



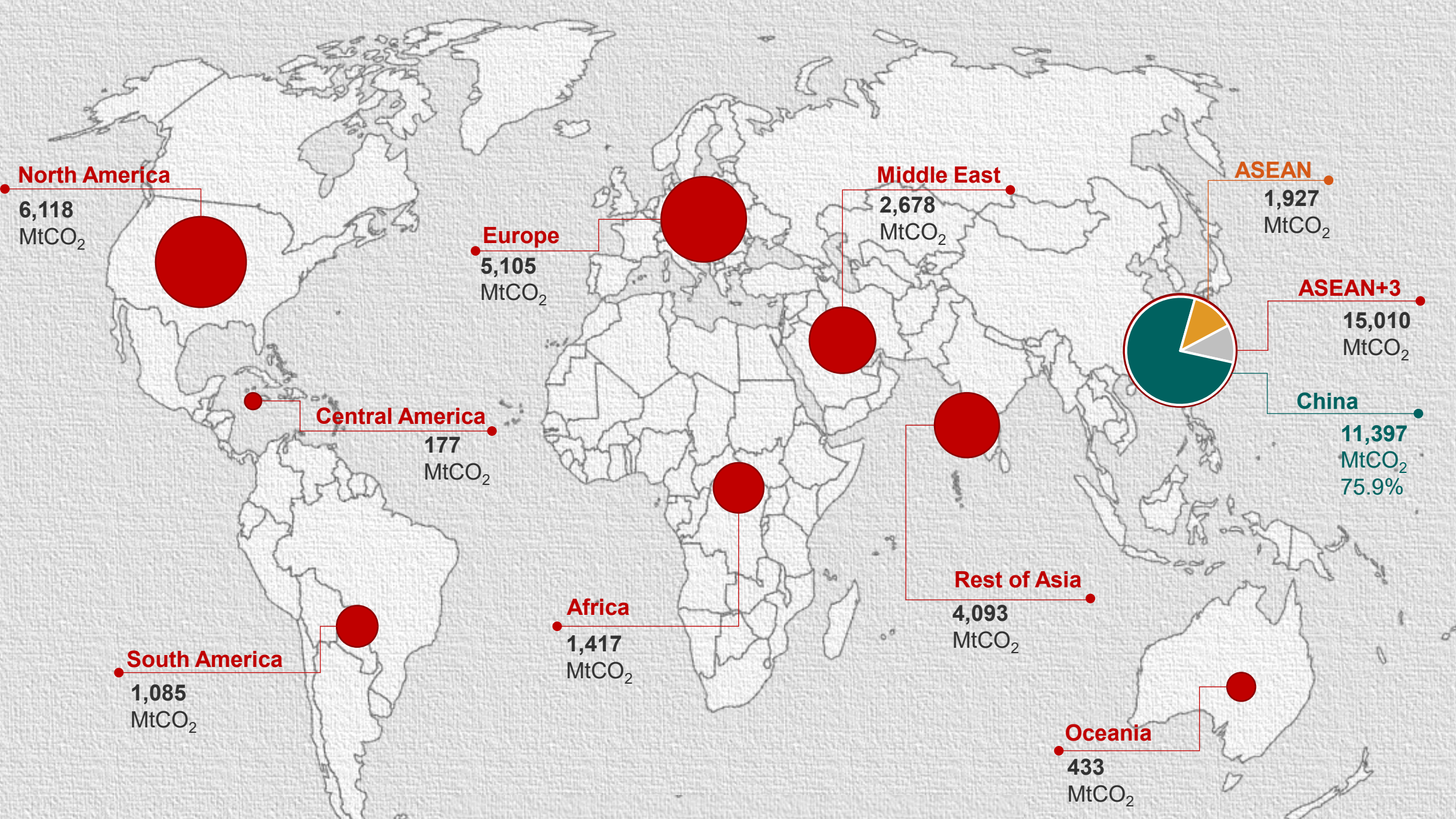
# ASEAN+3 *On the Road to Net Zero*

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ASEAN+3 Macroeconomic Research Office

Session III—Asia in the Global Fight Against Climate  
Change: Capturing Sub-regional Perspectives



27 August 2024, Almaty




Source: Global Carbon Atlas; AMRO staff.  
 Note: Bubbles represent each region's share to global fossil fuel emissions in 2022. Boundaries, colors, and other information shown on the above map do not imply any judgment on the part of AMRO concerning the legal status of any territory or the endorsement or acceptance of such boundaries.



## Outline

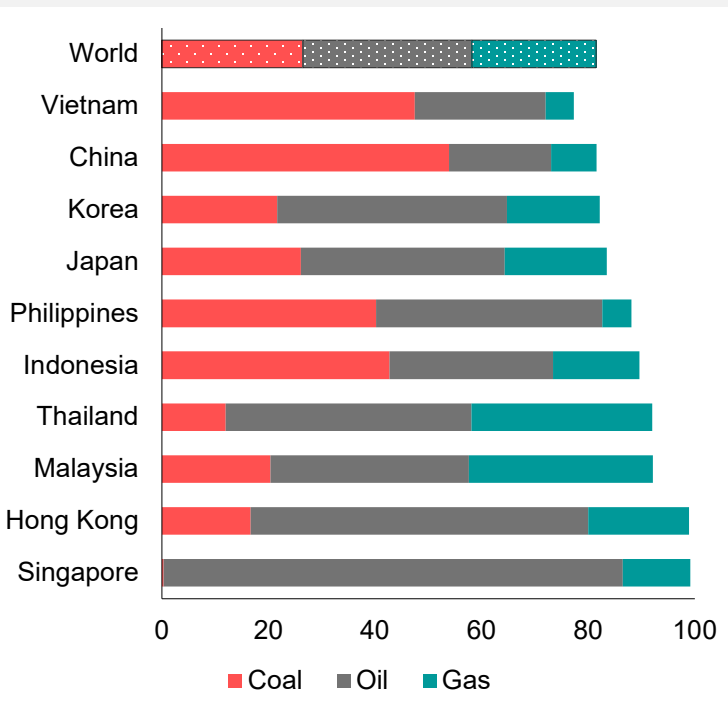
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- 01 What are the macro-financial implications of transitioning out of a high-carbon economy?
  - 02 What are the opportunities for transitioning into a carbon-neutral economy?
  - 03 How can finance play a role?
  - 04 Key takeaways



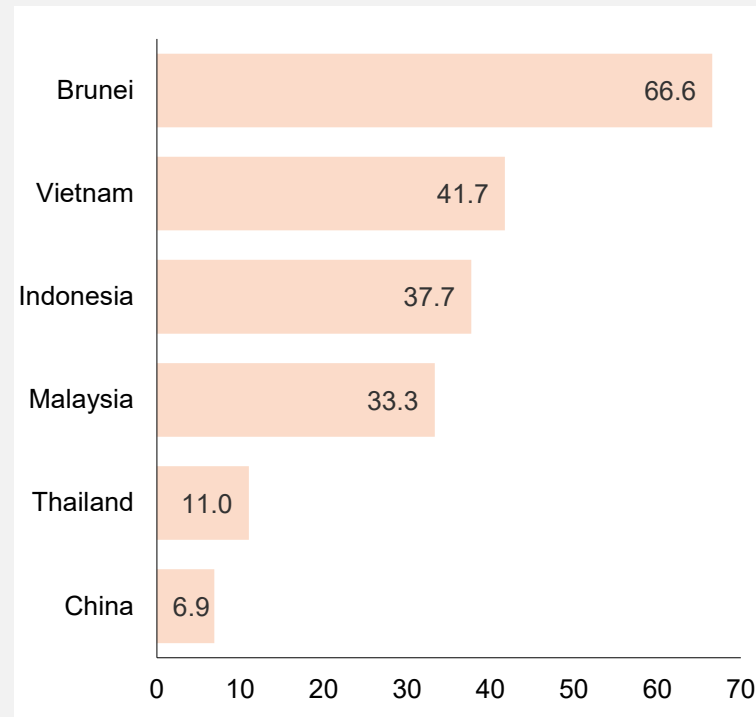
**What are the** macro-financial implications  
**of transitioning out of a high-carbon**  
**economy?**

# Key to the transition is appropriately pricing carbon emissions—yet without ready low-carbon alternatives, this could see **a sustained increase in inflation**

