

The future trends in ASEAN steel market

November 2022



Our community of metals experts extends across the world

Number of professionals and presence, 2022



	Americas	EMEA	Asia/Pacific
Expertise, regional split	~25 %	~50 %	~25 %
BMI core locations	1 Sao Paolo	3 Brussels, Dusseldorf, Moscow	2 Gurgaon, Shanghai

Total	51	443	39	533	6
	Partners	Consultants staffed on metals studies	Metals experts	Total	Hubs

1. BM Partners core group with majority of work in metals over the last year
2. Worked more than 280 hours on metals studies over the last year
3. Expert consulting, Capabilities & Insights, Solutions with a focus in metals

Key trends in the Global and ASEAN steel markets

Global



- 1 Strong price volatility across 2021-22**
Driven by broader commodity price pressure from post-Covid recovery, coupled with disruption of coke and semis supply
- 2 Growing demand for low-CO₂ steel**
Driven mainly by net-zero commitments by large players in construction and automotive industries

ASEAN



- 3 Robust ASEAN steel demand growth contri-buting ~40% of net global growth until 2030**
New infrastructure projects and robust population growth are driving strong steel demand in the 10-country region
- 4 Strong domestic supply expansion**
>46 Mt new steel capacity planned in ASEAN in the next decade with strong investment from Greater China (~41 Mt), which is set to reduce the current supply gap

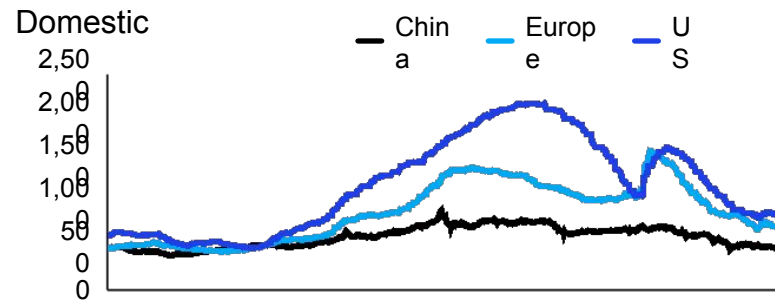


2022 marked a challenging period of high volatility across the global steel supply chain

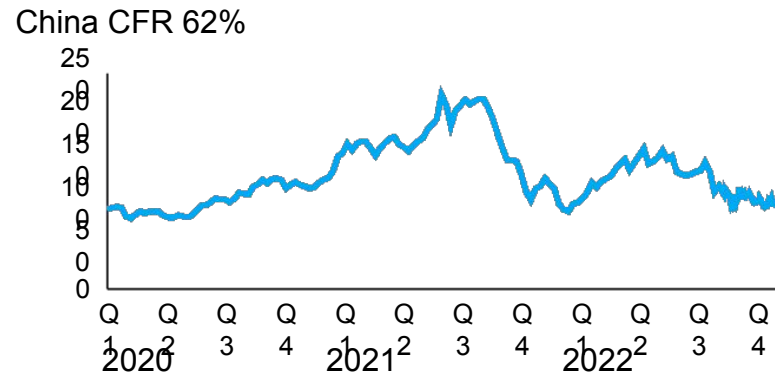
Price, USD/t, Q1 2020 – 20 October 2022

Steel value chain commodity prices have risen to record levels in 2021-2022, with volatility driven mainly by **post-Covid demand recovery** and the **increase in energy prices**

