



Global Forum on Steel Excess Capacity

Steel Overcapacity and Climate Change

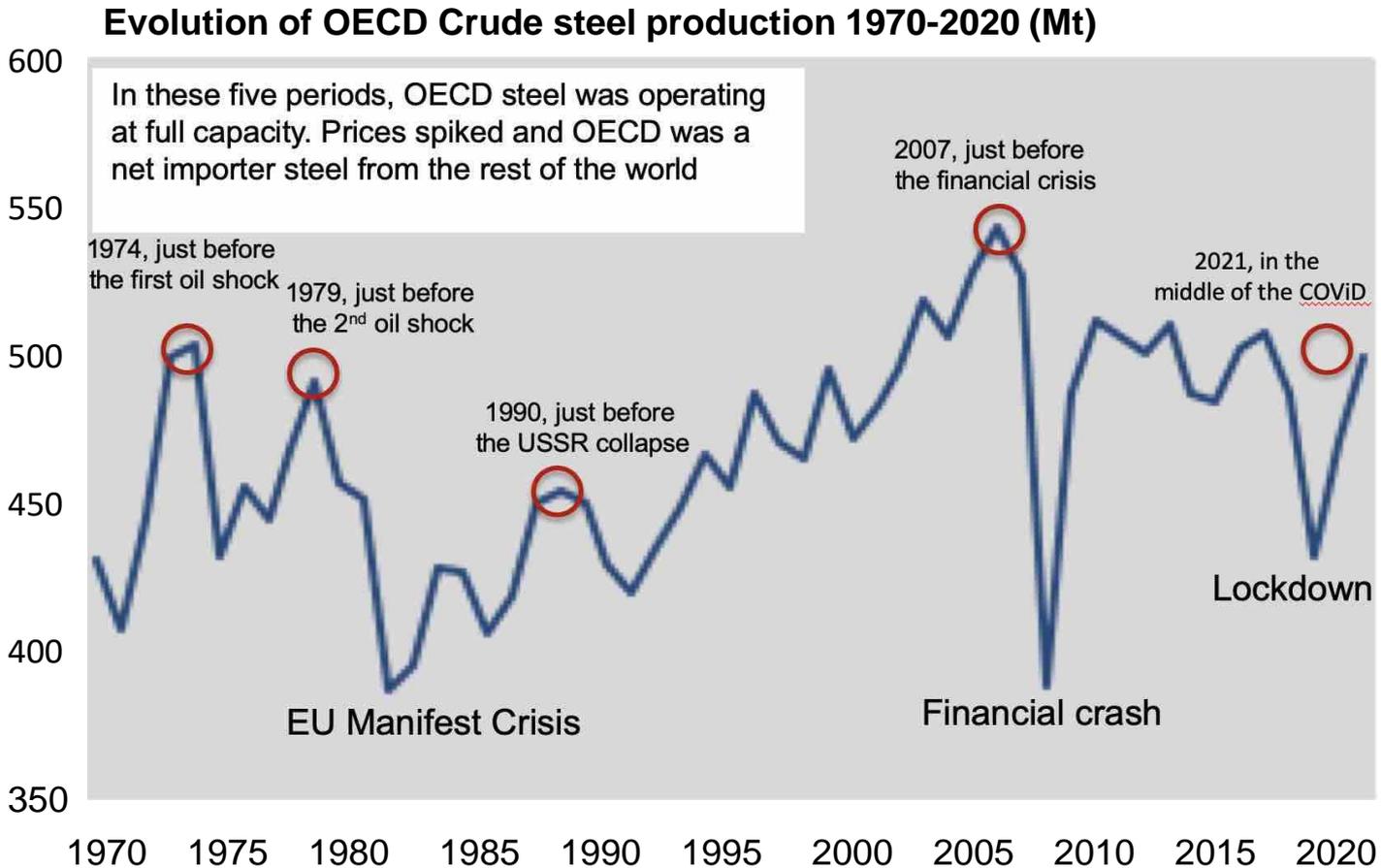
April 22, 2021

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Key points of this presentation

- Over the last 50 years, the global level of capacity utilization has fluctuated between the low 70ies and mid 80ies, despite tremendous efforts.
- In EU and America, we have learned the hard way that Steel Overcapacity is a particularly thorny “Tragedy of the Common”.
- Since 1970, the market was strong enough only a few times, ...and that includes today, after the severe impact of the first lockdown.
- Climate Change is a civilizational challenge that can only be mitigated by major adaptation of all economic sectors including steel.
- On top of material efficiency and several improvement approaches, Steel transition will also necessitate replacing many/most blast furnaces that need to operate 24/7 by new EAFs that can run intermittently and adapt to demand.
- Thus, fighting Climate Change will help reduce overcapacity by necessitating the replacement of the most CO2 intensive facilities by cleaner processes.
- In the future, it will be important to also monitor BF/BOF replacement by EAF (including DRI/H₂) to provide a comprehensive picture of overcapacity dynamic

Since 1970, the OECD steel industry has experienced a few episodes of relatively high capacity utilization



