Price Signal for Carbon & Impact on Decarbonisation

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Our 4 Key Messages for Today

1

From a policymaker perspective, we need to distinguish between:

Incentivising breakthrough technologies

vs.

Creating a level playing field on carbon

Too often the two get mix-up (i.e. exports discussion in CBAM)

2

Not all energy intensive sectors have the same risk of relocation due to high carbon prices

Market characteristics and level of exposure to international competition key

Evidence can be seen in recent energy price crises.

3

We fully support carbon pricing as a market-based mechanism to achieve climate neutrality.

But, for technologicial breakthroughs to happen here, we need a certain framework

The framework conditions are:

1) A level playing field on carbon (Until others adopt CO2 pricing = carbon leakage protection)
2) Long term power contracts
3) Financial support for R&D&i
4) Good relationship with the local authorities

4

We need to be conscious of the impact of high carbon prices not just on direct emissions but on industrial electrification.

If, due to high indirect costs, electricty becomes to expensive, industrial electrification as a decarbonisation route will be disincentivised

Decarbonisation Roadmap: How Non-Ferrous Metals can reach climate neutrality by 2050

Over the last 40 years, our sector have switched to more energy efficient electric processes.

Our major decarbonisation potential is to reduce the indirect emissions through low-CO2 electricity (provided by power generators)
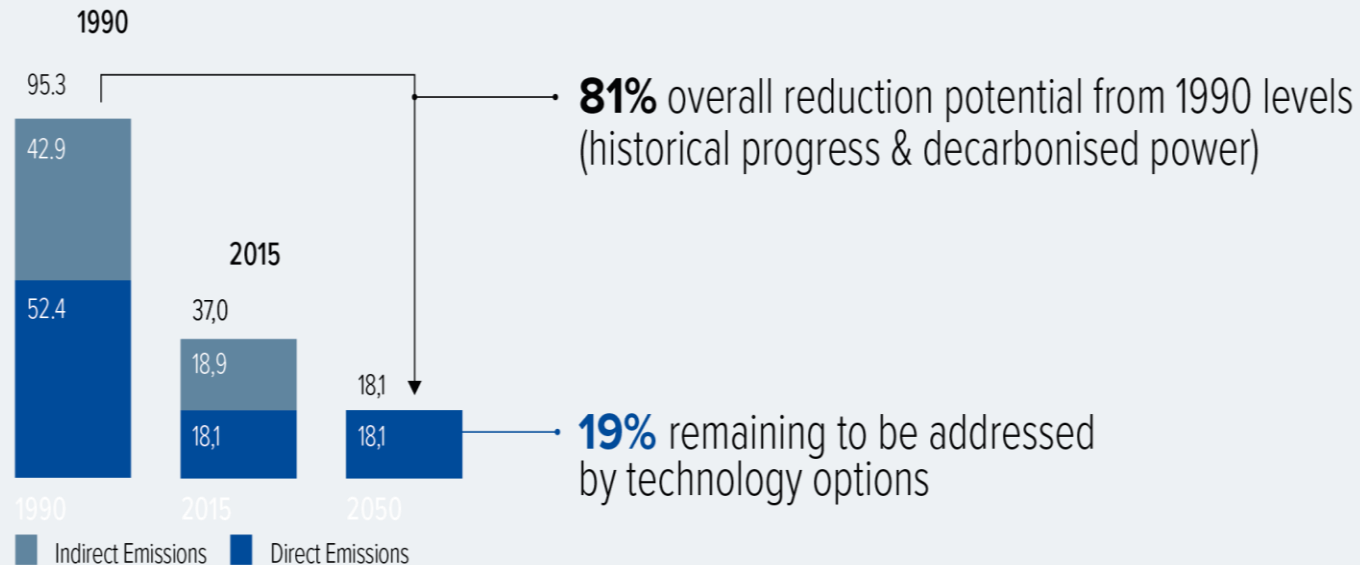
4/5ths of our reductions will come from decarbonising electicity

However, need to ensure power can decarbonise while not getting too expensive

On direct emissions, the race is one between companies to see who will break the carbon based anode

1990

95.3

42.9

52.4

2015

37,0

18,9

18,1

18,1

18,1

81% overall reduction potential from 1990 levels (historical progress & decarbonised power)

