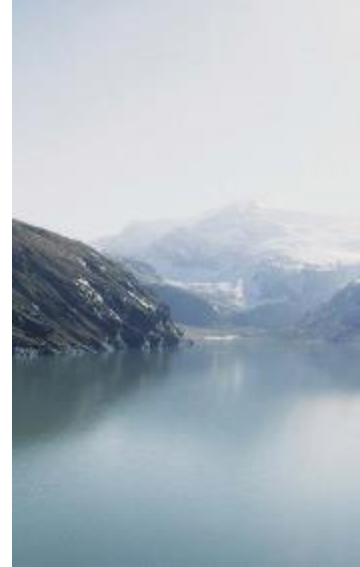


# Towards Sectorial Integration Through Collaboration With Other Players

## VERBUND's Activities

Rudolf Zauner, 16/11/2018



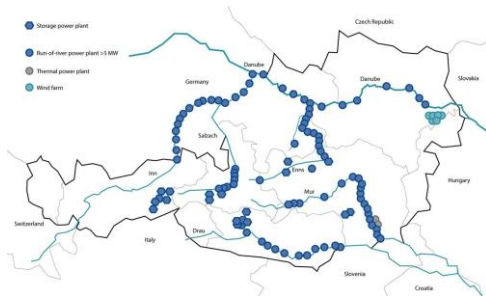
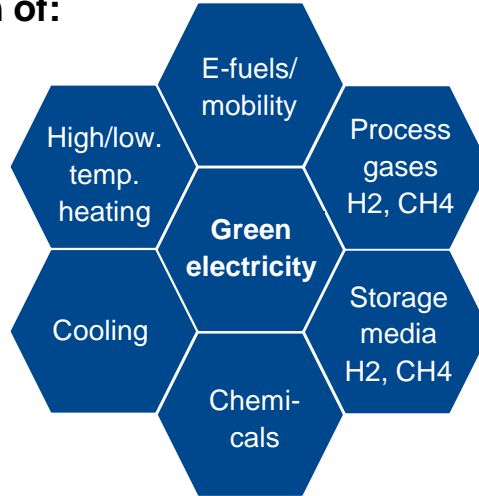
## Sectorial Integration with Green Electricity Offers New Degrees of Freedom

### Renewable electricity for the production of:

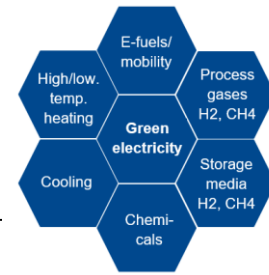
- green process gases,
- green energy carriers and
- green storage media

### Austria's ambitious goal:

100% renewable electricity by 2030  
(currently about 70%, mostly hydropower)



## Joint Effort: Energy & Industry Cooperation is Essential



**voestalpine**

ONE STEP AHEAD.

Worldwide innovation leader in the iron and steel industry

**Verbund**

Leading European electricity company focusing on renewable energy

**OMV**

International integrated oil and gas company

### Goal:

Cooperation for tackling challenges in the energy sector such as:

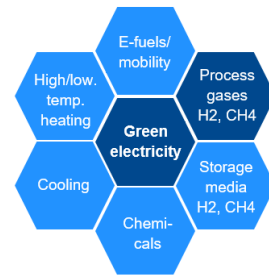
- Green electricity
- Demand side management
- Security of supply
  
- Green hydrogen
  - H2FUTURE: 6 MW electrolysis plant in Linz
  
- e-mobility
  - OMV: 40% of shares in e-mobility provider Smatrics (VERBUND/OMV/Siemens)





H2FUTURE

# H2FUTURE - Hydrogen for the Steel Industry



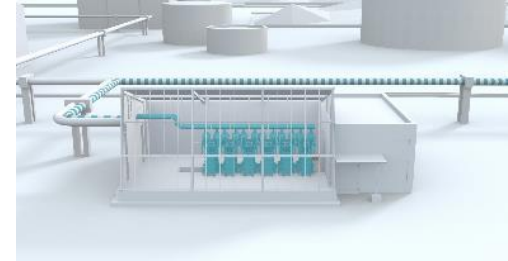
- Steel industry accounts for **30% of global industrial CO2 emissions (2 tons of CO2 emissions per ton of steel)**.
- Replacing carbon with green hydrogen as the reducing agent is the only realistic way of **fulfilling CO2 reduction targets in 2050**.

