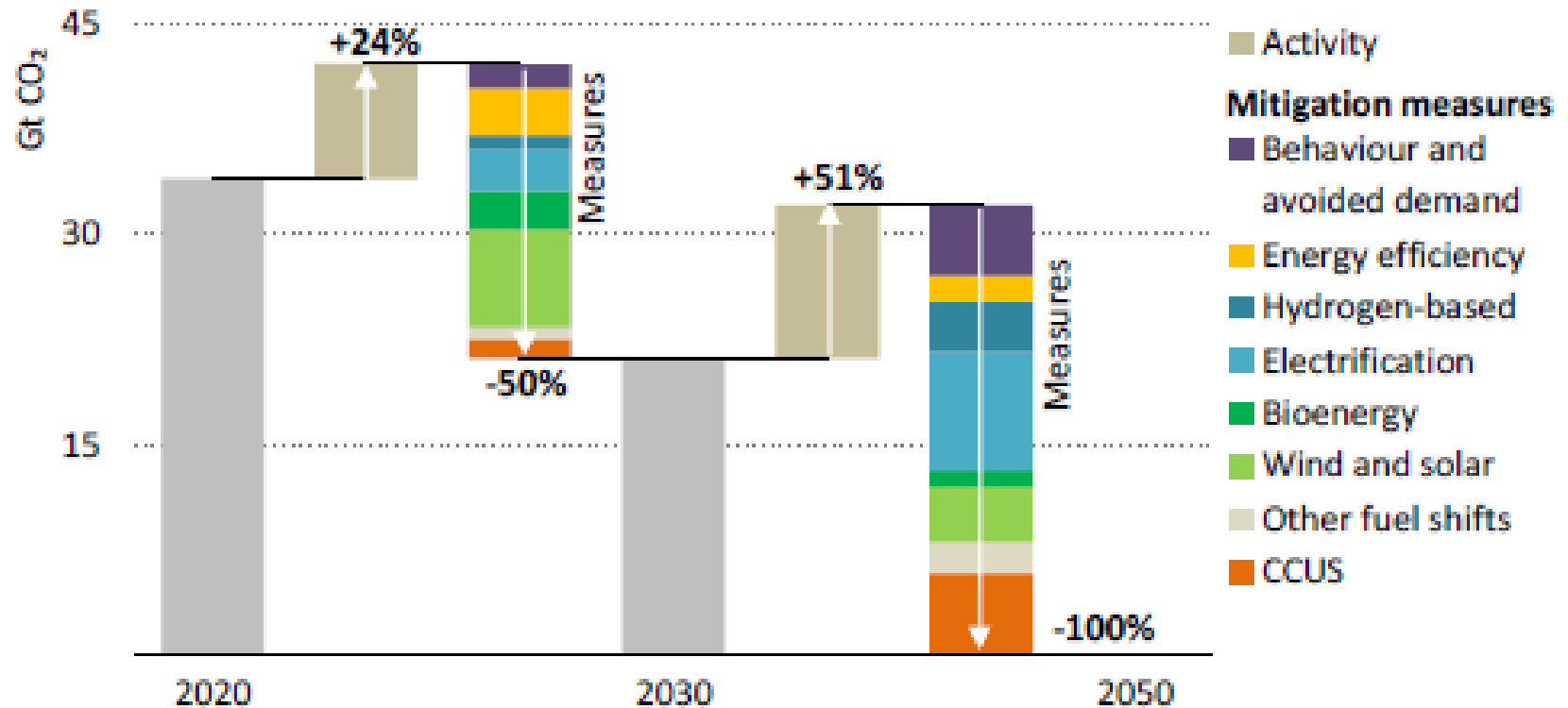


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*Renewables and nuclear power displace most fossil fuel use in the NZE, and the share of fossil fuels falls from 80% in 2020 to just over 20% in 2050*

