



# The beauty of hydrogen fuel cell technology

## How it works for data centres & call centres

The data centre is at the heart of the increasing demands of the internet and network computing. It's a hot environment. And building engineers face continual challenges in designing appropriate cooling systems. Recent research focuses on efforts to optimise local temperature distribution and increase the energy efficiency of the data centre system. That's where fuel cell systems come into their own.

Over the past decade, the power dissipated by each computer chip has increased by a factor of ten; heat dissipation of the microprocessor has also gone up by an order of magnitude. Yet increasingly consumer demand is pushing computer manufacturers to produce thinner and lighter systems. A 2006 study\* reported that a rack can accommodate 40 thin systems, with more possible when using bladed computer architectures. If each computer system dissipates 300W, a single rack can dissipate 12 kW. A 10,000m<sup>2</sup> data centre can house up to 5,000 racks, or up to 60MWs. An additional 30MW of electricity is required to cool the system.

At \$100/MWh, the total cost of the data centre would be around \$52.6 million per year to power the racks and an additional \$26.3 million per year in cooling cost.

In 2009, 40kW racks are regularly being installed with talk of 400kW arriving in the next 5 years. Clearly, efficient energy use and provision of cooling for data centres is of great interest for both environmental energy conservation and cost savings.

A fuel cell works most effectively in any situation requiring combined heat and power or combined heat, cooling and power.

Logan Energy has the expertise and knowledge to install energy centres for data centres that incorporate or are part powered by fuel cells. These can use hydrocarbon based fuels, such as natural gas to give a carbon reduction of up to 40% and later the system could be converted to run on a green gas with a zero carbon impact. No other distributed energy generator can duplicate this kind of flexibility.



If you'd like to know more about how your data centre, contact centre or call centre, can truly benefit, please contact John Lidderdale or Bill Ireland.

**Logan Energy Limited**

9-10 St Andrew Square, Edinburgh, EH2 2AF

Email: [mail@loganenergy.eu](mailto:mail@loganenergy.eu)

It's an elegant solution.



[www.loganenergy.eu](http://www.loganenergy.eu)

\*Reference: Local Temperature Control in Data Center Cooling: Keke Chen, David M. Auslander, Cullen E. Bash, Chandrakant D. Patel: Enterprise Software and Systems Laboratory HP Laboratories Palo Alto, 6 March 6, 2006.