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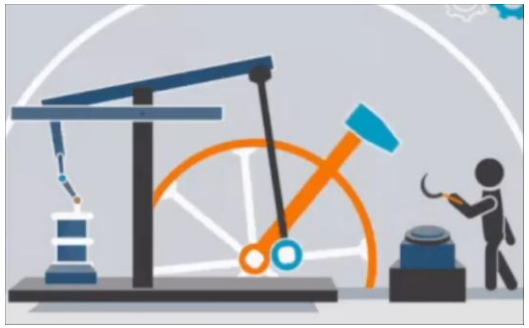
Energy Efficiency and Decarbonisation Strategy-BALCO

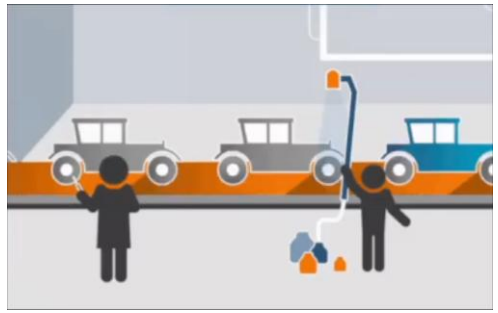
BALCO's Journey to Excellence

BALCO 1.0



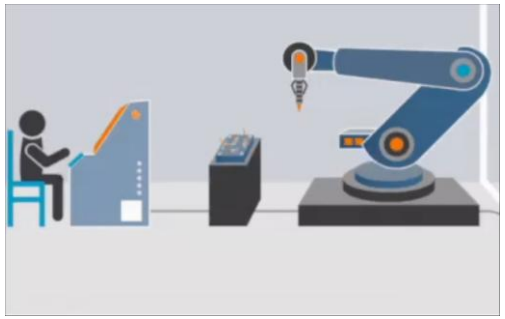
- Smelter **of 1 LTPA** with **Soder berg** technology in 1973
- BALCO was taken over in 2001 by **Vedanta**

BALCO 2.0



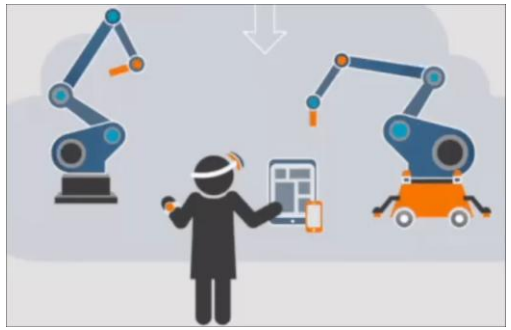
- **270 MW** Captive power plant
- **320 KA Smelter** with **GAMI – China**
- Expanding further by the installation of **3.25 LTPA** aluminium and

BALCO 3.0



- **540 MW** Captive power plant
- Expansion of the smelter by installing **5.10 LTPA** by employing 500 KA
- **1200 MW** thermal power plant.

