

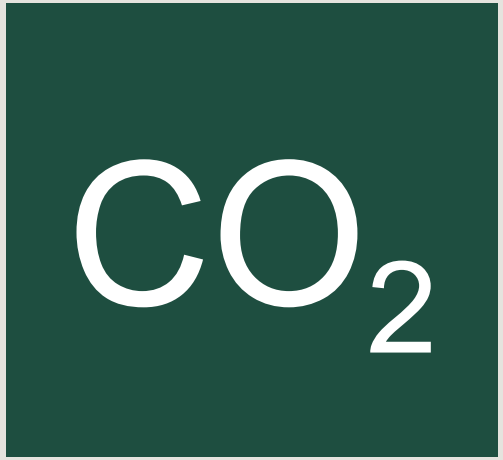
Transforming the future of steel

Mark Larsen
SSAB Europe

The need for change



Why change?



Global warming is primarily caused by carbon dioxide **from fossil fuels**



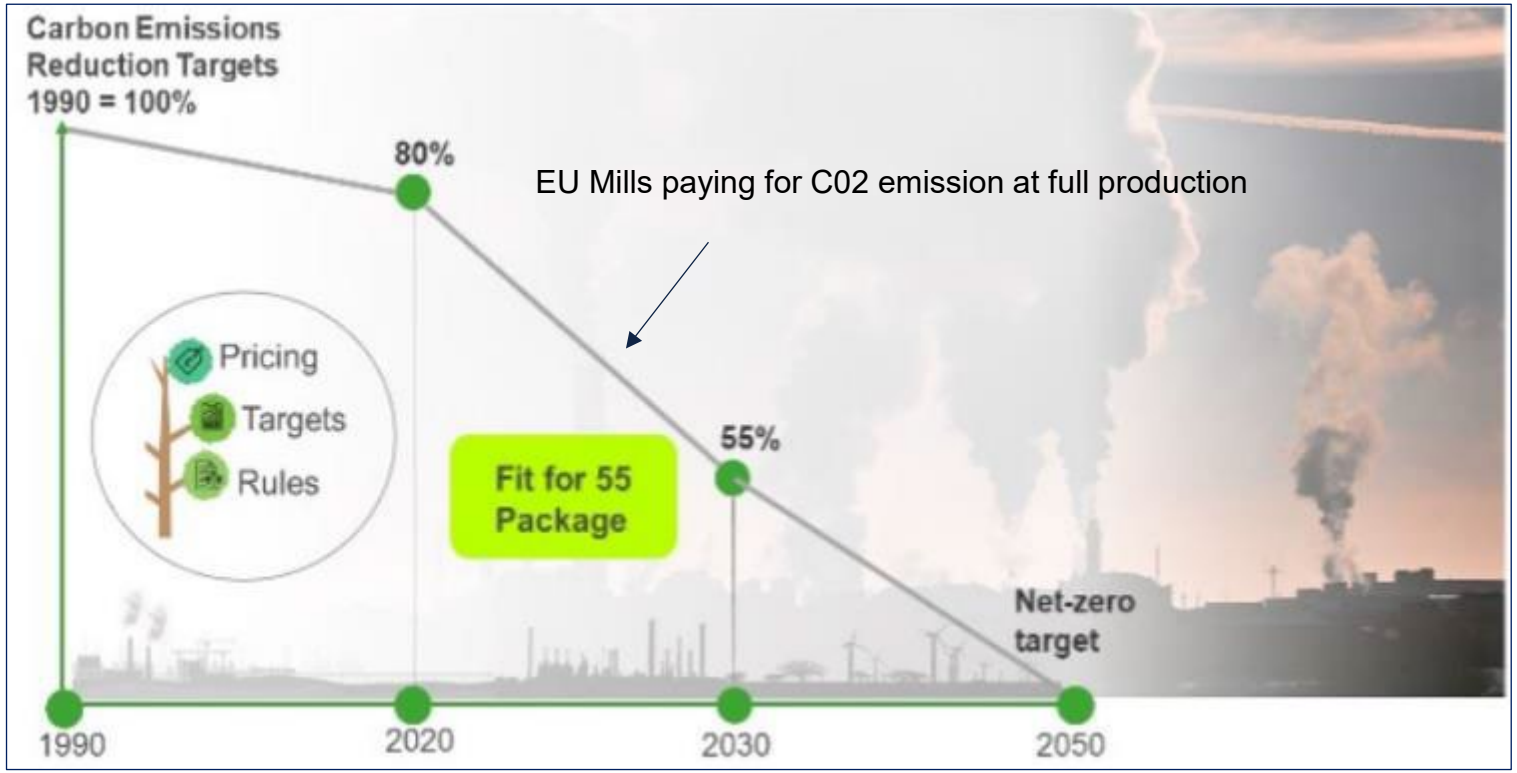
The **steel industry** accounts for 7% of global carbon dioxide emissions, making it one of the **largest single industrial CO_2 emitters**

