

60 MW electrolyzer „Green Ammonia Linz“ – Chances and challenges

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**GREEN
AMMONIA
LINZ**

The lighthouse project for green hydrogen



Green Ammonia Linz is a partnership project between VERBUND and LAT Nitrogen, Austria's largest user of hydrogen. It aims to replace ~10% of the grey hydrogen used with green hydrogen. This will result in CO₂ savings of up to 90,000 tonnes per year.

Key facts

- 60 MW electrolyzer at the Linz Chemical Park
- Production of up to 7,000 tonnes of hydrogen per year
- IPCEI (Important Projects of Common European Interest) Hy2Use funding and grants from Innovation Fund approved
- Use of green hydrogen for production of fertilizers, melamine and technical nitrogen products
- Use of by-products O₂ (in nitric acid production) and waste heat on site

A joint project between  

Funded by



Green Ammonia Linz (GrAmLi)

A decarbonization partnership of VERBUND and LAT Nitrogen



VERBUND

Austria's leading energy utility

Austria's **leading**
energy utility and electricity
company

Most valuable company at
Vienna stock exchange
with market cap of
EUR >30bn

Route length of electricity
transmission grid of
around **3,400** km



129 VERBUND
hydropower plants with over
8,200 MW of maximum
electricity capacity

~97% of the total
electricity generation
stemming from renewables

And approximately **900**
gas transmission pipeline
kilometers

Active RES positions in
AT, DE, RO, ES, and AL
with capacity additions of
3.8 GW by 2030

LAT Nitrogen

Austria's leading producer of ammonia, fertilizers and technical
nitrogen products

LAT Nitrogen Linz GmbH
is a member of
Agrofert Group

Owns the majority of the
**Chemical Park
Linz** and supplies
utilities and services to
industrial customers on
site