BALCO 4.0

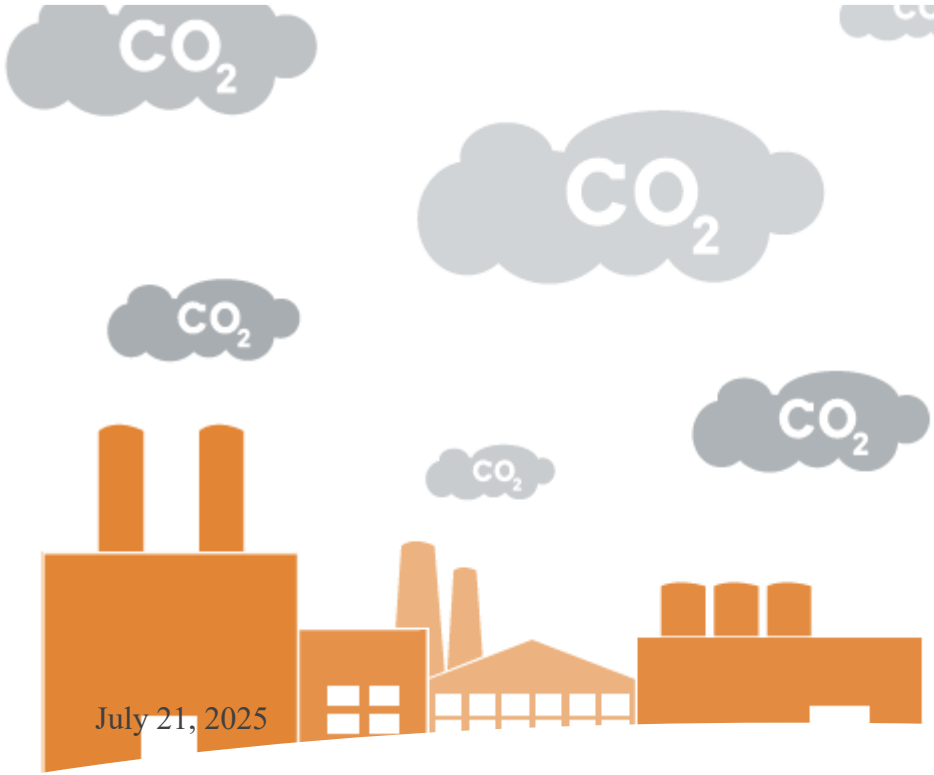


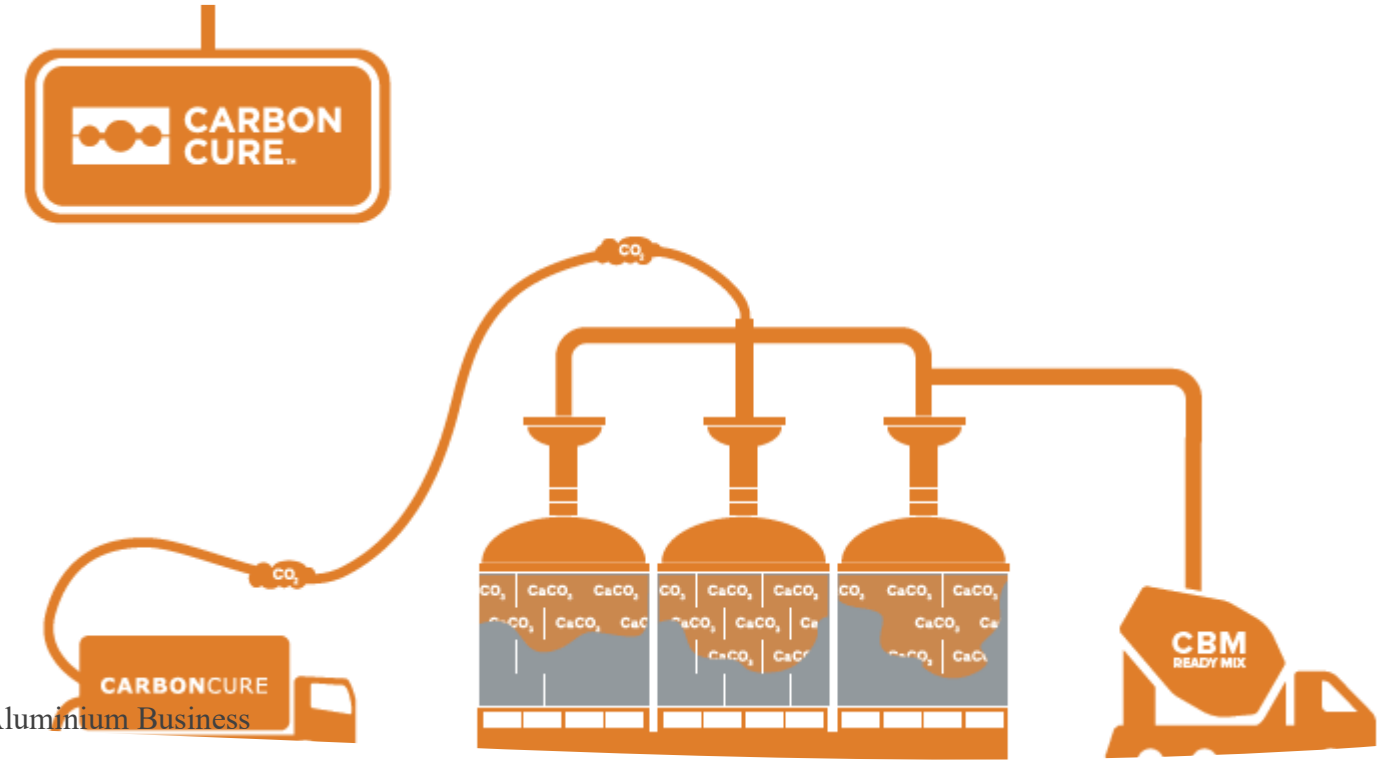
1 MnT Aluminium Club

- ✓ ESG Leader
- ✓ Digital Driven
- ✓ AI Based Operation

Aim : Aiming Net Zero carbon by 2050 or sooner

We have set an ambitious objective to reach Net Zero Carbon emissions by 2050. By 2030, our target is to decrease the greenhouse gas (GHG) intensity of our operations by 30% compared to the baseline set in 2021. Additionally, we are planning to engage in collaborations with our customers and logistics partners to reduce downstream Scope 3 emissions associated with our business.





GHG Emission - Sources

Emissions Sources

1 Fossil Fuel/Energy

2 Process emissions

3 GHG usage

Scope 1

Fossil Fuel Combustion

- Coal
- FO
- LDO
- LPG
- Diesel/petrol in vehicles
- LPG use in canteen

GHG Usage

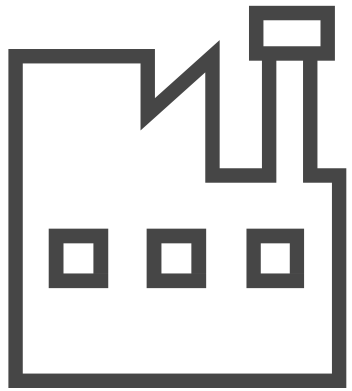
- Refrigerant refill
- SF_6 Circuit breakers use
- CO2 Fire extinguisher refill

Process Emissions

- CO_2 emissions – Anode Consumption
- PFC emissions- CF_4 and C_2F_6 in smelting

