

Sustainability in practise: Case Outokumpu

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outokumpu 

The history of Outokumpu



1910s–1920s

From 'weird' to the discovery of stainless steel



1930s–1940s

Major copper producer. 1932 Outokumpu Oy founded



1950s–1960s

Expanding into other metals



1970s–1980s

Multi-metal mining and technology company



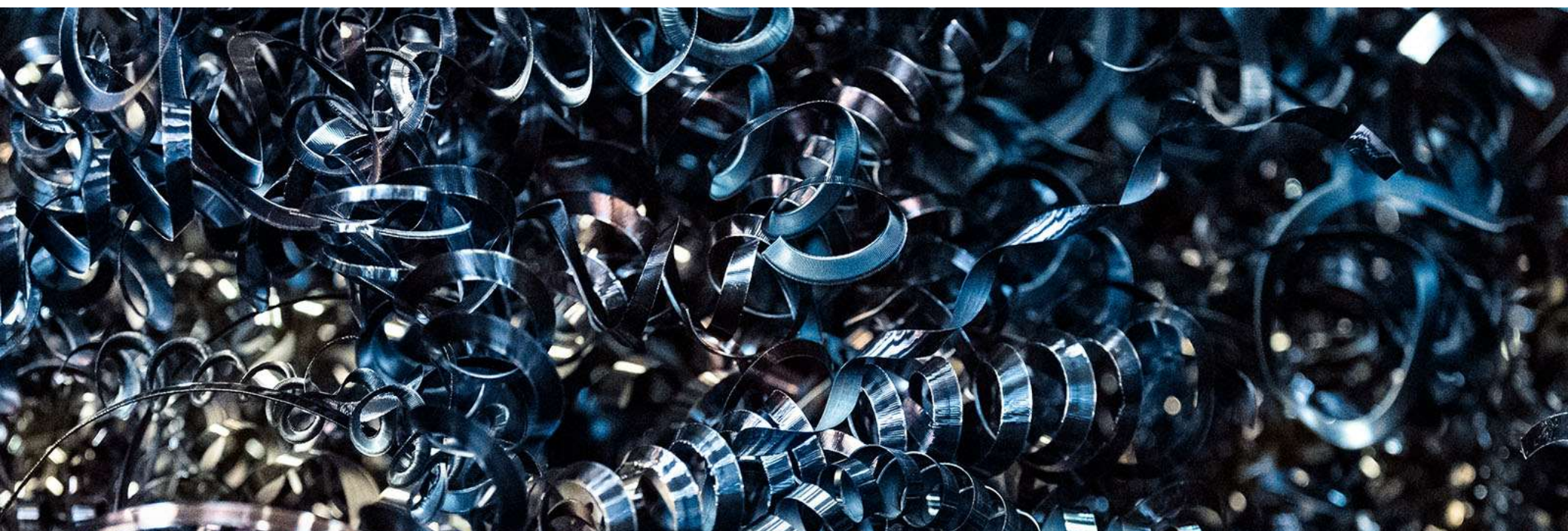
1990s–2000s

Focus on stainless steel



2010s

A new global leader in advanced materials