**ASEAN+3, World: Fossil Fuels in Primary Energy Consumption, 2023**  
(Percent of total primary energy consumption)



**ASEAN+3: Fossil Fuel Subsidies, 2022**  
(Percent, average subsidization rate)



**Selected ASEAN+3: Status of Carbon Pricing Policies, 2024**

Economy	Carbon Pricing Policy	
	Carbon tax	Emissions Trading System (ETS)
Brunei	Under consideration	Under consideration
China		Regional ETS Implemented in 2013; National ETS implemented in 2021
Indonesia	Under development	National ETS implemented in 2023
Japan	Implemented in 2012	Regional ETS implemented in 2010; National ETS under consideration
Korea		Implemented in 2015
Lao PDR	Under consideration	Under consideration
Malaysia	Under consideration	Under development
Philippines	Under consideration	Under consideration
Singapore	Implemented in 2019	
Thailand	Under development	Under development
Vietnam		Under development

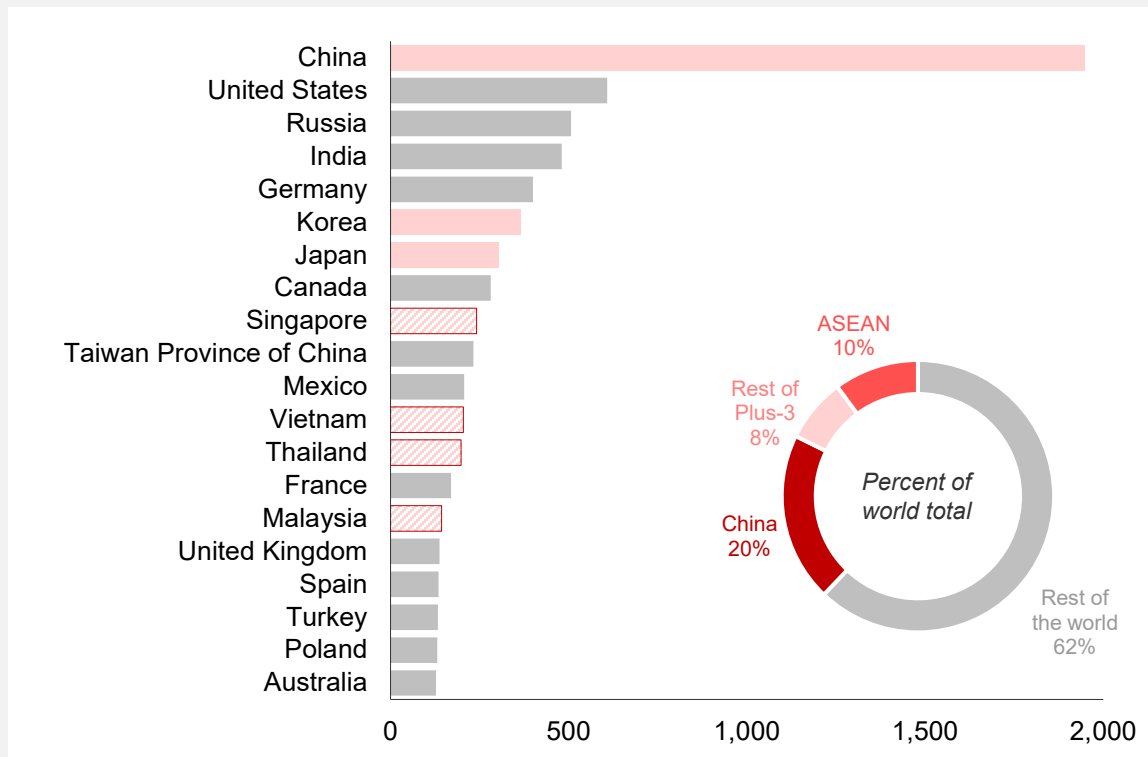
Source: BP Statistical Review of World Energy (2023); AMRO staff calculation.

Source: International Energy Agency.

Source: Andriansyah and Hong (2022); World Bank; AMRO staff compilation.

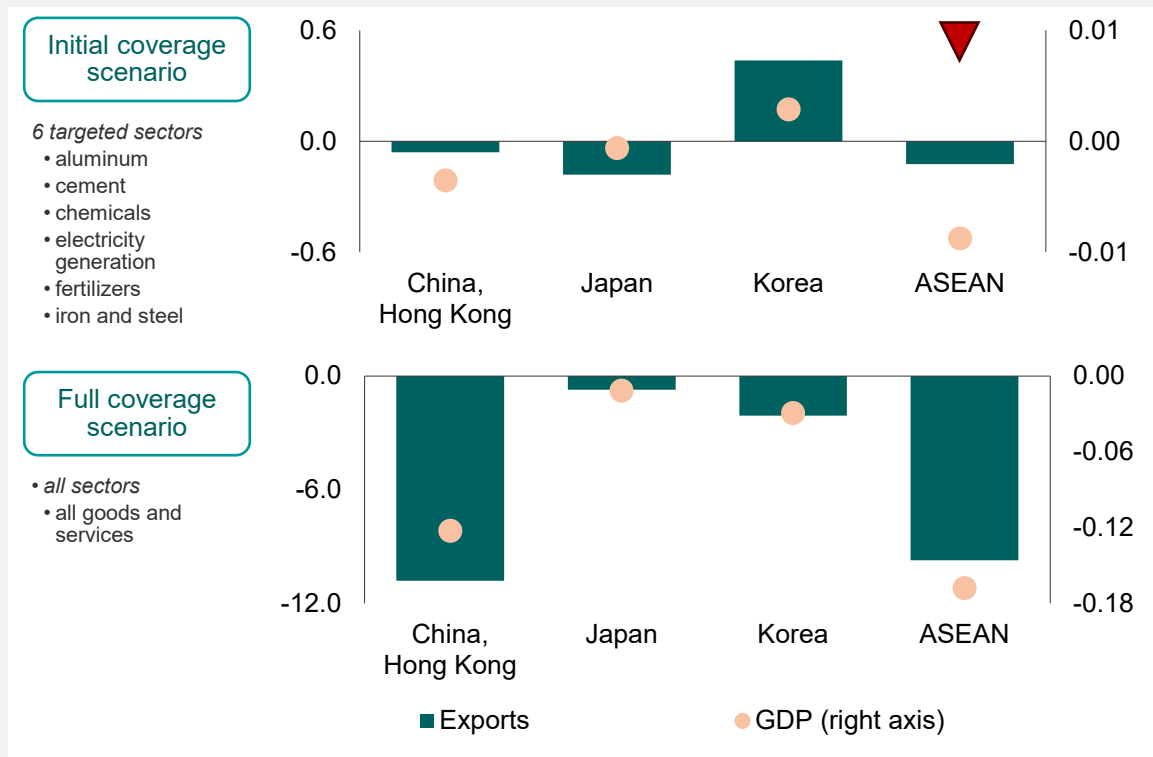
# Carbon pricing—and border carbon adjustments, or “BCAs”—could substantially reduce the relative competitiveness of ASEAN exporters

**Top 20 Economies: Carbon Dioxide Emissions Embodied in International Trade, 2018**  
(Million tons of carbon dioxide)



Source: OECD.Stat; AMRO staff calculation.

