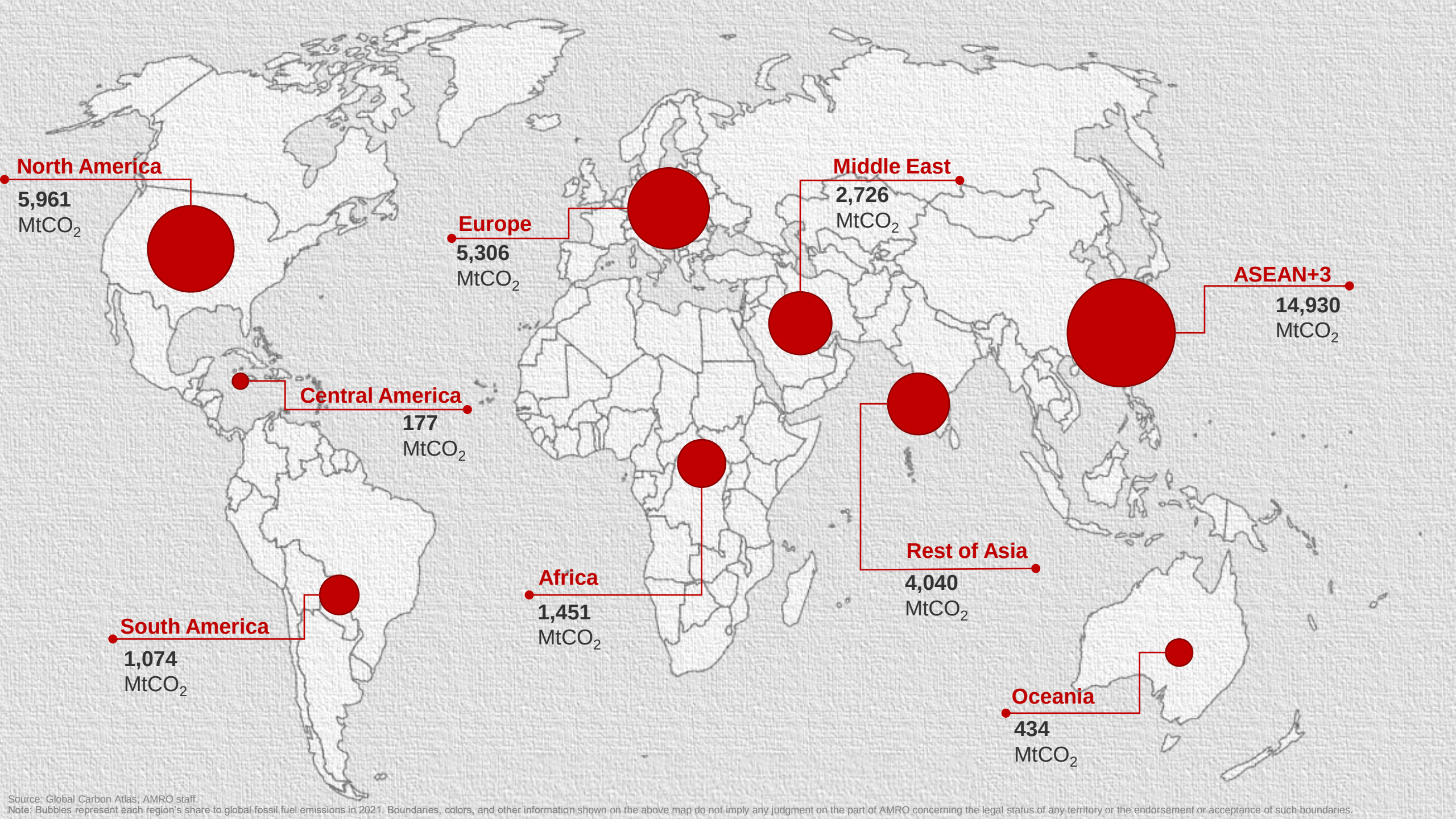
ASEAN+3
On the Road to Net Zero

ASEAN+3 Regional Economic Outlook 2023

Panel discussion

6 April 2023, Singapore



Source: Global Carbon Atlas; AMRO staff.
Note: Bubbles represent each region's share to global fossil fuel emissions in 2021. 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.

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

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

(How) Can finance facilitate the transition?

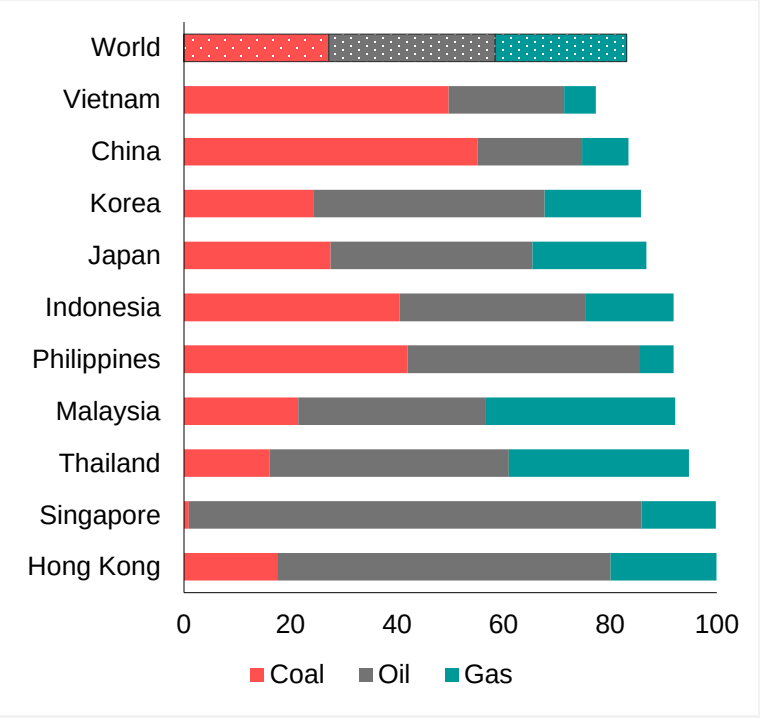
Key messages and policy recommendations

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, 2021

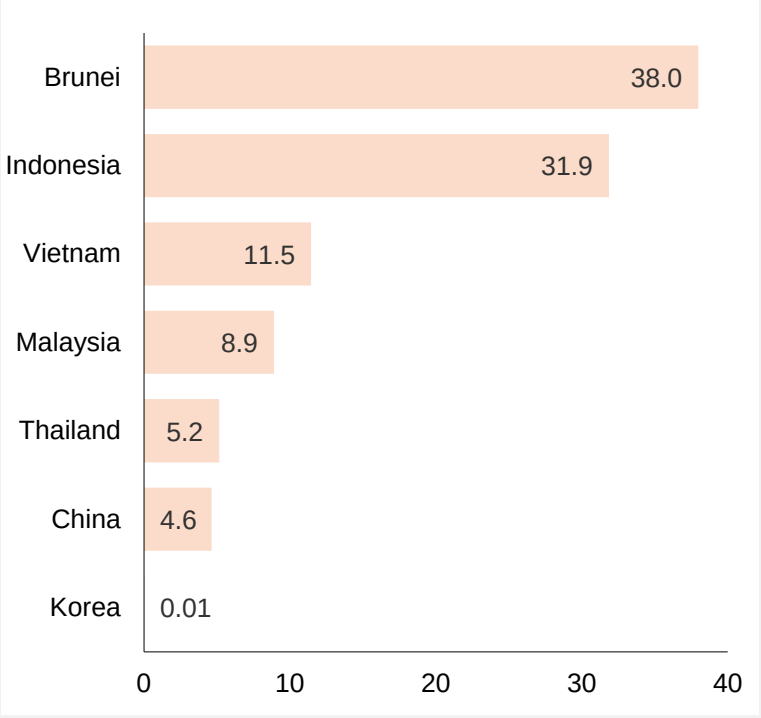
(Percent of total primary energy consumption)



Source: BP Statistical Review of World Energy (2022); AMRO staff calculation.

