voestalpine Group

Johann Prammer, Strategic Environmental Management

UNECE Workshop – 18 January 2017, Geneva

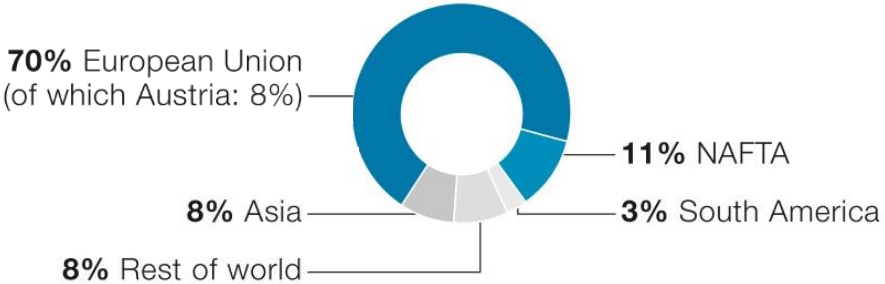
What does **“energy”** mean for voestalpine?

1. Company profile → customers and markets
2. Energy efficiency from two perspectives → production *and* products
3. Specific situation of the steel industry and voestalpine
4. Key factors for (not) implementing energy efficiency measures
5. Why in steel production “less CO_2” means “more energy”

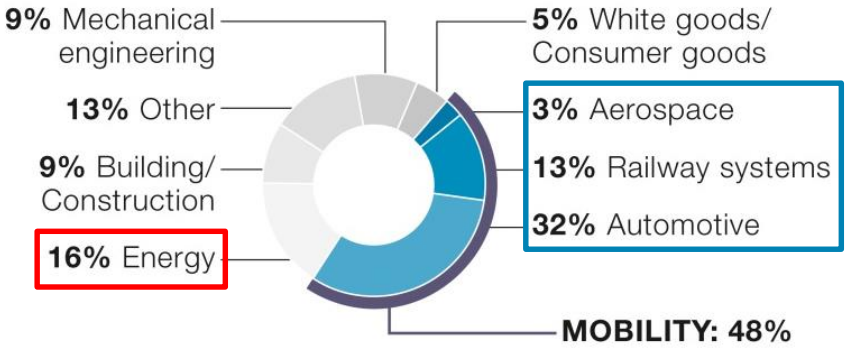
voestalpine Group
Global footprint

One Group – 500 locations – 50 countries – five continents

Revenue by regions (Business year 2015/16)



Revenue by industries (Business year 2015/16)



Revenue (BY 2015/16)	**EBITDA** (BY 2015/16)	**Employees** (BY 2015/16)
EUR 11.1 billion (~USD 12.6 billion*)	**EUR 1.6 billion** (~USD 1.8 billion*)	**48,500**

** Exchange rate: March 31, 2016 (end of Business Year 2015/16)*

Mobility
Products and innovations

Focus on safety, lightweight construction and highest efficiency over the entire life cycle

Aerospace: voestalpine is one of the
five largest aerospace suppliers worldwide
Aircraft parts made of high-performance materials (e.g., engine mount)

Automotive: voestalpine products are represented **in almost all automobile components**
Market leader in hot forming

Railway systems: World market leader in
turnout technology and special rails

Energy*
Products and innovations

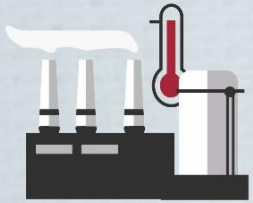
Focus on special materials and products for highest energy efficiency

* conventional and renewable

High-strength sour-gas-resistant seamless tubes

and gas-tight threaded connections for deep-sea pipelines

High-temperature steels



for highly efficient power plants

Heavy plate for pipelines

Linepipe plates for highest requirements, temperatures down to minus 60 °C, and extreme conditions

Deep sea pipelines up to **2,800 m**

Offshore pipelines up to **-60 °C**

Energy efficiency requires two perspectives

Production and processing

Efficient and cost-optimized use and re-use of raw materials, energy, water and by-products

voestalpine as industry benchmark in Europe

Regarding resource and energy efficiency as well as environmental compatibility
E.g.: Integrated energy cycles, water management and electrical self-sufficiency; emission reduction technologies

