N+P

“We utilize the value of waste to reduce the global Carbon footprint.

ABOUT

N+P Group

Markets


Alternative
Fuels


Waste to
Energy


Alternative
Raw Materials

Waste to Value

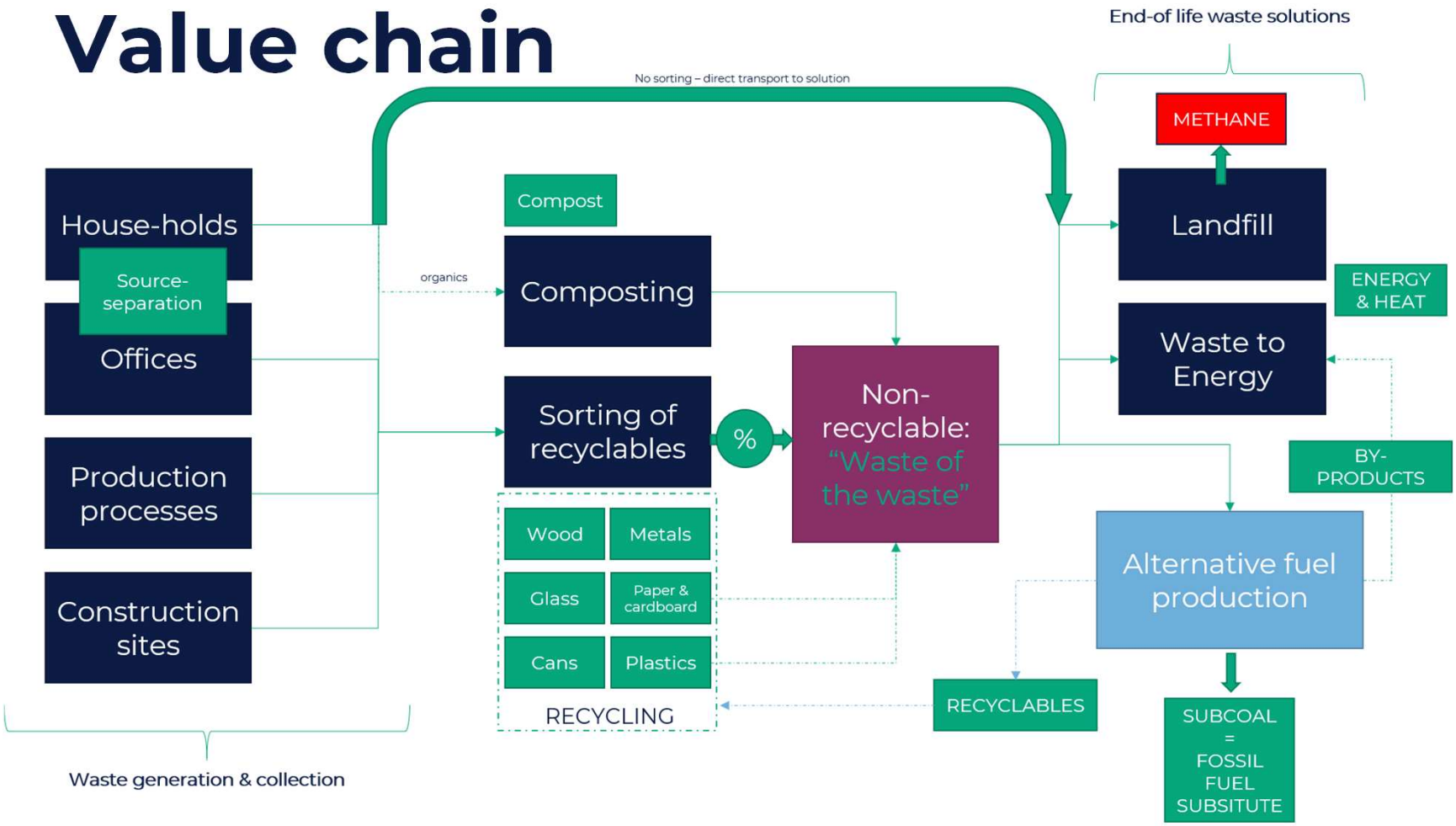
Alternative Fuels

WHY USING

Alternative Fuels

- Alternative Fuels are produced from non-recyclable end of life waste streams, predominately a mix of paper and plastics, which typically end up in landfill
- Alternative Fuels are produced to a specification so that they can be used in existing production processes, which are typically designed to use solid fossil fuels like lignite or coal
- By using Alternative Fuels, applications can significantly reduce their CO_2 emissions and as well as their operational costs

