

# Profitable Future with Green Hydrogen Storage

Strategic Business Case for H<sub>2</sub> Storage Pilot Project in the Vienna Basin, Austria

Investor Presentation



# Who we are

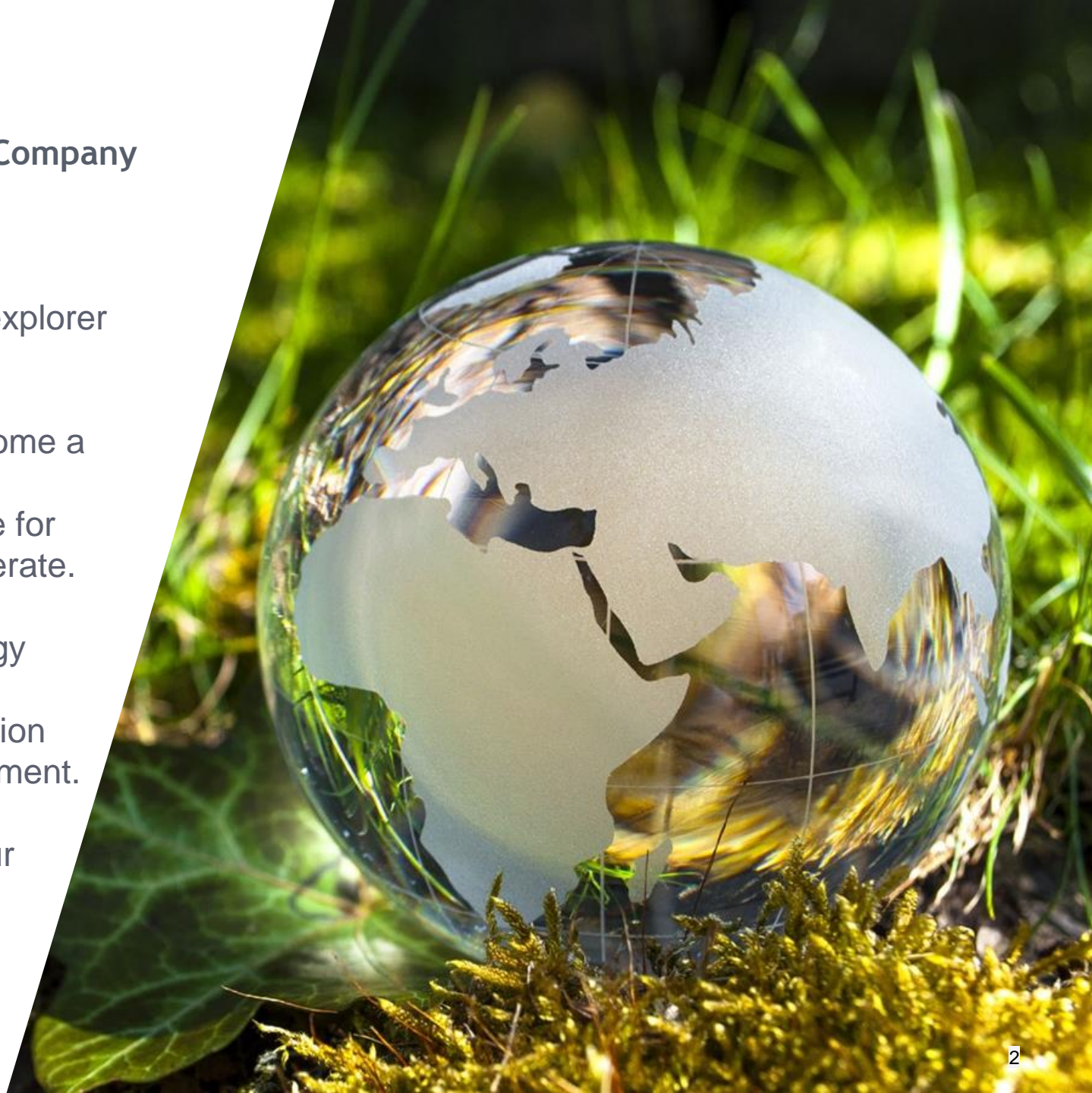
ADX Energy Ltd (ADX) is an ASX listed Oil & Gas Company

ADX is a rapidly growing European producer and explorer focusing on projects in Austria, Romania and Italy.

We are also working on intelligent solutions to become a leading European energy producer and provider of solutions for a low carbon society to enhance value for shareholders and the communities in which we operate.

We produce safe, low methane gas emission energy now to the highest environmental standards while redeploying our assets, people and skills for transition to low carbon energy production and carbon abatement.

We are well positioned to expand and transform our business for exceptional growth.



# Where we are going

Strategic Focus: To become a leading European focussed energy producer and the provider of energy solutions for a low carbon society



## ADX Values

- ✓ Fairness, integrity, honesty and transparency
- ✓ Create respectful, safe and rewarding workplaces
- ✓ Strive for excellence, innovation and teamwork
- ✓ Enrich the communities in which we work
- ✓ Meet and exceed required standards of safety, environmental protection and social engagement

