

Development and use of LCA and Product Carbon Footprint at Höganäs AB

Alvier Mechatronics Sustainability day

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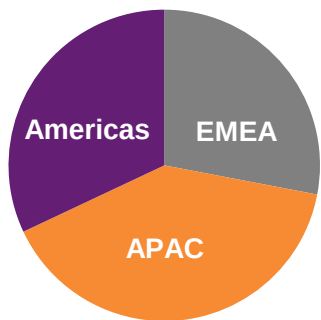
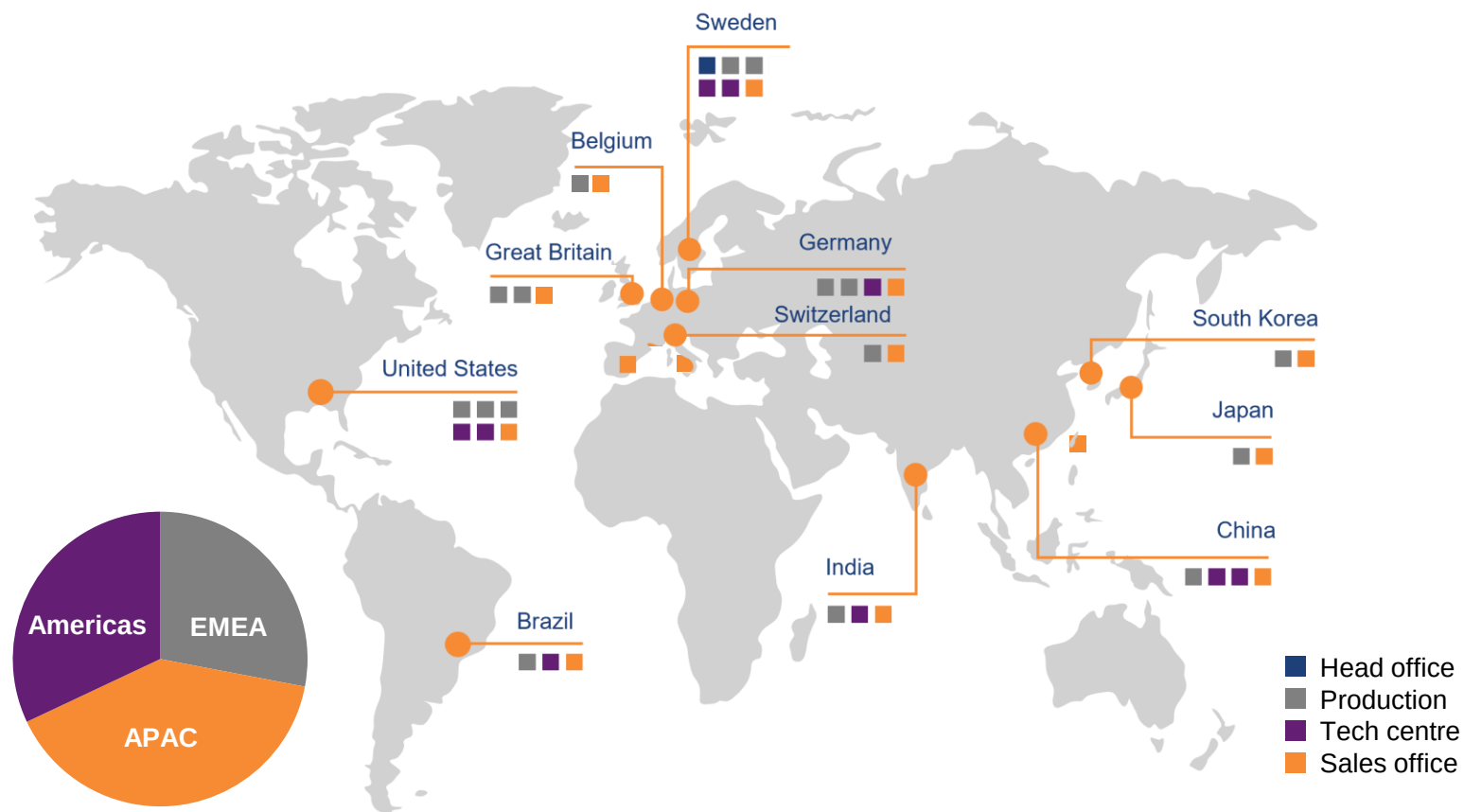
Content