# Key Pillars of Decarbonization

**Figure 2.12** ▶ Emissions reductions by mitigation measure in the NZE, 2020-2050

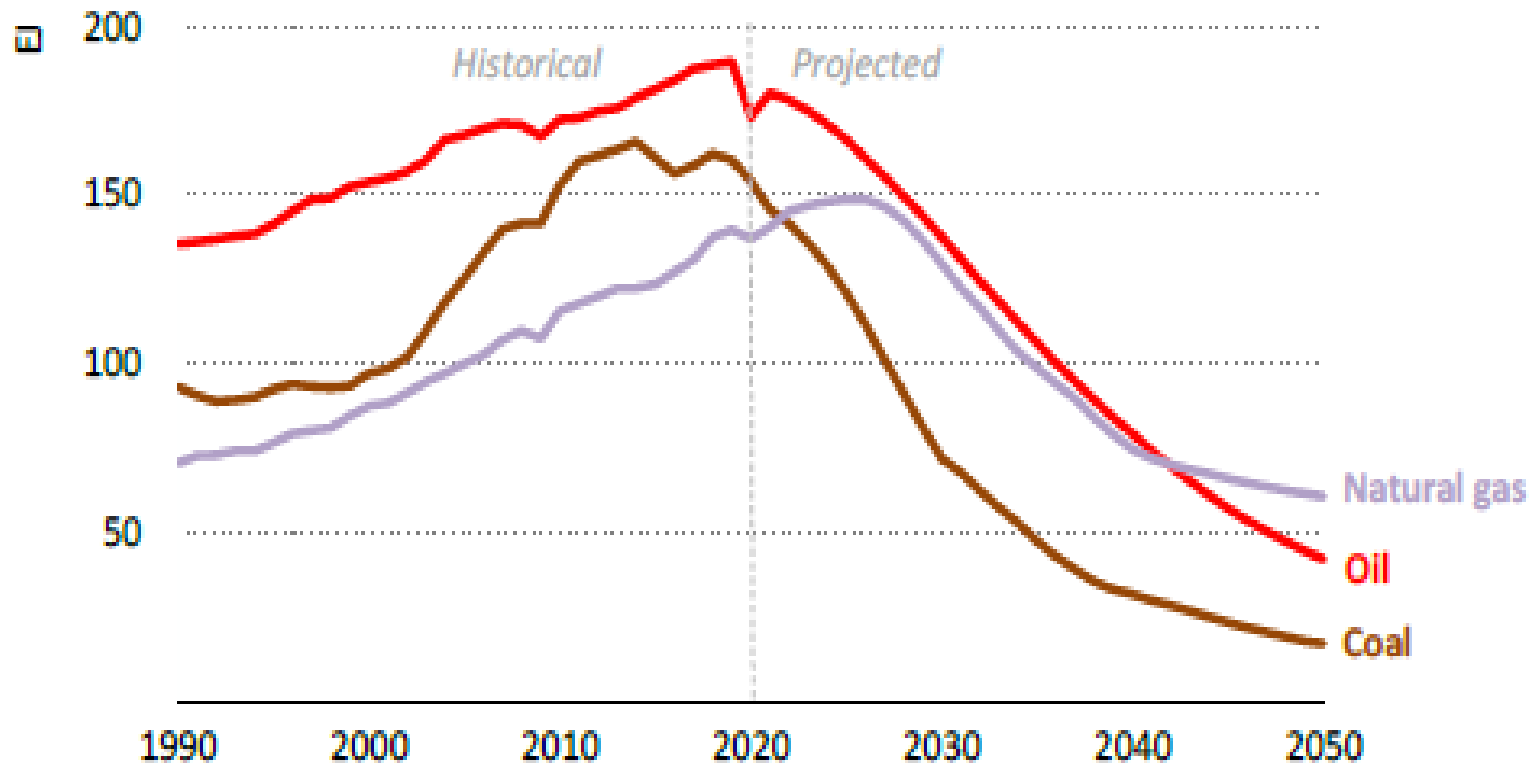


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*Solar, wind and energy efficiency deliver around half of emissions reductions to 2030 in the NZE, while electrification, CCUS and hydrogen ramp up thereafter*

