



Renewable energy has been a significant part of the national conversation for the past few decades. Greater energy demands, combined with the rise in innovative technologies to harness the power of cleaner energy sources have caused us to relook at the way we produce and supply energy. Furthermore, with increasing global awareness on the need to combat climate change, it is safe to say that we are now moving past incremental changes to a complete energy revolution in the near future.

According to researchers, GlobalData, renewable energy production in Europe is predicted to grow at over 8 per cent year-on-year until 2020; more than twice the rate of coal-fired electricity. In the UK specifically, a record 25 per cent of electricity generated in 2014 came from wind farms, solar panels and other renewable power sources, up from 9 per cent in 2011.

This is a step in the right direction for the world in general and the UK in particular. Nevertheless, at the heart of this discussion is the ongoing debate whether cleaner and alternative energy sources can meet current and future demands, and whether the UK can go beyond meeting its carbon emission reduction targets to sustaining a renewable energy economy in the long term.

The answers to these questions are dependent on whether industry players in the various sectors, government agencies, technopreneurs and consumers can work cohesively to move towards a circular economy; one that produces no waste and pollution by design and one where the customers are simultaneously both energy producers and consumers.

To do so, industry players should embrace some of the following opportunities;

### **Reducing Dependency on Natural Gas with Biomethane**

In 2015 the UK's biomethane industry was the fastest growing in the world. By the end of 2016 it will produce the equivalent of four liquid natural gas (LNG) tankers worth of gas yearly, which it injects directly into the country's natural gas grid. Biomethane, a renewable gas that is developed from the anaerobic digestion process, is identical in chemical composition to natural gas.

Anaerobic digestion (AD) systems are well-suited for processing food and farm waste, while there is enormous untapped potential for harnessing green gas from wastewater plants. The efficiency of the process in producing energy and managing wastes has resulted in increased enthusiasm in its adoption, particularly by large players in the agriculture and the food and beverage (F & B) sector.

Sainsbury's supermarket for example, is now using power generated



from its own recycled food waste. This entails the collection of food waste from Sainsbury's depots, which is then transported to an AD plant where it is used to generate gas. The gas is then exported to the national gas grid and supplied to Sainsbury's stores nationwide for power and heating.

This arrangement has made it possible for Sainsbury's stores to significantly increase their use of renewable energy while lowering

# THRIVING IN THE RENEWABLE ENERGY ECONOMY :

## Key Opportunities for UK Businesses



utility bills. Beyond that, it has also helped the chain to reduce the amount of inedible food waste sent to landfills.

Nestlé UK on the other hand, has built its own anaerobic digestion plant in its factory in Fawdon, where leftovers from making sweets such as Fruit Pastilles and Toffee Crisps are turned into biogas that can produce electricity and heat. With the AD plant in place, the site tackles around 1,200 tonnes of food waste a year while generating 8 per cent of the factory's power.

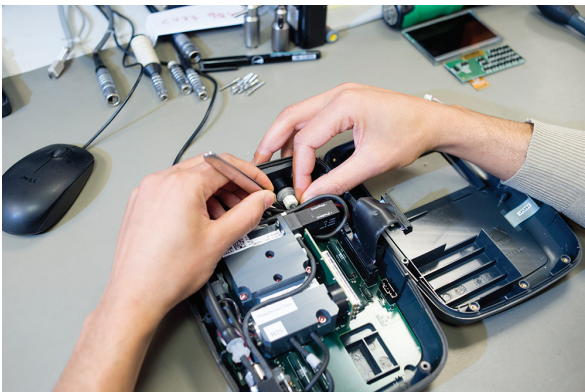
Additionally, AD plants allow farmers to diversify their revenue streams, provide high-quality fertilisers during soil crisis, and could play a role in delivering essential negative emissions energy.

For industry players to fully optimise their AD processes and produce enough biogas that could be turned into energy, it is important that their plant is equipped with the right tools. For example, a fixed gas analyser can provide helpful analysis of the quality and consistency of biogas produced before feeding into a generator.

This improves digester operation and maximises methane production. Beyond that, the equipment will also assist with process control, which can help protect CHP engines from hydrogen sulphide (H<sub>2</sub>S) and moisture damage. As a result, biomethane can be produced efficiently, boosting renewable energy production targets.

### Increasing Connectivity through Smart Grid and the Internet of Things

The new energy landscape will also be more complex, requiring interaction between energy providers and users like never before. Thus, the rise of the Internet of Things (IoT) phenomenon and its increasing application in the sector could not have come at a better time.



