

State of the Steel Industry and Decarbonization in ASEAN

2022 SEAIISI Steel Mega Event & Expo
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South East Asia Iron and Steel Institute

Singapore ▪ Malaysia ▪ Indonesia ▪ Myanmar ▪ Philippines ▪ Thailand ▪ Vietnam | South Korea ▪ Taiwan

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Since
1971

~900
Members

SEAISI EVENTS

May/June
November



for the
Steel

Represents
the Steel
Industry
in the **7** Largest
ASEAN
Economies

27
Countries

PUBLI-CATIONS

**E-
services**

Industry,
by the
Steel
Industry,

Supporting
Member
Countries **3**

>400
Employees^K

**Research
& analysis**

in
ASEAN

OUTLINE:

Economic Performance

Headwinds

State of Industry

Forecast for 2022

State of Decarbonisation

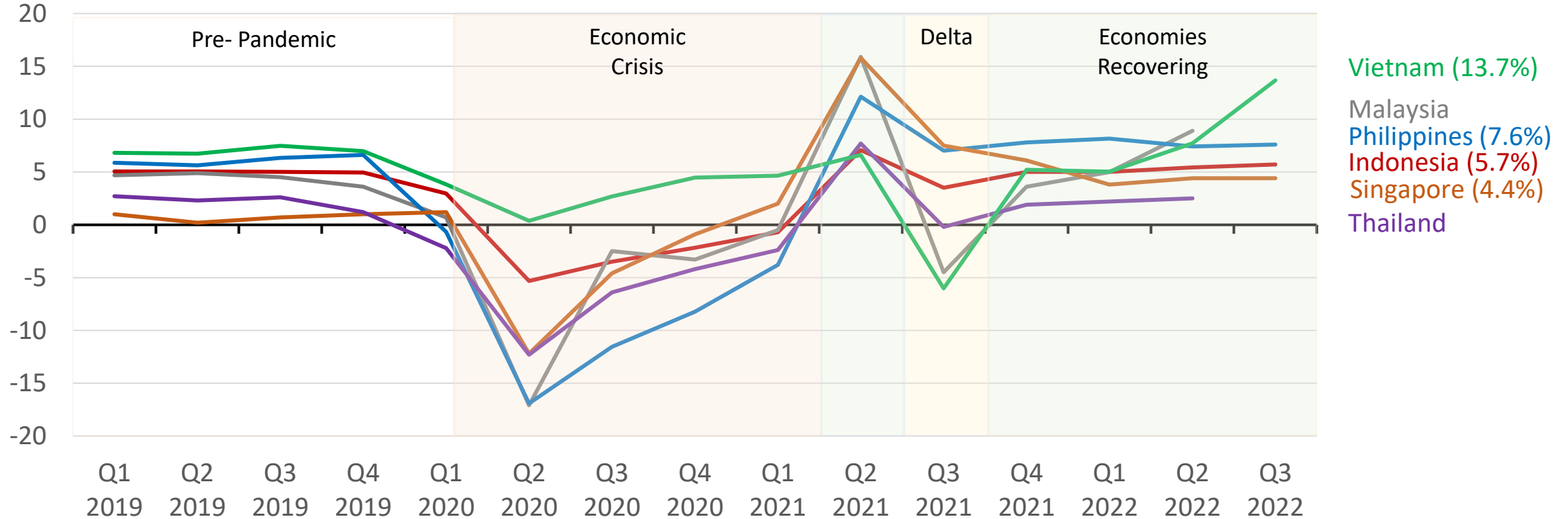
Key Direction

- GDP
- Construction
- Automotive
- Manufacturing

ASEAN-6 ECONOMIES ARE STILL GROWING ... AMID HEADWINDS

ASEAN-6 economies continue to expand with the easing of restrictions and opening of borders in H1 2022, as the latest variants are mild; Growth continues in Q3 2022 amid headwinds ...

Quarterly GDP Growth from Q1 2019 to Q3 2022 (year-on-year %)



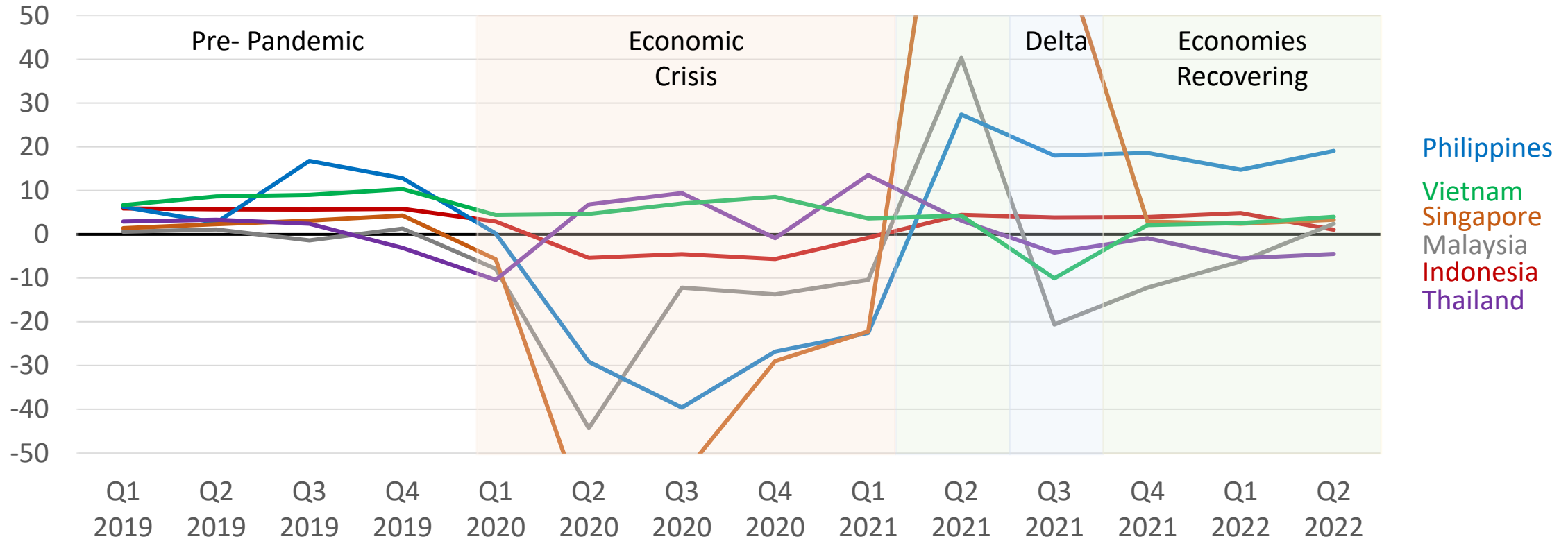
	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
2020	-2.1%	-5.6%	-9.5%	-5.8%	-6.1%	+2.9%
2021	+3.7%	+3.1%	+5.6%	+7.6%	+1.6%	+2.6%

Source: Various ASEAN country statistics

HOW ARE ASEAN-6 ECONOMIES DOING?

Construction activities continue to expand in Q2 2022, except for Thailand (projects ended)

Quarterly Construction Growth from Q1 2019 to Q2 2022 (year-on-year %)



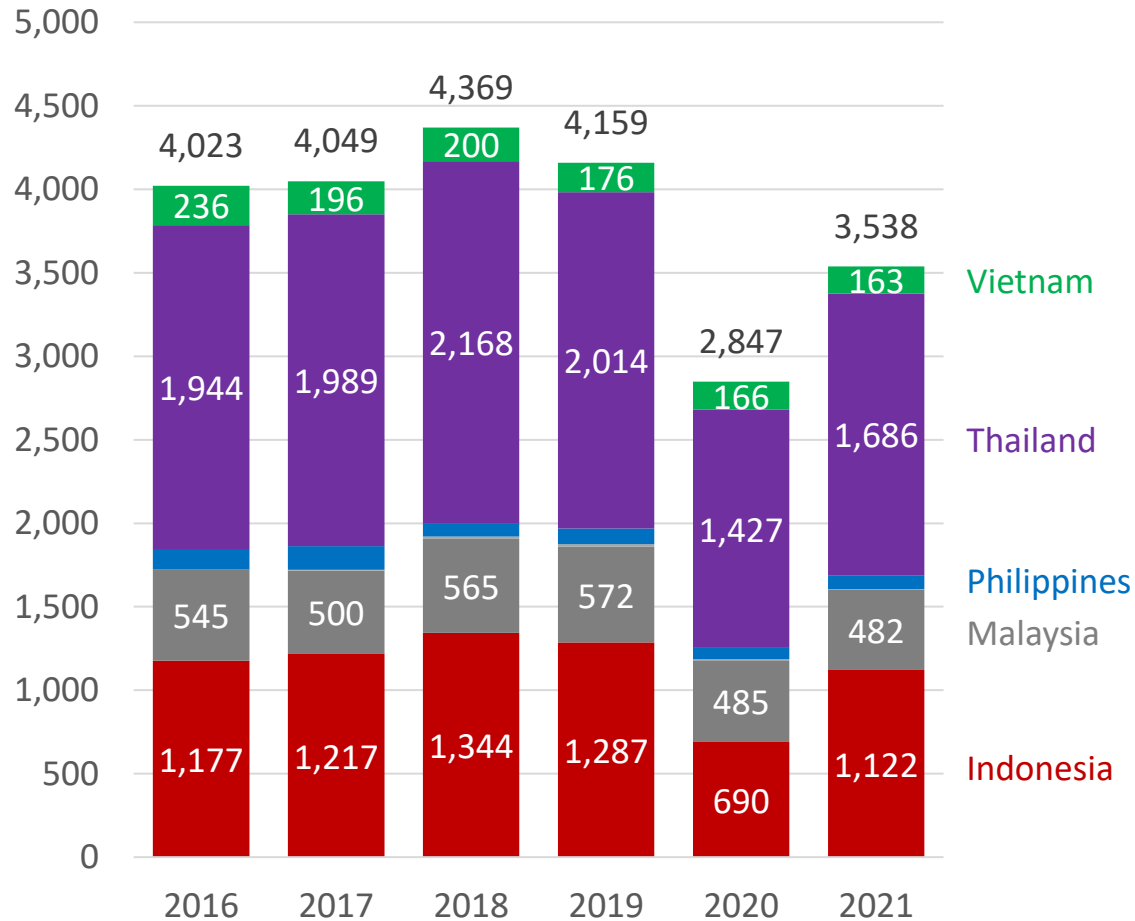
	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
2020	-3.3%	-19.4%	-26.0%	-38.4%	+2.0%	+6.4%
2021	+2.8%	-5.2%	+9.8%	+20.1%	+2.7%	+0.6%

Source: Various ASEAN country statistics

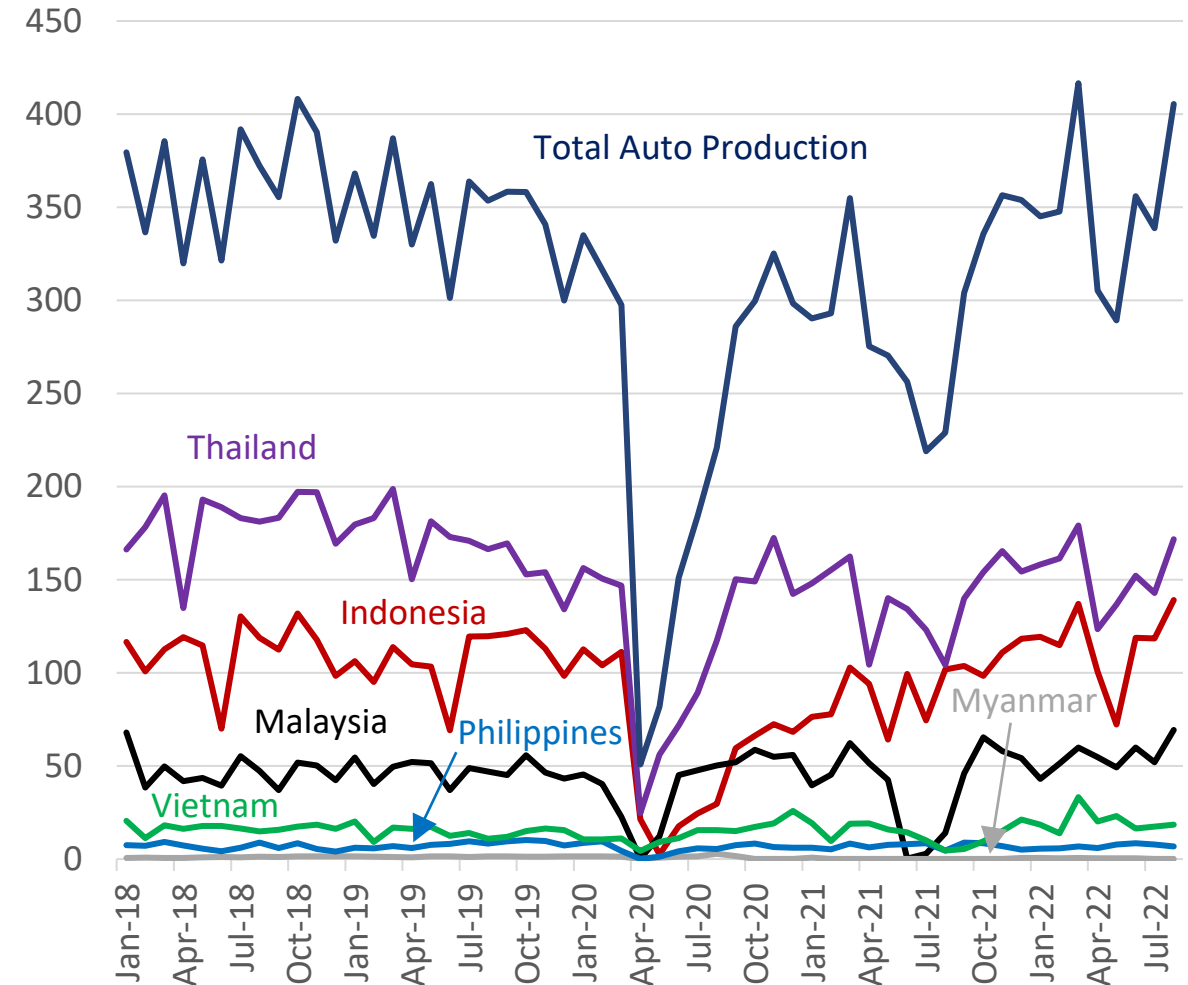
HOW ARE ASEAN-6 ECONOMIES DOING?