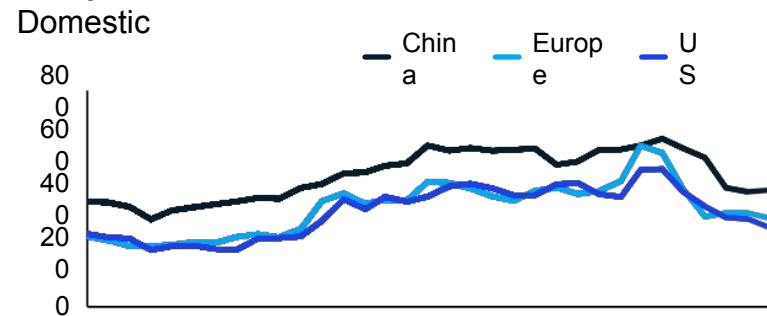
Steel HRC prices



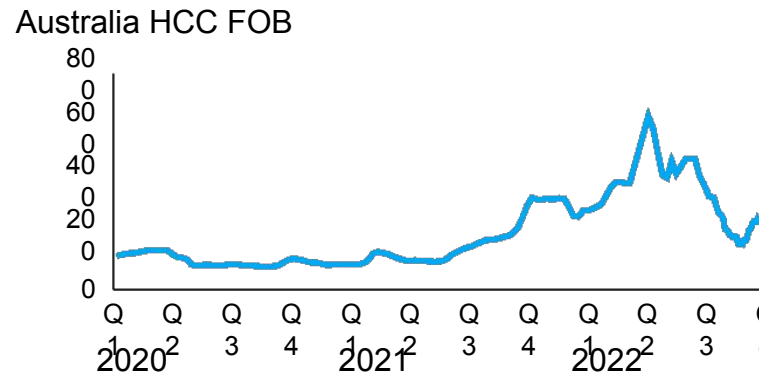
Iron Ore



Scrap¹



Met Coal



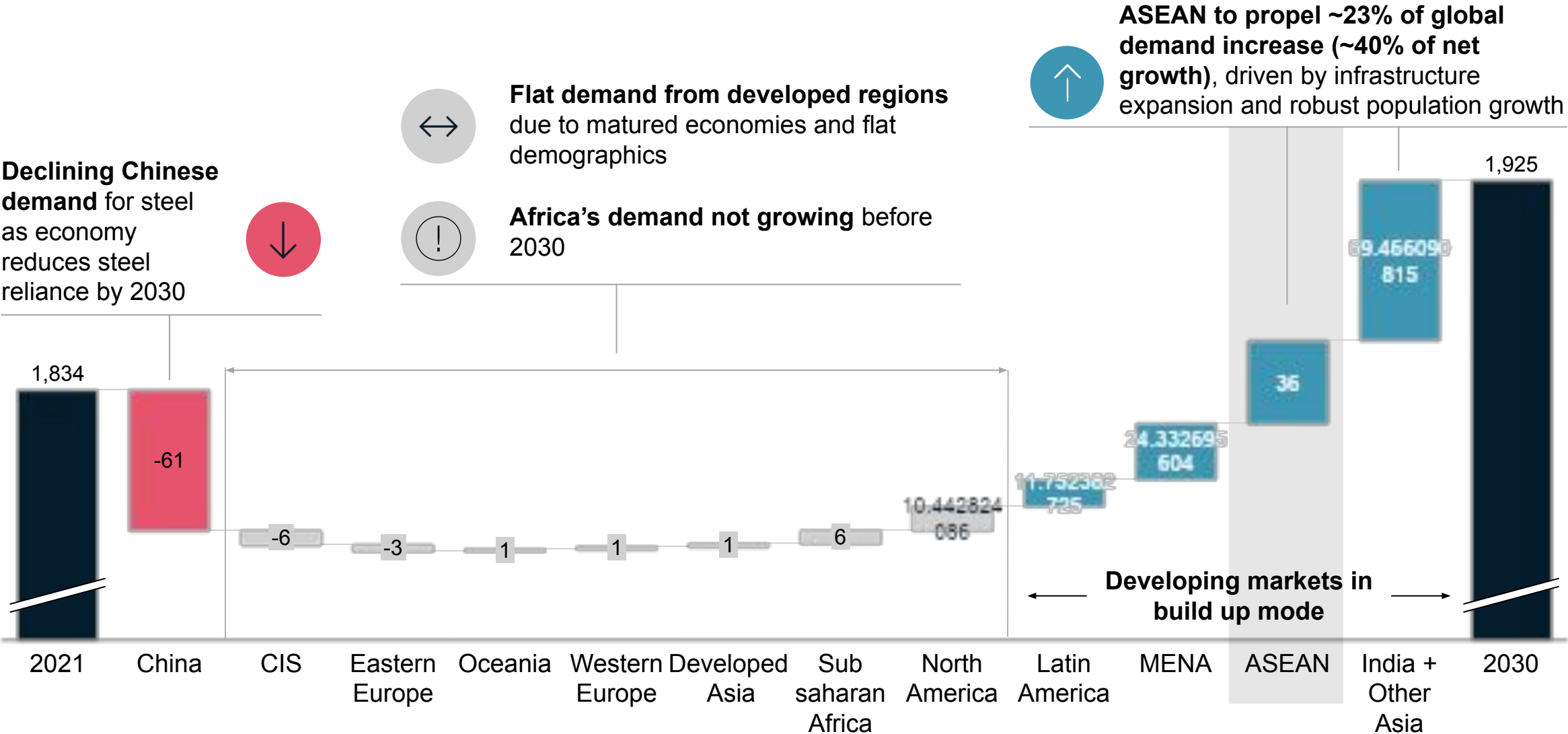
In 2022, ASEAN steel players faced common challenges

- **Supply chain disruption:** curtailment of supplies of semis and coking coal from Ukraine and Russia
- **Demand disruption:** fewer orders both domestically and from foreign importers
- **Inflation:** tightened financing capabilities while currency weakening affected exports. Vietnam and Thailand particularly affected

1. Scrap HMS 1&2

Despite a reduction/plateauing in China, steel demand is expected to increase 91Mt until 2030 driven largely by ASEAN and India