- » Who are we?
- » Höganäs sustainability agenda
- » Life cycle assessment (LCA) at Höganäs
- » Carbon Footprint of Somaloy products
- » Concluding remarks

Höganäs in numbers

Global presence & local reach



Turnover geographic market*



3,000

customers
in 75 countries



500,000

tonnes in annual
production capacity



16

production facilities
in 11 countries



2,300

employees in
15 countries



2

owners – privately owned
by FAM and Lindégruppen



3,500

products



800

granted patents



12,334

MSEK in turnover (2023)

Höganäs

* Numbers from 2023



Metal powders for every industry

- » **Iron powder** for automotive, consumer goods, chem/met, welding
- » **Customer specific mixes** for automotive, consumer goods
- » **High alloys** for aerospace, mining, agriculture, oil & gas, medical, dental
- » **Brazing filler metals and pastes** for automotive, thermal processing
- » **Advanced ceramic powders** for protective wear

Our main production processes

From reduction and atomising to mixing

- » **Sponge iron:** Reduction of iron ore – the Höganäs method and hydrogen reduced
- » **Water atomising:** Smelting of scrap and atomizing with water jet
- » **Gas atomising:** Smelting of raw material and atomizing with gas
- » **Plasma atomising:** Smelting of raw material and atomizing with plasma beam
- » **Annealing:** Post-treatment to reduce oxygen and add properties
- » **Mixing:** Powder grades and additives mixed to final product

Our focus areas



Powder metallurgy



Electrification



Surface coating



Additive manufacturing

Enables sustainable solutions



- » Metal powder technology...
- » ...uses recycled raw material
- » ...minimises waste
- » ...allows more efficient use of resources e.g., energy and labour
- » ...simplifies recycling of end products
- » ...extends product life cycle

Sustainability agenda

Climate

- » Towards net-zero emissions

Environment

- » Environmental impact mitigation
- » Process safety

Products

- » More sustainable products
- » Resource efficiency and zero waste

Workplace

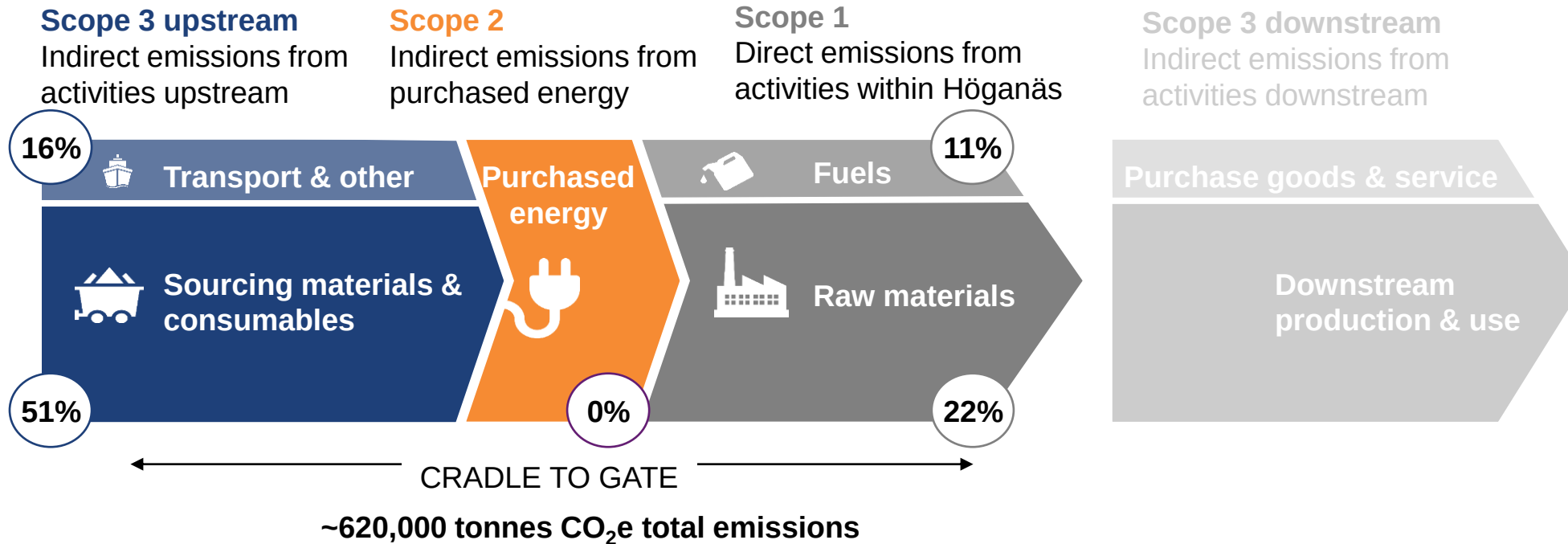
- » Zero accidents and healthy workplaces
- » Diversity, inclusion and equality