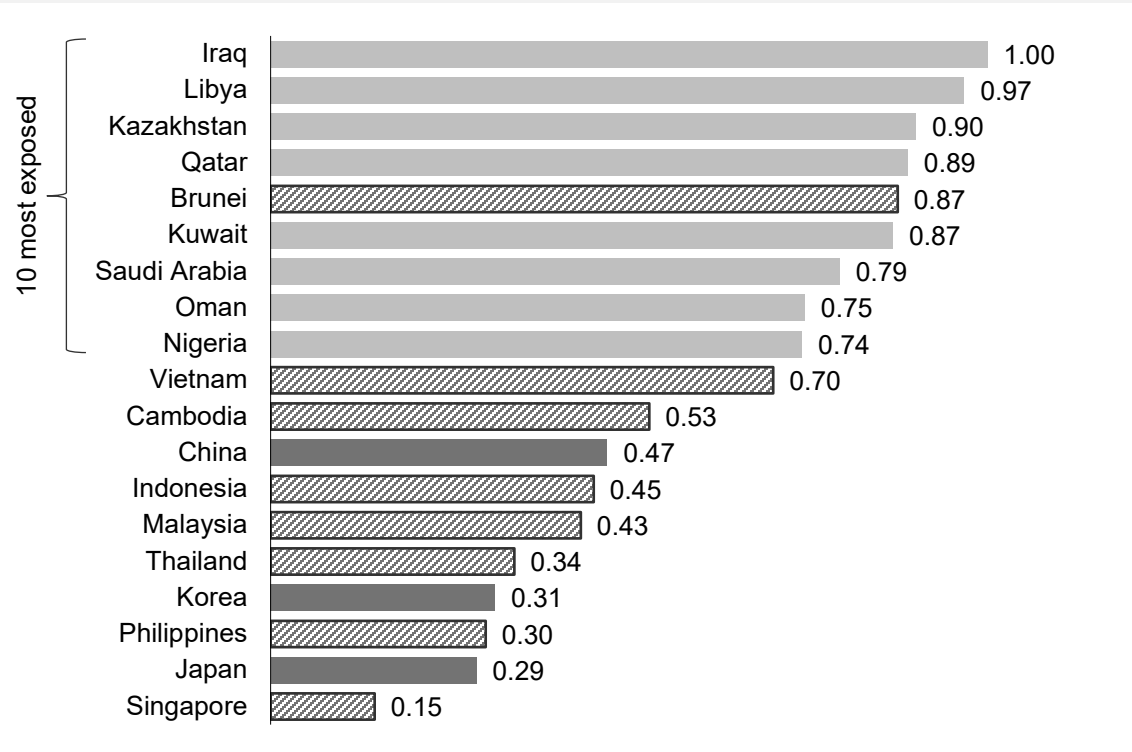
**ASEAN+3: Estimated Impact of CBAM on GDP and Exports to the European Union, 2030**  
(Percent change from baseline)



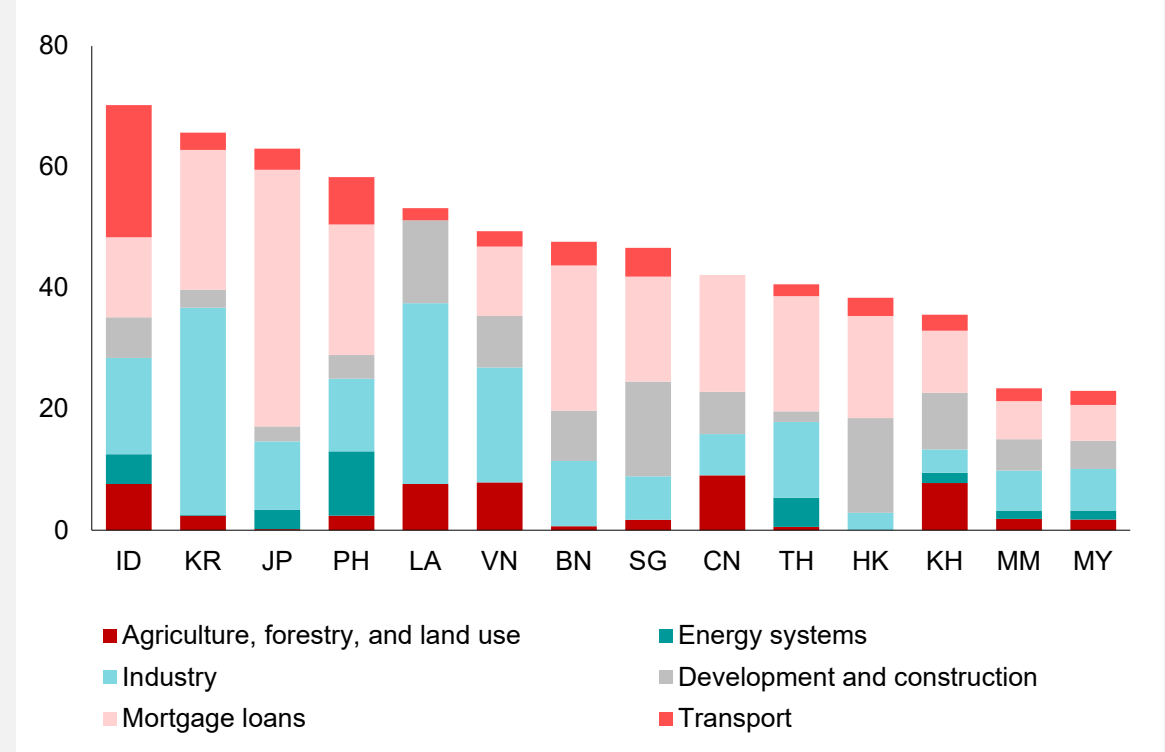
Source: AMRO staff.

# Deep and rapid structural adjustments required by net zero will result in **stranded assets**, which could have implications on **ASEAN financial stability**

**ASEAN+3 and Selected Economies: Exposure to Stranded-Asset Risk, 2019**  
(Index; 1 = most exposed)



**ASEAN+3: Climate Change-Related Loans, by Economy, 2021**  
(Percent of total bank loans)



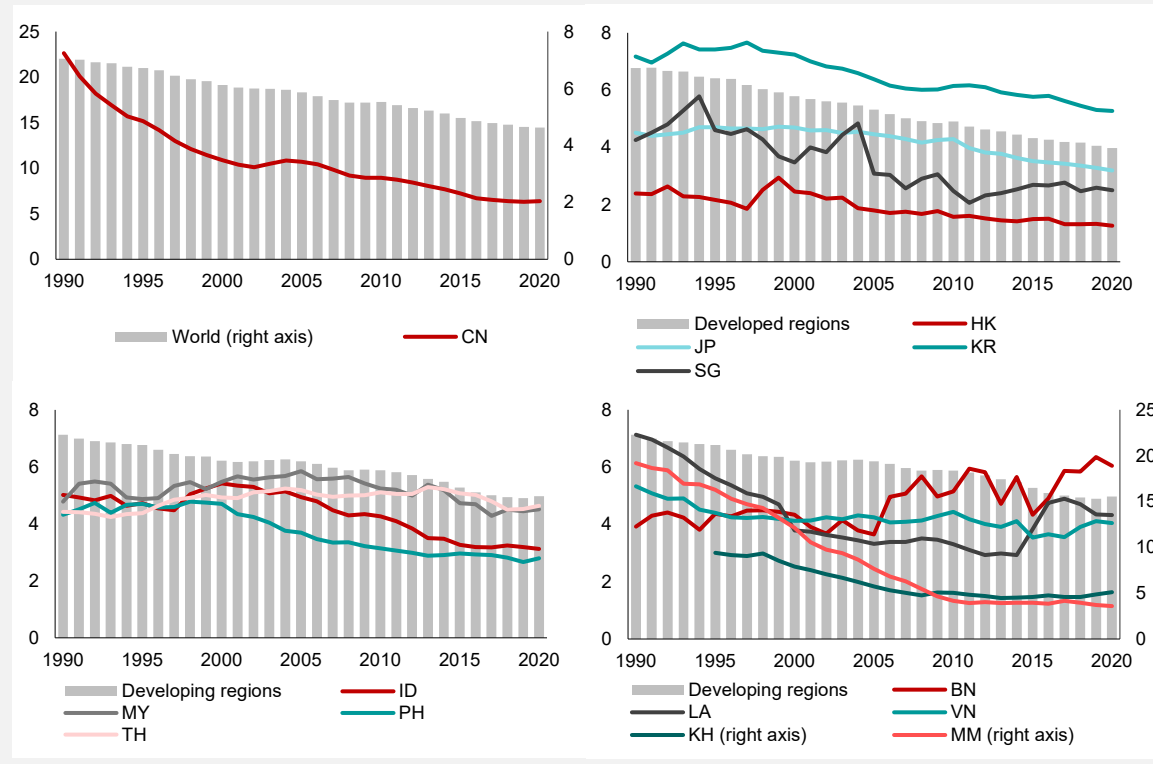
Source: Peszko and others (2020).

Source: National authorities via Haver Analytics; AMRO staff calculation.  
Note: BN = Brunei; CN = China; HK = Hong Kong; ID = Indonesia; JP = Japan; KH = Cambodia; KR = Korea; LA = Lao PDR; MM = Myanmar; MY = Malaysia; PH = Philippines; SG = Singapore; TH = Thailand; VN = Vietnam.