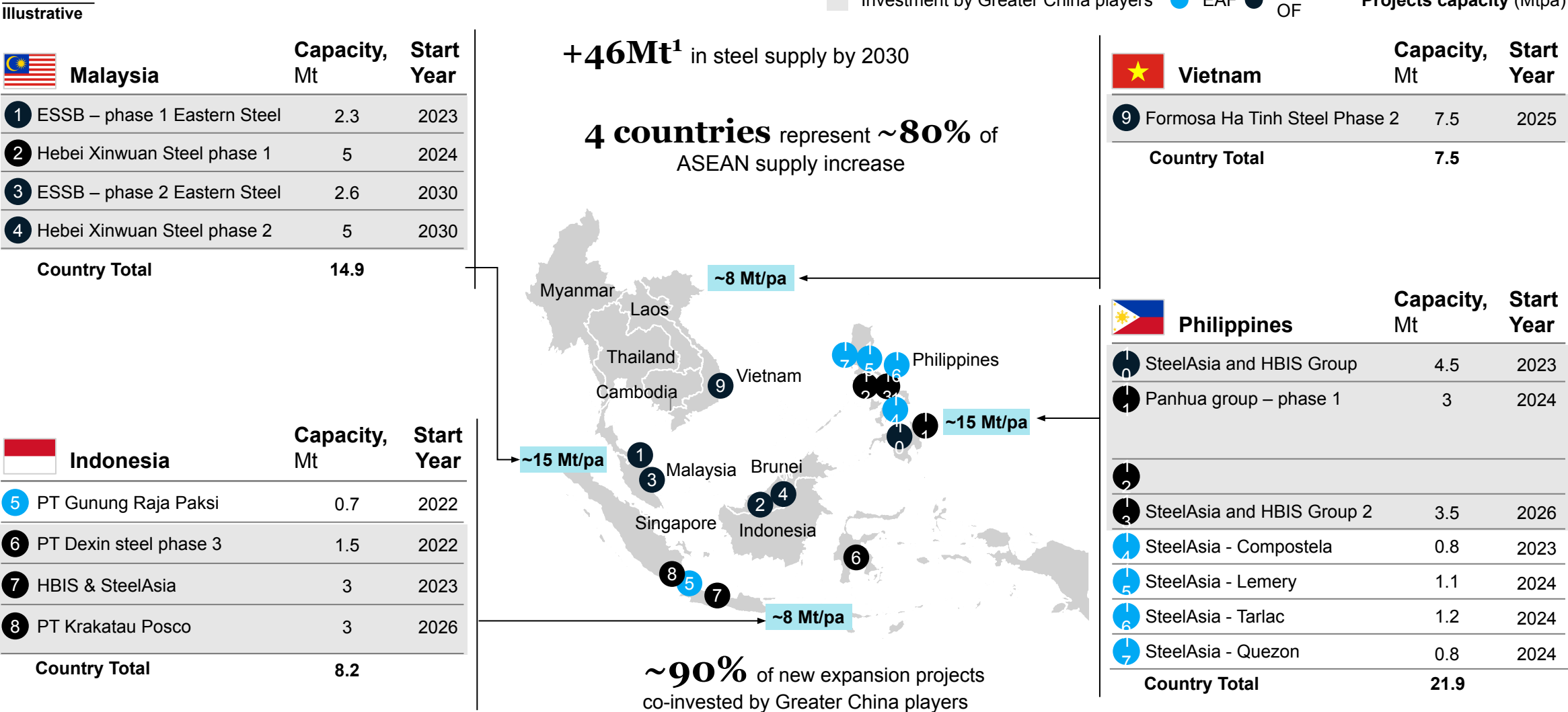
Global demand for Apparent Finished Steel, 2021 – 2030, Mt



Source: Worldsteel.org; McKinsey BMI

46Mt of announced steel investment projects (until 2030) comes from 4 main ASEAN countries; with 90% invested by GC players

Key steel projects in ASEAN

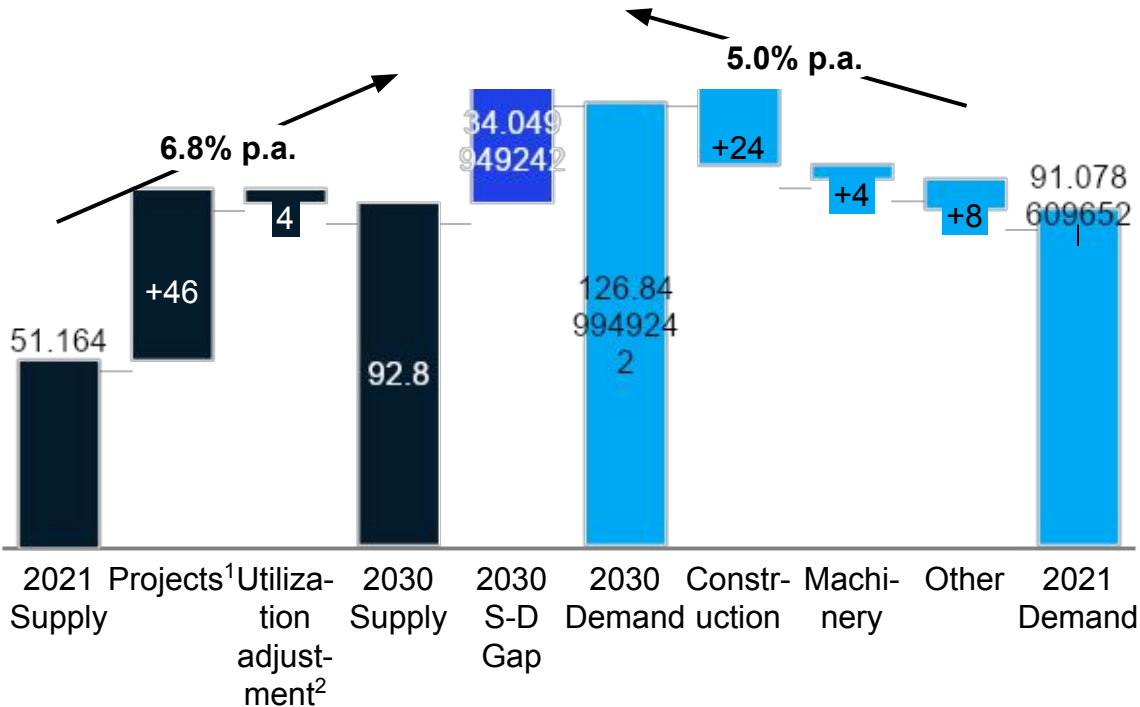


1. Including projects with start dates until 2030
Source: McKinsey BMI Crude Steel capacity database

New domestic capacity expansion is expected to gradually reduce the supply-demand gap and import reliance from 44 to 25% by 2030