Source Worldsteel, Laplace Conseil analysis. Note OECD = today's membership

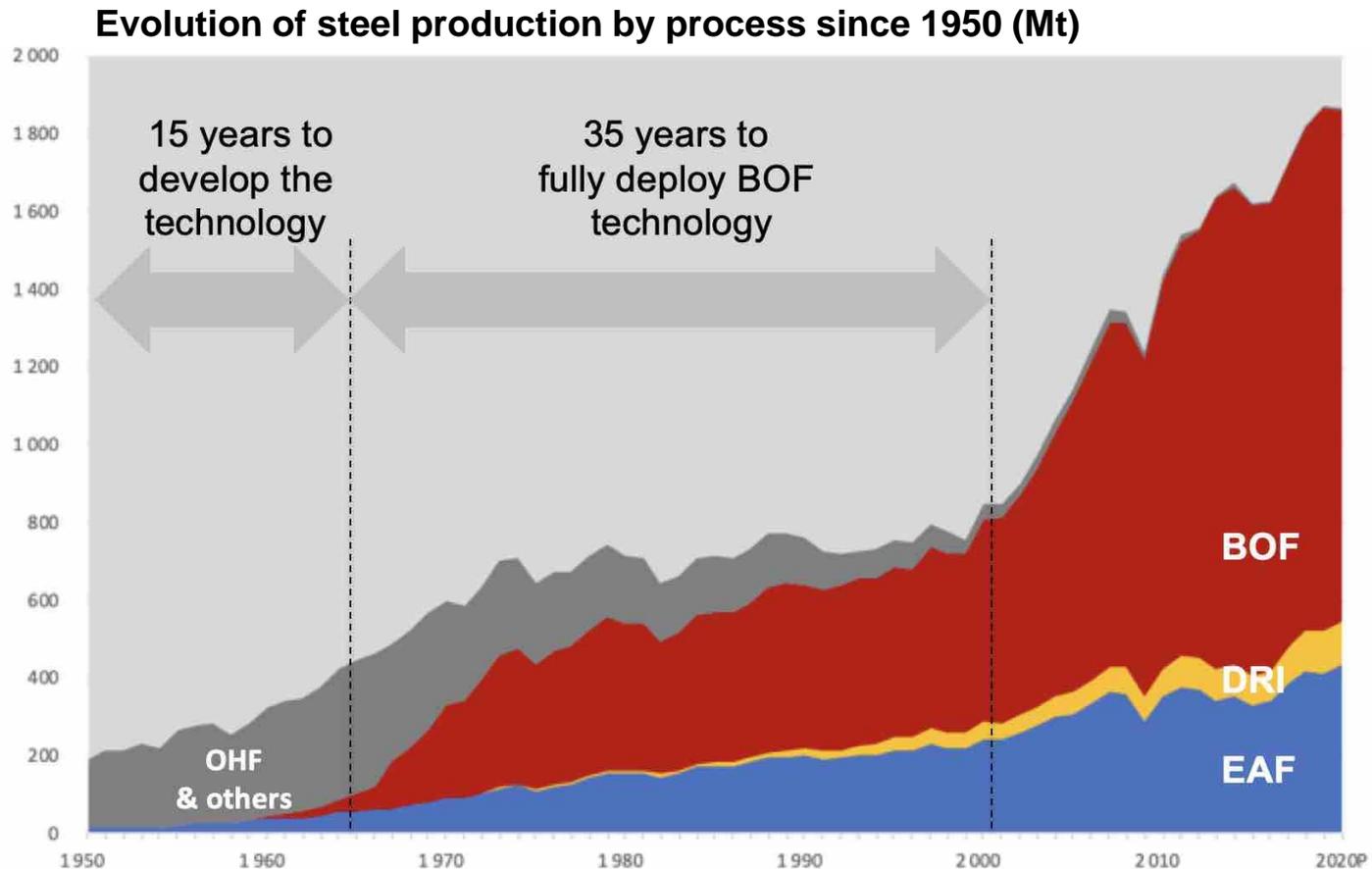
Historic producers have experienced several difficulties to manage the transition after 1975.

- **In Europe**, the post-war reconstruction led to a “Glorious Thirty” period (6% cagr).
- That period ended in 1975 with the first oil shock, but capacities continued to grow for the next five years (Taranto, Fos, Bremen,...) despite growing financial problems.
- Finally, the Commission declared the “Manifest Crisis” in 1980 and set quotas for all.
- Today, BOF overcapacity persists for flat products, while minimills produce 90% of long
- **The USA** had a very strong but already aging steel industry following WWII. Integrated steelmakers maintained their OHF and ingot casting facilities longer than their peers.
- Meanwhile, innovative minimills grew rapidly, first in long products, then in flat products while imports from third countries outcompeted domestic producers.
- Production collapsed in 1980 after the double dip recession.
- Domestic EAF minimills now control 70% of US market.
- **Japan** maintained a reasonable level of capacity utilization thanks to regular consolidations and an excellent level of quality that sustained exports

Lesson learned from past efforts at restructuring

- Anticipate “peak demand” as economies mature.
- When main infrastructures are built, demand usually decline.
- Cooperate to build a long term Country master plan.
- Mergers without clear capacity cut are inoperative.
- Prepare workers and regional reconversion.
- Innovate in new processes; close on time aging mills.
- Think hard before rebuilding coal based Blast Furnace

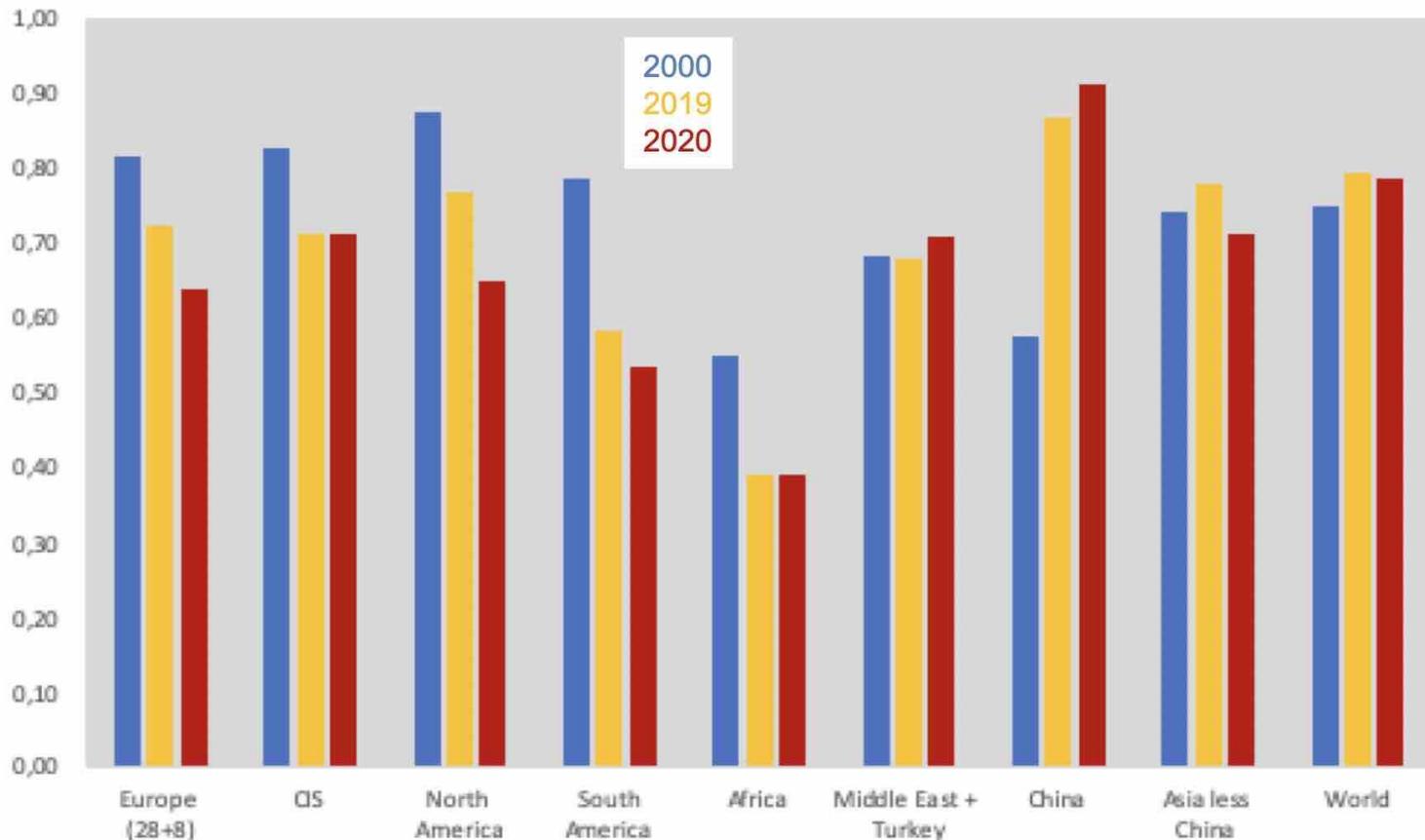
Steel technology transition is a long lasting process. Today we are on the verge of a new cycle with EAF