Selected ASEAN+3: Fossil Fuel Subsidies, 2021

(Percent, average subsidization rate)



Source: International Energy Agency.

Selected ASEAN+3: Status of Carbon Pricing Policies, 2022

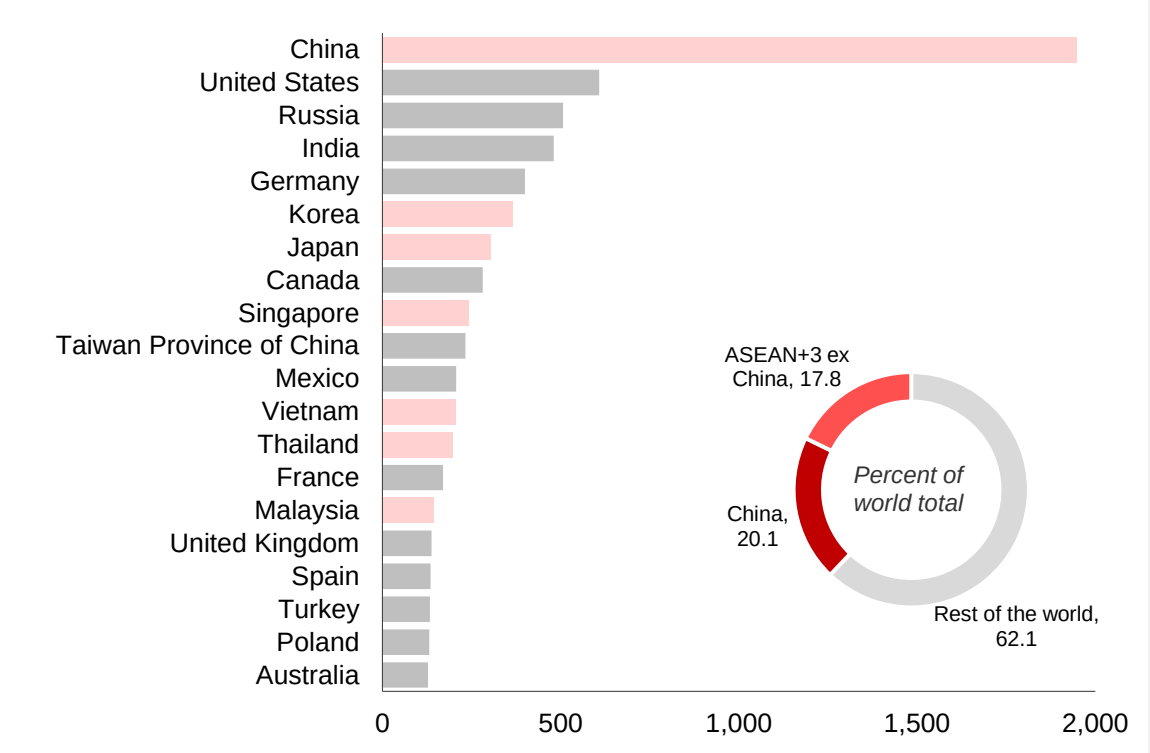
Economy	Carbon Pricing Policy	
	Carbon tax	Emissions Trading System (ETS)
Brunei	Under consideration	Under consideration
China		Regional ETS Implemented in 2013; National ETS implemented in 2021
Indonesia	Under development	Under development
Japan	Implemented in 2012	Regional ETS implemented in 2010; 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 consideration	Under development
Vietnam		Under development

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+3 exporters

Top 20 Economies: Carbon Dioxide Emissions Embodied in International Trade, 2018

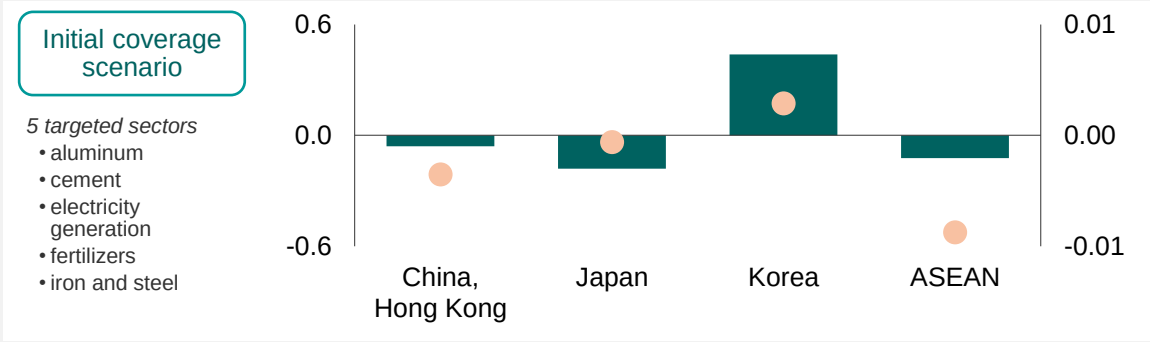
(Million tons of carbon dioxide)



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)

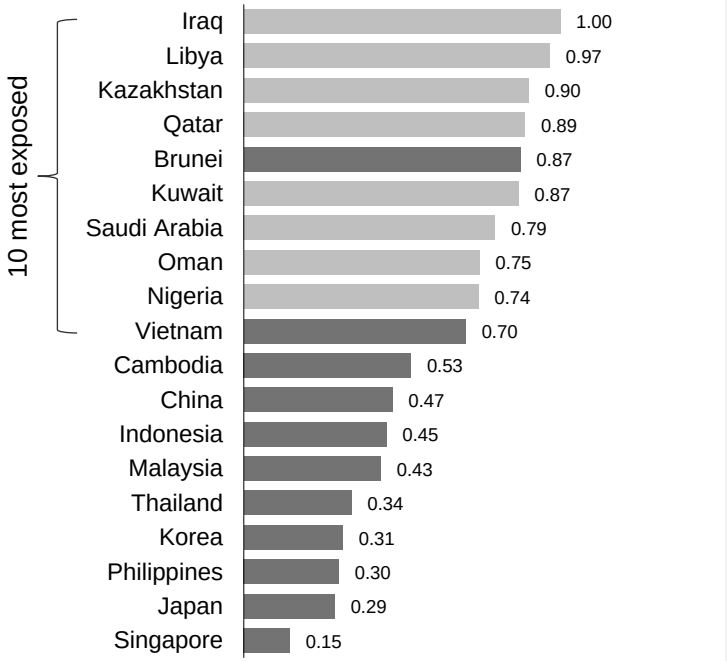


Source: AMRO staff.

