Regional Decarbonisation Roadmap: ASEAN-6

Presentation at the
Regional Decarbonisation Roadmap Workshop, in conjunction with the
2nd Breakthrough Technology Conference 2025
1 Dec 2025

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for the Steel Industry, by the Steel Industry, in ASEAN

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

27 Countries

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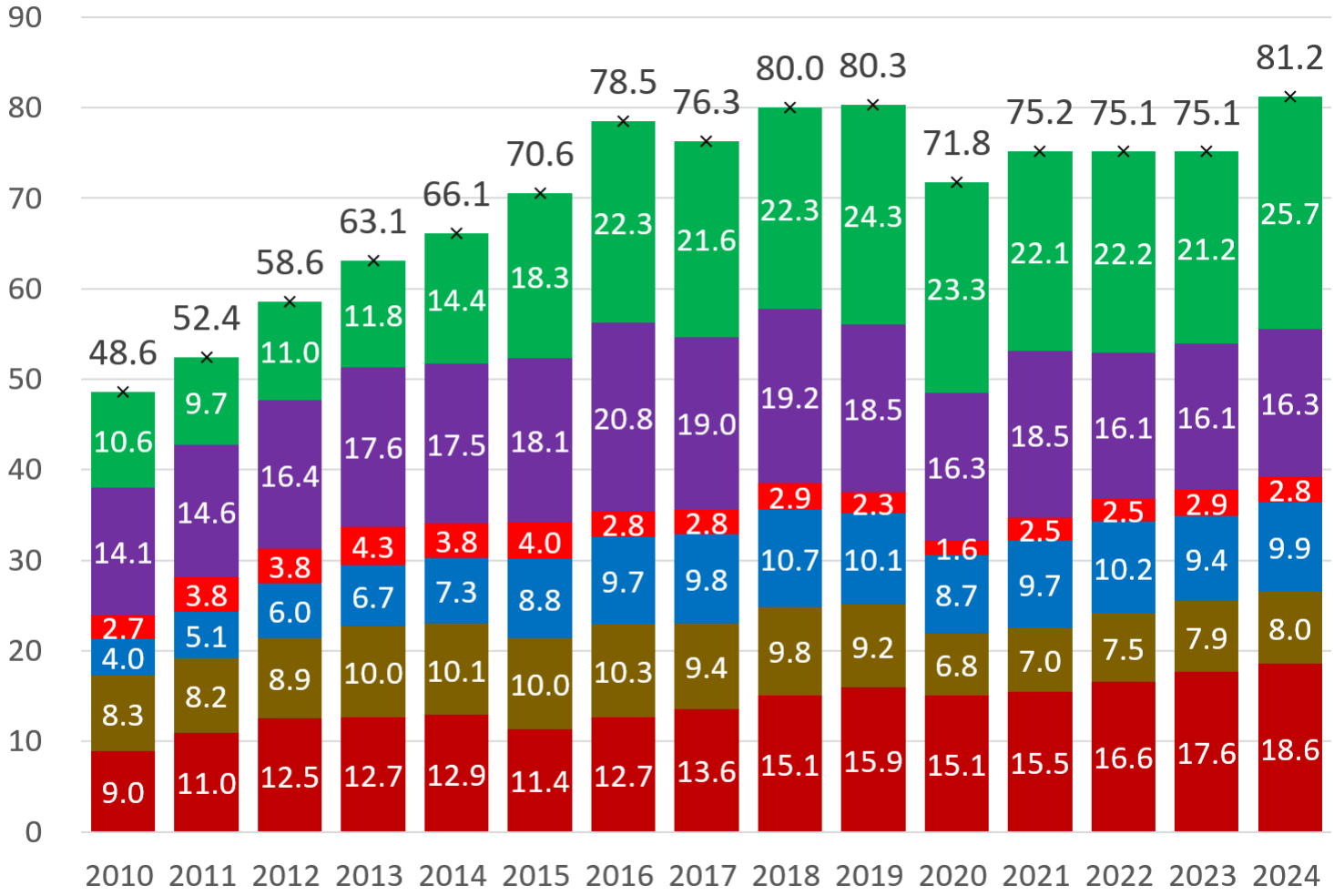
Research & analysis

OUTLINE:

- ASEAN Steel Industry
- ASEAN Policies
- Capacity Developments
- Implications

ASEAN-6 steel demand exceeded pre-COVID high with 81.2 million tonnes in 2024, but in comparison, the individual ASEAN countries are small producers

ASEAN 6 – Apparent Steel Consumption / Demand (million tonnes - MT)



Growth in 2024

ASEAN (7.9%)

① Vietnam (21.2%)

③ Thailand (1.2%)

Singapore (-3.5%)

Philippines (3.0%)

Malaysia (1.5%)

② Indonesia (5.4%)

Crude Stel Production

ASEAN Crude Steel Production vs World?

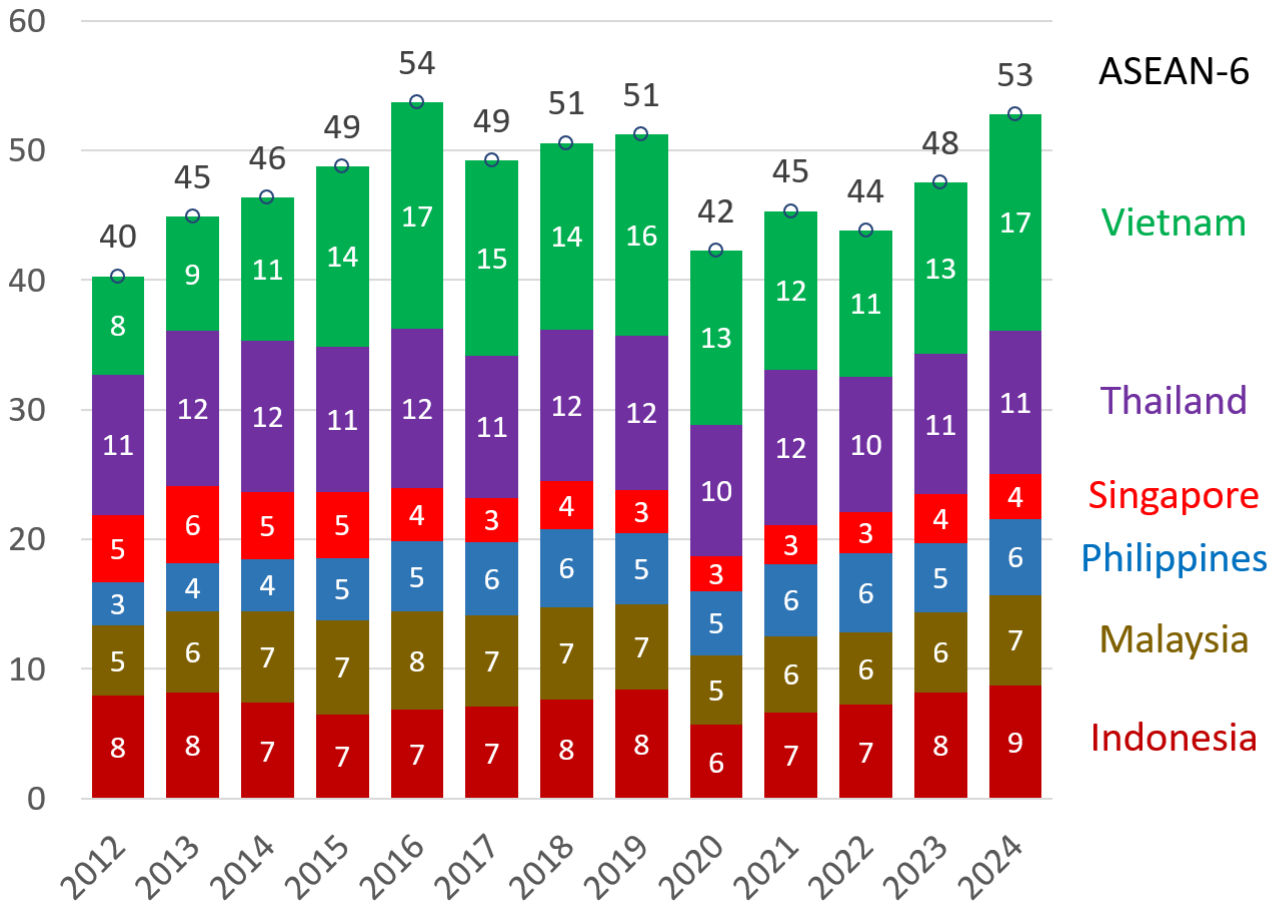
China	1,029 MT
India	141 MT
Japan	87 MT
US	81 MT
Russia	76 MT
S. Korea	67 MT
ASEAN	**51 MT**
Germany	35 MT
Turkey	34 MT
Brazil	32 MT