The IoT comprises a vast array of interconnected devices that produce, store and use energy. These devices communicate their energy deficits and surpluses and transport energy to where it is needed most. This will allow consumers to remotely control their devices to optimise energy usage.

This capability will enable a range of new energy technologies and business models to emerge. Consumers will have more say in what energy they use, how they use it and how often they do so. Data from consumers' energy usage can be used to predict consumption patterns and continually provide energy efficiency recommendations. As a result, energy suppliers and producers will be able to optimise their services by aligning them to the needs of the consumers.

Another technology reaching maturity is the 'smart' energy grid. Despite the self-sufficiency potential of renewable energy, the grid will not become obsolete. Pole and wire infrastructure will allow users to upload and download energy to maximise cost

effectiveness and reliability. As energy utilisation is automatised, unintentional consumption and waste will fall.

Beyond that, the smart grid will essentially computerise our existing grid, allowing for two-way interactivity that ensures greater energy security. With the smart grid, integration of renewable energy sources, including solar and electric car charging will also become more ubiquitous in the future.

To this end, I believe that the government's recent announcement that energy suppliers must offer to replace old analogue gas and electricity meters in homes and small businesses with smart digital meters is a step in the right direction. The aim of having 53 million meters installed by 2020, while ambitious, is definitely a positive move as it will not only save people money, but also promote more competition and innovation while changing the way the global energy industry works.

### Grooming Talents of the Future

Increasing support for the energy sector from both the public and government will no doubt help to keep it growing. With growth comes employment, as firms race to fill new roles and cater for the implementation of innovative ideas. According to the Renewable Energy Association (REA), the overall employment across renewable energy was estimated at around 110,000 in 2010 and could reach 400,000 by 2020.

A recent Hays survey has found that energy professionals are better paid compared with workers in other industries. Of those surveyed, the average salary in the sector is significantly higher than the UK national average of £26,244 with almost three quarters of renewable energy professionals earning in excess of £41,000.

While such growth and financial opportunities are good for the sector and the economy, experts predict a shortfall of staff with the skills necessary to support the growing renewable energy sector, particularly in operations and maintenance roles.

Therefore, in order to truly address the skills gap and ensure that we can fully embrace the opportunity to become a renewable energy economy, there needs to be a bigger strategic roadmap in place to attract, train and retain professionals in the sector in the long term.

This will require the collaborative effort between the government, higher learning institutions and private sector industry players to develop the right curriculum at the institutional level to suit market needs, the creation of certification standards, opportunities for apprenticeships, training programmes and government policy and incentives that will spur the growth of such efforts.

Furthermore, while industry players in general are aware of the kind of skills and experience that they need, young people who are about to choose their academic and professional paths should be made more aware of the opportunities and subspecialisation options in the sector.



#### About Steve Billingham:

Steve Billingham started his career at Geotech as an installation engineer over 26 years ago. In 2009, he became the Managing Director, responsible for Geotech's operations in the UK and worldwide. Having helmed the organisation for the past seven years, he is passionate about new technology and applications, research and development as well as business growth. As the MD, he believes in making Geotech the partner of choice for industry players and renewable energy project operators to help them optimise their biogas processes and increase financial returns.



For example, entrants with strong mechanical and electrical engineering backgrounds, along with other relevant cross sector skills will be well placed to move into this market. Likewise, those who possess oil & gas, aerospace and wider energy industries experience could also see a solid career trajectory in renewable energy.

I truly believe that through greater strategic partnerships, we can create the best career pathways that will produce highly trained experts and consultants in the green sector who are not just in high demand in the UK but also internationally.

Personally, I am encouraged to observe that the focus on environmental protection and combating climate change has gone beyond the spheres of activists, scientists and academics to a bigger nationwide focus on alternative and renewable energy sources in my lifetime.

Today, we are even seeing a global concerted effort to address the issue, as evident in the recent COP21 Conference in Paris where 171 world leaders came together and made public commitments to slow down global warming.

As we move towards the realisation of the scale and potential for renewable energy and its economic benefits, the UK is well placed to become a renewable energy powerhouse in Europe, leading the world in showcasing real-life solutions to the challenges of climate change.

There are inevitably technical and investment challenges for the sector. But I believe, they are anything but insurmountable. The UK, due to its geographical location, landscape and climate, has some of the best renewable energy resources in Europe. This, combined with greater national long term vision for energy security, a collaborative effort by industry players, researchers and consumers to harness the financial benefits of energy efficiency in a circular economy and a stronger emphasis on talent development across all areas of the sector, will put the UK back at the leading edge of technological and scientific innovation and transform the face of the energy industry as we know it.

I for one could not wait for this to become a reality.

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