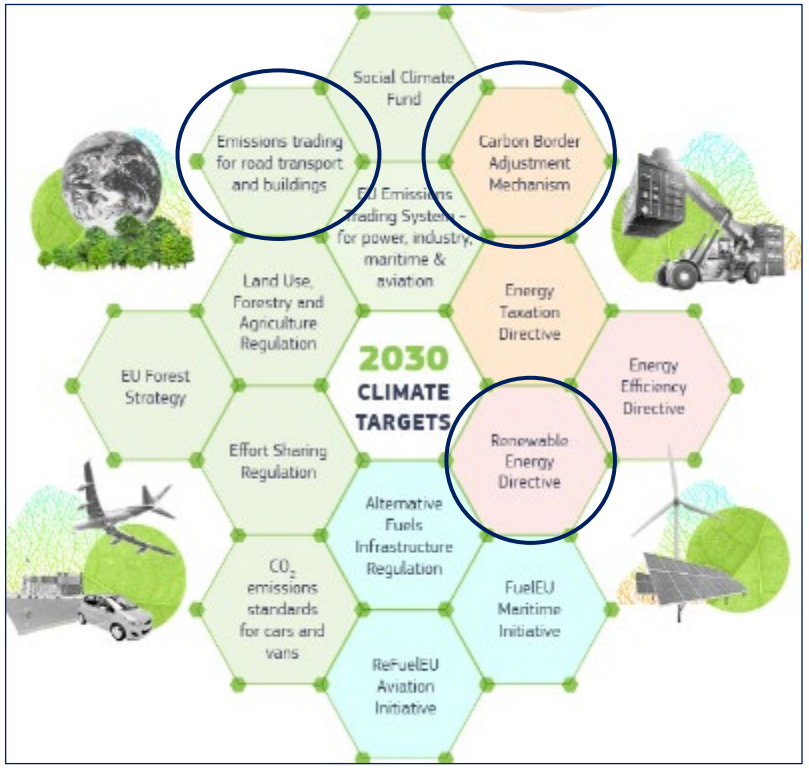


The growing **world population** is leading to demand for **new infrastructure.** And resource scarcity

EU´s Fit for 55: Delivering on the European Green Deal

- Stricter revisions to several directives
- Phasing out Free allowances
- Introduction of the CBAM (Carbon Border Adjustment Mechanism)





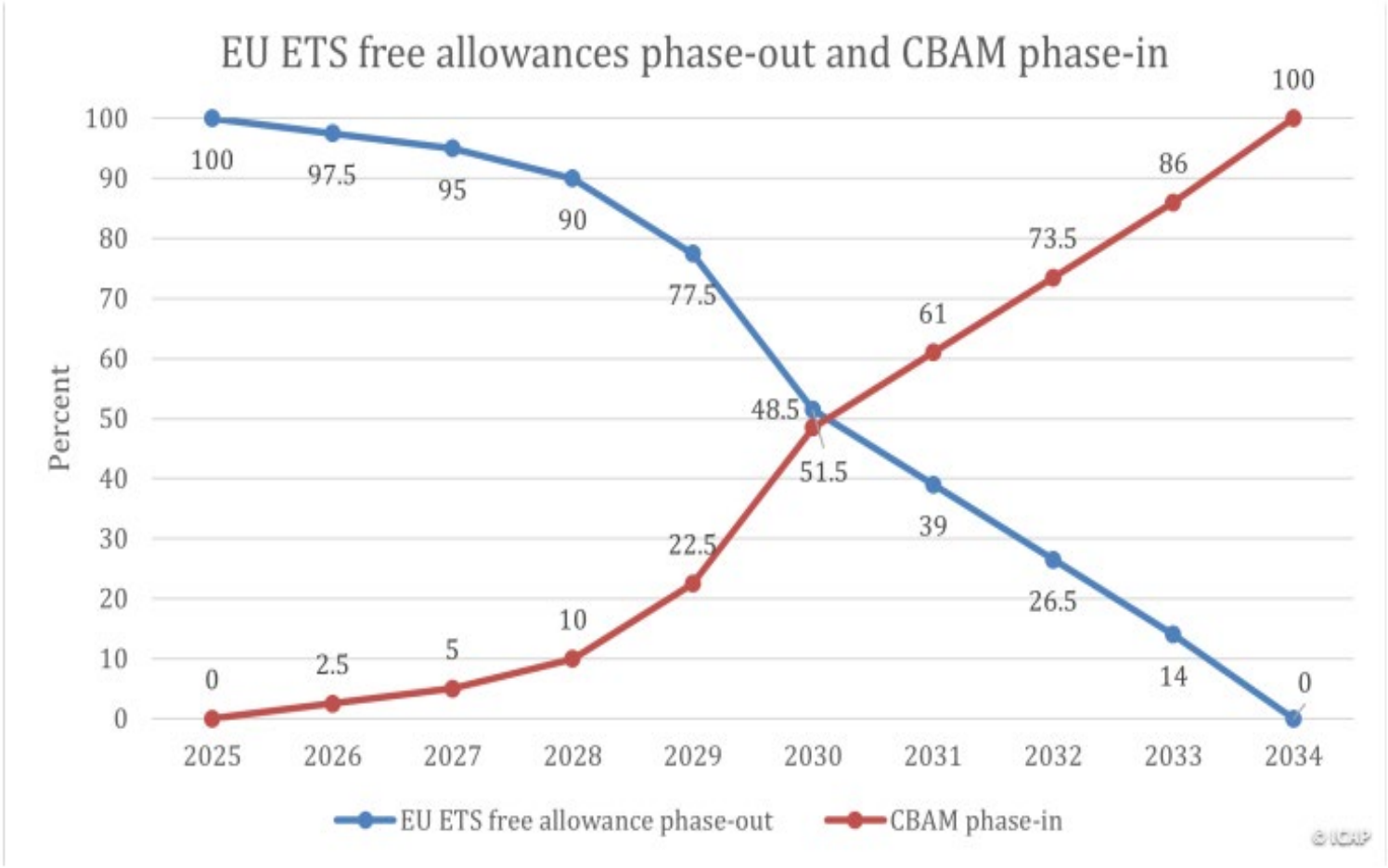
Co2 emissions rights – price development