- The ASEAN Auto Industry is on the path to recovery in 2021, but has not yet reached pre pandemic levels
- Monthly production rose beyond pre pandemic levels due to pent up demand

Annual Production ('000 vehicles)



Monthly Production from Jan 2018 – Aug 2022 ('000 vehicles)

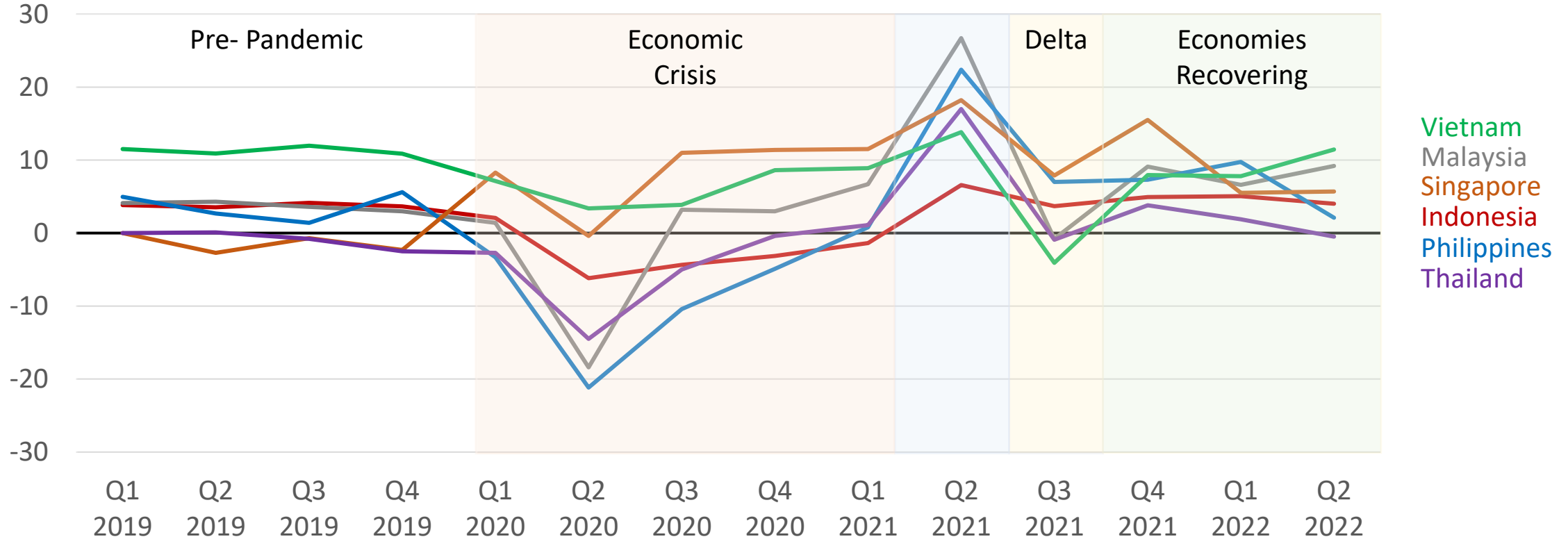


Source: Various ASEAN automotive sector statistics

HOW ARE ASEAN-6 ECONOMIES DOING?

ASEAN-6 manufacturing sector continued to expanded in Q2 2022 due to lifting of mobility restrictions, except for a slight contraction in Thailand

Quarterly Manufacturing Growth from Q1 2019 to Q2 2022 (year-on-year %)



	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
2020	-2.9%	-2.6%	-9.8%	-7.5%	-5.7%	+6.4%
2021	+3.4%	+9.5%	+8.6%	+13.2%	+4.9%	+0.6%

Source: Various ASEAN country statistics

OUTLINE:

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Key Direction

- Inflation & Int. Rates
- Foreign Exchange
- Falling & Volatile Prices
- China Slowdown
- Overcapacity

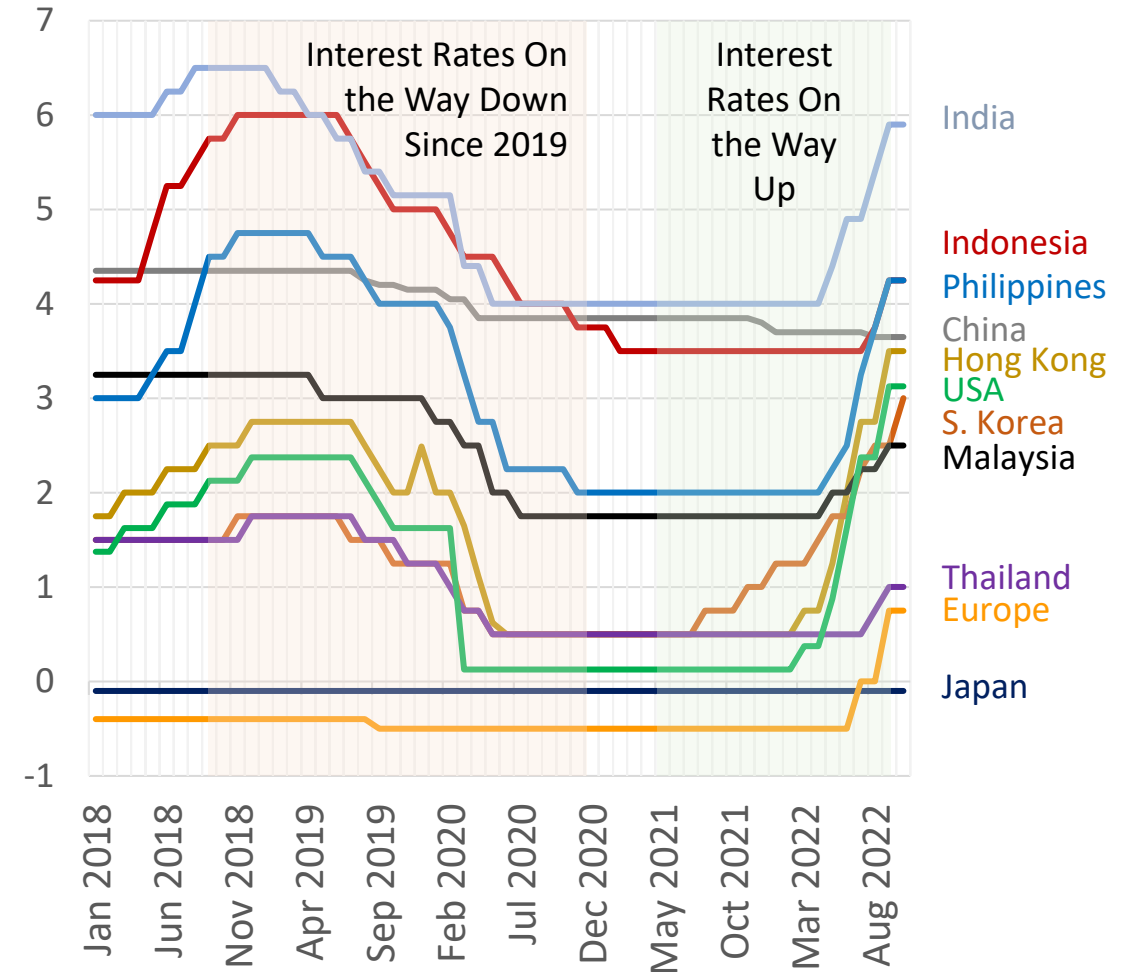
HOWEVER, INFLATION IS ON A RISE; SO ARE INTEREST RATES ...

Inflation is expected to rise in 2022 globally, including ASEAN and other major Asian economies, due to high commodity and energy prices; Interest rates hikes increase costs, raise business risk and will affect recovery

Inflation in Major Asian & Global Economies (%)

	2017	2018	2019	2020	2021	2022	2023
Southeast Asia	2.9	2.8	2.6	1.5	2.0	3.7	3.1
Indonesia	3.8	3.2	3.8	2.0	1.6	3.6	3.0
Malaysia	3.8	1.0	0.7	-1.1	2.5	3.0	2.5
Myanmar	4.0	5.9	8.6	5.7	3.6	8.0	8.5
Philippines	2.9	5.2	2.4	2.4	3.9	4.2	3.5
Singapore	0.6	0.4	0.6	-0.2	2.3	3.0	2.3
Thailand	0.7	1.1	0.7	-0.8	1.2	3.3	2.2
Viet Nam	3.5	3.5	2.8	3.2	1.8	3.8	4.0
Other Asia	1.5	2.0	2.6	2.2	1.1	2.4	2.0
Hong Kong	1.5	2.3	2.9	0.3	1.6	2.3	2.0
China	1.6	2.1	2.9	2.5	0.9	2.3	2.0
South Korea	1.9	1.5	0.4	0.5	2.5	3.2	2.0
Taiwan	0.6	1.3	0.6	-0.2	2.0	1.9	1.6
India	3.6	3.4	4.8	6.2	5.4	5.8	5.0

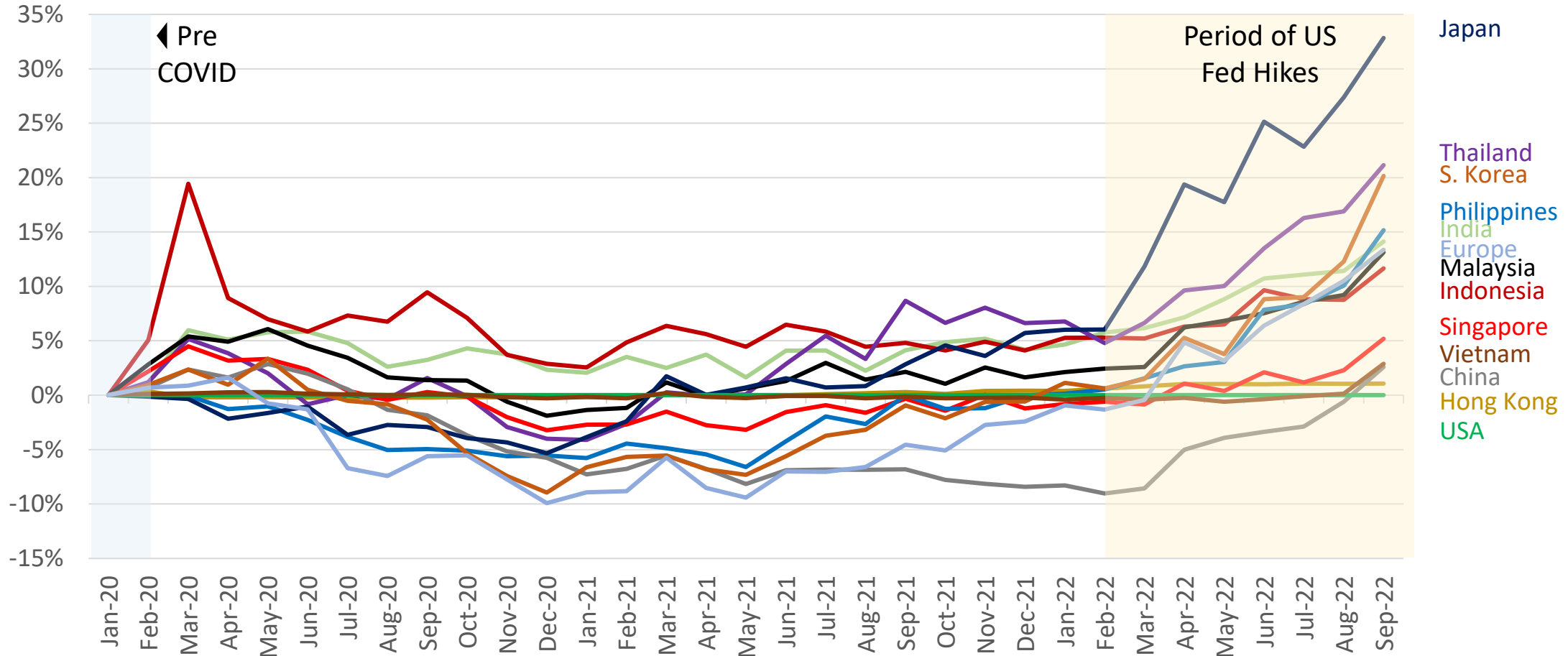
Policy Rates of Major Asian & Global Economies (%)



