



Vietnam Steel Association

Overview of Vietnam iron and steel sector towards a decarbonization pathway

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Vietnam Steel Association

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Vietnam steel sector introduction

Vietnam's crude steel production in 2022

Since the first batch of cast iron at TISCO (November 29, 1963), up to now, Vietnam has become a major steel producer in terms of crude steel production.

According to WSA, Vietnam's crude steel production reached nearly 20 million tons, ranked No. 1 in Southeast Asia and 13th in the world in 2022;

TT	Country	2022	2021	2022/2021 (%)
1.	China	1,013.0	1,034.7	-2.1
2.	India	124.7	118.2	5.5
3.	Japan	89.2	96.3	-7.4
4.	United States	80.7	85.8	-5.9
5.	Russia (e)	71.5	77.0	-7.2
6.	South Korea	65.9	70.4	-6.5
7.	Germany	36.8	40.2	-8.4
8.	Turkey	35.1	40.4	-12.9
9.	Brazil	34.0	36.1	-5.8
10.	Iran	30.6	28.3	8.0
11.	Italy	21.6	24.4	-11.6
12.	Taiwan, China (e)	20.6	23.2	-11.2
13.	Viet Nam (e)	20.0	23.0	-13.1

Unit: million tons

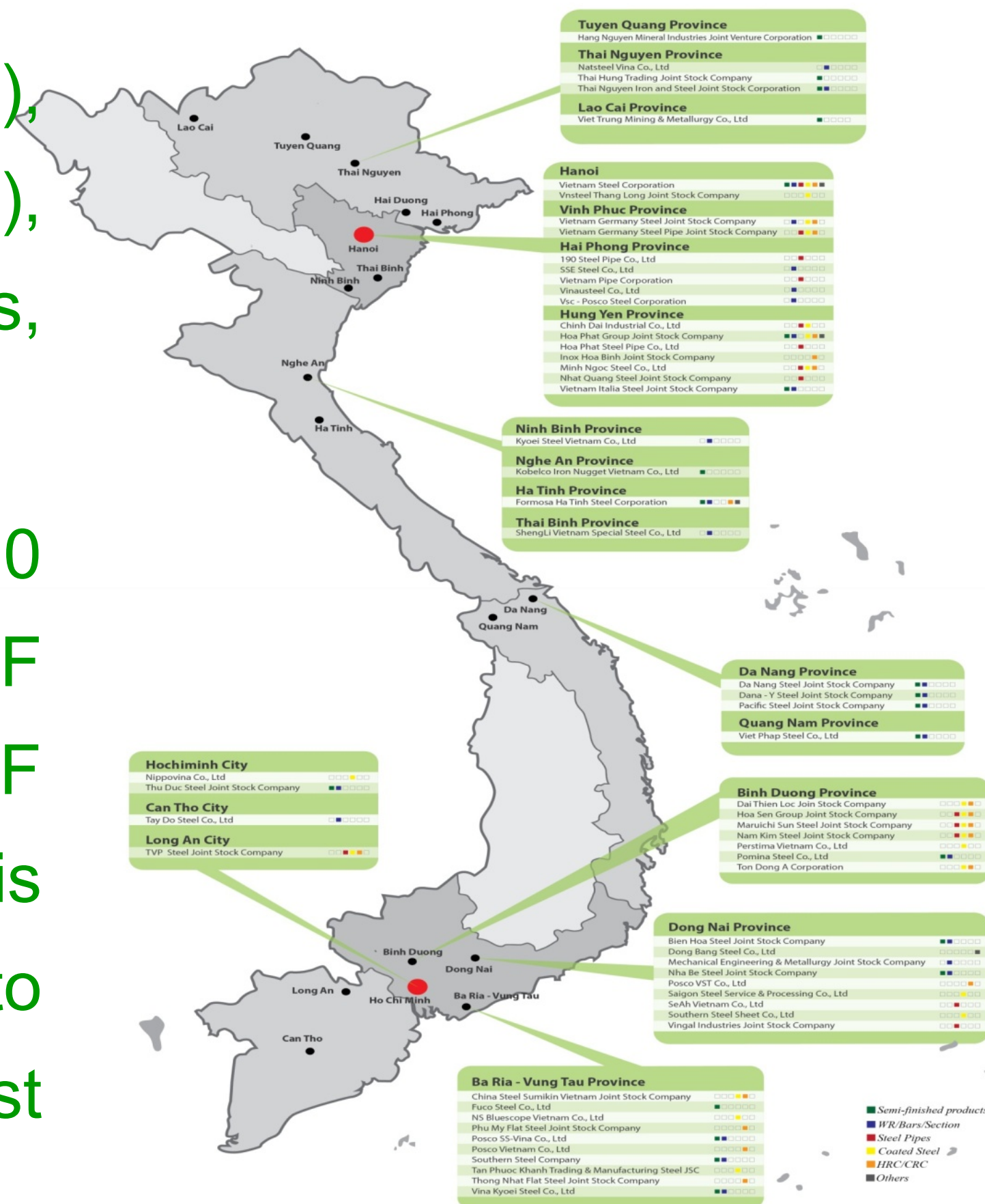
(Source: WSA)



