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OUTPUT

Sea of Change

The success of offshore wind

Also this issue:

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Protection

Decarbonising Heat - The
Freedom Project

Leading Voice interview with
Matthew Wright, MD, Ørsted

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WELCOME



welcome

This issue we've taken a look at the success of the offshore wind sector. The Crown Estate recently reported the busiest year yet for offshore wind with the sector reaching 33 operational offshore wind farms, amounting to 1,762 turbines and supplying the electricity needs of 5.3 million homes. It is a significant part of the UK's energy mix, currently generating 5 per cent of UK electricity, and expected to generate 10 per cent by 2020.

With comment from the Crown Estate and RenewableUK, our article reveals a maturing sector attracting significant investment which is supporting a growing domestic supply chain and placing the UK as a global leader. An explosion of innovation in the UK will transform how we think about wind turbines, according to work currently underway at the Offshore Renewable Energy (ORE) Catapult, and we look at how the sector might develop over the next few decades.

We also have an update from Oliver Lancaster at Wales & West Utilities on the FREEDOM Project, a £5.2m project evaluating Hybrid Heating Systems. The first of its kind, this collaborative future of energy project between electricity (Western Power Distribution) and gas networks has seen 75 hybrid heating systems installed in residential properties.

All this is rounded off with the usual news and updates from each Division. We hope you enjoy this edition.

Caroline Haine,
Editor, OUTPUT



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Setting Priorities for the Network Engineering & Equipment Group

Peter Day, NEEG Manager

April Meeting

Lorna Millington, Cadent Innovation Portfolio Manager, Network Strategy briefed members on Innovation from their 'Future of Gas' work and also day to day innovation on repex and operational areas. In addition Lloyd's Register Inspection Services updated the group on BIM (Building Information Management) and the 'Build Offsite Property Assurance Scheme' (BOPAS). BOPAS will have a knock on effect for companies installing new gas and electricity supplies to modular build properties.

RIIO-2

In March, Ofgem published its proposals for the framework to set the next network price controls (RIIO-2) from 2021 which will be tougher with lower expected returns for network companies. EUA held a workshop in April where NEEG

member companies contributed to EUA's response to these proposals. EUA supports strengthening the role of stakeholders in the RIIO process. Scrutiny and transparency can only benefit the industry, as will the move to a 5 year review period, which will provide certainty, and the ability to plan for the long term. EUA welcomes this clarity, but not at the cost of innovation. EUA is concerned that the proposed move away from direct innovation funding will reverse the good work being done. Read EUA's response in full on the EUA website

HS2

As part of ongoing engagement with HS2, EUA member companies received an exclusive opportunity to participate in a HS2 Meet the Contractor Event on Thursday 10th May 2018. NEEG members had insight into a range of work packages available with a follow up invite to this key event in Birmingham.

To build on the successful work of the group over the past few years, NEEG member companies were invited to submit their top three needs/areas of concern that they would like EUA to work on. In addition to ongoing group work streams and activities, this 'Setting Priorities' exercise revealed further areas of interest to member companies which the group will look to incorporate into the meeting schedule in 2018:

- Update and insight on irons mains replacement programme including current and future Tier 1, 2 & 3 priorities
- IGT engagement
- Business focus areas of GDN's - innovation, customer engagement, network resilience, major projects, NIA & NIC projects
- Infrastructure projects including HS2 & Old Oak and Park Royal Development
- House builder and developer engagement
- Skills shortage
- Renewables

BEIS Consultation on Standards for Smart Appliances

Ian Campbell, Chair, Smart Connected Homes and Buildings Group

EUA's Smart Connected Homes and Buildings Group continues its agenda to consider aspects of Government's Industrial Strategy most likely to impact member businesses and wherever possible, respond with a collective voice to industry-relevant developments. A key part of the overall Industrial Strategy is the Clean Growth Strategy and within this, the BEIS/Ofgem Smart Systems and Flexibility Plan.

The Plan identifies issues and action areas around enabling smart homes and businesses, primarily focused on the facilitation of demand-side response (DSR). It also recognises that smart appliances are key enablers of DSR for consumers and has led to the launch of a Government consultation on Smart Appliances which includes proposals to mandate standards for smart appliances.