Value chain


End-of life waste solutions
No sorting – direct transport to solution
METHANE
House-holds
Source-separation
Offices
Production processes
Construction sites
Waste generation & collection
organics
Compost
Composting
Sorting of recyclables
%
Non-recyclable: "Waste of the waste"
Wood
Metals
Glass
Paper & cardboard
Cans
Plastics
RECYCLING
Landfill
ENERGY & HEAT
Waste to Energy
BY-PRODUCTS
Alternative fuel production
RECYCLABLES
SUBCOAL = FOSSIL FUEL SUBSITUTE

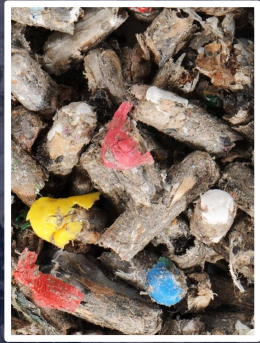
Portfolio

RDF - Refuse Derived Fuel (high/low grade)

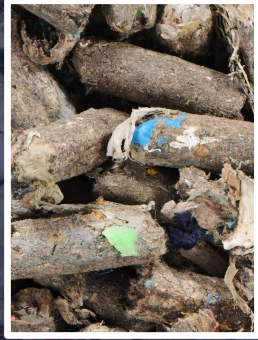
SRF - Solid Recovered Fuel (calciner/mainburner)

Subcoal Ø 6

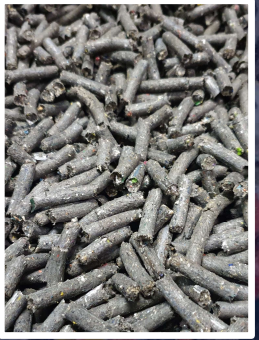
Subcoal Ø 8



Subcoal Ø 16

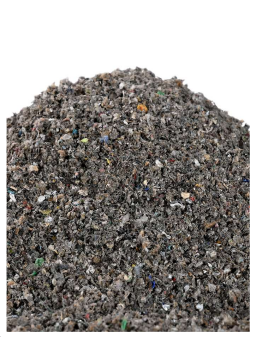


Subcoal PAF (pellet)



Subcoal Granulate

Subcoal PAF (milled)



