



Powering Birmingham's future

For cities like Birmingham there is an urgent need to address environmental issues such as air quality. A home-grown success story based right here in the city offers an opportunity to do just that with its innovative fuel cell technology.

Professor Kevin Kendall FRS and Dr Michaela Kendall

Pioneering fuel cell company Adelan is keeping Birmingham's rich engineering heritage alive and well with its remarkable energy technology innovation. Fuel cells are already known as the cleanest possible technology for dependable and reliable electricity generation, and as such are set to play a major role in addressing issues such as urban air quality and climate change. With its unique microtubular solid oxide fuel cell (mSOFC) technology though, Adelan's approach delivers key advantages even over other types of fuel cell system.

Adelan fuel cells are ideal as a replacement for diesel generators, and are much cheaper to run on cheaper, cleaner gas. Unlike other kinds of fuel cell which require pure hydrogen fuel, Adelan's quiet, compact and efficient fuel cells use readily available infrastructure fuels such as LPG or propane. As a result, the company's mSOFC technology can act as a stepping stone towards the low-carbon and clean hydrogen economy of the future.

In addition to its ability to operate on infrastructure hydrocarbon fuels such as natural gas – and hydrogen if it is available – there are general criteria that

make Adelan mSOFCs especially competitive. These include efficient generation of heat and power, quick start times, as well as quiet and low-emission operations.

The Adelan mSOFC system is stackable and scalable from small light-weight, portable applications like battery chargers right up to grid-connected power stations. Unmanned airborne vehicles, recreational vehicles, portable power, electric vehicles, remote power and micro combined heat and power (mCHP) have all emerged in recent years as strong growth markets for Adelan.

Founded by Professor Kevin Kendall FRS and Dr Michaela Kendall, the company specialises in the production of clean energy systems for portable or stationary, off-grid applications. Adelan is still run by its founders, and a growing team of young talented scientists and engineers is led by CEO Dr Michaela Kendall. It is the only fuel cell company in the world headed by a female scientist.

With one of the longest running fuel cell R&D programmes in the world – and as the longest running fuel cell company in Britain, established in 1996 – Adelan's core microtubular solid oxide fuel cell (mSOFC) technology was pioneered and patented by the

Kendalls in 1992. Progressive development to reduce manufacturing costs and improve primary performance criteria has resulted in favourable key performance indicators for Adelan fuel cells in terms of lifetime, energy density and cost. Accelerating commercial product development through component and system cost reduction, Adelan continues to optimise its mSOFC technology from materials to design specifications. Fundamental knowledge, continuous innovation, 25+ years of experience and a global network make Adelan a unique player in an important emerging global market.

Indeed, as the leading microtubular SOFC developer and the first company to develop mSOFC products, Adelan built worldwide commercial credibility for the core technology by developing, demonstrating and selling compact, portable power products. Adelan has the experience, skills and capabilities to design, develop and implement micro-power solutions for a range of applications and has produced numerous demonstrators since the company was founded. For example, Adelan built the world's first portable, rapid-starting SOFC system fuelled by natural gas.

Working through direct sales and collaborative partnerships with industrial players while engaging with both private and public sector clients, Adelan is attracting significant inward investment from global markets such as the US, China and Europe, which are actively looking to develop green energy market opportunities.

With expert industry knowledge, global networks and an unrivalled understanding of the SOFC market, Adelan's heritage of continuous technology research and development allows the company to leverage its experience for clients by engaging in bespoke R&D projects. Adelan was also a founding member of the European Industry Grouping for the Fuel Cell and Hydrogen Joint Undertaking.

Adelan's key market is the rapidly expanding decentralised power sector, a global, scalable market ripe for rapid, clean growth and driven by worldwide issues such as climate change and urban air quality.

With decades' of technology experience, the Adelan team is working to develop micro-power solutions to today's energy challenges, bringing investment, jobs and economic growth to the West Midlands. Birmingham is once again an energy technology powerhouse.