Source: SEAISI Statistics, STECO

With ASEAN FTAs effected in 2010, imports have gained significant inroads into ASEAN; Imports displacing local production and overcapacity has led to increasing exports

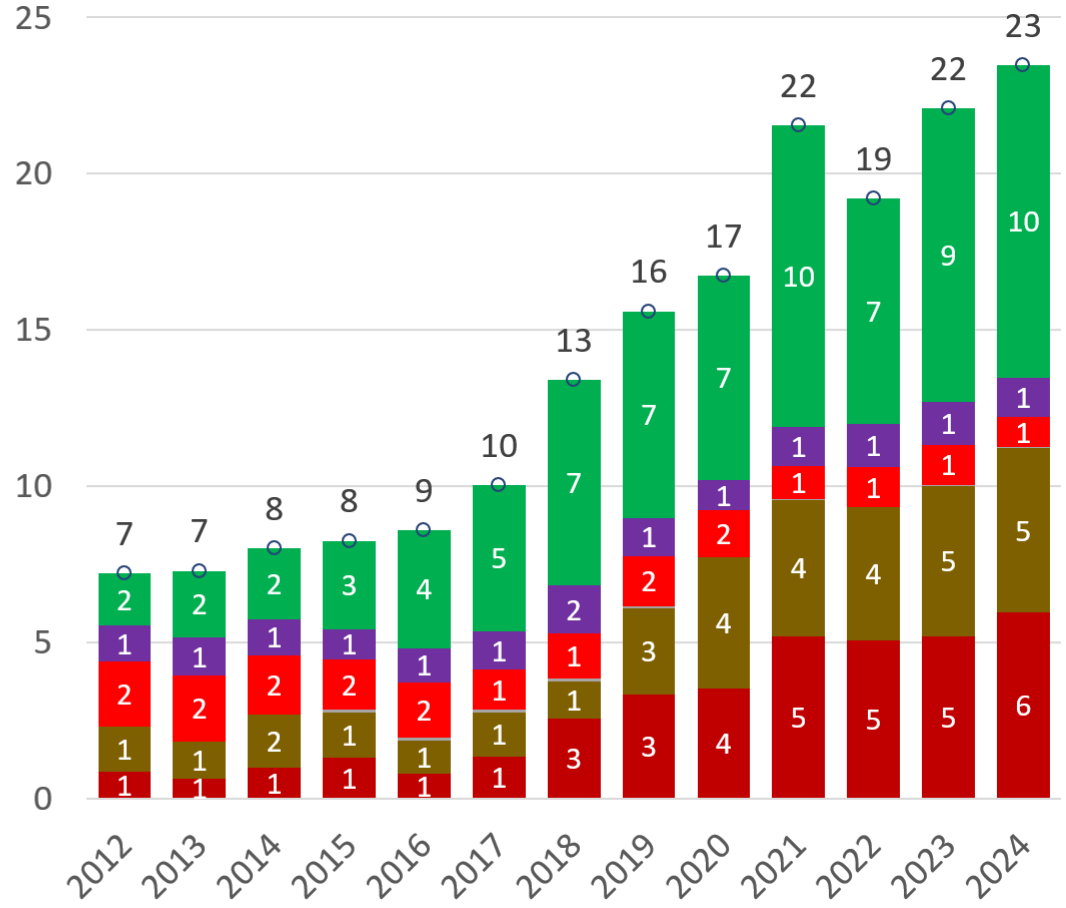
Import penetration into ASEAN is 60-70%. Significant competition and carbon leakage.

ASEAN-6 Steel Imports (million tonnes)



Surge in export due to displacement by imports and increasing regional overcapacity

ASEAN-6 Steel Exports (million tonnes)



Source: SEAISI Statistics, STECO

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Most ASEAN-6 countries have originally set net zero targets from 2050 to 2065, but are working towards aligning to a 2050 target in 2025 (Indonesia on the way)

