



Large Scale Wind Hydrogen Production in Argentine Patagonia

C.A.P.S.A. - *Capex S.A.* Group

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Executive Summary

The Project highlights the importance of Hydrogen as the fuel that will replace Fossil Fuels in the coming years, as well as the additional benefits it will provide in terms of Greenhouse Gas Emissions and their impact on Climate Change, issues that concern all in today's world. This will allow for a gradual change in the World Energy Matrix while keeping Sustainable Development ongoing.

Argentina stands out as one of the areas with higher potential in wind generated electricity as well as having the necessary resources for Hydrogen production. Detailed information related to winds in the Patagonian region, water resources, skilled labour force and available land, sea and air lanes are shown in the development of the project.

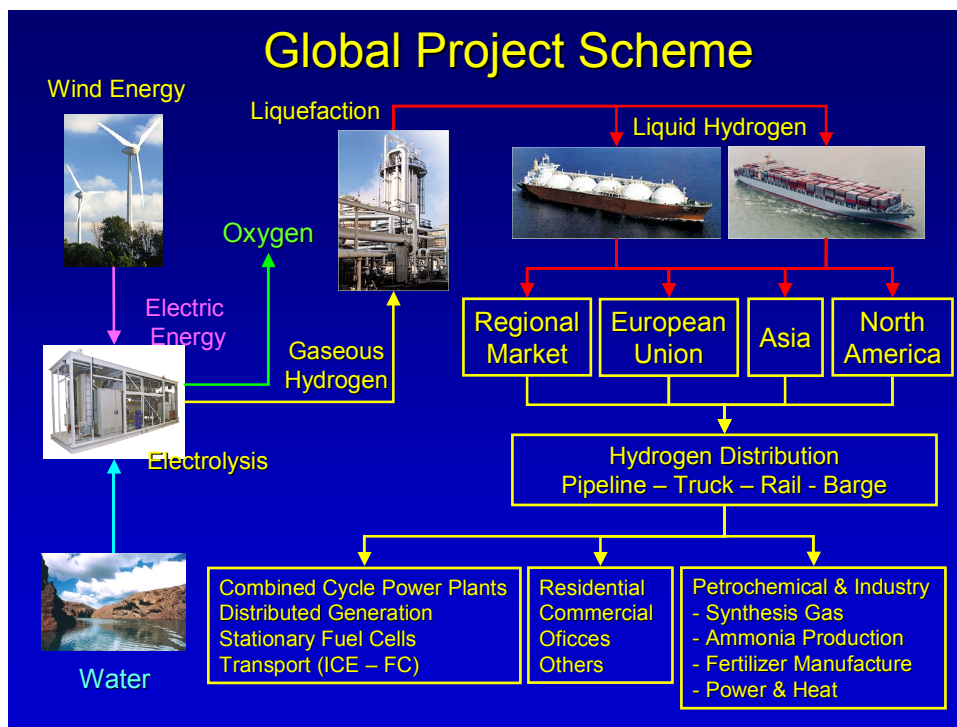
The final goal in the Large Scale Hydrogen Production Project is to supply the potential needs of Regional and International Energy Markets.

Capsa - Capex is an Energy Entrepreneurial Group engaged in Oil, Natural Gas, LPG and Electric Energy Production in Patagonia since 1977, is strongly committed to the Environment and considers that the World Energy Matrix Change must be launched at a Large Scale immediately



The Group has wide experience in energy resources exploitation and strong links to Patagonia, which that was chosen to start the first worldwide ambitious project to produce hydrogen with renewable energies. The Group is interested in being a key player in this Project and in the Matrix Change process mentioned within this framework.

As from this project, the groundwork is set for players sharing the same strategic vision to enter this market and to rapidly advance in the adjustment of the different variables in each stage, thus allowing for the project's implementation.



Project Synthesis

- Development of Large Wind Parks in the Northwest area of Santa Cruz Province of 16,120 MW in 10 years.
- Hydrogen Production through Electrolysis
- Liquid Hydrogen Production (13.3 million m³/year)
- Gradual supply of a fleet of 38,500 Taxis and 14,300 Buses in the City of Buenos Aires, "Future Clean City" and the Regional Market.
- Availability of Large Liquid Hydrogen surplus for export purposes.