Deep and rapid structural adjustments required by net zero will result in **stranded assets**, which could have implications on **ASEAN+3 financial stability**

ASEAN+3 and Selected Economies: Exposure to Stranded-Asset Risk, 2019

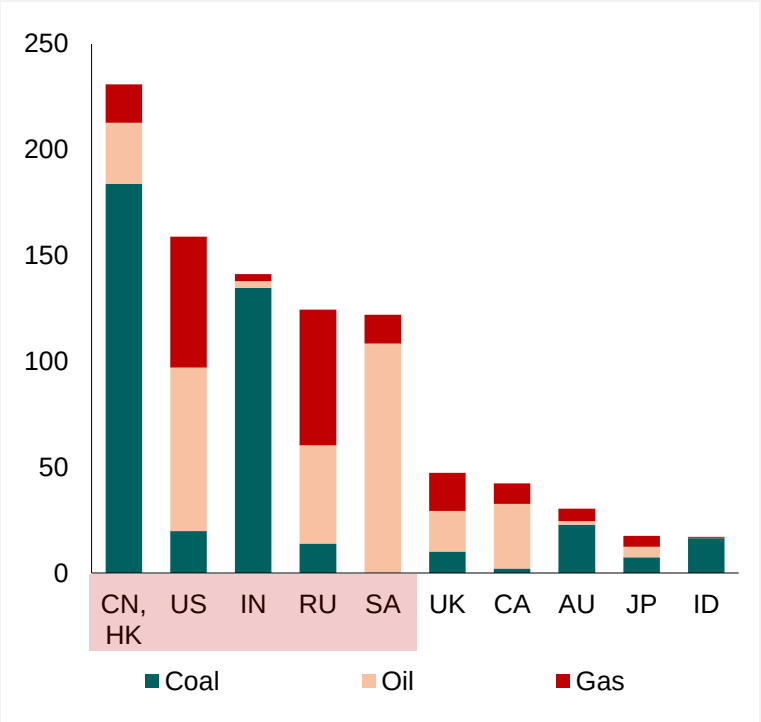
(Index; 1 = most exposed)



Source: Peszko and others (2020).

Embedded Emissions in Fossil Fuel Assets of Listed Companies, by Primary Location, 2022

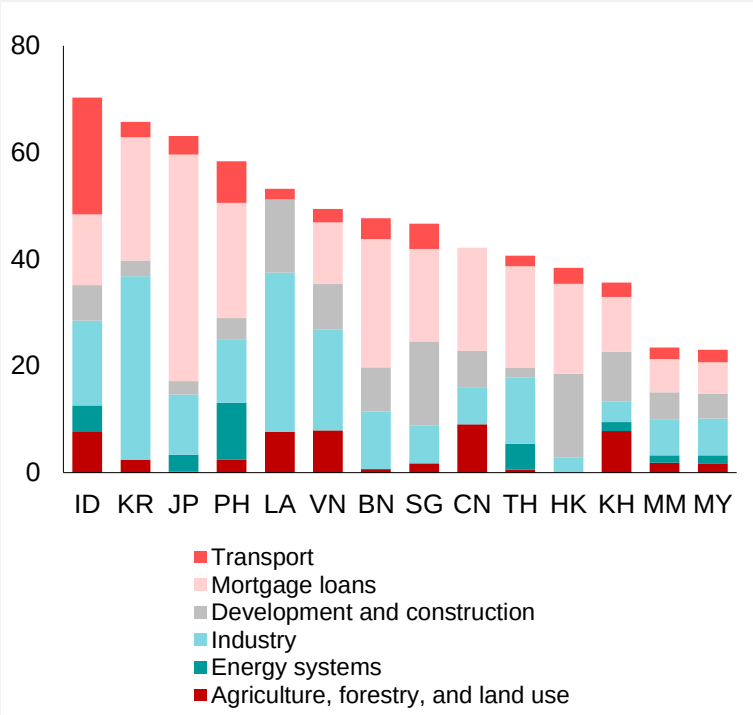
(Gigatons of carbon dioxide)



Source: Carbon Tracker (2022); AMRO staff calculation.
Note: AU = Australia (Sydney); CA = Canada (Toronto); CN = China (Shanghai and Shenzhen); HK = Hong Kong; ID = Indonesia (Jakarta); IN = India (Mumbai); JP = Japan (Tokyo); RU = Russia (Moscow); SA = Saudi Arabia (Riyadh); UK = United Kingdom (London); US = United States (New York).

ASEAN+3: Climate Change-Related Loans, by Economy, 2021

(Percent of total bank loans)

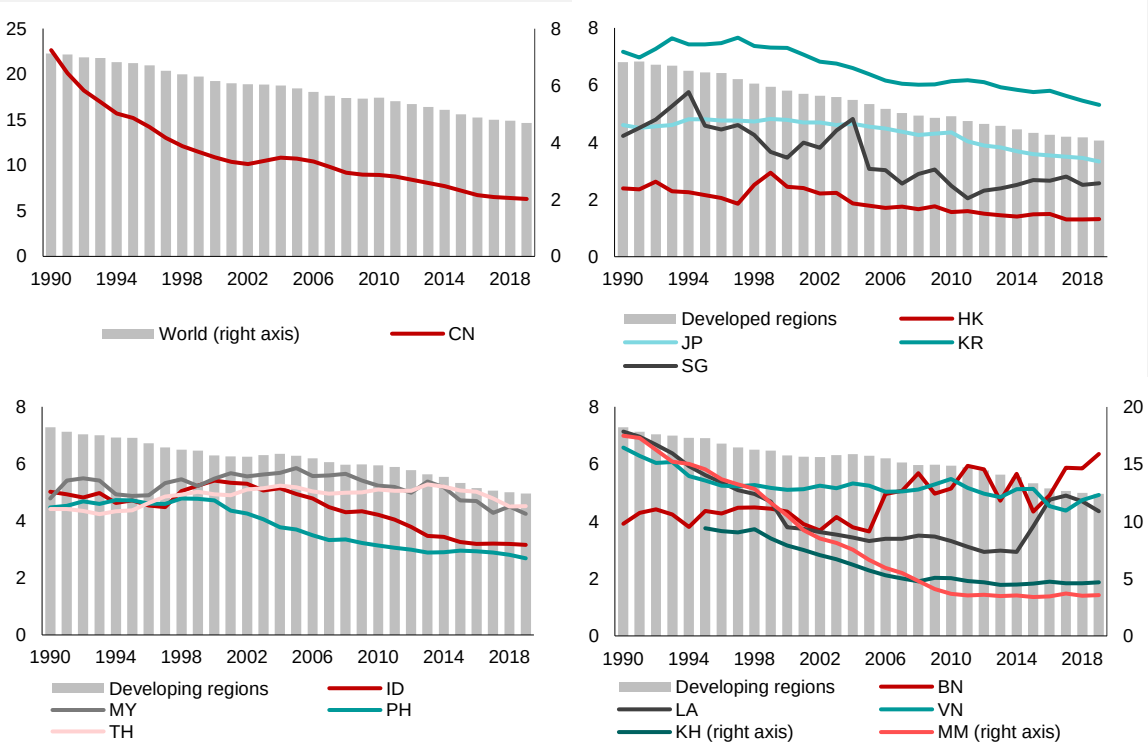


Source: National authorities via Haver Analytics; AMRO staff calculation.
Note: BN = Brunei; CN = China; HK = Hong Kong; ID = Indonesia; JP = Japan; KH = Cambodia; KR = Korea; LA = Lao PDR; MM = Myanmar; MY = Malaysia; PH = Philippines; SG = Singapore; TH = Thailand; VN = Vietnam.

