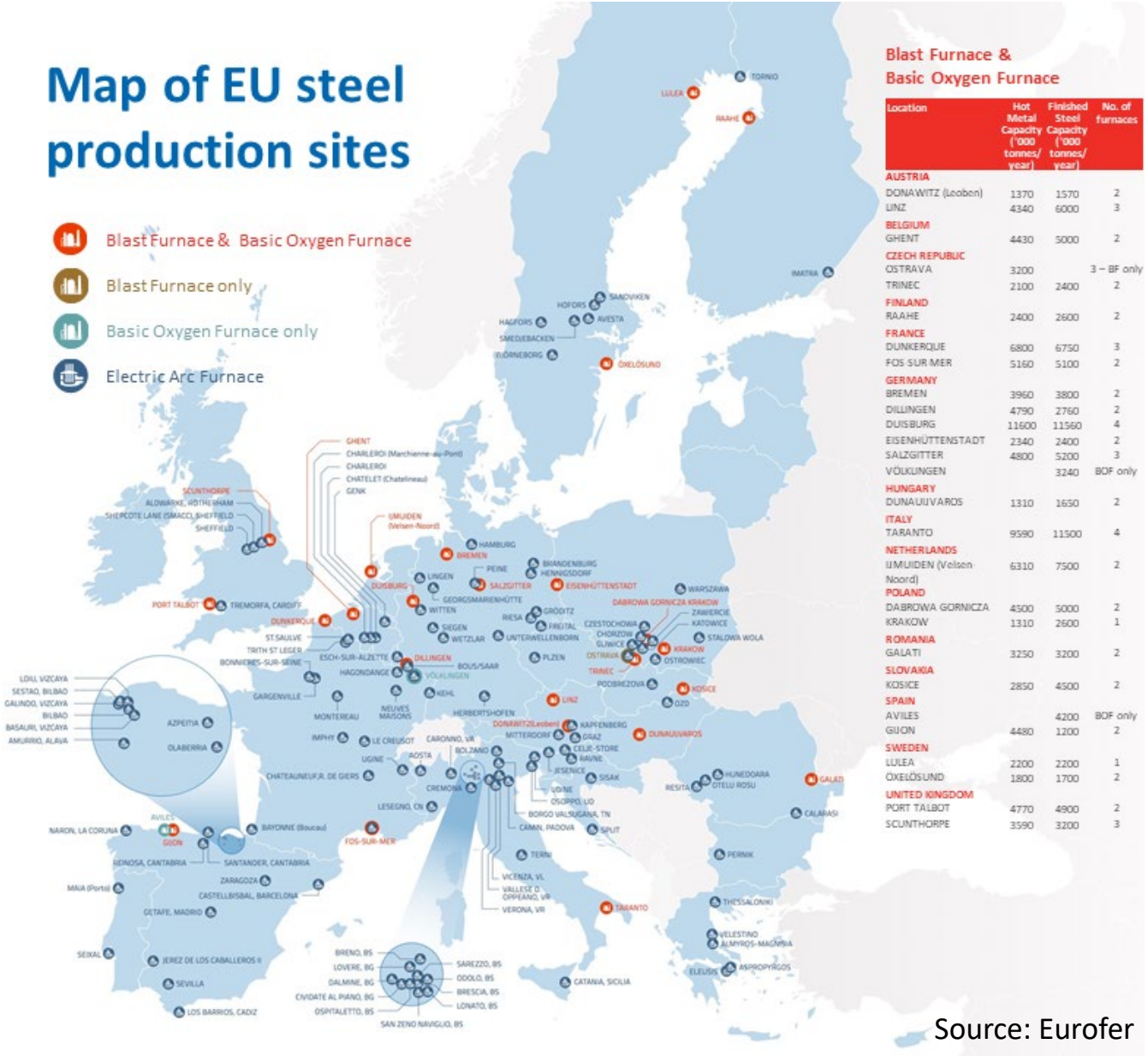
Decarbonisation of EU Steel industry

26th of October 2022

Hydrogen Europe

Why is decarbonisation of the steel sector important

Average GHG emission intensity is 1.9 tCO2 per tonne of crude steel



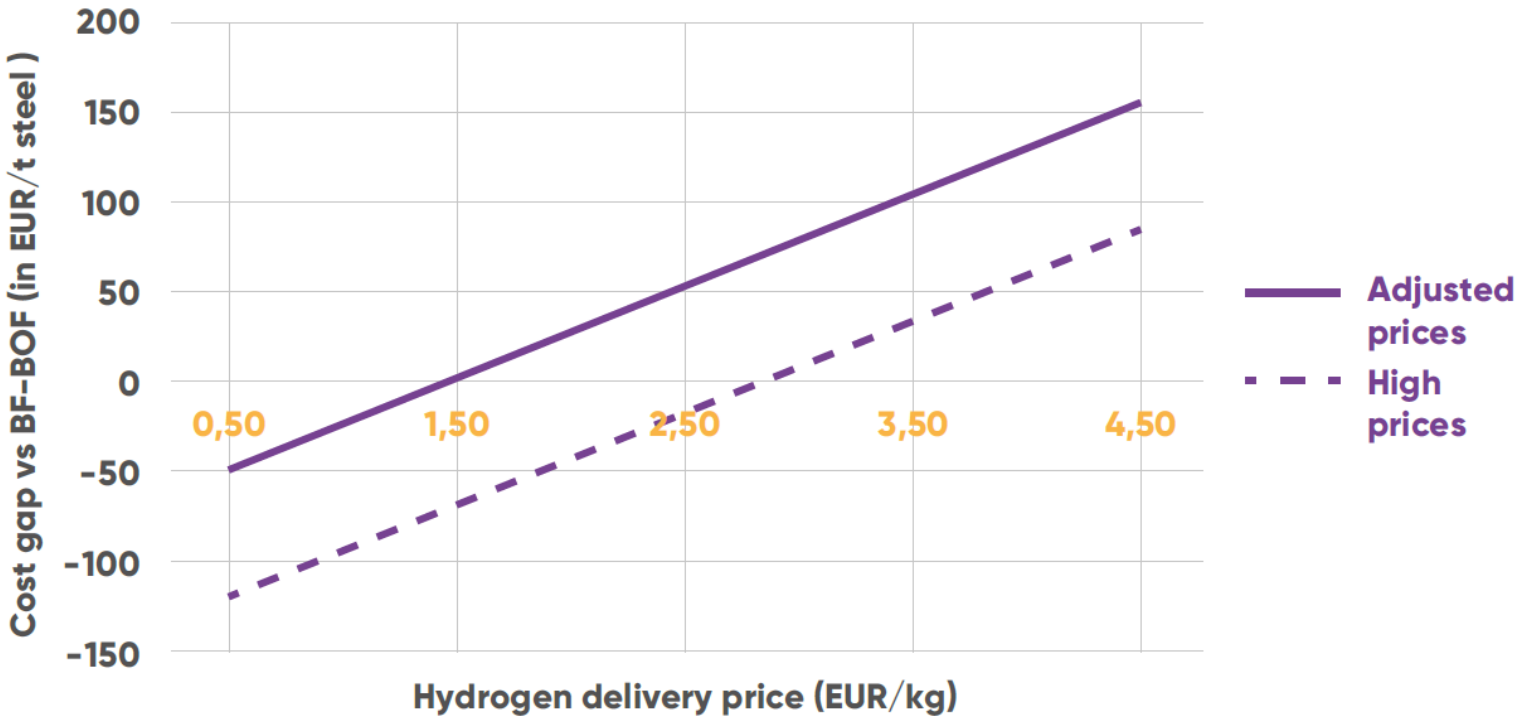
Blast Furnace & Basic Oxygen Furnace

Location	Hot Metal Capacity ('000 tonnes/ year)	Finished Steel Capacity ('000 tonnes/ year)	No. of furnaces
AUSTRIA			
DONAWITZ (Leoben)	1370	1570	2
LINZ	4340	6000	3
BELGIUM			
GHENT	4430	5000	2
CZECH REPUBLIC			
OSTRAVA	3200		3 – BF only
TRINEC	2100	2400	2
FINLAND			
RAAHE	2400	2600	2
FRANCE			
DUNKERQUE	6800	6750	3
FOS SUR MER	5160	5100	2
GERMANY			
BREMEN	3960	3800	2
DILLINGEN	4790	2760	2
DUISBURG	11600	11560	4
EISENHÜTTENSTADT	2340	2400	2
SALZGITTER	4800	5200	3
VÖLKLINGEN		3240	BOF only
HUNGARY			
DUNAUJVAROS	1310	1650	2
ITALY			
TARANTO	9590	11500	4
NETHERLANDS			
IJMUIDEN (Velsen-Noord)	6310	7500	2
POLAND			
DABROWA GORNICZA	4500	5000	2
KRAKOW	1310	2600	1
ROMANIA			
GALATI	3250	3200	2
SLOVAKIA			
KOSICE	2850	4500	2
SPAIN			
AVILES		4200	BOF only
GIJON	4480	1200	2
SWEDEN			
LULEA	2200	2200	1
OXELÖSUND	1800	1700	2
UNITED KINGDOM			
PORT TALBOT	4770	4900	2
SCUNTHORPE	3590	3200	3