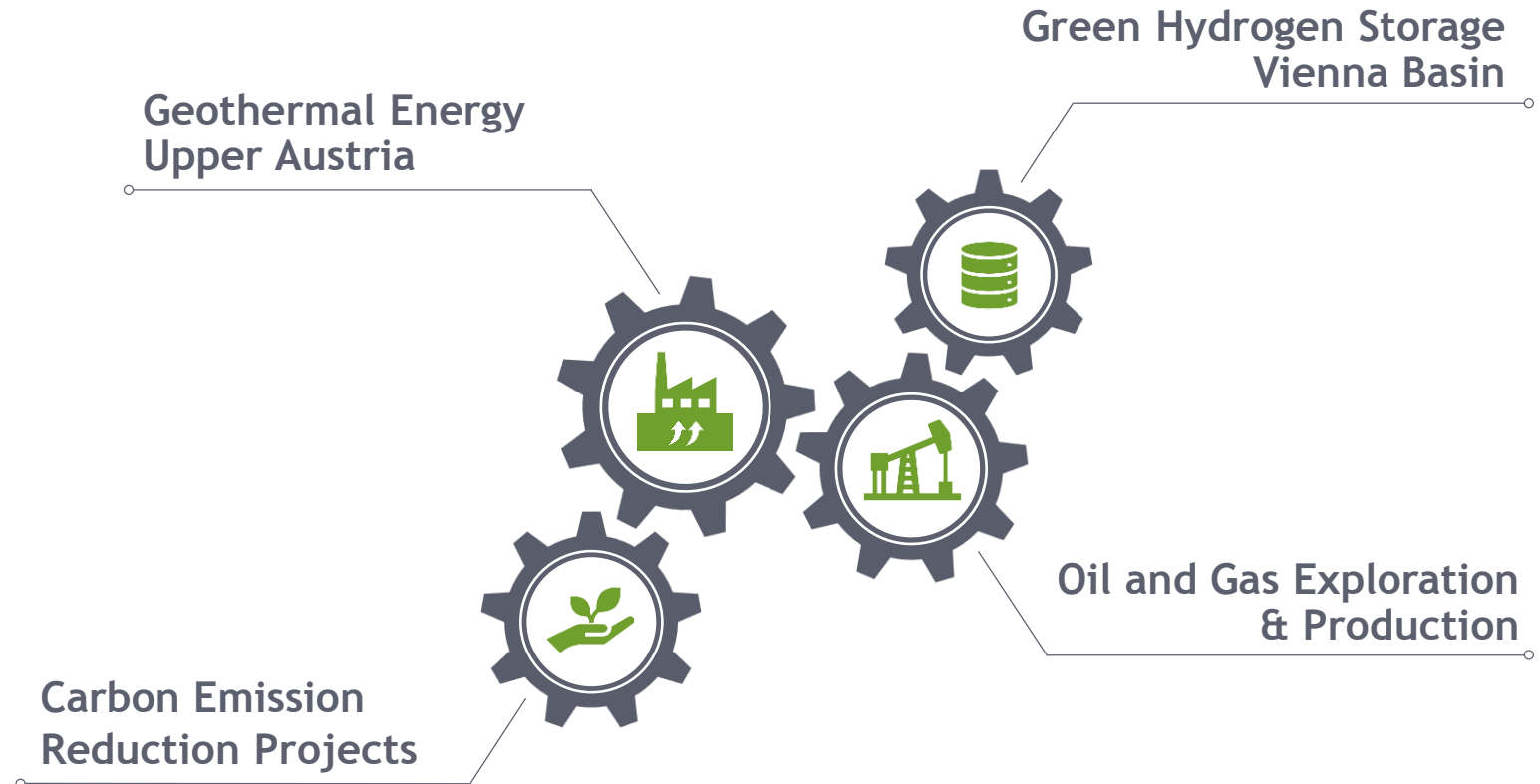


# How to expand our business

Utilising our existing assets and skills to transform our business into zero carbon energy production and emission reduction technology business

- » Redeploying subsurface reservoirs for safe, cost effective energy storage or green energy production
- » Utilising our operational geological, engineering and commercial skills
- » Creating innovative partnerships to develop zero carbon ecosystems
- » Leverage existing relationships with regulating authorities
- » Source ESG investment

*The compatibility between oil and gas operations, green energy production and emerging decarbonisation technologies enables us to make a strategic shift without diminishing our existing business.*



# What we plan to do

A lighthouse project in the European energy market



1

Developing with partners the hydrogen (H<sub>2</sub>) storage opportunities in depleted ADX gas reservoirs in the Vienna basin.

2

Offering substantial storage capacity for renewable energy, essential for the decarbonisation of our society.

3

Working with proven technologies that ensure environmentally safe operations, which is a key success factor.

4

Through its unique asset position in Austria, which ADX operates with a favourable production concession in the Vienna basin including land ownership.

5

Legislative changes and potential subsidies from the EU green deal for hydrogen projects make it the ideal time to start.

# What we have

Overview on the Vienna Basin Green Hydrogen Storage



## Great Fundamentals

- » Utilize oversupply of renewable energy in summer to generate green H<sub>2</sub>
- » Store H<sub>2</sub> in depleted ADX Energy reservoirs in the Vienna basin
- » Sell H<sub>2</sub> in winter at premium pricing when there is insufficient energy supply



## Perfect Success Factors

- » Multiple sources of wind power generation proximal to ADX Vienna basin fields
- » Ability to economically store H<sub>2</sub> in significant industrial scale quantities in ADX reservoirs
- » H<sub>2</sub> can be directly delivered into existing methane pipeline system

