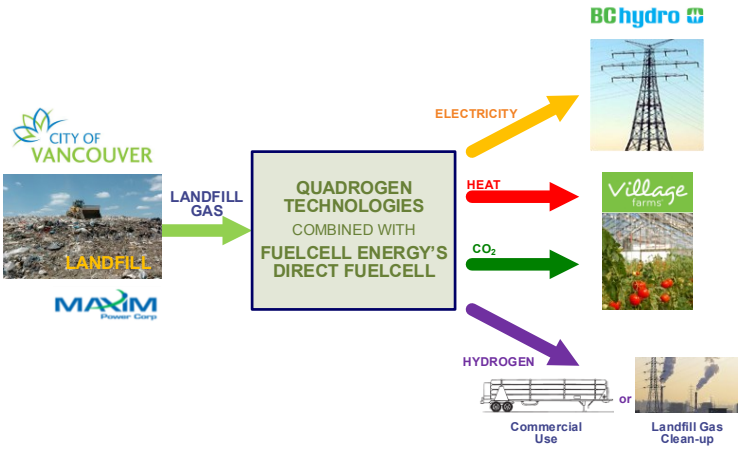
QUAD-GENERATION FROM LANDFILL GAS AT VILLAGE FARMS

Until now, landfill gas has been combusted for power and heat generation.
Quad-generation is the next step to fully utilizing the untapped potential of landfill gas as a renewable resource.

The quad-generation project is the first of its kind demonstrating the simultaneous production of renewable electricity, hydrogen, heat, and greenhouse quality CO_2 from landfill gas.



Landfill Gas Clean-up:
By purifying landfill gas to the parts-per-billion level, Quadrogen's clean-up technology enables the use of ultra-high efficiency fuel cell technology as well as permitting recovery of the CO_2 for greenhouse applications.

Power Generation:
FuelCell Energy's Direct FuelCell (DFC) produces power from landfill gas with industry leading efficiency.

Heat Recovery:
Waste heat from all stages is recovered via a hot water loop and used to heat the greenhouse.

Hydrogen Extraction:
Excess hydrogen produced by the DFC is concentrated and purified with combined Quadrogen and FCE technology, and then sold to a third party user.

CO_2 Recovery:
Purified landfill gas supplied to the DFC creates clean CO_2 (free of NO_x, SO_x, and other contaminants) that can be used directly in Village Farms' greenhouse to enhance growth, displacing fossil fuels normally used for CO_2 generation. In other applications, this CO_2 can also be used as fertilizer for algae production.

Project Benefits

Canadian Industry Competitiveness	Reduced operating costs for agricultural greenhouse sector
	Distributed power generation and electrical load displacement
Enabling of New Industries	Efficient source of renewable hydrogen, step toward hydrogen economy
	Multiple revenue streams improve economics for landfill gas recovery
Reduced Carbon Footprint	High efficiency power generation from under-utilized renewable resource
	Utilization of CO_2 from landfill gas displaces fossil fuel consumption

Project Sponsors and Partners

Investment Agriculture Foundation of British Columbia
FuelCell Energy — Ultra-Clean, Efficient, Reliable Power
Sustainable Development Technology Canada™
British Columbia
Canada NRC-CNRC
BC Bioenergy Network — Partnering for a Greener Future

