

Critical metals for a
low-carbon future



aabc
europe
11th International
advanced
automotive
battery
conference

VIRTUAL

19-21 JANUARY 2021

Nickel and The Low Carbon Economy



**BRAZILIAN
NICKEL**

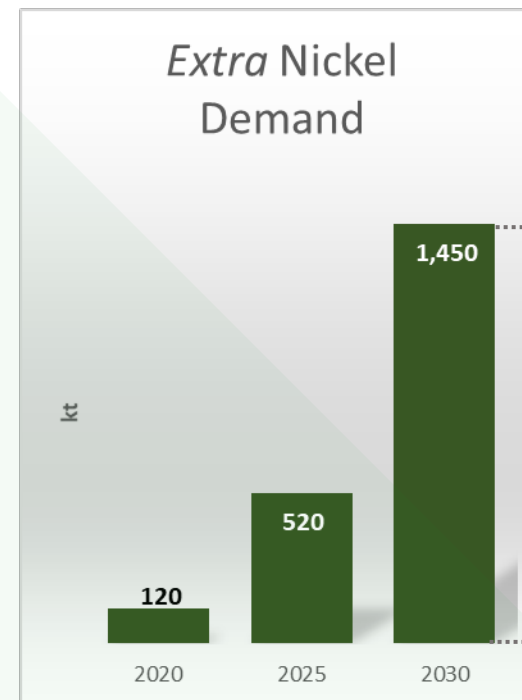
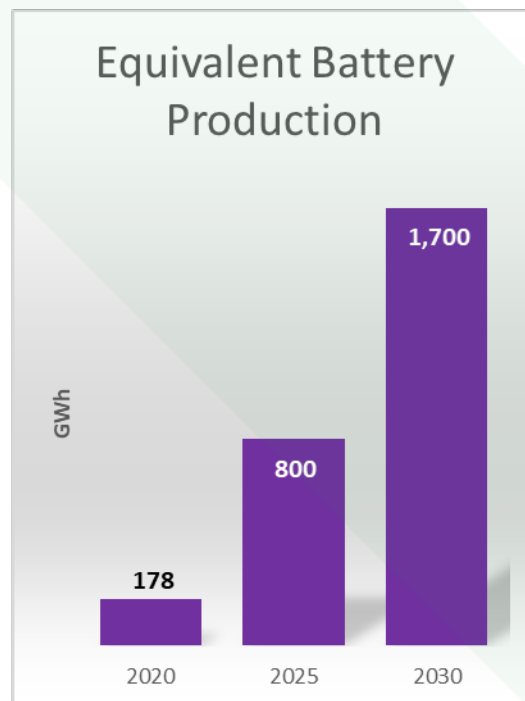
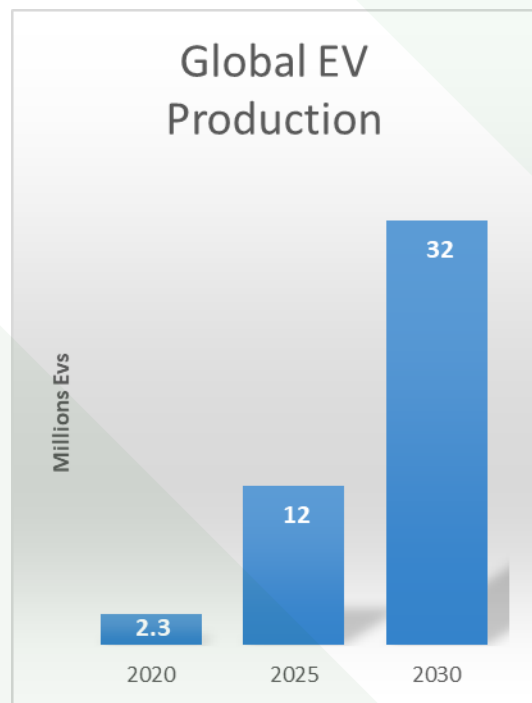
The Nickel Crunch



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*Tesla "recognize their **biggest risk**, from a strategic supply point of view, is **nickel**."*¹

