

# PowerHouse Energy to turn waste into hydrogen

Website: [www.powerhouseenergy.net](http://www.powerhouseenergy.net)



Keith Allaun, CEO of PowerHouse Energy

**P**owerHouse Energy's (PPG:AIM) vision is to propel the UK's burgeoning hydrogen economy whilst ridding the country of the scourge of waste plastic. Within 10 years, PowerHouse intends to develop a network of up to 200 waste-to-hydrogen plants around the UK. The plants are compact, so they can be built close to the source of waste, and do not produce harmful by-products or require a smokestack. Each unit is designed to consume about 25 tonnes a day of waste plastic or used tyres.

The UK currently exports 500,000 tonnes of waste plastic each year for recycling overseas but much of this plastic isn't recycled. Instead it finds its way via streams and rivers into our oceans. The Chinese government recently announced it would no longer accept waste plastic from the UK; instead this plastic is being exported to other countries such as Turkey, Malaysia and Vietnam.

## DEALING WITH THE WASTE PROBLEM

Keith Allaun, the CEO of PowerHouse Energy, says: "It's an absolute scandal that the UK exports waste plastic. Much



Small footprint: computer graphic of a distributed hydrogen station

of it won't be recycled, there's a carbon footprint to shipping it and the plastic recycling industry in the third world is one of human misery.

'Around 300m tonnes of new plastic is manufactured

each year so waste plastic is a problem that's not going to go away: we need sustainable technologies to recycle, transform or destroy it.'

PowerHouse Energy has developed just such a technology. Called Distributed Modular Gasification, DMG, a proprietary technology designed to transform waste plastic as well as used car tyres, into hydrogen and electricity in an environmentally benign way. In fact, the DMG system can be used to generate electricity from almost any waste stream.

**WHO IS POWERHOUSE ENERGY?  
AN AIM-QUOTED COMPANY WHICH HAS DEVELOPED A PROPRIETARY TECHNOLOGY TO CREATE ENERGY FROM WASTE.**

## Shares Spotlight

### PowerHouse Energy

Keith Allaun says: 'The hydrogen economy has been held back by the cost of producing and transporting hydrogen and also by the fact that current hydrogen production produces significant quantities of the greenhouse gas carbon dioxide. Our system produces hydrogen much more cheaply, at about the same cost as diesel, and produces one sixteenth of the CO<sub>2</sub> produced by standard processes.'

The DMG system is based on gasification, a method in which ultra-high temperatures are used to decarbonise waste such as plastic and turn it into synthesis gas, or 'syngas'. PowerHouse's technology modulates this syngas to produce hydrogen of a very high purity, which has been independently confirmed as road fuel quality.

#### TARGET MARKETS

'Hydrogen-powered fuel cell vehicles are our first target market. There are already fleets of hydrogen buses in London and other UK cities, there are diesel lorries being converted with hydrogen as a dual fuel and, in California, the use of hydrogen cars is growing rapidly. Hydrogen vehicles are environmentally the most friendly form of transport, as all they produce as exhaust is water vapour. To power this form of transport by destroying waste plastic is a perfect environmental solution.'

PowerHouse began work on its proprietary DMG system about three years ago. The company made major progress during 2017, including commissioning the prototype DMG unit at the University of Chester's Thornton Science Park and the signing of an agreement with Peel Environmental Ltd for the first commercial site, in Cheshire,



Demonstration unit: the DMG process in action at Thornton Science Park

for a DMG unit. Developing this site, and building and commissioning the first commercial unit, is one of the company's key objectives for 2018.

#### THE BUSINESS MODEL

PowerHouse's business model is to build, own and operate DMG facilities in the UK. At each of these facilities, the company would receive a gate fee for receiving waste and then convert the waste into hydrogen and green electricity for onward sale. The production cost of DMG hydrogen would be about £3 per kilo, compared with a current hydrogen price of about £12 a kilo. In addition to owning its own DMG units, PowerHouse intends to seek partnering deals with local authorities, transport and industrial businesses and fuel cell vehicle manufacturers.

In continental Europe, PowerHouse estimates it could open 500 sites in the next 10 years and is also exploring the potential for the technology

to be licensed worldwide.

The company has taken the first steps in the export of the DMG system by signing a memorandum of understanding in Qatar to explore the possibility of establishing a Qatari DMG network to convert waste to hydrogen.

Keith Allaun says: '2018 will be a tremendously exciting year with the development of our first commercial DMG system on a site in Chester. We are on the threshold of delivering on our vision of kick-starting the hydrogen economy through a profitable business based on the eradication of waste plastic.'

'Over €10bn has been committed to the rollout of hydrogen-fuelled transport by the likes of Mercedes, BMW, Toyota, Hyundai, and Honda over the next five years. Our ability to play a part in generating the cleanest fuel on Earth, in an economically advantageous and environmentally responsible manner, is unparalleled.'