

20 January 2021

## STRATEGIC AGREEMENT FOR HYDROGEN PREFEASIBILITY STUDIES FOR ADX VIENNA BASIN ASSETS

*“Co-operation Agreement with highly reputed and experienced hydrogen experts Horváth & Partners to evaluate deployment of ADX Gaiselberg and Zistersdorf production assets for hydrogen storage.”*



### Key Points:

- ◆ ADX is well positioned to potentially utilise already identified depleted reservoirs at its Gaiselberg and Zistersdorf fields in the Vienna basin (Fields) for hydrogen storage.
- ◆ The suitability of the Fields is due to their close proximity to major renewable electricity sources that can be used for renewable hydrogen production (Green Hydrogen), availability of high quality reservoirs at suitable depth and excellent gas export infrastructure that can be used for the export of Green Hydrogen or Green Methane (produced by the conversion of Green Hydrogen and CO<sub>2</sub> into methane).
- ◆ ADX and Horváth & Partners (Horváth) have entered a consulting agreement with the objective to support building a viable hydrogen business establishing ADX as a provider of large-scale hydrogen and green gas underground storage. The first phase seeks to reach the following milestones:
  - Utilise Horváth’s extensive hydrogen and green energy network and project experience to establish partnerships with major green energy providers such as the wind power operators next to the Zistersdorf and Gaiselberg fields of ADX. *Refer to Horváth’s capability and track record summary at the end of this release.*

- Establish the technical viability of reservoirs within ADX Fields as large-scale subsurface hydrogen storage facilities as well as the potential of converting Green Hydrogen and carbon dioxide into Green Methane which can be sold through the gas pipeline infrastructure as well as pure hydrogen.
- Form a joint venture with one or several green nearby energy providers to access European Green Energy Transformation funding in order to execute a number of projects establishing the technical viability of underground energy storage at the Fields and ADX as a certified participant in Europe's rapidly expanding energy storage market.

*Note: The potential for hydrogen storage is created by anticipated exponential growth in wind and solar energy production in Austria as a result of the recently ratified government directive for a 6 times increase in power generation (source: Austrian Power Grid AG). It is anticipated that during summer the renewable energy facilities will create an excess capacity of around 2 TWh per month. This energy has then to be either "destroyed" or exported at great cost if no large scale energy storage is available.*

- ♦ In the anticipated second phase studies ADX and Horváth intend to establish a detailed business plan and financing plan for the large-scale expansion and establishment of a profitable and growing energy storage and green gas business which may be linked to carbon dioxide sequestration.
- ♦ The ability to potentially utilise the Fields for renewable energy storage can create a new business opportunity as well as adding significant value to an asset that would otherwise be an abandonment liability later in field life.
- ♦ This business model can also be expanded into the recently awarded exploration, production and storage licenses in Upper Austria where ADX has secured a ready to drill portfolio of appraisal and exploration opportunities (refer ASX announcement from 11 January 2021)
- ♦ This strategic initiative is possible due to ADX having well positioned onshore operations and infrastructure in a supportive jurisdiction such as Austria enabling ADX to utilise its asset base for low carbon technologies and carbon abatement opportunities.

ADX is pleased to advise that it has entered an agreement with Horváth & Partners (Horváth) to undertake a pre-feasibility assessment for hydrogen storage at ADX's Gaiselberg and Zistersdorf fields in the Vienna Basin as well as the creation of a profitable hydrogen business model which will be complimentary and synergistic with ADX's current oil & gas energy business (Hydrogen Study). The Hydrogen Study is expected to be undertaken in two phases. The first is to establish the feasibility of the Fields for hydrogen storage and or green gas production, establish a joint venture partnership with renewable energy producers proximal to the Fields and determine the availability of feasibility project funding. The second phase will be to establish a detailed business and finance plan for a future project.

Horváth is a worldwide management consulting firm originating from Germany. Horváth has approximately 1,000 employees and a turnover of over US\$ 250 million with a strong presence in Europe, the United States of America and the United Arab Emirates. It has a proven track record of consulting the creation and implementation of hydrogen businesses with a focus on Germany.