Vietnam's steel sector introduction

Steelmaking BF-BOF (max 4350 m3), EAF (max 120 tons), IF (max 50 tons), continuous casting of billets, rolling lines, processing with advanced technology.

In 2022, Vietnam produces nearly 20 million tons of crude steel, of which BOF steel is about 13 million tons and EAF steel is nearly 7 million tons. With this output, the steel industry is expected to emit about 38-40 million tons of CO2 last year.

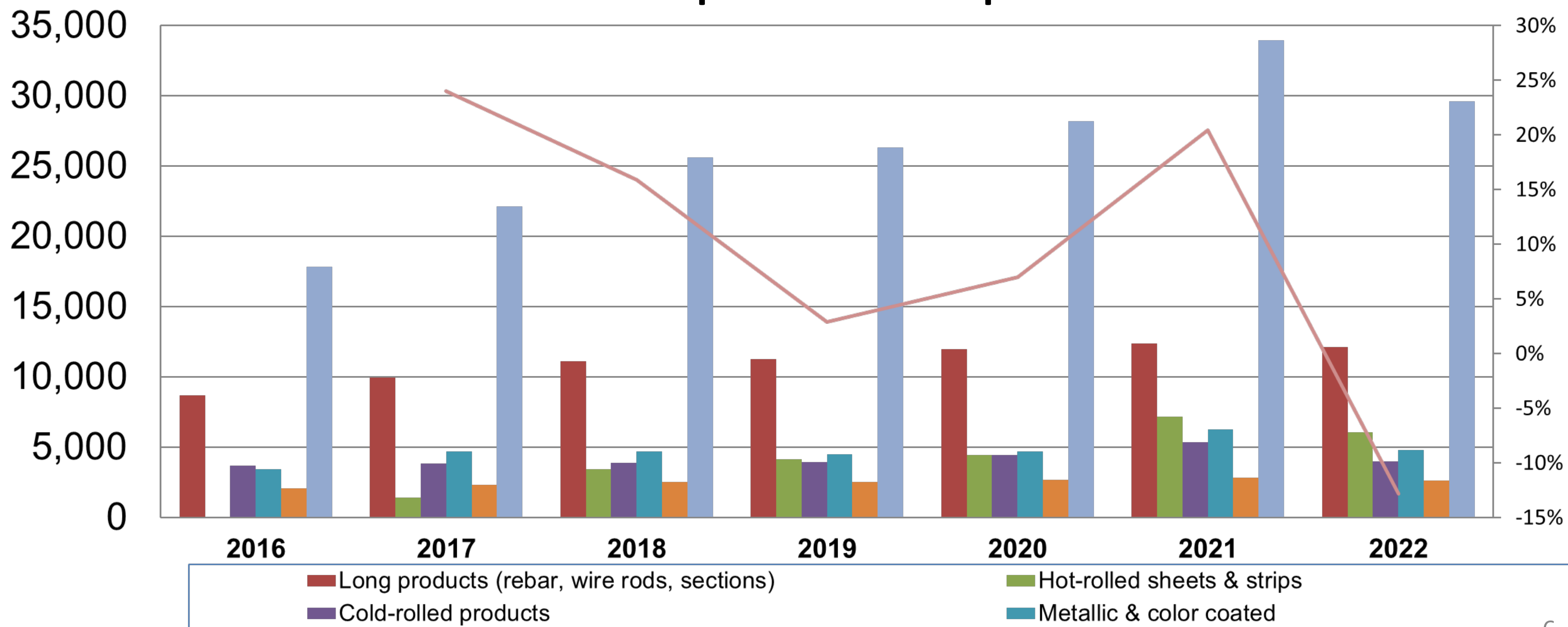




Vietnam steel sector introduction

In 2022, Vietnam's finished steel production of all kinds reached 29.3 million tons, down 11.9%.