Megatrends & sustainability

The world needs sustainable solutions to tackle climate change

Global
megatrends

Economic and
population
growth



Mobility and
urbanization



Climate change
and limited
resources



Stainless steel – at center of circular economy

Stainless steel is sustainable: 100% recyclable, efficient and long lasting

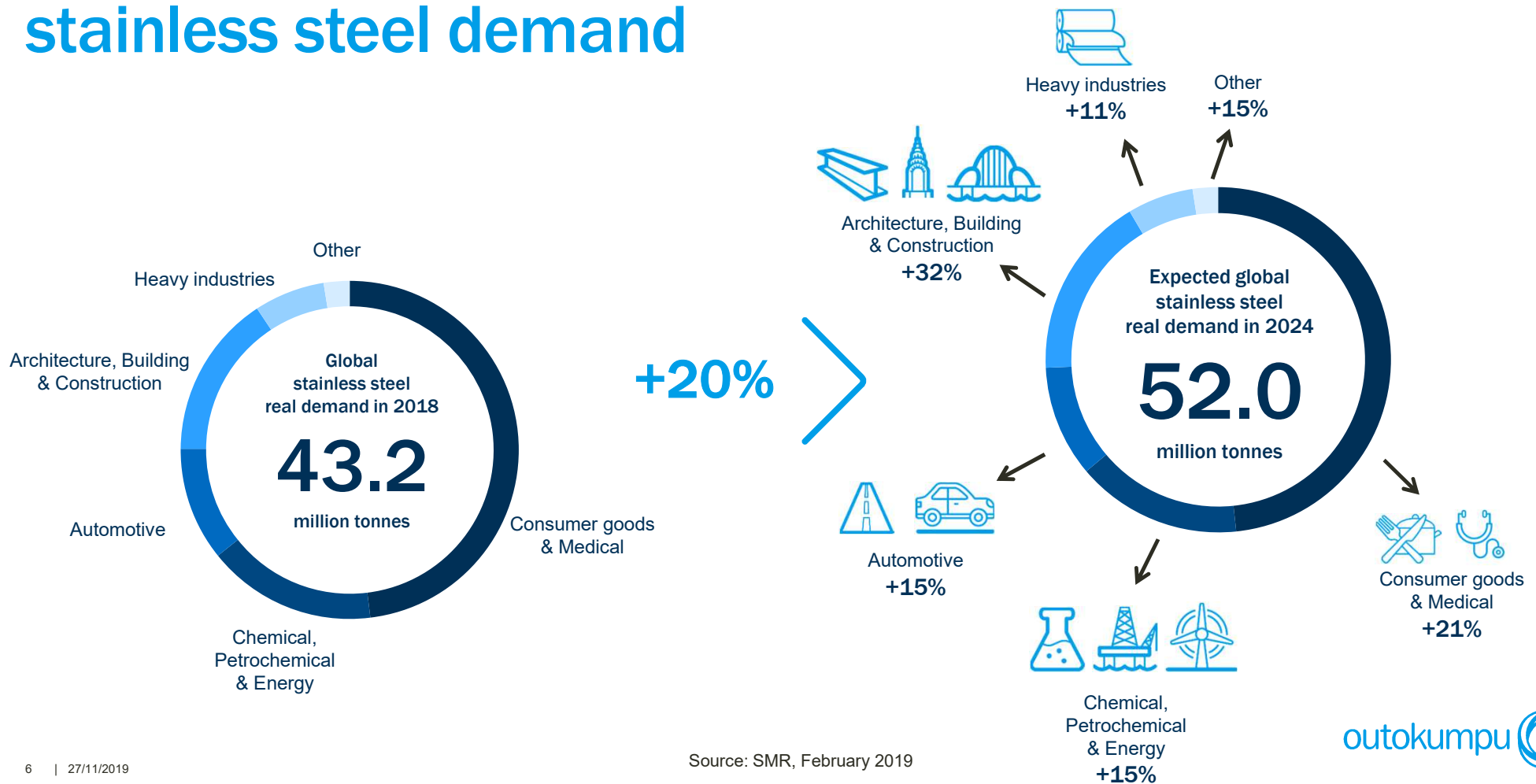
100% recyclable
Corrosion resistant
Heat resistant
High strength
Hygienic
Aesthetic
Cost efficient