ASEAN steel market supply & demand, 2021-30, in Mt

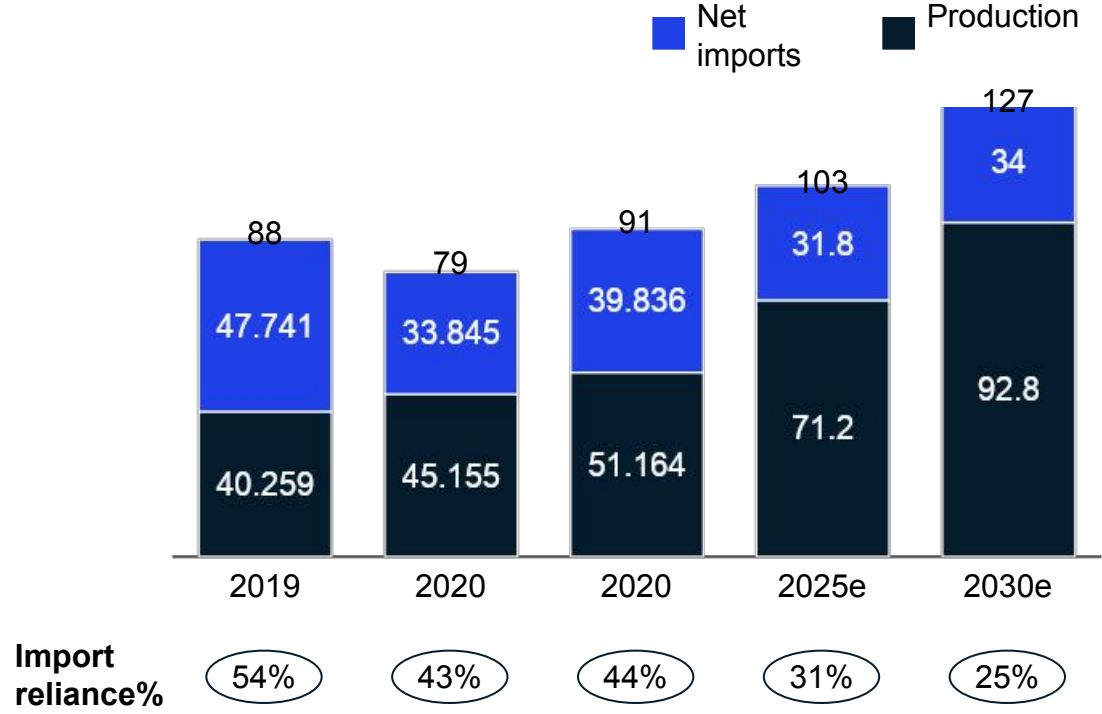
Pipeline projects set to almost double domestic supply capacity
Supply growth outpaces that of demand, reducing supply gap by ~6 Mt between 2021-30



1. New supply capacity from confirmed projects, assumed at 80% utilization rate
2. Adjustment to utilization from current 88% to the long-term rate of 80%, leading to reduction in capacity of existing supply
Source: McKinsey BMI Crude Steel capacity database, metallics model

Steel supply/demand balance in ASEAN market, in Mt

Relative reliance on imports to progressively decrease
Greater domestic capacity drives reduction in supply/demand balance, lowering imports to almost 1 out of 4 supply units by 2030



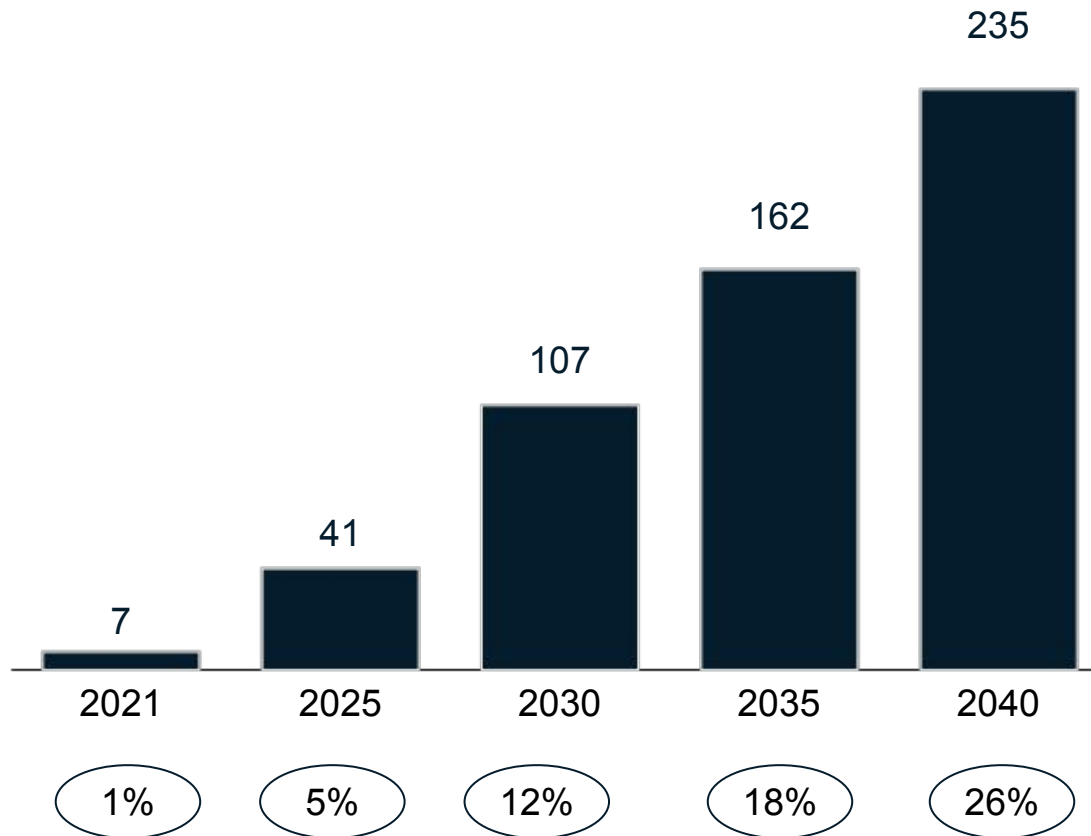
Global demand for low-CO₂ steel is set to increase exponentially by 2040

