

Microtubular-Solid Oxide Fuel Cell-Gas Turbine-Battery (MT-SOFC-GT-BAT) Hybrid System for an Aviation Project

GLASGOW, UNITED KINGDOM, May 3, 2021 /EINPresswire.com/ -- [Hy-Hybrid Energy](#)- Scotland (Glasgow) based fuel cell services provider is pleased to announce to work on microtubular-solid oxide fuel cell-gas turbine-battery (MT-SOFC-GT-BAT) hybrid system for an aviation project together with an undisclosed partner. The study is to examine the benefits of this hybrid drivetrain and compare its advantages with the other available designs such as low and high-temperature proton exchange membrane fuel cell & battery-based hybrid systems.



It has now been becoming clear that to achieve aviation sector decarbonization, we must move away from traditional jet fuels. The alternatives, such as battery electric and hydrogen are gaining recent interest, but battery electric systems are not suitable for long-haul due to their inherent weight/ range limitations and hydrogen infrastructure is not yet available at airports to support this move.

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Dr. Naveed Akhtar, CEO, Hy-Hybrid Energy

Within the fuel cell drivetrain there are other challenges, for example, the commonly use low-temperature, proton exchange membrane fuel cells (PEMFCs) require very high purity hydrogen, and their heat exchange capability is rather limited due to their working at low-temperatures. Furthermore, complex water management of PEMFCs is

very difficult to manage especially for aviation use.

To study the merits of solid oxide fuel cells due to their inherent benefits in fuel flexibility and

high-temperature operation which could offer the use of existing jet-fuel infrastructure, better heat exchange capability and no water management challenges, Hy-Hybrid Energy's team is studying the use of microtubular solid oxide fuel cells (MT-SOFCs) in a hybrid configuration.

[Dr. Naveed Akhtar](#), CEO, Hy-Hybrid Energy has been overseeing the project and has many years of experience in this technology, gained while working at German Aerospace Center (DLR), Germany and The University of Birmingham, UK. Dr. Akhtar's PhD (on the topic of single-chamber, micro-tubular, solid oxide fuel cells) has the honour to be the first modelling and experimental studies ever published.

"The solid oxide fuel cells offer wide range of fuels other than just relying on pure hydrogen, work at high-temperature, thus offering better dissipation of thermal heat without any water management challenges. The microtubular geometry is light weight and well proven against rapid thermal cycling, these are all the key attributes which led us to work on this exciting project", says Dr. Naveed Akhtar, CEO, Hy-Hybrid Energy.

The project is considering the use of microtubular solid oxide fuel cell, gas turbine and battery as a hybrid drivetrain and selects the most appropriate energy source during climb, cruise & descend phases of the flight while optimising the overall efficiency of the drivetrain.

Hy-Hybrid Energy has organized the world's [first international hydrogen aviation conference \(IHAC 2020\)](#) and is preparing for its 2nd round, IHAC 2021 to be held in Glasgow, Scotland on 2nd September 2021.

About Hy-Hybrid Energy Limited:

Working with the leading players in the hydrogen and fuel cell sector, Hy-Hybrid Energy provides services in clean energy technologies. Based in Scotland, UK, the team are specialists in all major fuel cell types, renewable energy systems, hydrogen storage and production, and support both low and high temperature fuel cell technology. In 2020, the Company organized the world's first international hydrogen aviation conference (IHAC 2020). The conference attracted high-level international speakers as well as a global audience discussing the role of hydrogen in aviation.

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