Source: Worldsteel, Laplace Conseil analysis

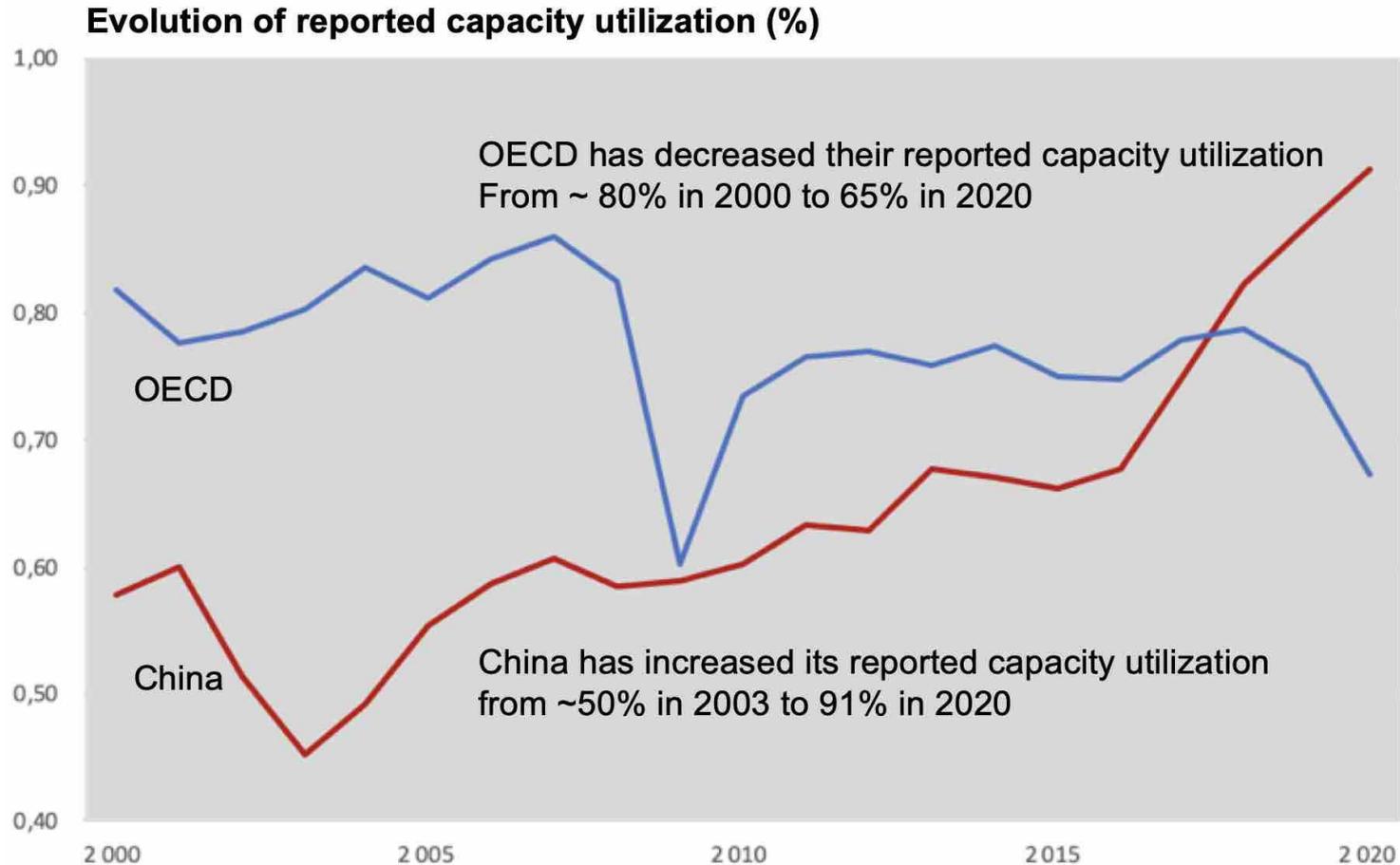
China now has the highest reported capacity utilization while EU, CIS, Africa and Americas declined

Evolution of capacity utilization of main steel producing regions (%)



