Strategic challenges to the EU ETS in the long-term.

Industrial Decarbonisation - The Next Challenge

ERCST Brussels

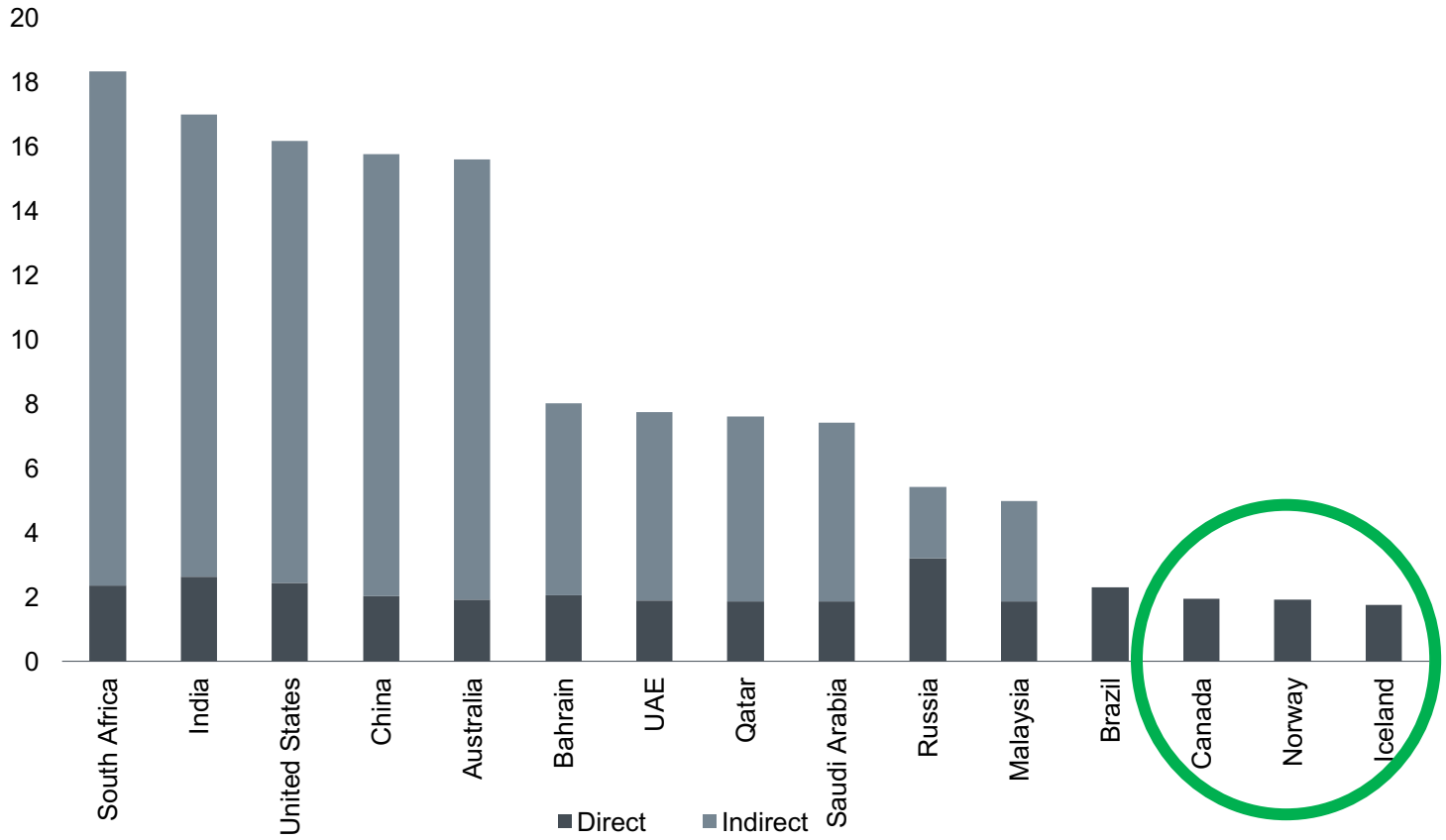
Norsk Hydro Ltd. 2018-11-18

Liv Rathe

Large differences in aluminium carbon footprint globally

- but no carbon costs for the most emission intensive

Emissions per tonne aluminium (electrolysis only)