Source: Eurofer

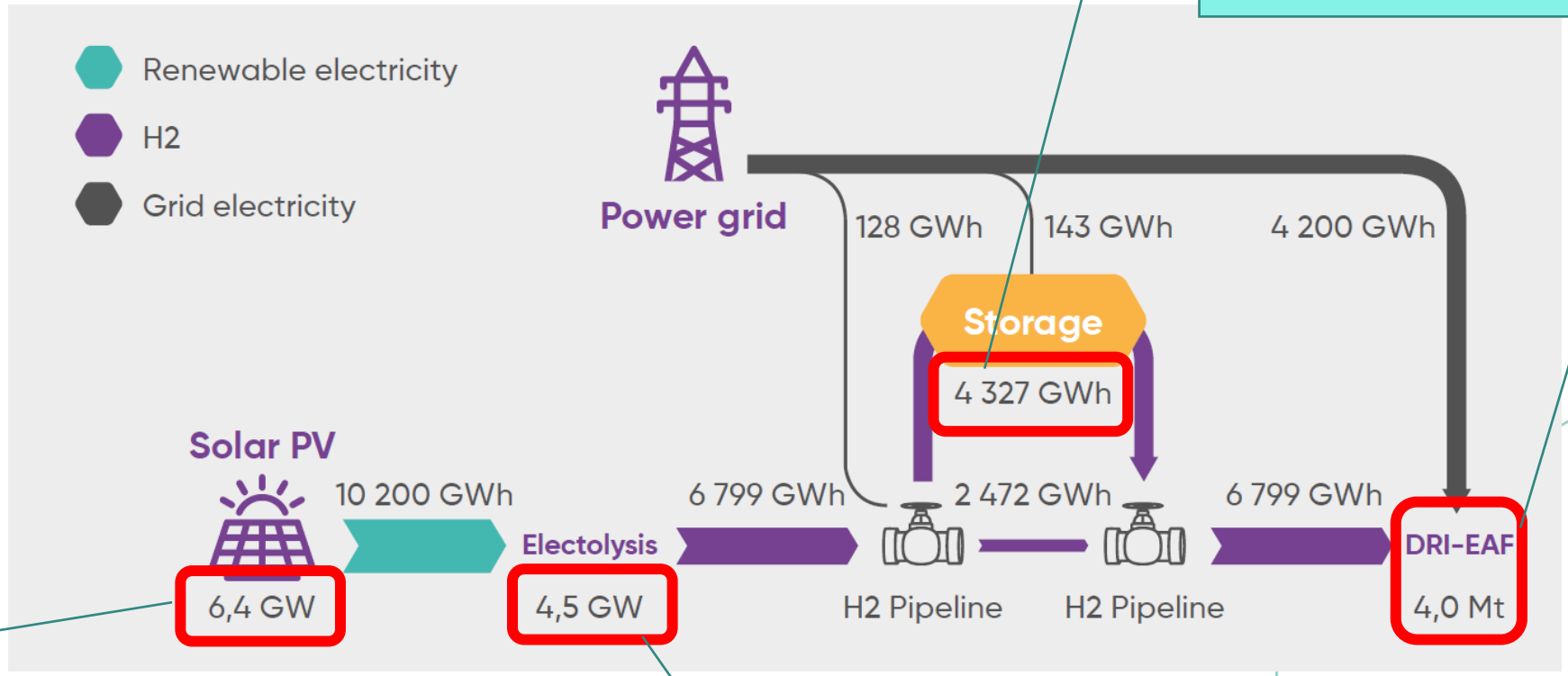
- Steelmaking is a key industry, underpinnig the EU economy and supporting around **2.6 million jobs**, but ...
- Primary steel production generates close to **200 Mt of CO2 emissions per year**
- In order switch all primary steel production to hydrogen based DRI would require **up to 5,3 Mt of renewable hydrogen**
- GHG benefits of using hydrogen for primary steel making are relatively high at **~ 26 tCO2 avoided per tH2**

Challenge #1: Green steel cost



- The hydrogen delivery break-even cost is between **1,5 EUR/kg and 3.0 EUR/kg**
- With current green hydrogen delivery costs (5.0 – 6.0 EUR/kg) this implies either a need for subsidies or a green steel price premium to be paid by off-takers
- For a typical passenger car, the extra costs of green steel would translate to an added cost of **100 – 170 EUR per vehicle.**

Challenge #2 and #3: securing the supply of hydrogen



3 000 x more than the largest battery storage facility in the world

Average size of EU primary steel production plant

4 Mtpa of steel would require 200 ktpa of hydrogen → 10,2 TWh of Renewable electricity

Depending on capacity factor.
Solar PV only would require up to 5 GW
Grid connected running at full load would require „only" 1,3 GW

Thank You

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