

CLEAN RESOURCES

CLEAN TECHNOLOGY

HYDROGEN

FUNDING DETAILS

Scale Up, Certification and Demonstration of Hydrogen In Motion (H2M) Low Pressure Solid State Hydrogen Storage

The world is moving to renewable energies and hydrogen is key to a carbon free society, but high costs, and technical challenges of storing and transporting hydrogen, either as a compressed gas or in liquid form, significantly impede the adoption of hydrogen technology.

Hydrogen In Motion Inc. (H2M) has engineered a patented nanomaterial that attracts hydrogen under ambient temperature and low pressure (50 bar), providing high density hydrogen at half the cost. Scaling up production and commercialization of H2M conformable tanks will revolutionize the hydrogen industry, dramatically driving down capital and operating costs and open new markets from drones and portables to heavy duty vehicles.



RECIPIENT:

**Hydrogen In
Motion Inc. (H2M)**



PARTNERS:

Croft Labs Inc.



TOTAL BUDGET:

\$2,880,447



AI HCOE FUNDING:

\$1,440,233



PROJECT DATES:

**JAN 2023 –
JAN 2025**



PROJECT TRL:

**Start: 4
End: 9**



APPLICATION

H2M hydrogen tanks are needed in hydrogen value chain, from generation, to transport and storage, to application. For hydrogen fuel cell applications, H2M's partner, Croft Inc, is focused on retrofitting gas/diesel vehicles (farm or heavy-duty trucks) to hydrogen powered using H2M's low pressure portable hydrogen tanks. On hydrogen generation side, H2M is in discussion with midstream gas companies in Alberta to store and transport their hydrogen.



PROJECT GOALS

The project goal is twofold: (1) to increase production capacity of H2M to manufacture our innovative hydrogen storage nanomaterial and (2) to place nanomaterial in a lightweight shell and certify these hydrogen tanks for commercial use.

At the end of this project, H2M will have demonstrated at TRL 9, a 10 kg weekly continuous flow synthesis process that can be scaled quite easily to a pilot plant of 500 kg weekly and larger and H2M will have a commercial-ready 300-gram hydrogen storage tank system available for demonstration, customer trials. and purchase.

BENEFITS TO ALBERTA

H2M will use the manufacturing design from this project to build a 10,000 kg annually hydrogen storage demonstration plant in Alberta. Eventually H2M will scale to six 500,000 kg/year hydrogen storage plants for domestic and export markets. Following the completion of the project, during the construction phase of the pilot plant, hundreds of jobs will be created. It is expected that 25 - 50 full time positions will be created for operating this demonstration plant and the development of hydrogen storage systems using H2M's hydrogen storage material. H2M will develop hydrogen storage and manufacturing expertise in Alberta with consideration to employment equity, diversity, and First Nation targets.



2 - 4 Publications



8 -12 Students Trained



2-4 Patents



15 - 20 Project Jobs



25- 50 Future Jobs



4-5 New Products/Services



1 Spinoff Company



0.5 – 1 kt/yr Project GHGs Reduced



130,000 – 300,000 kt/yr Future GHGs

CURRENT STATUS

JAN 2023

H2M nanomaterial is currently synthesized using a wet chemistry batch process, that does not use rare earth or metals, nor toxic materials. To date, H2M has upscaled the process from grams at lab scale to 100 grams using small scale industrial equipment. This project will allow H2M to upscale manufacturing to a continuous flow at a 10 kg/week scale.