WEAKENING FOREIGN EXCHANGE ADDS TO INFLATION

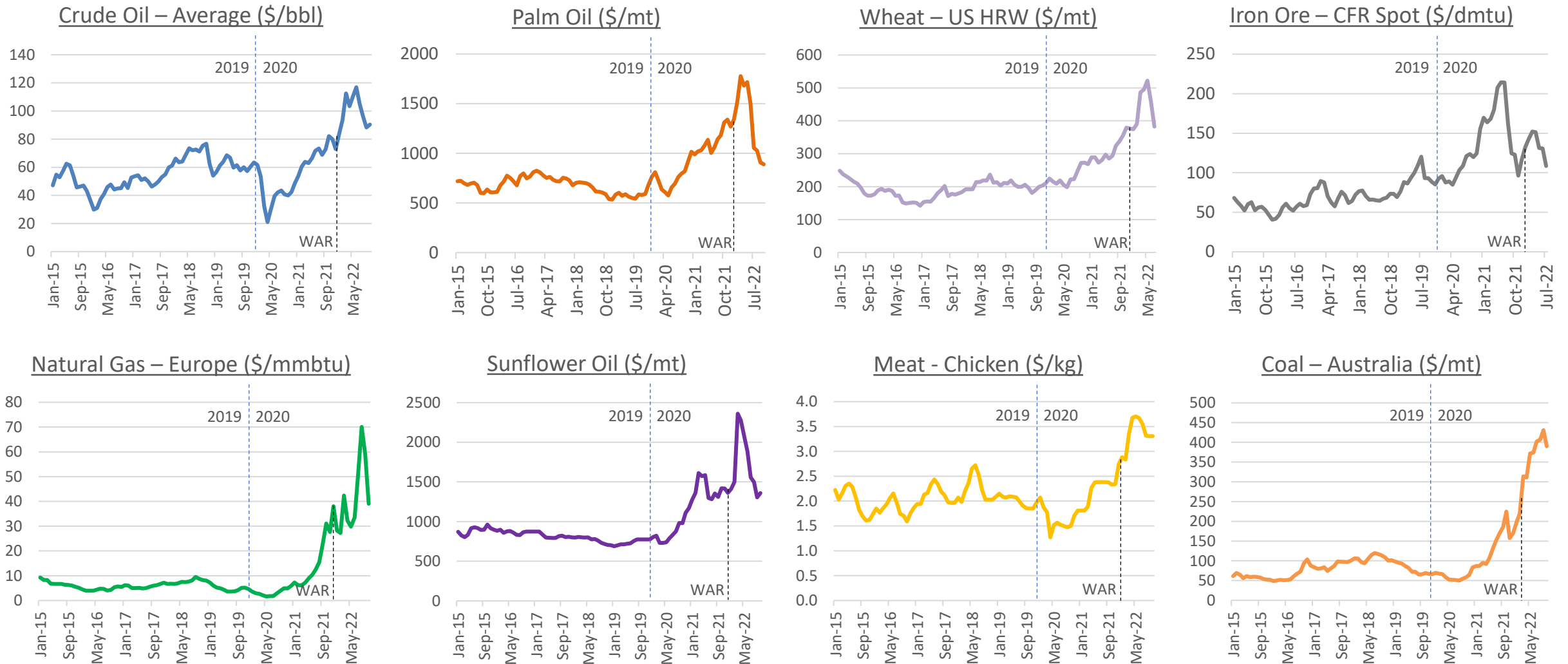
Most major Asian countries' currencies have weakened against the US dollar, adding to inflation woes, especially countries that depend a lot on trade or imports

FX Rates of Major Asian Currencies vs USD (% Increase)



COMMODITY PRICES

Commodity prices surged due to pent up demand in 2021 followed by another spike due to the Ukraine war; Prices have fallen in Q3 2022 except for Australian coal prices (including coking coal); Volatility remains



CHINA'S SLOWING GROWTH

In order to control the excesses of the Property sector and limit free credit, the market is now in crisis; With further lockdowns and likelihood that it will continue, the economy is taking a further battering

3 Red Lines Policy

Asset / Liability < 70%

Net Debt / Equity < 100%

Cash / Short Term Borrowings < 1

Limits on Liability Growth < 0, 5, 10, 15%

COVID Policy

More Lockdowns



**Property Market
in Crisis**

**Economic
Slowdown**

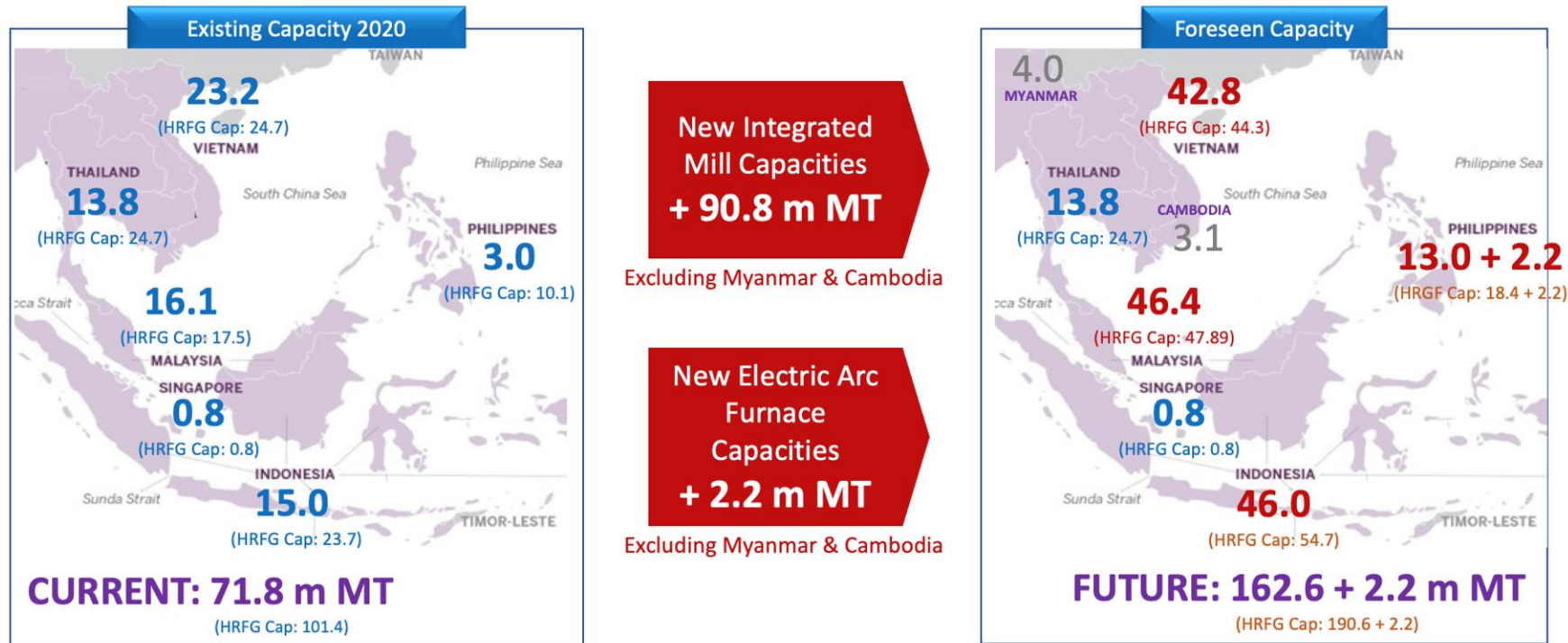
Will this lead to more
export of steel from China?

OVERCAPACITY IN ASEAN

SEASI has been highlighting the steel production overcapacity situation in ASEAN since 2019, which is expected to lead to an industry consolidation in ASEAN

THE FUTURE SCENARIO: ADDITIONAL CRUDE STEEL CAPACITY

Should all integrated mill capacities come on stream, there will be more than 90 million MT of steel coming from all the potential integrated mills in ASEAN, should all of them materialise



Note: Capacity is defined as crude steel capacity. Additional capacity of 83.9 million MT is from potential integrated mill. EAF capacities are an additional 2.2 million MT. Rolling capacities and further downstream capacities are not included. HRFG Cap = Hot Rolled Finished Goods Capacity equivalent. Hot rolled refers to rails, sections, bars, wire rod, hot rolled coils, plates.

Source: Various public sources, SEASI Yearbook 2021, SEASI Research & Analysis

Updated: May 2022

22

- Overcapacity due to rapid capacity expansions in Indonesia, Vietnam and Malaysia
- Vietnamese mills are shutting down blast furnaces amid weak demand
- More steel capacities approved in Malaysia
- Huge Chinese steel plants set up to sell back to China. With weak demand and overcapacity, where will all the steel go to?

OUTLINE:

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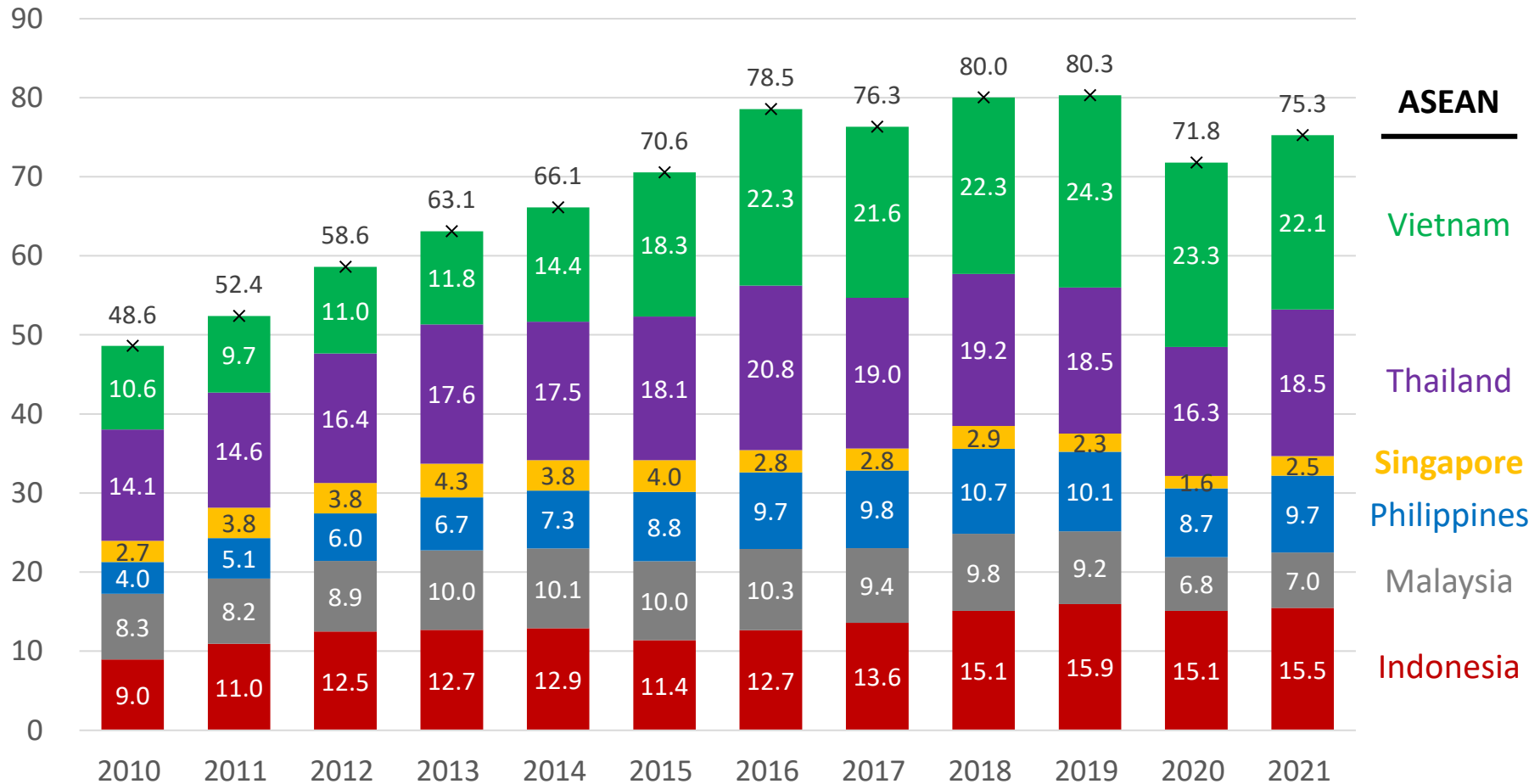
Key Direction