# Fossil Fuel Production under NZE 2050

**Figure 3.2** ► Coal, oil and natural gas production in the NZE

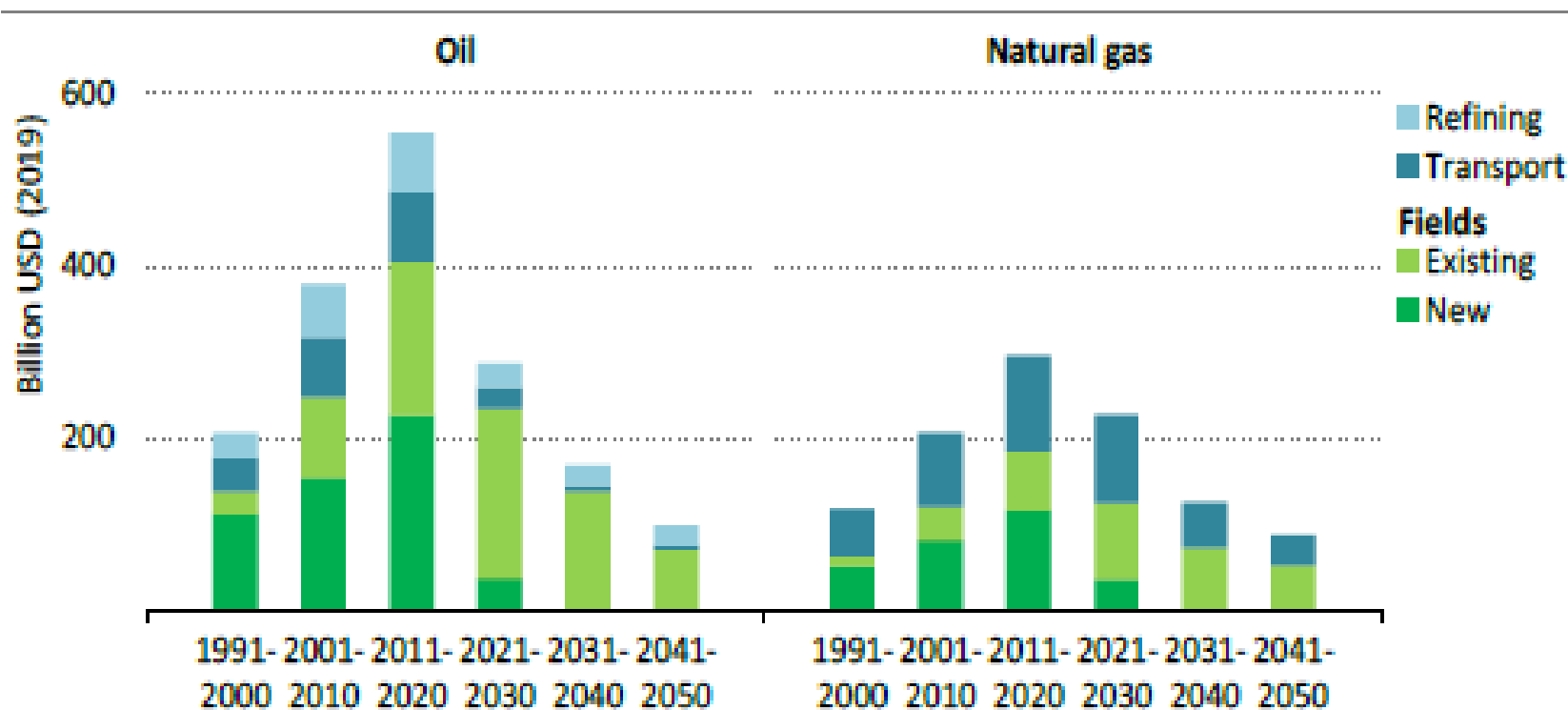


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*Between 2020 and 2050, demand for coal falls by 90%, oil by 75%, and natural gas by 55%*

# Oil and Gas Investment under NZE 2050

**Figure 3.4** ▶ Investment in oil and natural gas supply in the NZE



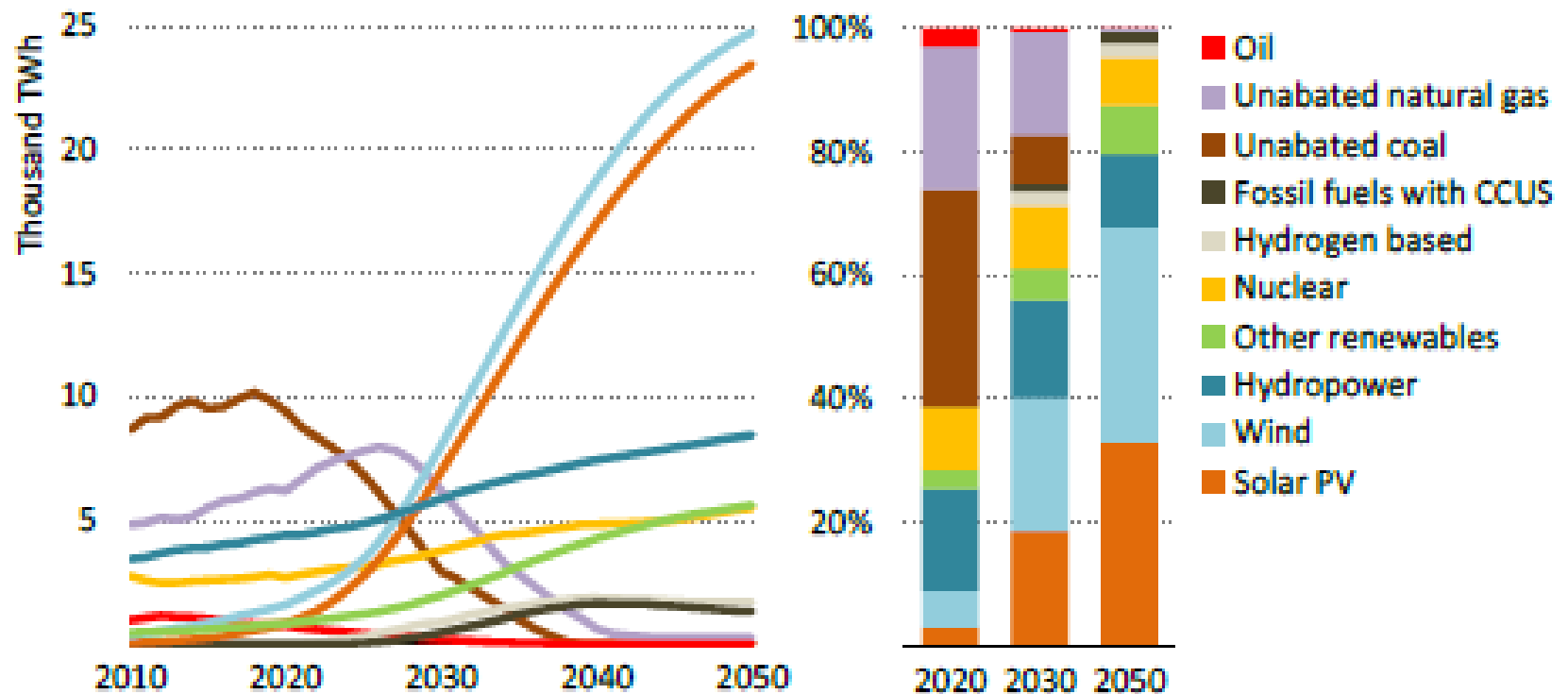
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*Once fields under development start production, all upstream oil and gas investment is spent on maintaining production at existing fields*