Scope 2

Emissions due to purchased electricity

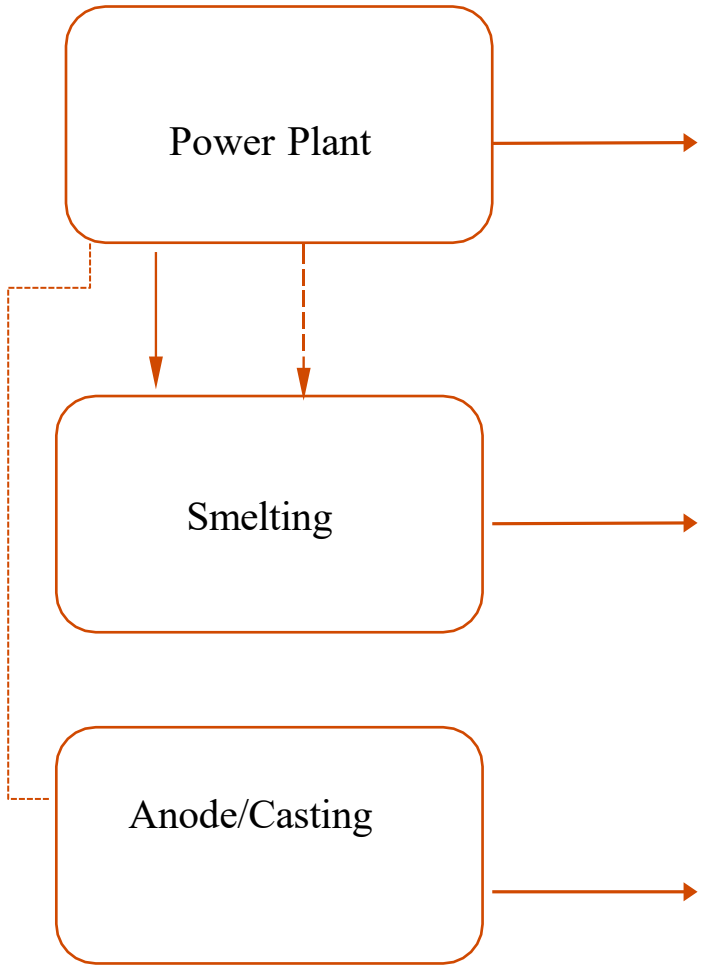


Scope 3

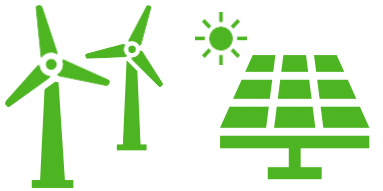
Other indirect emissions

1. Purchase of raw materials /services
2. Capital Goods
3. Fuel & Energy related
4. Upstream Transportation
5. Waste Disposal
6. Employee
7. Business Commute
8. Leased Assets
9. Downstream transportation & distribution
10. Processing of sold products
11. Use of sold products
12. End of Life treatment sold products
13. Downstream leased assets

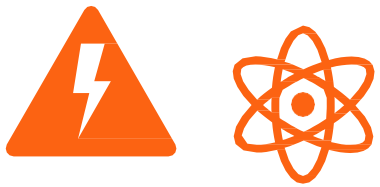
Decarbonization – Approach – BALCO

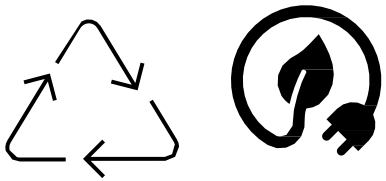


Decarbonisation power generation and the deployment of **Efficiency improvement through R&R**, **RE Power procurement and Biomass co-firing** offer the most significant opportunity to reduce emissions to net zero by 2050



Energy Efficiency to reduce smelting energy consumption and technologies to reduce the process emissions from smelting operation such as **Carbon Capture Utilisation and Storage (CCUS) ,Copper inserted cathodes, Pot controller upgradation., etc.**