Society

- » Responsible and ethical behaviour



Climate – CO₂ emissions 2023

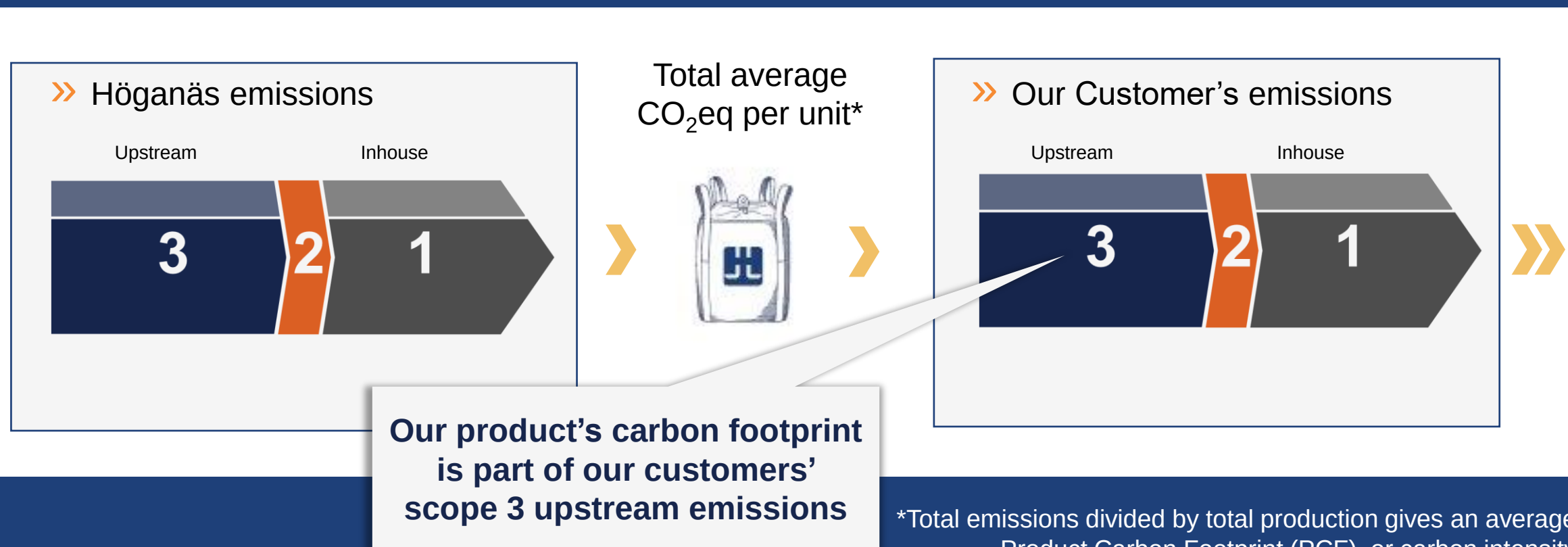


- ✓ Total carbon dioxide emissions in scope 1 and 2 decreased by 46 percent since 2018 (baseline year)
- ✓ The overall reduction in scope 3 is 25 percent since 2018
- ✓ We achieved our target to purchase 100 percent fossil-free electricity at all sites

Read more at [Sustainability report 2023 | Höganäs \(hoganas.com\)](https://www.hoganas.com/sustainability-report-2023)