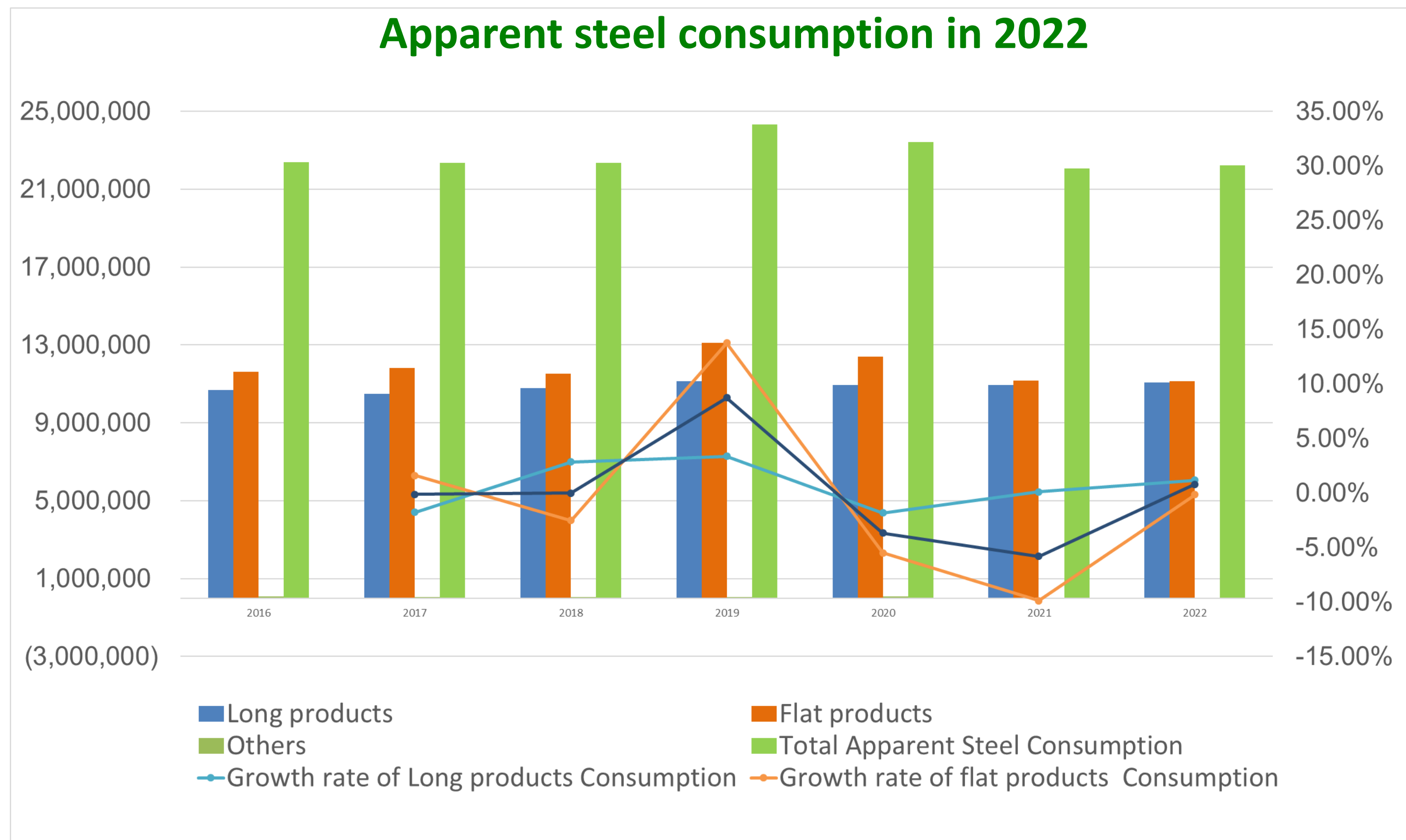
Finished steel production output in 2022





Vietnam steel sector introduction

❖ Consumption reached 22.2 million tons, up 0.9% y-o-y.