19% remaining to be addressed by technology options

1990   2015   2050

■ Indirect Emissions   ■ Direct Emissions

See: Wyns and Khandekar, 2019, Metals in a Climate Neutral Europe here

What an 100 euro a tonne carbon price means for Non-Ferrous Metals

Indirect costs in the EU (average) =

2017 **4%** Increase in Al production cost*

at a CO2 price of €6

Phase IV **50%** **Increase in Al production cost***

at a CO2 price of €100

- 50 % cannot be passed on to the customer (**Price Taker**)

- 50 % rise in production costs is far above profitability ratios (resulting from a 150% increase in power costs)

The result is **more carbon leakage**

The framework conditions for innovation – the Karmoy project Case Study

- The project is most energy efficent aluminium in the world

- What were the conditions needed?

    1. Level playing field via carbon leakage protection. In particular, guarantees on compensation for the indirect costs of the EU ETS

    2. Support for research and innovation (Norwegian innovation fund)

    3. Long term contracts

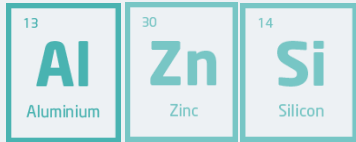   4. Good relationship with local authorities
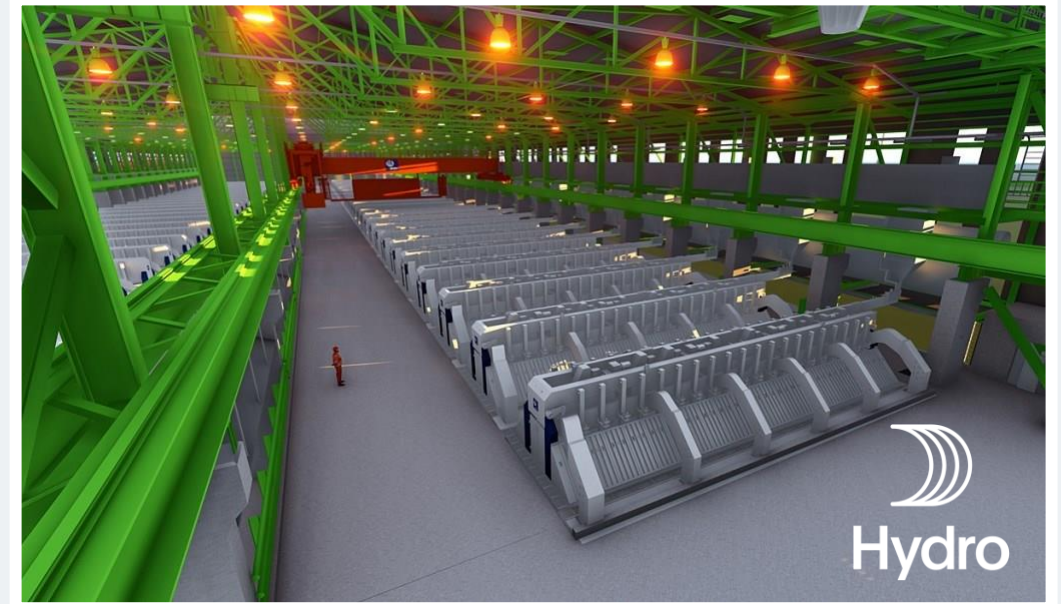
Looking ahead, the race is on to break the carbon based anode

All sectors are exposed but… some are more exposed than others

Electro-intensive

Europe's most electro-intensive industries

| Al (13) Aluminium | Zn (30) Zinc | Si (14) Silicon |

Electricity = **35-45%** of production costs

Vs.

Other energy intensive sectors

Electricity < **10%** of production costs

Price-taker

As price-takers, we cannot pass on any regulatory costs to the customer

$ 🌍   **+**   ⚡ EU

Metals priced globally by London Metals Exchange

=

Electricity costs vary from country to country

Automatic competitive disadvantage on global market

Five essential characteristics of a price-taker sector:
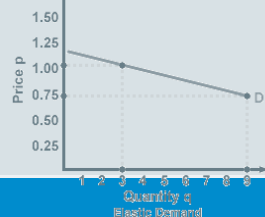
1 Comparable exchange traded