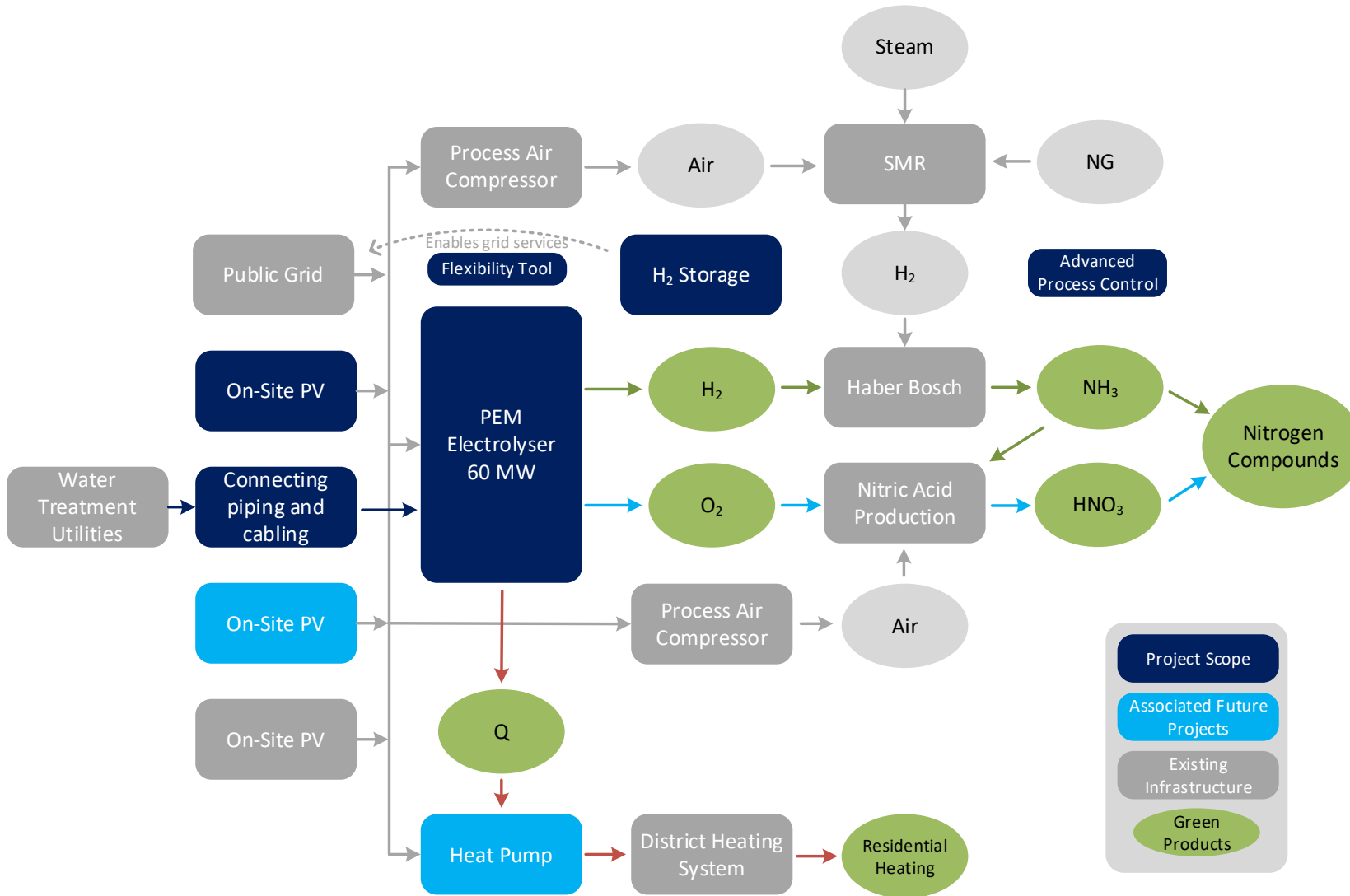


The largest hydrogen
producer and consumer in
Austria, with approx.
**100,000 tonnes per
year of hydrogen**,
as an intermediate for
ammonia production

Owns and operates **two**
ammonia plants, **two** nitric
acid plants, **three** fertilizer
plants and **two** melamine
plants in Linz

Produces more than
**500,000 tonnes per
year of ammonia** from
hydrogen and nitrogen