Vietnam steel sector introduction

Import/export of steel

Export: In 2022, Vietnam exported about 8.397 million tons of steel of all kinds, down 35.85% over the previous year. Export value reached 7.99 billion USD, down 32.2% compared to 2021.

Vietnam's main export markets by export turnover:

ASEAN (36.22%),

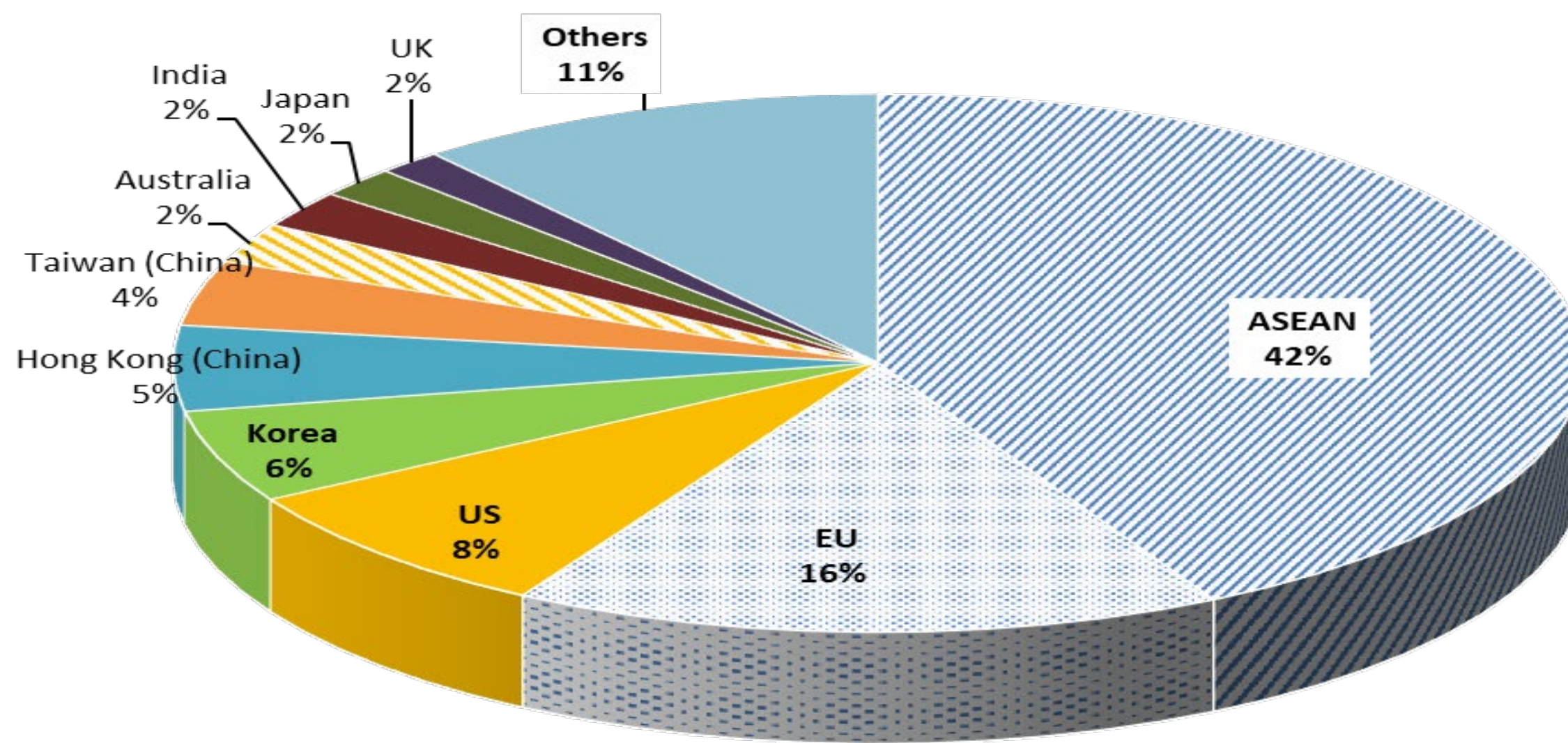
EU (18.37%),

United States (10.57%),

Korea (6.8%)

Hong Kong (4.1%).