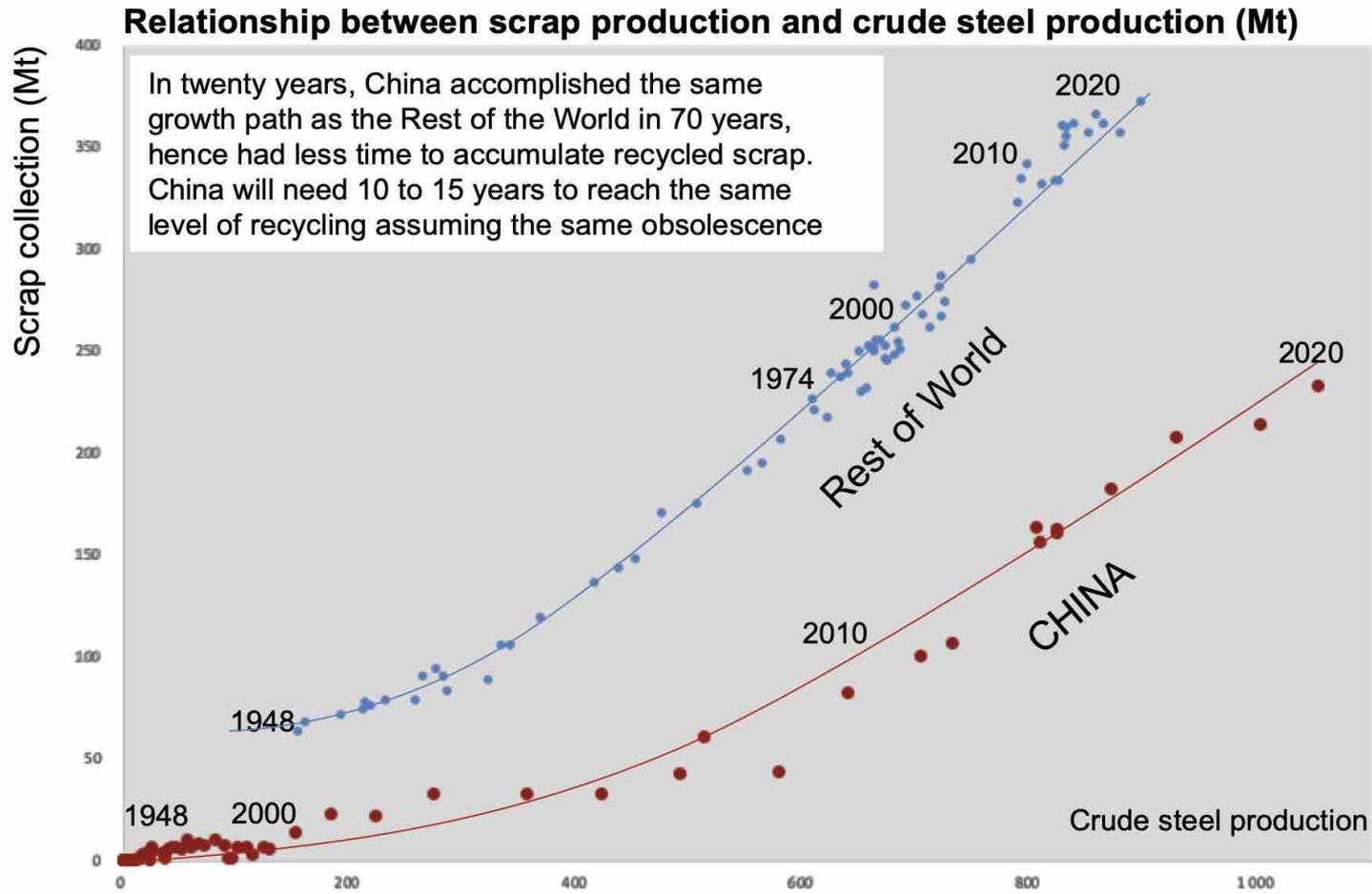
Source : Capacity utilization = Production (WorldSteel) / Capacity (OECD)

Since 2000, China has increased its reported capacity utilization, unlike OECD



Source : Capacity utilization = Production (WorldSteel) / Capacity (OECD)

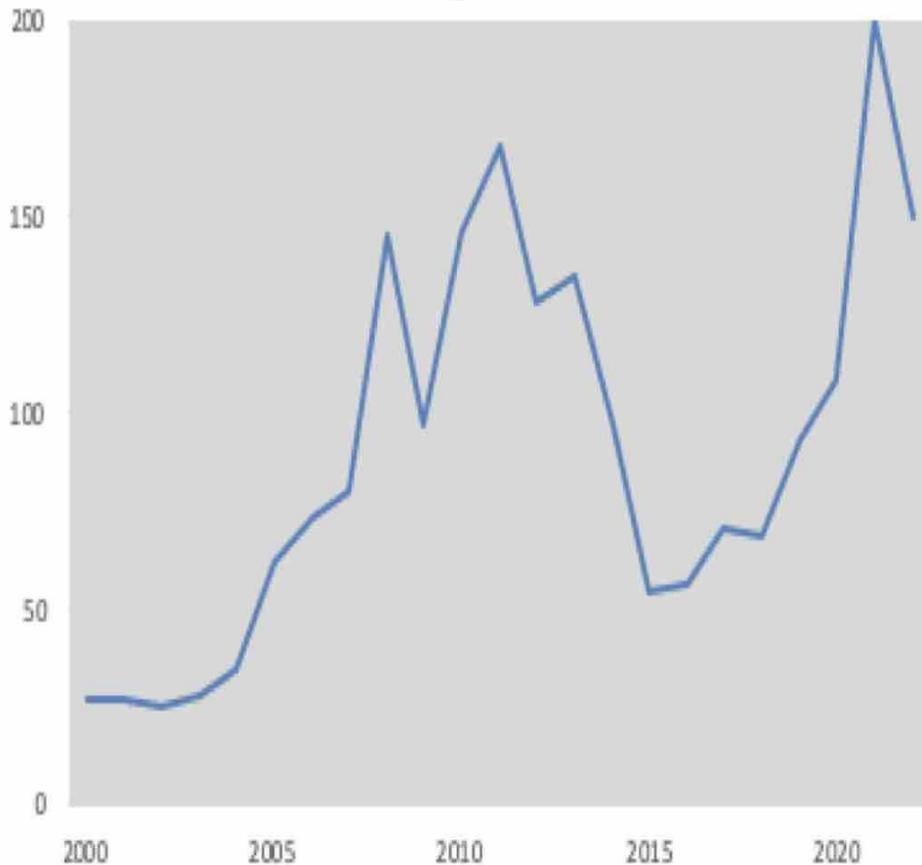
China developed its steel production so fast that it did not have time to accumulate much end-of-life scrap



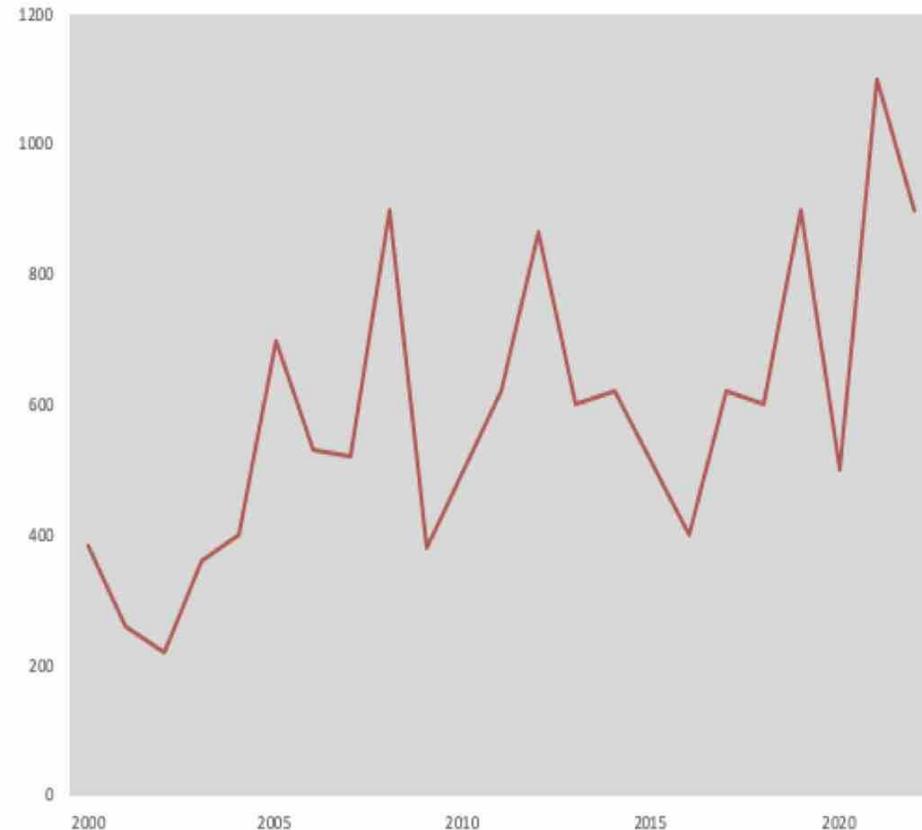
Source : Worldsteel, Laplace Conseil analysis