Source; Trading Economics

- **Ca 70-80 EUR/ton in 2025**
- CRU estimate a price range of **€150/ton** towards 2034[1]

Proposed ETS (Emission Trading System) revisions aim for quicker emission reductions and phasing out of free allowances



In 2034 EU Steel Mils will pay for ALL C02 emission

In 2034 imported steel will be ”taxed” with C02 emission Tax

According to ETS system

CBAM (Carbon Border Adjustment Mechanism)

Scarcity of allowances and high CO_2 price incentivizes participants to reduce their emissions or invest in low-carbon technologies

EU ETS free allowances phase out trajectory for 5 main steel products, (Mt of EUA carbon permits available)

Period	Hot metal production	Iron ore sintering	Met coke production	= BF output	EAF carbon steel	EAF high alloy steel	Reduction vs. Reference
2021-2025	1.288	0.157	0.217	**1.662**	0.215	0.268	
2026	1.256	0.153	0.212	**1.621**	0.210	0.261	-2 %
2027	1.224	0.149	0.206	**1.579**	0.204	0.255	-5 %
2028	1.159	0.141	0.195	**1.495**	0.194	0.241	-10 %
2029	0.998	0.122	0.168	**1.288**	0.167	0.208	-23 %
2030	0.663	0.081	0.112	**0.856**	0.111	0.138	-49 %
2031	0.502	0.061	0.085	**0.648**	0.084	0.105	-61 %
2032	0.341	0.042	0.058	**0.441**	0.057	0.071	-74 %
2033	0.180	0.022	0.030	**0.232**	0.030	0.038	-86 %
2034	0	0	0	**0**	0	0	-100 %