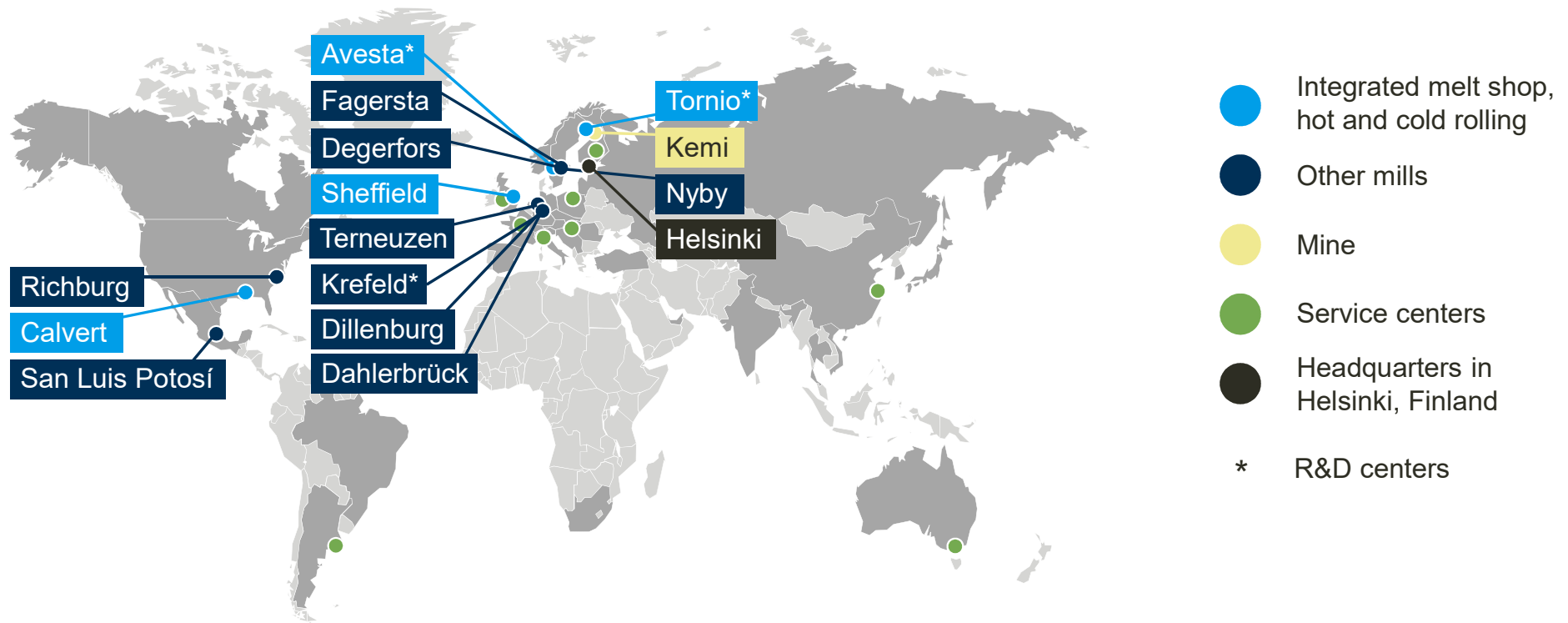
- Oil & gas, petrochemical
- Chemical and pharmaceutical
- Automotive
- Aerospace & marine transport
- Catering and household goods
- Architecture and building
- Medicine and medical engineering