### ADX Vienna basin asset potential for H<sub>2</sub> storage

ADX can benefit from the expertise and extensive network of Horváth to secure a project which transforms selected depleted gas reservoirs in its Fields into large subsurface hydrogen and green gas storage reservoirs. If successful it is likely to be a profitable business model that can be redeployed on other fields in ADX's portfolio.

## ASX RELEASE

The ADX Fields are ideally located in the centre of Europe, proximal to extensive renewable energy generation infrastructure which is expected to be rapidly expanded due to the recently announced Austrian government target to increase wind and solar generated electricity by a factor of 6 before 2030. This Austrian policy initiative is supported by a commitment from the European Union for the building of a hydrogen based energy landscape backed by a minimum €150-billion budget of “hydrogen” related grants and loans to be utilised between 2021 and 2027.



**Photograph showing ADX Gaiselberg and Zistersdorf Field infrastructure proximal to large wind farms suitable for generating hydrogen.**

ADX has already identified ideally suited reservoirs in terms of depth, pressure, sealing capacity, productivity, well coverage and fluid contents which may be excellent candidates for future hydrogen storage.

An example of a suitable reservoir is shown below, which is a Gaiselberg field Pannonian age reservoir covered with a large number of wells and excellent quality modern 3D seismic. The reservoir has produced around 18 million cubic meters of sweet methane gas at high well rates and is ideally suited for safe hydrogen storage. It is estimated that this single reservoir could hold around 60 GWh of energy as hydrogen (not accounting for potential energy losses when the hydrogen is again brought to surface and possibly used for electricity generation or re-injecting into the ADX pipeline infrastructure).

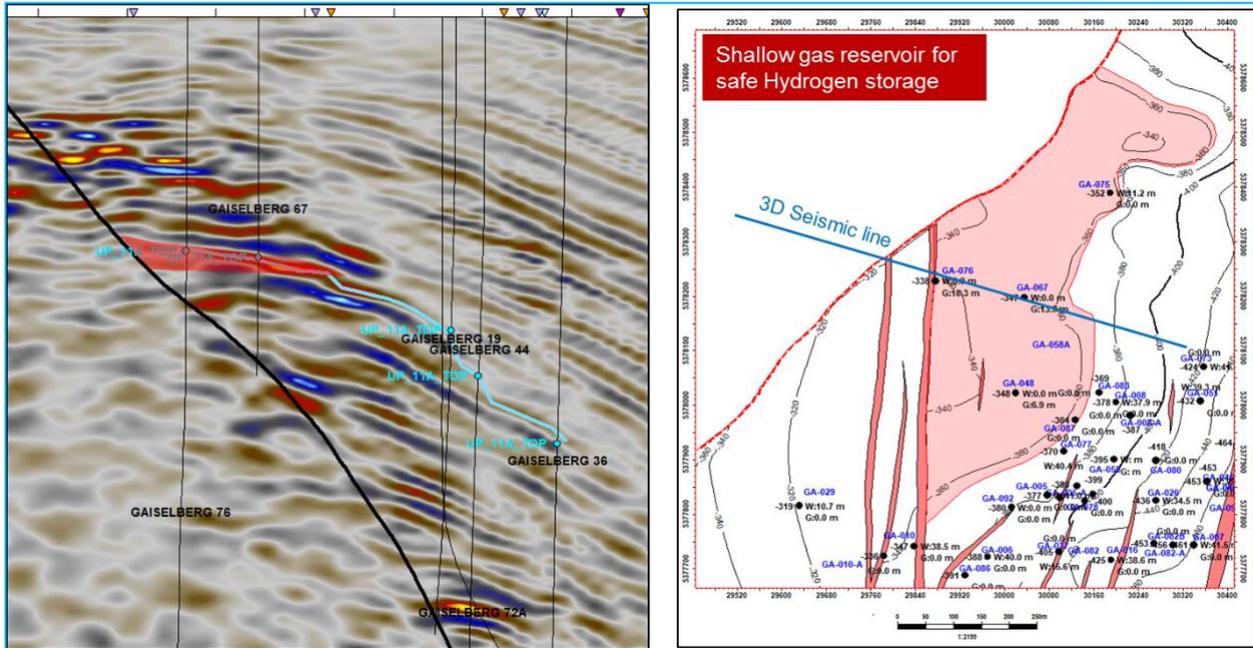


Figure above shows 3D seismic through depleted gas reservoir (red) and structure map with extensive well control on the right. This reservoir is technically ideal for H2 storage.