Protecting ASEAN+3's long-term growth while transitioning away from fossil fuels will depend largely on future energy efficiency gains

ASEAN+3: Energy Intensity of GDP

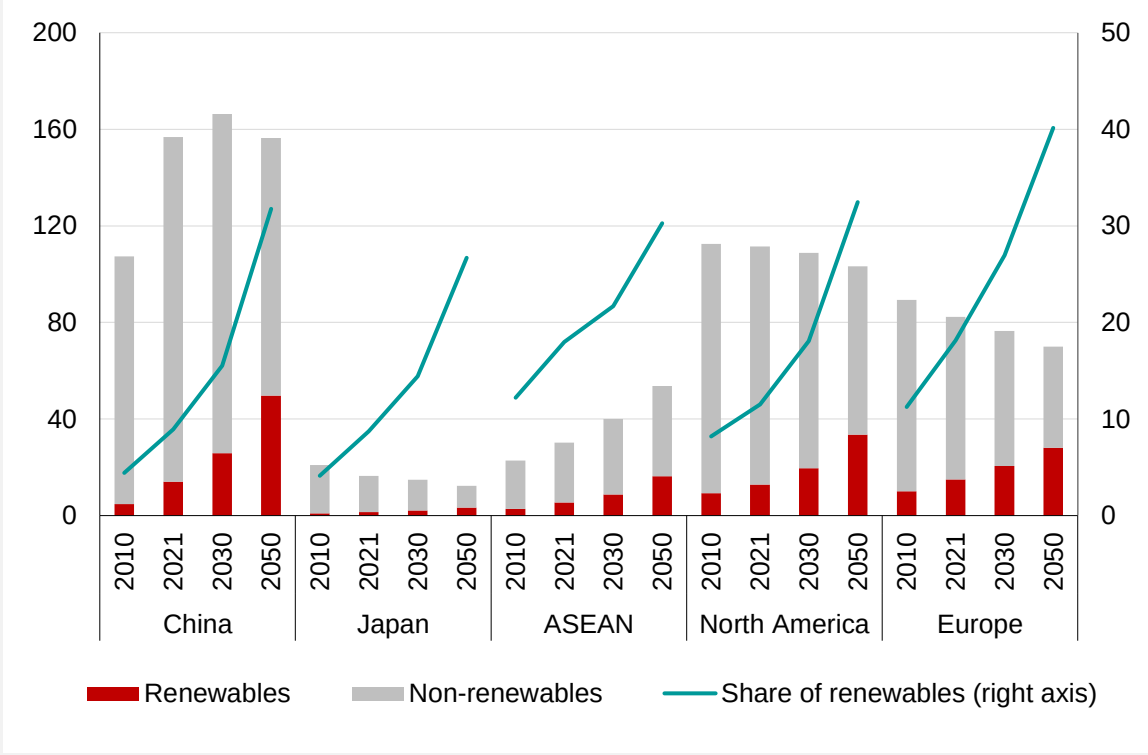
(Megajoules per constant 2017 international dollars using PPP)



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.

Selected Economies: Projected Energy Mix and Supply

(Petajoules; percent)



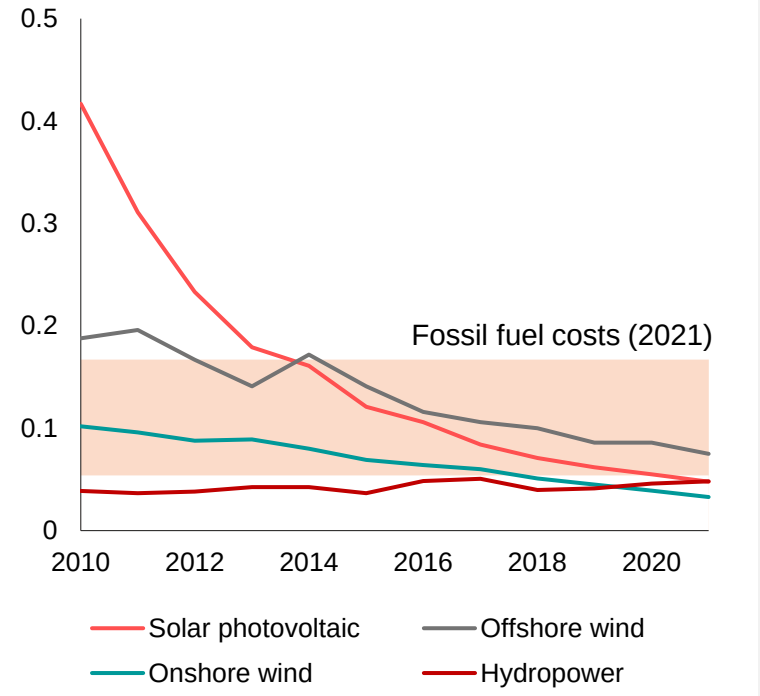
Source: International Energy Agency; AMRO staff calculation.

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

The net-zero transition holds prospects of expanding markets for the ASEAN+3, especially in **clean energy and low-emissions products**

World: Levelized Costs of Electricity, by Selected Technology

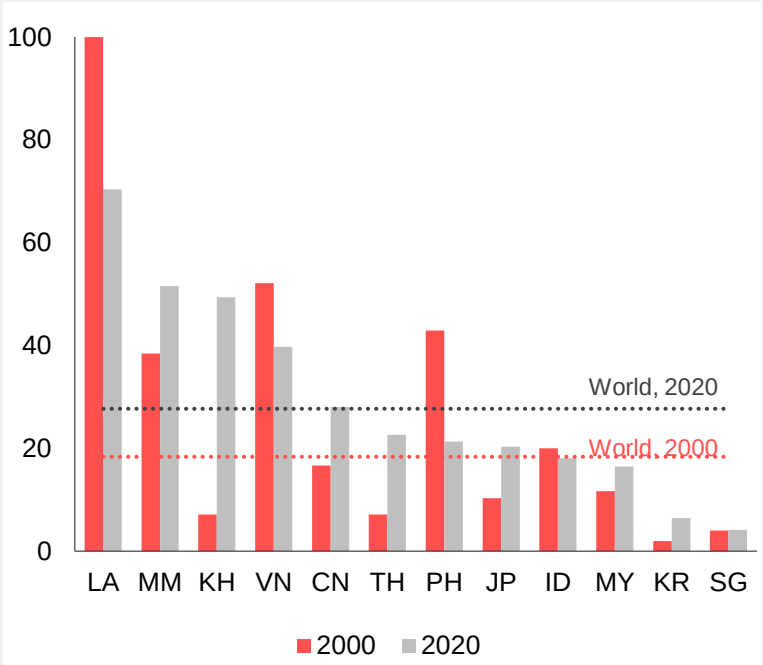
(2021 US dollars per kilowatt-hour)



Source: International Renewable Energy Agency.