Alternative Fuels

CO_2 reduction

DECARBONIZING GLOBAL INDUSTRIES

CO_2 reduction

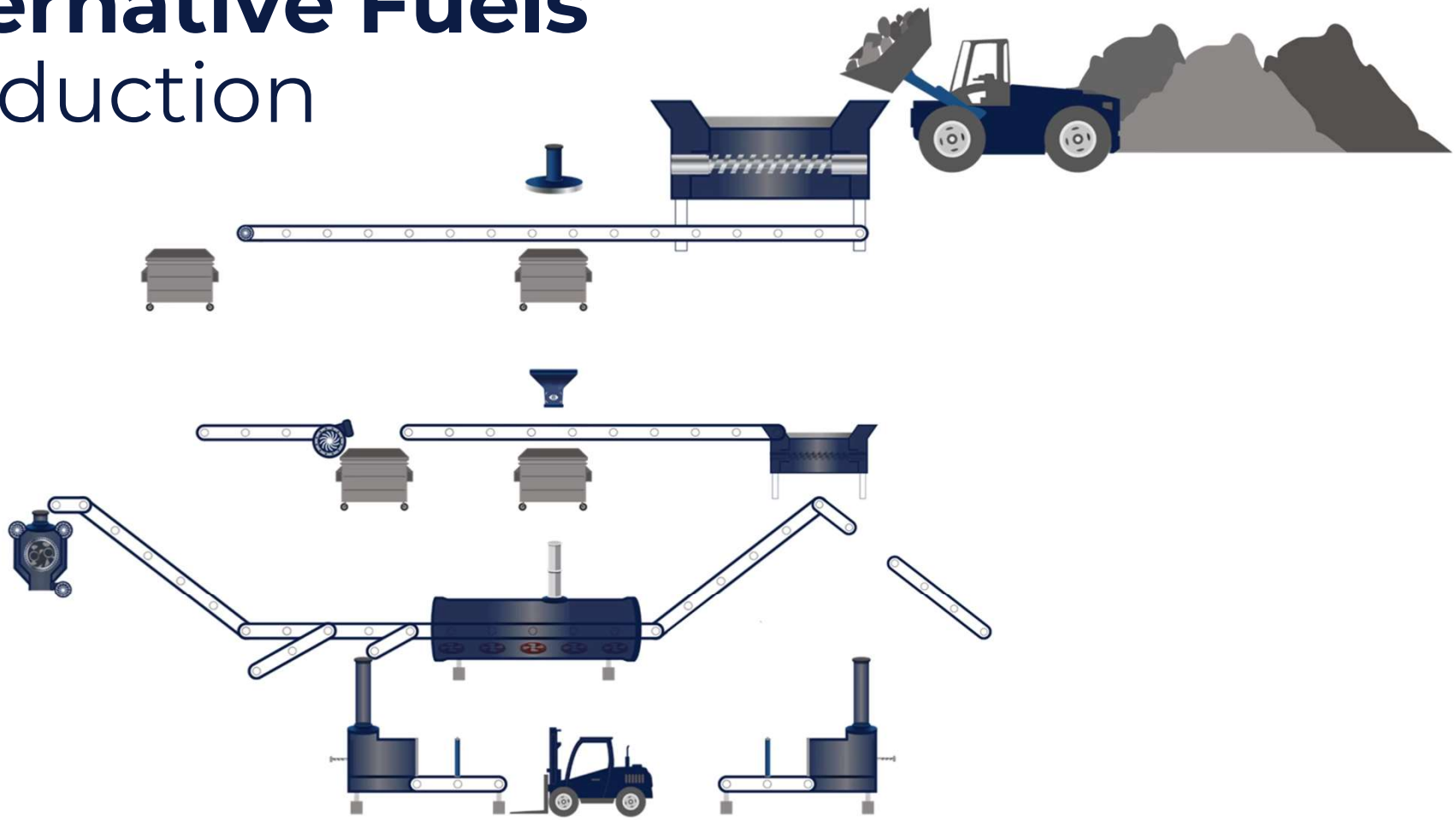
- Composition of the “waste of the waste” consists of approx. 45 to 55% of biogenic content
- Biogenic content comes from fractions like paper, cardboard, textiles and wood
- A study carried out by Ingenia (NL) have calculated interesting CO_2 reduction numbers, up to 1.6 ton of reduced CO_2 emissions for each ton of fossil fuel which is replaced
- With rising CO_2 prices this increases the potential value of alternative fuels thus increases the driver to switch to alternative fuel usages

N+P's new production facility in the UK
Subcoal® Production TSP (Teesside)

Annual output capacity:
Subcoal® pellets: 140kton
SRF: 80kton

Annual input capacity
RDF: 280 kton

Alternative Fuels
Production



Expansion plans (Forecast)

The Netherlands
- Farmsum (revamp)
- Rotterdam

United Kingdom
- Teesside, UK (commissioning)
- Protos, Cheshire
- Thames Enterprise Park
- Teesside 2
- Hull, UK