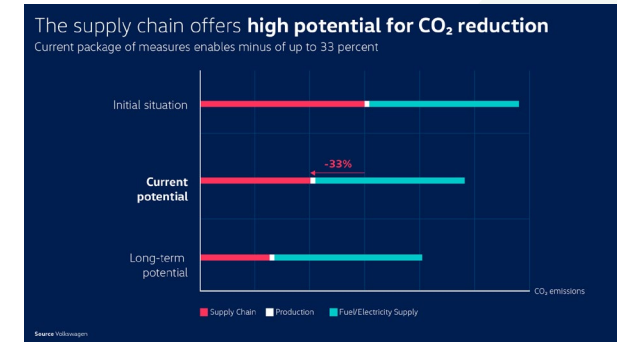
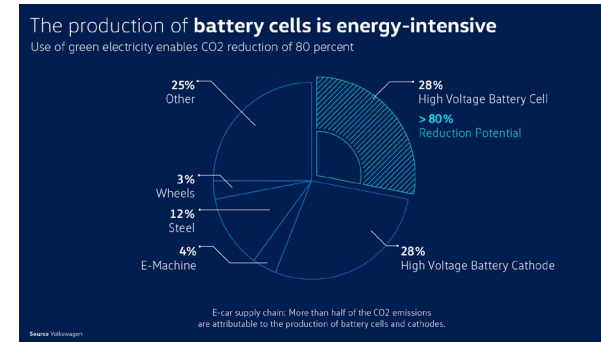
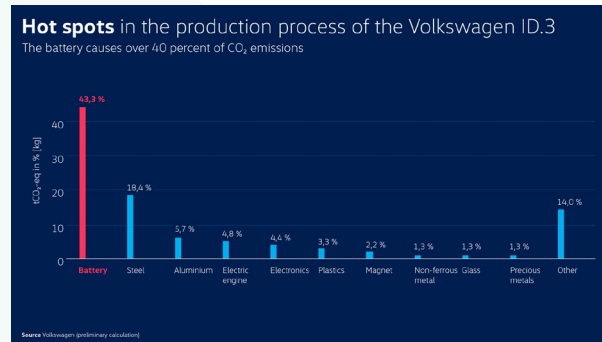
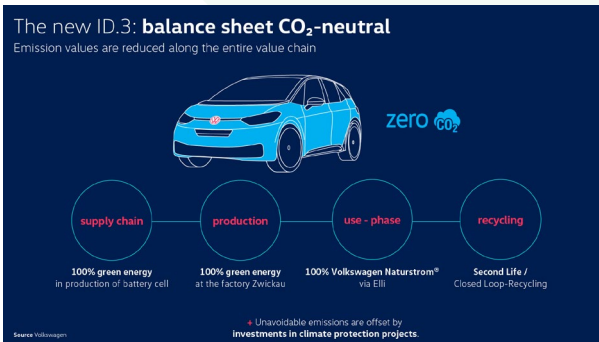