ASEAN+3: Renewable Electricity Generation

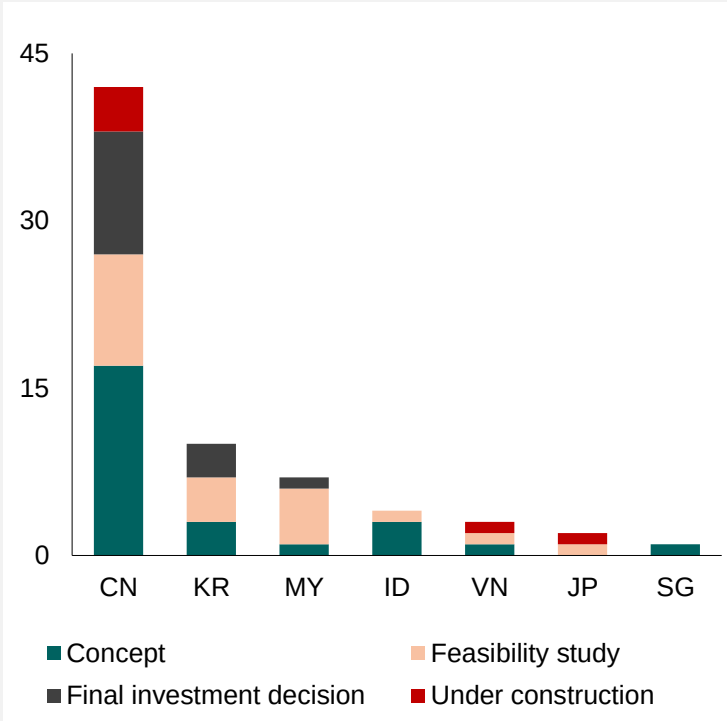
(Percent of total generation)



Source: International Renewable Energy Agency; AMRO staff calculation.
Note: 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: Upcoming Clean Hydrogen Projects, as of October 2022

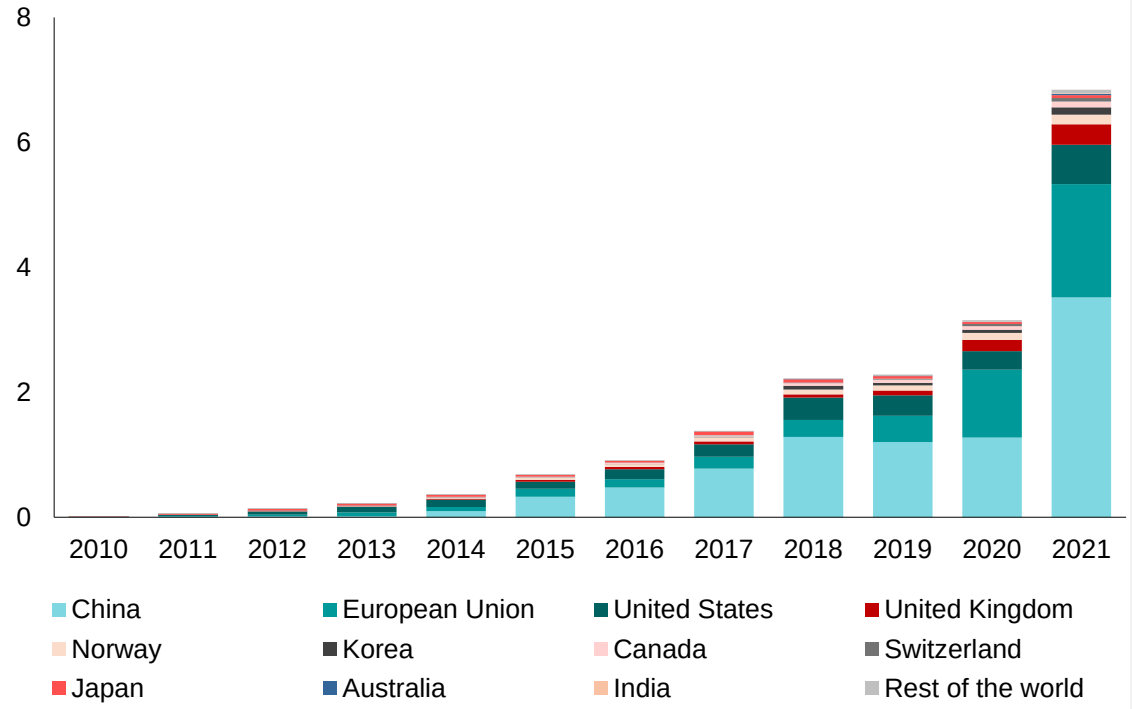
(Number of units)



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

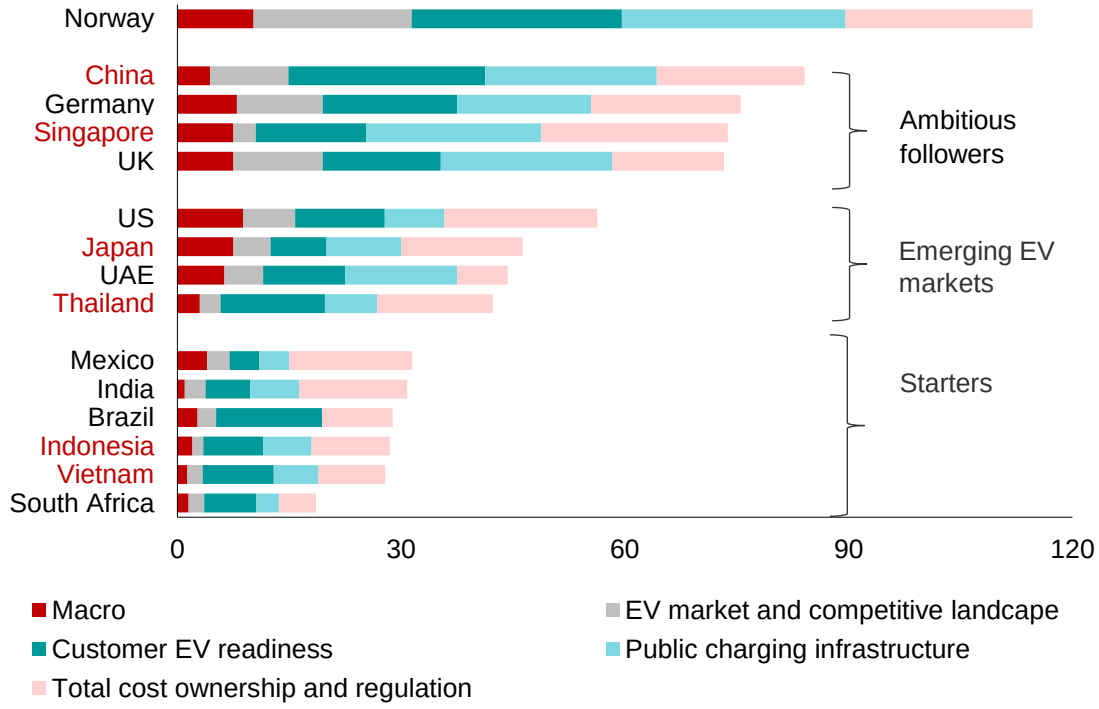
Adoption of **electric vehicles** in ASEAN+3 will help spur investments and bring about the needed transformation in the region's auto industry

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



Source: International Energy Agency; AMRO staff calculations.