Source: EC, S&P global, Market Intelligence Team analysis

The HYBRIT technology



PUBLIC

Creating a fossil-free value chain

Electricity from Vattenfall

Supplying SSAB with electricity from fossil-free energy sources



Iron ore and pellets from LKAB

Fully fossil-free sponge iron production from mine to iron

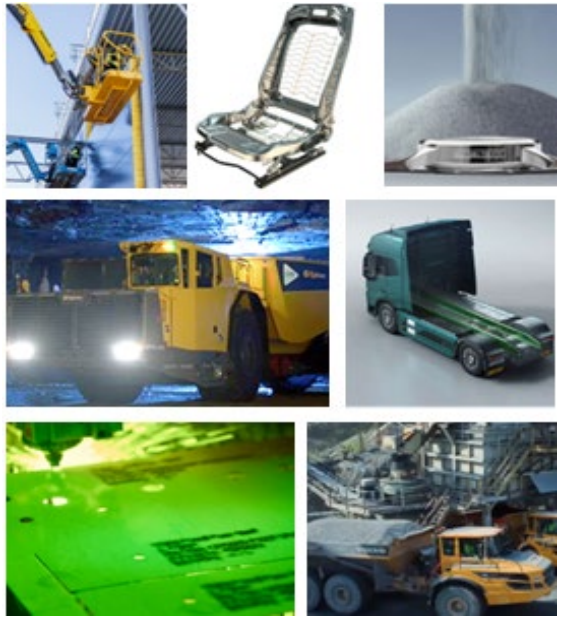


Steel from SSAB

Production of fossil-free steel based on HYBRIT® technology



Products



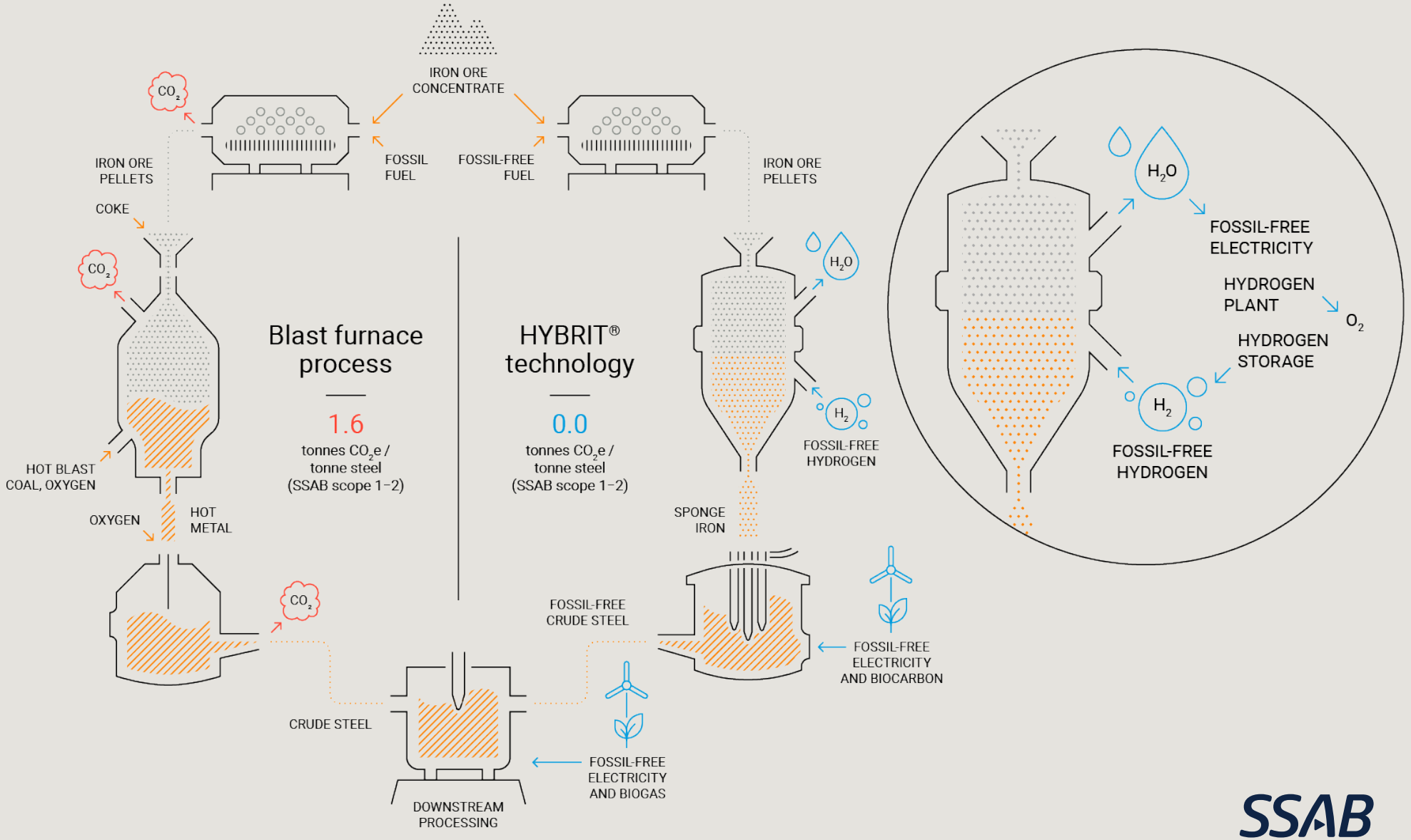
SSAB

HYBRIT® technology

Fossil-free electricity makes hydrogen from water with electrolysis.