Within 10 years the world will need >58 Piauí Projects

¹ Bloomberg, 2020



OEMs aiming for Carbon Neutrality



>40% CO₂ emissions from battery

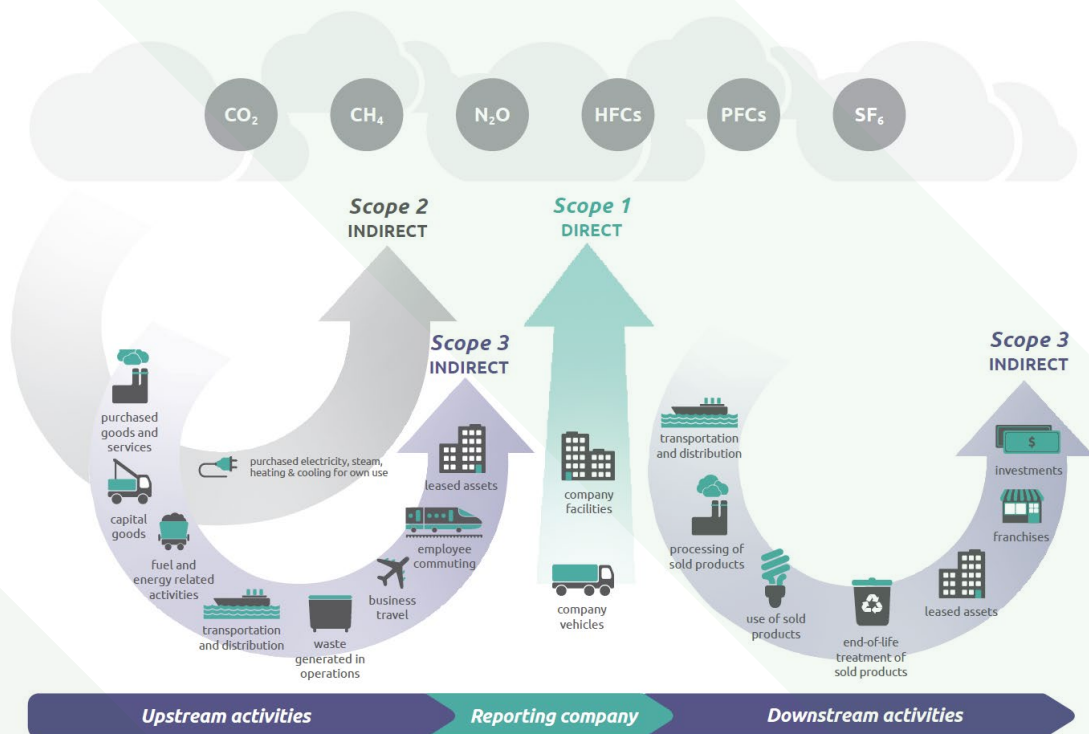
- Zero carbon is currently only possible from cell manufacture and beyond
- Even then only with use of renewable energy in all stages of manufacture
- There are therefore huge opportunities for carbon reduction in the raw material supply chain

CO₂ Emissions of Nickel Production

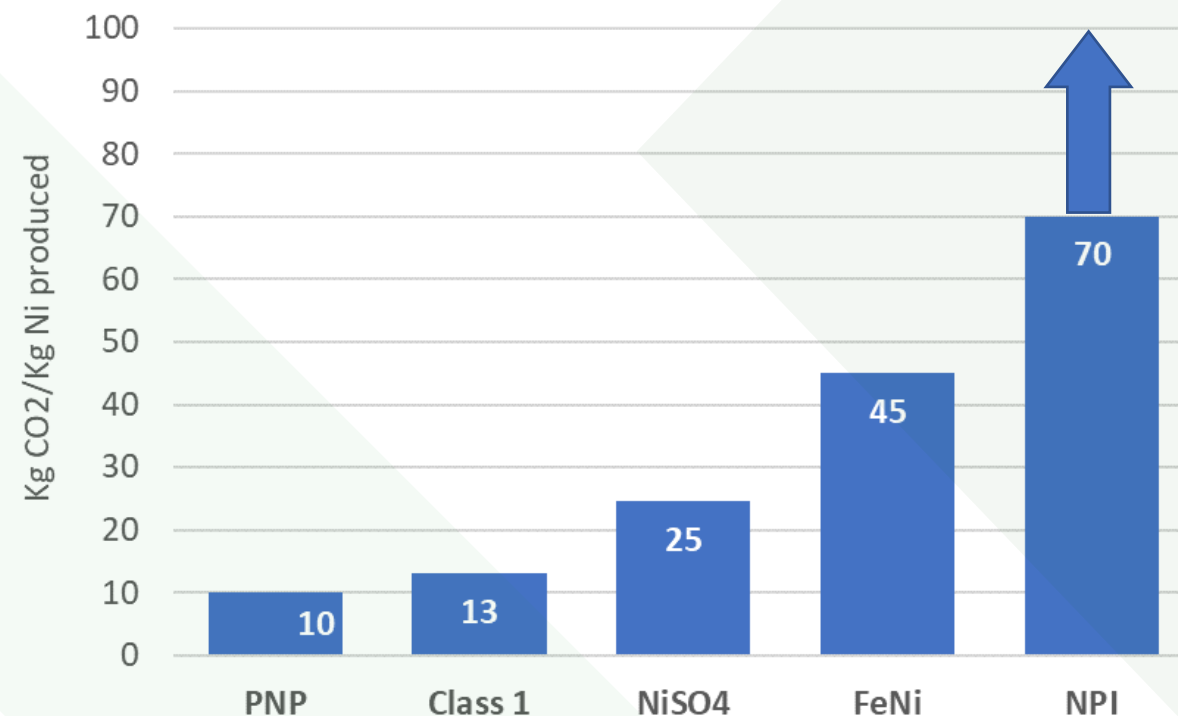


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Scope 1 & 2 (Cradle to Gate) Emissions