# Protecting ASEAN's long-term growth while transitioning away from fossil fuels will depend largely on **future energy efficiency gains**

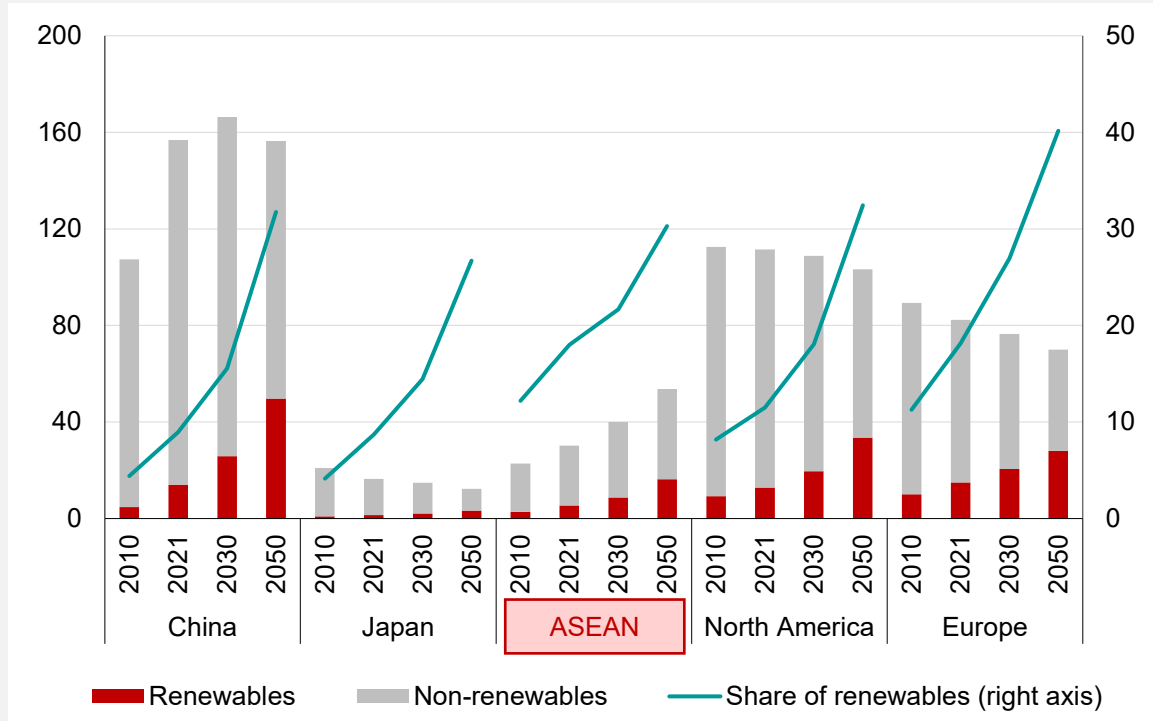
## ASEAN+3: Energy Intensity of GDP

(Megajoules per constant 2017 international dollars using PPP)



## Selected Economies: Projected Energy Mix and Supply

(Petajoules; percent)



Source: International Energy Agency.  
 Note: Note: BN = Brunei; CN = China; HK = Hong Kong; ID = Indonesia; JP = Japan; KH = Cambodia; KR = Korea; LA = Lao PDR; MM = Myanmar; MY = Malaysia; PH = Philippines; SG = Singapore; TH = Thailand; VN = Vietnam.

Source: International Energy Agency; AMRO staff calculation.

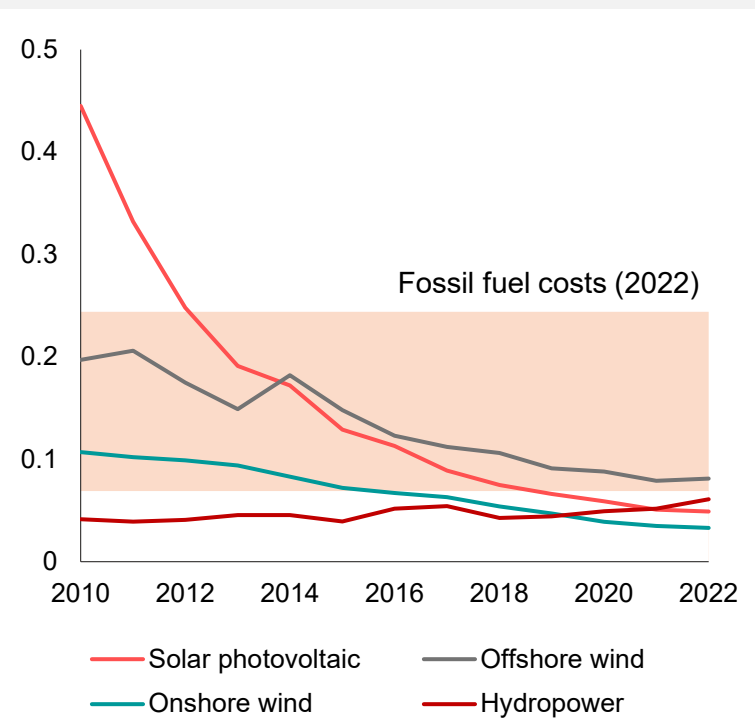




**What are the opportunities  
from transitioning into a carbon-neutral  
economy?**

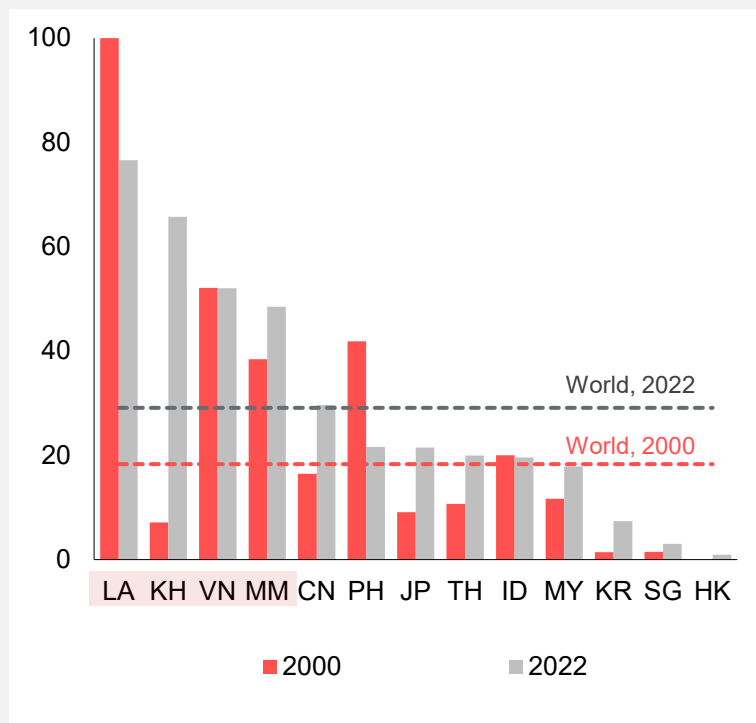
# The net-zero transition holds prospects of expanding markets for ASEAN, especially in **clean energy and low-emissions products**

**World: Levelized Costs of Electricity, by Selected Technology**  
(2022 US dollars per kilowatt-hour)



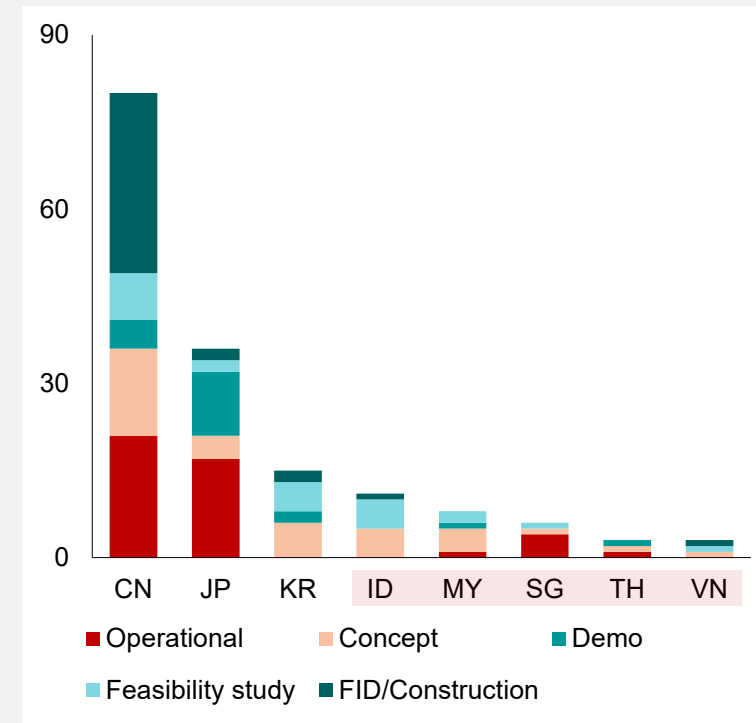
Source: International Renewable Energy Agency.