% low-CO₂ demand out of total flat steel demand

Global low-CO₂ flat steel demand, Mt

Low-CO₂ footprint steel

Steel manufactured using technologies and practices that result in carbon emission < 0.6t/T steel

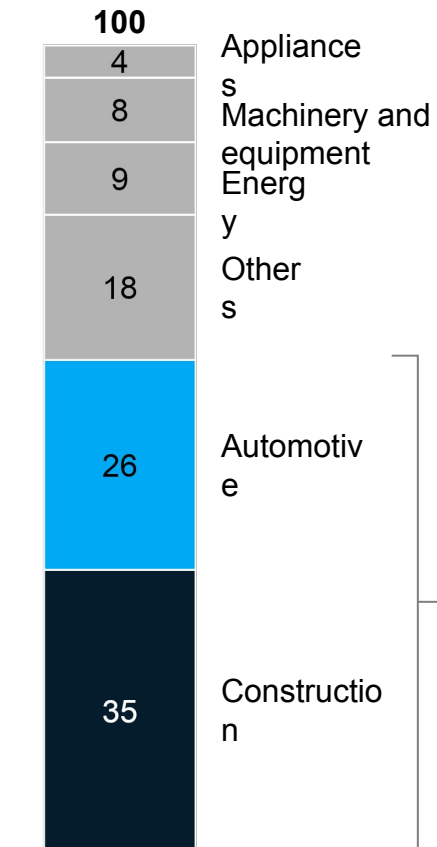


- Global low-CO₂ flat steel demand expected to grow **>15X** in next decade
- Low-CO₂ flat steel demand forecast to represent **~5% of total flat steel demand in 2030**
- Demand to accelerate to **~25% of total demand in 2040**









Strong scope 3 emission reduction targets across key customers are the main driver of demand for low-CO₂ steel...

Case point for automotive and construction industry








Share of Global green steel in 2030, %



Automotive industry

Example companies	Scope 3 emission reduction target by 2030	Year of carbon neutrality
	100%	2030
	100%	2030
	51%	2040
	42%	2039
	40%	2050
	40%	2050
	40%	2040
	37%	2050

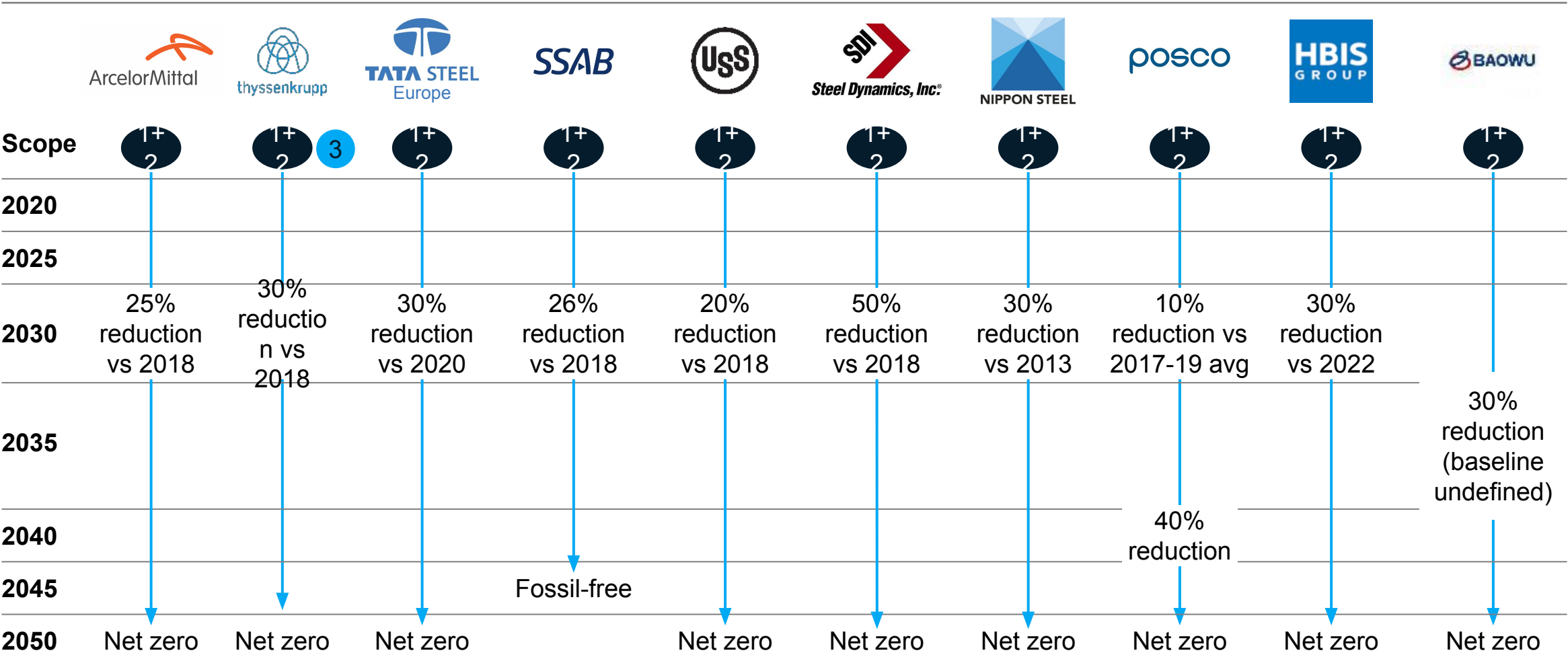
Construction industry

Example companies	Scope 3 emission reduction target by 2030	Year of carbon neutrality
	50	2050
	50	2045
	50	2045
	42	2050
	30	2050
	20	2050
	20	2041