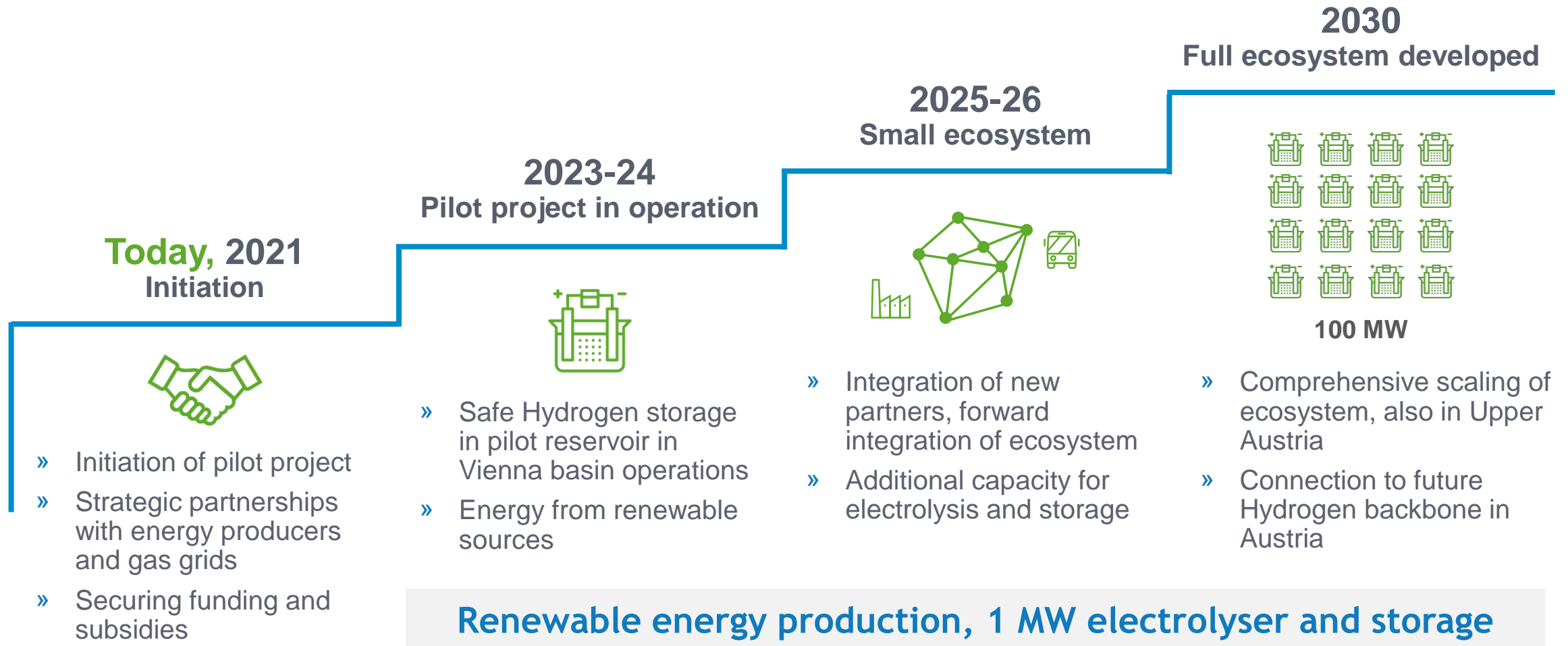


## Austrian & EU Policy Support

- » Austrian policy to increase current renewable energy output by factor 6 by 2030
- » Increasing funding available on favourable terms for renewable projects
- » EU subsidies for hydrogen projects

# Our green hydrogen vision

To build a substantial, profitable & green H<sub>2</sub> ecosystem for the energy sector



# Need for renewable energy storage

Matching the peaks of renewable production with energy demand in Austria

## Renewable energy production Austria

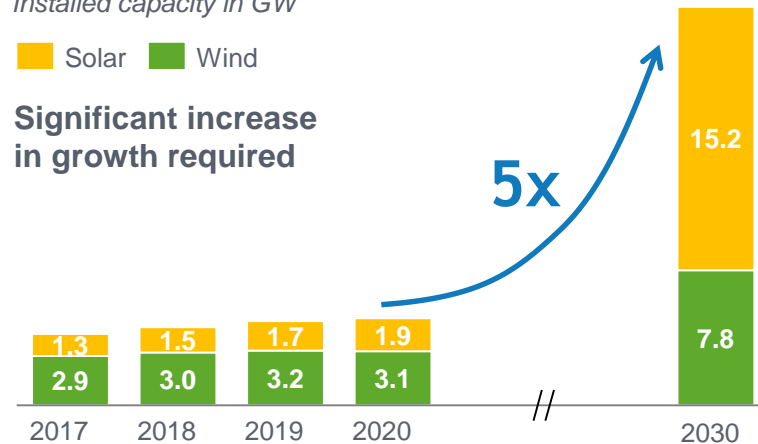
excluding water, biomass

increase based on targets according to Erneuerbaren-Ausbau-Gesetz (EAG)

Installed capacity in GW

Solar Wind

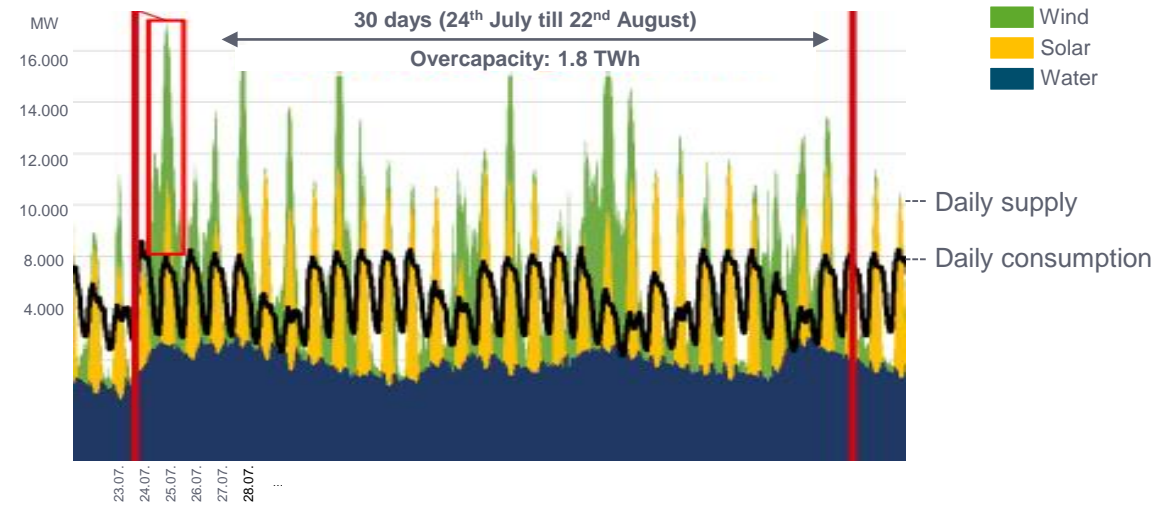
Significant increase  
in growth required



Source: Horváth & Partners

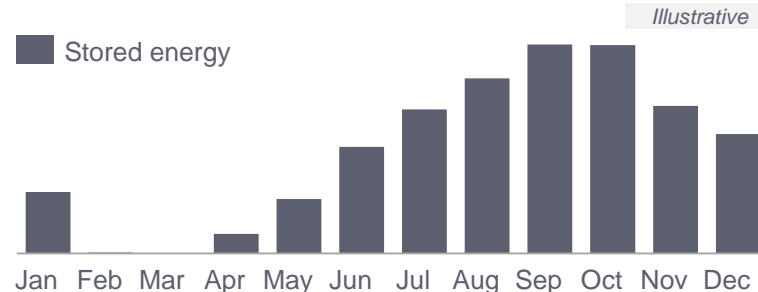


## Load in summer 2030



Source: APG

## Seasonal storage required



- » Substantial capacity to store renewable energy required to reach climate goals as defined in law (EAG).
- » Seasonal storage is necessary in order to balance energy production and demand between seasons.
- » 1.8 TWh is equal to 3 times the capacity of Austria's largest hydro pump storage station or the yearly need for half a million Australian households.