Germany
- Ruhr area
- Bremen
- Cologne

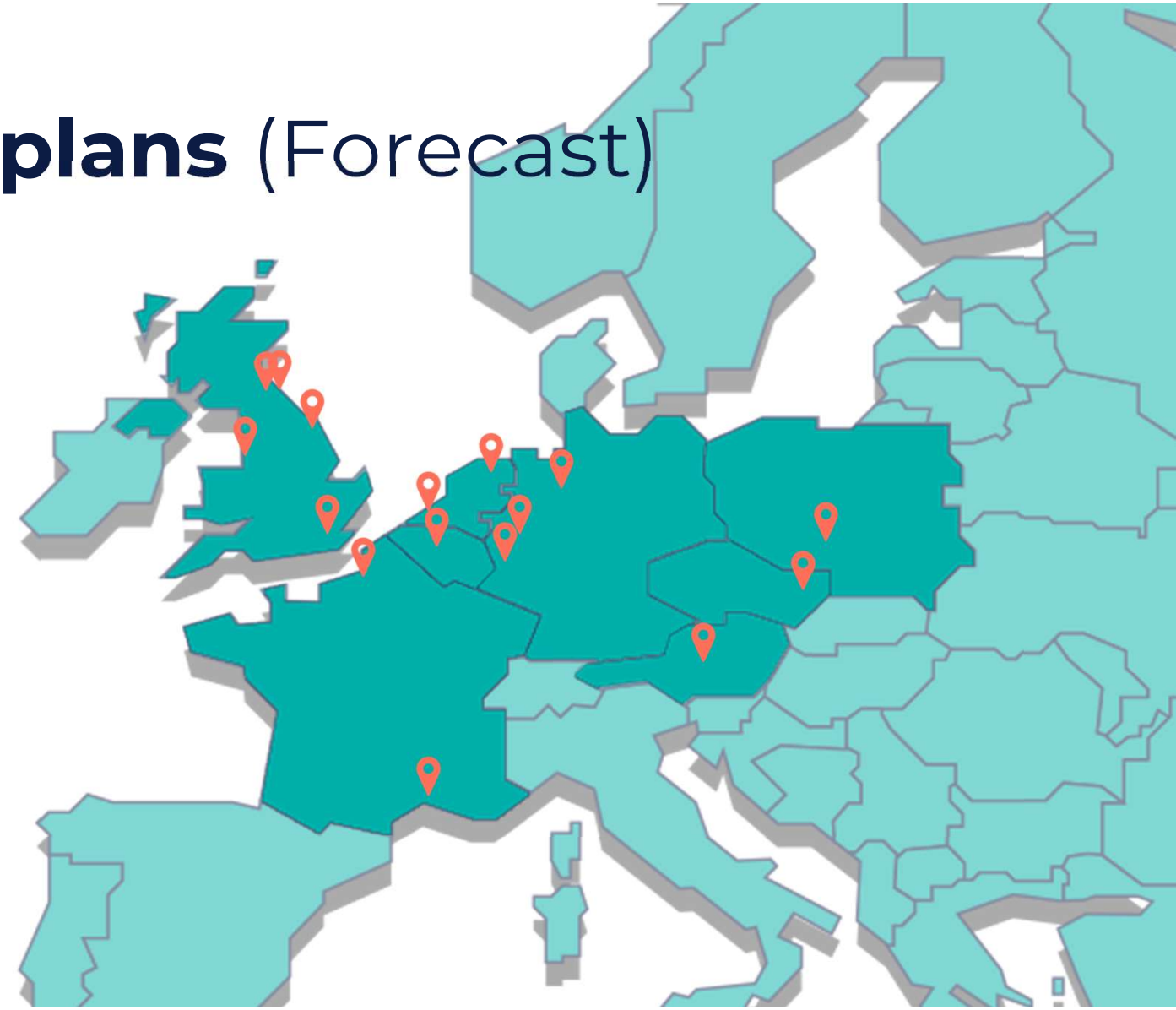
France
- Dunkirk
- Fos-sur-Mer

Czech Republic
- Ostrava

Belgium
- Antwerp

Poland
- Katowice, PL

Austria
- Upper Austria / Styria



Alternative Fuels

Applications

ALTERNATIVE FUELS

Fossil Fuel substitute

- Our Alternative Fuels are specifically produced to meet requirements from existing pyro processes in order to substitute fossil fuel in these existing installations
- Goal is to achieve both chemical and physical properties in order to maximize the substitution of fossil fuel but whilst maintaining process stability
- Depending on the application up to 100% fossil fuels can be substituted
- N+P's Alternative Fuels properties are designed so that the fuel can be used in a number of different energy intensive industries
- Continuous development in order to improve fuel properties and develop other routes to substitute fossil fuels in various industries