Iron ore and steel prices are the highest since 2000 ! (and also higher than the previous peaks of '74 and '75)

Reference Iron ore prices



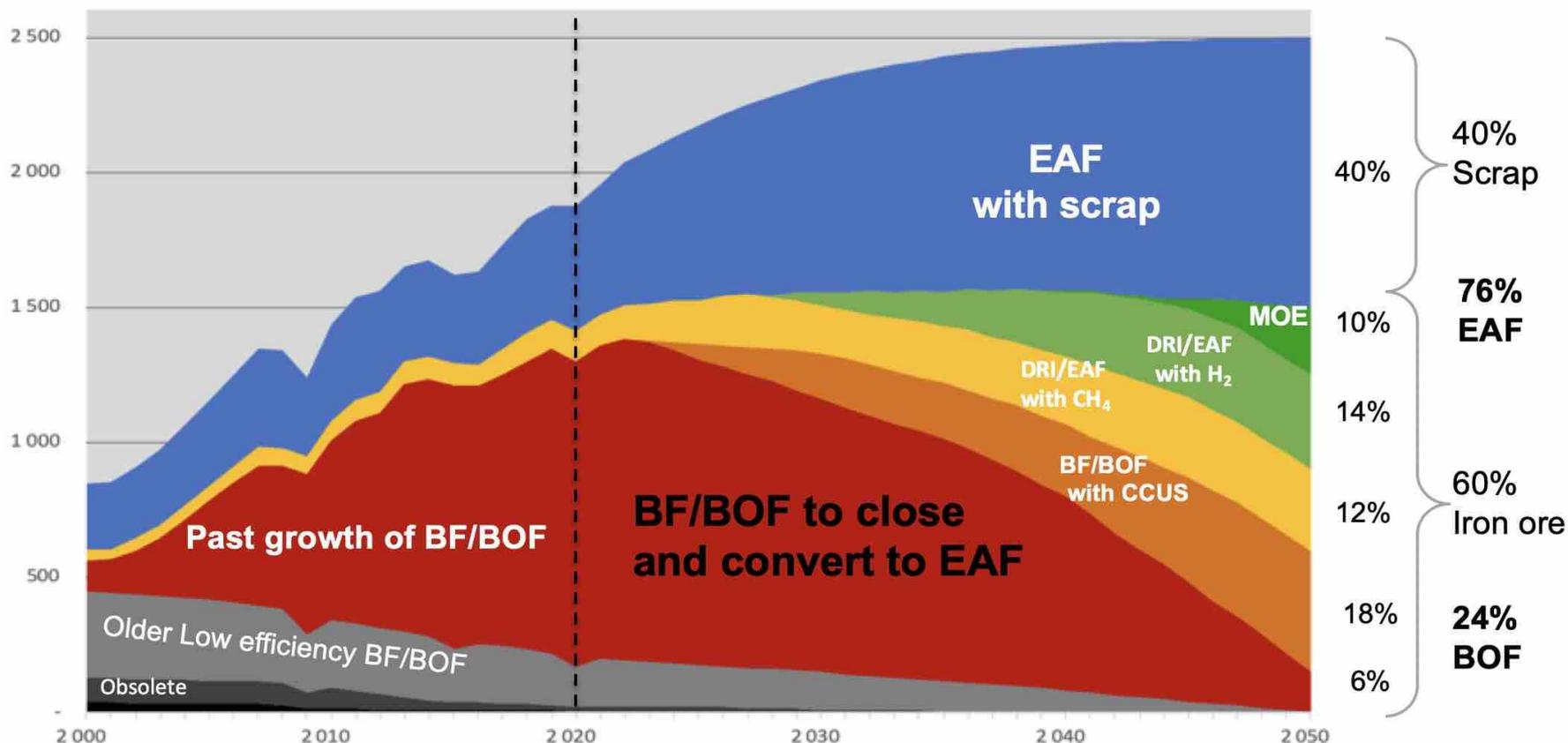
Average delivered HRC prices (\$/tonne)



Source: Kallanish, Laplace Conseil analysis

We anticipate an accelerating rate of change in a rainbow of steel process technologies