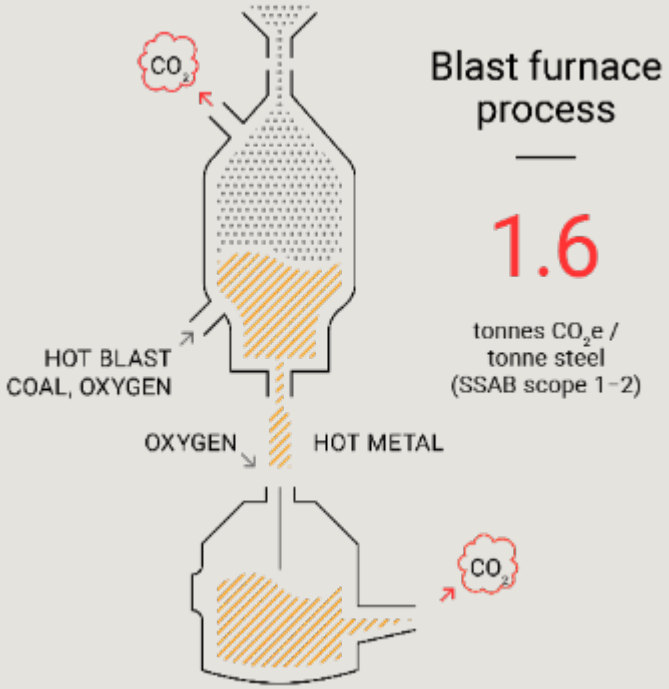
The hydrogen is used in the ironmaking process generating water as a by-product.

The water is used to make hydrogen again.



Energy efficient

Energy consumption per tonne of crude steel in SSAB production.



Blast furnace process

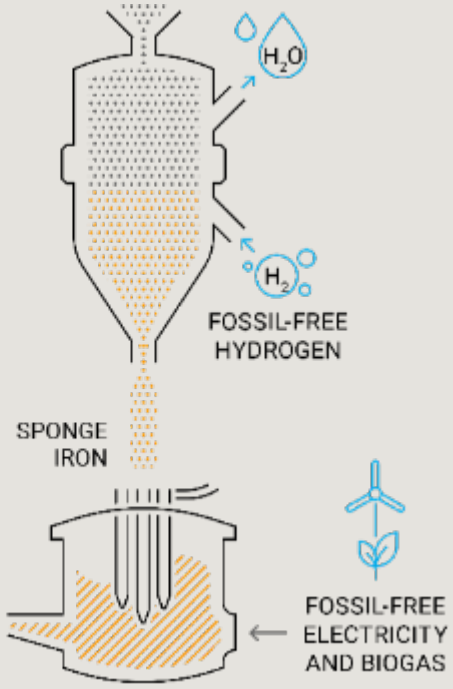
1.6

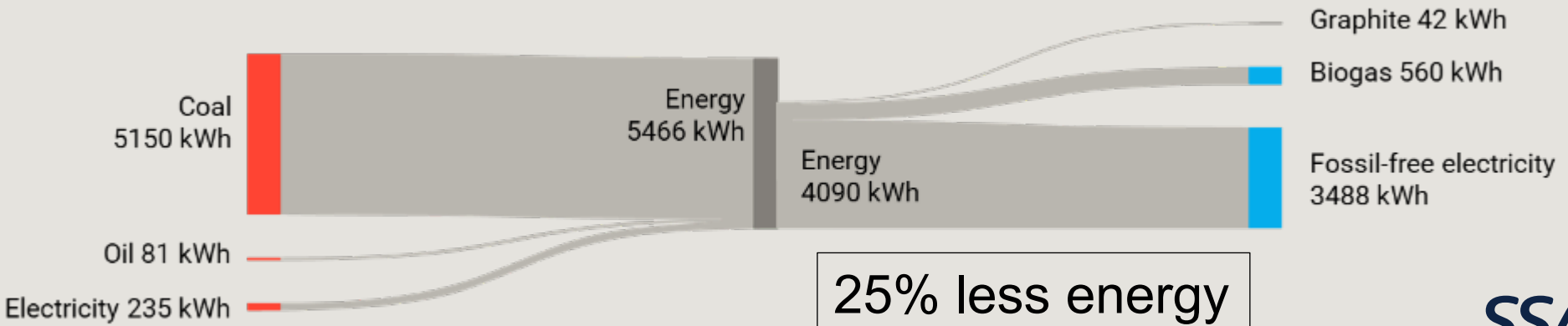
tonnes CO_2e / tonne steel (SSAB scope 1–2)

HYBRIT® technology

0.0

tonnes CO_2e / tonne steel (SSAB scope 1–2)





25% less energy

SSAB

The world’s first fossil-free steel



The HYBRIT pilot plant in Luleå, Sweden was inaugurated in 2020.



On August 18, 2021, Swedish Minister for Business, Industry and Innovation Ibrahim Baylan signs the world’s first fossil-free plate, together with the CEOs of the three HYBRIT Development owner companies.