Material: high-tech steel

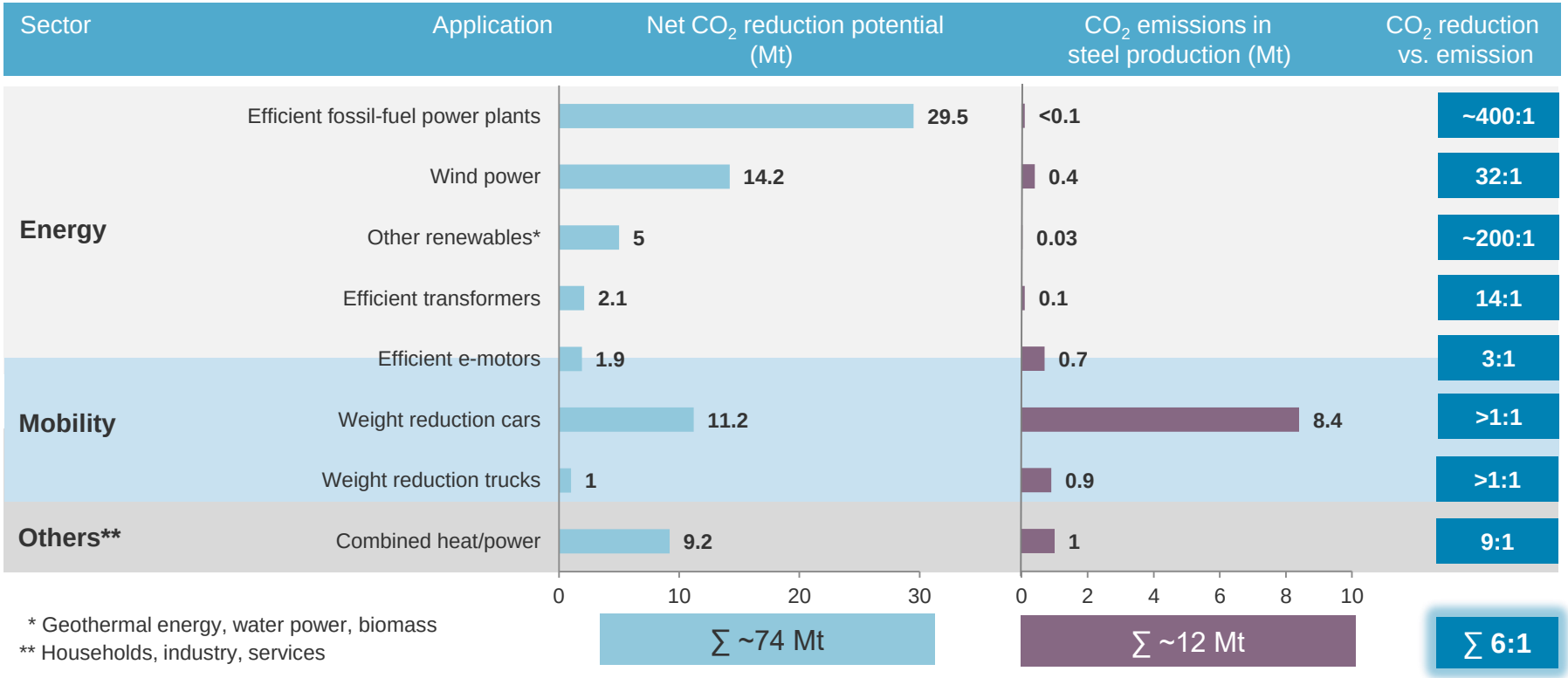
Resource balance over the entire life cycle; potential of a material for sustainable savings of resources

Advantages of steel in comparison with other materials

Life cycle assessment as basis for sustainable resource efficiency
E.g.: Lightweight construction, increase of energy efficiency (power plants, turbines), contribution to “low carbon” transformation