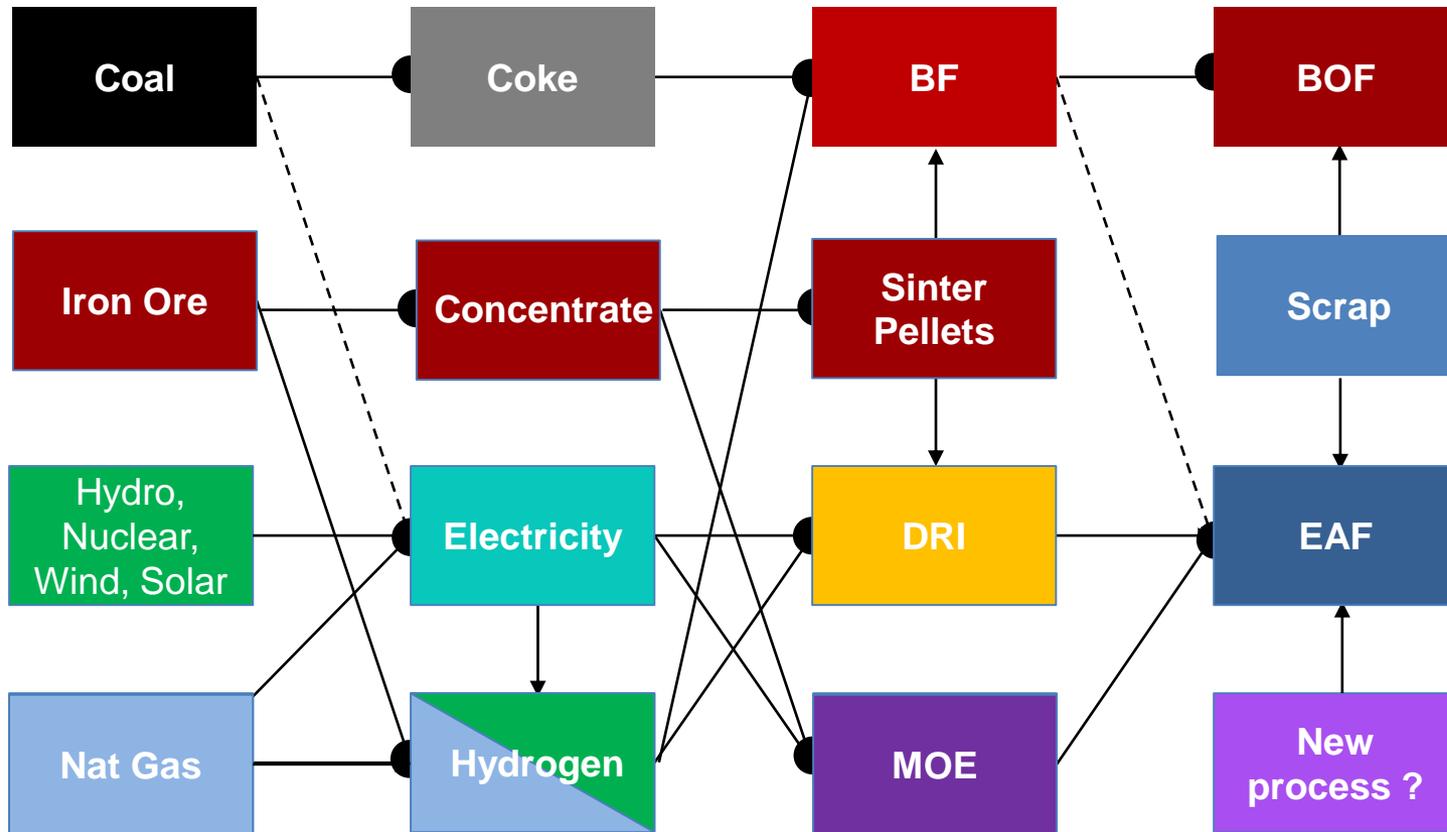
Evolution of global crude steel production by process technology (Mt/yr)



Source : Worldsteel, Laplace Conseil analysis

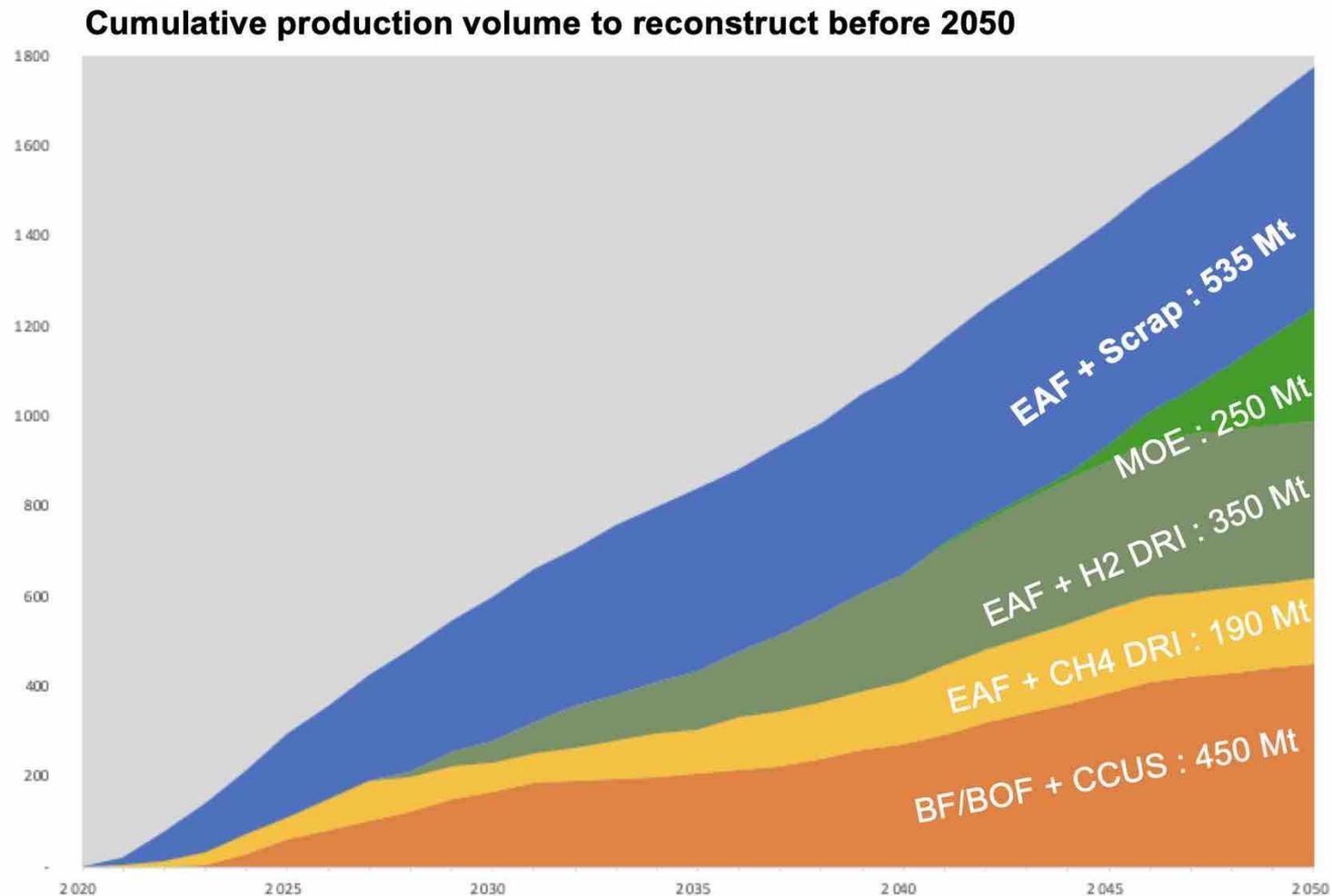
The necessary decarbonation of the steel industry has strong implications for Industry processes

Integrated facilities will need to install CCUS or switch to EAF



Minimills will need to diversify their source of energies and increase DRI

The reconstruction of the steel industry in the next 30 years will imply a large increase in climate friendly EAFs