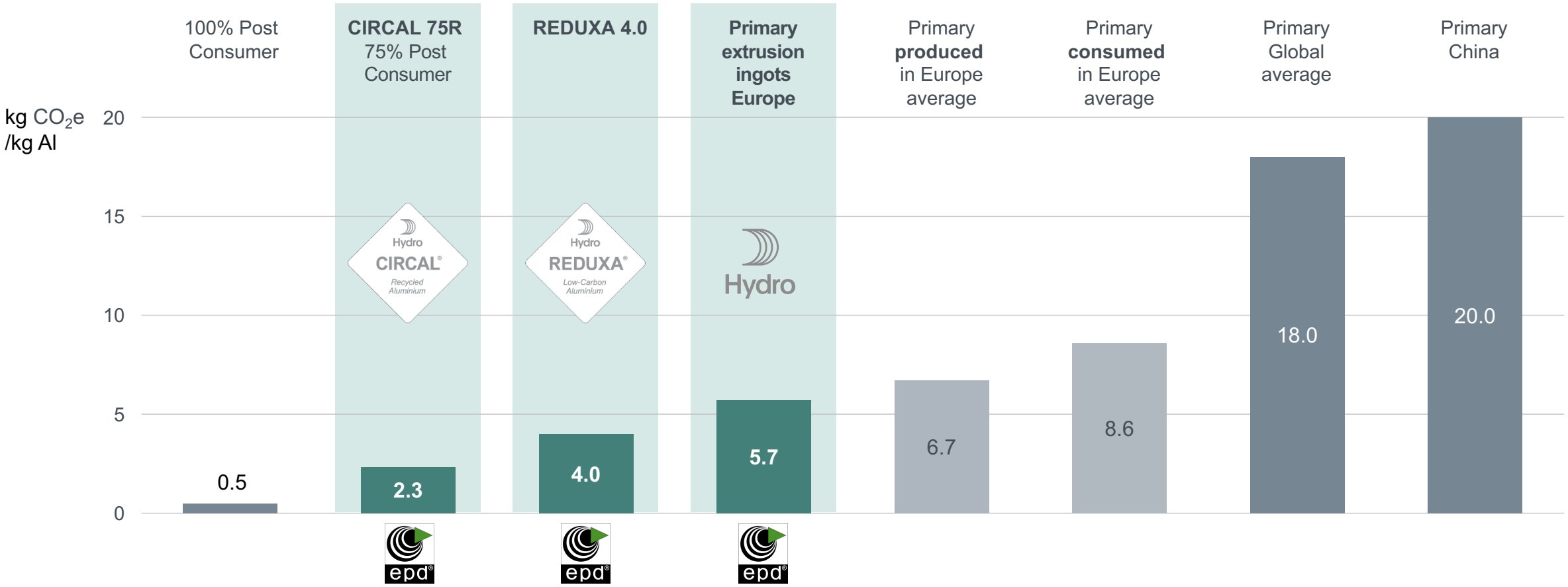
1. **Global competitors have considerably higher CO_{2e}-content**
2. **These do not face any costs related to carbon content**
3. **Only those with CO_2 free power do**

No competitive advantage in being low-carbon!

Not including B&A - emissions

Aluminium CO_2 footprint by origin

CIRCAL and Reduxa: Hydro products aligned with EU's ambitions



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The long-term (2030) and 2050 context

- Incoming **Commission** President pledged climate agenda:
  - **Towards a climate neutral continent in 2050**
  - 50% to 55% reductions in 2030 EU-wide compared to 1990
    - Leaving share btw ETS and ESR unchanged
    - 52% to 57% reduction for EU ETS cp to 2005

What does the proposed 2030 target change mean?