Energy savings of steel

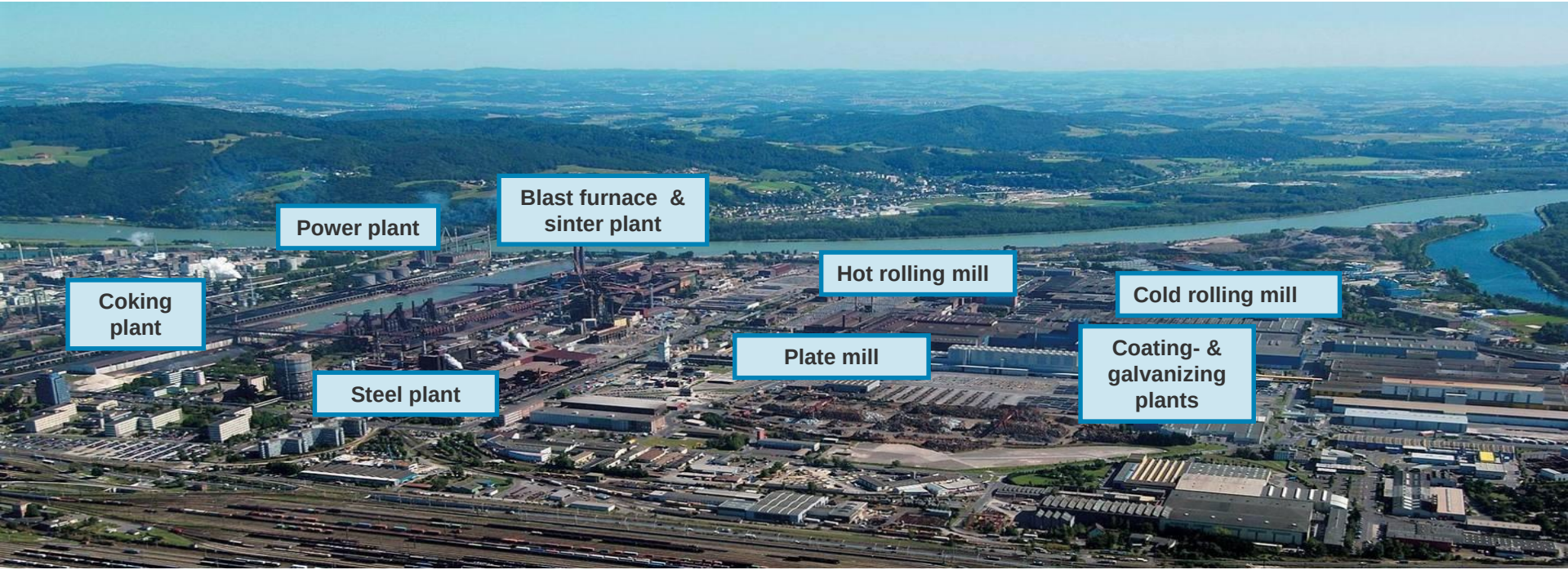
Source: WV Stahl, Boston Consulting Group;



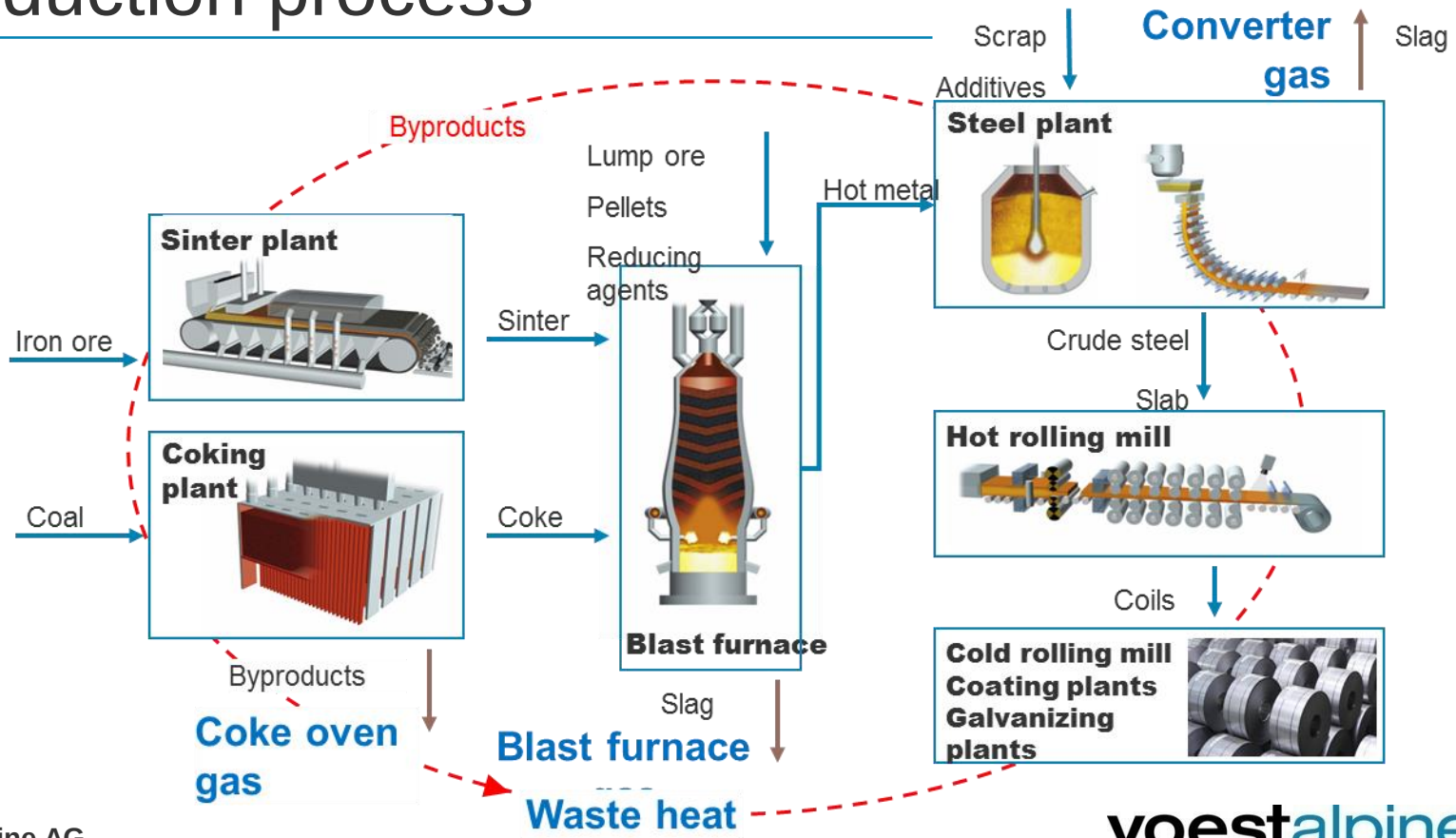
* Geothermal energy, water power, biomass
** Households, industry, services