An additional direct benefit of utilising ADX Fields for Hydrogen storage will be the extension of the life of the Fields and resultant increase in oil and gas profitability due to shared operations and infrastructure.

The Business Case for H<sub>2</sub> storage in Austria

The business case for underground energy storage has been established with the ever-increasing capacity of intermittent wind and solar energy. In Austria alone a six-fold increase from currently 3.8 GW in wind and solar energy is necessary to meet the minimum European Union (“EU”) renewable energy targets by 2030. It is a fortunate coincidence for ADX that the largest wind and solar capacity is located close to its Vienna basin oil and gas fields.

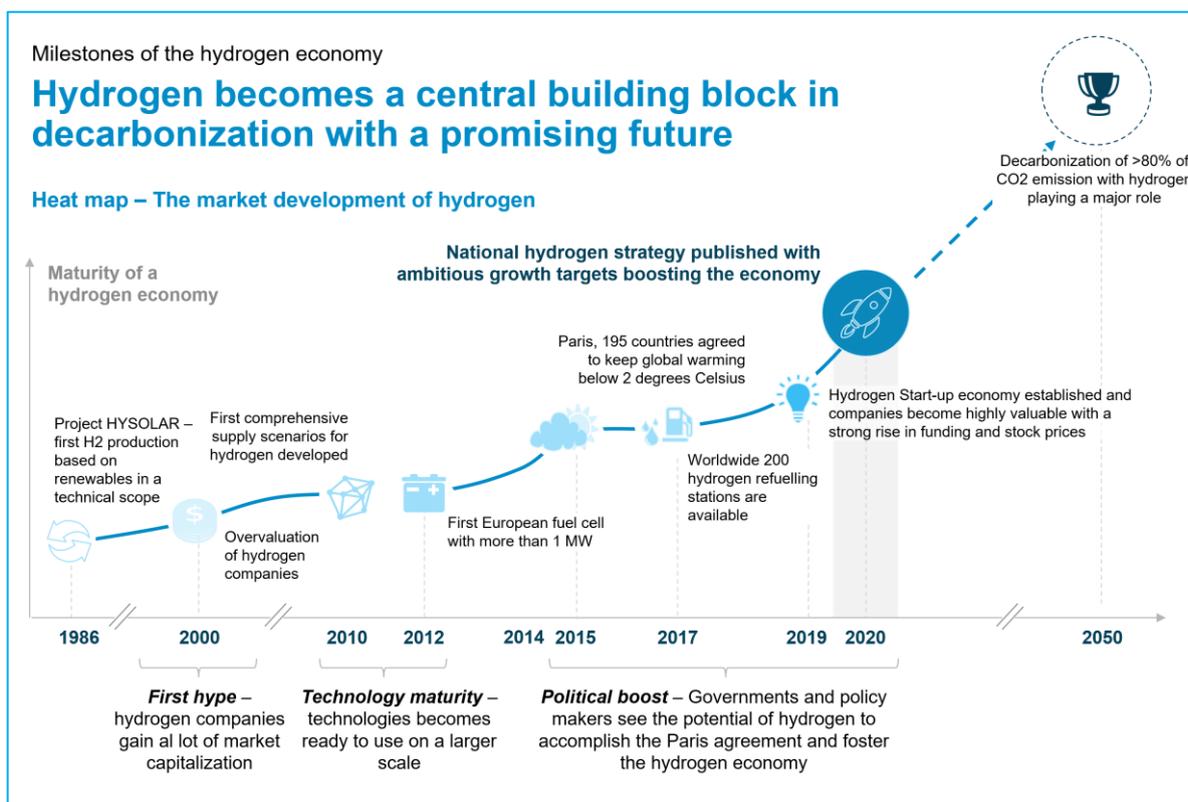
In order to achieve these EU targets, financial instruments in the order of a minimum of EUR 150 billion is planned to be spent between now and 2027. Horváth has the experience to assist ADX and its potential renewable energy partners and hydrogen providers to access the funds necessary for phase 1 of the Hydrogen Study as described previously.