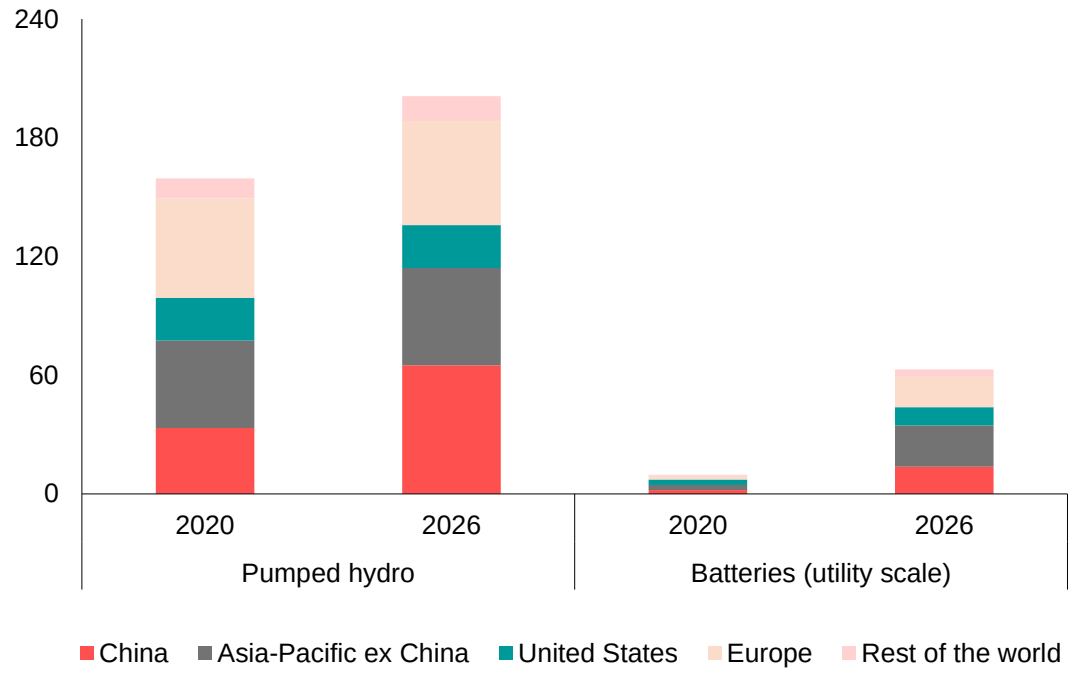
Selected Economies: Electric Mobility Readiness, 2022
(Index)



Source: Schlosser and others (2022).

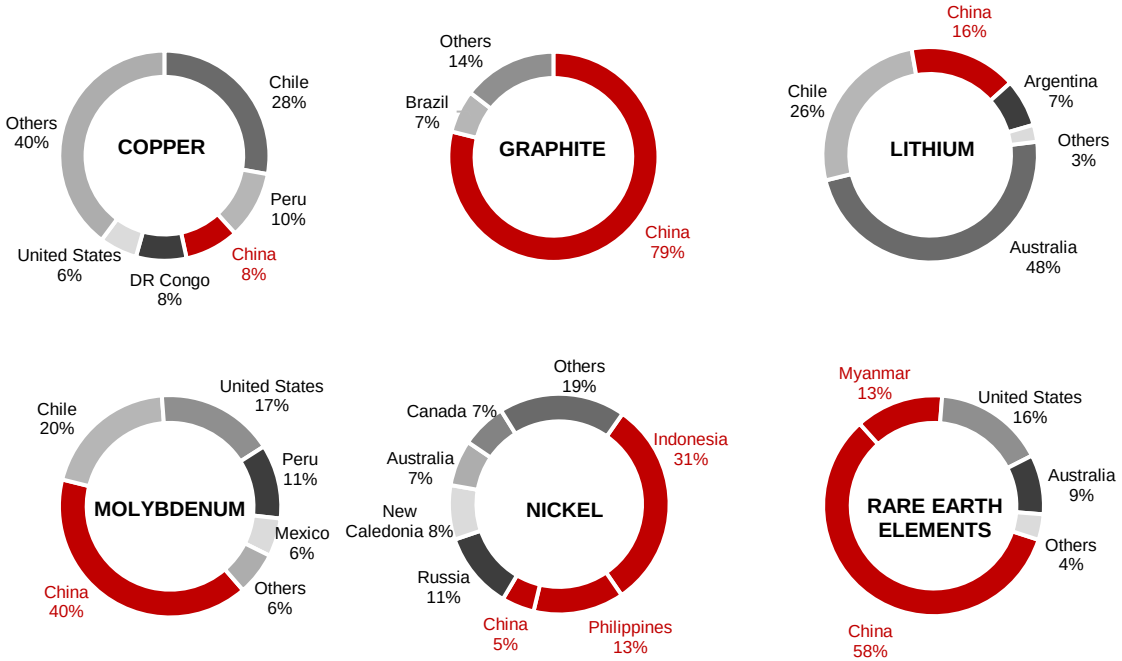
ASEAN+3 can leverage existing technological expertise and abundant mineral resources to meet robust demand for energy storage and critical minerals

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



Source: International Energy Agency.

World: Major Producers of Critical Minerals, 2020
(Percent of total global production)

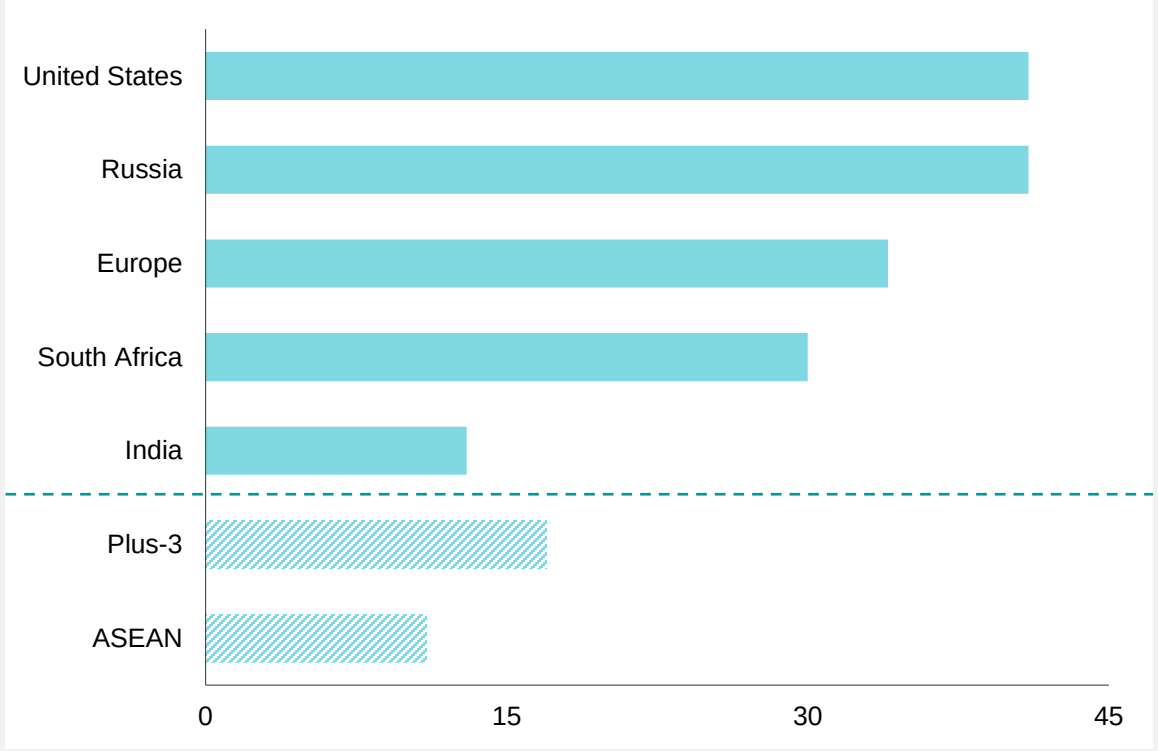


Source: United States Geological Survey (2022).