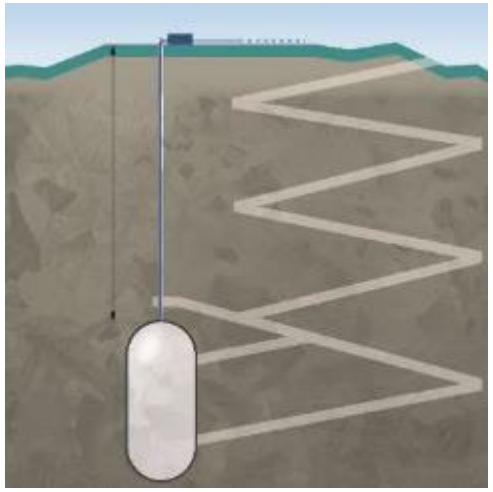
Hydrogen storage – for intermittant power generation

H2-storage pilot successfully commissioned

- Water pressure test up to 275 bar
- Compressed H2-gas up to 250 bar (designed pressure)

2-year test program started

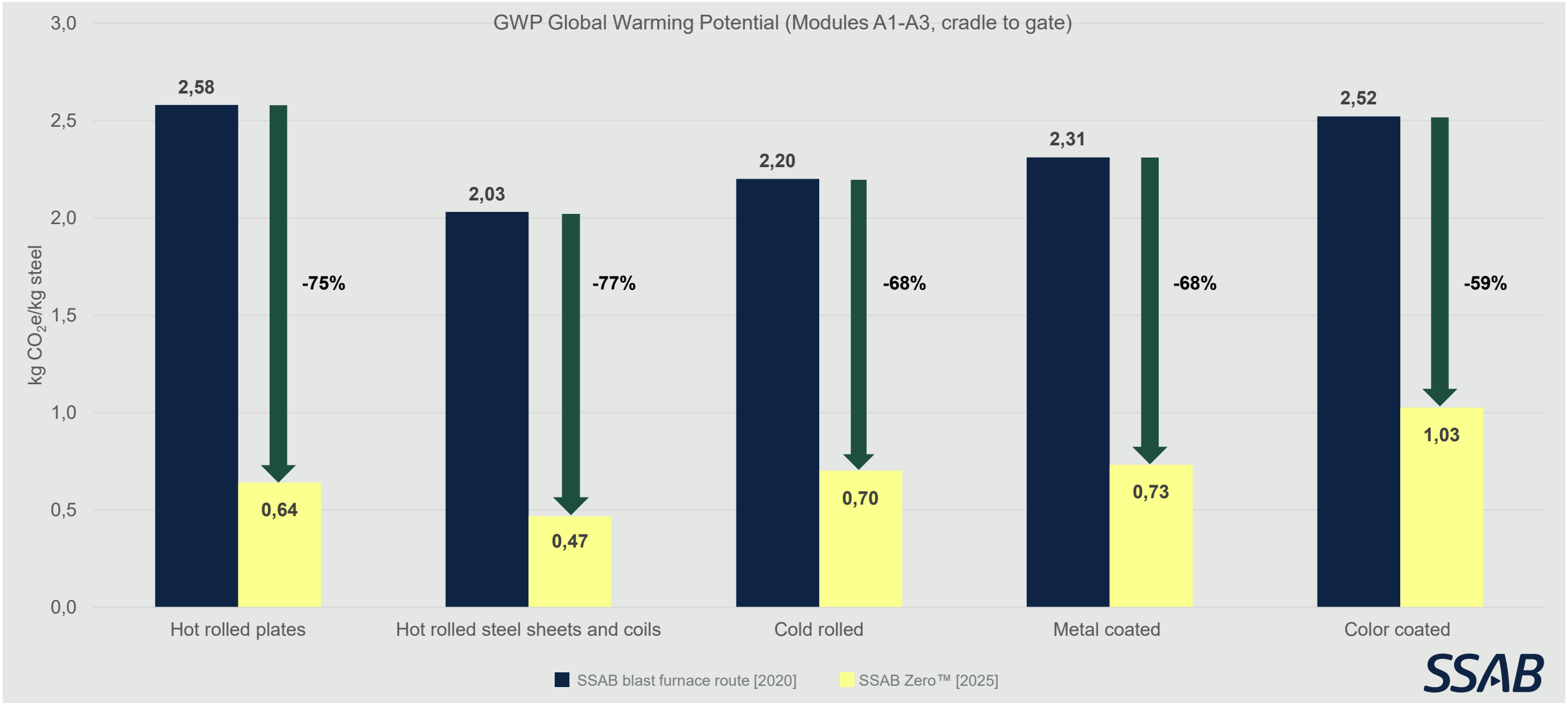
- Thereafter results will be evaluated







Significant reduction in carbon footprint – TODAY With SSAB Zero™