Thailand 2050 ~~2065~~

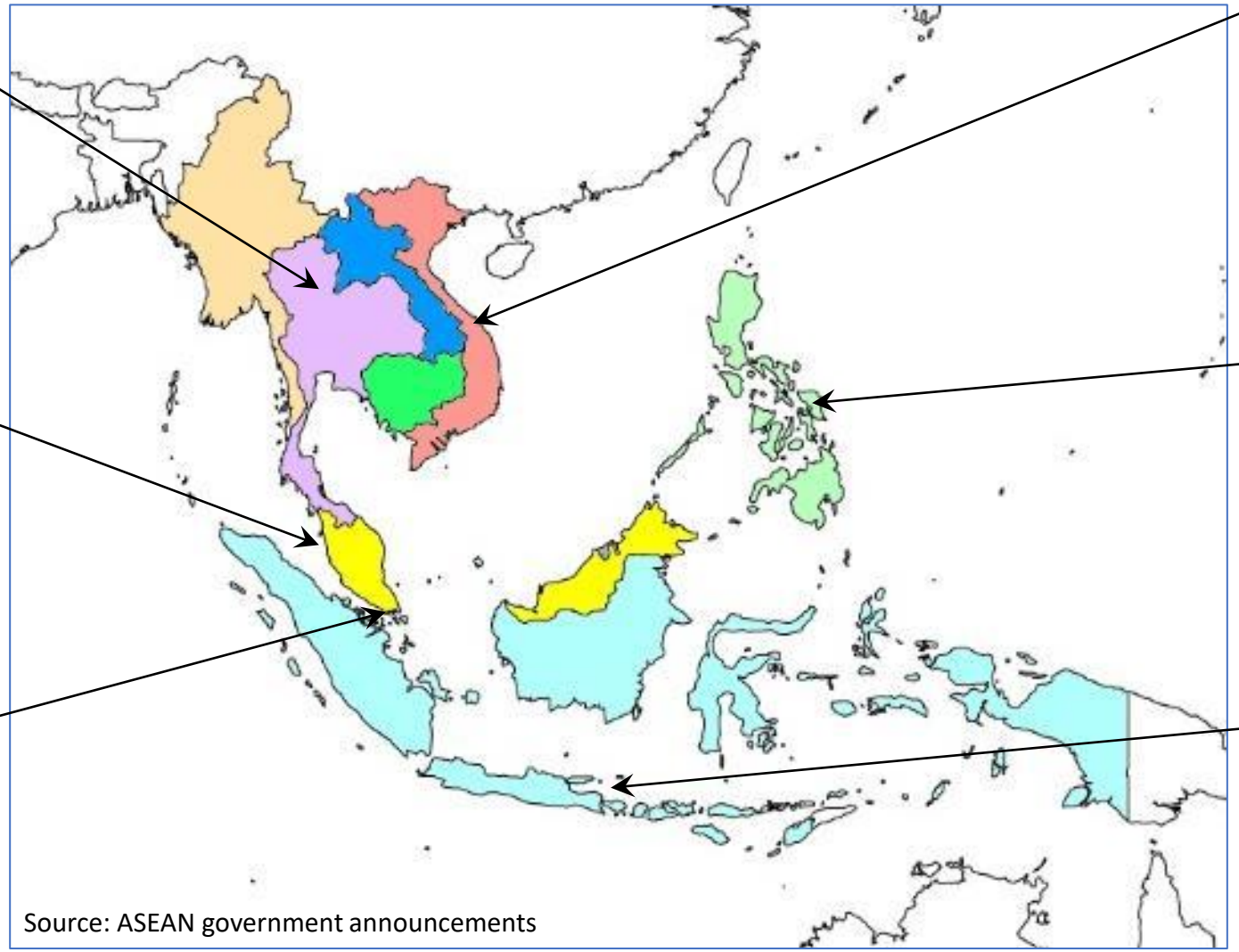
47% reduction below 2019 levels by 2035 ~~30% unconditional & 40% conditional reduction below BAU by 2030~~

Malaysia 2050e

35% unconditional & 45% conditional reduction below 2005 levels by 2030

Singapore 2050

Peak emissions at 65MtCO2e by around 2030



Source: ASEAN government announcements

Vietnam 2050

~~9%~~ 15.8% unconditional & ~~27%~~ 43.5% conditional reduction below BAU by 2030

Philippines

2.7% unconditional & 72.3% conditional reduction below BAU by 2030

Indonesia 2060 or 2050?

~~29%~~ 31.9% unconditional & ~~41%~~ 43.4% conditional reduction below BAU by 2030

Driven by climate change and external pressures, decarbonisation efforts in ASEAN are focusing mostly at the policy development and implementation phase

	CLIMATE CHANGE	EXTERNAL PRESSURE	EU CBAM
Decarbonisation Drivers	Vulnerability to Climate Change affecting agriculture and tourism (Typhoons, Floods, Heatwave, Rising Sea Levels)	Corporate Pressure Investor Pressure Financial Institution Pressure	The EU CBAM is accelerating the introduction of carbon pricing in ASEAN

	ENERGY	INFRASTRUCTURE	CARBON MARKETS
ASEAN Decarbonisation Policy Focus	1. Renewable Energy 2. Hydrogen Hubs 3. Moratorium on Coal 4. Captive Coal Projects (Indonesia)	1. CCUS 2. Taxonomy 3. MRV & EPDs 4. Sustainable Finance	1. Emissions Trading 2. Carbon Tax 3. Allowances 4. Carbon Credits 5. Local CBAMs

ASEAN DECARBONISATION EFFORTS (1/2)

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	INDONESIA	MALAYSIA	PHILIPPINES
Net 0	2060 or earlier (2050?)	2050 ~~earliest~~	-
Peak	2030 (using Forestry)	2029 - 2034	-
CCUS	15 projects 7.9 MTPA (2030) Storage 25.5 MTPA CO2 (2030) and 190 MTPA (2060)	3 projects 15 MTPA (2030) +2 projects 40 – 80 MTPA (2050) Investment tax allowances / income tax exemptions	-
H2	4.2 MTPA (2060)	3 hubs @ 2.5 MTPA (2050)	1 low carbon H2 hub (2030) Commercial scale 2 hubs for local market and export (2050)
RE	19% - 23% (2030) 36% - 40% (2040) 70% - 72% (2060)	33% (2030), 51% (2037), 68% (2040), 74% (2050),	35% (2030) 50% (2040)
ETS	99 coal powered plants (Vol 2023) Mandatory (2027)	Voluntary System BCX (Dec 2022)	Mixed ETS & carbon pricing to start in 2025/2026. Proposed price PHP 1,170 (USD 20) /tCO2e up to PHP2,925 (2030)
C. Tax	Complimenting ETS. Delayed to 2025? (~USD 2.10).	2026 (energy, iron and steel)	
CBAM	No news	Yes (Steel Industry Roadmap)	-

ASEAN DECARBONISATION EFFORTS (2/2)

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	SINGAPORE	THAILAND	VIETNAM
Net 0	2050	~~2065~~ 2050	2050
Peak	2028	2030	2030
CCUS	≥ 2 MTPA of carbon capture potential (2030) & > 6 MTPA of carbon abatement (2050)	3.2 MTPA (2035)	Planning
H2	H2 power plants to meet 50% of power needs by 2050	Projects under development. Draft plan to blend H2 with NG (5%) for electricity (2030)	Hydrogen with CCUS capacity 100-500k TPA (2030) and 10-20 MTPA (2050), incl green steel production
RE	≥ 2 gigawatt-peak (GWp) of solar capacity by 2030 (~3% demand)	74% power generated (2050) 30% total energy supply (2037)	50% (2035)
ETS	Voluntary System CIX by SGX (Jun 2023) Cross border carbon credits	Thailand Voluntary Emission System – T-VER (Oct 2013) Premium T-Ver (Oct 2022)	Emission quota allocation for industry (2025-26), National carbon credit exchange (2028)
C. Tax (/tCO_2e)	SGD 5 (2019), SGD 25 (2024) SGD 45 (2026), SGD 50-80 (2030) Covers 80% of emissions	THB 200 (USD 5.70) in 2025, substituting fossil fuel tax	Low Carbon Economy Investment Act passed (2023) - carbon pricing
CBAM	-	Yes (Draft Climate Change Act)	-