Our carbon emissions from supply chain, energy use and process emissions are transferred to our Product Carbon Footprint and become

Customer's upstream scope 3 emissions

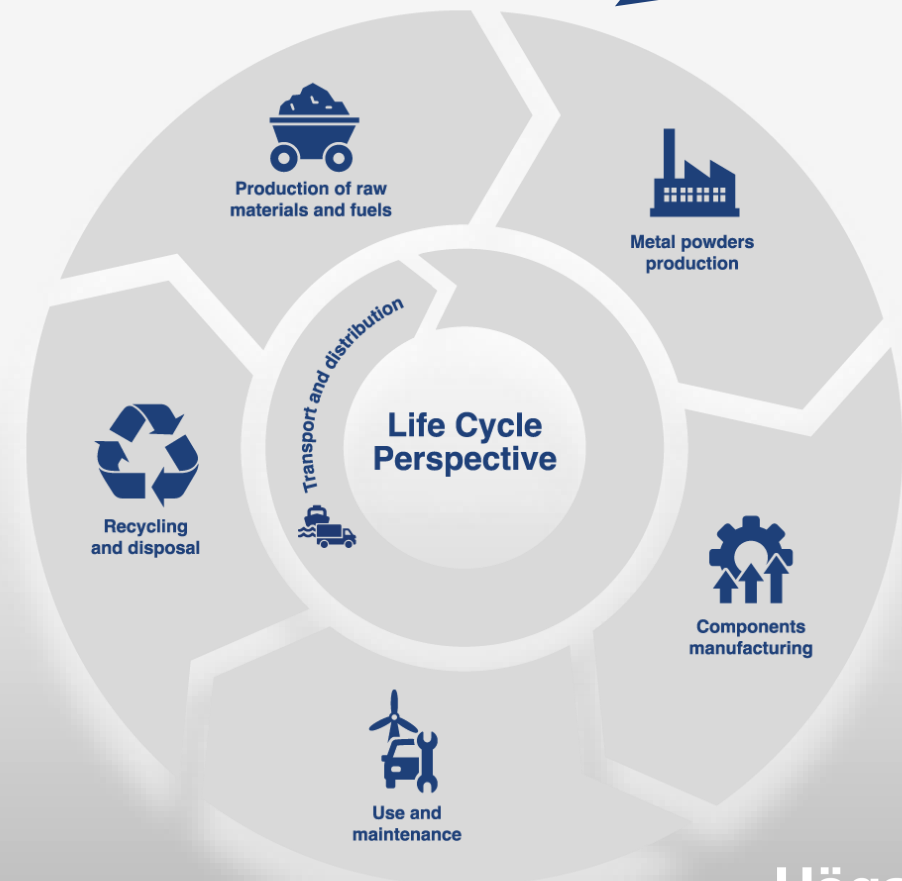


Life cycle assessment - LCA

» Environmental LCA quantifies the potential environmental impact of a product through its “life cycle”

- » Systematic, consistent and according to standardised methodologies*
- » Trustworthy, product specific carbon footprint
- » Enables compliance to EU legislation (CBAM, Green claims)
- » Can be used for much more than carbon footprint

*LCA related standards and guidelines are for example: ISO 14040, 14044, 14067, EPD, PEF



Höganäs LCA Roadmap



1st CF assessment
1st Carbon Footprint (CF) through external consultancy

2016

Establishing LCA Foundation

2 LCA Resources hired
LCA tool (LCA FE)
First LCA for our 3 prioritized production sites (through external consultancy)
First customer PCF collaboration project

2022

2021

Net Zero Targets

Climate Roadmap integrated into Business Plan

2020

Climate Roadmap

Extensive work to create local climate mitigation action plans and set targets

Expanding the LCA models

Executing our Process level LCA Plan
Third LCA Resource hired

2024

2023

First 3rd party verified LCA

PCF of our Electro Magnetic Materials, Somaloy 5P product family is verified based on ISO14067

