ALBERTA INNOVATES

CLEAN ENERGY

ADVANCED HYDROCARBONS

CLEANER HYDROCARBON PRODUCTION

FUNDING DETAILS

Service Rig Electric Hybrid Conversion

Greenheart has identified an opportunity to reduce CO2 emissions in the Canadian Oil and Gas service rig market. Greenheart has participated in overseas markets where capital equipment acquisitions of full electric service rigs is achievable, something not viable in Canadian operations. Greenheart has identified a step-change that would utilize existing equipment to reduce operating costs and CO2 emissions in the range of 48-55% per rig while all while gaining market share, lowering operating costs, and increasing day rates. Our innovation is a 'drop-in' electric hybrid system that will integrate into existing service rig platforms with minimal modifications. This will offset up to 200 HP of diesel horsepower with electric motors. The hybrid system would reduce both emissions and fuel usage for the service rig operator. This would assist the O&G companies to reduce their overall CO2 emissions approximately 89 to 103 tonne/yr/service-rig based on 229 days/yr operating 24hrs/day.

RECIPIENT:

Greenheart Technologies

PARTNERS:

Treeline Well Services LP

Suncor

TOTAL BUDGET:

$365,000

AI FUNDING:

$182,000

PROJECT DATES:

NOV 2024 – AUG 2025

PROJECT TRL:

Start: 3

End: 5

APPLICATION

New capital expenditures on electric well servicing equipment is expensive. This hybrid gearbox is a drop-in replacement that allows an incremental step that allows a lower capital outlay while gaining the benefit of electric hybrid to offset diesel consumption and lower greenhouse gas emissions at the same time while not effecting the current operational profile of the equipment. The system is designed to tap into a multitude of electric supply to maximize available electric energy to offset engine horsepower.

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PROJECT GOALS

- We aim to complete the project with a prototype unit operating on a test platform. This will demonstrate that the electric control system can regulate motor speed within 10% of engine RPM during simulated well service operations to achieve smooth operations.
- The system will be designed for future integration onto a real-world test platform. This will help progress the technology from TRL 5 to TRL 7, with support from our industry partner, Treeline Well Services LP.
- A fully engineered electrical package will be delivered, ready for deployment on a mobile rig. It will meet operational, safety, and environmental standards for field use in well service applications.

BENEFITS TO ALBERTA

GHG Emissions Reduction

The system is expected to significantly reduce greenhouse gas (GHG) emissions during well servicing operations, with estimated savings in the range of 89 to 103 tonnes of CO_2 equivalent per year per service rig.

Lower Capital Requirements for Electrification

Our solution is designed to reduce the capital investment required by operators aiming to electrify their service rig fleets. It maintains full mobility and can operate in remote areas where grid power is limited or unavailable.

Reduced Operating Costs

By lowering fuel consumption, the system will yield reduced operating expenses for service companies, improving their bottom line.

Job Creation Potential

This initiative supports workforce growth in design, implementation, and ongoing maintenance of advanced electrification systems.

1 Patent

2-3 Project Jobs

4-5 Future Jobs

6 New Products/Services

1-2 kt/yr Project GHGs Reduced

2-4 kt/yr Future GHGs Reduced

CURRENT STATUS

MAY 2025

Greenheart Technologies has completed the gearbox design and is set to enter manufacturing of the prototype system in the next 2 weeks. Electric control theory is complete, and programming is underway to develop the PLC program.