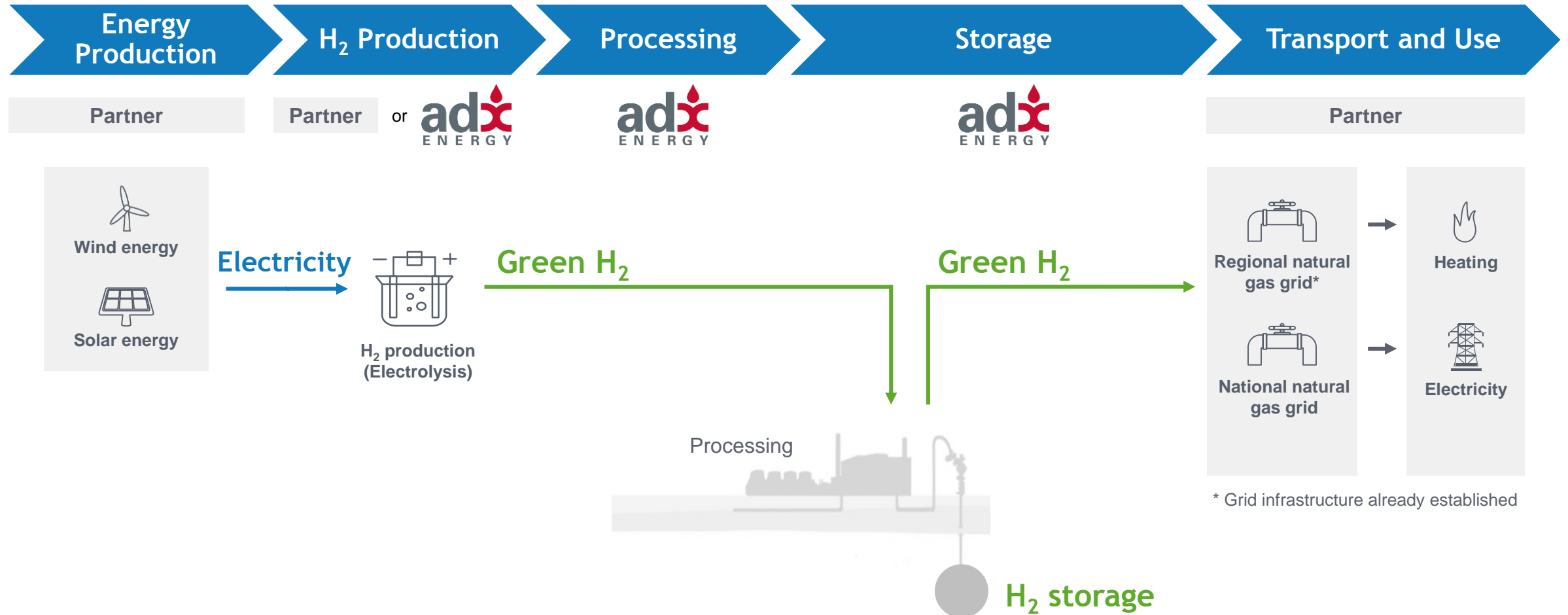
\*Total storage capacity: 588,3 GWh



# H<sub>2</sub> ecosystem development overview

Phase 1 - Pilot Project - ADX position in the H<sub>2</sub> value chain

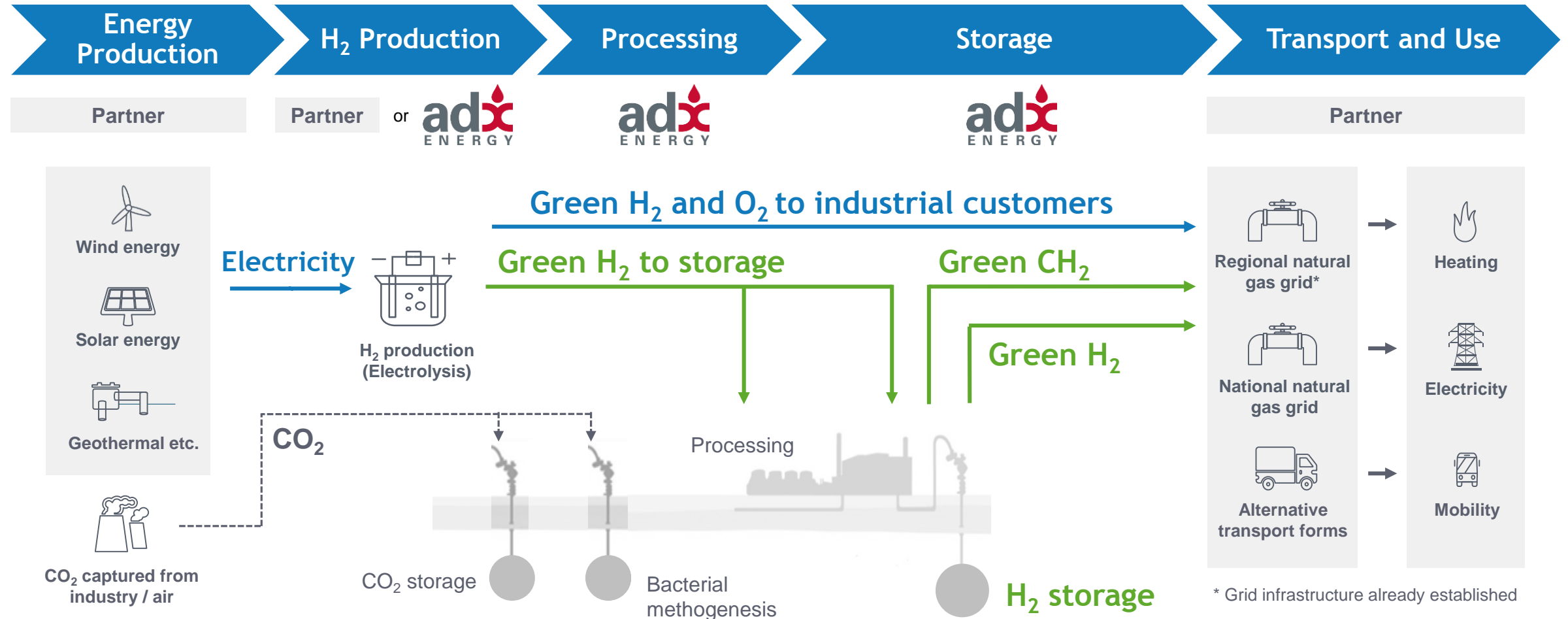
2021



# H<sub>2</sub> ecosystem development overview

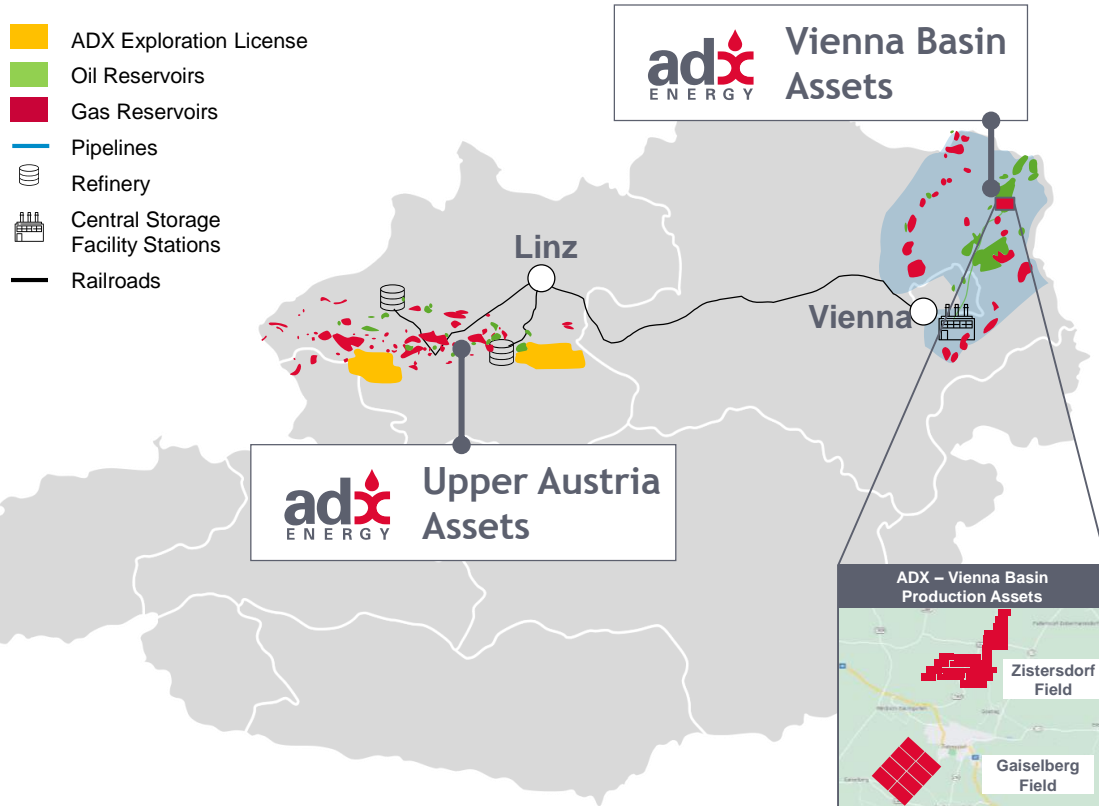
Phase 2 - Full development project potential

2030



# ADX underground assets

Several Reservoirs with half a million m<sup>3</sup> storage capacity in Lower and Upper Austria



## Asset Position



ADX owns licenses (exploration, production and storage) for ~50 reservoirs in the Vienna Basin (Zistersdorf and Gaiselberg fields) and further reservoirs in Upper Austria

H<sub>2</sub> and CO<sub>2</sub> storage potential

**10 - 20**  
**reservoirs**

in the Vienna Basin



Assets managed and operated by ADX local team

**100%**  
**equity**

- » in appraisal, exploration, gas storage and geothermal acreage in Upper Austria
- » in oil production assets in Vienna Basin

ADX has acquired the Vienna Basin oil & gas production from RAG in 2019 and since then successfully invested in the fields to increase production.

ADX also has operational experience in Tunisia, Italy and Romania and undertook all activities in a safe manner with no LTI's or major incidents.

In 2021, ADX got two further exploration licenses by the Austrian Government in Upper Austria, which are fully covered with modern 3D seismic acquired by RAG.



# How big is the ADX Underground Storage?

## Illustrative Comparisons



### Area

The **subsurface** hydrogen storage reservoir (“sponge”) is approx. 20 hectares in area and 10 meter thick, i.e. the size of 30 soccer fields or a bit larger than the London Serpentine Lake, Hyde Park.

On the **surface** only a few well pad areas as in the picture below are required. That means that only a few hundred square meters are needed.

### Energy

ADX can store in one large hydrogen underground reservoir approx. **500 times** the energy – equivalent of the largest Tesla energy storage Mega-Pack (approximately 200 MWh).

Alternatively, our underground hydrogen storage solution could supply 20,000 households with electric energy equivalent for an entire year.