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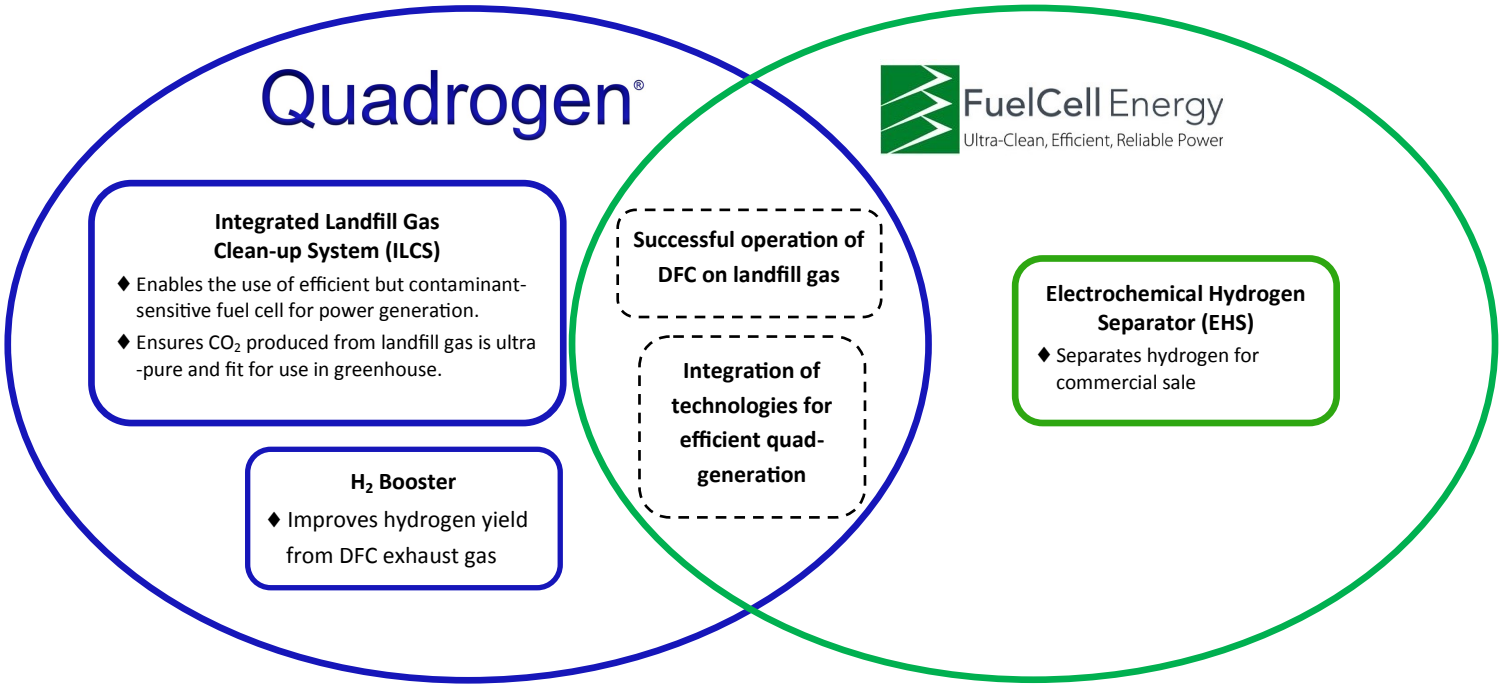
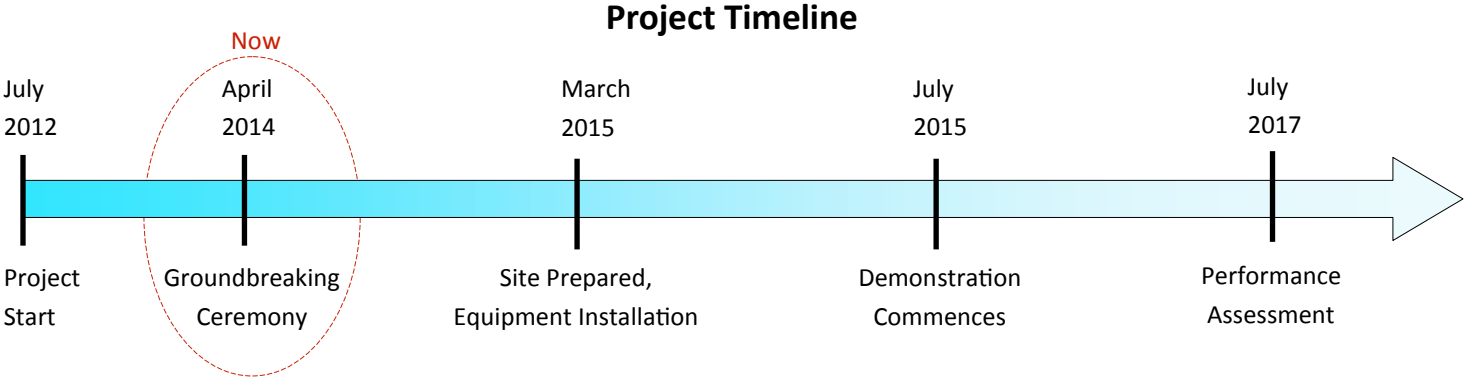
New Technologies Demonstrated



Key Outputs

OUTPUT	QUANTITY	COMPARISON
Power	Up to 250 kW	Power for approximately 250 homes
Heat	Up to 12 GJ/day	Heat for approximately 50 homes
Hydrogen	Up to 125 kg/day	Fuel for up to 6 hydrogen buses or 85 hydrogen cars
CO_2	Up to 5 tonne/day	Displaced CO_2 emissions equivalent to 350 cars or 144 GJ/day of natural gas consumption.

Project Timeline



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