



Our steel lasts for generations and so must the planet

Building the future of steel



P A T H W A Y T O

DECARBONIZING

STEEL
PRODUCTION

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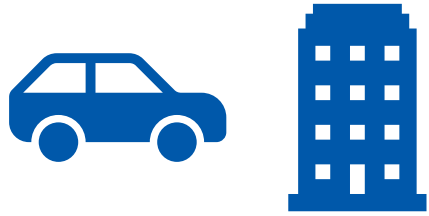
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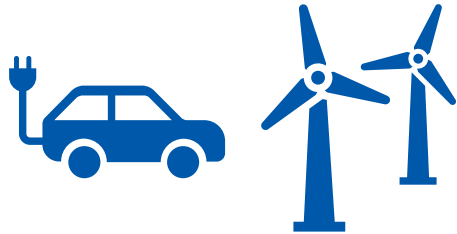
Key messages for today

1. **Steel** is an **essential** material not only today but also for the **green economy of tomorrow**
2. **USSK** is hard at work defining its **decarbonization plan**
3. **Hydrogen** could play **an important role** in the decarbonization of steel making in Košice, especially in the longer-term

Why steel: steel is an essential material for green technologies and is fully recyclable



Steel is the backbone of modern society



Steel is crucial for renewables, e-mobility and other green technologies



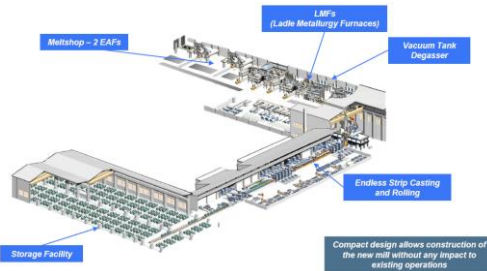
Steel recycles forever and is the backbone of circular economy

USSK is the largest flat steel producer in the region



- USSK produces **more than 4mtpy** of steel in an integrated way
- **95+%** of production exported
- **Over 500 customers** in automotive, home appliances, construction, machinery, cans/tins, etc.
- Production requires ~500kg of coal per tonne leading to **CO2 intensity of ~2.00 tCO2/t steel**

Our potential transformation relies on three pillars combining several technologies



Electric steel making

3mtpy with electric arc furnaces (EAFs) and direct casting and rolling (DCR)



Integrated route efficiency

Portfolio of projects to reduce carbon intensity of the remaining blast furnace route



Utilization of new technologies

Research and exploration of new decarbonization technologies such as **hydrogen** or CCS/CCU in the long run

In the mid-term, we can **reduce our emissions by ~70%**

Hydrogen can enable **further reduction** of our CO2 footprint

Technological **maturity** and **cost** are key factors

Green hydrogen could help us reduce our CO2 footprint in several areas (and time horizons) with increasing CAPEX requirements



Illustrative examples only

Potential use cases



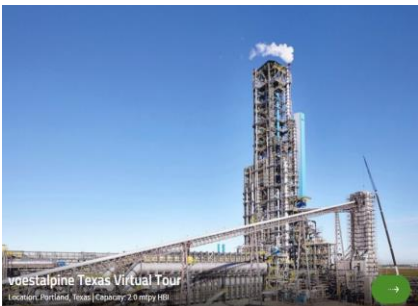
Ammonia replacement

Replace existing ammonia based H2 production – H2 used in downstream processes



Fossil fuel replacement in existing processes

Replace fossil fuels in existing operations – blast furnaces, natural gas burners, etc,



Potential technological change

Direct reduction of iron ore with green hydrogen

The transformation of the steel industry, including USSK, requires multiple enablers



Eurofer's view from Nov 2022



Green steel will cost up to 35%-100% more

- Contracts for difference and other risk sharing instruments
- Incentives for green steel use (e.g. Automotive, construction, etc.)
- Public procurement

EU steel is highly exposed to international competition (30Mt in/20Mt out)

- Benchmark based free allocation
- Compensation of indirect CO₂ costs
- Complementary carbon border adjustment
- Measures fostering steel recycling in the EU

Green steel needs 400 TWh of electricity

- Build the necessary infrastructure – starting where it is most efficient
- Rump up production of low carbon electricity and H₂
- Reward the use of low carbon energy in state aid and taxation
- RePowerEU

Investment amounts 50 to 60€ bn

- Innovation Fund and ETS revenues
- Important Projects of Common European Interest
- National support based on state aid rules

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