...and this growth is supporting stainless steel demand



Outokumpu has a solid presence in key regions



Broadest product portfolio globally

Flat products



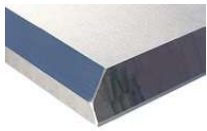
Slab



Hot rolled
black coil



Hot rolled
white coil



Quarto plate



Cold rolled
white coil



Precision strip

Long products



Cast semis



Rolled and
forged billet



Bar



Rebar



Wire rod



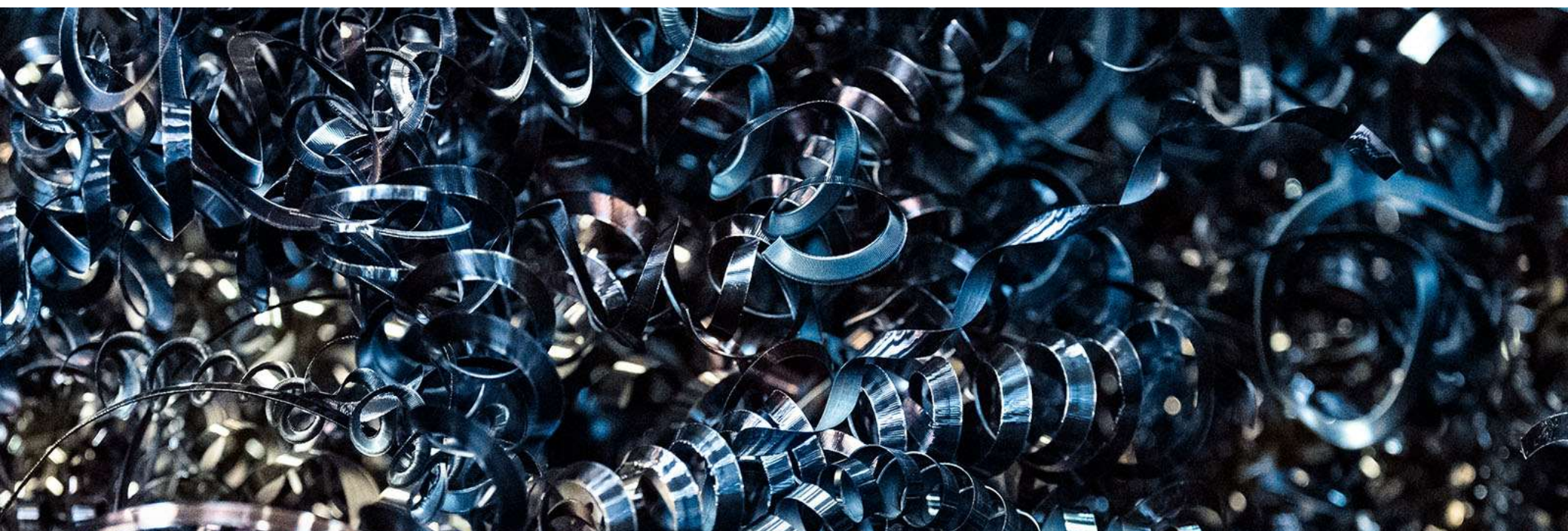
Wire

Ferrochrome



By-products



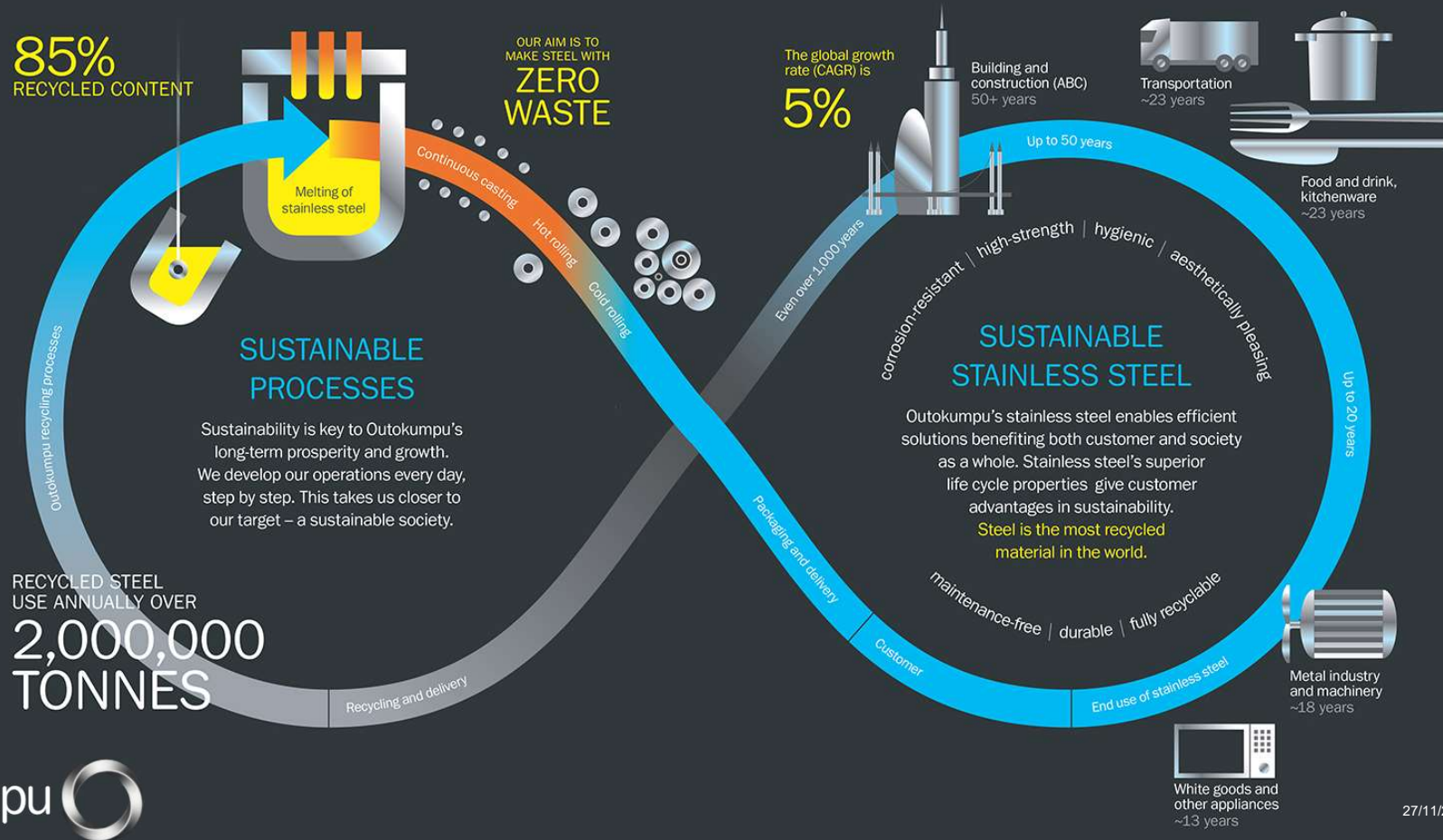


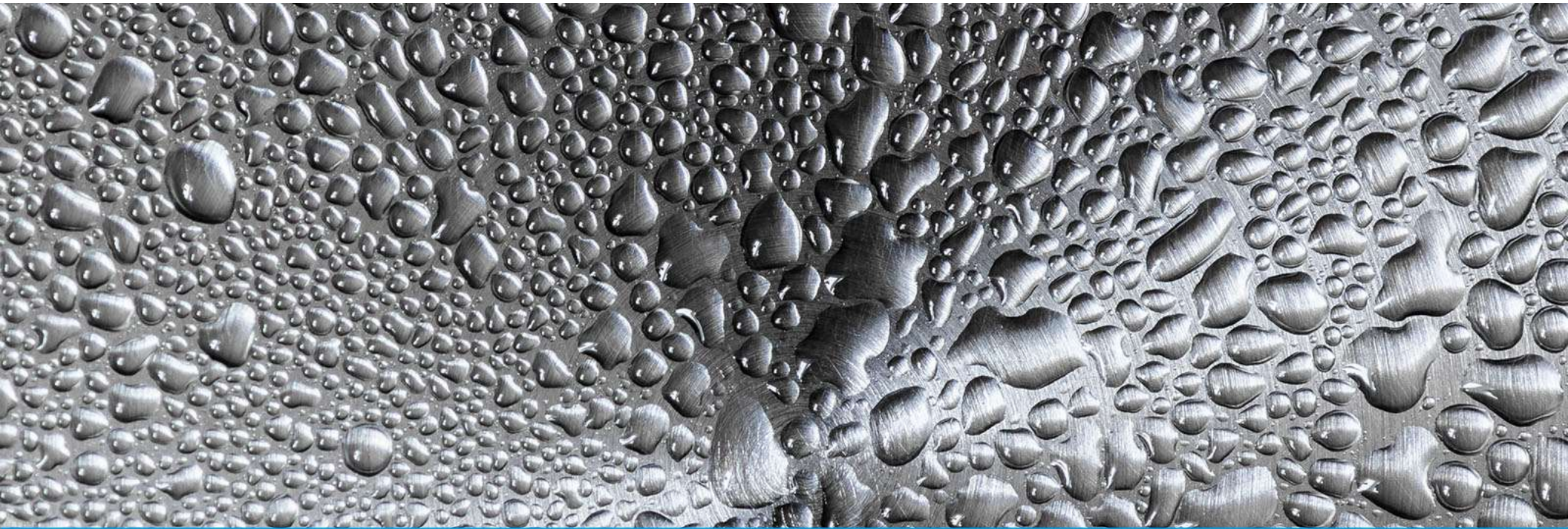
Circular economy of Outokumpu

Our stainless steel contains the highest proportion of recycled content on the market



