

15th July 2009

**PROFESSOR IAN ARBON TAKES CHAIR OF WASTE2TRICITY AS IT
ANNOUNCES JOINT VENTURE WITH TNE LTD TO PRODUCE ULTRA LOW
CARBON EMISSION ELECTRICITY FROM COAL**

Hydrogen fuel cells and Underground Coal Gasification enable 99% CCS

London, 15 July 2009 – The board of Waste2Tricity is pleased to announce the appointment of Professor Ian Arbon, CEng, CEnv as Chairman. Professor Arbon's appointment coincides with the news of a proposed joint venture to bring together the most efficient technology to convert coal into electricity combining new generation fuel cells with underground coal gasification (UCG).

Professor Arbon previously served as Chairman of the Energy, Environment & Sustainability Group at the Institution of Mechanical Engineers (IMechE). He is also a Visiting Professor in Alternative Energy at Newcastle University.

Peter Jones, Director of Waste2Tricity says: "The appointment is further acknowledgement of the potential of Waste2Tricity's technologies, in attracting a person of his experience and gravitas in the energy from waste arena."

In a bid to bring to market an ultra low carbon emission technology to convert coal into electricity, Thornton New Energy Ltd and Waste2Tricity Ltd have signed a memorandum of understanding. Also allowing for the capture of carbon dioxide as part of the process, the proposed joint venture is the UK's first commercial application to generate clean electricity from coal, combining new generation AFC Energy fuel cells with UCG and other proven technologies. The gasification of coal underground generates a fuel with a low emissions profile and the potential for complete carbon capture and storage (CCS) at low energy and financial costs.

Thornton New Energy, a subsidiary of BCG Energy Ltd, was in January 2009 awarded the first UK licence to carry out UCG and develop deep, previously un-mineable coal reserves under the Firth of Forth, Scotland. Waste2Tricity has exclusive rights for the application of AFC Energy fuel cells with any gasification technology within the UK, including energy from waste.

Thornton New Energy's director of surface facilities, Alan Borrowman, says: "When combined with UCG, the hydrogen fuel cells enable a higher efficiency conversion of the energy in coal to electricity. We were very keen to partner with Waste2Tricity in order to utilise AFC Energy's new generation fuel cells and create the first clean coal electricity model that outperforms conventional coal power stations in terms of net energy generated from coal, the low cost opportunity to eliminate CO₂ emissions, and even the potential to eliminate the need for conventional coal mining activities.

"We are highly impressed with AFC's fuel cell system which has successfully completed initial field trials in the Chlor-alkali industry. Furthermore, the technology is anticipated for full scale roll out on a timescale compatible with the Firth of Forth UCG opportunity."

Professor Ian Arbon, chairman of Waste2Tricity comments: "This is a major breakthrough in the future utilisation of coal for electricity generation and could have a significant impact worldwide in eliminating greenhouse gases produced from coal. In the UK and abroad, fossil fuels such as coal will continue to play a significant role in the foreseeable future. The benefits of ultra-low carbon technologies, such as UCG, combined with high efficiency AFC Energy fuel cells, not only help with energy security but also in substantially reducing emissions from fossil fuels. This is one of the few technologies available to us which will actually help us to meet the UK's ambitious 2020 emissions commitments."

The production of hydrogen from UCG, combined with efficient conversion of hydrogen into electricity through the fuel cells, will offer significant environmental and business benefits. Other CCS systems have the unfortunate side-effect of reducing the overall efficiency of conventional coal-fired power stations, whereas this technology significantly increases the 'fuel-to-busbar' efficiency while also maximising carbon capture.

In contrast to conventional coal-fired power stations, lower capital and operating costs per megawatt are required. Because UCG takes place underground, normal coal extraction processes are eliminated, reducing noise and visual impact and the technology can be incorporated on existing coal mines. The technology also lends itself ideally to Decentralised Energy production which minimises transmission losses via a centralised grid.

The process:

The technology can revolutionise the whole approach to generating electricity from coal, especially from brown coal, which has a lower energy content than black coal and is less economic to mine in poorly accessible sites. The process minimises environmental impact as

gasification takes place underground and there is no coal extraction or transport process. The inherent cleanup process of the technology results in elimination or control of traditional environmentally-impacting by-products of electricity generation from coal.

Once the coal is gasified, it is maintained by continuous oxidant flow which converts it into syngas, a combustible hydrogen-rich synthetic gas. The syngas is piped to the surface and undergoes a number of cleaning processes before going through a water gas shift reaction to enrich the hydrogen content of the gas stream. The hydrogen is then extracted from the resultant gas by pressure swing absorption (PSA), separating the gas into two streams, one pure hydrogen and the other pure CO₂. The hydrogen stream will feed the high efficiency AFC Energy fuel cells, generating electricity with water as a by-product. By requiring the output energy gases to be converted to obtain hydrogen, a by-product of this process is the free capture of CO₂, usually the most expensive component of CCS. At least 99% of the carbon present in the syngas can be captured in this process and is then available for storage.

In terms of market size, well over 600 billion tons of coal suitable for UCG production is available globally. Relative to global reserves, the main UCG markets include the US (27%), China (13%) and India (10%). In the UK, the British Geological Survey found that the coal resource potentially suitable for UCG was an extra 17 billion tonnes or 300 years at current consumption.

Generation by this system will also make a significant contribution to UK electricity supply. The UK is entering into a period of criticality for electrical energy supply. With 35% of base load generation capacity coming off line by 2015, due to emissions regulations and nuclear de-commissioning and the inability of renewable resources to make up the shortfall in time, more sustainable ways of using existing fossil fuel reserves will be essential over the next few years.

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About Waste2Tricity

Waste2Tricity is a new British venture established to make energy conversion viable, efficient and economical - by implementing a unique combination of new generation alkaline fuel cells with plasma gasification and other existing proven technologies. The system will therefore have significant environmental and cost benefits over other methods of electricity generation. For more information, visit Waste2Tricity at <http://waste2tricity.com>

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About Thornton New Energy

Thornton New Energy Ltd, a subsidiary of BCG Energy Ltd, brings together skills from the oil and gas, petrochemical and coal industries to achieve an environmentally sustainable fuel source from untapped coal resources. Earlier this year Thornton New Energy was awarded the UK's first underground coal gasification license to develop a major coal resource located deep beneath the Firth of Forth. Applying cutting edge oil and gas technology to the coal field allows the company to exploit coal resources that otherwise would be too deep, difficult or expensive to recover. The company is focused on energy generation with minimal environmental impact, and is working with international partners to speed the introduction of low emission power, fuels and chemicals together with carbon capture and sequestration. For more information, visit <http://www.bcgenergy.co.uk>

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REF: 09-088**DATE: 15.07.09**

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