Energy systems across the globe are undergoing a fundamental transformation to increase the quality of air and to decrease their dependency on oil, coal and gas as a primary energy source. Driven mainly by a political vision to decrease the negative impacts of climate change and decarbonize the power sector, wind and solar technologies have emerged as key renewable technologies. While the cost of renewable technology has decreased much faster than expected, integrating these intermittent energy sources into the power grid is highly challenging due to the increasing need for grid flexibility and energy storage solutions. This is where Hydrogenics, a global hydrogen technology company, is leading the way in delivering a clean and everlasting solution to the renewable energy equation.

Electrolysers are very fast-reacting devices
Water electrolysers are devices that use electrical power to split water ($\text{H}_2\text{O}$) into hydrogen ($\text{H}_2$) and oxygen ($\text{O}_2$). Thanks to Hydrogenics’ focus on continuous innovation, electrolysers are now capable of modulating their electrical energy input very rapidly (less than 1 second) over the total power range, making them a very attractive solution for the provision of grid balancing services to the power sector in the MW-scale range. Hydrogenics’ electrolysers are ‘plug and play’ units, safely and reliably producing very pure hydrogen in continuous or dynamic operation modes.

Hydrogen is used in a wide range of applications
Hydrogenics has delivered hundreds of electrolysers systems for every industry, including ammonia production plants (fertilizers), oil refineries, industrial manufacturing plants (steel, float glass, semi-conductors), power plants (generator cooling) and for the hydrogenation of oils in the food industry. In addition, Hydrogenics has supplied electrolysis technology to over 50 hydrogen refuelling stations worldwide where hydrogen is used as a fuel for fuel cell electric vehicles.

Renewable hydrogen as an energy vector
Hydrogenics is leading the industry in renewable hydrogen projects where electrolysers are used to store renewable electricity (wind and solar) into hydrogen. Once the renewable hydrogen is produced, there are several ways to commercialize it in the energy system. Hydrogen can be re-electrified via a fuel cell to deliver power again when needed (power-to-power). Hydrogen can be directly injected in gas grids (power-to-gas) under certain conditions or combined with carbon dioxide ($\text{CO}_2$) to produce synthetic methane ($\text{CH}_4$).

"Renewable hydrogen can be used in industrial applications (power-to-industry), in fuel production (power-to-fuels) at refineries or in the production of methanol. When produced from renewable power, hydrogen offers the capability to significantly decarbonize the power, gas, transport and industrial sectors, by substituting oil, coal and natural gas."

In this case, hydrogen acts a 100% renewable energy vector, connecting these sectors to renewable power.

A fast growing market with game changing potential
It seems quite clear now that hydrogen technologies will be at the core of our new decarbonized energy system. Whether it’s for transportation, fuel production or energy storage, major companies around the world are strategically transitioning to renewable hydrogen to help reduce their carbon footprint.

Hydrogenics: the leading provider of renewable hydrogen solutions
Hydrogenics is the global innovation leader with over 60 years of experience in designing, manufacturing and installing industrial and commercial hydrogen systems around the world.

Hydrogenics electrolysers deliver pure hydrogen solutions for industrial processes, renewable hydrogen projects and hydrogen refuelling stations. The company also designs hydrogen fuel cells for light and heavy fuel cell electric vehicles including urban transit buses, commercial fleets, utility vehicles and trains, as well as for stationary applications such as critical power and hydrogen power plants.

Hydrogenics has production sites in Canada, Belgium and Germany and sales offices in select locations around the world. Hydrogenics is publicly listed on the NASDAQ (HYGS) and TSX (HYG) and is the only global company to produce both state-of-the art water electrolysers (alkaline and PEM) and PEM fuel cells, making it the leading company in clean hydrogen technologies.

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