- Consumption
- Production
- Import
- Export

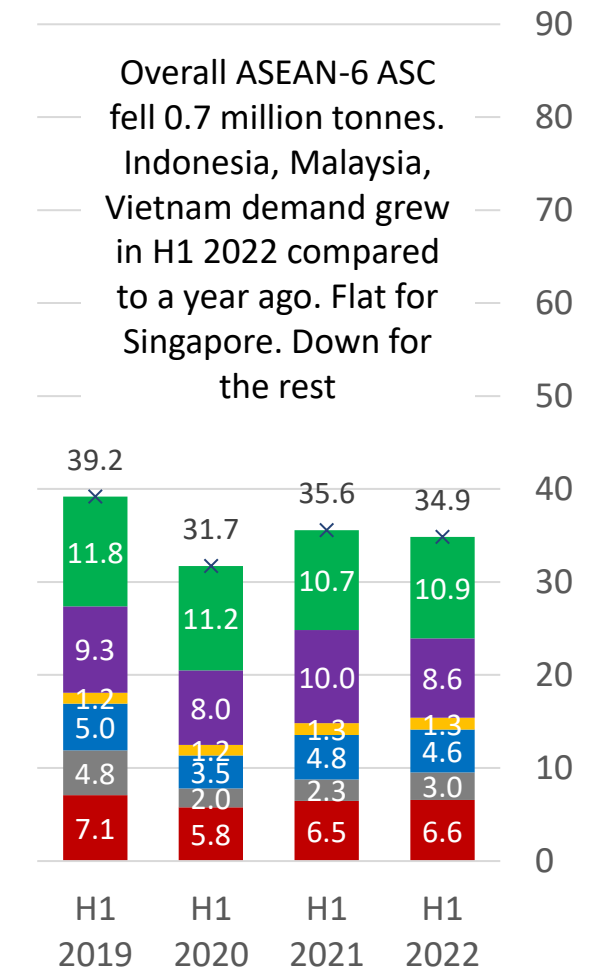
ASEAN-6 STEEL DEMAND / CONSUMPTION

ASEAN-6 steel consumption grew to 75.3 million tonnes in 2021; H1 2022 consumption was 34.9 million tonnes, down 1.9% from H1 2020; Differences in growth rates reflect the recovery of construction industry

ASEAN 6 – Apparent Steel Consumption (million MT)



ASC H1 Figures (million MT)



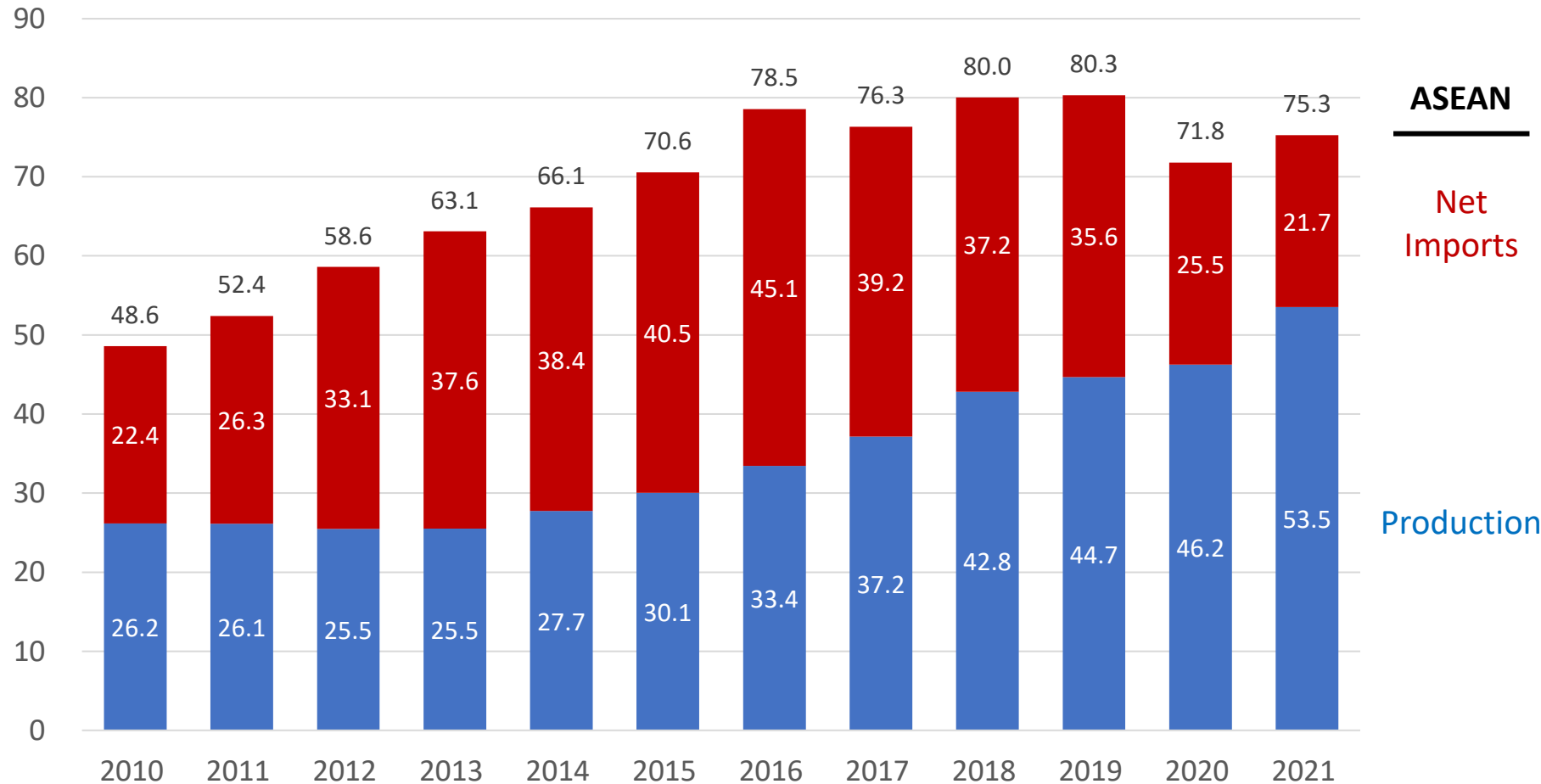
Overall ASEAN-6 ASC fell 0.7 million tonnes. Indonesia, Malaysia, Vietnam demand grew in H1 2022 compared to a year ago. Flat for Singapore. Down for the rest

Source: SE AISI Statistics, STECO

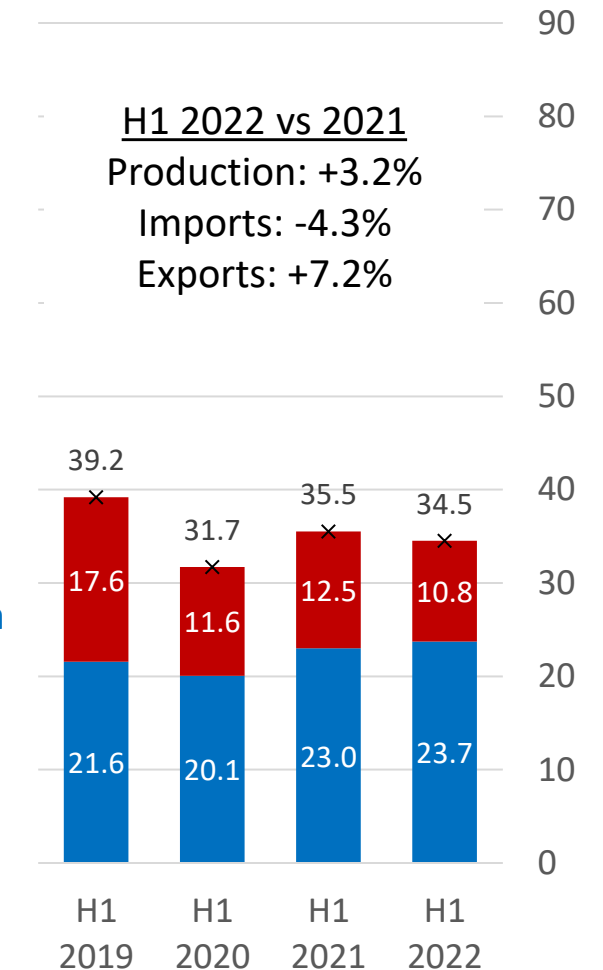
ASEAN-6 STEEL PRODUCTION

In 2021, domestic production increased 7.3 million tonnes (up 15.8%) to support the short fall in imports from supply chain disruptions; Production growth levelled off in H1 2022 and imports declined with slowing demand

ASEAN 6 – Apparent Steel Consumption (million MT)



ASC H1 Figures (million MT)

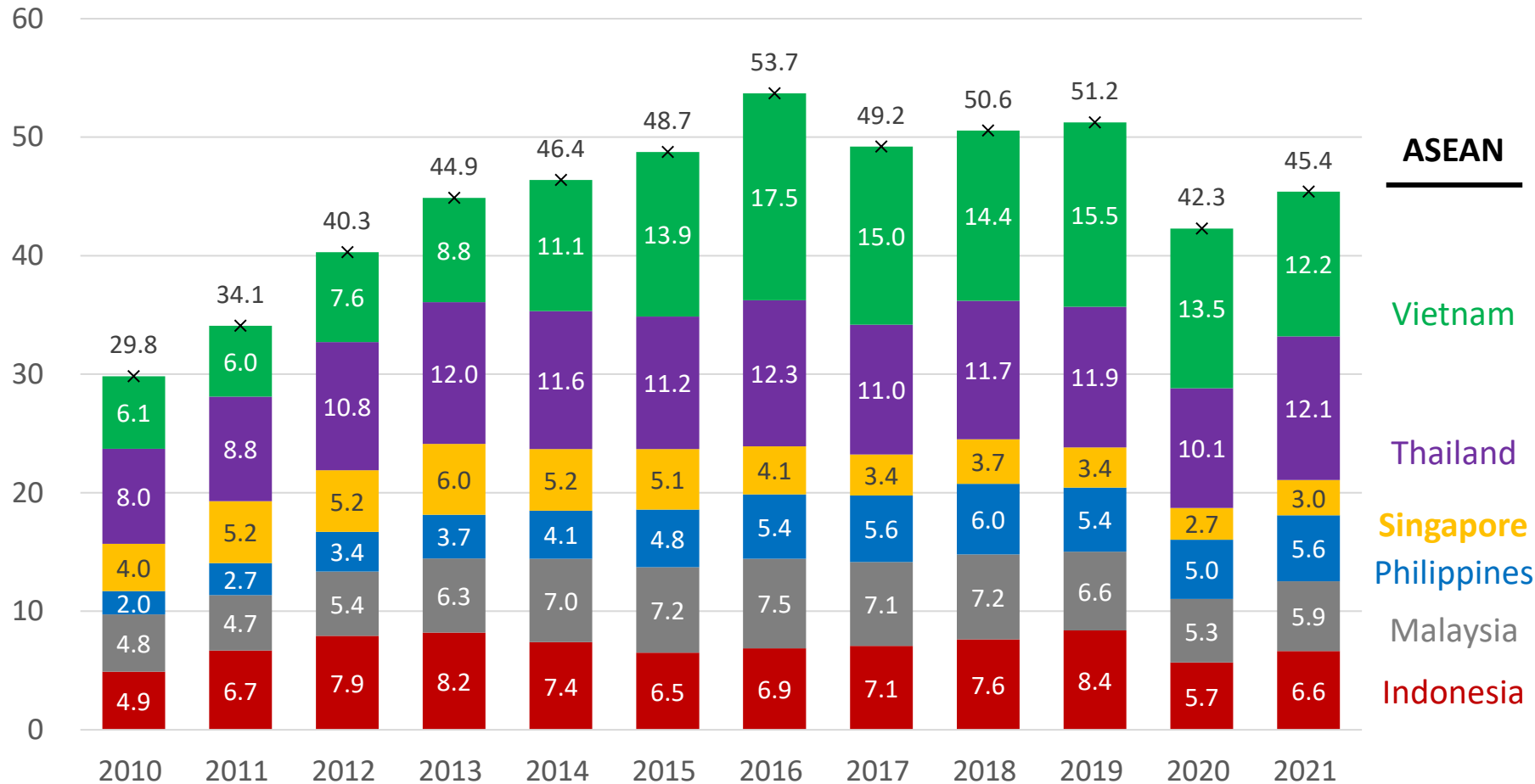


Source: SE AISI Statistics, STECO

ASEAN FINISHED STEEL IMPORTS

In 2021, imports rose to 45.4 million tonnes from 42.3 million tonnes a year ago; During H1 2022, imports declined by another million tonnes (down 4.3%) from the same period a year ago