**ASEAN+3: Renewable Electricity Generation**  
(Percent of total generation)



Source: International Renewable Energy Agency; AMRO staff calculation.  
Note: BN = Brunei; CN = China; HK = Hong Kong; ID = Indonesia; JP = Japan; KH = Cambodia; KR = Korea; LA = Lao PDR; MM = Myanmar; MY = Malaysia; PH = Philippines; SG = Singapore; TH = Thailand; VN = Vietnam.

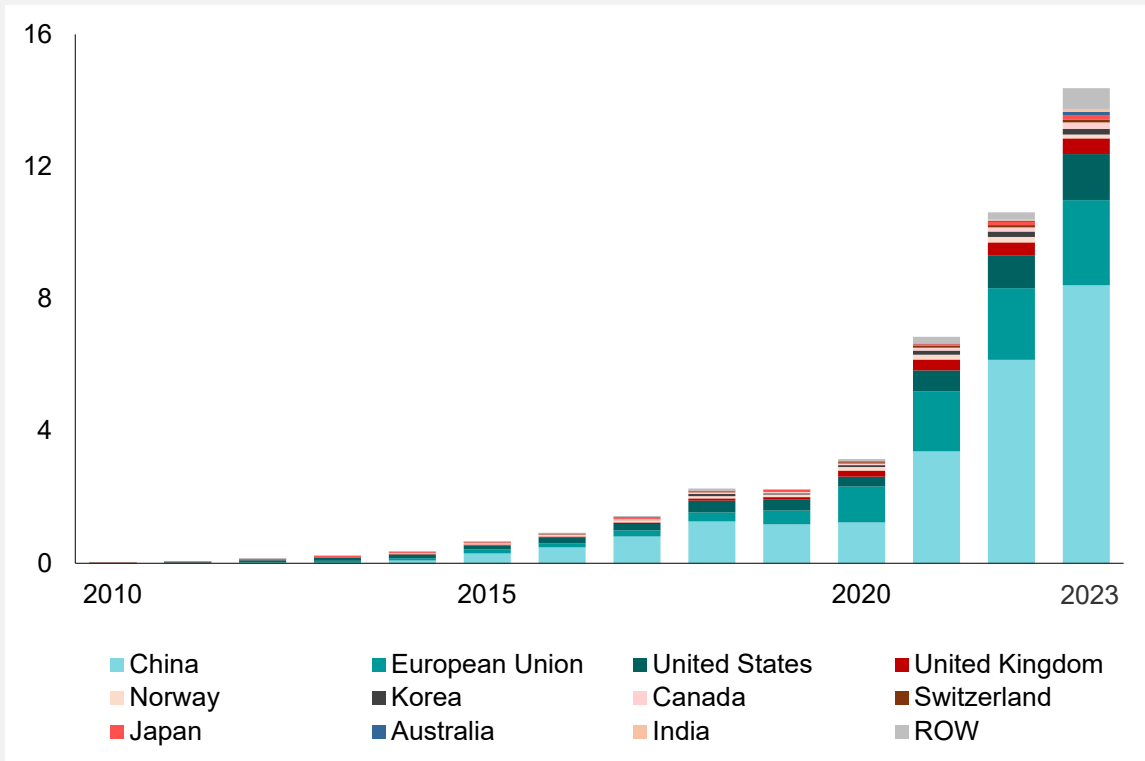
**ASEAN+3: Clean Hydrogen Projects, as of October 2023**  
(Number of units)



Source: International Energy Agency; AMRO staff calculation.  
Note: CN = China; KR = Korea; FID = final investment decision; ID = Indonesia; JP = Japan; MY = Malaysia; SG = Singapore; VN = Vietnam.

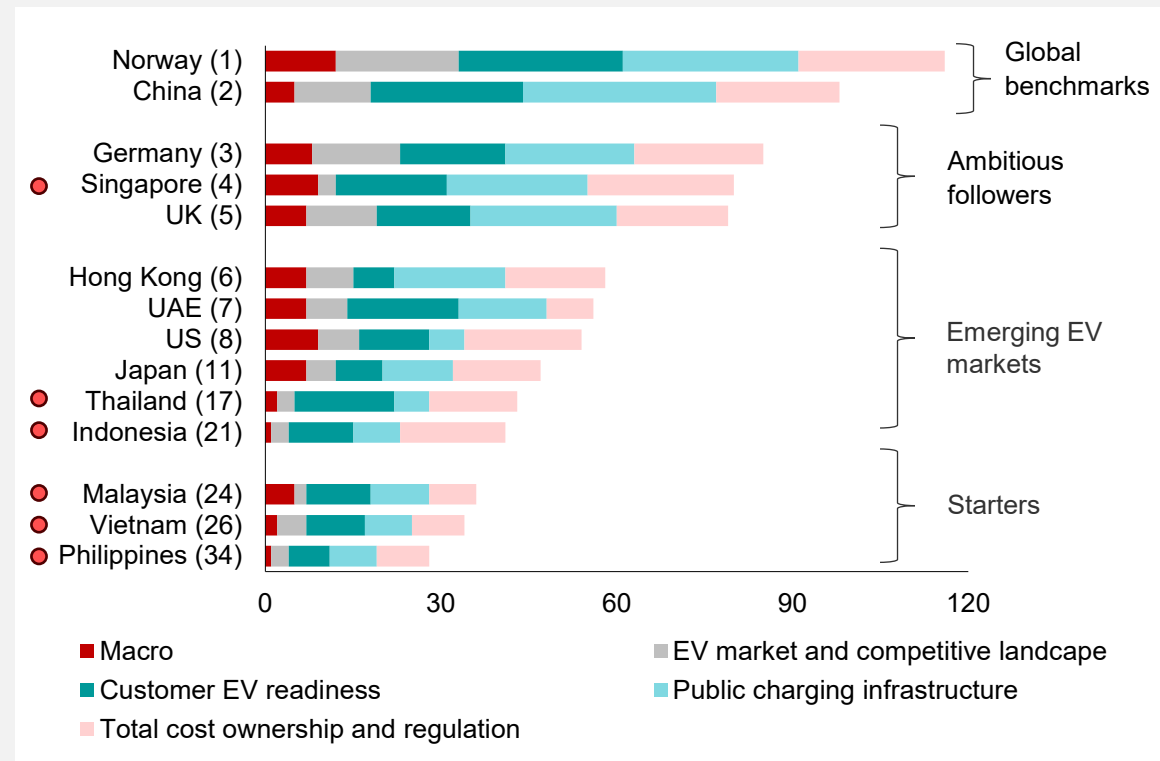
# Adoption of **electric vehicles** in ASEAN will help spur investments and bring about the needed transformation in the region's auto industry

**World: Electric Vehicle Sales by Economy**  
(Millions of units)



Source: International Energy Agency; AMRO staff calculations.