Application references

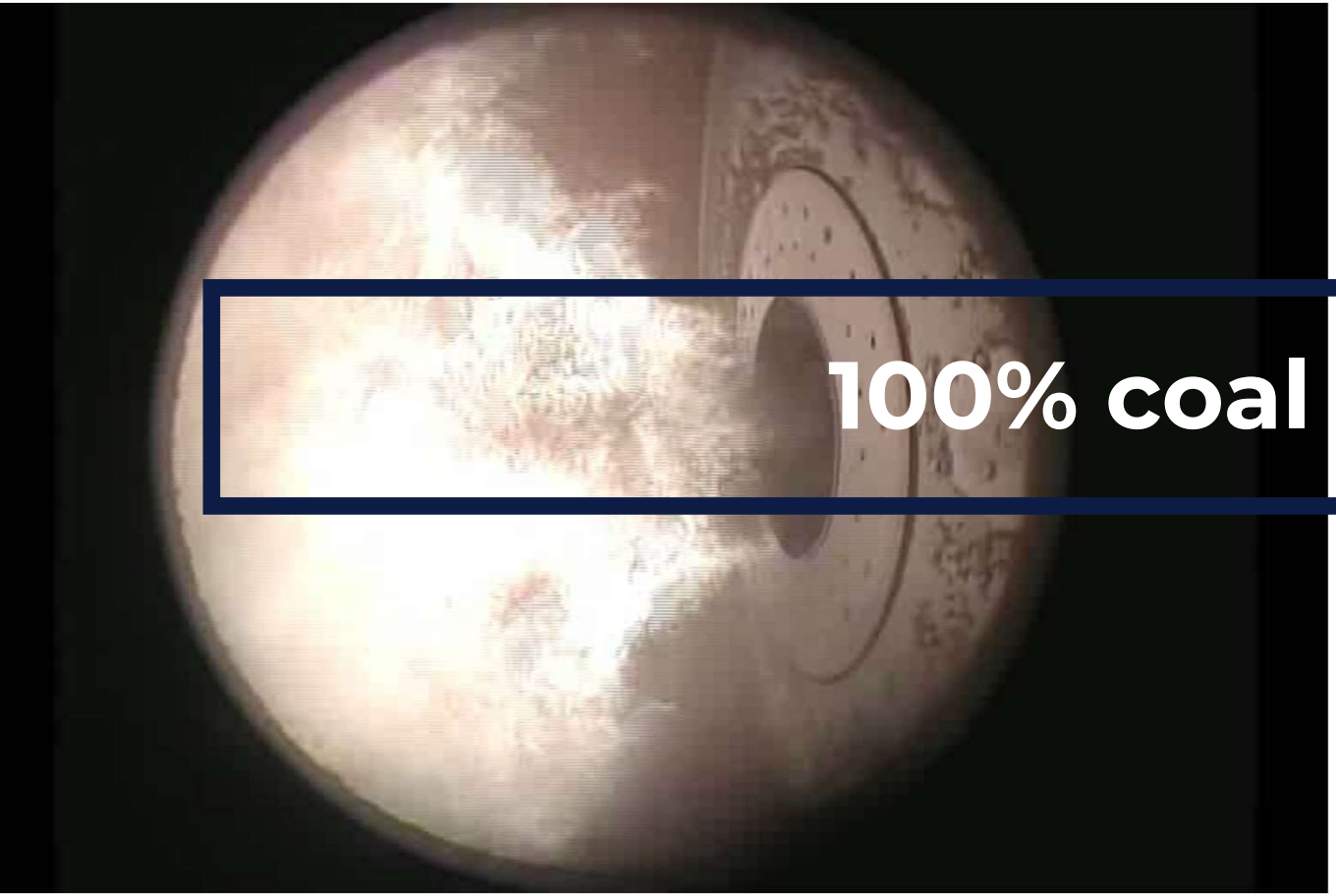
1. **Cement industry**
   The cement industry is currently the biggest user of waste derived alternative fuels. Alternative fuels like SRF and Subcoal are both used in the calciner and main burner, and helped kilns achieve 100% substitution.

2. **Lime industry**
   Because of the high quality of the fuel (low ash content), and the different physical forms which can be produced; Subcoal® is used in both vertical as horizontal lime kilns to substitute the primary fuels. Milled Subcoal® (PAF) is one of the only alternative fuels which can be used in vertical lime kilns.

3. **Steel Blast Furnaces**
   Subcoal® is used to reduce the coking rate in a blast furnace, where it is injected at the bottom of the blast furnace using bespoke equipment or together with pulverized or granulated coal systems.

4. **Coal fired power stations**
   Subcoal® is one of the cheaper options for a power station to reduce its CO_2 emissions and also reduce the cost of using conventional coal. Subcoal® is milled together with coal or in a dedicated system. Recent successful trials proof that 100% coal substitution is possible in a power plant.

Milled Subcoal® (PAF) has been successfully used to achieve a 100% waste derived flame at a 25 MW_t burner at 3.7 tph, achieve a stable flame with a good emissions profile



Decarbonizing Industries

100% coal substitution

THANK YOU FOR YOUR ATTENTION

Any questions?