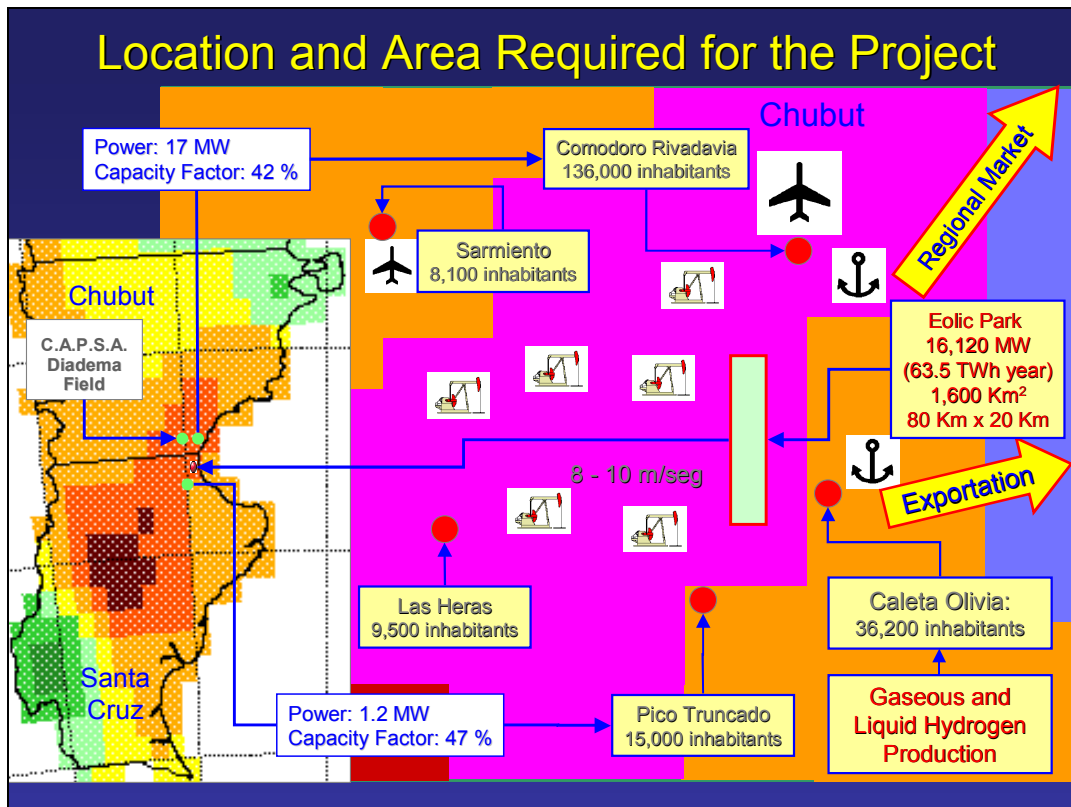


Figure 1: Location of the Wind Hydrogen Generation Project in Patagonia
(Wind Park dimensions: 80 Km x 20 Km)