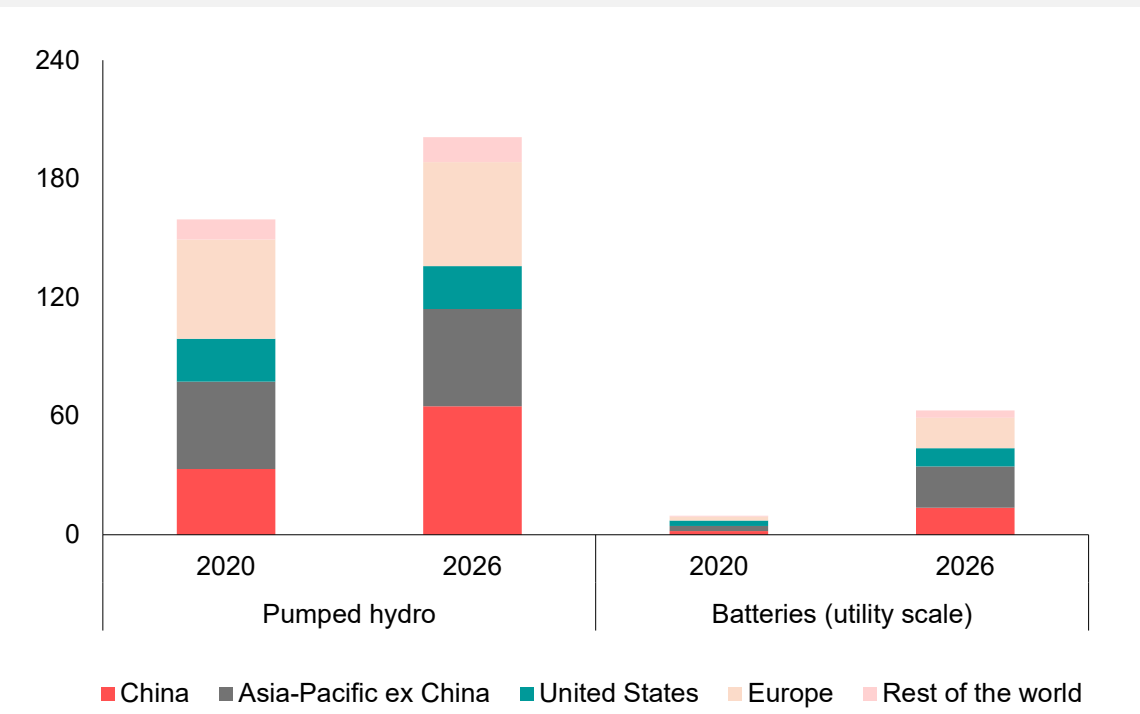
**ASEAN+3 and Selected Economies: Electric Mobility Readiness, 2023**  
(Index)



Source: GEMRIX (2023).

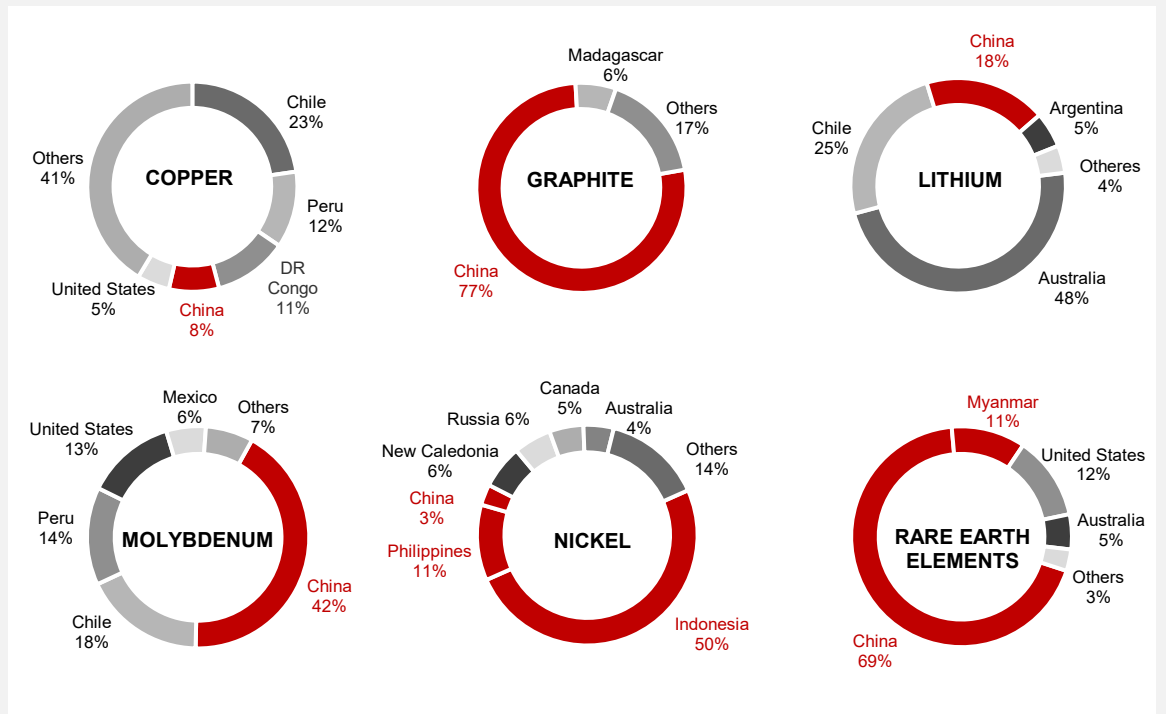
# ASEAN+3 can leverage existing technological expertise and abundant mineral resources to meet robust demand for **energy storage and critical minerals**

**World: Actual and Projected Installed Energy Storage Capacity (Gigawatts)**



Source: International Energy Agency.

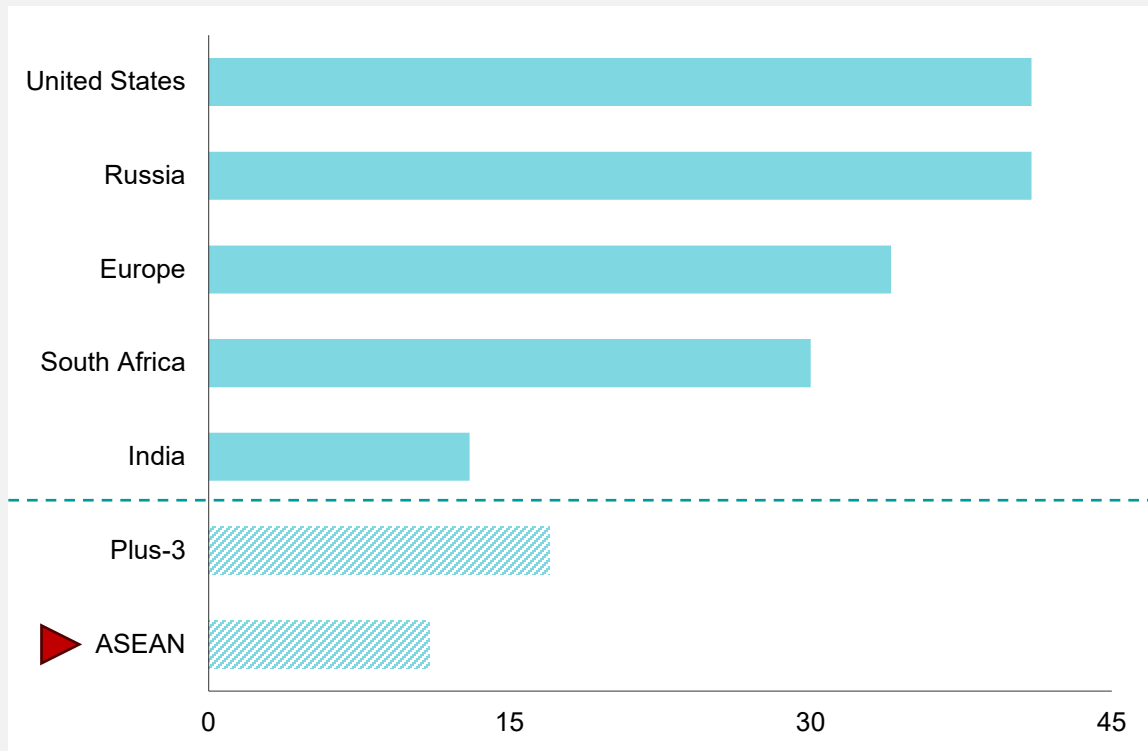
**World: Major Producers of Critical Minerals, 2023 (Percent of total global production)**



Source: United States Geological Survey (2024).