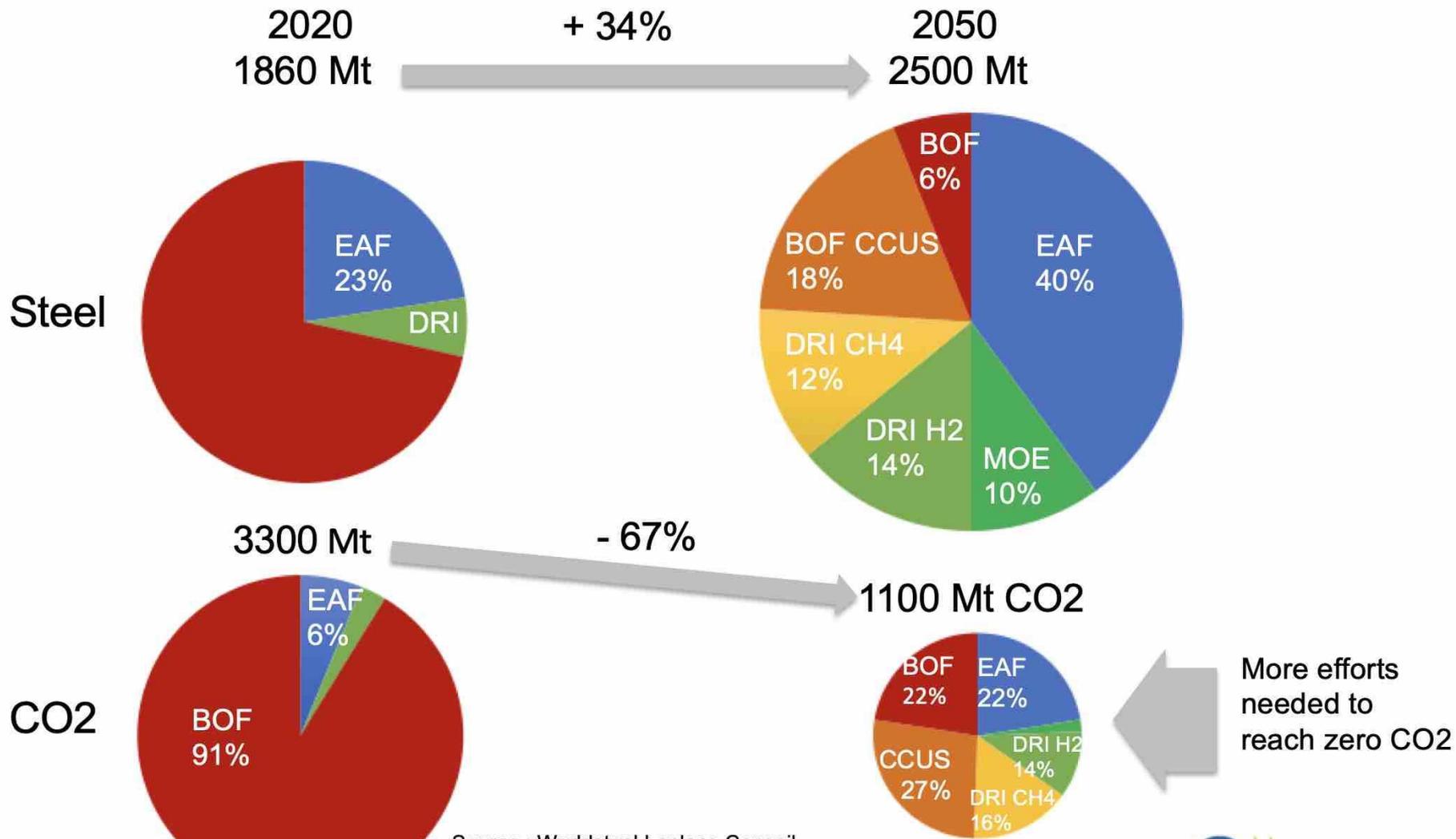


Source : Laplace Conseil estimates

The Steel transition will require major capacity additions by 2050 and major financing

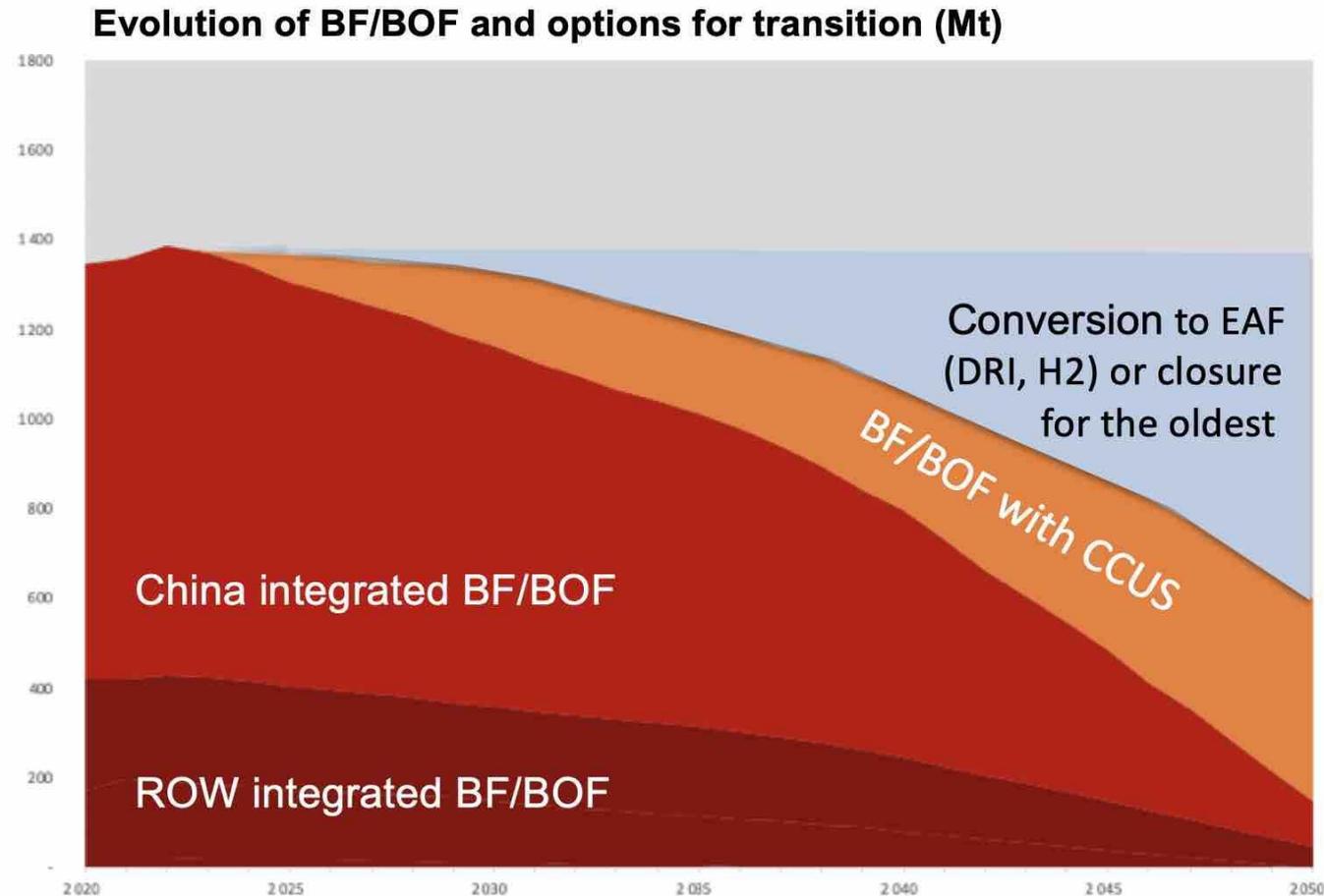
- 1300 Mt of new EAFs, of which 900 to replace BF/BOFs
- 540 Mt of new DRI of which 350 Mt of H2 DRI
- 250 Mt of Metal Oxide Electrolyzer
- 450 Mt of BF/BOF with CCUS
- Investment spread over 30 years will require for its financing an increase of approximately 4 – 5% of the cost of sales, which is much less than the current price increase
- Correspond to approximately 40 €/tonne CO2 avoided