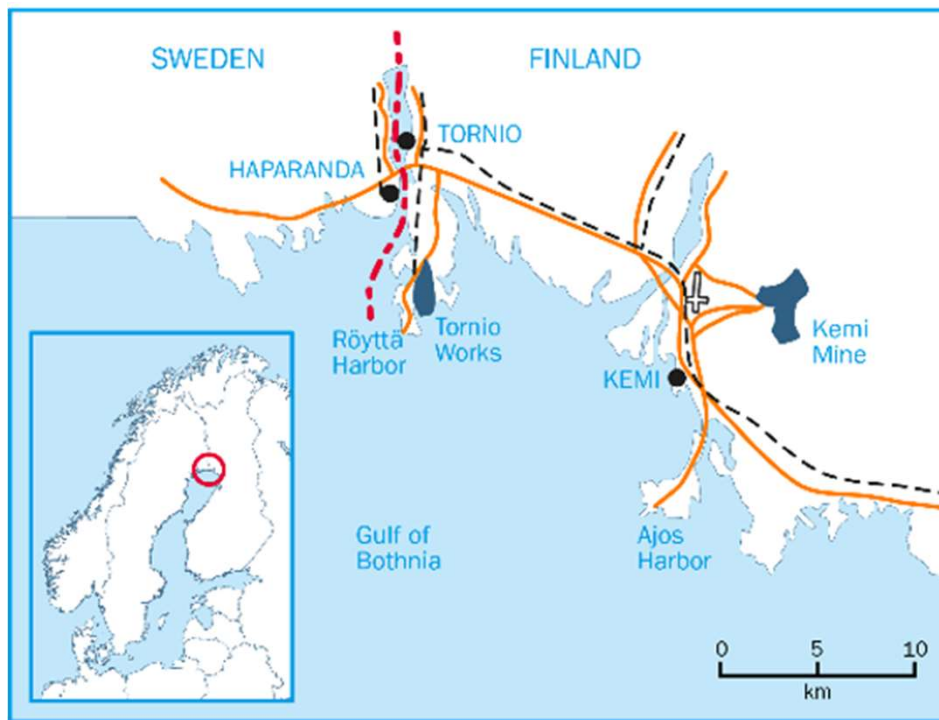
100% recyclable





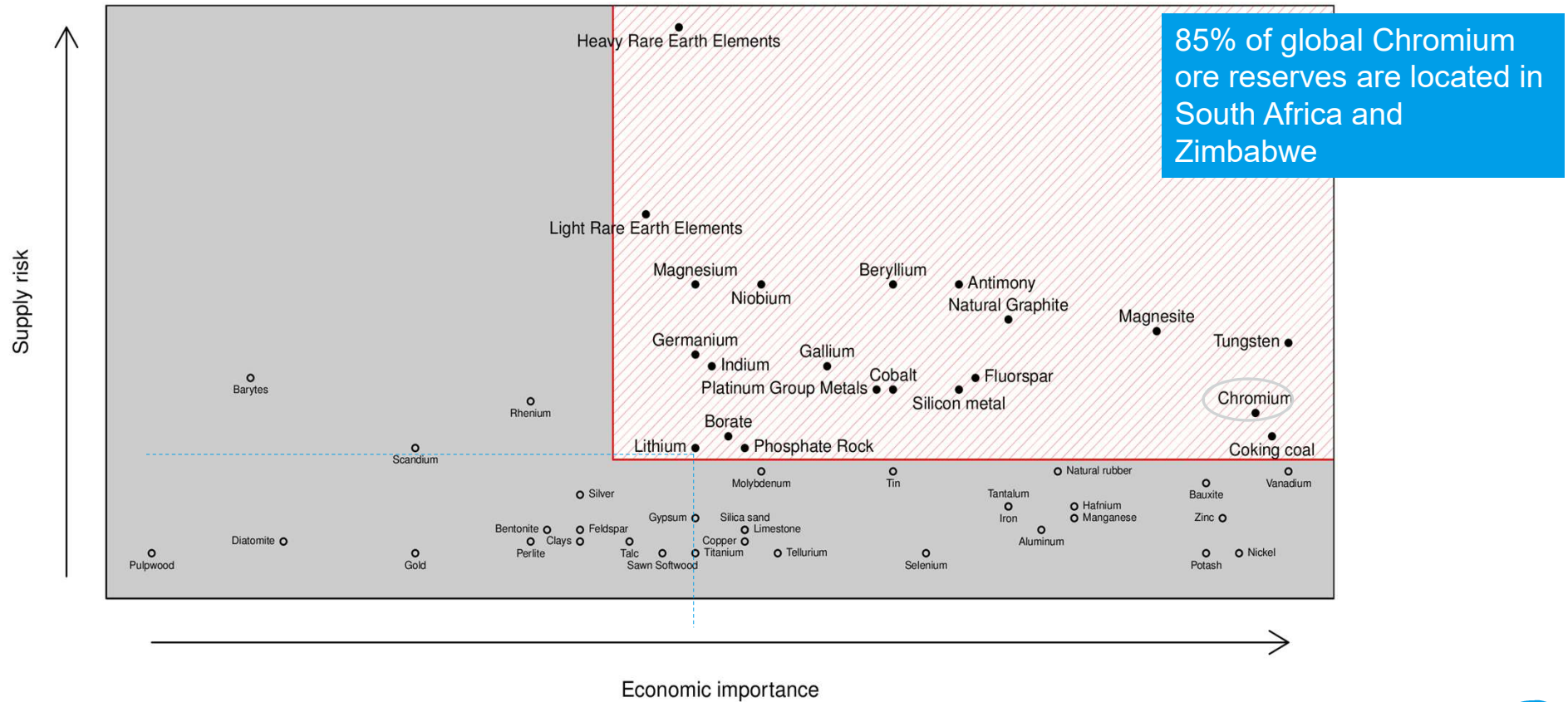
Case Outokumpu in Finland

Kemi mine and Tornio Operations



- Integrated ferrochrome and stainless steel production chain in Kemi-Tornio area.
 - ✓ Integrated, world class operation
 - ✓ World class chrome deposit in EU
 - ✓ Stable, low carbon electricity
- Target capacity of ferrochrome production is 530,000 tons annually.
- Target capacity of stainless steel production is 1,400,000 tons annually
- Impact of direct and indirect employment:
 - > 10 000 jobs in Finland

Chromium makes steel stainless



Source: Critical minerals and metals for the EU.

Kemi Mine – The only chromium mine in the EU

- The biggest underground mine in Finland. Annual ore handling capacity is 2.7 million tons.
- Chromite ore is mined from the underground mine and processed in the mills above ground. Producing annually
 - 0.85 Mt fine concentrate.
 - 0.40 Mt lumpy ore.
- Products are delivered to close by Tornio FeCr-plant and stainless steel mill
- Ferrochromium (FeCr) is the most important alloy for stainless steel
- Mines are needed – recycling of metals is not enough