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, 2020

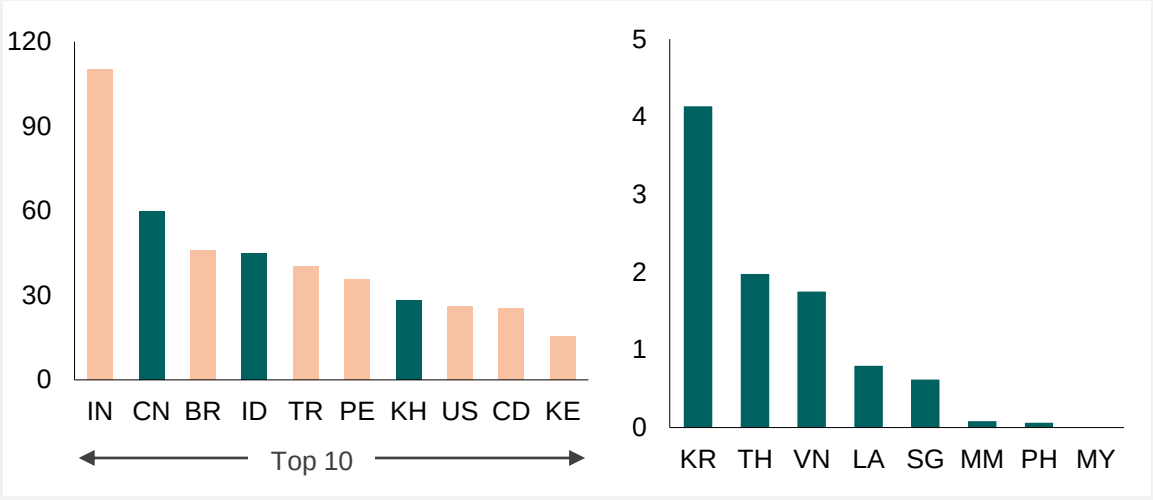
(Years)



Source: International Energy Agency; AMRO staff calculations.

ASEAN+3 and Selected Economies: Available Credits from Hosted Carbon Offset Projects, July 2022

(Megatons of carbon dioxide equivalent)

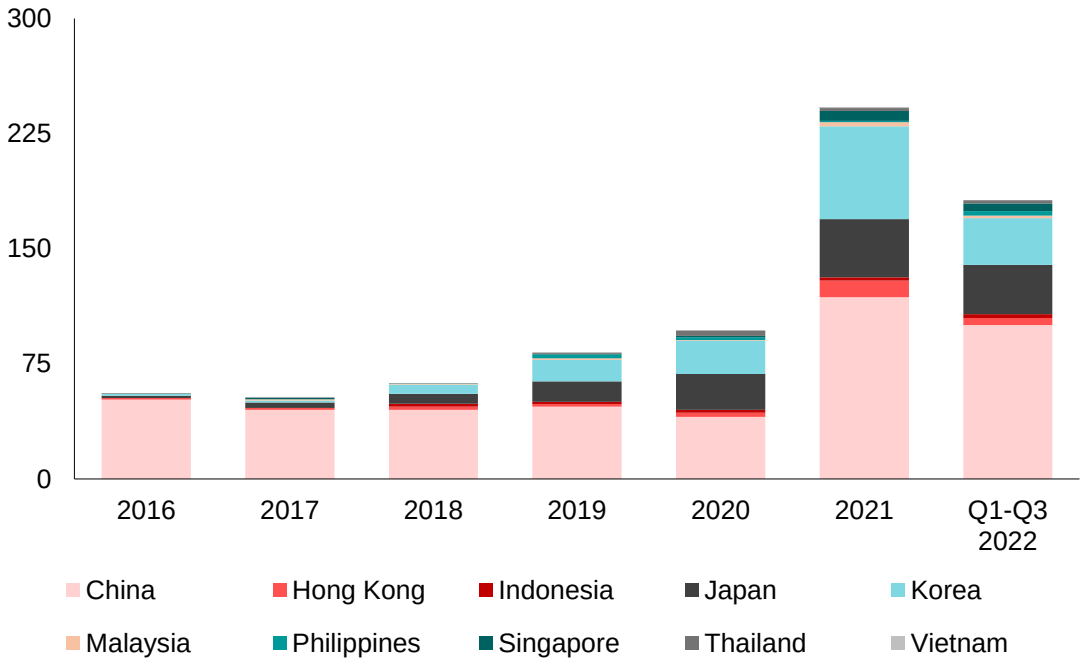


Source: International Energy Agency; AMRO staff calculations.
Note: BR = Brazil; CD = Democratic Republic of Congo; CN = China; ID = Indonesia; IN = India; KE = Kenya; KH = Cambodia; KR = Korea; LA = Lao PDR; MM = Myanmar; MY = Malaysia; PE = Peru; PH = Philippines; SG = Singapore; TH = Thailand; TR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

(How) Can finance facilitate the transition?

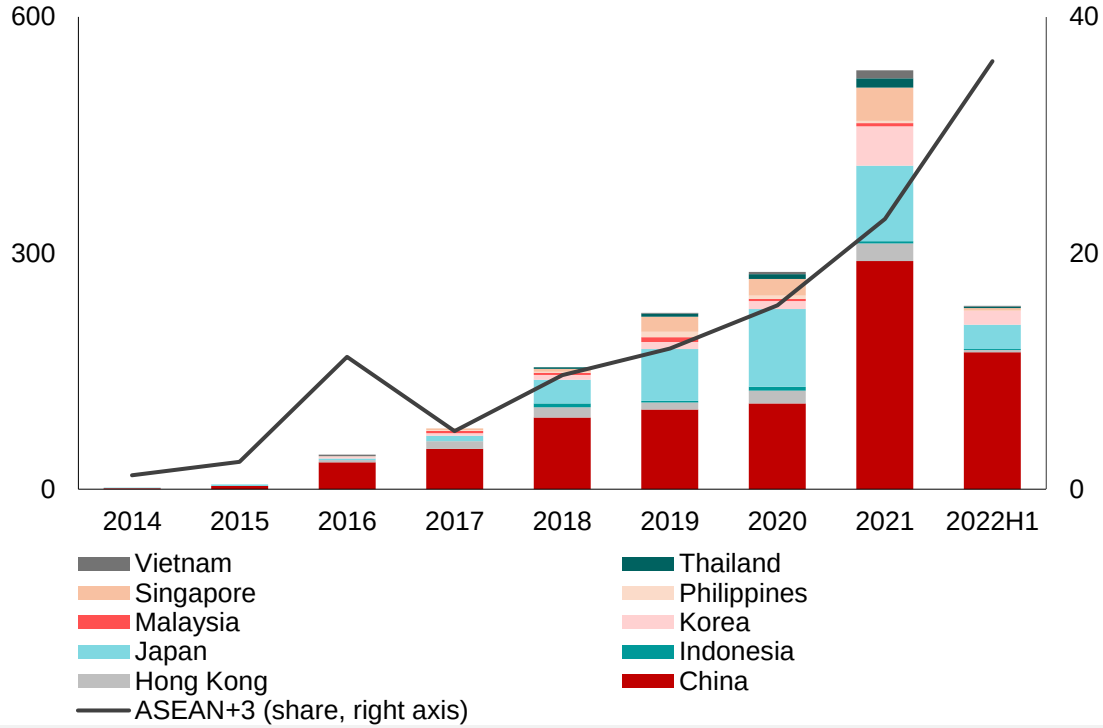
ASEAN+3 financial markets are increasingly adopting "green" products and practices to facilitate the transition—but more needs to be done