ASEAN taxonomy (3rd draft) will influence the Financial Institutions

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Tier 1: Foundation Framework (FF) applies to all ASEAN Member States

Environmental Objectives and Essential Criteria

Environmental Objectives (EO)

E01: Climate Change Mitigation

E02: Climate Change Adaptation

E03: Protection of Healthy Ecosystem & Biodiversity

E04: Promote Resource Resilience & Transition to Circular Economy

Essential Criteria (EC)

EC1: Do No Significant Harm

EC2: Remedial Efforts to Transition

EC3: Social Aspects (*new*)

Qualitative Assessment for EO and EC

Classification System (sector agnostic)

Green – FF:
Meets one or more of the environmental objectives and does no significant harm

Amber – FF:
Meets one or more of the climate and environmental principles but causing harm. Nevertheless, making efforts to remediate

Red – FF:
Causing harm and no efforts to remediate

Tier 2: Plus Standard (PS) will be used selectively by more advanced countries

Technical Screening Criteria for
6 Focus Sectors and 3 Enabling Sectors & Activities (*new*)

Sectors & Activities Within

Focus Sectors:

1. Agriculture, forestry & fishing
2. Electricity, gas, steam and air conditioning supply
3. Manufacturing
4. Transportation & storage
5. Water supply, sewerage, waste mgmt.
6. Construction & real estate

Enabling Sectors

1. Information & communication
2. Professional, scientific & technical
3. Carbon capture, storage & utilisation

Technical Screening criteria for EO and EC

Classification System

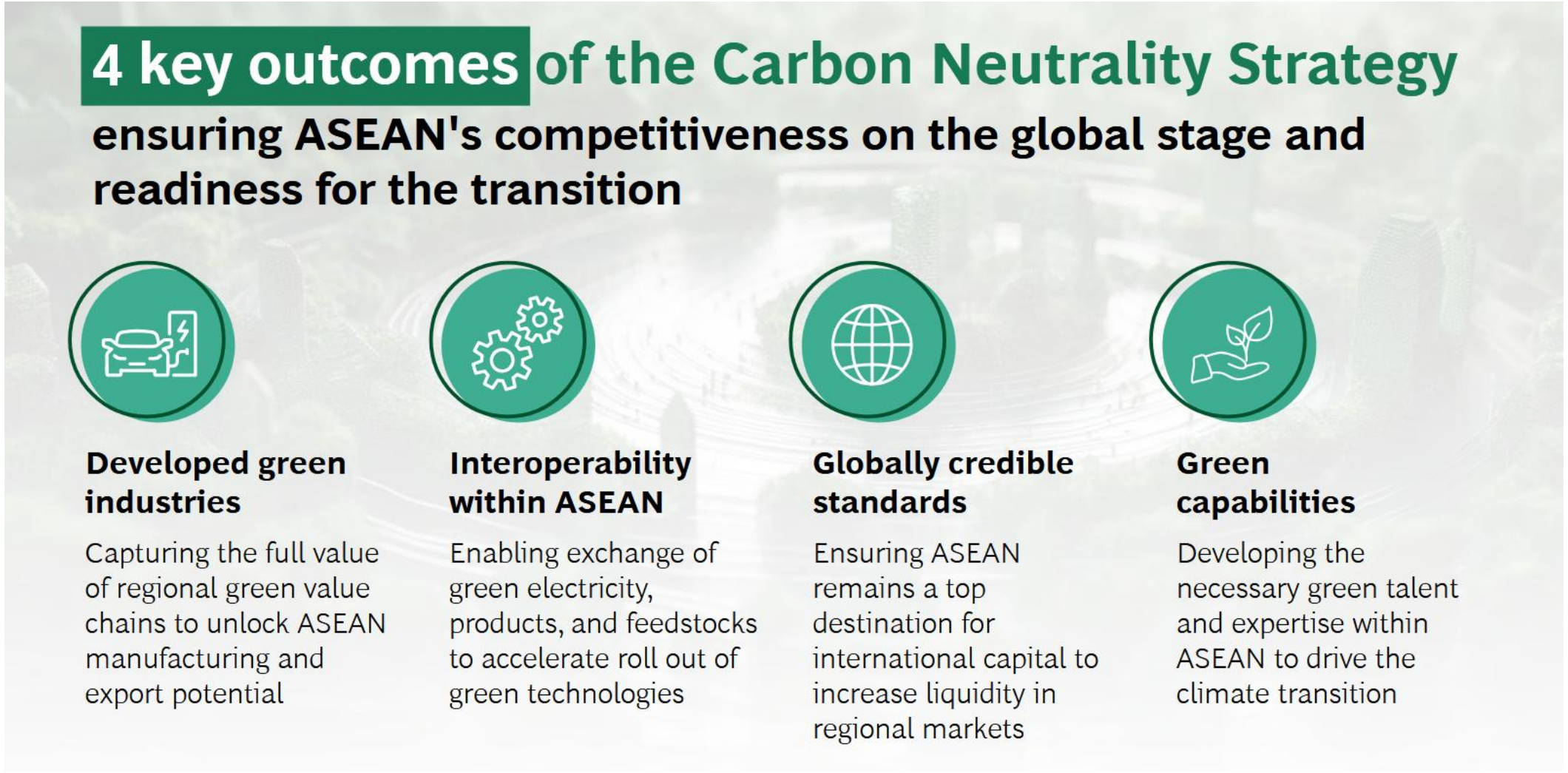
Green Tier 1:
Benchmarked to the 1.5ºC target

Amber Tier 2:
Harm Remediated within 3.5 years

Amber Tier 3:
Harm Remediated within 5 years

Red:
Fail to Remediate Harm within 5 years

The ASEAN Strategy for Carbon Neutrality aims to accelerate an inclusive transition towards a green economy, fostering sustainable growth and complementing national efforts as part of a regional collective effort



Source: ASEAN Strategy for Carbon Neutrality

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RISE OF THE INTEGRATED MEGAMILLS (CARBON STEEL)