voestalpine‘s main site in Linz (Austria)

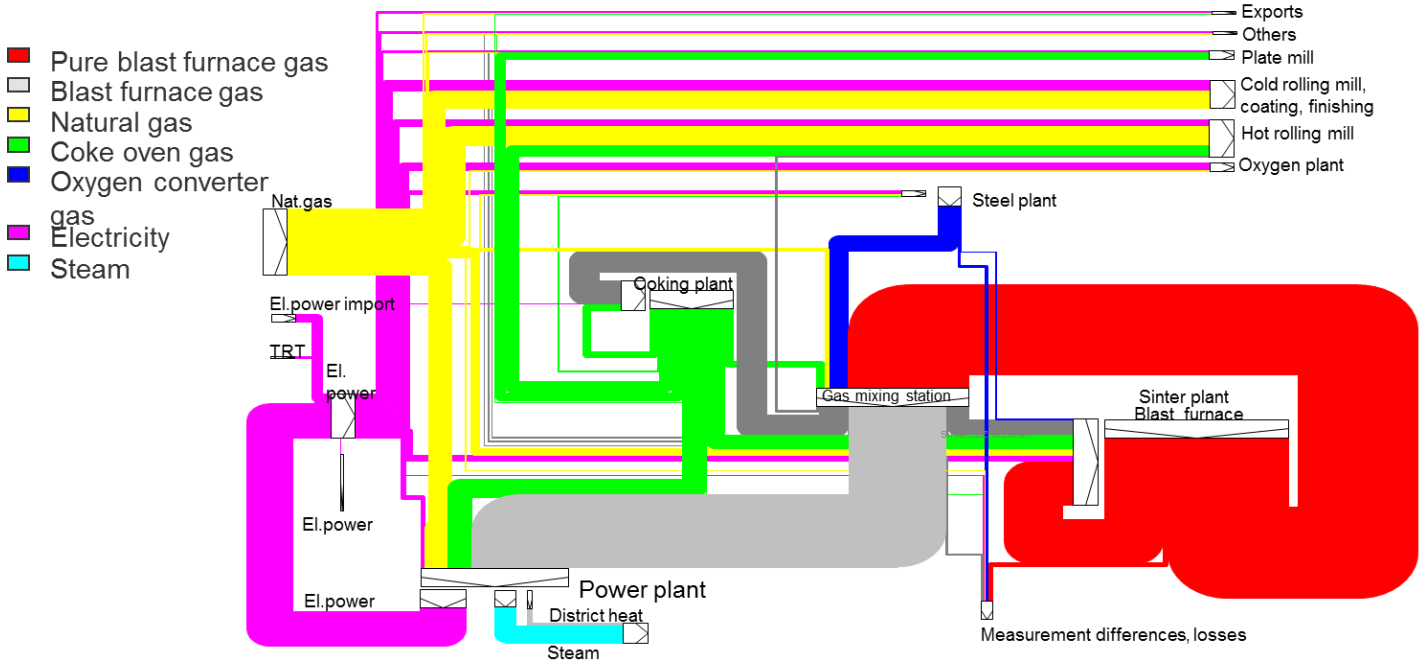
A highly integrated steel mill



Production process

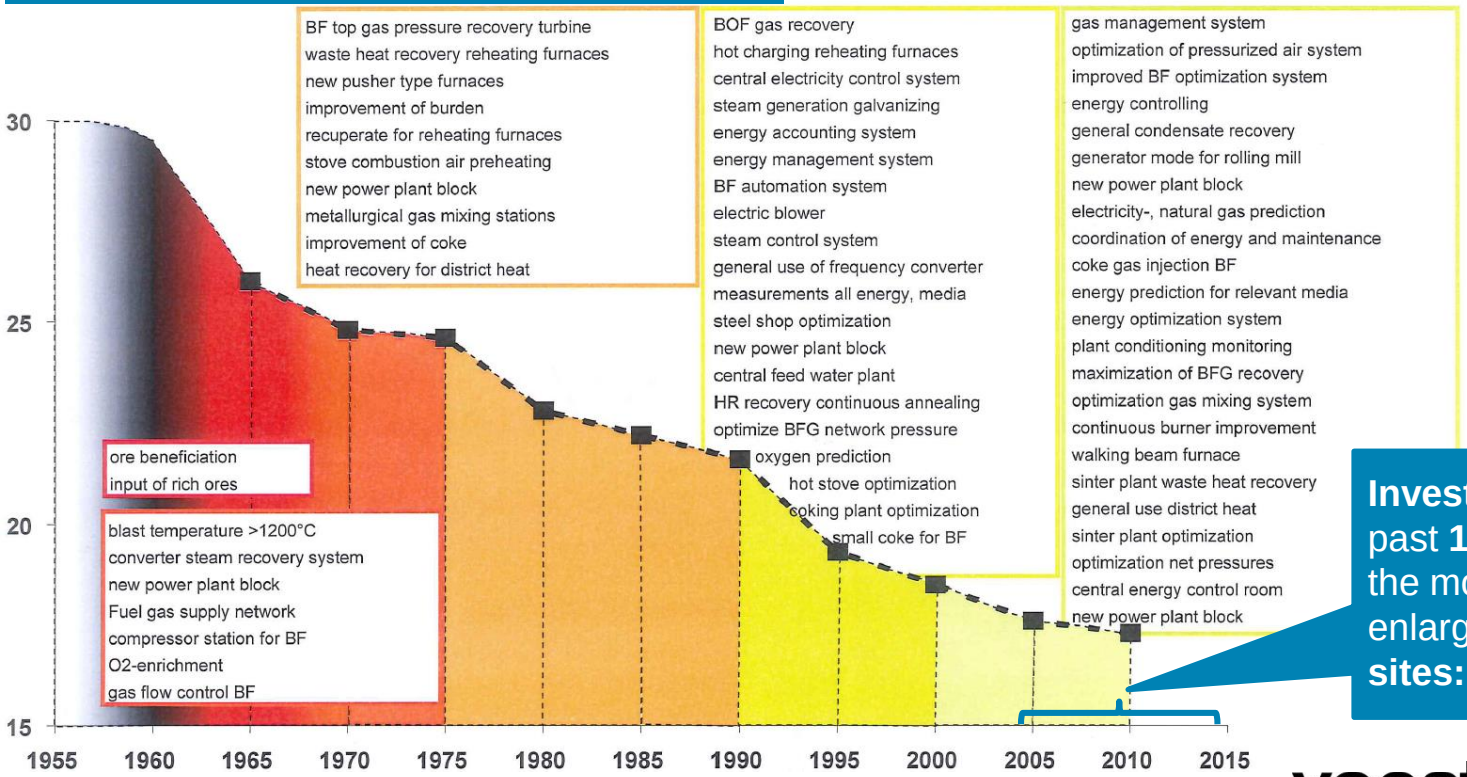


Integrated energy cycles



voestalpine: Reduction of specific energy consumption

Specific energy consumption in GJ/t crude steel



Investments over the past **10 years** alone in the modernization and enlargement of **Austrian sites: > EUR 7 bn**