**TOP 10 VIETNAM'S STEEL EXPORT MARKETS
IN 2022**



(Source: VITIC, VSA, share of export by output)



Vietnam steel sector introduction

Import/export of steel in 2022

Import: In 2022, imports of finished steel products of all kinds to Vietnam are about 11,679 million tons with a value of more than 11.92 billion USD, down 5.62% in volume but increasing 3.04% in value compared to 2021.

(Source: VITIC, VSA)

Country	Year 2022		Share (%)	
	Volume (tons)	Value (1,000 USD)	Volume	Value
Total	11,679,503	11,920,179	100.00%	100.00%
China	5,096,789	4,964,240	43.64%	41.65%
Japan	1,915,161	1,795,288	16.40%	15.06%
Korea	1,231,719	1,462,917	10.55%	12.27%
Taiwan (China)	1,170,392	1,053,585	10.02%	8.84%
India	1,061,851	774,686	9.09%	6.50%
ASEAN	652,849	1,314,887	5.59%	11.03%
Russia	271,350	227,546	2.32%	1.91%
Australia	99,731	69,905	0.85%	0.59%
Brazil	75,948	61,577	0.65%	0.52%
EU	24,457	104,105	0.21%	0.87%





Vietnam steel sector introduction

Forecast

- ❖ Vietnam is a developing country with an expected population of 104 million by 2030; Steel consumption per capita is currently at 240 kg/person and is expected to increase to 290 kg/person by 2030.
- ❖ The steel market will increase demand for steel in manufacturing, high strength steel, stainless steel and diversified in steel shapes, sizes and grades.
- ❖ It is forecasted that Vietnam's total steel demand in 2030 is 30-32 million tons.



Decarbonization trend in iron and steel sector

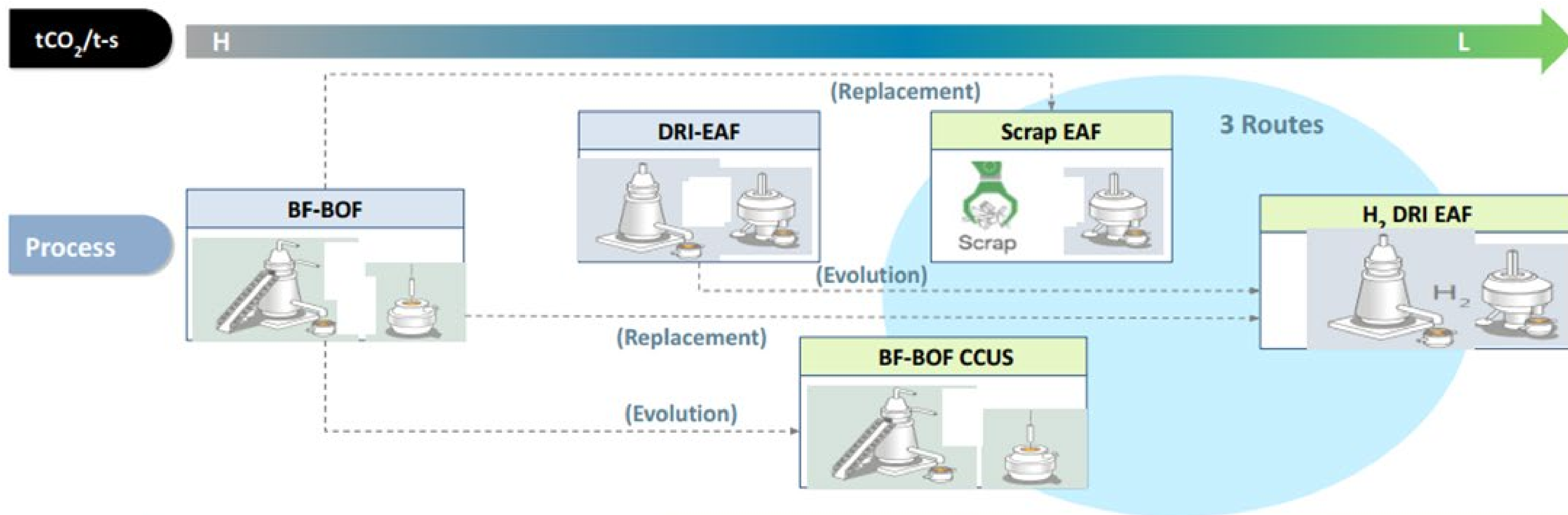
Global iron and steel in decarbonization trend

- Coal contributes to about 70% of global steel production (2022: 1.878 billion tons);
- CO₂ emissions from production are higher than steel output (about 2 tons CO₂ / 1 ton);
- The steel industry's CO₂ emissions account for about 7-9% of global emissions (3.7 billion tons of CO₂);
- We still can not replace all steel producing materials, forecasted demand in 2050 is about 2.2 billion tons;
- Carbon-free steel production requires huge amounts of green energy, and enhancing green energy production requires huge amounts of steel.