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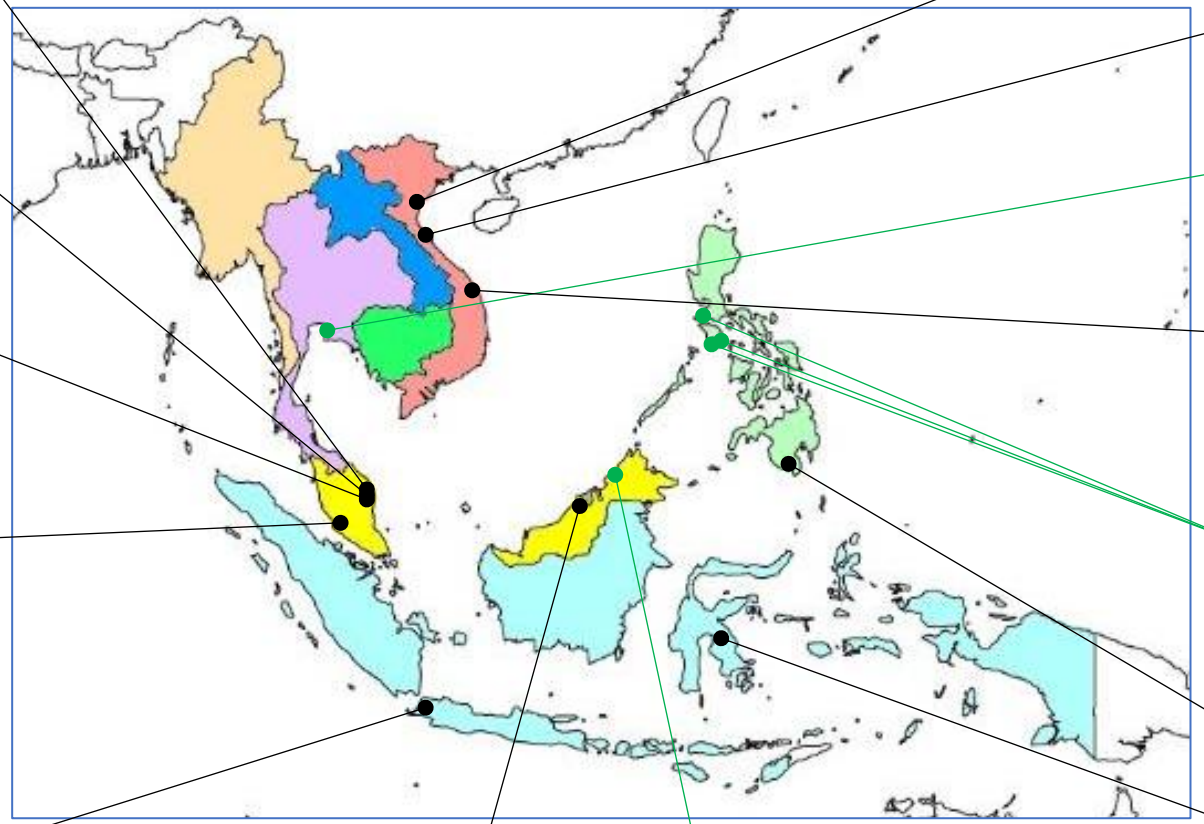
LEGEND:

China	FP	Flat Products	OP	Operations
S.Korea/Indonesia	LP	Long Products	RS	Restart
Taiwan/Japan	FLP	Flat & Long	CS	Construction
Local ASEAN	HG	High Grade	PL	Planning
			RV	Review



Eastern Steel (MY) — BFBOF
5.5 million MT
2012/18 : 0.7 MT — FLP — RS
2023 : 2.0 MT — FP — OP
? : 2.3 MT — ? — PL
6

Alliance Steel (MY) — BFBOF
10 million MT
2018 : 3.5 MT — LP — OP
2026 : 6.5 MT — ? — PL
3

JXR / Perwaja (MY) — EAF
7 million MT
2024? : 7.0 MT — LP — PL

Lion Steel (MY) — BFBOF
5.5 million MT
2022? : 3.3 MT — FP — RS
? : 1.5 MT — FP — PL
? : 1.0 MT (HG) — LP — PL

Krakatau Steel (KS) / Krakatau POSCO (KP) — BFEAF / BFBOF
10 million MT (ID)
2014 : 1.8 MT (KS) — FP — OP
2014 : 3.0 MT (KP) — FP — OP
2023? : 1.2 MT (KS) — FP — CS
2026 : 3.0 MT (KP) — FP — PL
2026? : 1.0 MT — ? — PL
1

WenAn Steel (MY) — BFBOF
10 million MT
2027-30? : 10.0 MT — FLP — CS

E-Steel Sabah (MY) — DRIEAF
5 million MT (?)
2025 : 2.5 MT — HBI — PL
Ph 2+3 : 2.5 + 2.5 MT — ? — PL

Xuan Thien (VN) — EAF
7.5 + 2.0 m MT
2024-26 : 9.5 MT — LP — PL

Formosa Ha Tinh (VN) — BFBOF
7.5 million MT
2017 : 7.5 MT — FLP — OP
2

Meranti Green Steel (TH) — EAF
2 million MT
2027 : 2.0 MT — FP — OP

Hoa Phat Group (VN) — BFBOF
10.75 million MT
2019-21 : 2.0 + 2.0 MT — LP — OP
2025-6 5.6 MT — FP — PL
4

SteelAsia (PH) — EAF
3 million MT
2026 : 1.1 MT — LP — PL
2027 : 1.0 MT — LP — PL
2028 : 1.2 MT — LP — PL

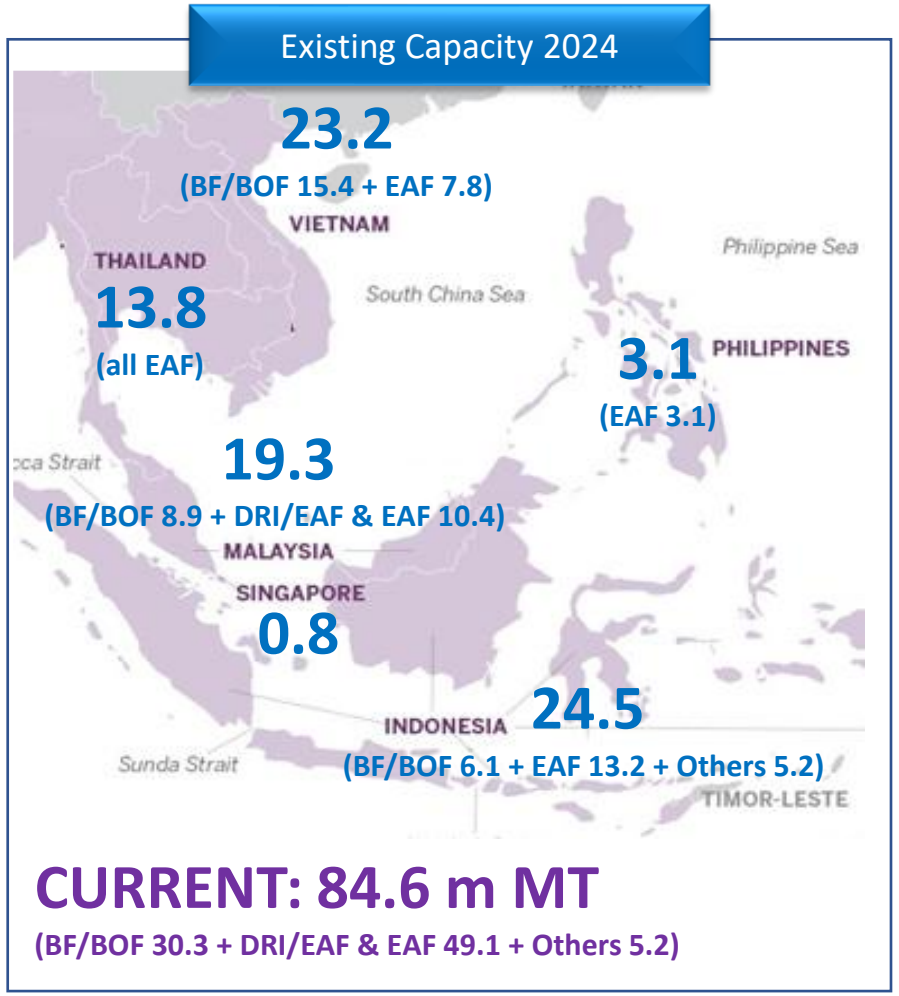
Panhua Group (PH) — BFBOF
10 million MT
2025-35 : 2+3+2.5x2 MT — FP — CS