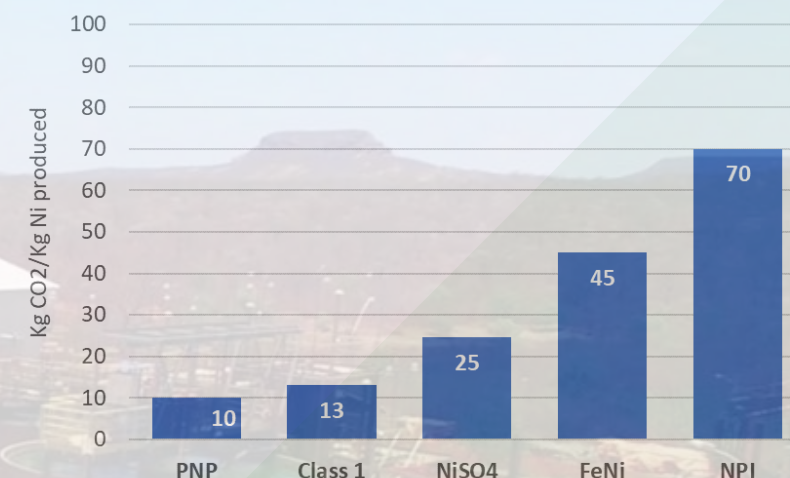


Further CO₂ Reduction Possible

Already inherently low for HL, but

How to further reduce our carbon footprint?

- BRN is working on a more detailed independent LCA
- Current situation has lower CO₂ emissions than other nickel production
 - 80% of Class I; 42% of NiSO₄; 23% of FeNi; 15% of NPI
- BRN is working on innovations to lower or remove any CO₂ emission
 - CO₂ capture in the impurity removal circuit with high MgSO₄ process solutions
 - C sequestration in both mine bedrock and waste products.
- Electrification of transport fleet.
- On site renewable energy with ESS for any back-up power if/when required



Not just CO₂ that is important but ESG



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Nickel & Cobalt Production must also have:

- ◆ Strong Sustainability & ESG credentials
- ◆ Environmental Sensitivity
- ◆ Responsible Sourcing
- ◆ Efficient Logistics
- ◆ Shared benefits
- ◆ Transparency (EITI)
- ◆ Effective Closure Planning



Tesla will give you a giant contract for a long period of time, if you mine nickel efficiently and in an environmentally sensitive way... ¹



*Nickel investing comes with a heavy price
The metal is in short supply and hard to source ethically ²*



Environmental Sensitivity - Heap Leaching at Piauí



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Simple flexible technology at *ambient* conditions:

- Reduces energy intensity
 - PNP has negative energy – sells 12-15KW power back to the grid.
 - HPAL of equal size would require approx. 3x energy
- Increased resource utilisation, less mine waste & longer operational life
 - all ore above cut-off is processed, no blending or separation of ore types required.
 - Leaches saprolite, limonite and transition material

Optimized Process

Minimizes water use and acid consumption

Only solid residues –

no tailings dams required
no deep sea disposal

Nickel Hydroxide intermediates as final product

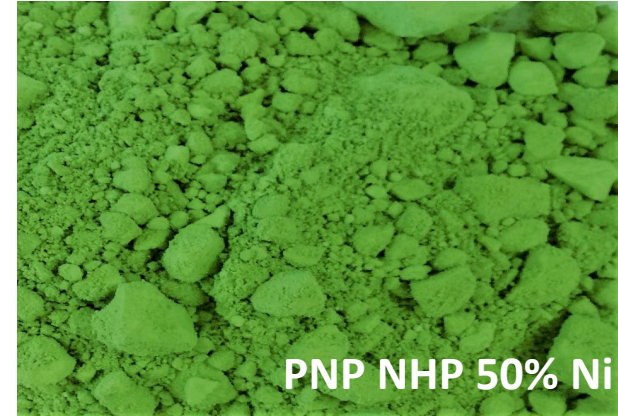
~50 % Ni (dry basis)
better for transport to customer