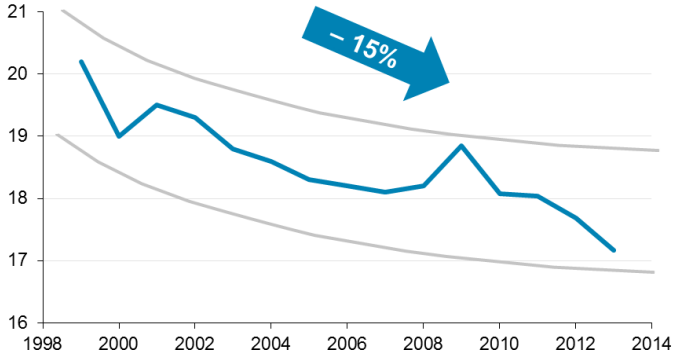
voestalpine AG

ONE STEP AHEAD.

Energy efficiency at voestalpine

- The Linz site is nearly energy-independent and takes every effort to continually optimize process gas utilization and to increase energy recovery.
- Continual improvement is achieved through measures such as energy savings in thermal processes and utilization of waste heat.
- The implemented energy monitoring system is a powerful instrument in continually improving overall energy efficiency and plant optimization.
- Broadly implemented energy management systems across the Group (ISO 50001, EMAS, …)

Energy consumption per t crude steel
in the past ~ 2 decades



Energy efficiency measures
Key issues and burdens

- Energy (including raw materials as basis of the integrated energy cycles) accounts for up to 25% of total crude steel production costs – reduction in the past 3 to 4 years of max. 3% despite a broad range of implemented measures → large financial effort, but comparably little effect on the Group level
- Variety and quality of national legislation, e.g.
  - Equipment efficiency standards
  - Requirements for energy audits
  - Training and awareness building programs
  - Co-funding programs for energy efficiency research and development
  - Austrian Energy Efficiency law (“EEffG”)
- However, lack of tax related incentives, low-interest energy efficiency loans etc.

Energy efficiency measueres
Key issues and burdens (2)

- Economic factors, such as payback period and criteria for investments
- Time frames for investments in energy efficiency techniques determined by expansion or replacement of facilities, but very little effect of energy prices alone.
- Cross-functional assessment (e.g. R&D, production, product and technology development)
- Inadequate understanding of the correlation between greenhouse gas emission reduction, energy efficiency and energy consumption in the public and political discussion.

Less CO_2 = less energy?