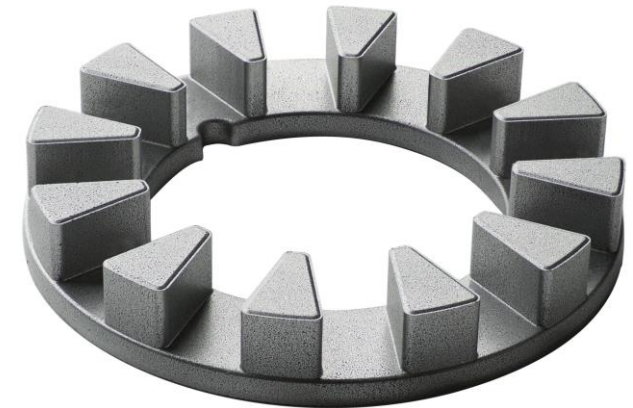
Full coverage of Höganäs sites

Covering Höganäs all core processes and products at the global level

2030

Höganäs SMC Materials – Somaloy®

- » Somaloy® is Höganäs' trademark for soft magnetic composite powders
 - Made of iron powder particles coated with an electrically insulating layer
 - Can be formed into complex shapes by means of powder metallurgy
- » Benefits
 - Size and weight reduction of components
 - Reduction of the total number of parts in the final application
 - Less need for machining
 - Low scrap rate in manufacturing
- » Applications: Automotive/Industrial
 - Traction motors, pumps, air conditioning compressors and more



*AFM stator for electric water pump.
Source: Höganäs image gallery*

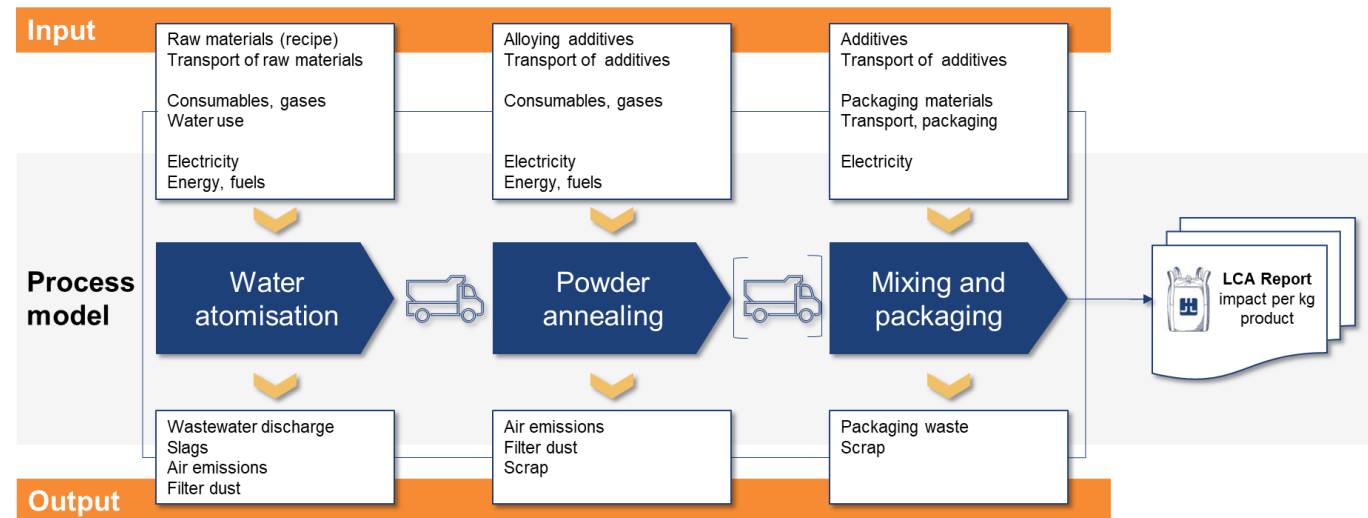
Carbon Footprint of Somaloy 5P

Method and framework

- » ISO 14067:2018, Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- » **Gate-to-gate** (i.e transport to customer is excluded)
- » Fossil Global Warming Potential (GWP) expressed in **kg CO₂ equivalents (kg CO₂eq.)**