Power for the operation from on site H_2SO_4 plant,

Carbon Free with excess sold to national grid

Local Community Engagement & Support

Legacy – Plan closure with local communities to give a lasting positive legacy



PNP NHP 50% Ni

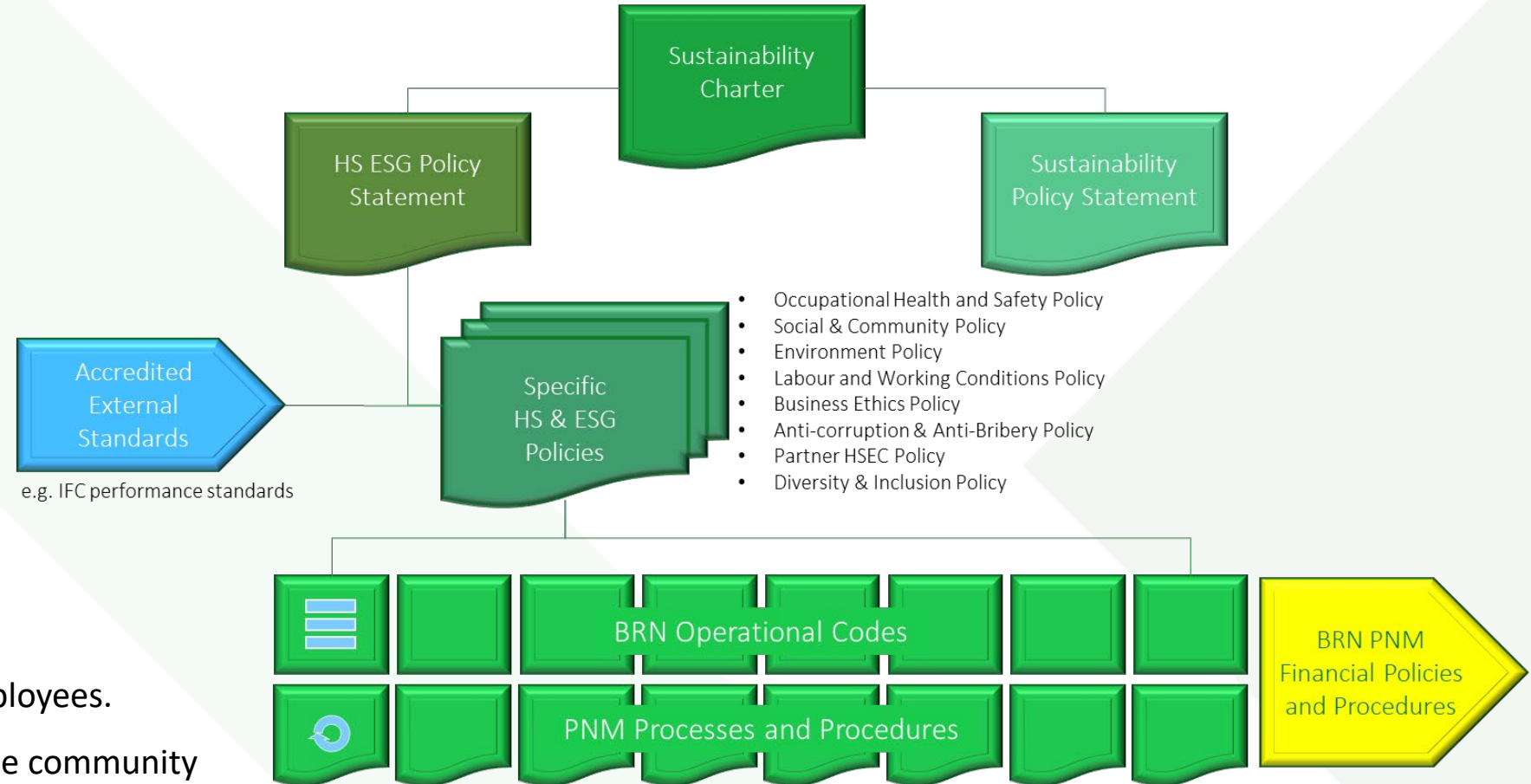


Impurity Filter Cake
Dry Residue



BRN's Sustainability Charter

... provide long-term benefits through continuous improvements in health, safety and environmental performance ... sharing the benefits of our activities with the communities within which we operate.