# Power Generation under NZE 2050

**Figure 3.10** ▶ Global electricity generation by source in the NZE

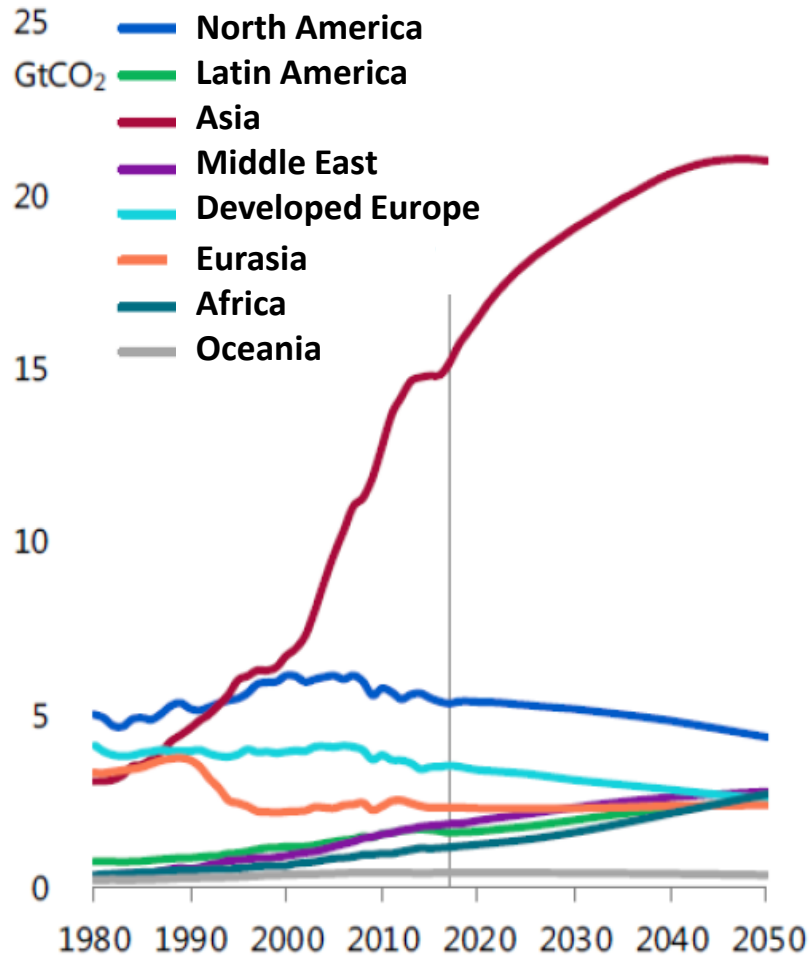


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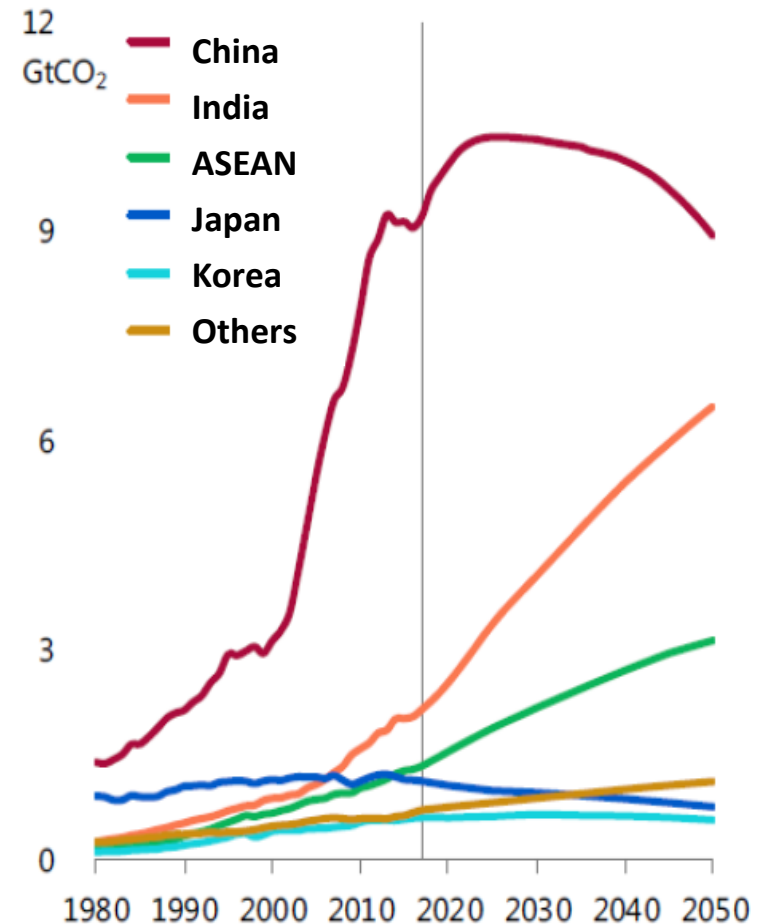
*Solar and wind power race ahead, raising the share of renewables in total generation from 29% in 2020 to nearly 90% in 2050, complemented by nuclear, hydrogen and CCUS*