The Smart Connected Homes and Buildings sub-group: Heating and Hotwater controls has already produced a set of simple definitions of Smart Appliance Controls aimed at being easily understandable and recognisable to consumers. HHIC too was tasked with creating technical definitions through the BEIS/HHIC Domestic Heat Strategy Group and further to this work HHIC has collaborated with BEAMA to build on the initial work. We hope to update members on all of this very soon.

EUA will provide a response to the Smart Appliances Consultation and a draft was circulated for discussion at the last SCHAB meeting on 30 May.

Gary Cottrell,
EUA Smart Meter
Lead



This is the year of the smart meter

Another few months have elapsed and are we any nearer to the mass roll out? Well, yes, I believe we are getting ever closer to mass deployment of SMETS2 meters and operation via the Data Communications Company (DCC). The evidence:

- We have SMETS 2 meters available from several of the meter manufacturers and these are being tested via the suppliers and DCC systems
- Meters are also being processed through the SMDA test house
- Suppliers and third party training teams are ramping up efforts to recruit and train dual fuel installers.

A few wider issues exist: There have been reports of some installation issues but these are generally "business as usual" rather than being directly related to smart. The benefit of smart is that because the whole industry is focused and alert to these issues, they are being analysed and rectified immediately by re-training and/or minor re-designs.

Interoperability - In the initial stages of the smart meter roll-out a number of energy suppliers are installing first generation SMETS1 devices in consumers' premises. However, they are

not always interoperable with and supported by the systems used by all suppliers, making changing supplier complicated for consumers. DCC has now developed a plan and designed a solution for the incorporation of such devices into its national network. It intends to offer the ability for SMETS1 consumers to maintain their smart services following a decision to switch supplier. However, reports suggest this is going to be yet another facet of DCC that is expensive. (The next generation of smart meters - SMETS2 - will be operated via the DCC's national network from the outset and allow smart switching between suppliers as standard).

Alternative HAN - A standard smart metering installation will, in most instances, include gas and electricity smart meters, an In-Home Display (IHD) (for domestic premises) and a communications hub. These devices will communicate with each other via a home area network (HAN). Consumption and tariff information will be available to the consumer via the HAN allowing consumers to see energy information on their IHD, and also allow them to link a range of other smart devices via the consumer access device (CAD) to the HAN. However, not all premises will be suitable for the standard HAN which will be 2.4GHZ

Zigbee or 868 MHz standards. Alternative HAN equipment may be needed in around 3.5% of consumer premises it is estimated. Alternate HAN procurement and development is progressing well and would appear to be one of the only streams of the implementation programme that is on schedule!

WEEE Directive - I will be joining several other industry representatives at a Ministerial Round Table to debate the industry's readiness and understanding of the obligations of each player in the industry under the WEEE Directive and/or other waste and environmental regulations. I hope to be able to publish definitive guidance to all our members via our newsletter and in the next issue of Output. This is a vital aspect of the programme as the industry will be installing over 50 million meters with around a 15 year life-cycle and, of course, taking out the same number of traditional meters. All of these meters either traditional or smart, must be processed and disposed of in a correct and environmentally safe way.

My only real concern for the credibility of the programme at this time is that the official line from Government is still that they are focused on a 2020 completion date. This is looking increasingly unlikely.

HHIC News

HHIC Members Lunch

The inaugural HHIC annual members lunch took place in March at the RAF Club Piccadilly, London. It provided an opportunity to gain insight into wider HHIC work, network with industry peers, and most importantly celebrate the progression that the heating industry has made in the past 12 months.

Stewart Clements, Director, HHIC said: "The industry moves at such a fast pace, it's important to take the time to reflect, re-group and of course, celebrate. The HHIC annual member's lunch has been created to provide a platform to do just this.

This past year has been an exciting and busy one for us. There's been new legislation with Boiler Plus. An idea that HHIC worked on with the Department for Business, Energy and Industrial Strategy (BEIS), consulted on with industry and now it becomes regulation. That's a great achievement for HHIC.

HHIC has also produced a series of guides to support installers and consumers on a range of topics, and launched an installer platform, to enable installers to get involved with the wider industry.

We look forward to seeing how industry continues to progress and innovate. HHIC will remain at the forefront; shaping policy and

providing expertise and representation for its members."