Outokumpu Tornio works - the biggest material recycler in Europe



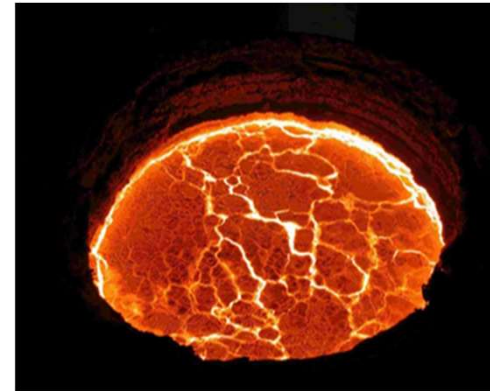
Recycling steel requires a high amount of electricity

- Outokumpu Tornio is the biggest electricity user in Nordic countries – energy costs are one of biggest production factors > energy savings are steering principles
 - The most energy efficient production
- Main raw material (recycled steel) is melted and most important component (ferrochrome) is made by electricity. The best available technique for melting is to use electric arc furnaces.
- Metals cannot be recycled sensibly without melting with electricity



By-products create sustainability in society

- Without slag there is no metal products
 - Slag formers needed (natural limestone etc.)
 - Slag = Mineral product
- Quality steering of slag products starts from the molten phase – continuous testing guarantees the quality
- Outokumpu slag products are sold mainly to construction purposes
 - Technical properties are better than in natural stones
 - E.g. annual use of Tornio FeCr slag in road and basement construction saves 1 000 000 tonnes of virgin materials and 350 000 t CO₂ emissions