... forcing global leading steel players to make bold commitments to Net Zero

Major global steel players decarbonization target timeline





Carbon Neutrality (CO₂ emissions)



Source: Company reports, press search

Potentially in line with government targets which are balancing economic development and decarbonization

ASEAN countries with high production of steel in ASEAN¹

	<div>  </div> <div>Malaysia</div>	<div>  </div> <div>Indonesia</div>	<div>  </div> <div>Philippines</div>	<div>  </div> <div>Vietnam</div>
GHG emissions reduction 2030 target ²	<div>45%</div> <div>relative to 2005</div>	<div>32%</div> <div>below BAU³</div>	<div>2.71%</div> <div>below BAU³</div>	<div>9%</div> <div>below BAU³</div>
Net Zero carbon target	Committed to Net zero carbon emissions by 2050	No explicit target communicated	No explicit target communicated	Committed to Net zero carbon emissions by 2050
Carbon Tax (Price)	<div>×</div>	<div>✓</div> <div>~USD 2/tCO₂e</div> <div>with limited scope for coal power plants</div>	<div>×</div>	<div>×</div>

✓

Piloting

×

Under review

ASEAN governments are balancing economic development with decarbonization; and are at different stages of commitment

- Big differences in GHG emission targets across countries
- Indonesia piloting carbon tax with limited scope for coal power plants
- Malaysia and Vietnam as the only ASEAN countries committed to reach Net zero by 2050

1. 46Mtpa of announced new steel expansion projects (before 2030) comes from these countries
 2. According to NDCs (nationally determined contributions) to support the Paris Agreement ambition
 3. Business as usual scenarios include emissions from land use, land use change, and forestry (LULUCF)

Winning will require ASEAN steel players to act across three main axes

1 Optimize supply chain and ensure strategic material security of supply

... to counter the impact of structural supply chain challenges and short-term volatility becoming the new normal

2 Combine the best of traditional improvement levers with end-to-end digital enabled transformation

... to strengthen business profitability and the technology enablement of green field projects, while also transforming existing assets pulling lean, digital and sustainability levers across the entire organization

3 Identify and co-develop fit-for-ASEAN low-CO₂ steel technology opportunities

... to improve energy efficiency, adopt green energy sources, and implement technology changes for achieving the longer-term decarbonization targets



1: Rethinking supply chain to secure high quality stock and protect against commodity pressure



Potential partnership

Backwards integration

Long-term supply contracts & partnerships

Green partnerships

Description

Traditionally aimed at **securing supplies of raw materials** (e.g., met coal and iron ore) and **leveraging their value pools**

In the current context, can be leveraged to **reduce exposure to raw materials price volatility**

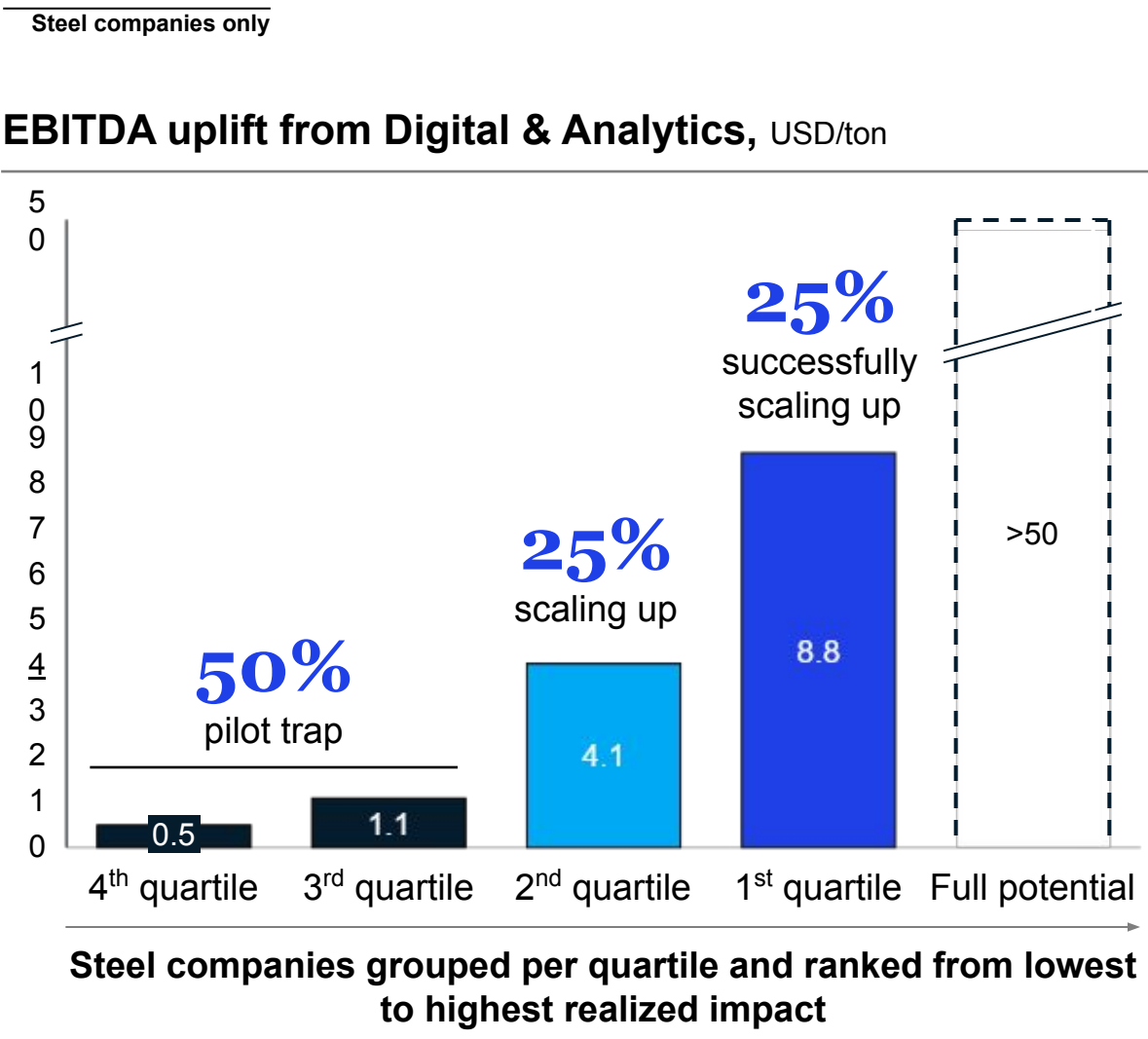
Supply contracts to **stabilize EBITDA and secure sales volumes**. Synchronization of supply and customer contracts (facilitated if there is backward integration)