### Costs

It costs Tesla approx. € 150 MM to build their “giant” 200 MWh battery storage. ADX can build the subsurface energy storage facility for a tenth of the Tesla battery cost and **2.500 times cheaper** on an energy equivalent basis.

As the price of electrolysis comes down, this will be a much more cost efficient way to store energy, with a lot less valuable land required for the facility.

London, Hyde Park Serpentine Lake area = area of H2 underground reservoir (sponge)



Tesla Battery Storage, Australia, needs 10,000 m<sup>2</sup> of land



ADX well site area, needs 100 m<sup>2</sup> of land

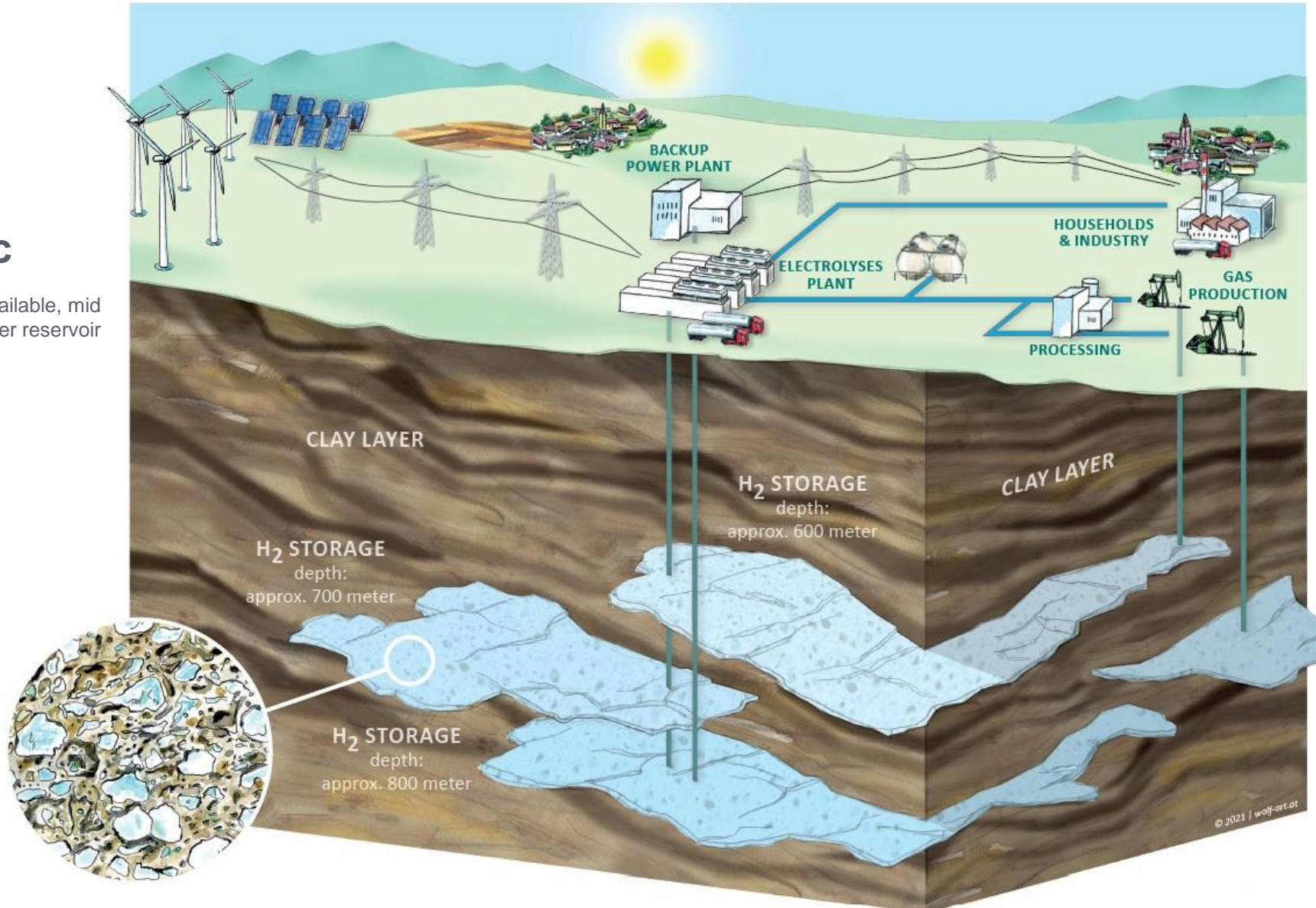


# Depth panorama ADX gas fields

Bright energy future with underground storage reservoirs

## 3D seismic

\*Several reservoirs available, mid range figures shown per reservoir





# Underground storage reservoirs

Large capacities well positioned to infrastructure and energy markets

Reservoirs tested by many wells, historic gas storage operation and 3D seismic – **safe hydrogen storage opportunity.**

Parameter*	Unit
Reservoir depth	660 meters
Geometric volume	0,5 MM m <sup>3</sup>
Hydrogen storage volume	25 MM m <sup>3</sup>
<b>Hydrogen energy storage capacity</b>	<b>75 GWh (max)</b>
Reservoir pressure	Around 60 bar
H <sub>2</sub> max. flow rate	30 MWh/ h
H <sub>2</sub> max. flow rate	0,2 MM m <sup>3</sup> /d
Electrolyser max. power	50 MW



**Storage capacity  
can be increased  
by a factor of 1:10.**

The ADX hydrogen storage reservoirs are “porous media” reservoirs.



**Porous media reservoirs are  
the safest possible form of  
underground storage.**

Hydrogen will be contained in small pores between sedimentary rocks. The same rocks have contained natural gas for several million years without any leakage. There is no better proof of safe storage than this amazing achievement of nature itself!