Dexin Steel (ID) — BFBOF
20 million MT
2020-21 : 4.0 MT — FLP — OP
2023 : 3.0 MT — FLP — OP
2025-9? : 14.0 MT — FLP — PL
5
7

Source: Various public sources, SEAISI Research & Analysis

Updated: 9 Sep 2025

Unsustainable overcapacity is looming in ASEAN, should more than 80 MT of new capacity appear in the next decade

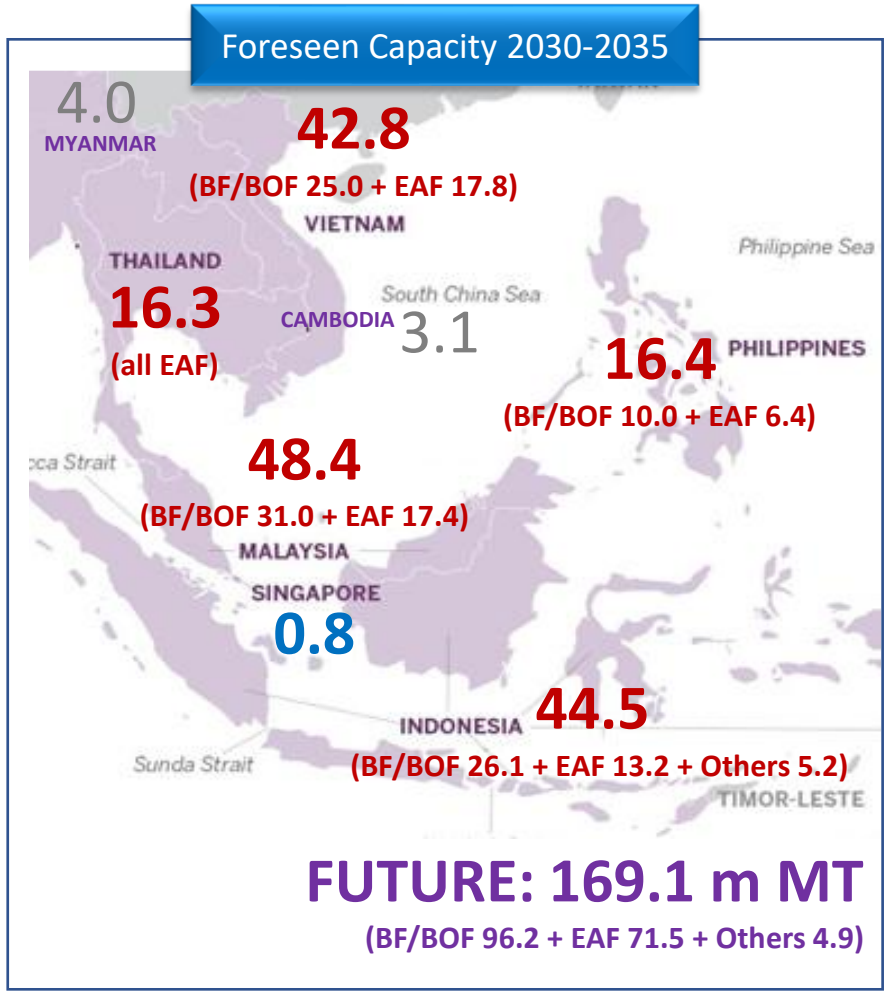


New Capacities
+ 84.5 MT

BF/BOF Capacities
+ 57.7 MT

DRI, DRI/EAF Capacities
+ 26.8 MT

Excluding Myanmar & Cambodia



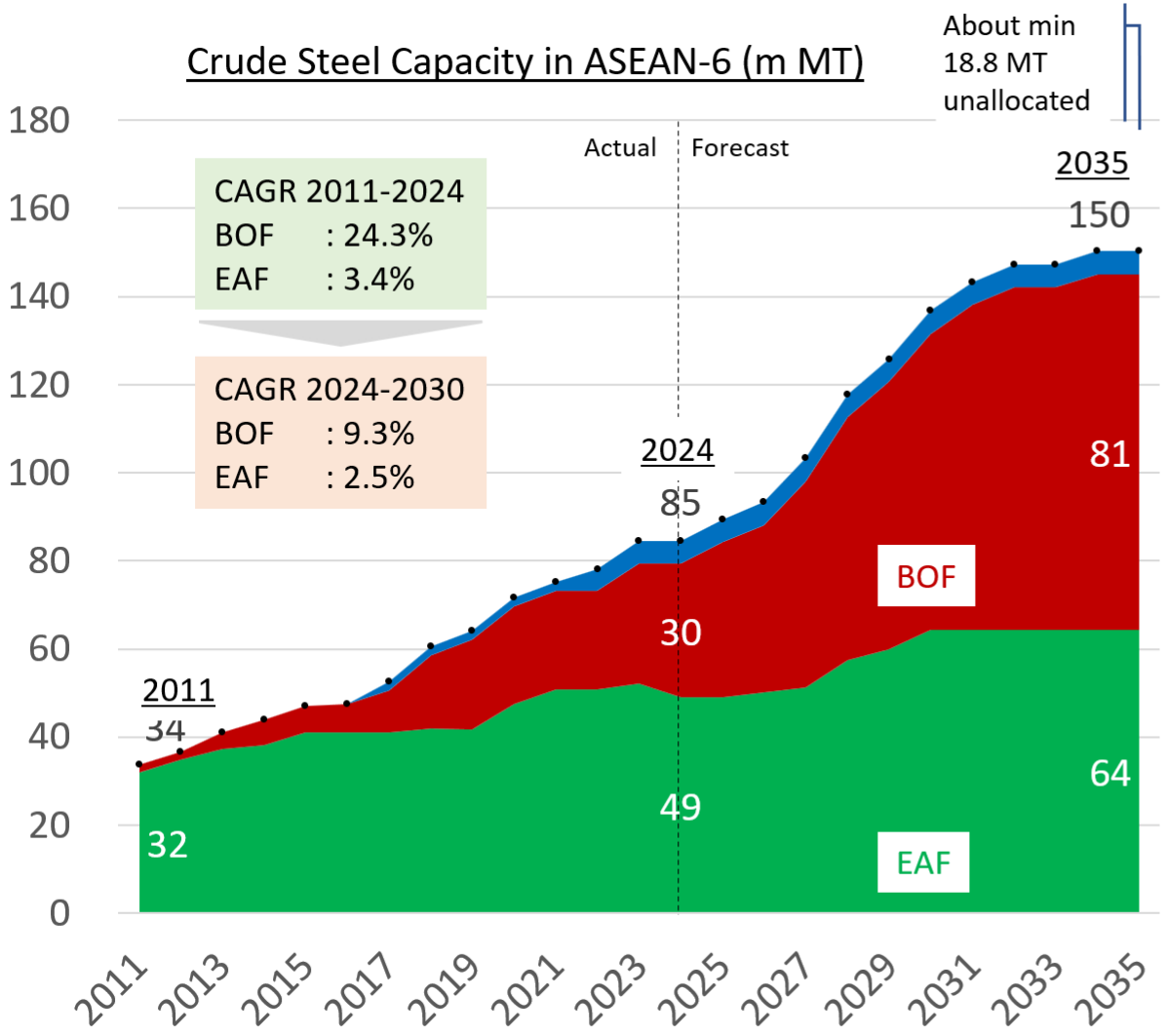
Note: Capacity is defined as crude steel capacity.
Rolling capacities and further downstream capacities are not included.

