Challenge: LCBA – Carbonaxion Bioenergies on Modular hydrogen electrolyzers

Challenge Statement/Synopsis:

There is a need for high-efficiency, modular, water electrolyzers with a nominal nameplate capacity of 5 MW_e, for the local production of hydrogen in small power-to-gas applicatiosn (e.g. production of hydrogen fuel, synthetic methane, etc.).

High Energy Conversion Efficiency. The primary cost driver of green hydrogen is the cost of the renewable electricity. Although the price of renewable electricity is relatively low in Canada, green hydrogen is still more expansive than blue or grey hydrogen. The only avenue left to reduce OPEX is to boost efficiency as high as possible, the closer to 100% the better.

Modularity. Canada is a large country, with many small communities. Labor is expensive and summer, short. To reduce all-up CAPEX, there is hence a premium for electrolyzer systems with « plug-and-play» modularity, easier to couple with modular wind or solar farms.

Context for the Challenge:

As indicated above, Canada is a large country, with many small communities, often isolated especially in the North. Even in the South, outside large metropolis, the energy transition will also be implemented through locally available renewable energy sources, such as wind and solar, distributed by their very nature. To that end, Quebec has recently published a Call for Interest on Regional Energy Ecosystems (REE)1, part of the government's commitment to encourage the local production and consumption of green hydrogen or bioenergy, hereby increasing the energy autonomy of the region, creating economic and sustainable prosperity and improving the province's trade balance.

Response Criteria:

The modular, plug-and-play electrolyzer, including the stack, DC power converter, and all ancillary equipment, shall meet the following minimum requirements:

Selection Criteria	Target
TRL	> 8
Nameplate capacity	~ 5 MW_e
h	> 90%
CAPEX	< 2000 CAD/kW_e
Power input	600 V, 60 Hz

[1] Écosystèmes énergétiques régionaux | Hydrogène vert et bioénergies | Gouvernement du Québec (quebec.ca), (in French).

The Opportunity:

As part of the LCBA Canada project, you may have the opportunity to participate in the «*Electromethane Neuville*» project being developed by Carbonaxion Bioenergies inc. The project is waiting funding from the Natural Resources Canada (NRCan) Clean Fuel Program. CAVEAT: Carbonaxion is reasonably expecting a positive answer before the end of CY 2022, but no assurance can be provided, as of Sep. 20th, 2022.

The objective of the *Electro-Methane Neuville* project is to ultimately build a power-to-gas facility with a nameplate capacity of approximately 2,500,000 Nm^3/year of synthetic renewable natural has (RNG), with a lifetime extending from 2025 up to 2050. Located in Neuville, Québec, the proposed facility is based on an advanced bio-catalytic methanation technology, with the biogenic CO_2 coming from a co-located landfill gas (LFG) processing facility.

About Carbonaxion Bioenergies Inc.:

As a wholly owned subsidiary of Carboniq Inc, Carbonaxion Bioénergies Inc., incorporated under the Laws of Quebec, was specifically created to develop and implement concrete initiatives that will improve the lives of our customers, our partners, our local communities, our employees, while protecting the future of the planet. As such, the company acts as a promoter and integrator of solutions, often innovative in terms of technology or business model, aimed at decarbonizing the Canadian economy.

Toward that goal, Carbonaxion has invested and continues to invest substantial human and financial resources in the development of RNG production projects. Where and when possible, we endeavor to take advantage of synergies between our varied initiatives.

More information about Carbonaxion Bioénergies Inc. can be found on its website at: https://www.carbonaxion.com/services1?lang=en

Carbonaxion
Dare to be green!

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