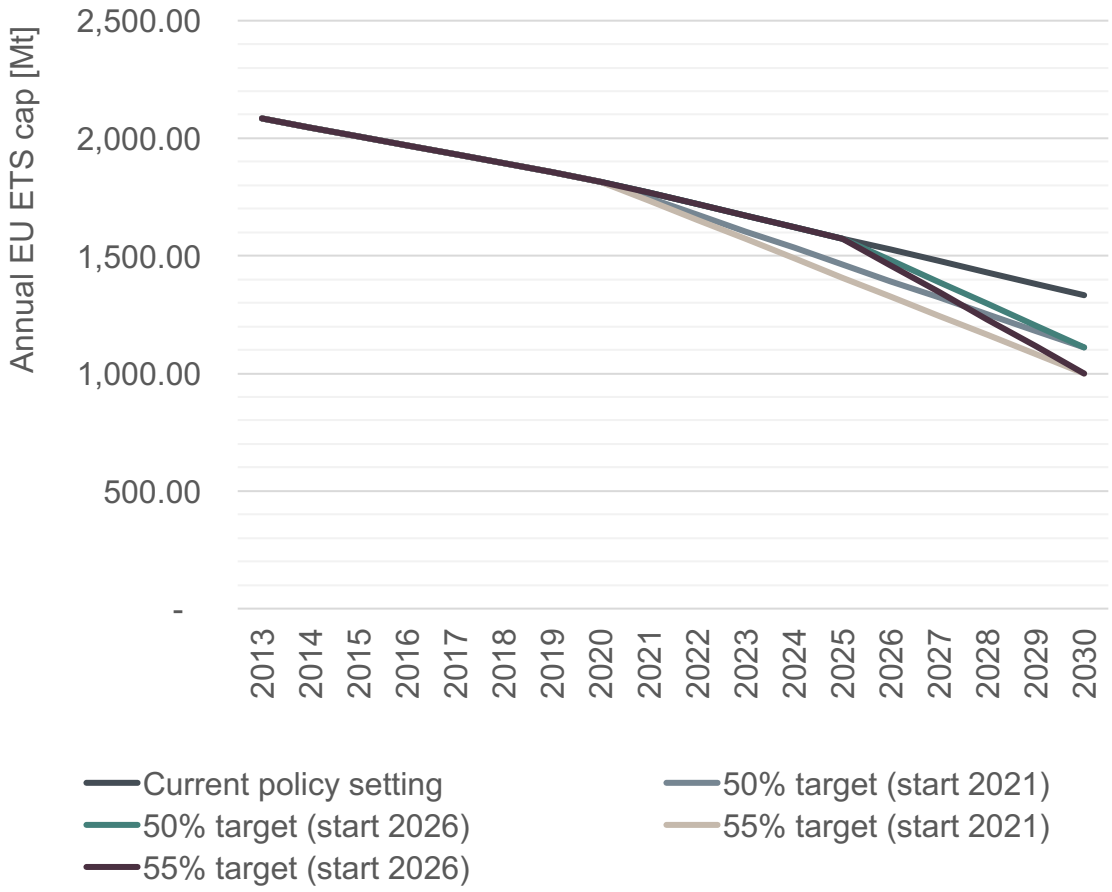
Industries emissions in ETS 2018: 810 MT.

Emission reduction targets for EU ETS and non-ETS sectors

	1990	2005	2020	2030 (40% target)	2030 (50% target)	2030 (55% target)
EU ETS		2,338 Mt	1,817 Mt	1,333 Mt	1,111 Mt	1,000 Mt
Non-ETS		2,848 Mt	2,759 Mt	2,099 Mt	1,749 Mt	1,575 Mt
Total	5,720 Mt	5,186 Mt	4,576 Mt	3,432 Mt	2,860 Mt	2,574 Mt

Resulting changes to the linear reduction factor (LRF)

