



GreenGT presentation

R&I collaboration between Canada - Switzerland - Wallonia

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About GreenGT

Expertise

GreenGT is a designer and integrator of innovative technologies, dedicated to the development of electric-hydrogen propulsion systems for high-power mobility.

Operations

- Integration of hydrogen systems
- Customized development of :
 - Fuel-cell systems
 - Battery systems
 - Powertrains
- Manufacture and supply of:
 - Prototypes
 - Pre-series
 - Limited series

Areas of application

- Road • Maritime • Air • Rail

Establishment	2008
Shareholding	Private group
Number of employees	45

Switzerland
Head office at EPFL Innovation Park
in Lausanne and factory in Collombey

France
Le Castellet

2008

2021

<p>2008 Battery Race Car Pelletier Cooling System</p> 	<p>2009 Electric Race GMP 300 kW</p> 	<p>2011 Race Electric Air Compressor 300 gr/sec</p> 	<p>2013 Truck Electric Engine 450 kW</p> 	<p>2015 Race Buffer Battery pack 2,4 kWh 150C</p> 	<p>2017 Race H2 Powertrain All integrated 460 kW (FuelCell, GMP, Electronic control, Power Control)</p> 	<p>2019 Truck GMP 420 kW with GearBox</p> 	<p>2020 GreenGT NGT System</p> 		
<p>2008 GreenGT 200 kW</p> 	<p>2010 Citroën Survolt 200 kW</p> 	<p>2011 GreenGT 300 kW</p> 	<p>2012 GreenGT H2 (V1) 320 kW</p> 	<p>2013 GreenGT H2 (V2) 320 kW</p> 	<p>2015 Renault Maxity 20 kW FC rang extender</p> 	<p>2016 Pininfarina H2 Speed 460 kW</p> 	<p>2018 GreenGT LMPH2G 460 kW</p> 	<p>2020 Kamaz 40/44 Tonk Truck 420 kW</p> 	<p>2021 SeaBubbles 75 kW fuel cell</p> 

H24

Pays: France

Sports partner: ACO

Operator: Ecurie H24 racing

Industry: Auto racing

Vehicle: Le Mans Prototype

Year: 2018 - 2025



Customer requirement:

High-power electric-hydrogen propulsion solution, in the context of the development of an LMP prototype and the regulations for the future hydrogen category of the 24 Hours of Le Mans 2025

GreenGT solution:

- Design, development and manufacture of a 250 kW multi-stack hydrogen fuel cell system
- Design, development and manufacture of a 3.1 kWh high-energy-density battery system
- Design, development and integration of a 737 hp (550 kW) hydrogen-electric powertrain into an ADESS carbon LMP chassis

Benefits for the customer:

- Refueling time: 3 minutes
- Range at 700 bar refueling: 45 km (similar to diesel)
- Brake energy recovery system
- Top speed: >300 km/h
- 0 to 100 km/h: 3.4 seconds
- No clutch, differential or gear shift



Technical features

Number of stacks: 4

Fuel-cell system weight: 230 kg

Battery capacity: 3,1 kWh

C rate batterie: 90 C/150 C
(charge/discharge)

Number of engines: 2

Number of tanks: 3

Charging pressure: 700 bar

On board hydrogen: 8,6 kg

CATHyOPE

Pays: France

Vehicle OEM: Kamaz

Operator: Carrefour

Industry: Large scale distribution

Vehicle: 44 tons truck

Year: 2021



Customer requirement:

A high-powered, long-range, silent propulsion solution, with zero CO₂ or fine particle emission, for a refrigerated logistics application aimed at large and medium-sized stores.

GreenGT solution:

- Development and approval of a demonstration truck and an 85 kW hydrogen fuel cell system
- Design and integration of a 520 hp (390 kW) hydrogen-electric powertrain into a new Kamaz chassis
- Triple redundancy (battery and two 85 kW H₂ fuel cell systems)

Benefits for the customer:

- Refueling time: equivalent to diesel
- Range at 350 bar refueling: 450 to 480 km
- Carrying capacity (with or without trailer): between 19 and 34 Euro-type pallets
- CO₂, P100, hydrocarbon, NO_x emissions: 0 g
- Engine noise level: low



Technical features

Fuel cell power: 170 kW

Battery capacity: 60 kWh plug in

Max battery power: 250 kW peak

Max engine torque: 90° C/150° C (charge/discharge)

Number of tanks: 12

Charging pressure: 350 bar

On board hydrogen: 46 kg

H₂ consumption: 7/9 kg / 100km

	Topics	Desired progress
1	High Temperature Fuel Cell	Simplified cooling, high efficiency
2	Composites plates	Durability, cost, weight.
3	Supercapacitor	Efficiency and performance (Motorsport)
4	Cryogenics* (Hydrogen engine/storage)	Efficiency, storage density (kg/kg)
5	Simulation CFD*	Aerodynamic cooling efficiency
6	Durability models	Control of degradation, warranty, costs

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