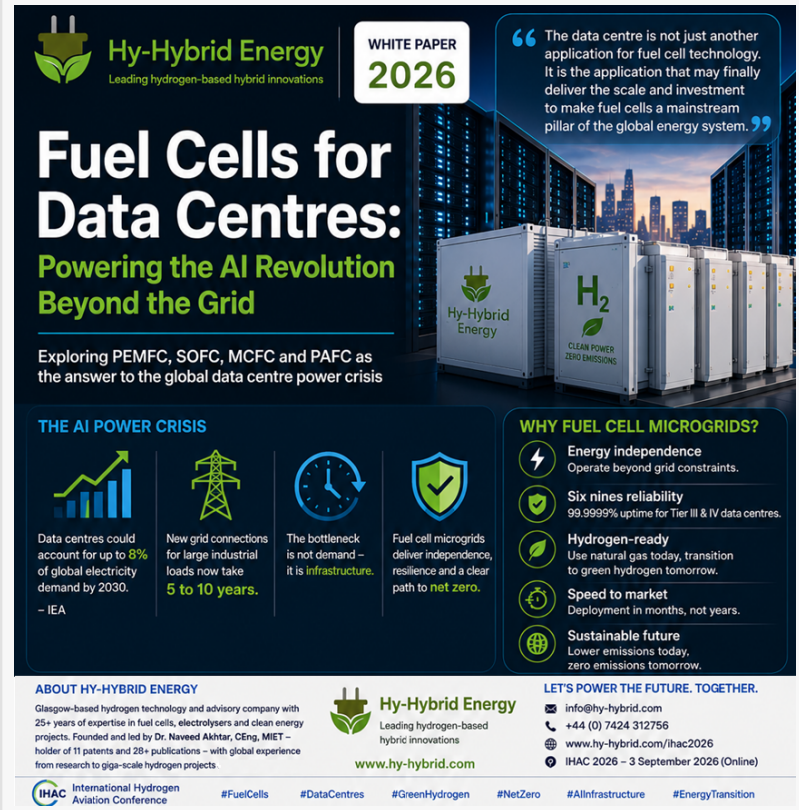
Hy-Hybrid Energy Publishes Landmark White Paper: Fuel Cells for Data Centres-Powering the AI Revolution Beyond the Grid

Groundbreaking research sets out a technology-validated pathway for replacing diesel generators with clean fuel cells - addressing the data centre energy crisis



Fuel Cells for Data Centres

GLASGOW, UNITED KINGDOM, June 3, 2026 /EINPresswire.com/ -- As global data centre electricity consumption accelerates past 400 TWh annually - driven by the explosive growth of artificial intelligence, cloud computing, and hyperscale infrastructure - the sector faces an urgent and escalating energy crisis that neither incremental efficiency improvements nor grid connectivity alone can resolve. Against this backdrop, Hy-Hybrid Energy, the Glasgow-based clean energy technology company led by Dr. Naveed Akhtar, has published a comprehensive White Paper making the definitive technical and commercial case for fuel cells as the primary power solution for next-generation data centres.

The White Paper, titled "Fuel Cells for Data Centres: Powering the AI Revolution Beyond the Grid" represents the most detailed examination to date of how fuel cell technology - encompassing Proton Exchange Membrane Fuel Cells (PEMFCs), Solid Oxide Fuel Cells (SOFCs), Molten Carbonate Fuel Cells (MCFCs) and Phosphoric Acid Fuel Cells (PAFCs) systems - can directly address the twin challenges of reliability and decarbonisation that now define the industry's strategic agenda. Drawing on Hy-Hybrid Energy's extensive expertise across all major fuel cell types, the paper evaluates real-world performance data, total cost of ownership modelling, integration pathways, and the regulatory landscape shaping investment decisions globally.

The publication arrives at a critical inflection point. Data centres collectively account for approximately 1–2% of global electricity consumption, a figure projected to triple by 2035 as AI model training, inference workloads, and digital services multiply. Leading hyperscalers - including Microsoft, Google, and Amazon - have committed to net-zero operations, yet continue to rely heavily on diesel emergency generators and carbon-intensive grid power. Fuel cells offer a fundamentally different proposition: continuous, silent, zero-emission power with no combustion, no particulate emissions, and resilience characteristics that surpass conventional backup systems.