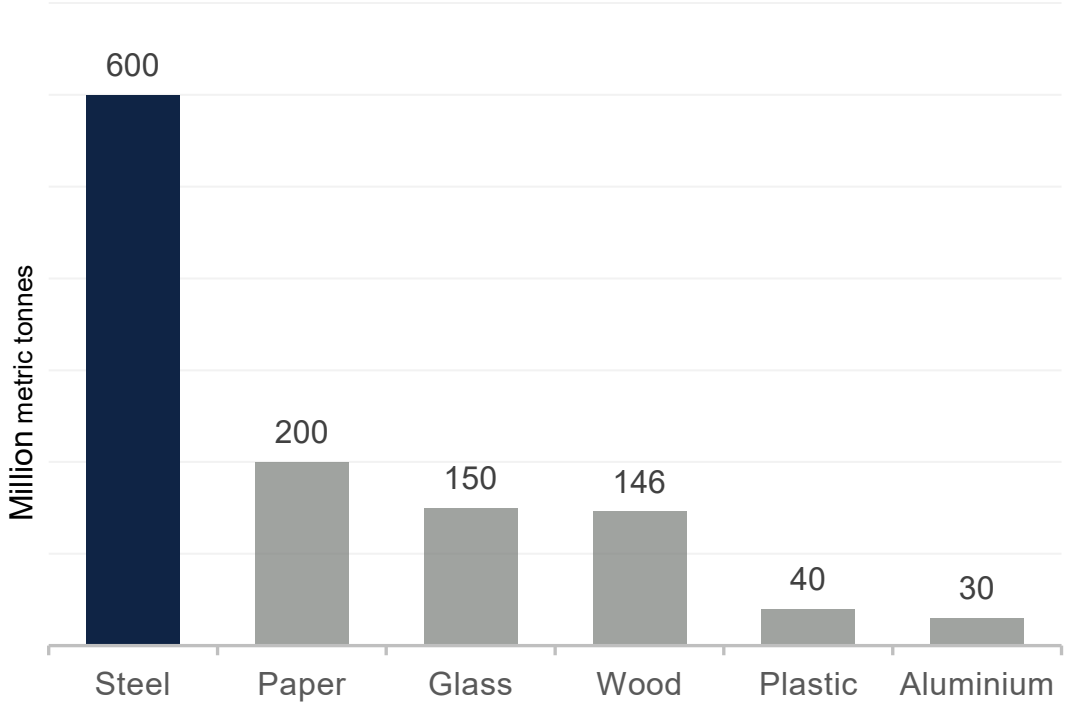


Same quality – zero emissions

- The mechanical properties of steel are created in the downstream processes and will remain the same as they are today.
- The only difference is using fossil-free fuels and electricity.

Steel is the world's most circular material

Amount of materials recycled globally





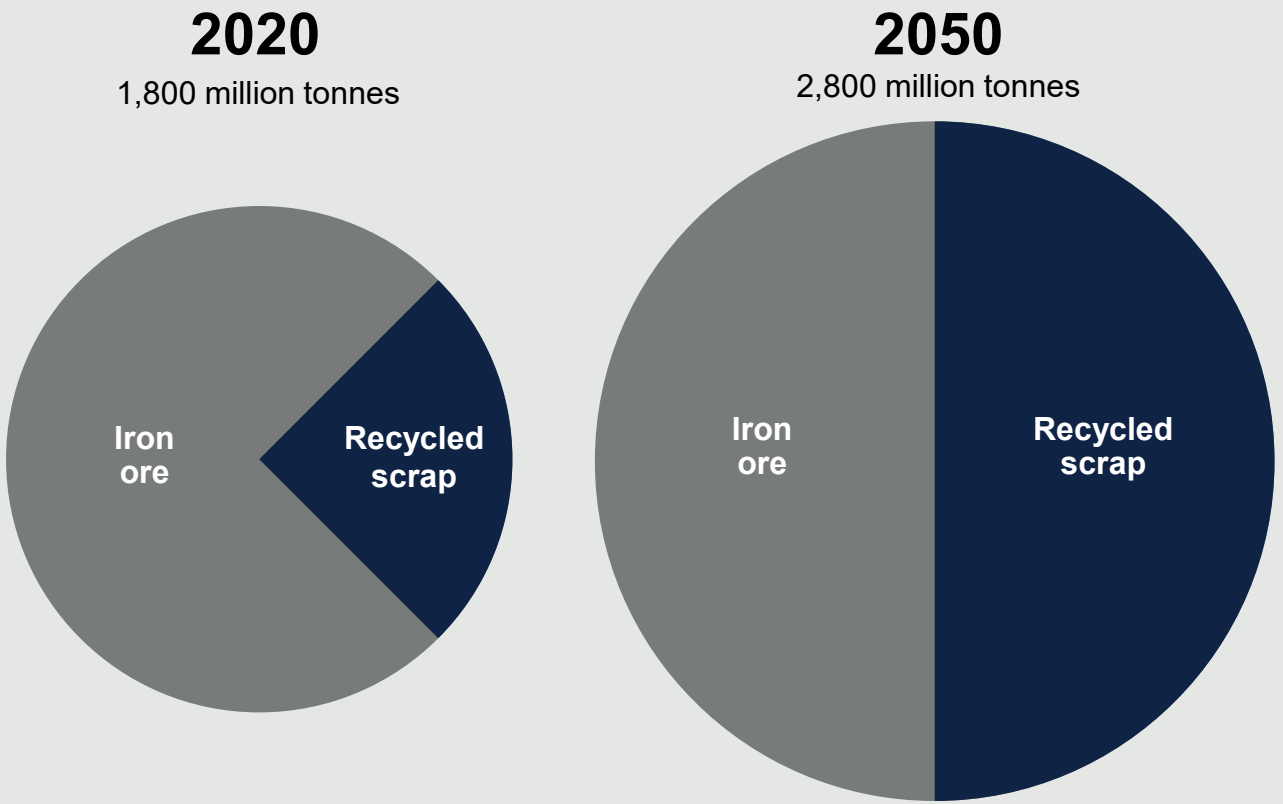
Did you know?