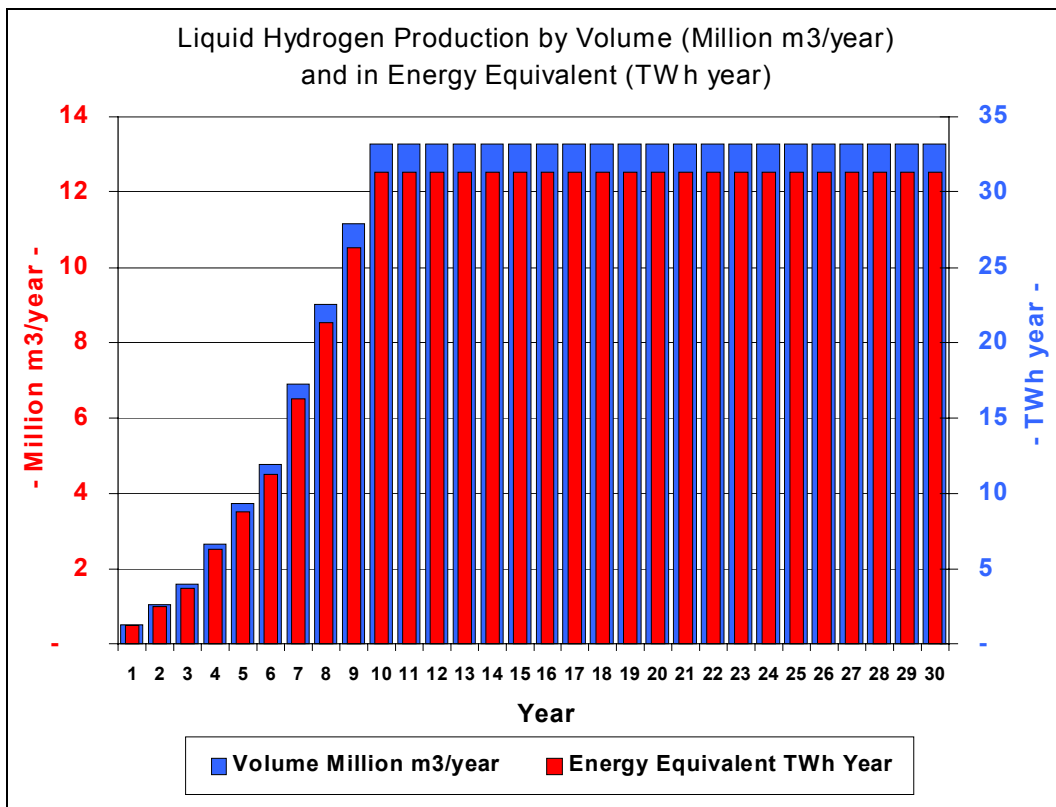


Figure 2: Liquid Hydrogen Production by Volume and in terms of Energy Equivalent

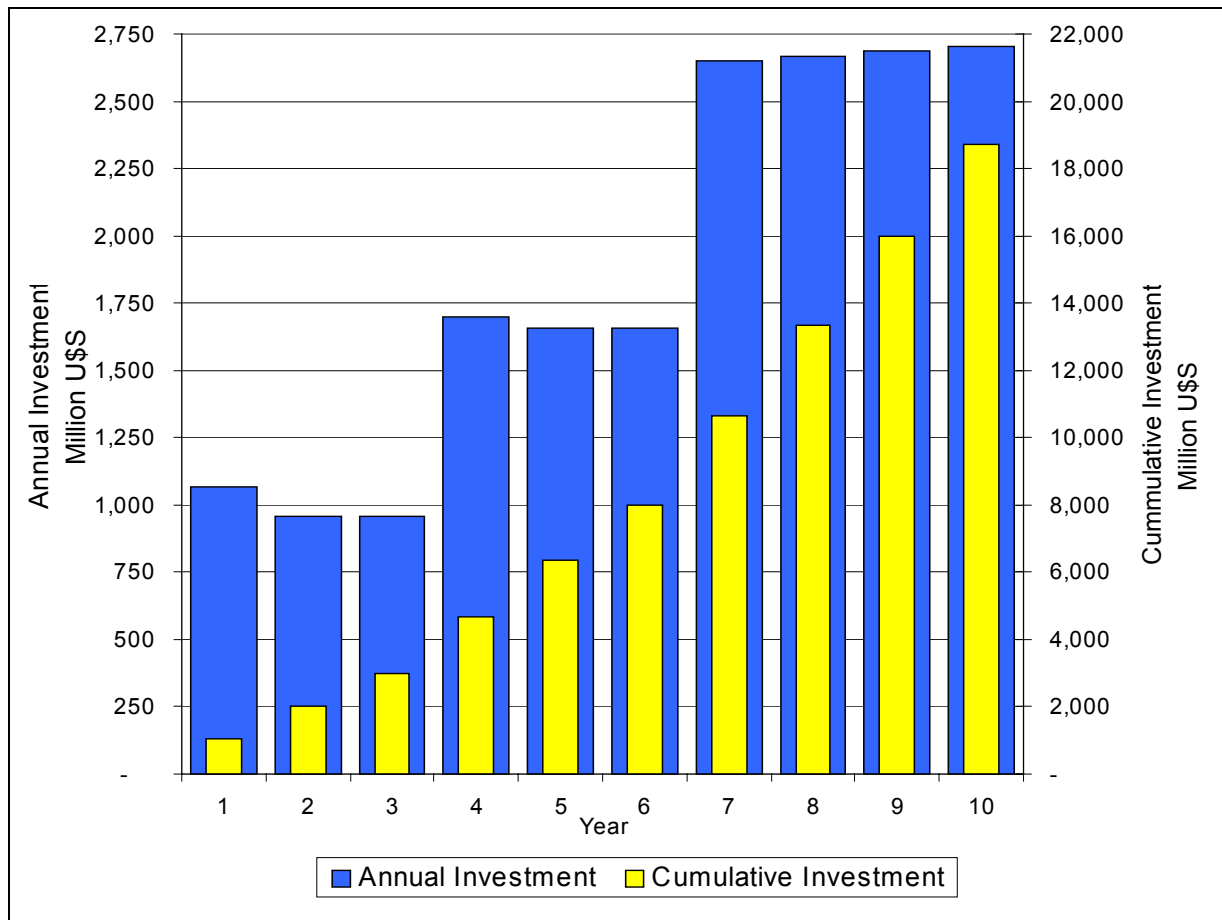


Figure 3: Annual and Cumulative Investment Detail in Million U\$S

Conclusions

- World Energy Matrix change cannot be avoided; its impact may be reduced if it starts immediately.
- Hydrogen is the only Energy Vector capable of replacing fossil fuels, securing Sustainable Development and Climate preservation.
- Patagonia has important Resources as Wind, Water, Area, Labour and Infrastructure, that will allow it to become one of the main Hydrogen Producers Worldwide.
- Argentina has the necessary expertise, as proved by its successful implementation of NGV in its vehicle stock.



Projects of this nature demand....

- Commitment of World Political Leaders, who must find the way to secure a quick transformation of the Energy Matrix
- Collaboration of Economy Sectors and NGOs, so as to facilitate Accessible Funds availability
- The Support of a consolidated Carbon Certificate Market, whose prices must reflect the Climate Change Impact reality and not the commitment of a few ones.

Main Indicators

- **The End of Hydrocarbons** (Association for the Study of Peak Oil – ASPO)
- **Climate Change and its Impact** (Intergovernmental Panel on Climate Change IPCC), *The Scientific Basis; Impacts Adaptation and Vulnerability; Mitigation; Summary for Policymakers 2001*- United Nations Environment Programme, Geneva, *The Ozone Secretariat*
- **Sustainable Development** (The World Bank Group)
- **Argentine, Potential Wind Hydrogen Producer** -Argentine Energy Undersecretariat (“Atlas de Recursos Eólicos”) - Argentine Hydrogen Association
- **Wind Hydrogen Production Project in Patagonia** - (C.A.P.S.A.-Capex S.A. - Argentine Hydrogen Association)