A study by APG (“Austrian Power Grid”) who operate the Austrian electricity transmission system has determined that during typical Austrian winters when there is little contribution from solar a minimum of 3.3 TWh (Terrawatt Hours) per month of storage capacity or stable fossil deliveries or nuclear generated electric energy will be required to avoid a collapse of the energy net-work. In contrast during summer the renewable energy generation facilities will create excess capacity of around 2 TWh in one month alone. This energy has then to be either “destroyed” or exported at great cost if no large-scale energy storage is available. Austria has already largely exploited the geological possibilities for large scale hydropower pump storage in its mountains which means that other energy storage solutions will be required, ideally close to the production of excess renewable energy, such as is the case for the ADX Fields in the Vienna Basin. Based on the above projections the hydrogen storage business proposition in Austria is very promising.

# ASX RELEASE

The outlook for hydrogen worldwide is equally promising. The International Energy Agency has revealed that global low-carbon hydrogen production has increased from just 0.04 million tonnes in 2010 to 0.36 million tonnes in 2019 and is expected to reach 1.45 million tonnes in 2023 based on new hydrogen plants opening around the World. The cost of producing hydrogen power is falling at a dramatic rate, with figures from the US Department of Energy predicting that the cost of producing Green Hydrogen could fall from US\$6 per kg in 2015 to as low as US\$2 per kg by 2025. The primary use of hydrogen to date is as a form of energy storage depending on primary energy generation such as solar and wind converted into electricity when needed.

While the technical and economic potential of a hydrogen based energy economy has been long recognised it is only now that a clear pathway to profitability and eventually outstanding investor returns can be projected as shown in the “milestones of the hydrogen economy” in the chart below which is provided by Horváth.



Source: Horvath & Partners

**ADX Executive Chairman, Mr Ian Tchacos, said,** “ADX is very pleased to be accompanied by a highly credentialed, European consulting firm with leading expertise in the hydrogen industry, as Horváth. The business case for hydrogen is very compelling in Austria where there is a confluence of rapidly increasing green energy production, proactive government policy and large European financial incentives. ADX is fortunate to be very well placed for hydrogen storage in terms of its operational skills and the location of its assets at Gaiselberg and Zistersdorf which are in close-proximity to large scale wind power generators. We look forward to reporting further on this pivotal strategic initiative that provides another important string to our bow. It is not just our contribution to an Austrian government led green energy initiative, for ADX it is also an outstanding business opportunity. The ability to redeploy our existing fields is not just a new business opportunity it also potentially adds significant value to our existing hydrocarbon assets through increased profitability and life extension.”

ADX Energy Ltd (ASX:ADX)  
**ASX RELEASE**



For further details please contact:

Paul Fink  
Chief Executive Officer  
+61 (08) 9381 4266  
[paul.fink@adx-energy.com](mailto:paul.fink@adx-energy.com)

Ian Tchacos  
Executive Chairman  
+61 (08) 9381 4266  
[ian.tchacos@adxenergy.com.au](mailto:ian.tchacos@adxenergy.com.au)

Authorised for lodgement by Ian Tchacos, Executive Chairman

Horváth & Partners capability and track record summary

Horvath have a significant track record in the hydrogen business, starting with projects in Germany where strategies for hydrogen subsurface storage were developed for salt caverns in Northern Germany. Horvath & Partners are also part of the so called “Evety” Joint Venture which is summarized in the figure below. JV partner “OGE” is Germany’s largest gas transmission operator with a network of 12,000 km in Germany alone. The other partner “TÜV SÜD” is a German globally active company with over 25,000 employees who optimise leading edge plant technology and complex systems. Their core business today is technical innovation in the fields of autonomous driving, renewable energy and hydrogen. It was established in 1866 as a boiler inspection and certification company.



Source: Evety and Horvath & Partners