We will achieve this by:

- Targeting **Zero Harm** to our employees.
- Leaving a **positive legacy** in the community
- **Conserving** and where possible enhancing the natural environment.
- **Respecting** and protecting the rights of employees and host communities.
- Doing Business **Responsibly** and **Transparently**
- Ensuring adequate return for shareholders.

Brazilian Nickel and the Piauí Nickel Project - Status Jan 2021

Dec 2020 finalised a US\$ 27.57 million equity investment
Currently completing a further US\$ 15 m debt facility

Use of Funds:

- Early production (“The PNP1000”)
- Completion of a Bankable Feasibility Study (“BFS”) for the full-scale Piauí Nickel Project

All Environmental Permits awarded

Full Scale Project

25,000 tpa Ni contained in NHP

900tpa contained in CHP

USD 465M Max exposure
(approx. 1/3rd of competing technologies)

C1 Opex USD 6,130
(lowest quartiles)

NPV 10% USD 1.14 billion

IRR 53%

The PNP 1000 – Fast Track to Producer Status



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Demonstration Plant precipitation circuit

Description

- Converts existing Demo Plant (DP) into small production unit
 - 1,400 tpa nickel and 35 tpa cobalt
- Uses existing mining rights
- US\$ 23 million capex/working capital/contingency

Benefits

- Further develops customer portfolio
- Provides cash flow e.g. in full-scale construction period
- Enhances industrial partnership opportunities
- Continues work force development and training

Schedule

- Jan-21 Kick-off
- May-21 Mining begins
- Nov-21 Plant Construction complete
- Mar-22 “First Nickel”