# Hydrogen storage capacity & costs

Cost effective storage potential for H<sub>2</sub> that can be further expanded easily

## Power from 8 wind turbines (24 MW)

is needed for 1 year to fill up the pilot reservoir with Hydrogen

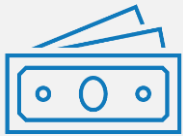


## Pilot reservoir - energy storage capacity approx. 75 GWh

Potential for 10 additional reservoirs in the fields with 500 - 1,000 GWh capacity



## Energy storage cost comparison



Battery: 30 - 40 EUR / MWh

Pump storage: 35 - 105 EUR / MWh

ADX reservoir: **30 EUR / MWh\***



The pilot reservoir alone has approx.  
**15% of the storage capacity  
of the Maltakraftwerke<sup>2</sup>**

Austria's largest hydro pump  
storage



**20,000 households**  
can be supplied with  
**electricity for 1 year<sup>1</sup>**

\* Target costs including electrolysis which is expected to significantly drop in cost

1 | Assumption: Electricity and heat consumption of 14.000 kWh

2 | Total storage capacity: 588,3 GWh

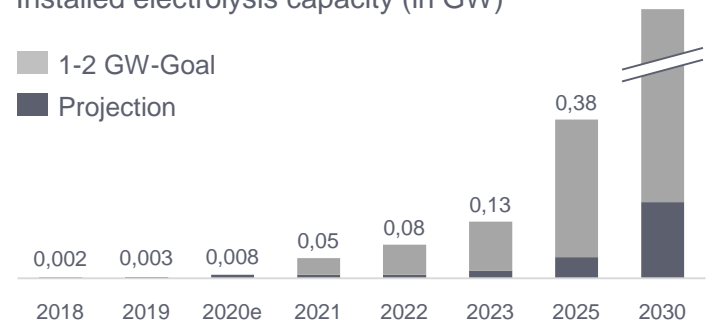
# Hydrogen trends

Compelling circumstances for H<sub>2</sub> storage project development

## Increasing electrolyser capacity inline with ADX phase 1 requirements

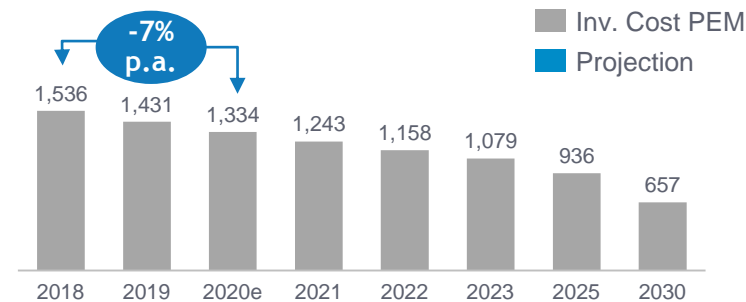
Installed electrolysis capacity (in GW)

■ 1-2 GW-Goal  
■ Projection



**GAP** – goal within the AUT H<sub>2</sub> strategy vs. projection given growth

## Decreasing PEM electrolyzers cost trend



Cost development of PEM electrolyzers 2018 - 2030 (in EUR/kWe)

**PEM costs:**  
**-7% p.a.**

PEM: Polymer electrolyte membrane

## Hydrogen blending in the natural gas grid up to 10% with proximity to potential future H<sub>2</sub> grid



## Large subsidy programs have been implemented to boost the Hydrogen economy

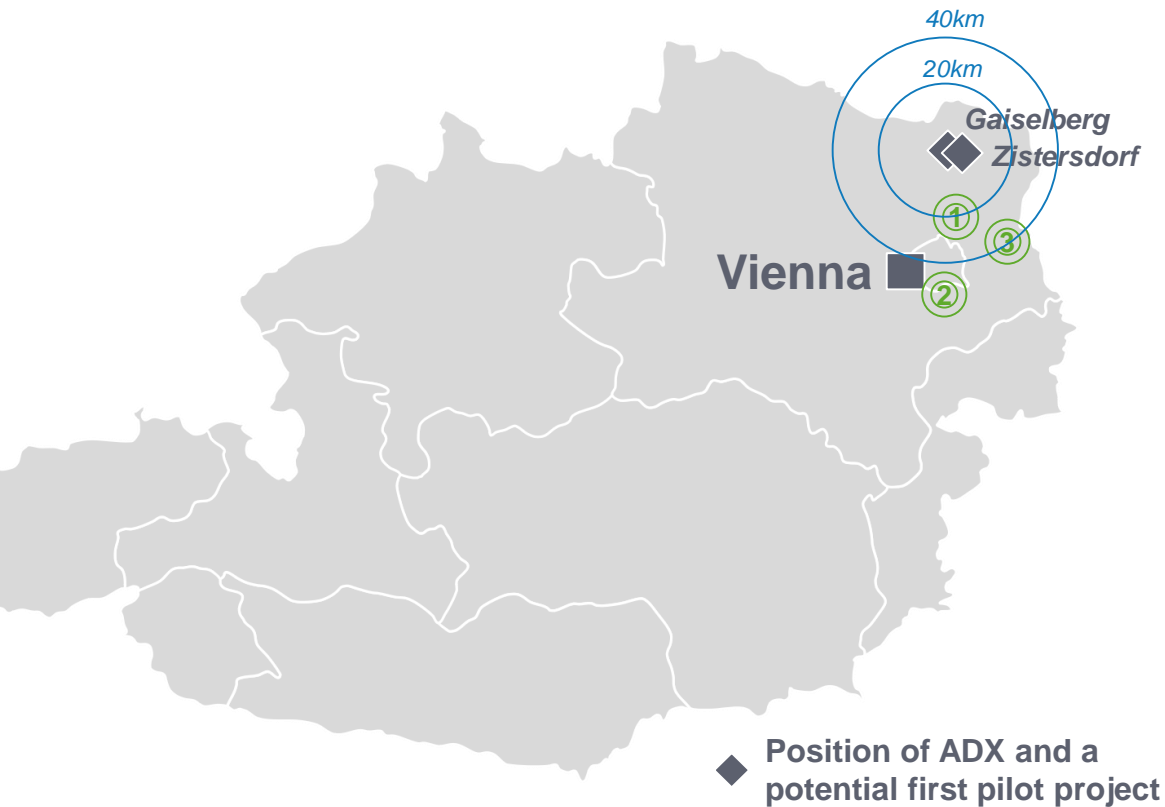
- » EU Innovation Fund
- » Important Project of Common European Interest
- » Horizon Europe
- » Austrian “Klima und Energiefonds”