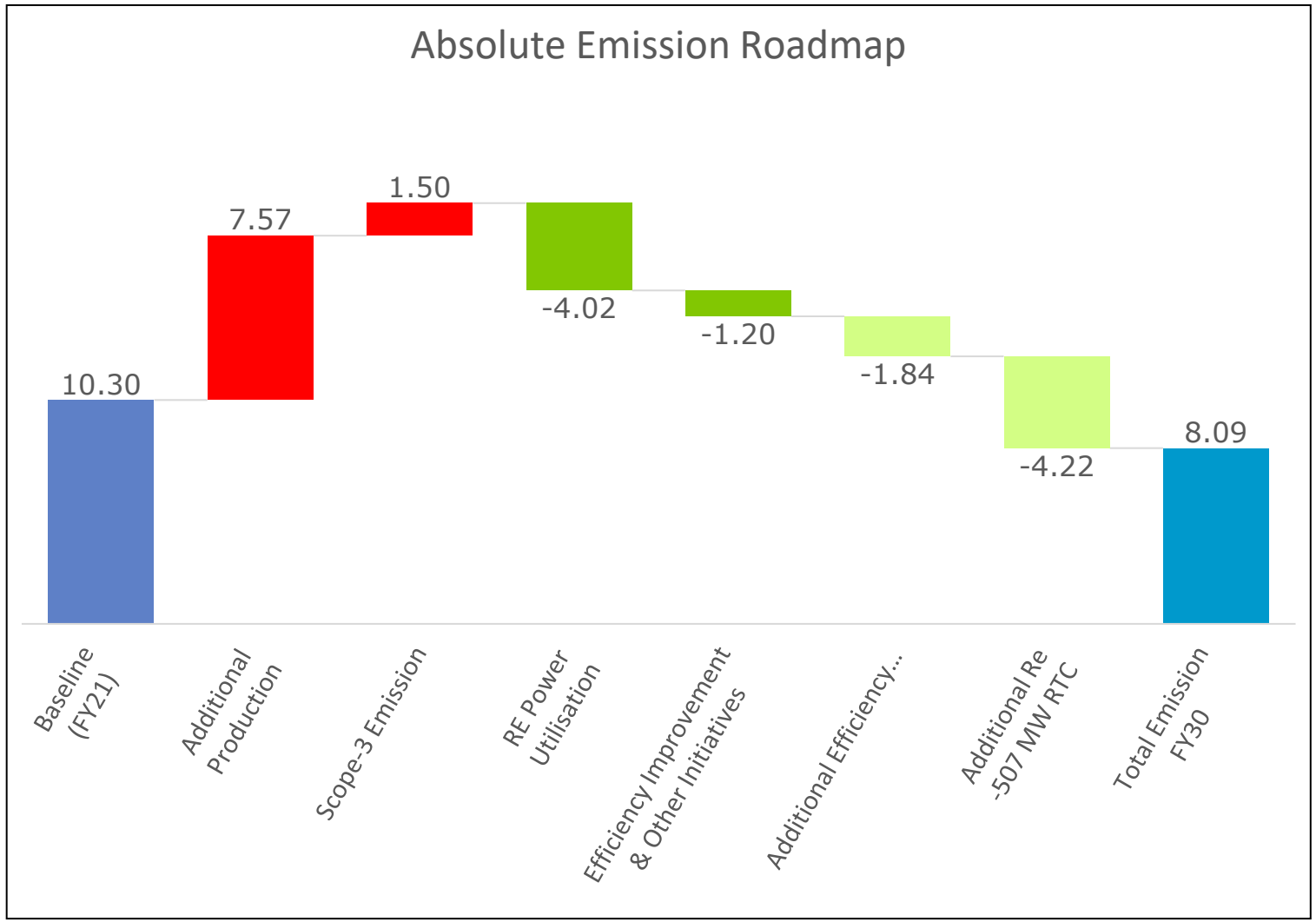




Emissions from fuel combustion can be reduced by **Electrification, Fuel switching to Natural gas and CCUS** offer the most credible options to reduce GHG emissions