ASEAN 6 – Imports (million MT)



Imports H1 Figures (million MT)

ASEAN

Vietnam

Thailand

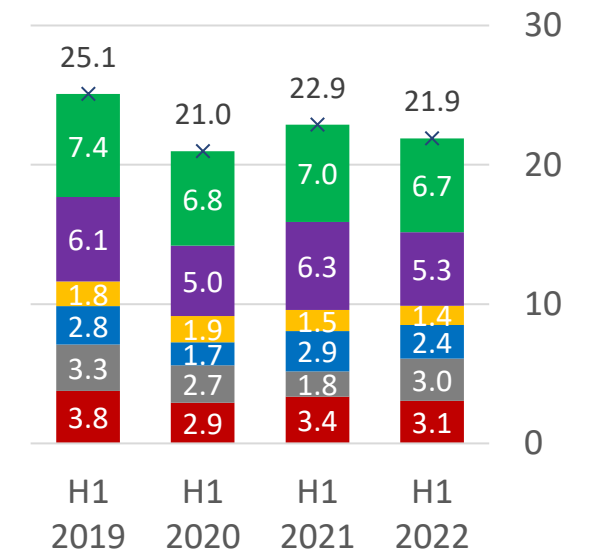
Singapore

Philippines

Malaysia

Indonesia

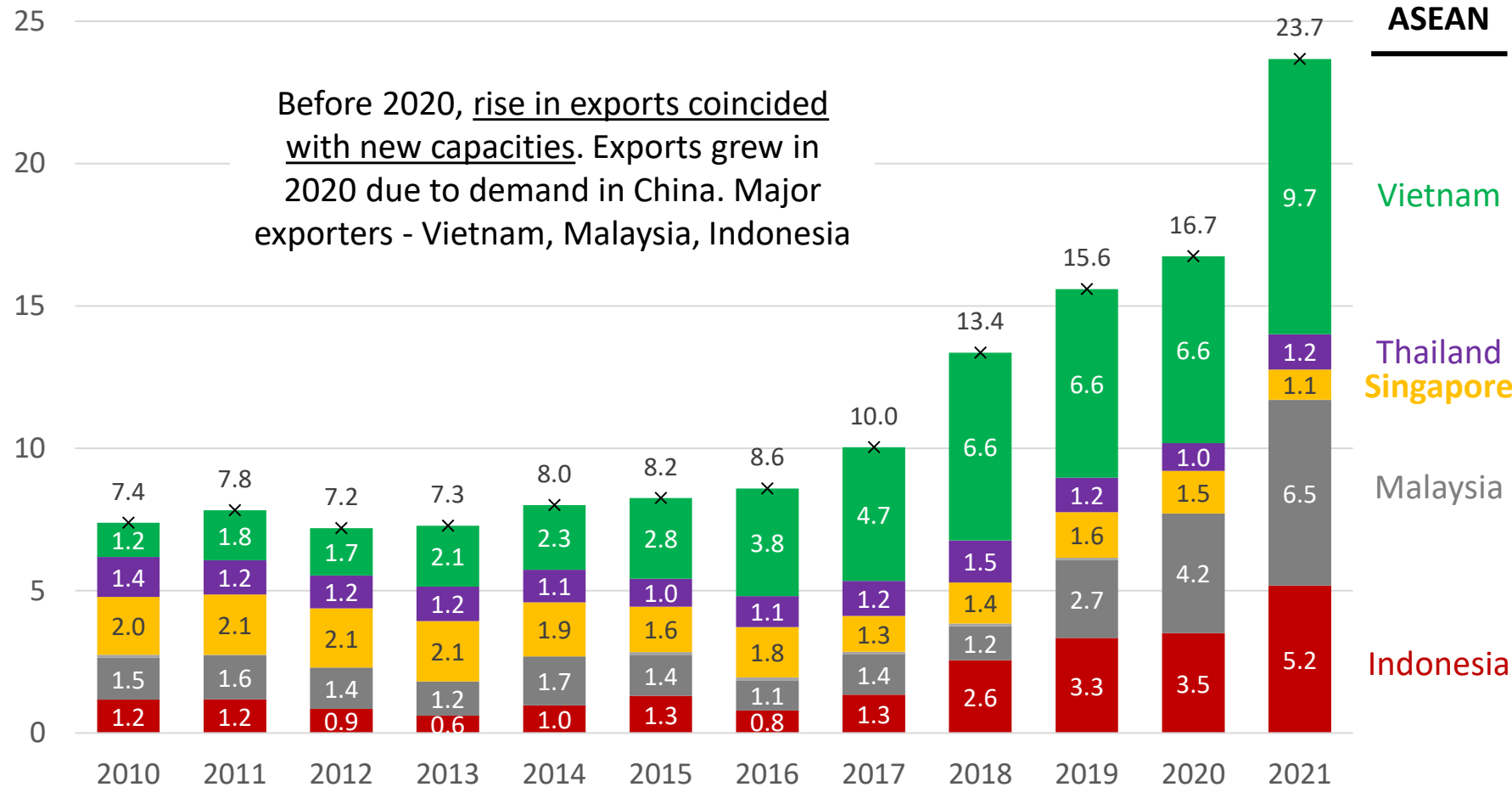
Imports are down by 1 million tonnes. Declining imports for all countries except Malaysia in H1 2022.



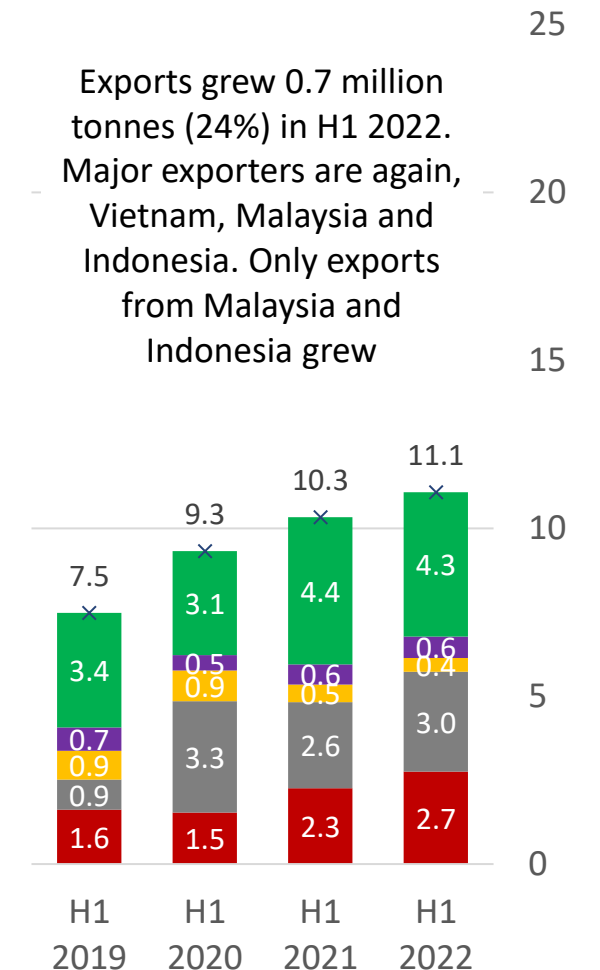
ASEAN FINISHED STEEL EXPORTS

In 2021, exports rose to 23.7 million tonnes from 16.7 million tonnes a year ago; Major exporters are Vietnam Malaysia and Indonesia; During H1 2022, exports grew at a slower pace of 0.8 million tonnes or 7.2%

ASEAN 6 – Exports (million MT)



Exports H1 Figures (million MT)



OUTLINE:

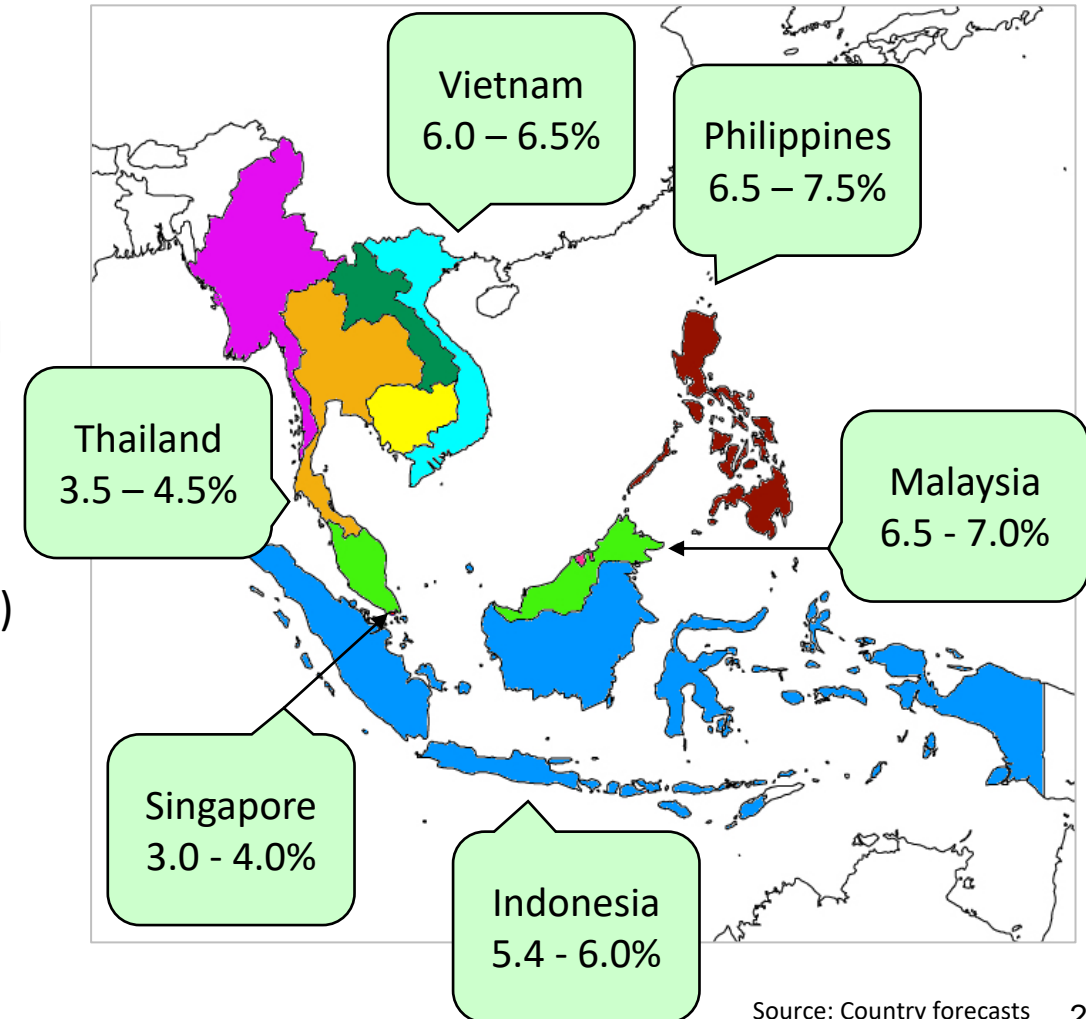
- Economic Performance
- Headwinds
- State of Industry
- Forecast for 2022
- State of Decarbonisation
- Key Direction

DEVELOPMENTS IN ASEAN-6

2022 appears to be yet another challenging year with high commodity prices, the Ukraine war continuing to impact supply chain for food and energy leading to high inflation and worsening China economy