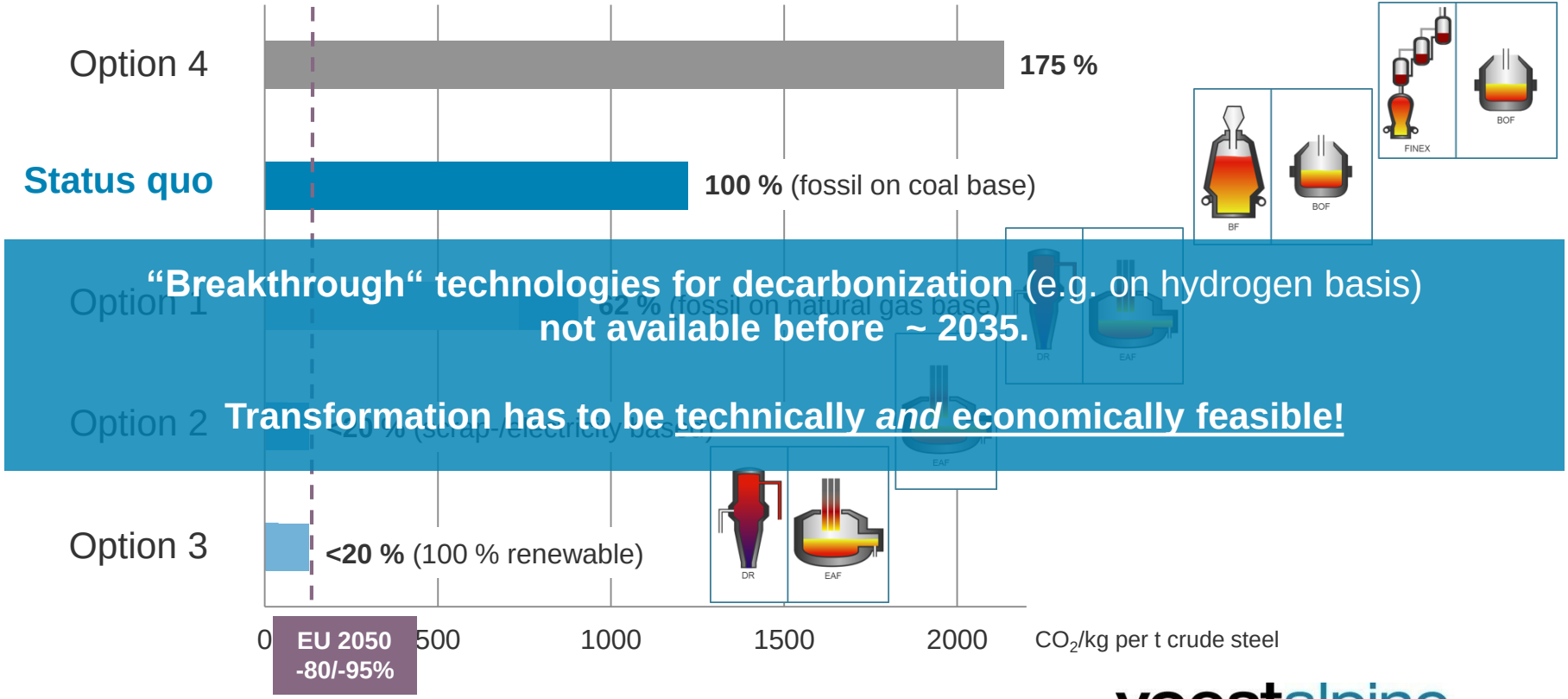
For steel industry, the calculation doesn‘t work

Less CO_2
(e.g. electricity or natural gas instead of fossil fuels)

No – on the contrary!
Further CO_2 reduction
=
higher energy consumption!

Higher external energy demand
(e.g. instead of integrated energy cycles based on coke/coal and gas)

Technology options only available in the long term



"Breakthrough" technologies for decarbonization (e.g. on hydrogen basis) **not available before ~ 2035.**

Transformation has to be technically *and* economically feasible!

Decarbonization
Additional demand of electricity for voestalpine

- Steel production sites in Austria are **currently self-sufficient** with electricity **(based on coal/coke)**
- **Zero carbon scenario** would require **additional** (renewable) electricity of **33 TWh** to be supplied by external power grid
- This equals **more than > 30 river power plants** only for voestalpine …
- … or **four times the** projected **increase in wind power** in Austria.
- For **European steel industry** overall, this decarbonzation scenario would additionally require **the entire production growth of renewable** electricity!

Neither nationally nor on the European level, this additional demand is provided for in existing energy expansion scenarios and forecasts!

Summary

Energy and climate policies – What do do?

- It is shortsighted to focus only on **emissions;** the implications on **energy consumption** have to be considered as well.
- The success of innovative **low carbon technologies** will therefore depend on the **suffcient availability of energy at competitive prices.**
- We therefore urgently need to develop a national, but especially a **coordinated European energy strategy.**
- In this context, also the **financing of transformation** (including energy transition) **has to be adressed.**
- A **reliable and calculable framework for** long-term **investment decisions** (e.g. legal security, regulations, incentives, …) is essential.
- A **global level playing field for climate** protection is inevitable.

Summary

Energy and climate policies – 5 thoughts to discuss

1. **Climate policy = energy policy = industrial policy**
2. **“Energy” is the key to transformation**
3. **No unilateral approach, but fair competition by developing European and global strategies**
4. **Financing issues and technical as well as economic feasibility have to be adressed and secured**
5. **Basic materials industry (in Europe) is indispensably required for solving climate and energy targets**

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Back-up

voestalpine Group
Overview

- European technology and capital goods group that has its own steelmaking facilities
- Leading partner to the global automotive and consumer goods industries and the oil and natural gas industry
- Global market leader in high-tech railway infrastructure (rails, turnouts) as well as tool steel and special sections
- Listed on the Vienna Stock Exchange since 1995 – owned 100% by private shareholders
- Ecological pioneer – benchmarks for emissions and energy efficiency
- Worldwide investment volume in the BY 2015/16: EUR 1.3 billion

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