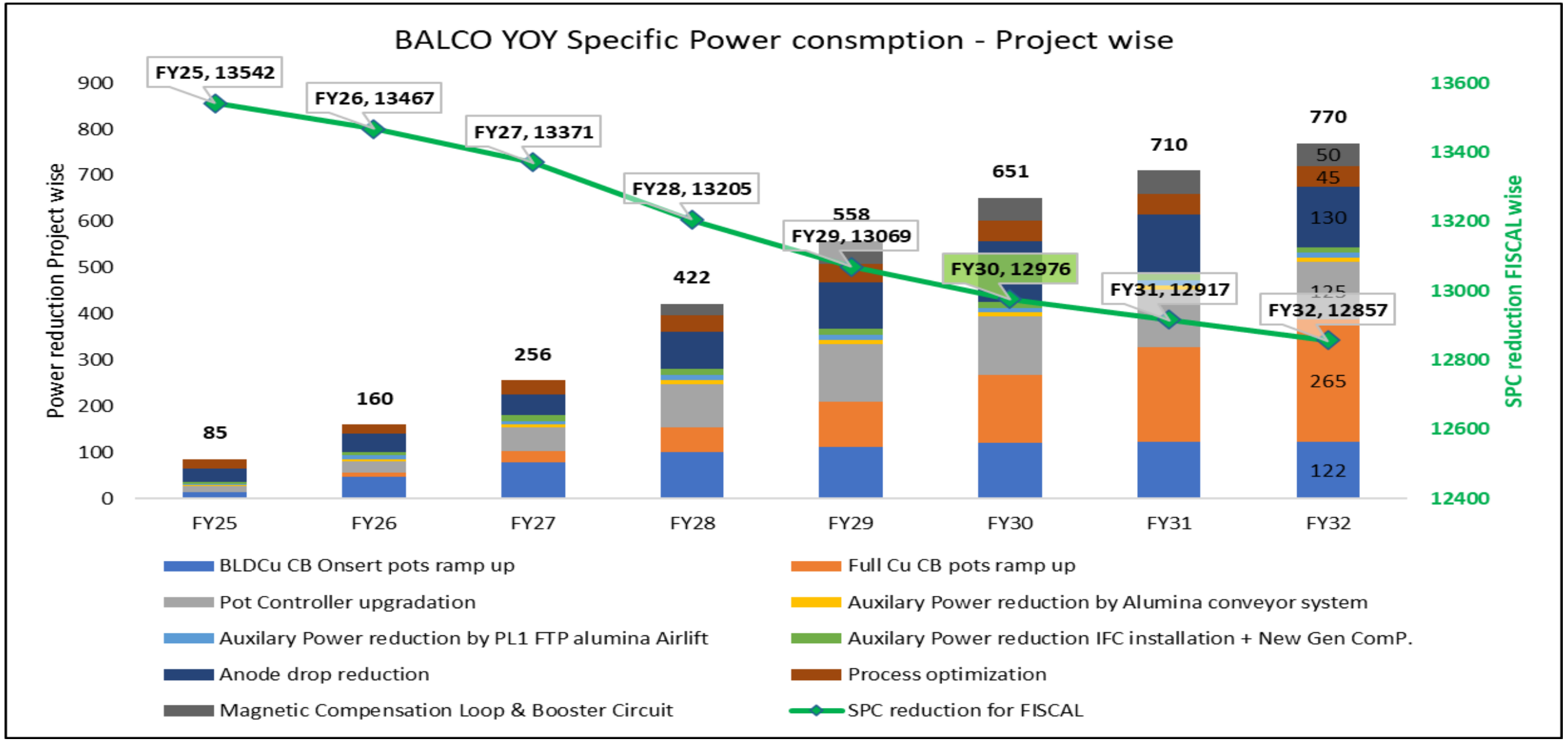
Another important decarbonization lever for Aluminum Sector is – Recycling

Total emission Roadmap for FY30- BALCO



- BY FY 30 the total emission will be reduced by 2.2 Mn tCO2e per year
  - 9.07 MTCO2e will be increased due to increase in production volume
  - 4.02 MTCO2e will be reduced due to RE Power utilisation
  - 1.20 MTCO2e will be reduced by implementation of identified projects
  - 1.84 MTCO2e will be reduced by additional efficiency improvement projects
  - 4.22 MTCO2e will be reduced by additional RE of 507 MW

Roadmap for 13000 SPC (Potline)



Best Practices - BALCO

We have undertaken various initiatives to reduce our carbon footprint-

- ✓ Implementation of **Graphitised cathodes in smelter** – Saving of 880 tCO_{2eq}.
- ✓ Introduction of **Copper insert cathode in smelter** – Saving of 0.42 tCO_2/MT Al.
- ✓ The trail development of **Pot Controller Upgradation** in smelter- Expected Savings of 150 KWh/MT.
- ✓ The adoption of **Biomass** cofiring in TPP's– Saving of 19766 tCO_{2eq}
- ✓ Adoption of **6 EV Forklifts** reduced a total of **246 tCO_{2eq}** emissions during FY 2024.
- ✓ Substitution of HFO with **LSHS** -in the metal processing areas.
- ✓ **RE Power** procurement - 179.91 MU -127735 $tCO_{2e.}$

Way Forward

- ✓ We have additionally secured agreements for 218 MW of RE power by FY 2025, with plans to increase this to approximately 507 MW by FY 2030.
- ✓ All our units are working on 100% EV transition by FY 30.
- ✓ Setting up of direct carbon capture technology demonstration at BALCO smelter as pilot project.

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