The White Paper further addresses the strategic imperative posed by growing energy security concerns. With geopolitical instability placing pressure on fuel supply chains, and electricity grid constraints already delaying data centre approvals across the UK, EU, and United States, the ability to generate or store hydrogen on-site represents a compelling strategic advantage. Hy-Hybrid Energy's analysis demonstrates that hydrogen storage - whether as compressed gas or in advanced metal hydride systems - provides far greater energy density and duration than lithium-ion battery arrays, enabling multi-day autonomous operation without grid input.

> “Fuel cells can help decarbonise data centres by providing reliable, scalable, zero-emission power - meeting the growing energy demands of the AI-driven digital economy.”
>
> *Dr. Naveed Akhtar*

Dr. Naveed Akhtar, who has spent over 25 years pioneering hydrogen and fuel cell technologies across transport, aviation, and energy sectors, commented on the publication's significance: "We are at the moment where the data centre sector must make durable infrastructure decisions that will define its carbon footprint for decades. This White Paper is intended to provide technology leaders, investors, and policymakers with the evidence base they need to act with confidence. Fuel cells are not a future technology - they are a present solution."

Research Context & Methodology

The White Paper is the product of extensive technical analysis conducted by the Hy-Hybrid

Energy research team, incorporating performance data from four principal fuel cell architectures - PEMFC, AFC, SOFC, and PAFC - against eight defined performance criteria including power density, efficiency, reliability, fuel flexibility, dynamic load response, operating temperature, hydrogen purity requirements, and commercial scalability.

The analysis is contextualised within the evolving regulatory environment, including the UK's Climate Change Act targets, the EU's Renewable Energy Directive III (RED III) mandates for industrial hydrogen deployment, and the US Inflation Reduction Act's production tax credits for clean hydrogen, which are already reshaping the economics of the sector in favour of fuel cell adoption.

Hy-Hybrid Energy draws on its direct experience in providing services for low and high temperature fuel cell systems for off-grid, backup, and primary power applications across transport and industrial sectors, as well as its pioneering work in sustainable aviation through the International Hydrogen Aviation Conference (IHAC), to bring a uniquely cross-sectoral perspective to data centre energy systems design.

Industry Implications

The publication is expected to catalyse significant discussion among data centre operators, colocation providers, hyperscale cloud platforms, and infrastructure investors who are under increasing pressure from regulators, shareholders, and enterprise customers to demonstrate credible net-zero pathways. The White Paper provides, for the first time in a single consolidated document, both a technology comparison framework and a commercial deployment guide tailored specifically to the data centre context.

Hy-Hybrid Energy is now actively inviting engagement from data centre developers, energy infrastructure investors, and technology partners who wish to explore pilot projects, co-development agreements, or advisory engagements based on the White Paper's findings. The company is particularly focused on opportunities in the United Kingdom, Europe, United States and the Middle East, where regulatory drivers and grid constraints are creating the most immediate market conditions for hydrogen power adoption.

The White Paper is available for download at www.hy-hybrid.com, and qualified enquiries are welcome at info@hy-hybrid.com.

About Hy-Hybrid Energy

Hy-Hybrid Energy is a Glasgow-based clean energy technology company specialising in hydrogen, fuel cells, and sustainable energy systems. Founded and led by Dr. Naveed Akhtar, the company brings over 25 years of applied expertise across all major fuel cell types - PEM, SOFC, AFC, and DMFC - and operates across transport, aviation, industrial, and off-grid energy sectors. Dr. Akhtar is the founder of the International Hydrogen Aviation Conference (IHAC), the world's first

dedicated global platform for hydrogen aviation, established in 2020. The company works with leading players across the hydrogen and fuel cell sector globally, providing research, system development, and strategic advisory services.

Web: https://www.hy-hybrid.com/

About International Hydrogen Aviation Conference (IHAC)

The International Hydrogen Aviation Conference (IHAC) is the world's first platform dedicated exclusively to hydrogen use in aviation. Established in 2020, it serves as a global forum for collaboration, innovation, and knowledge exchange to accelerate the transition toward zero-emission flight.

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