- Borders are open across ASEAN countries
- ASEAN economies continue to expand, albeit slowly in Q3 2022
 - Public infrastructure works on the rise
 - High costs (materials, energy, labour)
 - Rising interest rates, removal of subsidies, new taxes
 - Diversion of funds towards social spending and support and defending local currency
 - Continuing lockdowns in China affecting supply of materials
- Governments managing construction demand, but:
 - Weak demand (high property prices, slowdown in economy)
 - Weak local currencies impacting imported material prices
- Manufacturing activities continue to expand up to Sep 2022:
 - 11 month high in manufacturing activities expansion
 - Contractions in Myanmar and Malaysia
- Global freight volumes down due to slowing economies

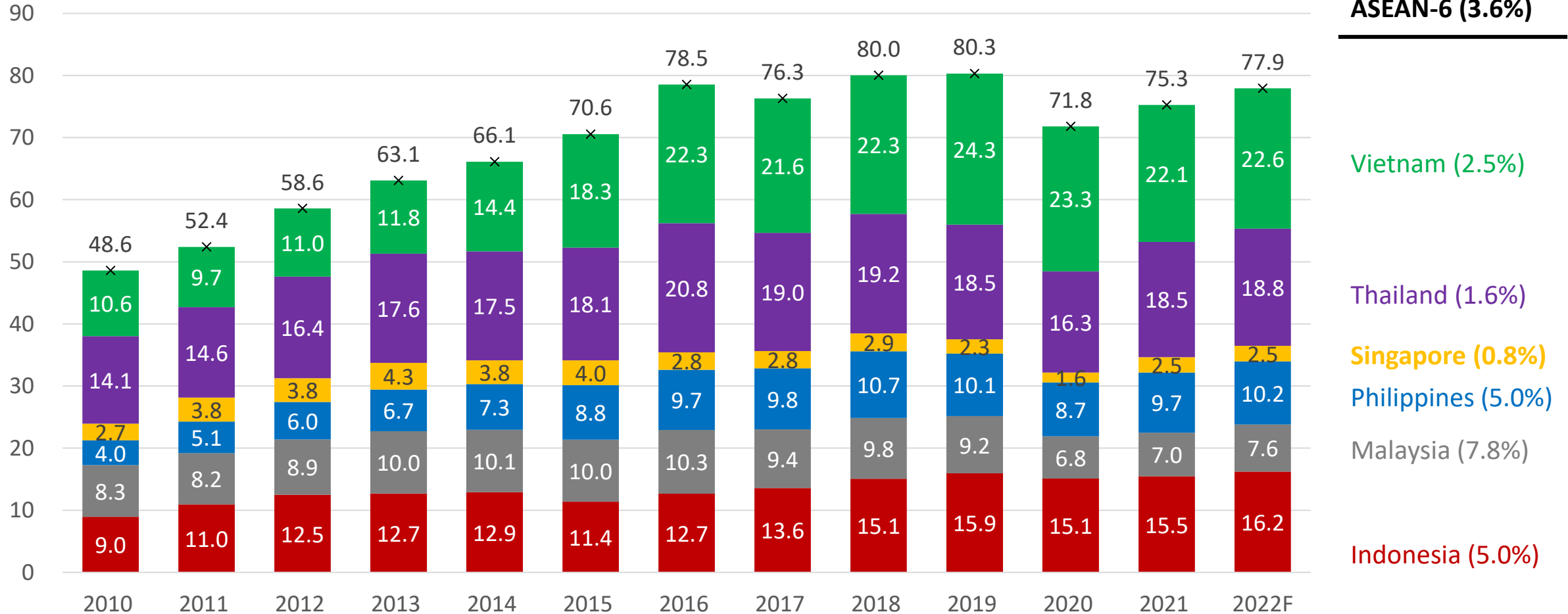
ASEAN-6 GDP Forecast for 2022



ASEAN-6 STEEL DEMAND FORECAST

ASEAN-6 steel demand is projected to reach 77.9 million tonnes in 2022; The projected 3.6% increase is still subject to significant global risks from high inflation, volatile prices amid slowing demand in China and region

ASEAN 6 – Apparent Steel Consumption (million MT)



OUTLINE:

- Economic Performance
- State of the Industry
- Forecast for 2022

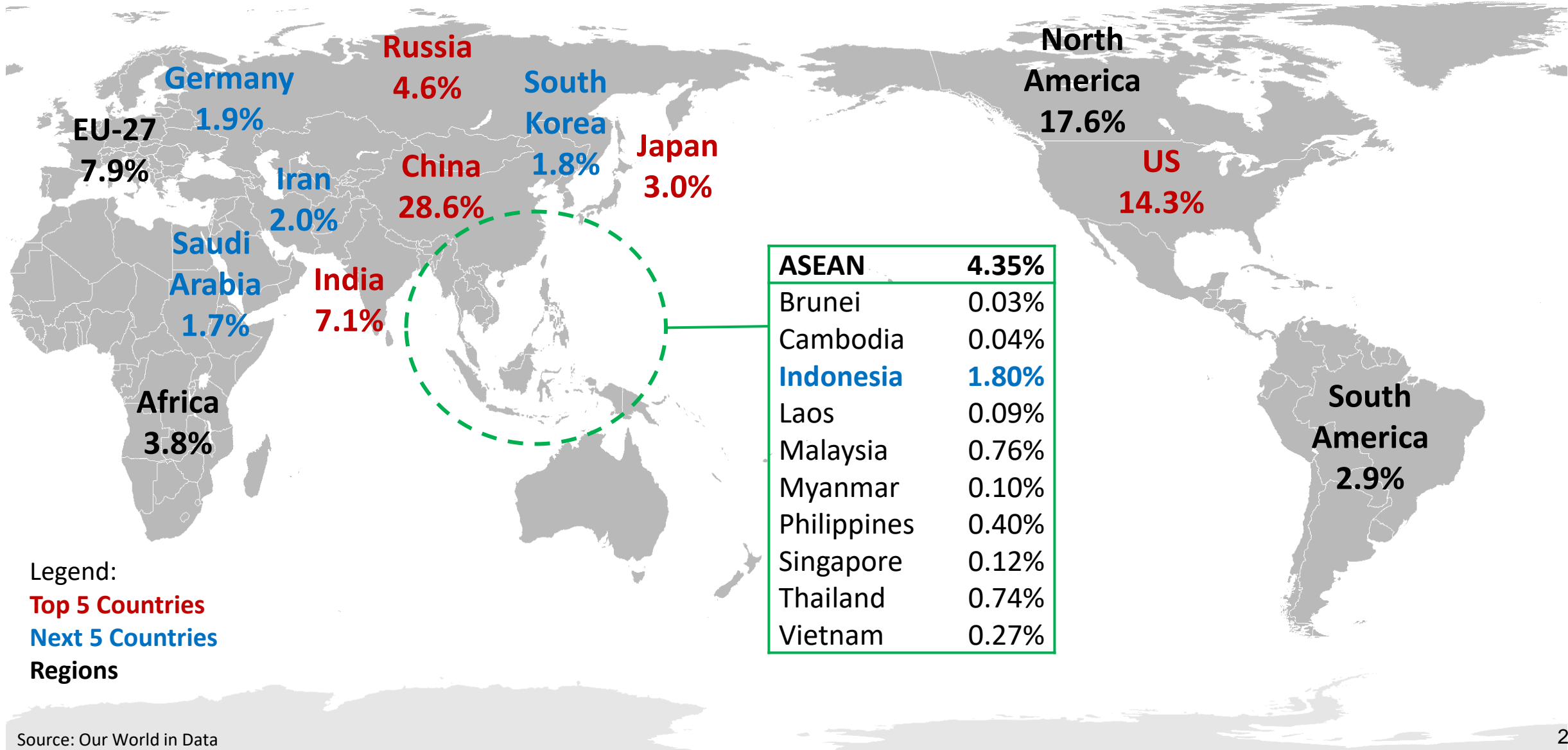
- State of Decarbonisation

- Challenges & Moving Forward

- Emissions Position
- Over-investments
- The Grid
- Government's Direction
- Private Sector

GLOBAL & ASEAN POSITION IN EMISSIONS

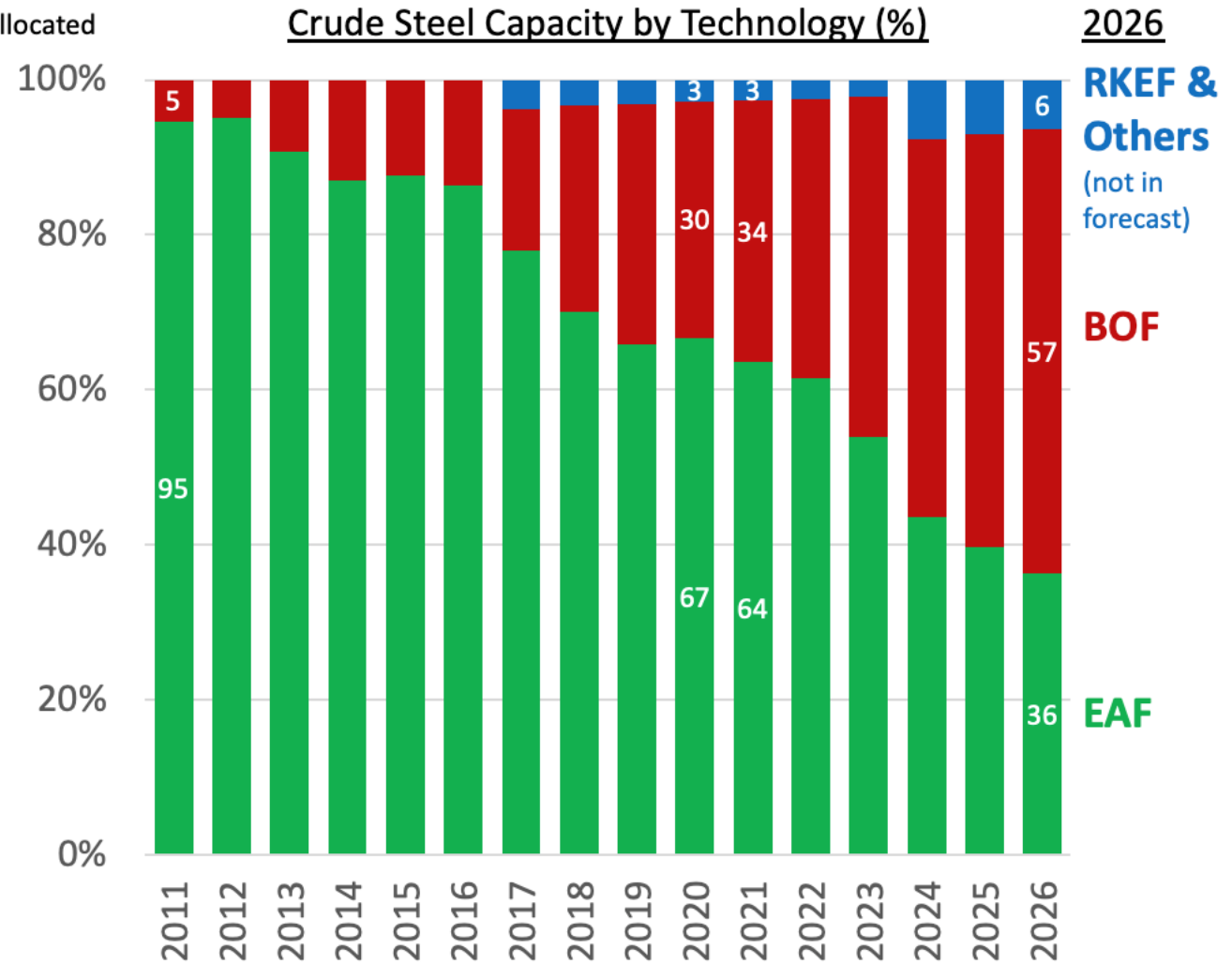
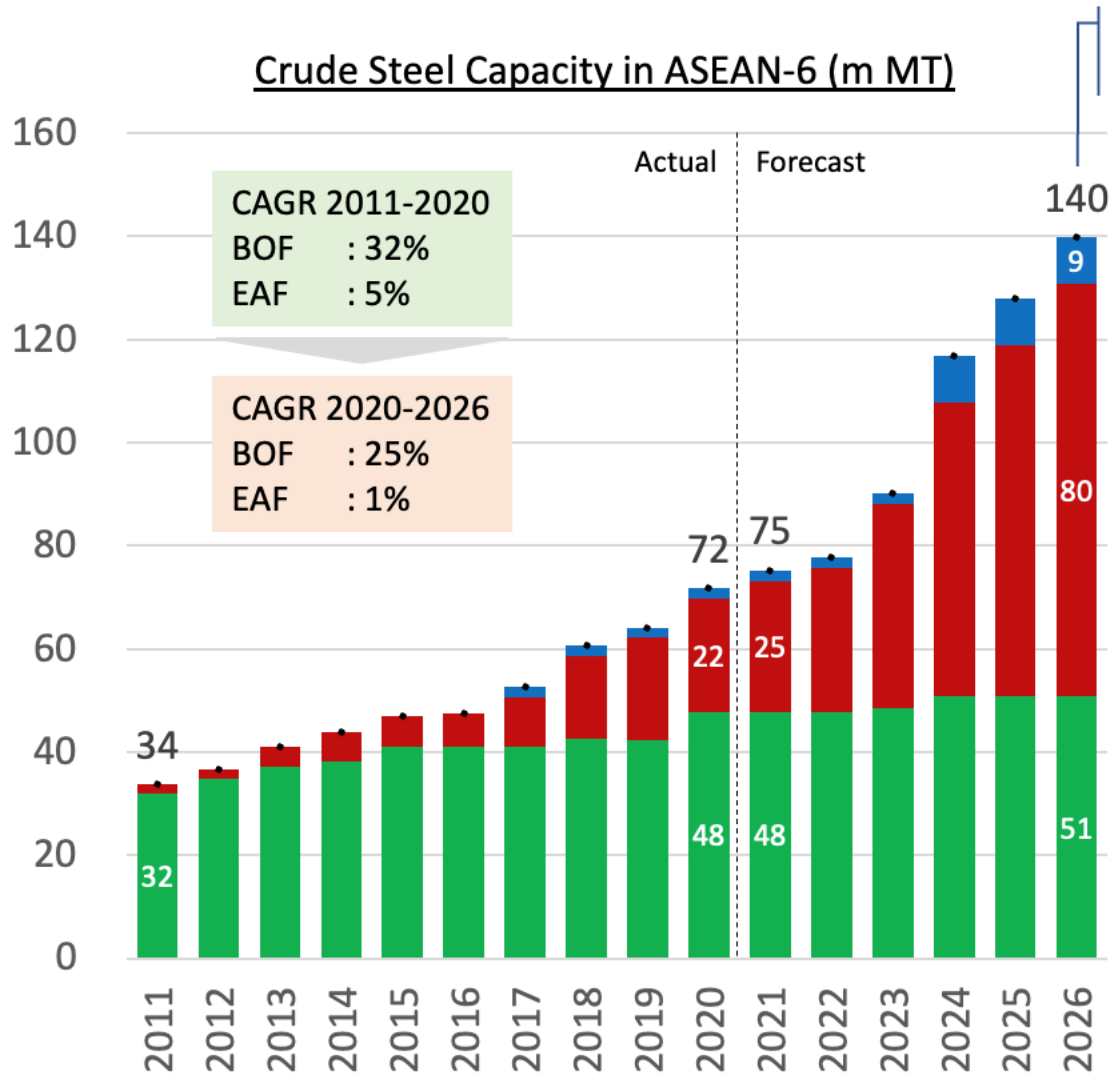
Most ASEAN countries are not significant generators of CO2 in the world