# Asia Region Crucial for Global Decarbonization

## Global CO2 Emissions towards 2050

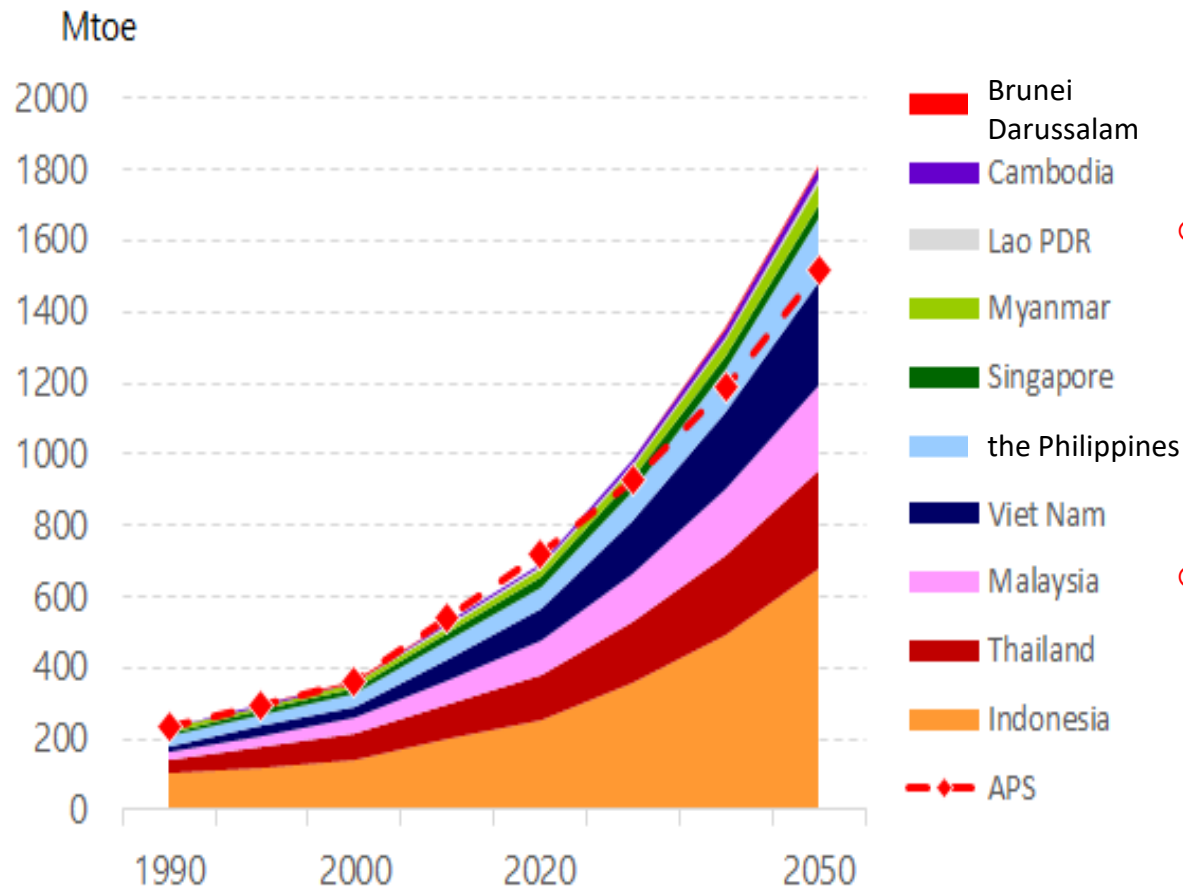


## Asian CO2 Emissions towards 2050



Source: IEEJ Asia and World Energy Outlook 2019

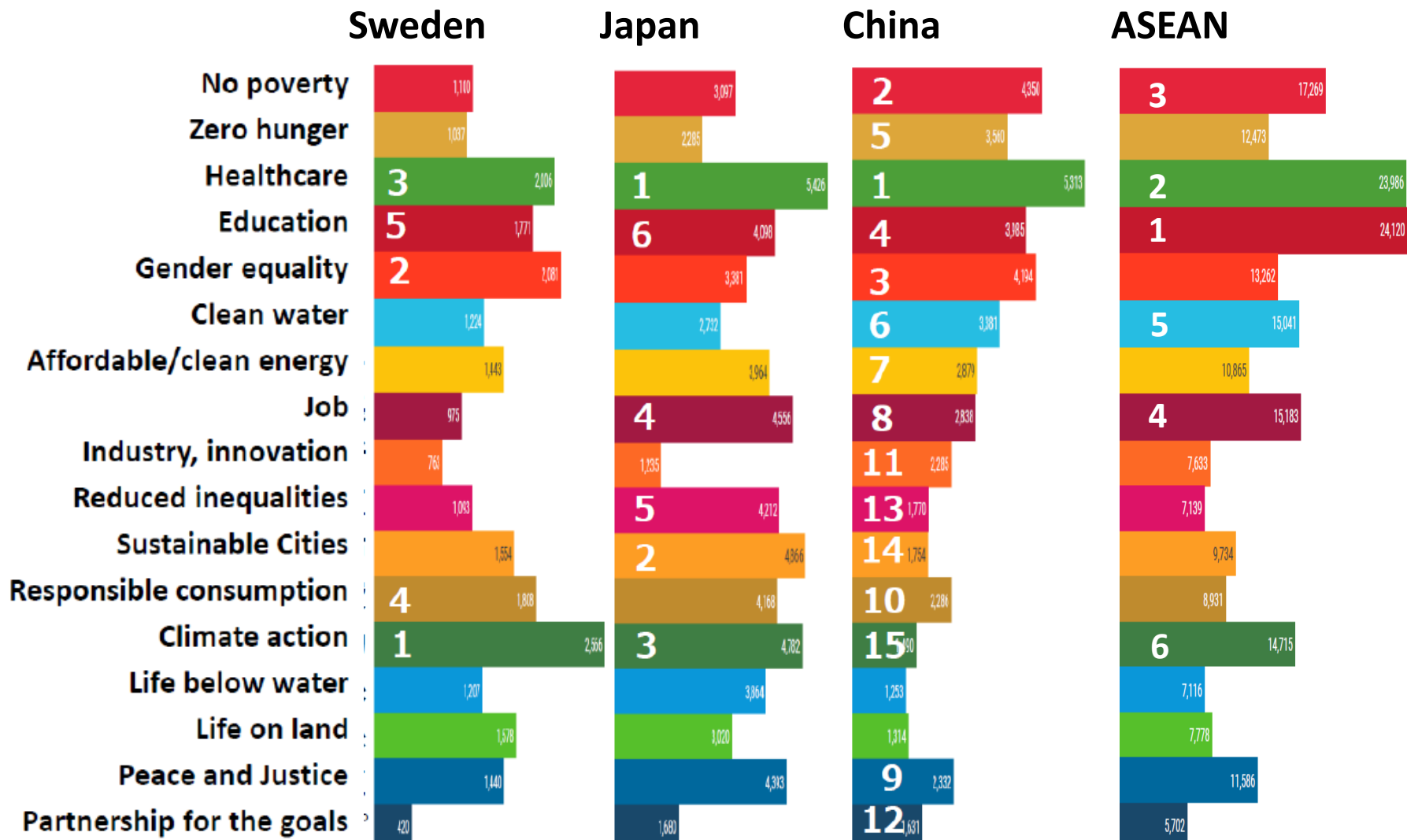
# Rapid Growth in Energy Demand & the Energy Landscape