Interaction with OEM, construction and tech customers to **secure customer networks and create customized offers**

Strategic partnerships to address sustainability, ESG and circularity:

- **New green technologies** (JV with raw material suppliers and R&D)
- **Partnerships with energy industry** to supply steel for green energy projects




2: Half of the steel companies got stuck in a digital transformation “pilot trap” due to 3 key themes of challenges



1. Based on McKinsey DTS survey results
Source: McKinsey Survey Digital in Metals (06/2020), McKinsey DTS survey results

Top 5 challenges of digital transformations		
Based on top 3 obstacles identified ¹ , %		
<div>Business</div> <div></div>	Full deployment cost is too high	44
	Lack of short-term benefit	44
	Value from pilot is unclear	41
<div>Organization</div> <div></div>	Lack of talent and knowledge	45
<div>Technology</div> <div></div>	Lack of confidence in scalability of IoT architecture	27

2: Steelco's across the world are scaling their “triple” digital transformation across Business – Organization – Technology

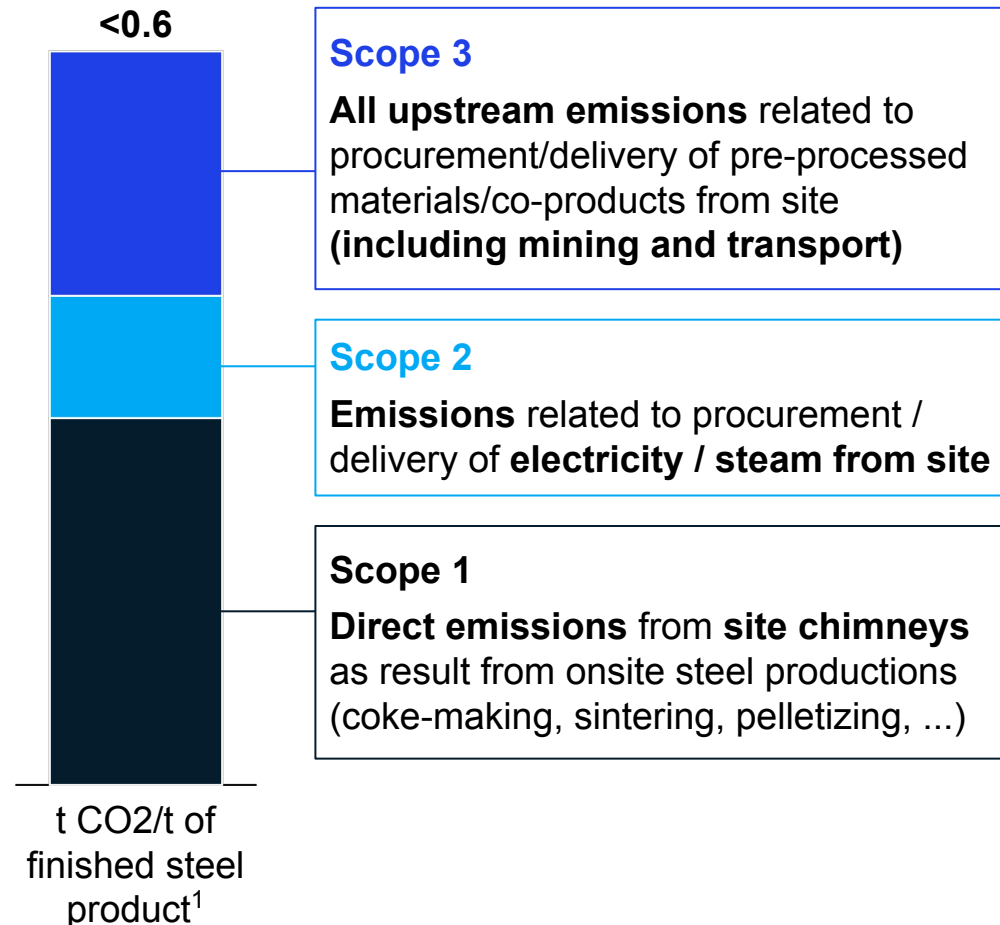
Category	Solution space					
Business 	Grow Revenue (Digital M&S + digital R&D)		Reduce Cost and Improve Throughput			Optimize Cash
	Digital M&S	Digital R&D	Digital procurement	Digital manufacturing	Back-office process digitalization	Digital supply chain/ inventory
	Sample use cases Digital-enhanced sales decisions via “real-time” margin visibility		Stabilization/ optimization of yield, energy and quality via smart sensors			Usage of digital twins through stochastic simulation & product traceability (Cell DNA footprint)
Organization 	Valuable use cases “The soul”		Performance infrastructure “The brain”			Financial transparency “The eye”
	Mindset & behavior change “The heart”		Digital capability building “The muscle”			Agile organization “The yogi”
Technology 	Data infrastructure “The blood”		IIoT technology “The skeleton”			Tech ecosystem “The community”