Green Ammonia Linz



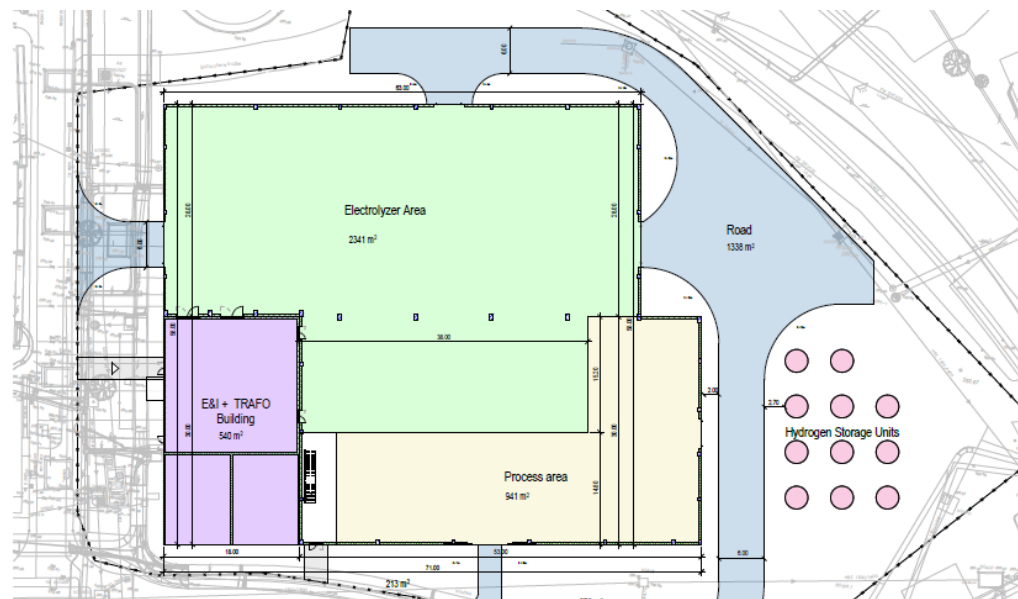
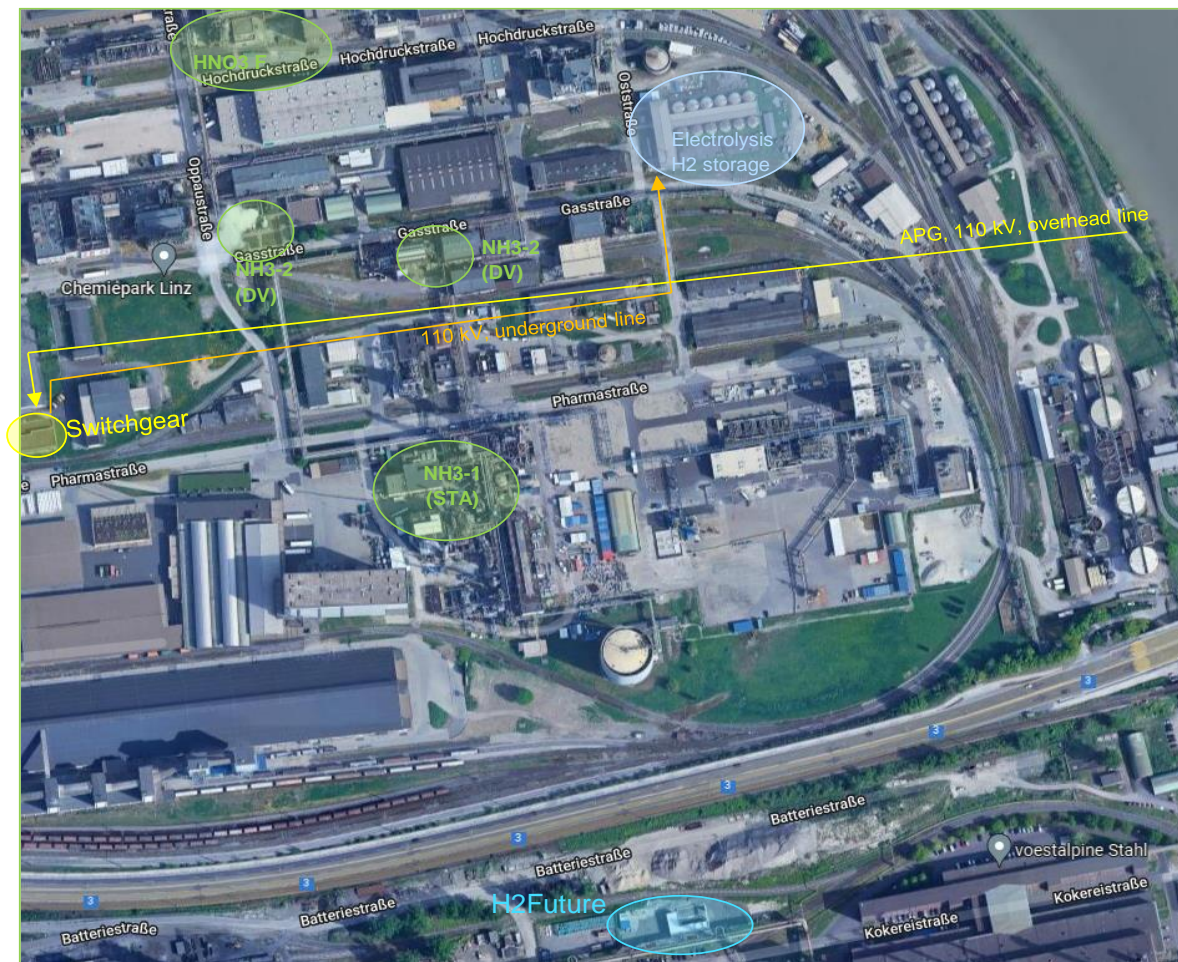
- NEW FACILITIES:**
- 60 MW PEM ELECTROLYSER
 - H_2 STORAGE
 - H_2 CONDITIONING
 - O_2 CONDITIONING

Substitution of up to 10% of grey H_2 conventionally used in ammonia production **reducing up to 90,000 t_{CO_2}/a**

Full **integration** in existing industrial complex:

- € Reduced need for new utility facilities improving overall **cost efficiency**
- Provision of grid services facilitating deep **renewable penetration**
- Utilization of O_2** in nitric acid production improving economics
- Utilization of waste heat** further reducing CO_2 emissions

Location – Chemiepark Linz (AT)



Challenges – technological novelty and economics



Technological novelty

- Large scale PEM electrolyzer
- Developing electrolyzer market
- Provision of services for the electricity grid
- Combination of flexible operation of the electrolyser and constant offtake using H₂ storage
- Connection to two ammonia plants with different setup and technologies
- Utilization of side products oxygen and heat
- Overall optimisation tool

Economics

- CAPEX and OPEX costs are still high
- Green hydrogen is more expensive than grey hydrogen (produced from natural gas)
- Financing is key - long term hydrogen purchase contract needs to be in place
- Public funding: combination of different grants is necessary
- In a long term view, costs need to decrease, and the willingness to pay of the customer/end user needs to increase

