


16 April 2021

## ITRE REPORT ON HYDROGEN

### The role of low carbon hydrogen in the transition

# ERCST

European Roundtable on  
Climate Change and  
Sustainable Transition



## Developing an EU hydrogen strategy

### Some lessons from the H2FUTURE Project

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# Scenario for transforming the steel industry

**Iron/steel making  
with classical technologies**

**blast furnace route**

**direct reduction process**

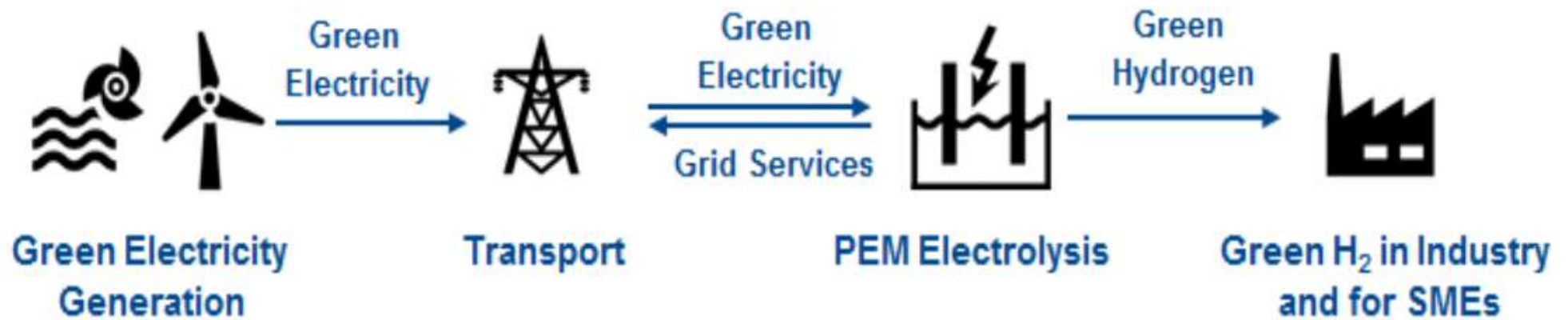
**Iron/steel making  
with breakthrough technologies**

**H<sub>2</sub> generation with  
PEM electrolysis**

**H<sub>2</sub> based direct reduction  
electric arc furnace route**

# The H2FUTURE Project

## Hydrogen from electrolysis for low carbon steelmaking



# The H2FUTURE Project

## Key data



**6 MW PEM electrolyser**  
**Pilot plant commissioned**  
**26 months demonstration and quasi-commercial operation**

**Project budget € 18 million**  
**2018 -2022**

**Verbund**

voestalpine

ONE STEP AHEAD.

**SIEMENS**

**IC1 MET**  
metallurgical competence center

**APG**  
AUSTRIAN POWER GRID

**ECN**

# The H2FUTURE Project

## Project objectives

- **Design and installation of a 6 MW Siemens PEM electrolyser**
- **Industrial integration in the steel making process**
- **Demonstration phase**
  - **Stress tests in continuous 24/7 operation**
  - **Qualification for power reserve markets**
  - **Integration into steelworks operation**
  - **Revenue streams from both hydrogen and power**

# The H2FUTURE Project

## Some lessons and implication for the EU hydrogen strategy

- **The amount of (green) electricity required is huge**

Switching fully to a hydrogen technology would require just for voestalpine almost half of total electricity production in Austria

- **A hydrogen strategy needs to broaden its scope beyond the supply of green electricity and the transport of hydrogen**

What and where are the potential comparative advantages of hydrogen in a low-carbon economy?

# A checklist for developing a hydrogen strategy

## □ **Functionality based approach**

Where do we really need the high quality of H<sub>2</sub>:  
energy, transportability, storability

## □ **Whole value-chain based approach**

Where can we raise the product productivity of steel, cement, etc.  
How can the concept of a circular economy be integrated

## □ **Market-integration approach**

How can we create complete markets

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# Thank You.

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