Legend:
Top 5 Countries
Next 5 Countries
Regions

ASEAN'S RAPID SHIFT TOWARDS BF/BOF TECHNOLOGIES

With the new investments in BF/BOF accelerating, carbon emissions from the steel industry is expected to rise; There is no news if decarbonization requirements are delaying or diminishing such investments



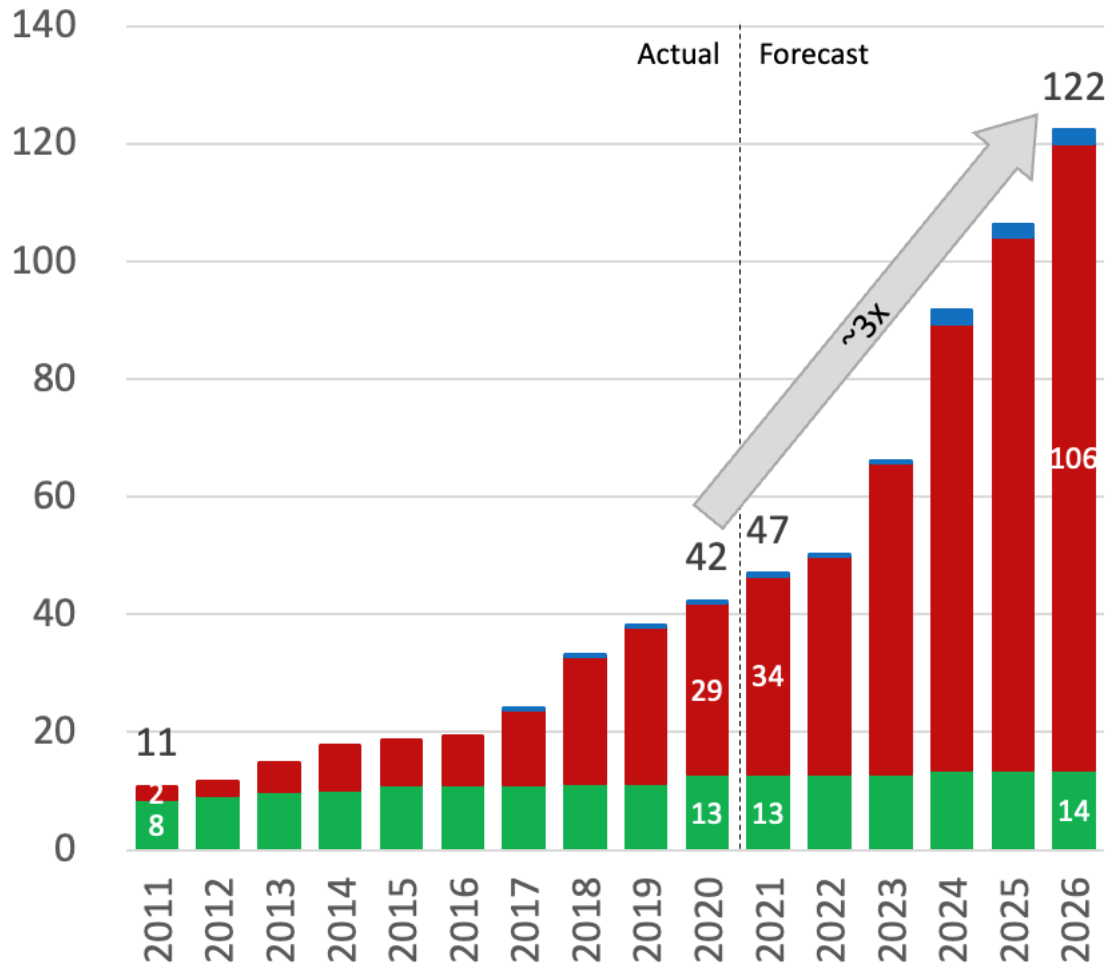
Source: SEASIS Statistics, SEASIS Research & Analysis, publicly available information

Note: Forecasts are based on available information. They may not be complete and are subject to changes

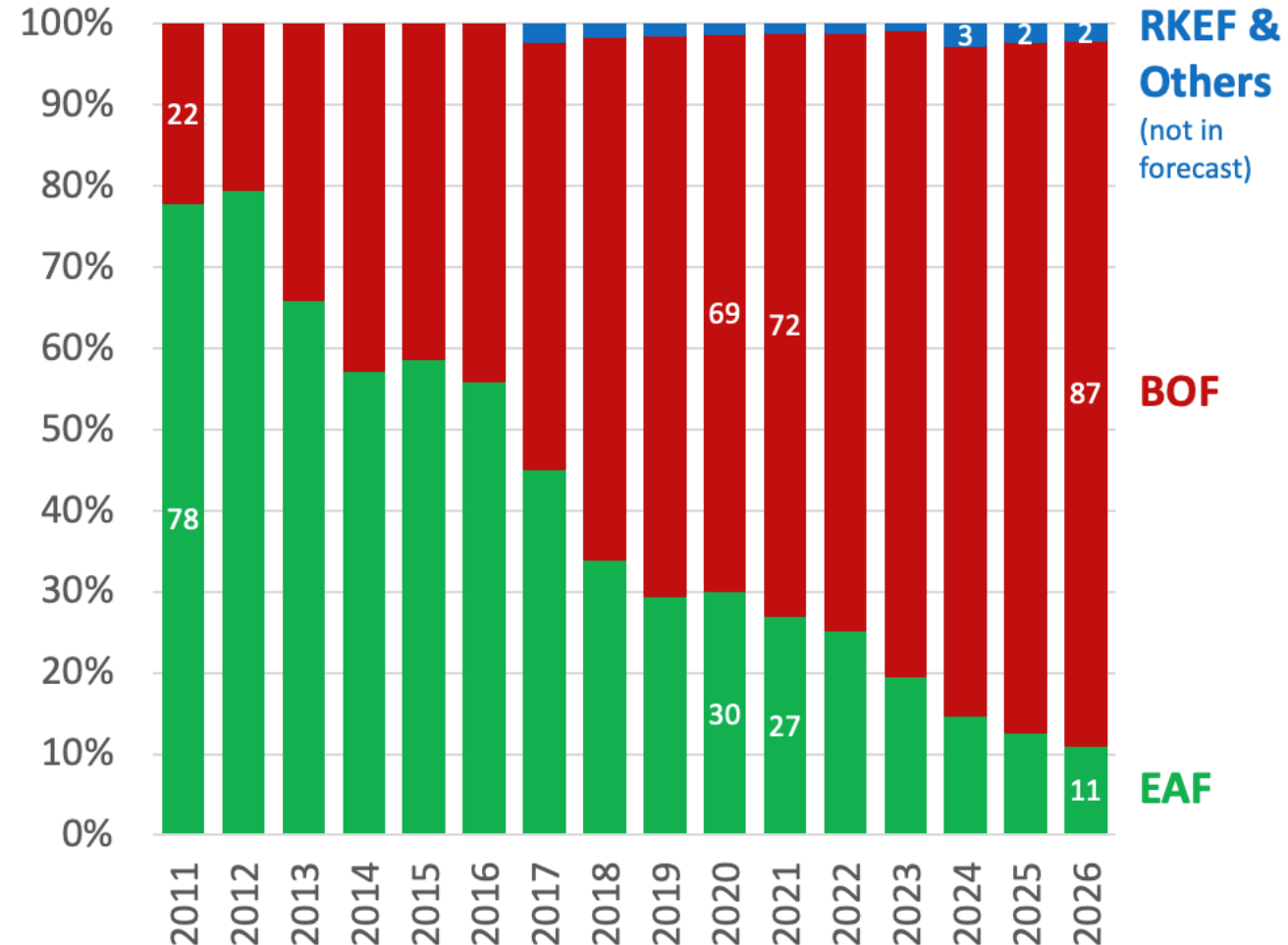
THERE WILL BE AN EXPLOSION OF CARBON EMISSION WITHOUT CCUS

Based on EU benchmarks for Blast Furnaces (1.331 tCO₂e) and EAFs (0.266 tCO₂e), ASEAN will see an explosion (~3x) in Carbon Emissions from its Steel Industry, if CCUS technologies are not implemented

Carbon Dioxide Emissions by Technology (million tCO₂e)



Carbon Dioxide Emissions by Technology (%)