- In line with rapid economic growth, energy demand in ASEAN countries are expected to expand sharply towards 2050 and later.
- Even in the APS (Alternative Policy Scenario), which includes ambitious energy-saving targets, ASEAN's primary energy demand grows 2.2 times by 2050.
- At current energy system, fossil fuels (oil, coal, and natural gas) make up almost 80% of the primary energy mix for ASEAN region.

Source: ERIA EAS Energy Outlook 2019

# SDG Priority Gap across Countries

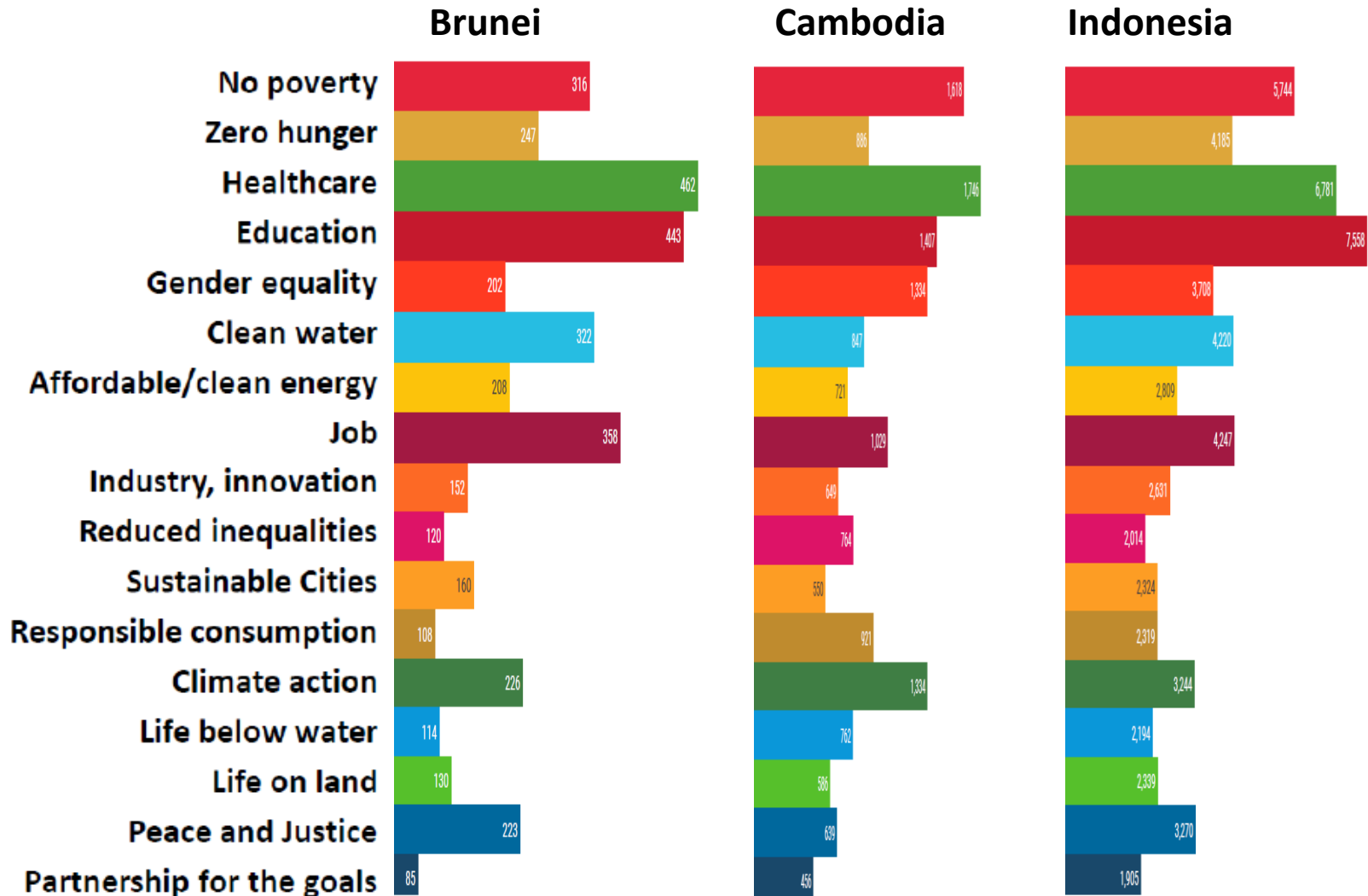


Source: United Nations My World 2030

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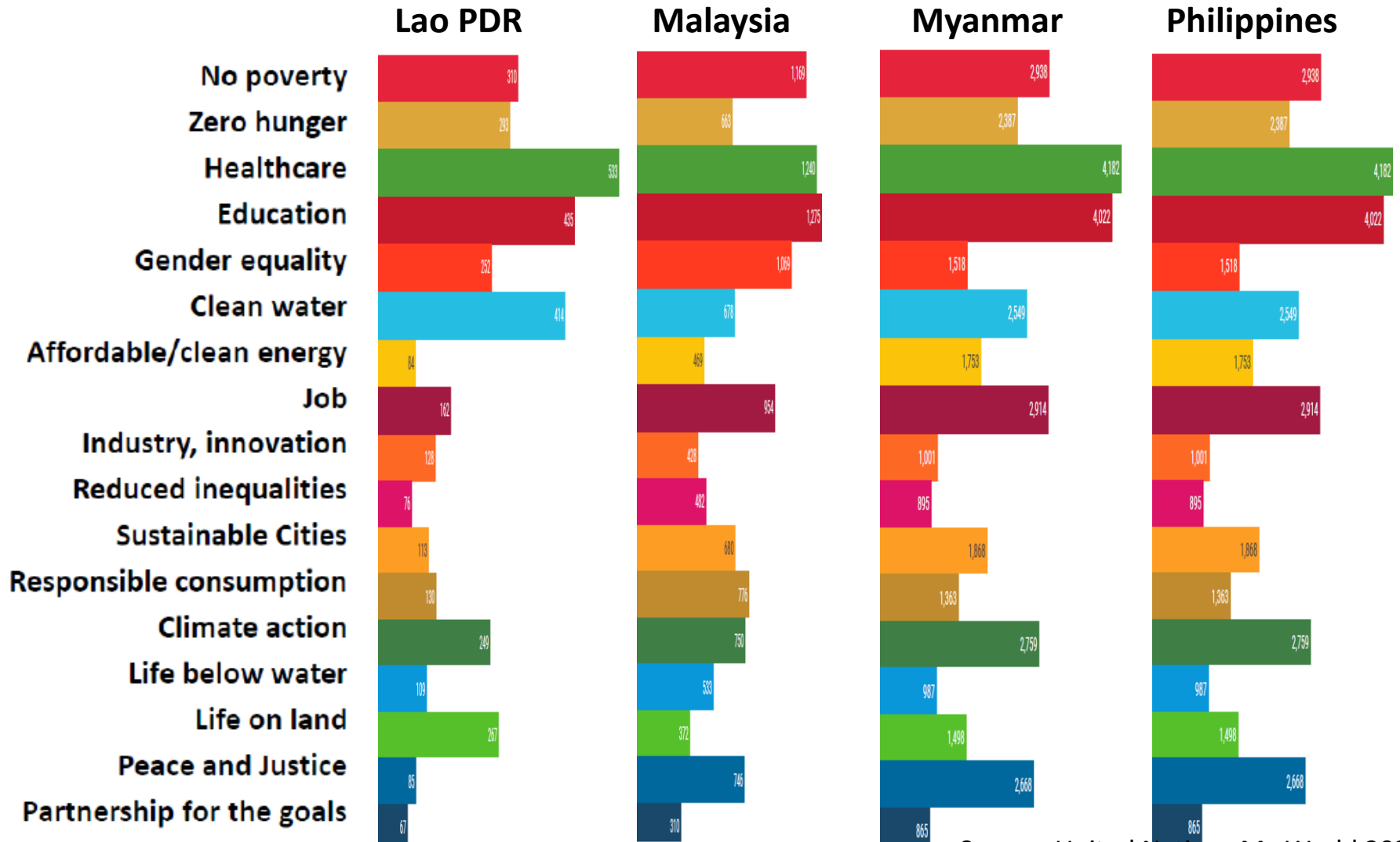