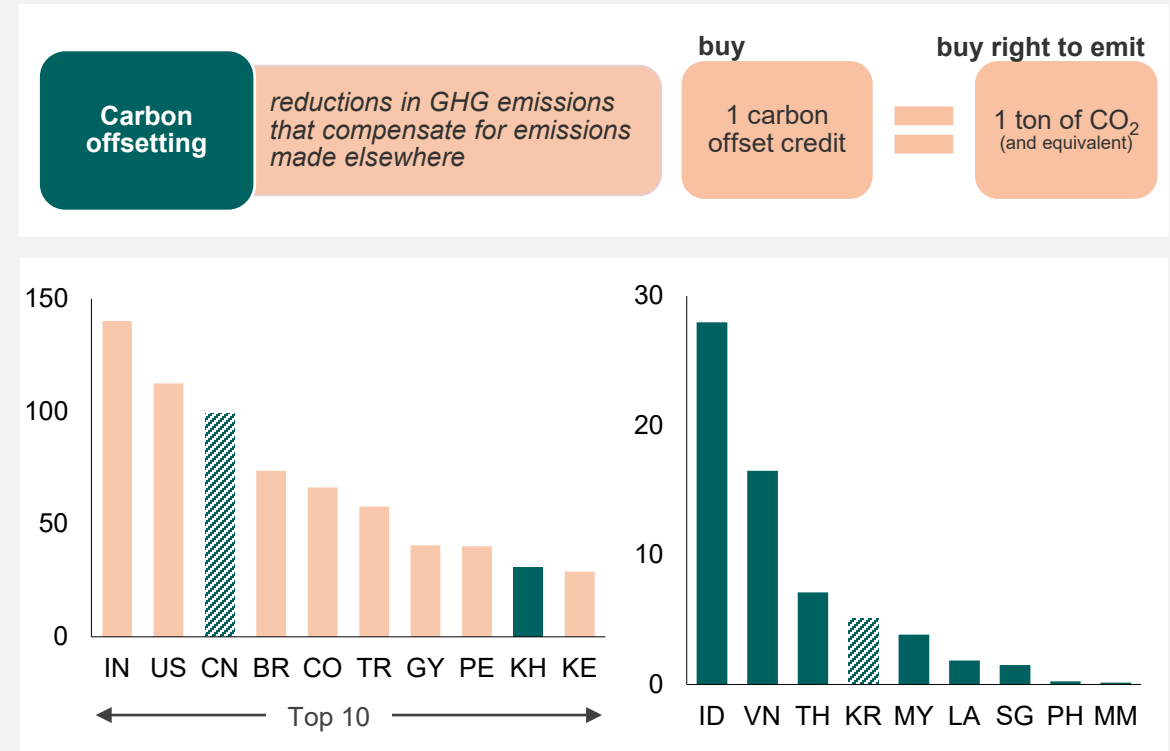
# Carbon capture can help minimize the risks from asset stranding, while carbon offsetting can create new financial assets from natural endowments

ASEAN+3 and Selected Economies: Average Age of Existing Coal Plants (Years)



Source: International Energy Agency; AMRO staff calculations. Note: Latest data is for 2020.

ASEAN+3 and Selected Economies: Available Credits from Hosted Carbon Offset Projects, August 2024 (Megatons of carbon dioxide equivalent)



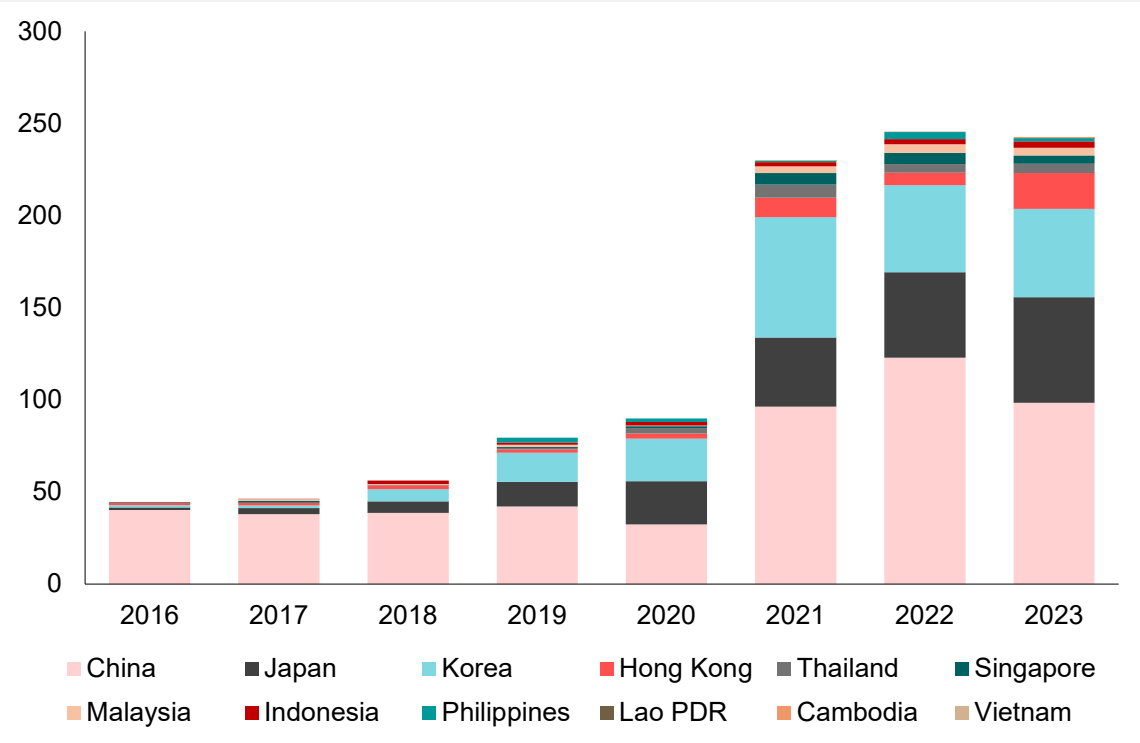
Source: International Energy Agency; AMRO staff calculations. Note: BR = Brazil; CD = Democratic Republic of Congo; CN = China; ID = Indonesia; IN = India; KE = Kenya; KH = Cambodia; KR = Korea; LA = Lao PDR; MM = Myanmar; MY = Malaysia; PE = Peru; PH = Philippines; SG = Singapore; TH = Thailand; TR = Turkey; US = United States; VN = Vietnam.



**(How) Can finance play a role?**

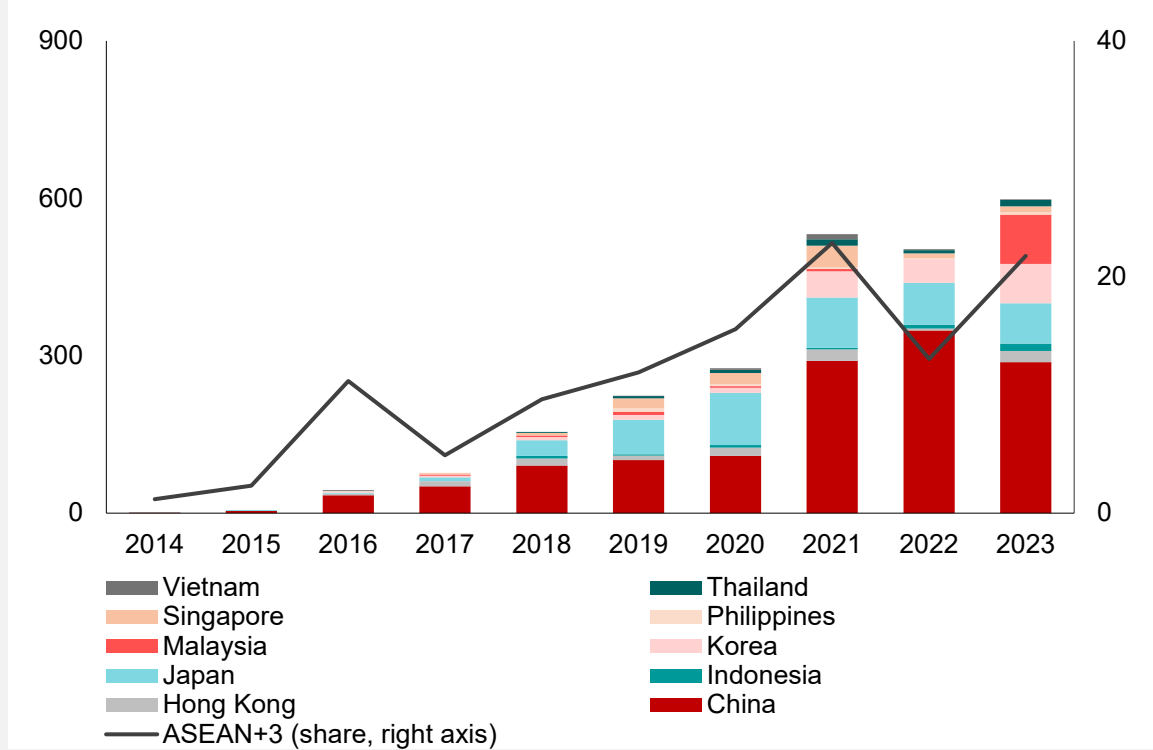
# ASEAN financial markets are increasingly adopting “green” products and practices to facilitate the transition—but more needs to be done

**ASEAN+3: Annual Issuance of Labeled Bonds, by Jurisdiction**  
(Billions of US dollars)



Source: AsianBondsOnline, Asian Development Bank; AMRO staff calculation.