Decarbonization trend in iron and steel sector

Low-carbon steel production technologies



	BF-BOF	DRI-EAF	BF-BOF CCUS	Scrap EAF	H ₂ DRI EAF
KSF	Facilities going bigger and consolidated	Natural gas procurement cost	Economic feasibility for CCUS tech. (power use, capture rate)	Scrap sourcing cost, thin-slab casting & rolling	Green energy procurement, operation efficiency, & unit scale-up
Future issues (Competitive edge)	Carbon tax, Coal price volatility	Carbon tax, NG price volatility	Commercial feasibility, CO ₂ removal rate	Stable supply of renewable E., Limit in high-end steel quality	Stable supply of DR pellet, Limit in 100% H ₂ operations

Decarbonization trend in iron and steel sector

STAGE-BY-STAGE APPROACH

1. Period 2021-2025 (reduce 10-30% CO₂): Optimization

- Optimization of processing;
- Optimization of Energy;
- Optimization of technology;
- Optimization of raw materials (scrap).

2. Period 2025-2030 (reduce 30-40% CO₂): Transition

- Transition to low-carbon fuels;
- Increase the amount of H₂ in the sponge iron factory to 30%;
- H₂ injection into blast furnace/iron pellets/electric arc furnace (EAF);
- Continuous production process;
- Hybrid flexible steel mill;
- Launch of carbon capture, use, storage and recycling (CCUS) model;
- Make use of low quality ore.



Decarbonization trend in iron and steel sector

- 3. Period 2030-2050 (reduce 70-90% CO₂): Green steel**
 - Limit the use of direct carbon;
 - Sponge iron factory using green energy (H₂);
 - Electric arc furnaces using green energy (renewable electricity);
 - Enhance the implementation of CCUS.

Source: "Challenges of the steel industry" presented by Primetals Technologies at VSA's Conference on July 1, 2022 in Da Nang



Decarbonization trend in iron and steel sector

Actions of VSA and VSA member enterprises to reduce emission

- Comply with the provisions of the law (Environmental protection, Decree 06/2022/ND-CP, Decision 01/2022/QD-TTg, National strategy on climate change...) and commitment of Vietnam at COP26;
- Technology optimization, energy saving, digital transformation, application of carbon emission reduction technology (residual heat generation, cup dry stamping, continuous rolling casting...);
- Strengthening international cooperation (ASEAN-Japan Steel Initiative, SEAISI, CISA, KOSA, TISA, JISIF, WSA, Steel Committee of OECD...) and domestic cooperation (VSA-VFMSTA, VSA-HUST...) to researching, updating, applying BAT and the latest technologies for the steel industry.





CBAM impacts on steel sector in Vietnam

- ❖ EU is one of the export markets for Vietnamese steel products. In 2022, the total amount of Vietnam's steel exports is about 8.4 million tons, the EU accounts for 16% (about 1.3 million tons), CBAM will directly affect the export of Vietnamese steel products to the EU.
- ❖ VSA thanks the ETP for organizing this consultation workshop in which VSA and Vietnamese steel enterprises have the opportunity to access information and solutions related to the impact of CBAM on Vietnam's steel industry.



Our recommendation regarding CBAM

1. There should be CBAM guidelines, encouraging businesses to apply strategies/action plans to respond to CBAM. At the same time, there should be an appropriate solution on trade remedies in accordance with WTO regulations

- Actively responding to CBAM will promote Vietnam's steel exports to Europe.
- In Korea and Japan, the question of whether CBAM violates WTO rules is being raised.

2. Simplify the procedure for receiving and reporting data related to CO2 emissions

When CBAM is in place, EU importers must collect information regarding carbon emissions from exporters and report them to EU authorities. This procedure is very difficult and can potentially become a barrier. (Korea is trying to consider measures to simplify this procedure).

3. There should be a detailed guidance document on how to verify carbon emissions and submitting data to entities related to CO2 emissions

(Comments and opinions from VSA's members)





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