Regulatory challenges



Regulatory uncertainty

- Required regulatory framework in development
- RFNBO requirements are high
- The transition phase for the “grandfathering clause” until the end of 2027 is driving the project schedule

Chances



Markets, value chains and technologies are changing during the green transformation

The earlier the transformation is started, the easier it is to accomplish

→ The chances are the development of markets, partnerships and technologies that make our companies fit for the future

Technology

- First industrial deployment of new technologies in large scale
- Development of our assets, process optimisation
- Prove technology, and roll it out to multiple locations
- Steep learning curve

Chances – markets, partnerships



Partnerships

- Not only technologies are changing – value chains are also changing
- Combine expertise of partners
- Green Ammonia Linz project: Hydrogen producer and hydrogen client
- Key enabler for the hydrogen economy

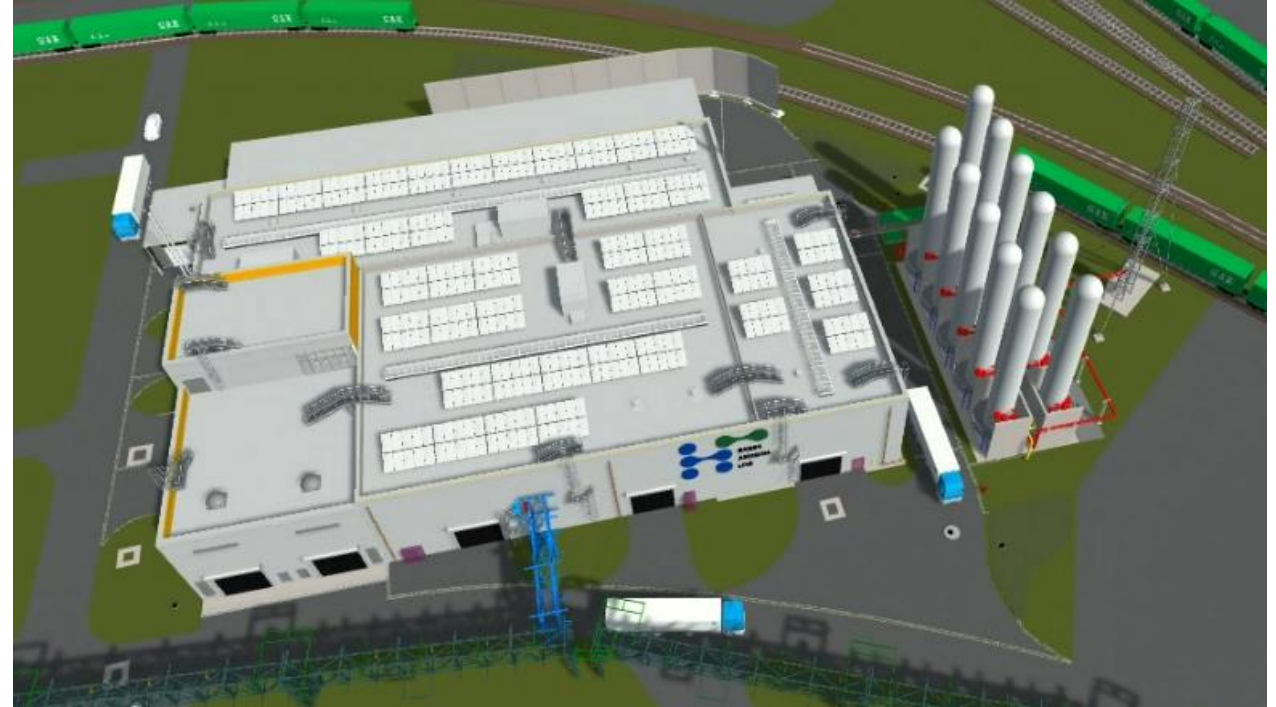
Markets

- Customers demand green and low carbon products
- Need to prove the product carbon footprint → certification
- Market development
- Green premium
- Early mover advantage

→ We need to have a green/low carbon product in order to develop the market

Conclusion

- **Hard work to cope with the challenges**
- **Basic Engineering and Permitting are close to completion**
- **Rewarding chances: development of markets, partnerships and technologies that make our companies fit for the future**
- **Final Investment Decision is planned for mid-2025**
- **Startup of the green hydrogen plant is expected for 2027**



Thank you.