Commodities with globally set prices traded on commodity exchanges such as the

London Metals Exchange

2 Price elasticity

Even a small price increase impacts the market share negatively
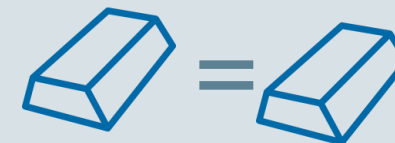

3 Global market share

Globally-set prices and relatively low global market share of the European production

EU = 4%
China = 60%

4 Homogeneity

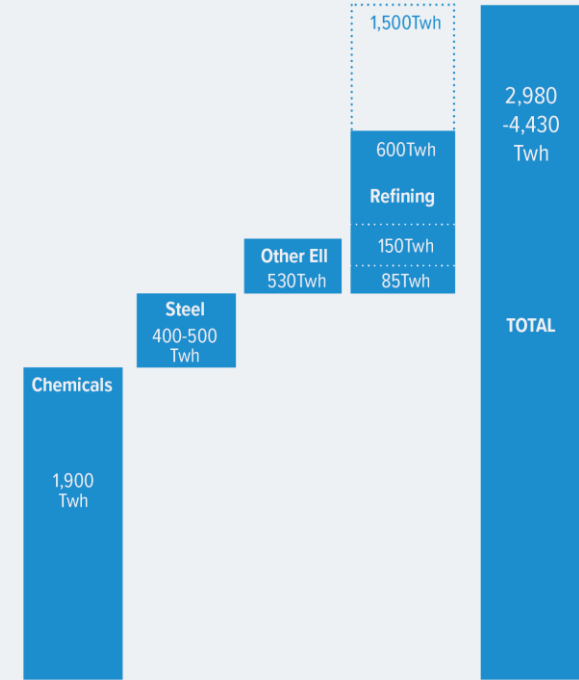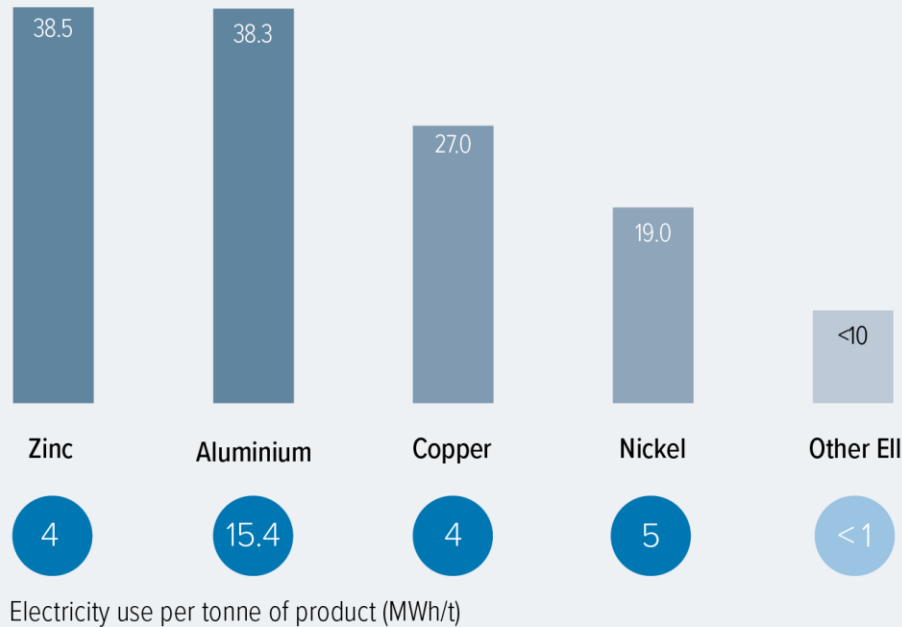Homogeneity of the product meets high global competition

5 Transport costs

Low transportation cost share of production value. For our metals, they range between:

0.5 – 5%

Conclusion: Industrial Electrification for Decarbonisation

High levels of electrification vs. other energy-intensives

Electricity use per tonne of product (MWh/t)

& Other Energy-Intensive Industries are expected to follow

If you want other industries to electrify (direct and indirect) then need to ensure most electrified industry can survive. The power sector needs a high carbon price. Only way to provide this while keeping electro-intensive in Europe is to provide compensation for indirects carbon costs to globally exposed industries.