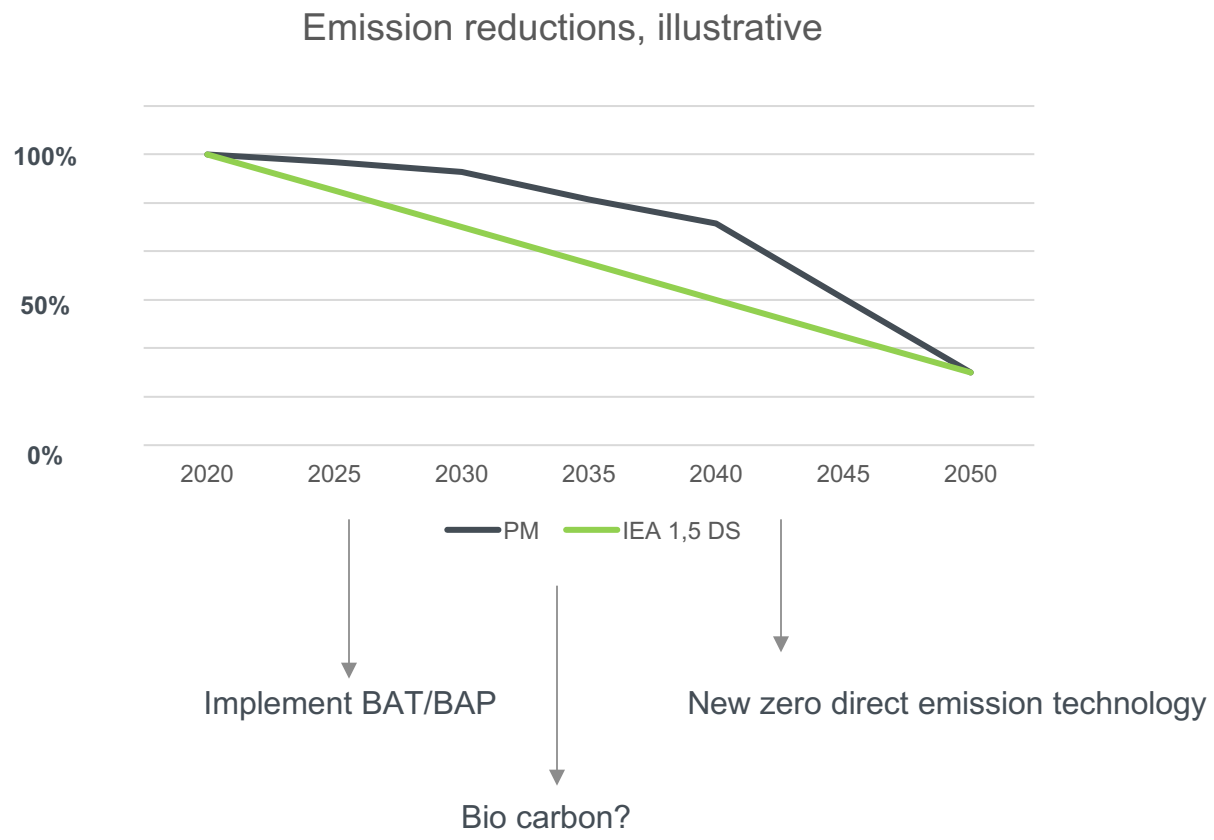
	Cap reduction p.a. (2021-2025)	Cap reduction p.a. (2026-2030)	LRF 2021-2025	LRF 2026-2030
LRF – current setting	48.4 Mt	48.4 Mt	2.2%	2.2%
LRF (50%)- all TP4	70.6 Mt	70.6 Mt	3.2%	3.2%
LRF (50%)-half TP4	48.4 Mt	92.8 Mt	2.2%	4.2%
LRF (55%)- all TP4	81.7 Mt	81.7 Mt	3.7%	3.7%
LRF (55%)-half TP4	48.4 Mt	115.0 Mt	2.2%	5.2%



Source: EEA, ICIS

Our response – smelter view

Probably not one solution, but several initiatives spread out in time



No green transition with red numbers

The EU roadmap

A clean planet for all

7 “main building blocks” of the strategy:

- Maximise the benefits from Energy Efficiency including zero emission buildings
- Maximise the deployment of renewables and the use of electricity to fully decarbonise Europe’s energy supply
- Embrace clean, safe and connected mobility
- **A competitive EU industry and the circular economy as a key enabler to reduce greenhouse gas emissions**
- Develop an adequate smart network infrastructure and inter-connections
- Reap the full benefits of bio-economy and create essential carbon sinks
- Tackle remaining CO2 emissions with carbon capture and storage

Source: European Commission 2018: Communication on
A Clean Planet for all - A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy

New 2030 target and post-2030 EU ETS regulation context

Industry cannot decarbonize if operational CO_2 cost burden is too high

- Need increased focus on industries' costs

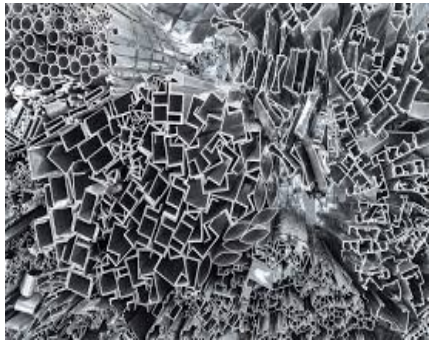
- Possible options to evaluate:
  - **LRF reflects technological possibilities?**
  - Post 2030 ETS - the instrument to decarbonize industries?
  - Carbon Border Adjustments?
  - Low cost credit eligibility?

- Post 2030 - a crystal ball exercise

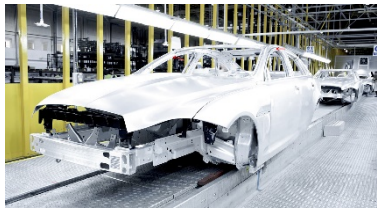
To get full effect of a CBTA-system: all products taxed according to material content

Tax on primary aluminium

Tax on rolled and extruded products



Tax on components – share of aluminium



Tax on final products – share of aluminium

Iphone
31 g al

Car
200 kg al

If part of the value chain is untaxed: imports shift down the value chain

MSR reviews

- Today MSR
  - Backward looking instrument for tackling historical surplus
  - An additional CAP correction instrument

- WCI and its auction regulation, both correct surplus and deficit - ensuring sustainable and economical viable growth

- EU's MSR don't support beneficial global GHG friendly growth in Europe

- The cancellation option should be reviewed to
  - Avoid naïve imported higher GHG
  - Improve industrial sustainable growth conditions in EU
- And too high outtake rate and too low thresholds create artificial high prices

A challenge to link ETSs
Global level playing field for all industries - not realistic in near future

A mistake to solely look at CO_2 price. It's the costs that counts :P1*B*P2*CSCF

Risk variables	Risk variable	EU	International
Prices (P1)	Allowances	Highest	Lower
	Low Cost Credits	No	Vary
	Non-Compliance Fee	High	Low
Benchmark (B)	Levels	Lowest with decrease	Higher no decrease
	Emission inclusion	High	Lower
	MVR standard	Strict	Vary
Production(P2)	Level	Historical	Dynamic
	Production change	Not dynamic	Dynamic
CSCF	Free allowances correction	Uncertain	No

Conclusion
The transformation require massive financial support

The EU ETS only a part of the solution

- Ungent to bring low-carbon technologies to the commercial stage
  - But too high EUA prices hinder R&D, piloting and investments as it reduce industries financial strengtl
  - Investment both capital and risk intensive, due to their pioneering nature.

- Process technologies need to be market ready in 2030ties to be deployed across the EU by 2050

- Decarbonize the heavy industry involve
  - Entirely new processes
  - Change of material use and improved efficiency
  - Use of low-carbon energy
  - Carbon Capture Utilization and Storage

- Capital intensive, technically risky and require massive support from the authorities.

Hydro

We are aluminium