The theme of the day was very much about reflecting on the excellent work that goes on within the eleven HHIC member groups.

A number of the HHIC Group Chairs gave an update on activity including: Darren Slater (British Gas), Chair of the HHIC Large Installer Committee; Andrew Keating (Baxi) HHIC Chair, Carl Arntzen (Bosch Thermotechnology), Chair of the Domestic Heat Strategy Group, Keith McBain (Kamco), Chair of the Water Treatment Group; Dr Elaine Lancaster (Ideal Boilers), Chair of the Boiler Manufacturer Group



Members enjoyed a delicious three course lunch then were regaled with an after dinner speech by Geoff Miller, former cricket player and Chairman of Selectors for

English cricket. Even those with little sporting interest enjoyed Geoff's dry northern humour and unwillingness to take things too seriously!

Thanks to our sponsors Baxi Heating, Bosch Thermotechnology and Vaillant for their support and to all those who attended what was a sell-out event. We look forward to seeing you all there next year!



One industry, one goal

Not content with just one event in February, Installers First also held an 'Audience with Gas Safe' event on the 20th February. The industry event offered an opportunity for registered gas engineers to meet with Gas Safe, discuss current industry activity, opportunities and challenges to help shape the future of the industry.



We were really pleased with the response to the event. Registered gas engineers present had taken time out of their working day to come along and

get involved. There were lots of proactive discussions about industry challenges and potential solutions.

One thing that was apparent throughout the day was that everyone ultimately had the same goal; a safe, fair and robust gas industry. One industry, one goal.

There were a number of tangible actions that Installers First took away on behalf of the installers attending and we have already started work on them.'

If you would like to know how you can get involved more directly with the work Installers First are doing, get in touch info@installersfirst.co.uk

Part one of the event minutes can be found on www.installersfirst.co.uk.

Heating industry hold frozen condensate summit

During the spell of extremely cold weather in March the UK experienced a high rate of frozen condensate pipes, preventing boilers from functioning. At the peak of the cold spell, it was reported that the gas emergency helpline received 40,000 calls in a single day.

Exactly the same problem with frozen condensate pipes was reported following icy spells in 2010 and 2014, so the industry took action and a frozen condensate summit was held on the 27th March at HHIC's offices, where representatives from across the heating industry met to review and discuss the matter.

Stewart Clements, Director, HHIC said; "We called this 'summit' to discuss what needs to be done to prevent a repeat of the problems the industry, and of course consumers, experienced earlier in the month. It meant looking at existing regulations around boiler installations; preventative measures to protect external pipework from freezing and what advice and guidance consumers need.

We had a wealth of experience on the day. HHIC together with the Association of Plumbers and Heating Contractors (APHC), the Chartered Institute of Plumbing and Heating Engineering (CIPHE) met with manufacturers and individual heating

engineers, recognising that action must be taken.

From the feedback received it was clear that a significant proportion of installations were not installed to current standards and manufacturer's instructions.

(That said, we are acutely aware that in extreme weather conditions external pipework carrying water is at risk of freezing, particularly when there is a high wind chill factor. Obviously, it is difficult to legislate against the most extreme weather conditions.)

However, action is required. Greater enforcement and strengthening of the building regulations will reduce the risk of boiler condensate pipes freezing and industry will now work with Government to seek the changes required. In the meantime, HHIC will continue to advise consumers and Gas Safe engineers to assess whether condensate discharge pipes are compliant with the manufacturer's instructions during a boiler service."

Industry action to take forward following the Summit:

- Seek greater enforcement and strengthening of current building regulations

- Review current installation techniques that may reduce condensate pipework freezing and produce good practice guides
- Update the HHIC 'Consumer Guide to gas boiler servicing' to include a condensate pipe check
- Include condensate pipe inspection as an item for the CIPHE consumer home compliance group
- Update the benchmark gas boiler commissioning checklist to emphasise correct condensate installation
- Support the industry with product innovation and development
- Actively raise awareness with consumers of the standards required to minimise the risk of frozen condensate
- Actively raise awareness with heating engineers of the standards and relevant building regulations required to prevent frozen condensate
- Bring about an industry 'extreme weather protocol'
- Support Government reviews currently being undertaken to improve compliance with building regulations
- Liaise with gas industry training providers to ensure Gas Safe engineers have whole job competence.