Steel is 100% recyclable indefinitely, without losing its properties or quality. The recycling rate is more than 85%


SSAB
TRANSFORMING
THE FUTURE
OF STEEL
SSAB
Transforming
the future
of steel
1204
SSAB
Transforming
the future
of steel
1211
SSAB
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The future needs both iron ore and recycled scrap

Development of steel demand



Source: Swedish iron and steel producers' association, Jernkontoret

ⓘ Did you know?

Steel is used in every aspect of our lives. It is critical for building society and infrastructure. The need for steel is growing in many sectors and industries

World’s first commercial fossil-free sponge iron

Integration with iron pellet making

- Transportation and logistics
- Electricity supply and energy optimization



ⓘ Did you know?

Capacity of 1.3 million tonnes of fossil-free sponge iron

Goal to expand production to 2.7 million tonnes by around 2030

New 1,5m Ton EAF in Oxelösund in 2027



- Going into production in 2027
- Closing down the coking plant and two blast furnaces
- New infrastructure for biofuels
- Expansion of scrap handling and efficient material logistics
- Rolling mill and Q&T lines remain
- Large site, ability to run new and old production system in parallel during transition period

4,5 bn EUR investment in Luleå 2028



2.5 M
Ton EAF and Hot Rolling Mill

1.3 M
Ton Cold Rolled & Coated Steel

0.0 CO2
Co2 emissions per ton steel

SSAB



New mini-mill in Raahe

Next step in our transformation

SSAB

SSABs Nordic transformation plan well under way

① Zero Steel

- Produce Zero steel in Iowa, USA
- Fossil-free pilot shipments continue

100-200 ktonnes CO_2 saved per year

Now ✓

② Oxelösund EAF

- Replace current blast furnaces and coke plant
- Melt scrap and HYBRIT sponge iron also in Europe

~1.5 million tonnes CO_2 saved per year

2026 ✓

③ Luleå mini-mill

- State-of the art mini-mill with hot rolling, cold rolling and coating
- Close current coal based system

~4 million tonnes CO_2 saved per year

2028 ✓

④ Raahe mini-mill

- Conversion to electric arc furnace based production
- Close current coal based system

~4 million tonnes CO_2 saved per year

Next

10 mio ton of C02 per year eliminated by 2030

SSAB

More than 65 fossil-free steel partners



Worlds first building with Fossil Free steel – in Lund, Sweden.





SSAB leverer SSAB Zero™ til Volvo Cars

- **High Strength Low Alloy** stål, (HSLA)
- SSAB Zero™-stål bruges i **strukturelle dele** af den fuldt elektriske **SUV EX60** samt i andre modeller baseret på næste generations SPA3-platform.
- **Volvo Cars er den første bilproducent, der bruger SSAB Zero™ i serieproduktion.**



Källa: SSAB



Peab
Enköping's Business Park in Enköping, Sweden

Industrial building potential savings

EPD	Steel ton	As-is tCO_2e/t	As-is tCO_2e	SSAB Zero™ tCO_2e/t	SSAB Zero™ tCO_2e
Plate	6	2.71	16.3	0.64	3.8
Cold rolled	266	2.34	622.4	0.70	186.2
Hollow sections	499	2.41	1202.6	*0.70	349.3
Outside SSAB scope	*50*	*2.40*	*120.0*	*2.40*	*120.0*
Total	**821**		**1961**		**659**

66% savings CO_2e

*Preliminary estimate

SSAB

Always request EPD´s - to ensure validity of emission data



SSAB

Oxelösund 2025




Transformation

Oxelösund 2025



Kran til EAF bygning 2026



EAF