3: Steel producers can pull a range of levers to reduce CO₂ emission across scope 1-3

CO₂ threshold for low carbon steel



Example decarbonization levers



Improve sourcing of inputs (e.g., improve transport scheme)
Source from suppliers with lower carbon footprint (e.g., mines)
Switch to inputs with low(er) carbon content

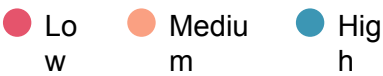
Source 100% “green” energy for production

Improve energy efficiency of existing production
Employ CO₂-reduced production methods

Most feasible levers for ASEAN players

1. First finished steel product in value chain (e.g., Hot rolled coil for flat steel players)

3: ASEAN players have to identify fit-for-ASEAN low-CO₂ steel technology opportunities



Key local requirements for at scale adoption of decarbonization technology¹

Technology	Requirement	Applicability in ASEAN
NG-DRI+EAF+CC(U)S	Access to cheap NG	● Medium
	Access to CO ₂ storage	● Medium
H2-DRI+EAF	Available RES	● High
BF-BOF+CC(U)S	Access to CO ₂ storage	● Medium
	Relatively low CO ₂ price	● High
Biomass usage	Available non-food biomass	● Low
	Access to CO ₂ storage	● Medium
Scrap EAF	Available scrap	● Low
	Available RES	● High

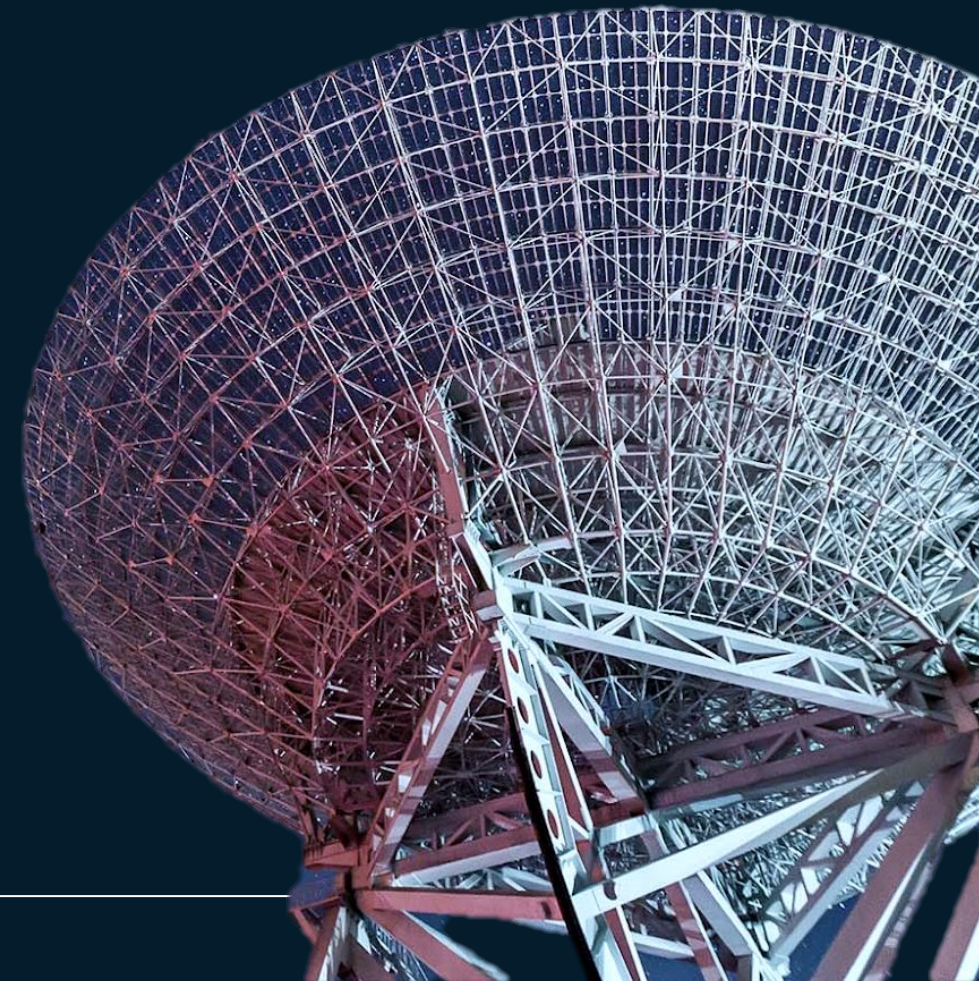
Given the high focus on investment projects until 2030, ASEAN players can consider more feasible technologies as following

- **NG-DRI+EAF+CC(U)S** due to access CO₂ storage and relatively cheap NG
- **H2-DRI+EAF** due to the availability of RES
- **BF-BOF+CC(U)S** due to relatively low CO₂ price and adequate access to CO₂ storage

1. Excluding requirements such as e.g., political support and capex; 2. CC(U)S efficiency at reducing scope 1 emissions is roughly 60%

Key takeaways

- 1** Optimize supply chain and ensure strategic material security of supply
- 2** Combine the best of traditional improvement levers with end-to-end digital enabled transformation
- 3** Identify and co-develop fit-for-ASEAN low-CO₂ steel technology opportunities



Thank You