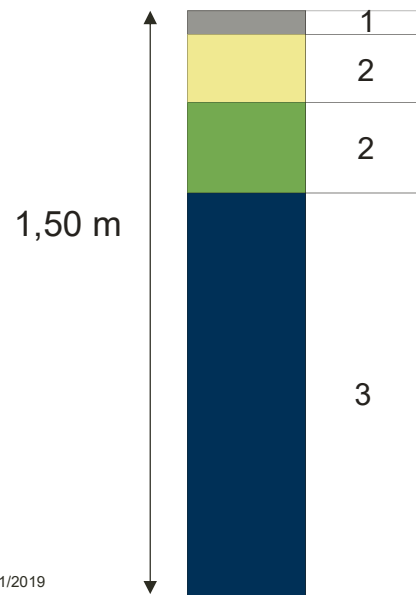


Environmental and economical benefits in geotechnical engineering: roads

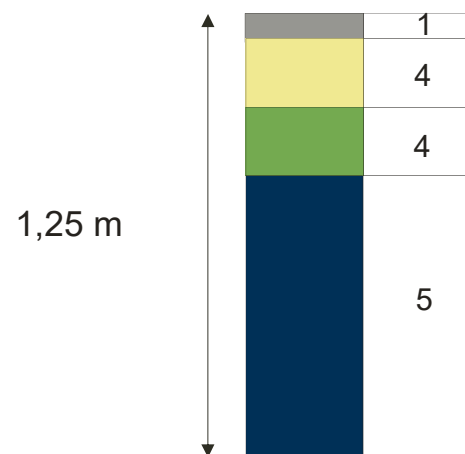
In standard road construction the use of slag products means ~35% less total material (~200 truck loads less per road kilometre!)


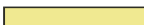




Sand/aggregate construction



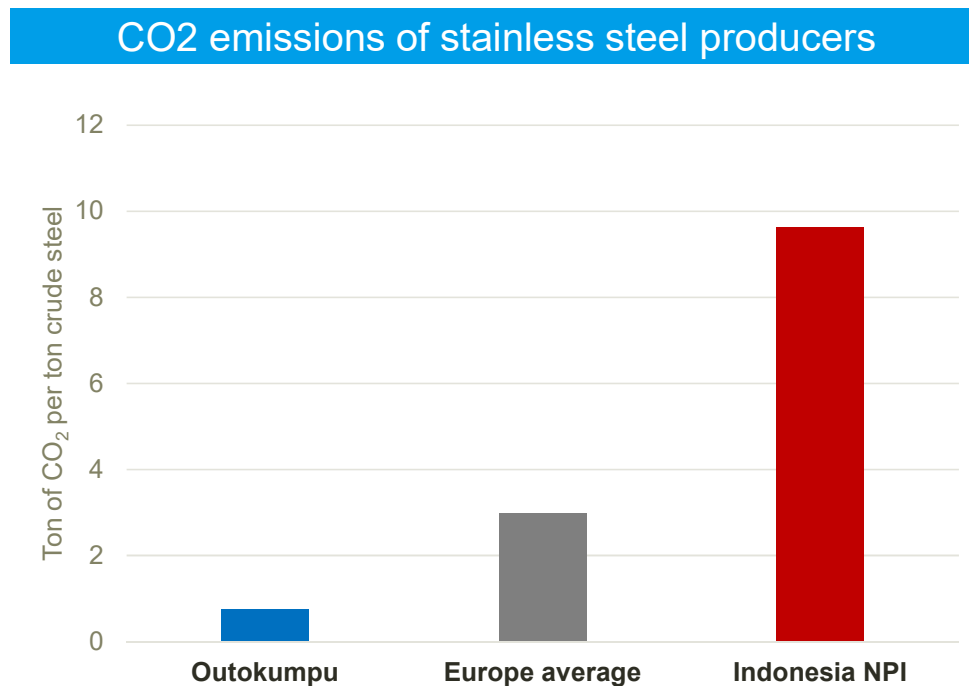
FeCr slag construction



-  Tarmac
-  Base layer
-  Sub-base layer
-  Filter layer

- 1 Tarmac
- 2 Rock aggregate
- 3 Sand
- 4 Crushed FeCr slag aggregate
- 5 Granulated FeCr slag

Stainless steel produced in Asia creates up-to 10 times more CO₂ emissions compared to Outokumpu in Finland



Outokumpu's fully integrated production in Finland is unique in the world – enabling the lowest emissions

Outokumpu: Tornio works, meltshop2
Europe average: source: ISSF (2017)
Indonesia NPI: Stainless steel production in Indonesia using nickel pig iron

Outokumpu has the lowest carbon footprint in the stainless steel industry

1 Industry leading recycled content

2 In-house ferrochrome with low carbon footprint

3 High usage of low carbon electricity

Outokumpu is the leading producer of sustainable stainless steel globally

Significant
investments in
environment

€450m

During the last 15 years

Highest
proportion of
recycled
content on the
market

> 85%

Low CO₂
footprint for
our
ferrochrome

< 42%

of industry average ⁽¹⁾

Low CO₂
footprint of
our stainless
steel

30%

of industry average ⁽²⁾

1) Source: ICDA LCI

2) Source: ISSF, company data

Thank you!

Stay tuned and
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