# Hydrogen ecosystem development in Austria

Potential for innovative partnership opportunities for ADX H<sub>2</sub> storage

## Announced Hydrogen projects in Austria



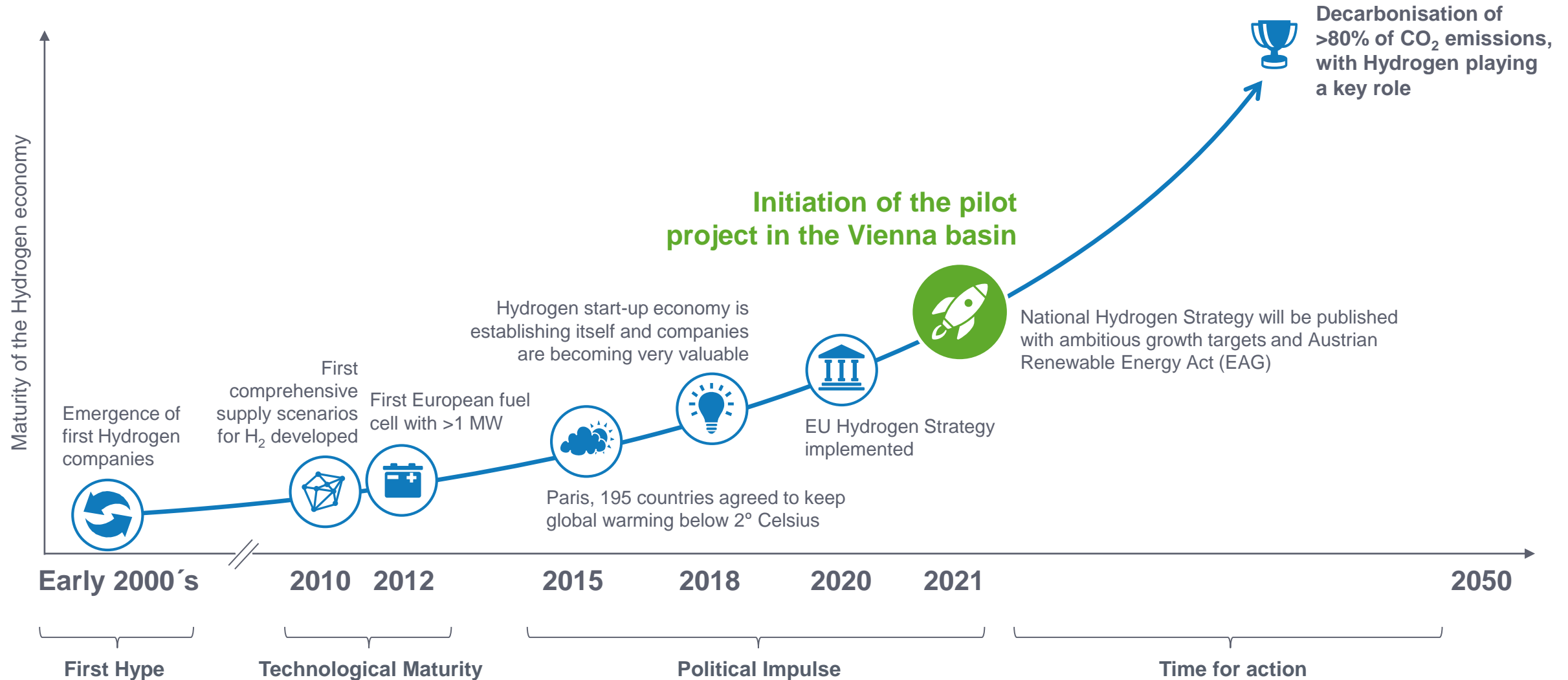
### ○ H<sub>2</sub> Hubs and examples of Hydrogen pilot projects

- ① **Wind2Hydrogen** pilot facility in Auersthal converted power from wind turbines into transportable, storable Hydrogen
  - ② **H<sub>2</sub> Pilot** in Schwechat - Electrolysis capacity 10 MW - Initial operation is planned for 2023
  - ③ Baumgarten will be part of the **IPCEI project “Green Hydrogen @ Blue Danube”** and will become a European hub for H<sub>2</sub> transport
- Further potential partners in the surrounding region for an ecosystem approach



# Hydrogen economy growth in Europe

Perfect timing for ADX to take off



# Benefits for participants

To be a partner in a sustainable energy project

## Being part of the Hydrogen megatrend

gaining knowledge, increasing attractivity for stakeholders and improving reputation of the company

## Optimize value from seasonal energy trends

overcoming the seasonality of the renewable energy production and selling zero carbon energy at peak value

## Use momentum in subsidies

utilise subsidies to boost initial investments with capital from funds based on the EU green deal\*

\* 750 bn EUR total subsidies for Green Deal in EU

## Unique Opportunity provided by ADX assets

including capabilities and expertise regarding Hydrogen technology and operations (incl. safety) as well as infrastructure and land rights



# Community Benefits

Sustainable future for the local community





# Next Steps for ADX

Project status and immediate way forward

4

## Initiation of the pilot project

- » Detailing of technical documents
- » Supplier pre-selection, application for funding, etc.

3

## Memorandum of understanding

- » Agreement with potential Partners
- » Public announcement(s)

2

## Concept in detail & search for partnership(s)

- » Discussion of business model
- » Terms of agreement

1

## Introductory discussions

- » Capabilities and market conditions
- » Hydrogen vision of high-level ecosystem



# Transforming our Business

Profit from ADX assets for renewable energies and decarbonization technologies



“

**Low emissions production, renewable energy and decarbonising technologies including hydrogen are not just good for our planet - they are good business!**

“

**Ian Tchacos**

Executive Chairman of ADX Energy Limited



Committed to the Generation of Tomorrow