

Canadian experts in Lithium-ion batteries and thermal management offers products and services to enable electric vehicles to go further, be safer, charge faster and be more affordable

Summary

Profile type	Company's country	POD reference
Technology offer	Canada	TOCA20230607029
Profile status	Type of partnership	Targeted countries
PUBLISHED	Commercial agreement with technical assistance Research and development cooperation agreement Investment agreement	• World
Contact Person	Term of validity	Last update
Rita Elste - Tomsone	7 Jun 2023 6 Jun 2024	7 Jun 2023

General Information

Short summary

A Canadian SME develops an innovative thermal management solution for Li-ion batteries, fuel cells and power electronics systems. They have also produced thermally improved Li-ion energy storage systems, which has been designed for ground, aeronaval electric and hybrid electric-hydrogen propulsion applications as well as stationary storage systems.

They would like to establish either a commercial agreement with technical assistance, an investment, or a R&D cooperation agreement with a partner.

Full description

Performance, safety, and cost are the main barriers to the adoption of electric and hydrogen vehicles. These three issues may be related to a lack of optimized thermal management solutions (TMS) for Li-ion batteries.

Our client developed an innovative TMS that optimizes the thermal path from battery cells to the heat dissipation method, whether it be air or liquid, increasing the thermal performance of the battery. Their innovative TMS passively maintains critical systems in their optimal range of temperature, enhancing their performance and lifetime. The offered solution thus paves the road to efficient air-cooling thermal management.

Our client's solution takes the appearance of a metallic sheet, 1mm to 3mm thick with a thermal conductivity 10x to 100x superior to copper depending on the thermal design. It transports heat pipes principles, transporting and uniformizing heat efficiently between cells and the cooling/heating source to keep cells within their operating temperature range. Experiments showed that our client's solution, when coupled with air cooling was as performant as a traditional cold plate system. By dramatically reducing thermal resistance from heat transport, our client's solution enables air cooling to be as performant as liquid cooling.

The solution offered cools down the cells and uniformizes cells temperature below 5°C to reduce premature aging and to improve vehicle's range. It also prevents heat propagation to adjacent cells in the case of thermal runaway. It can be applied to any temperature-sensitive structures such as Li-ion batteries, fuel cells and power electronic systems. It is a perfect solution for power applications such as ground and aerospace electric/hybrid propulsion, swappable battery systems and for stationary energy storage systems.

Our client has further developed the first air-cooled Li-ion module of 2kWh/48V that allows for fast charging for Low-Speed Vehicle applications. Several modules can be plugged in series/parallel to create a battery pack of up to 16kWh/220V.

Our client is looking for industrial partners and customers to:

- Develop/adapt/produce thermal management solutions for green propulsion applications.
- Develop and produce battery packs with improved thermal management for power and energy storage applications.

Ideally, our client would like to find a partner with whom they can establish either a commercial agreement with technical assistance, an investment, or a R&D cooperation agreement.

Advantages and innovations

Advantages:

- Increases lifetime and vehicle range by up to 35%,
- Innovative passive TMS based on heat pipes principles,
- Thermal conductivity 10x – 100x copper
- Uniformize cells temperature bellow 3°C,
- Cool-down/warm-up critical systems efficiently,
- Allows for efficient thermal management using forced ambient air,
- Reduced weight, size, and cost,
- Compatible with Li-ion cells, fuel cells, and power electronics components

Advantages of Li-ion battery pack:

- Air-cooled
- High energy density
- Modular from 2kWh/48V to 16kWh/220V
- Increased range at low ambient temperature
- Increased lifetime

Technical specification or expertise sought

Stage of development

Already on the market

IPR Status

IPR granted

Sustainable Development goals

- **Goal 11: Sustainable Cities and Communities**
- **Goal 7: Affordable and Clean Energy**

Partner Sought

Expected role of the partner

Our client is looking to develop long-term partnerships with:

- Battery manufacturers
- Propulsion system manufacturers
- Fuel cells manufacturers
- Airframers

For commercial purpose and collaborative product development.

Type of partnership

Type and size of the partner

Commercial agreement with technical assistance
Research and development cooperation agreement
Investment agreement

- **Big company**
- **SME 11-49**
- **SME 50 - 249**

Dissemination

Technology keywords

- **04007005 - Heat pipes**
- **04001003 - Storage of electricity, batteries**
- **04002001 - Fuel cells**
- **04002008 - Cooling technologies**

Targeted countries

- **World**

Market keywords

- **03003 - Power Supplies**
- **03002 - Batteries**
- **06011 - Energy for Transport**

Sector groups involved

- **Aerospace and Defence**
- **Energy-Intensive Industries**
- **Mobility - Transport - Automotive**
- **Renewable Energy**