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)

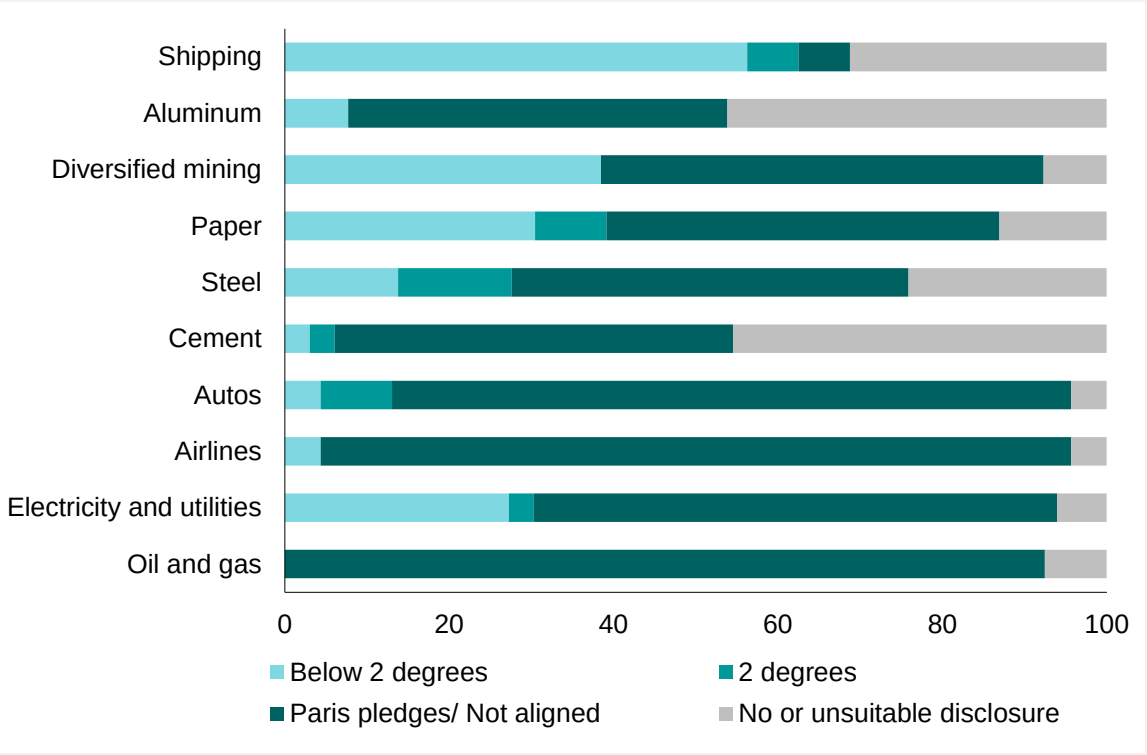


Source: Climate Bonds Initiative Green Bond Database.

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

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

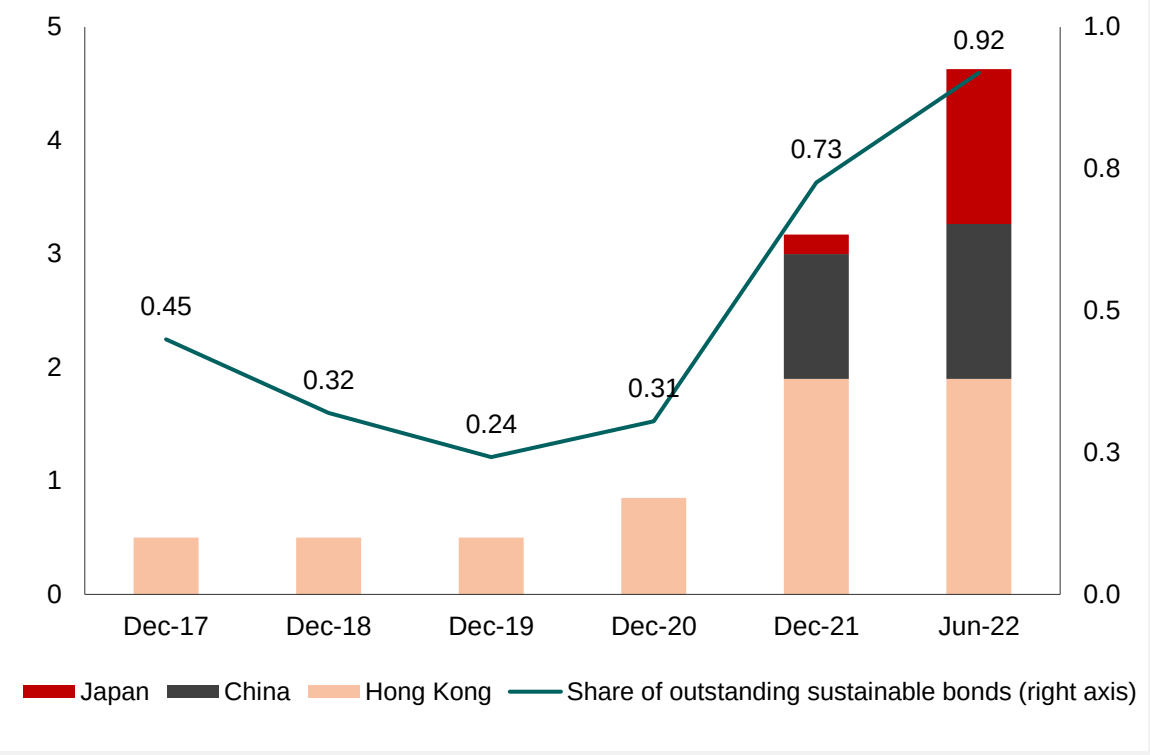
(Percent of companies per sector)



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 and policy recommendations

Macro-financial implications

Opportunities

Role of finance

- All ASEAN+3 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+3, the less painful and costly the transition away from fossil fuels will be.

Key takeaways

Macro-financial implications

Opportunities

Role of finance

- Indeed, the road to net zero is rich in opportunity.
- Many economies in the region are already well-placed to leverage their existing comparative advantage in areas of technology, manufacturing, natural resources, and financial services to reap the economic benefits from the transition.
- By mobilizing private capital, ASEAN+3 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

For the region

- 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

2050

Thank you.

AMRO

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