PROTÓN

CLEAN, LOW-COST HYDROGEN

Introduction to Proton Technologies

Alternative methods for local hydrogen production



September 6, 2022



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Proton's process for negative carbon intensity hydrogen

Potential for application of Proton's process in Austria

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Producer of clean hydrogen energy from hydrocarbons



Commercializing the process at owned site in Canada



Net production costs competitive with grey hydrogen today



Carbon-negative production when combining H_2 production and CCS



Strategic potential for large scale localized production in Austria / EU





The key chemical reactions: (1) Water Gas Shift, (2) Partial oxidation (3) Aquathermolysis, (4) Pyrolysis, (5) Thermal decomposition, (6) Gasification

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Our circular emissions / energy concept allows us a path to carbon negative intensity while having best in class cost and scalability

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Note: (2) Autothermal reforming also uses oxygen. (3) Proton calculations assuming CO2 sequestration

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We create two value chains where emissions removal and energy production converge around our technology and our asset





Proton is already producing hydrogen at its site in Canada





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JENBACHER

Proton Technologies Canada 4,187 foliowers

Jenbacher has units that can burn pure hydrogen, methane, or anything between. Proton plans to have 3 of these in operation at site #1 in Saskatchewan Canada next September.



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Proton's process for negative carbon intensity hydrogen

Potential for application of Proton's process in Austria

Hydrogen resources

- Vienna basin is largely depleted of commercial oil & gas deposits
- Upper Austria basin
- Estimated 40 70 mTH2 recoverable hydrogen
- In-country competency for development of projects

- Lower quartile for solar power
 - 100% of land receives under 1400 KwH/kWp/Yr)
- Limited wind power resources:
 - No offshore potential, limited wind power density

Alternative sources



Demand

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- Considerable demand for industrial scale hydrogen production
- Clustered developments in Linz & Vienna
 - Export potential for German markets based on demand profiles
- Hard to abate industrial sectors CCS cement, petrochemicals & others
- High level of energy dependence from Russia

- Political & societal focus on green hydrogen
- Regulatory prohibition for CCS until 2023 beyond pilot tests
 Roadblocks

Wind and solar potentials for green hydrogen production in Austria are limited due to its weather, green hydrogen imports are also high cost as a landlocked country







Energy prices are unsustainable for business & citizens



Fertilizer plants can not operate in this energy environment



Soaring gas prices hit Europe fertilizers, chemicals Updated on 18 August 2022

Yes,

Austria is well placed to benefit from this process if there is a political and commercial desire to do so by Austrians, for Austrians



- With support of **local industry** across the value chain: Suppliers, producers & offtakers
- With support of local, regional and national authorities to produce strategic energy resources that support hydrogen & energy self reliance

Our vision:

To leverage Proton's hydrogen production method together in a consortium with local operators, industry and local infrastructure to develop 1 or more large scale net zero hydrogen valleys in Austria. (Vienna basin and Upper Austria basin)

What does a Proton integrated energy hub look like? Sample concept: Upper Austria Net Zero Energy Hub





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Thank you

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