By 2050, the rainbow of technologies will reduce emissions by two thirds for a volume one third larger



Source : Worldsteel Laplace Conseil

In order to achieve the energy transition, most BF/BOF will have to use CCUS or switch to EAF or close

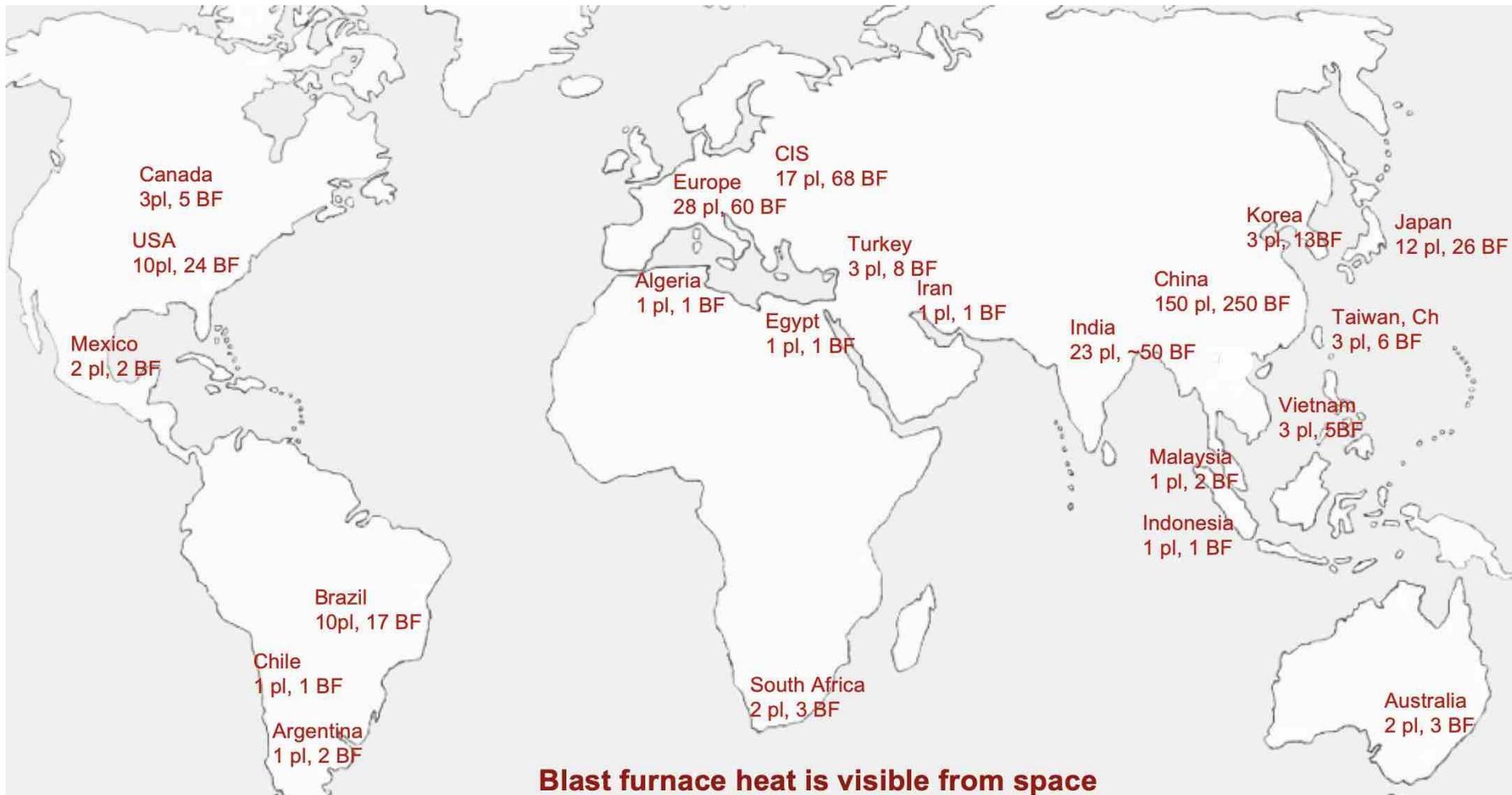


Source : Worldsteel Laplace Conseil

China is posting new steel capacity replacement policy

- The capacity replacement ratio implemented in environmentally sensitive areas will be adjusted from 1,25:1 to 1,5:1 including in the Beijing-Tianjin-Hebei Area, the Yangtze River Delta and the Pearl River Delta. As for other areas, the former 1:1 ratio will be replaced with 1,25:1.
- Preference will be given to companies that promote substantial mergers and reorganizations, as well as electric arc furnace steelmaking and low-carbon process technologies.
- Provinces that have not completed their steel capacity control targets will not be allowed to accept any steel capacity quotas transferred from other regions. New or expanded steel smelting projects outside the compliance zone along the Yangtze River Economic Belt region are prohibited.
- Illegal new capacity replacement projects commissioned since 2016 should be penalized, as should companies with poor environmental protection measures.
- EAF steelmakers should face fewer or no production restrictions, other than not being allowed to increase overall capacity.

Integrated steel is produced by 37 Countries, 108 companies, 342 plants, 400 BOF and 554 BF



Blast furnace heat is visible from space

Recommended actions

- Keep monitoring excess capacity; identify BOF and EAF
- Add monitoring BF and next reline date
- Identify and encourage “switchers” from BF/BOF to DRI/EAF
- In Mature economies, discourage BF reline unless with solid CCUS
- In China, support capacity replacement policy
- In Developing economies, assist closing the last few old BF/BOF and replace with DRI/EAF

Thank you for you attention!



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