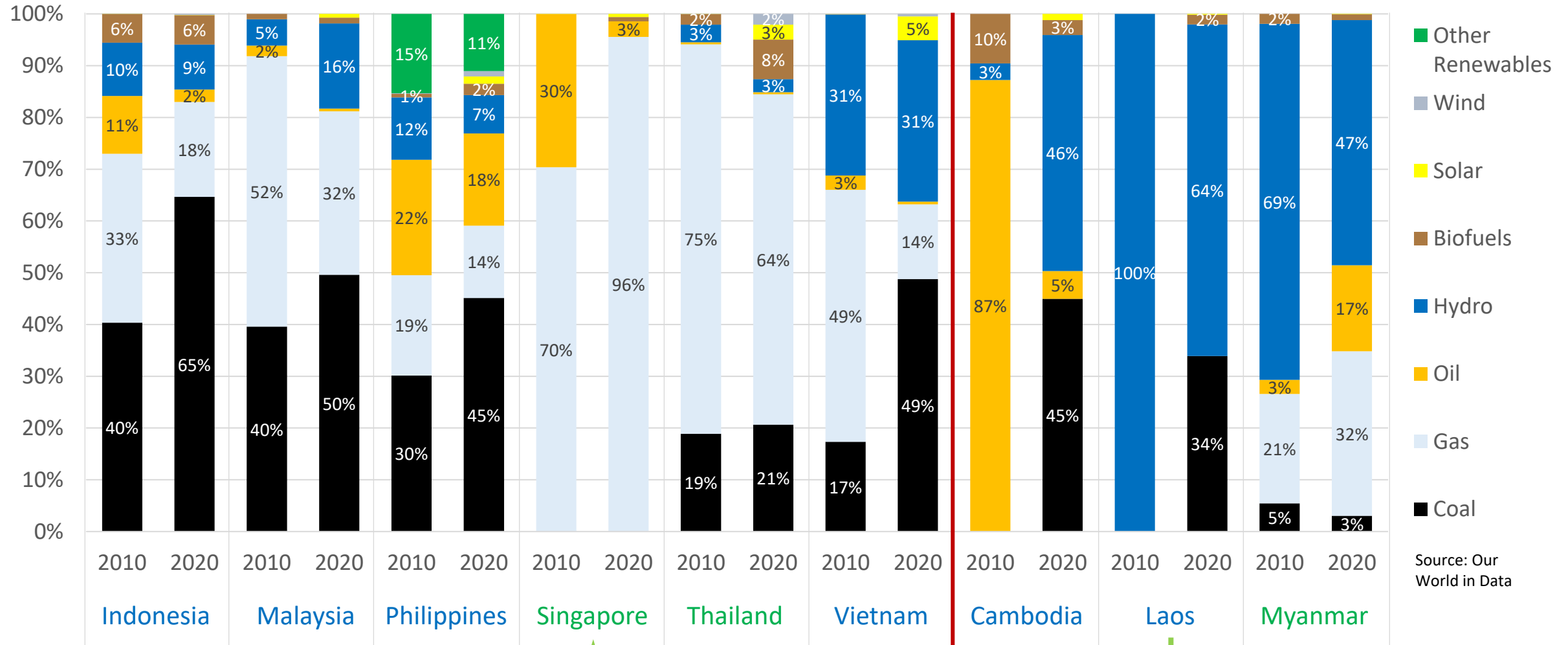
Source: SEASIS Statistics, SEASIS Research & Analysis, publicly available information

Note: Forecasts are based on available information. They may not be complete and are subject to changes

ASEAN SOURCES OF ENERGY FOR ELECTRICITY

Coal power has become the major source of electricity across ASEAN over the last decade, except Singapore, Thailand, Myanmar; More renewable energy in Cambodia, Laos and Myanmar; Grid is not really green

Source of Power for Electricity in ASEAN-9 Countries (2010 vs 2020)

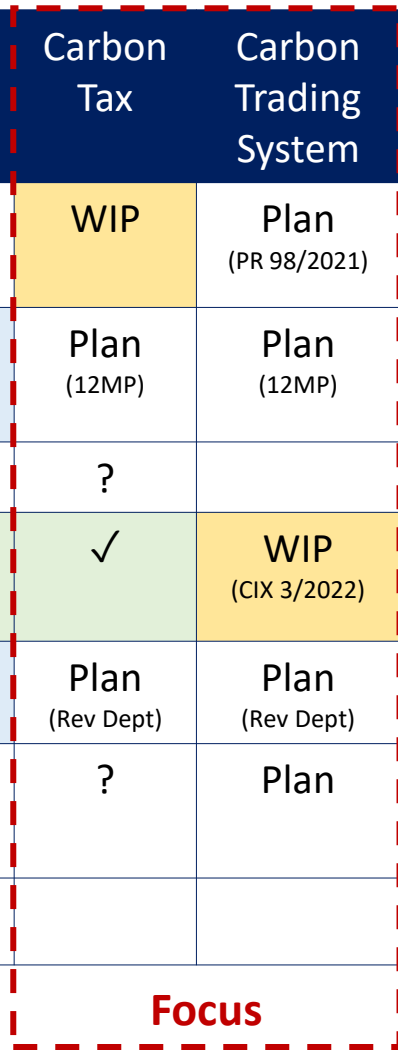


CLIMATE CHANGE POLICY DIRECTION IN ASEAN

Climate change efforts are on the way in ASEAN-6 countries; While only Singapore has implemented carbon tax with Indonesia on the way, it seems likely that other ASEAN-6 countries will follow suit

Broad Climate Change Policy Direction in ASEAN-6 as at September 2022

	Net 0 by	GHG Red. Targets (2030)	Long Term Strategy	Policy Passed into Law	MRV System	Voluntary Carbon Trading	Carbon Tax	Carbon Trading System	CBAM	Notes
Indonesia	2060	29-41%	✓ (UNFCC)	✓	WIP (CEMS2021)	?	WIP	Plan (PR 98/2021)	-	Focus on Power sector. Carbon tax postponed since April 2022 (USD 2.10/tCO2e).
Malaysia	2050	45%	WIP (end 2022)			WIP (Bursa 2022)	Plan (12MP)	Plan (12MP)	-	CCS investment tax allowance 100%, 10 years against income. Equipment tax exemption. 2023-2027
Philippines	-	75%	WIP				?		-	
Singapore	~2050	36%	✓ (UNFCC)	✓	✓	-	✓	WIP (CIX 3/2022)	-	JV for CCUS (energy, chem) Clean Energy Import (Laos) C. Tax: USD 3.6 > 18 > 32 > 36-57/t
Thailand	2050	20-25%	✓ (UNFCC)	✓	✓	✓	Plan (Rev Dept)	Plan (Rev Dept)	-	Carbon tax expected in 2023
Vietnam	2050	8-27%	✓ (Decision 896/QD-TTg)	✓	WIP (Decree 6/2022)		?	Plan	-	57 million carbon credits from forest reserves to be sold (USD 285m/year)
ASEAN										1 st Draft Taxonomy



Source: ASEAN Taxonomy for Sustainable Finance, various announcements

Note: ■ Done ■ Work in Progress ■ Private Sector Focus Area

STEEL INDUSTRY & SEASI INITIATIVES

The Steel Industry's efforts are generally on compliance and efficiency & control; However, some are venturing into green steel and getting ready for a low carbon future amid effort to recover from COVID, price volatility

A. CONTINUING EFFORTS

Environmental Compliance	Internal Efficiency & Control
<p>Compliance to local regulations:</p> <ul style="list-style-type: none"> • Air Emissions • Water Discharge • Hazardous Waste • Radiation Protection <p>... and Going Beyond:</p> <ul style="list-style-type: none"> • Reducing Emissions and Discharge Further 	<p>Reducing energy costs and minimising impact to the environment:</p> <ul style="list-style-type: none"> • Energy Efficiency / Heat Recovery • Emission Controls • Water Management • Waste Management • Recycling • Material Quality • Material Substitution

Source: Company annual reports and news

B. CURRENT INDUSTRY EFFORTS

Alternative Energy	Preparing for a Carbon Future
<ul style="list-style-type: none"> • Solar Power, Nat Gas, Renewable Energies 	<ul style="list-style-type: none"> • Carbon Tax <ul style="list-style-type: none"> ▪ Only Singapore ▪ Next is Indonesia • Carbon Credits <ul style="list-style-type: none"> ▪ Gunung Group Indonesia
<p>Market Adaptation</p>	
<ul style="list-style-type: none"> • Green Products / Certification <p>Examples:</p> <ul style="list-style-type: none"> • CSC Malaysia • Ann Joo Malaysia • NatSteel Singapore • Krakatau Steel Indonesia • Tata Steel Thailand • Hoa Phat Vietnam 	<ul style="list-style-type: none"> • Long Term Climate Change Strategy • Measurement Reporting and Validation

Source: Company annual reports and news

C. UPCOMING

What is Next?
<ul style="list-style-type: none"> • Carbon Leakage • Carbon Trading (local and international) • Implementing Green Technologies / CCUS <ul style="list-style-type: none"> ▪ This will not happen with carbon leakage
<ul style="list-style-type: none"> • Policy Front <ul style="list-style-type: none"> ▪ Carbon Border Tax ▪ Support for Transition ▪ R&D for Investments in Green Technology

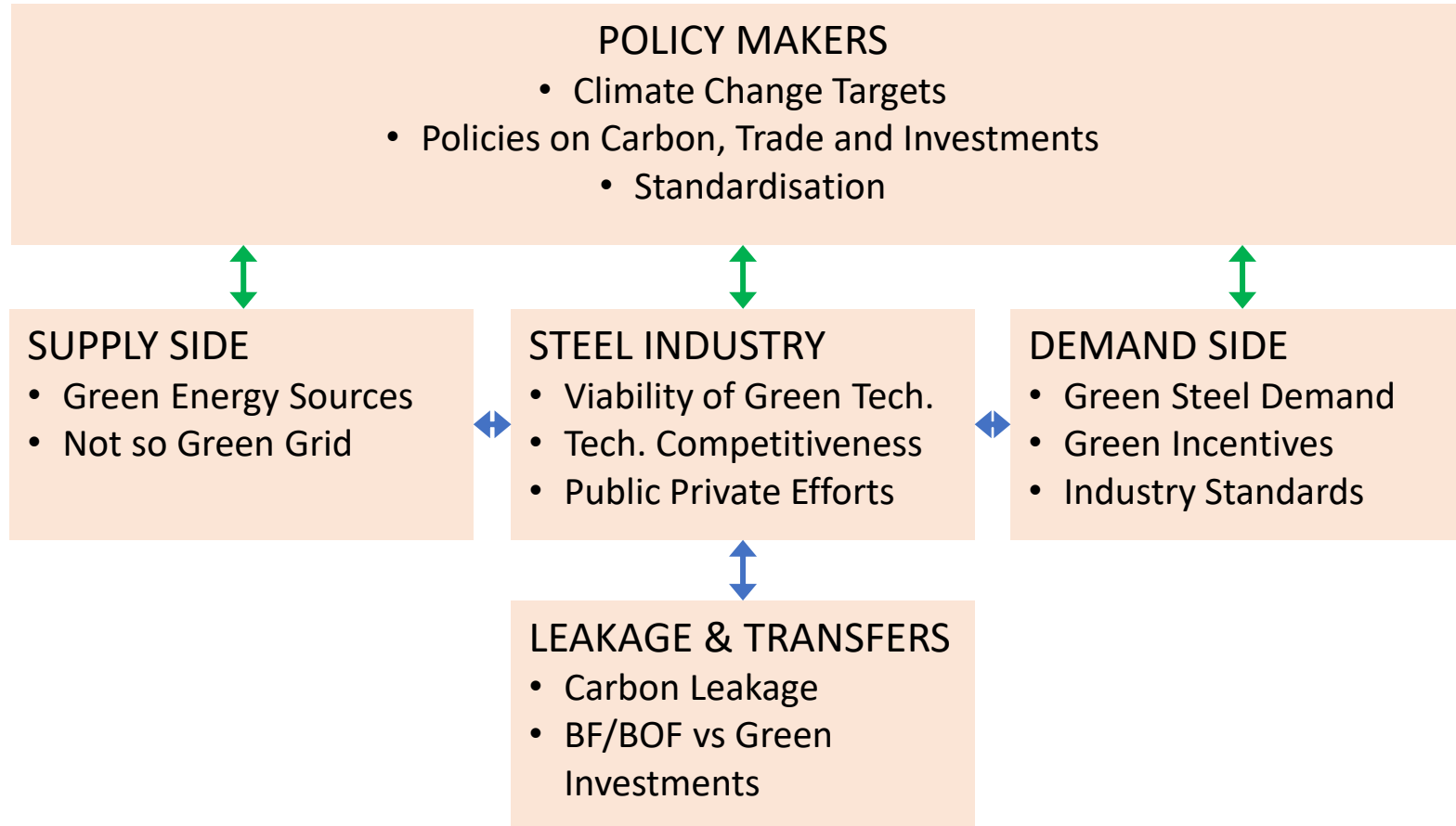
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CHALLENGES & WAY FORWARD

A Global Action Plan on Steel Decarbonisation should have a 360° approach to building demand for green steel and encouraging the industry to move towards a low carbon future

A 360° Views on Decarbonisation by Industry



Key components of an effective global action plan on steel decarbonization:

- Incentivizing Green Steel
- Transforming the Industries (inc. Steel)
- Greening the Grid
- Green Policies on Carbon, Trade and Investments

Capacity Developments should consider:

- Encouraging investments in sectors / segments that are not in overcapacity
- Discourage investments that are not green without mitigation plans
- Encourage new green technologies

Policy makers and industry players should regularly engage on:

- Policies as mentioned above
- Development of Green Incentives and Industry Standards for green efforts
- Building a low carbon, sustainable Steel Industry (support, financing, policies)

*Thank You
for
Your Kind Attention*



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