Source: Various public sources, SEAISI Yearbook, SEAISI Research & Analysis

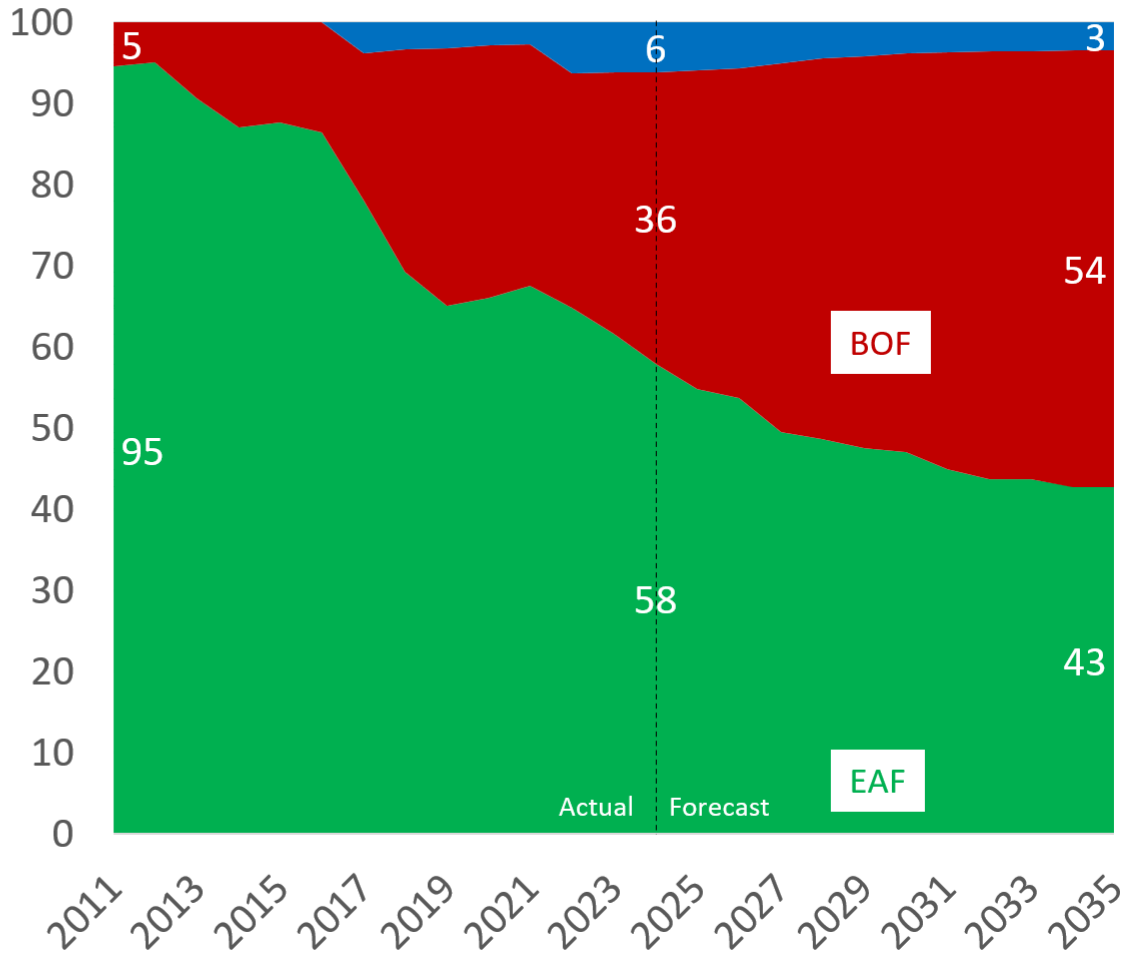
Updated: 9 Sep 2025

Rapid growth in BF capacity will "de-green" the ASEAN steel industry …

From a green industry to an accelerating carbon intensive industry in the near future …



… where blast furnace (BF) systems will become the dominant technology in the ASEAN steel industry