## Challenges

- Total **replacement of carbon** results in a significant increase in production costs.
- Huge demand for **green electricity 24/7** in the steel industry.



Source: voestalpine



Verbund

voestalpine  
ONE STEP AHEAD.

SIEMENS

**IC MET**  
metallurgical competence center

**APG**  
AUSTRIAN POWER GRID

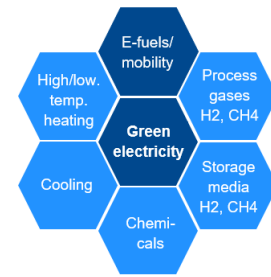
**ECN**



**FUEL CELLS AND HYDROGEN**  
JOINT UNDERTAKING

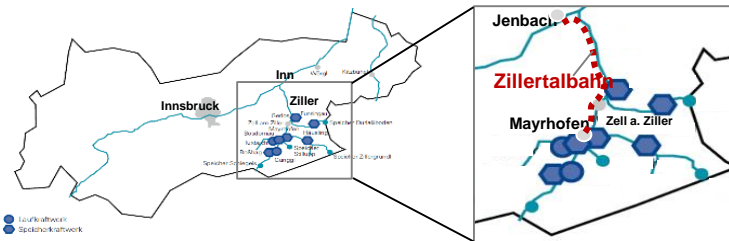
<http://www.h2future-project.eu>

## Green Hydrogen for Transportation



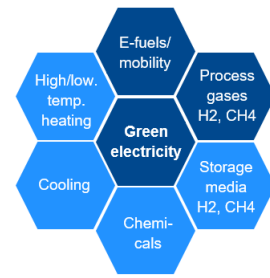
Source: ZVB

- World's first hydrogen operated narrow gauge railway in Zillertal tourist region ([www.zillertal.at](http://www.zillertal.at))
- Green hydrogen supply from VERBUND's local hydroelectric power stations
- Early business case for sector coupling using green hydrogen



Slogan: "Trains operating on crystal clear water from the Zillertal valley"

## Green Hydrogen for Refineries



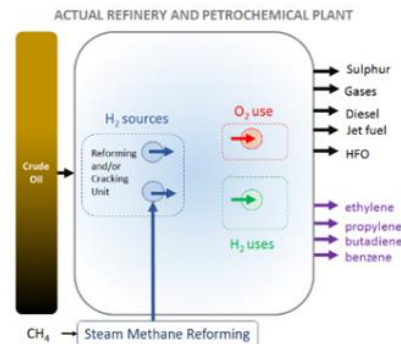
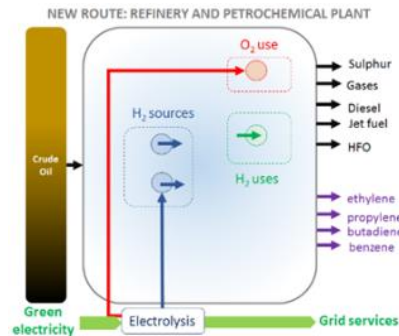
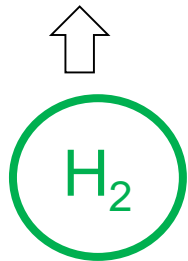
Hydrogen for hydration and desulphurisation of crude oil

Economic feasibility depends on accountability of green hydrogen for biofuels quota (RED II)

Current cooperation: evaluation of feasible locations for large-scale green hydrogen production



