

# Green Hydrogen Comes to Atlantic Canada:

## SMART MOVE OR DECARBONIZATION DISTRACTION?

by **PAIGE CROWELL** /// EAC Volunteer

Anyone who has visited Newfoundland can tell you that it's windy. Really windy. And it's in this setting that Prime Minister Justin Trudeau and German Chancellor Olaf Scholz met in August, to announce a "hydrogen alliance" that calls for the harnessing of Newfoundland's winds to supply Germany with green hydrogen as an alternative energy source to fossil fuels. The politicians met in Stephenville, part of the Port au Port peninsula, to sign a "joint declaration of intent" which once implemented will establish a hydrogen supply chain from Canada to Germany. But what exactly is green hydrogen, and what could this mean for energy development in Atlantic Canada?

### What's in a name?

Hydrogen gas can be produced by splitting water molecules into hydrogen and oxygen. The hydrogen is then stored and used as a fuel source which, when burned, releases no greenhouse gases. However, how the hydrogen is produced matters, and this is where wind comes in. Producing hydrogen requires energy, and "green hydrogen" is produced through the use of renewable resources. Therefore, the use of wind energy is what renders the proposed outputs of the Canada-Germany agreement "green hydrogen".

In hydrogen nomenclature, there are nine different colours of hydrogen energy, each of which corresponds to the specific way in which the fuel is produced. Forms that rely on fossil fuels fall in the grey, brown, and black category. Blue hydrogen is also produced using fossil fuels, however the resultant emissions are sequestered through carbon capture and storage technology.

Because hydrogen gas is difficult to transport, it is often transformed into liquid ammonia, shipped as such, and then either chemically split upon arrival, or used directly as ammonia. The recently inked Canada-Germany agreement aims for the first trans-Atlantic shipment of ammonia by 2025.

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### Why here, why now?

For Germany, this agreement comes as part of efforts to reduce the country's dependence on Russian natural gas. Canadian green hydrogen offers one alternative supply chain for Germany's highly industrialized and energy intensive economy. But why Newfoundland? The basic requirements for green hydrogen production and export are renewable resources, water, and transport capacity. Newfoundland possesses all three, in the form of wind, water, and established shipping facilities. The recent lifting of a provincial moratorium on wind energy development further paves the way for the 164 wind turbines proposed by the Port au Port-Stephenville Wind Power and Hydrogen Generation Project. However, this is not the only interest in green hydrogen in Atlantic Canada, and the new Canada-Germany agreement calls on Canada to accelerate the development and export of green hydrogen. So...what's next?

### Nova Scotia's green hydrogen action plan

In Newfoundland and Labrador alone, over a dozen proposals for wind development on crown lands have been received. In Nova Scotia, the government has announced its intentions to grant leases to produce five gigawatts of offshore wind energy by 2030, to support green hydrogen production within the province. Premier Tim Houston explained that "setting this target sends a clear signal to the world that Nova Scotia is open for business and becoming an international leader in offshore wind and green hydrogen development," and that the province "is taking every opportunity to develop [its] renewable energy market." A green hydrogen action plan to be released in 2023 will outline the role of green hydrogen in attaining the province's goal of net-zero emissions by 2050. To manage this expansion, the Canada-Nova Scotia Offshore Petroleum Board will become the Canada-Nova Scotia Offshore Energy Board, and will regulate offshore renewable energy. Thus far, there is only one green hydrogen project proposed for Nova Scotia; EverWind Fuels has proposed a hydrogen production facility in Point Tupper, Cape Breton.



## TAKE ACTION

Hydrogen is a quickly emerging industry in Nova Scotia. Stay tuned for opportunities to provide input to ensure hydrogen supports decarbonization in ways which are effective and fair.

PHOTO: Raymond Plourde

## The future is...green?

The appeal and potential of green hydrogen is undeniable. Besides being carbon-neutral in both production and combustion, hydrogen gas is energy dense, stores well, and ships well (as ammonia). It has also been heralded as a key alternative for industries that have been slow to decarbonize, including industrial processing, heavy transportation, and marine industry. However, one barrier to broader market access is the price, as green hydrogen is far from being cost-competitive with existing fuel sources. However, this has not dampened industry and political excitement at the prospect of hydrogen development as a means to contribute to emission reductions while providing local jobs and revenue.

As with any common resource, green hydrogen production must be carefully considered and balanced against the potential impacts of utilizing this resource. The same community and environmental concerns that surround wind energy by extension apply to green hydrogen proposals in Atlantic Canada, as evidenced by community concern in the Port-au-Port area slated for development. These concerns include the potential noise pollution from the development, as well as how the project's spatial footprint, including during construction, could impact the unique local ecosystem. The scale of this development has some questioning if smaller initial test sites are a better option, and the pending provincial environmental assessment for the project will no doubt be closely read.

## Hydrogen, hydrogen everywhere

Closer to home, offshore wind is the fuel of choice for Nova Scotia green hydrogen proposals. Offshore wind energy provides its own series of considerations, especially impacts to benthic and marine habitats and the animals who rely on them. Additionally, there is the question of how the hydrogen will be produced, and where it will end up. While green hydrogen has been hailed as a means to reach the province's goal of supplying 80 per cent of electricity through renewable energy by 2030, it is unclear how much green hydrogen would actually contribute to this. For example, the EnergyWind project, the only in-province project proposed thus far, would export the final ammonia product, rather than returning it to the provincial electricity grid. This proposed business model obscures the link between in-province hydrogen production and the decarbonization of Nova Scotia's electrical grid.

The demand, both local and global, for clean energy sources is steadily increasing, and Atlantic Canada seems poised to make the leap into the green hydrogen industry. This renewable resource, produced locally, could aid in the region's transition away from carbon-based energy. However, in the rush to market, careful consideration must be paid to the potential impacts on local communities and ecosystems, and a transparent accounting of production, from development to fuel consumption, should be provided to ensure that the reality of green hydrogen in the region lives up to the hype.