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

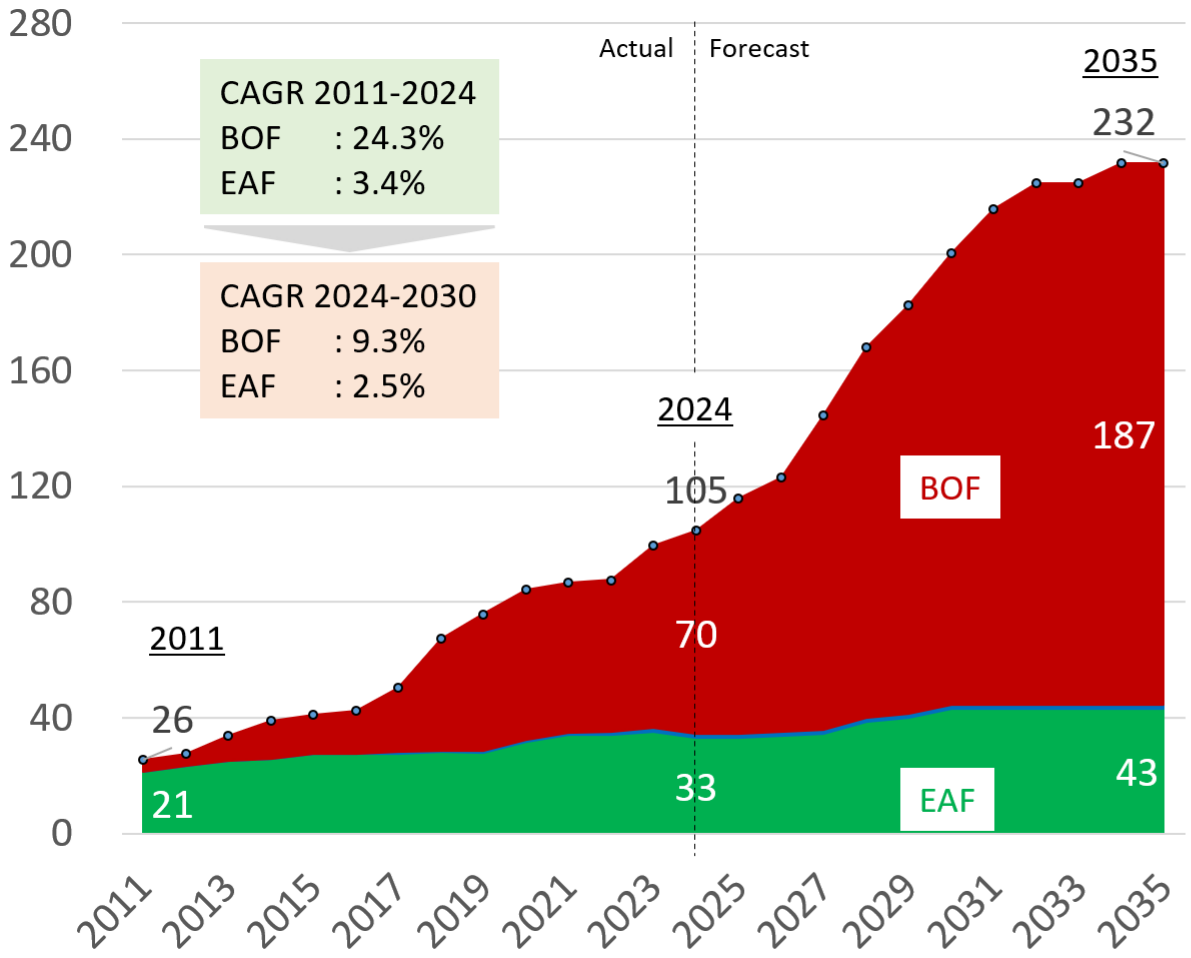
Updated: 10 Sep 2025

… and this is expected to lead to an explosion of emissions (81% by 2035)

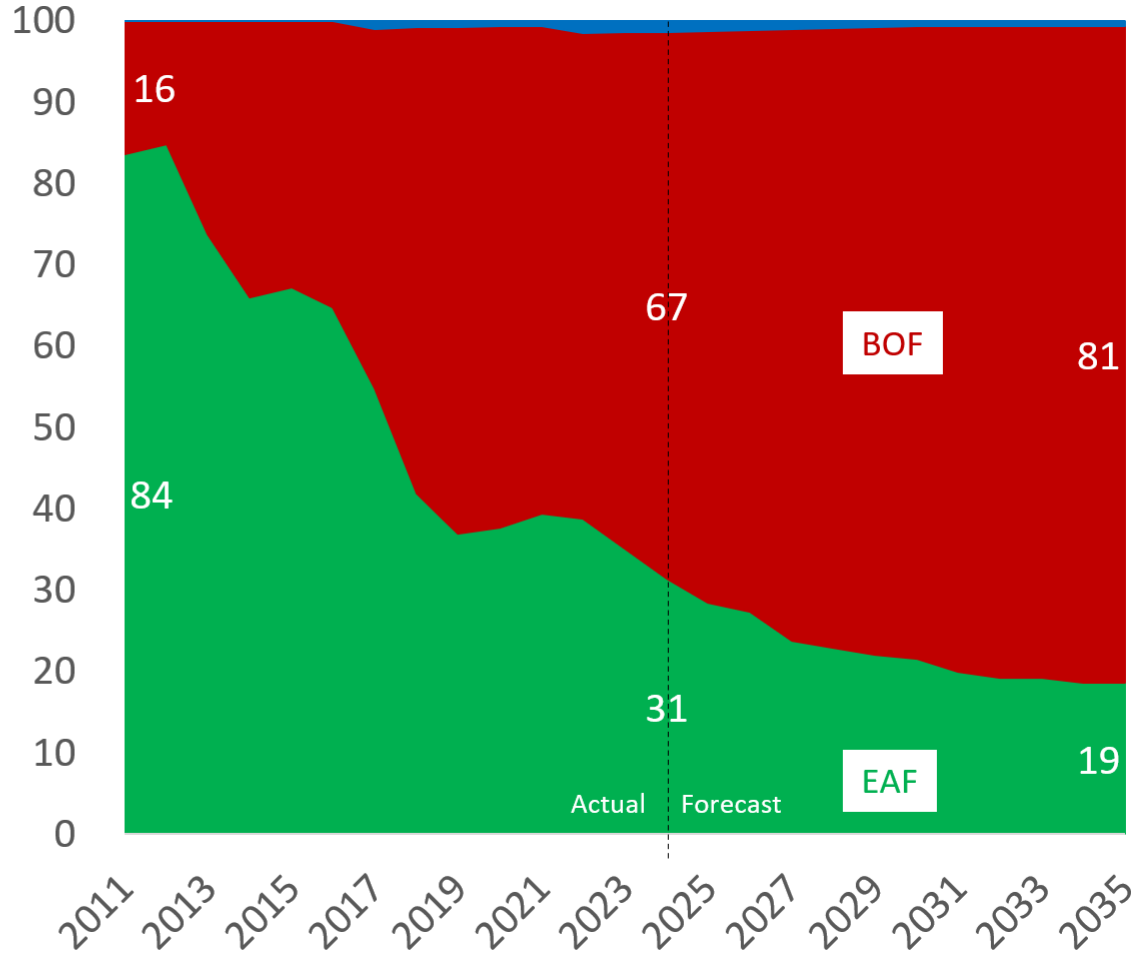
BF systems' carbon emissions (2.33 tCO2e/tc) vs EAFs (0.68 tCO2e/tc) will accelerate…

… leading to an explosion of emissions in the ASEAN-6 steel industry, if their implementation is not controlled

Emissions Capacity in ASEAN-6 (m tCO2e)



Emissions Proportion by Process (%)



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IMPLICATIONS

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Trends

Aggressive Net Zero Targets
- Net Zero re-scheduled
- Carbon peak 2029-2034

Policy Rolled Out
- Started ~2021
- Acceleration in 2024/25

Short term uncertainties
- Trade Diversions
- Minimum investments

But …

Breakthrough Technologies
- ASEAN is no tech leader
- Policy & Finance are keys

Implications for the Steel Industry

Ongoing Projects
- Review and Re-strategise (BF BOF, Coke making)
- New Opportunities (Green DRI/HBI/Steel)
- Moving up the value chain

Impact on New Investments
- Shift to green iron and EAFs in long run
- Pause / halt in BF investments (risk of stranded assets)
- Halt capacity and carbon transfers to ASEAN

Indonesian Implications
- Captive power plants for mineral processing acceptable
- Emissions reduction start 2030, phased out by 2050
- More capacity and carbon transfer to Indonesia?

But …

Effectiveness of Execution
- A 2050 net zero target is very ambitious for developing countries.
- Are the targets realistic and achievable?

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Thank You for Your Kind Attention

Wee-Jin YEOH

Secretary General

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