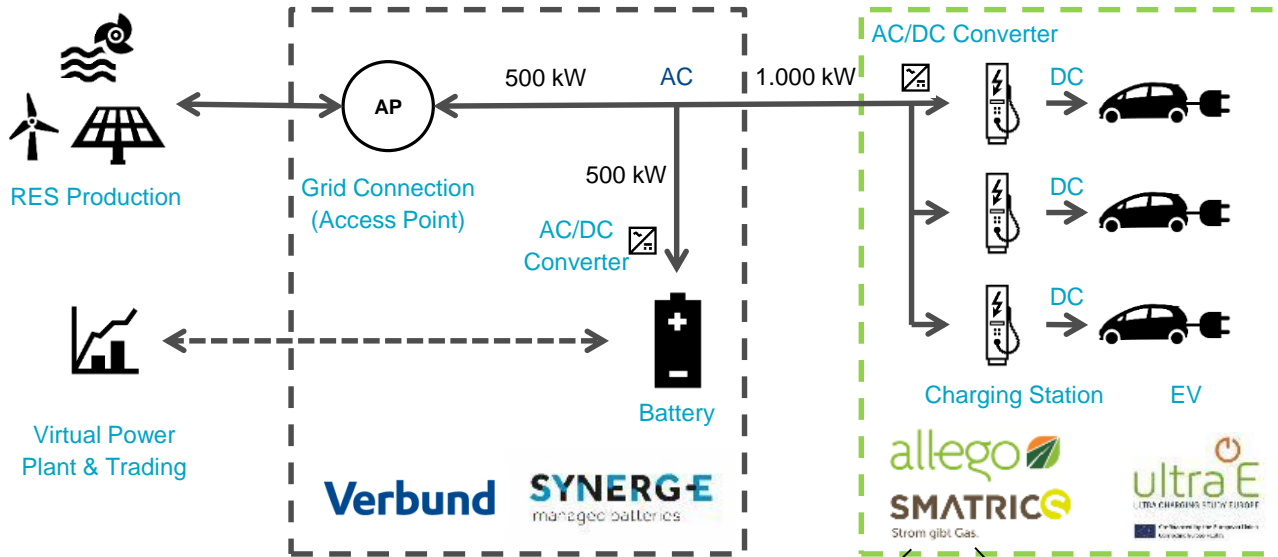
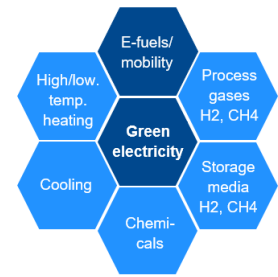
### Green hydrogen for synthetic methane and e-fuels?





# Verbund

## Synerg-E: Charging and Storage for e-Mobility



 Co-financed by the European Union  
Connecting Europe Facility

Verbund  SIEMENS

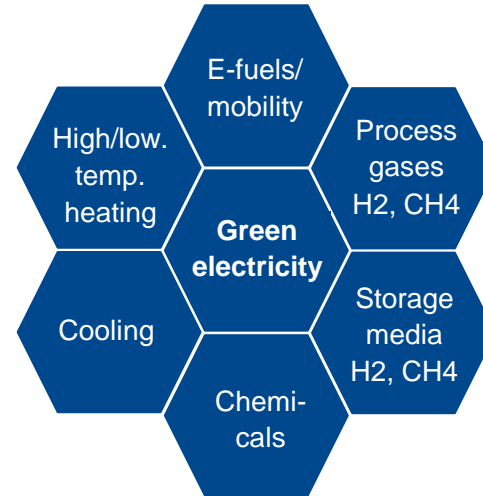
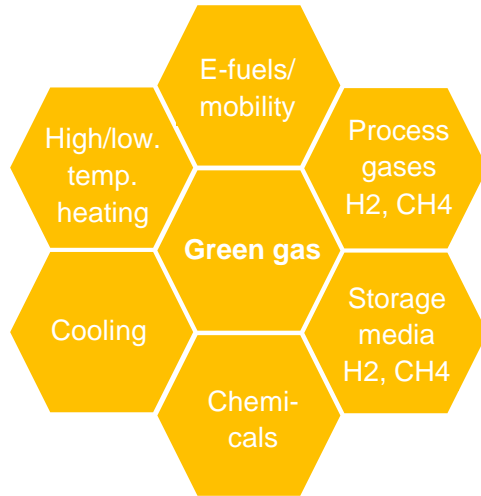
## Under Austria's EU Presidency: Signing of the Hydrogen Initiative in September in Linz



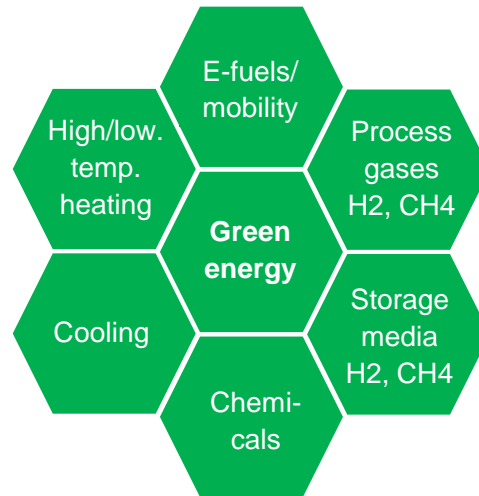
Source: BMNT



## Sectorial Integration from the Viewpoint of the Gas Sector



## Sectorial Integration with Green Energy: Collaboration of the Electricity and Gas Sectors



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