**ASEAN+3: Green Bond Issuance**  
(Number of deals; percent of global deals)

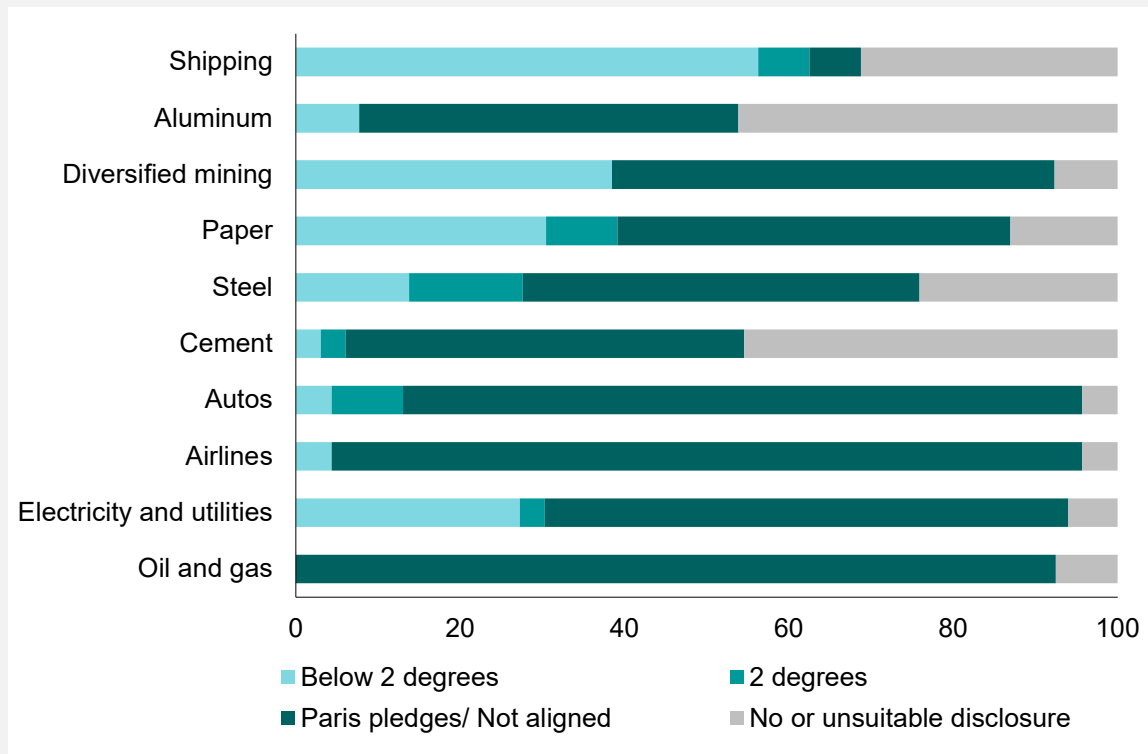


Source: Climate Bonds Initiative Green Bond Database.

# More transition financing is required for sectors with non-green, high-carbon activities

**Carbon Performance Alignment with Paris Agreement Benchmarks in 2030, by Sector**

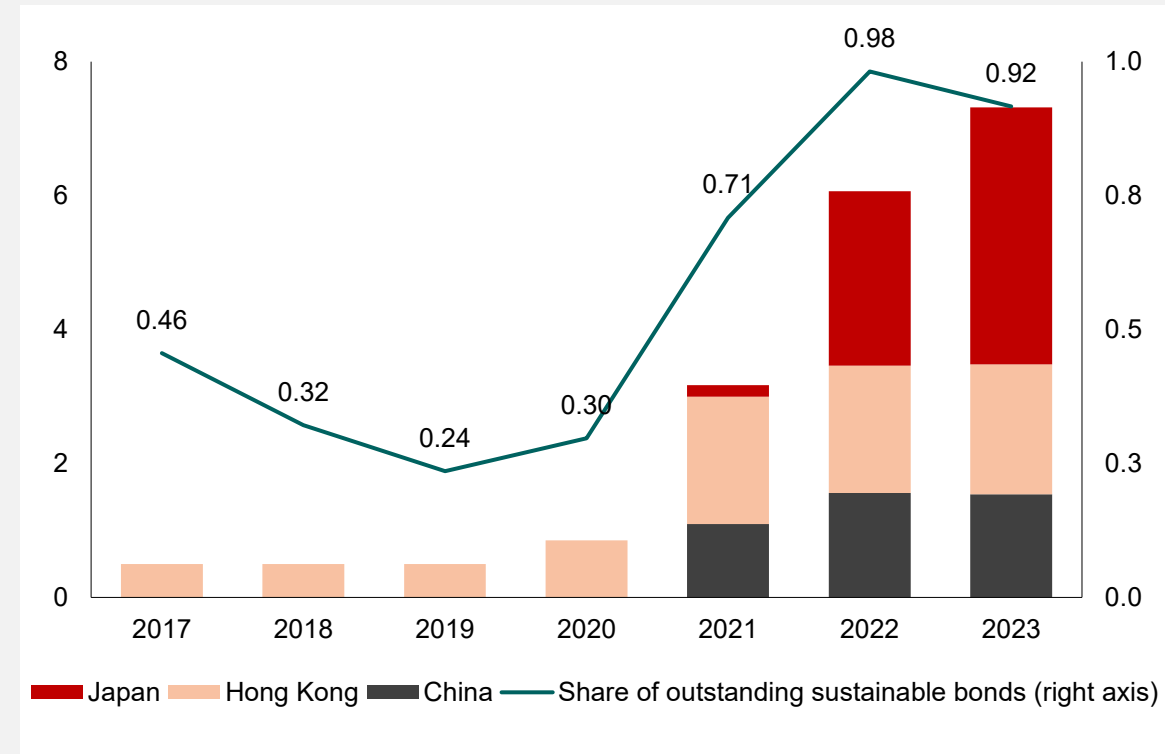
(Percent of companies per sector)



Source: Dietz and others (2021).

**ASEAN+3: Outstanding Transition Bonds**

(Billions of US dollars, end of period; share of outstanding sustainable bonds)



Source: AsianBondsOnline, Asian Development Bank; AMRO staff calculation.





## **Key** takeaways



## Macro-financial implications



## Opportunities



## Role of finance

- All ASEAN economies have made commitments to mitigate climate change. Key to mitigation is to put an appropriate price on carbon emissions.
- But with the region relying mainly on fossil fuels, carbon pricing carries implications for inflation and export competitiveness in the medium to long term.
- Some economies also face substantial risks from stranded assets, with potential consequences for regional financial stability.
- The sooner scalable, reliable, and affordable low-carbon alternatives become available for ASEAN, the less painful and costly the transition away from fossil fuels will be.

Macro-financial implications

Opportunities

**Role of finance**

- Indeed, the road to net zero is rich in opportunity.
- Many ASEAN economies are already well-placed to leverage their existing comparative advantage in areas of manufacturing, natural resources, and financial services to reap the economic benefits from the transition.
- By mobilizing private capital, ASEAN can realize the economic gains from the net zero transition while minimizing its negative impact on growth.
- Comparable standards and frameworks across the region for sustainable finance instruments will be crucial in accessing much-needed financing.

## For individual economies

- Utilize climate-informed public expenditure and fiscal tools for an orderly transition
- Enhance the ability of the financial system to mobilize green and low-carbon financing
- Maintain the integrity of green markets and instruments through transparency and standards-setting
- Strengthen cross-government agency coordination to ensure alignment with a credible economy-wide, long-term transition strategy

- Accelerate energy cooperation and cross-border renewable energy exchange
- Explore regional green project developments, harnessing the power of public-private partnerships
- Strengthen regional sharing of knowledge and innovative technologies to promote widespread rollout
- Advance green finance networks

## For the region

2050

Thank you.



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