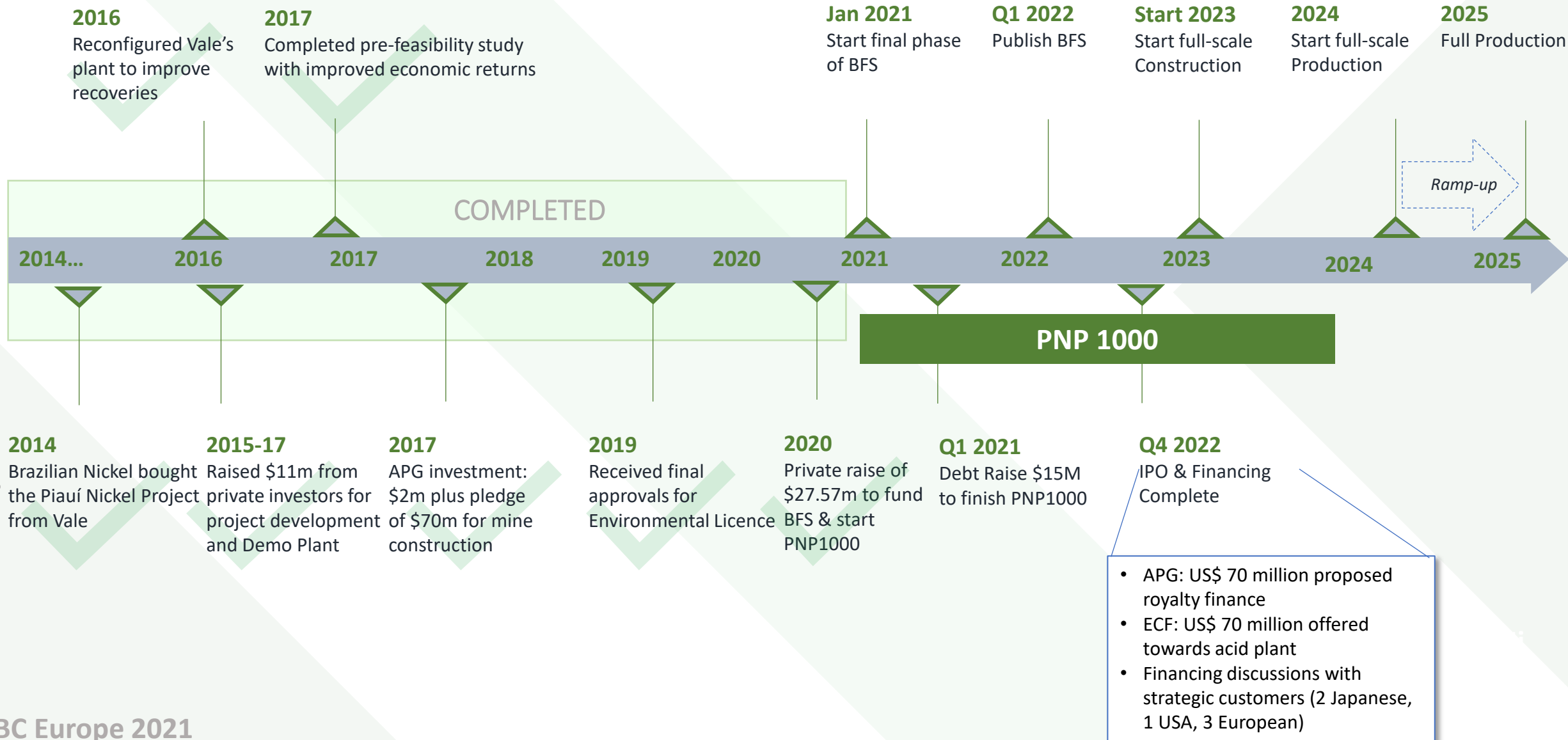
The PNP Development Schedule



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OPERATIONAL

FINANCIAL / PERMITTING



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Nickel and Cobalt

Made Easy

Global Policy Statements for Decarbonization



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Paris Agreement leads

Decarbonization is very metal intensive

Increasing Regulation & Policy

Policies include:

Zero Emission Goals by 2050 or earlier

ICE reduction or bans

EV Growth incentives

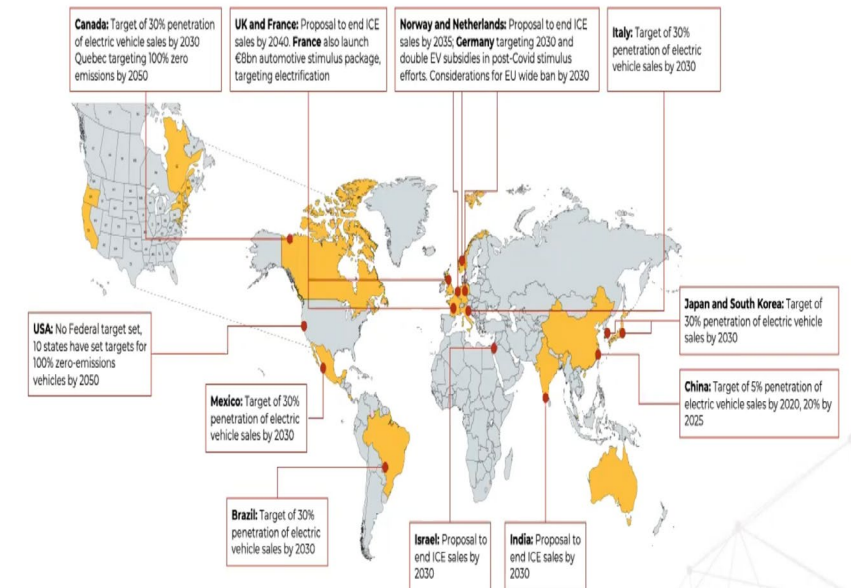
EU Green Deal

Electric Vehicles Initiative EVI – 15 member countries

EV30@30 – 10 of the EVI countries signed up

Air pollution – not carbon is a driver for some

UK is now 2030



Note: ICE - Internal Combustion Engine