# Priority on Climate Change among ASEAN Countries



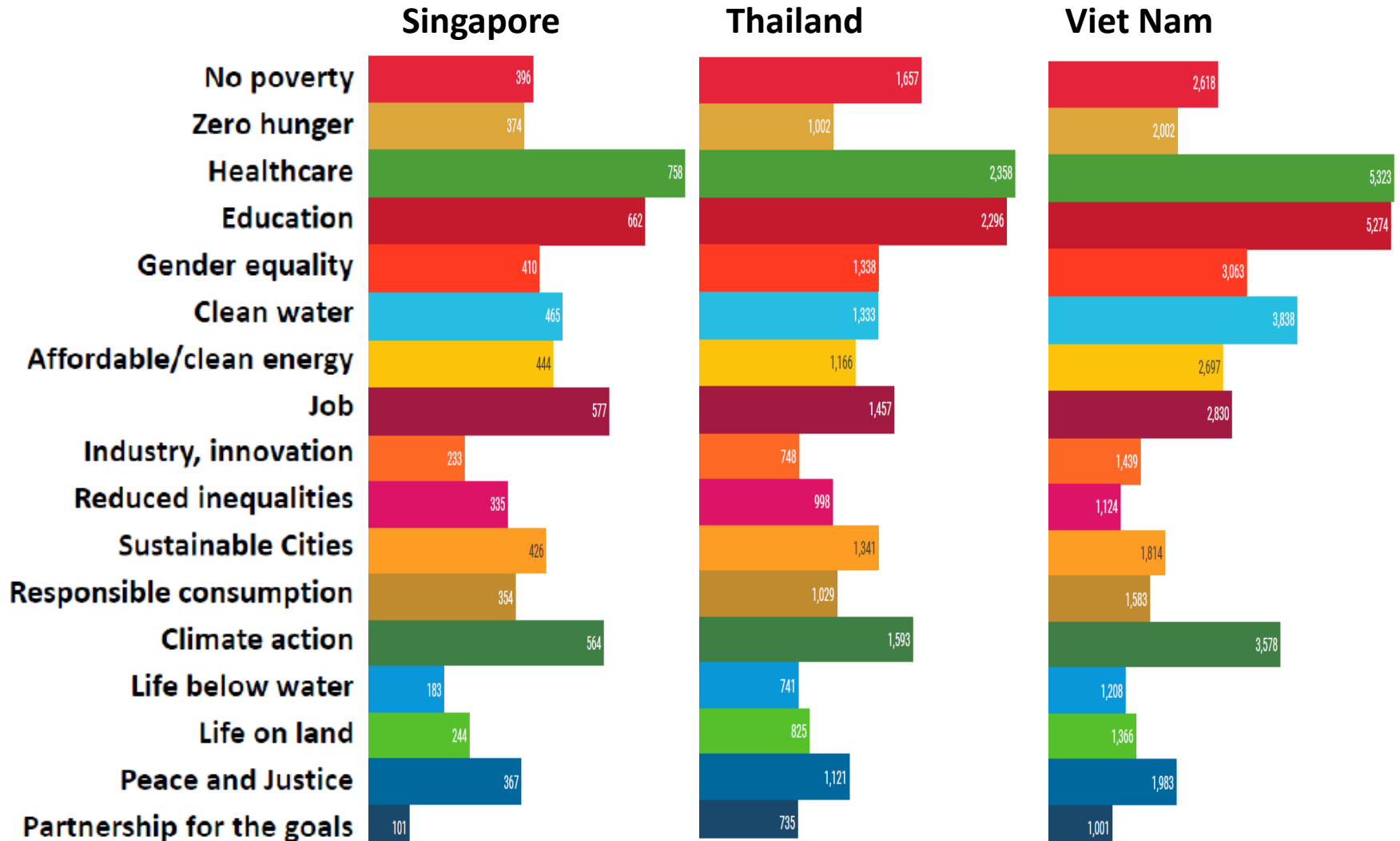
Source: United Nations My World 2030

# Priority on Climate Change among ASEAN Countries



Source: United Nations My World 2030

# Priority on Climate Change among ASEAN Countries



Source: United Nations My World 2030



# G7 Cornwall Summit (June 2021)

- As G7 members, we all reaffirm our commitment to the Paris Agreement and to strengthening and accelerating its implementation through robust national policies and measures and scaled up international cooperation. To this end we collectively commit to ambitious and accelerated efforts to achieve net zero greenhouse gas emissions as soon as possible and by 2050 at the latest, recognising the importance of significant action this decade. In line with this goal, we have each committed to increased 2030 targets and, where not done already, commit to submit aligned Nationally Determined Contributions (NDCs) as soon as possible ahead of COP26, which will cut our collective emissions by around half compared to 2010 or over half compared to 2005. We also commit to submit 2050 Long Term Strategies (LTSs) by COP26

# G20 Climate and Energy Ministers Meeting (June 2021)

- We recall our collective commitment to hold the global average temperature increase well below 2° and to pursue efforts to limit it to 1,5° C above pre-industrial levels
- We, ... note with concern the initial findings of the Synthesis Report prepared by the UNFCCC Secretariat on NDCs under the Paris Agreement which highlights many Parties are yet to update or communicate NDCs, confirming the need to enhance global action to achieve the objectives of the Paris Agreement, while acknowledging national circumstances and respective capabilities. To this end, we intend to update or communicate ambitious NDCs by COP26 and we welcome those who have already done so.
- In this context and bearing in mind our leadership role and our common mission, we acknowledge those who already committed to achieve net zero GHG emissions or carbon neutrality by or around mid-century. We urge all members to formulate such long-term strategies that set out pathways consistent to achieve balance between anthropogenic emissions by sources and removal by sinks and a resilient future, as soon as possible, and strive to do so no later than COP26 to globally and collectively contribute to hold the global average temperature increase to well below 2° C and to pursue efforts to limit to 1.5° C, with the aim of keeping the above temperature limit within reach,

# Challenges

- Availability, accessibility and affordability of energy supply is the most fundamental requirement for the ASEAN countries
- In the Business As Usual scenario, ASEAN region will continuously depend on fossil fuels.
- The Paris Agreement sets ambitious 1.5-2.0 degree goals. As the Parties to the Paris Agreement, ASEAN countries need to pursue low carbon energy transition pathways aiming at carbon neutrality in the second half of this century.
- Pathways towards carbon neutrality could be diverse among countries. One size does not fit all. Each country's specific national circumstances must be taken into account and decarbonization pathway needs to ensure other policy objectives, namely, availability, accessibility and affordability.
- Given high priority on poverty eradication, affordability strongly matters. Technology optimal approach would be needed for minimizing cost.