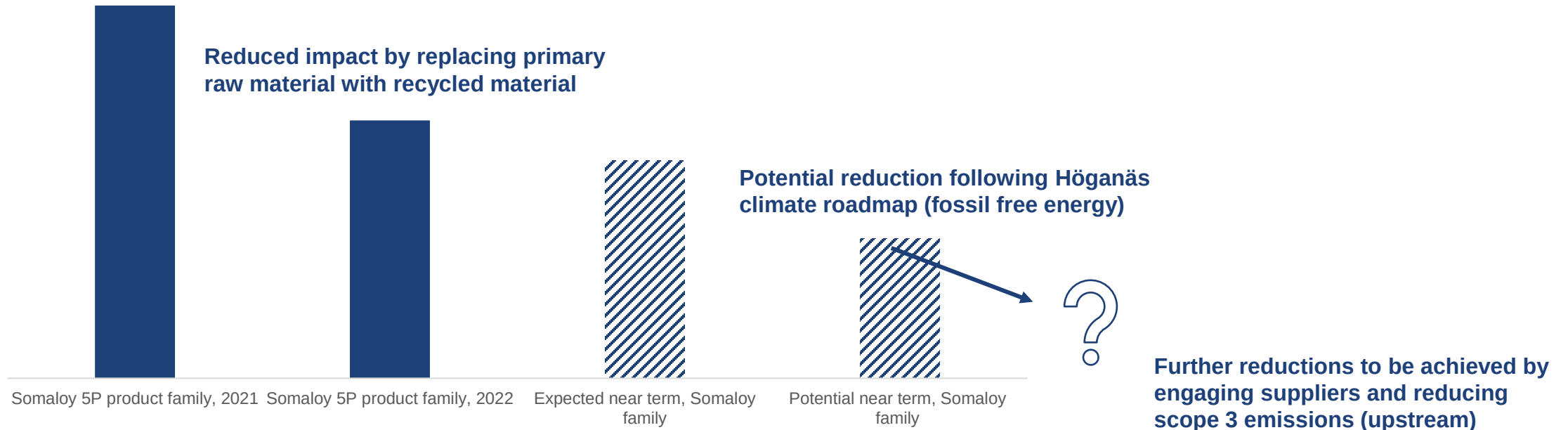
Process model: Water atomised iron powders

- » Process model is populated with product specific data - Life Cycle Inventory (LCI)



PCF Somaloy products

Benchmark and future potential



LCA helps identify optimal ways to reduce product carbon footprint



Fossil free
electricity



Recycled input
materials



Biofuels or
electrification



Additives with
lower footprint

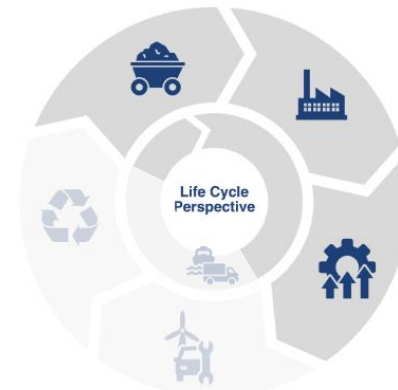


Energy
efficiency

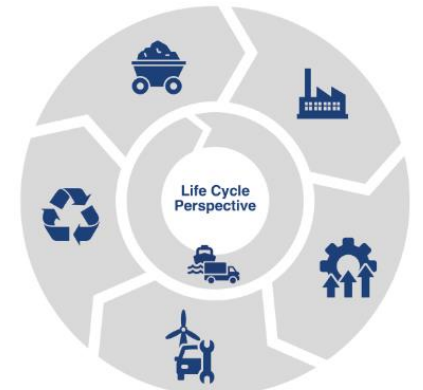
Cooperation is key
to utilise the full
potential of LCAs



Höganäs



Our Customers



Full life cycle

Concluding remarks

- » Our vision is to be the preferred supplier of sustainable powders – driving positive change through material innovation
- » Höganäs has an ambitious climate and sustainability roadmap that drives the progress on corporate and product level
- » LCA is selected as a holistic tool to support decisions and communicate the sustainability performance of our products
- » Climate is in focus, but other sustainability areas must not be forgotten

- » Read more in our Sustainability Report 2023

[Sustainability report 2023 | Höganäs \(hoganas.com\)](https://www.hoganas.com/sustainability-report-2023)

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How can we inspire you?