HWA
NewsHWA supports
Government's call for
evidence **on the Future
Framework of Heating**

The Hot Water Association (HWA) welcomed the call for evidence, opened in March, by the Department for Business, Energy and Industrial Strategy on the Future Framework for Heating in Domestic and Non-Domestic Properties. In particular the inclusion of proposals to mandate hot water tanks in new build properties.

The UK needs more housing but there is no justification for building homes with a permanent legacy of high energy bills. New buildings need to be 'future proofed' to break the vicious cycle of expensive retrofitting programmes.

Chapter 5 of the Call for Evidence 'Futureproofing new build homes' states:

'5.8. The announcement was made in the Clean Growth Strategy that, subject to the outcome of the independent review of Building Regulations, the government will consult on ensuring new homes in England are futureproofed for the installation of lower carbon heating systems where this

is cost-effective, affordable and safe to do so. A review of Part L of the Building Regulations commenced in Wales this year.

5.9. It can be expensive to retrofit buildings for clean heating. We are keen to explore options for including clean heating when built or to include measures suited to clean heating - 'futureproofing.' Consideration needs to be given to the relative costs and benefits of these.'

5.10. Examples of measures that could be included to futureproof new build are:

Include space for hot water storage; Require a hot water tank and/or a battery to be installed; amongst others.

New buildings need to be 'future proofed' to enable them to benefit from new technologies. One way of achieving this is to make homes 'hot water ready'. Currently, hot water storage is the only practical solution for turning the energy produced into something useful and banking it for when it needs to be used. Be it a thermal store or hot water tank;

Isaac Occhipinti,
Head of External Affairs,
the Hot Water
Association

whether for hot water only, or in conjunction with space heating, putting a mix of useful energy into a hot water storage unit can provide benefits all year round. Some products can take input from multiple heat sources; including solar panels, biomass, heat pumps and other uncontrolled heat sources.

With fast approaching carbon budgets, and increasing pressure being placed on the Government to improve the nation's air quality, decarbonisation of heat and making the UK's housing stock more energy efficient is high on the political agenda. Whilst retrofitting the existing housing stock will prove complex (80% of the current housing stock will still be in place in 2050), ensuring new build properties are efficient, low carbon and futureproofed, serves as a good way to start reducing domestic emissions.

The HWA is delighted that Government is finally considering the hot water needs of householders. We will be responding to the call for evidence which will be available on the website from 11th June 2018.

NGV
Network
NewsSeema Kennedy, MP, visits
CNG Fuel's Leyland site

Seema Kennedy, MP, Parliamentary Private Secretary to the Prime Minister, visited CNG Fuels refuelling station in Leyland in late April.

She said of her visit to the site in her South Ribble constituency "I've been really impressed. We've got huge wagons fuelling up with 100% renewable gas. This is really exciting, it is the decarbonised future that we're all looking for."

Capable of refuelling more than 500 heavy-duty vehicles per day, the compressed natural gas (CNG) is certified as renewable and sustainable, as CNG Fuels pays for an equivalent amount of biomethane made from food waste to enter the network. The facility is backed by gas network Cadent and the site has been operational since 2016.

A growing number of big retail and logistics firms like Waitrose, Asda, DHL and Argos are now using it. H Parkinson Haulage, based at Walton Summit, Preston, based near the Leyland site, has added seven CNG vehicles to its fleet this

year. Steve Sugden, General Manager of H Parkinson Haulage, said: "We believe this is the future of green logistics, and if these trucks perform as expected we plan to add more to our fleet. These seven trucks will each cover almost a quarter million miles in a year, so they will cut our annual emissions and save us money over their lifetime."

Latest data shows the volume of gas dispensed at the site in March this year was 170 per cent higher than in March 2017, more than tripling in the last year.

David Jones, Transport Strategy Manager at Cadent, said: "This site is attracting lots of interest. Its impressive results prove that gas can be the fuel of choice for HGVs and have a big impact in reducing UK carbon emissions."

Philip Fjeld, CEO of CNG Fuels, said: "Renewable biomethane is the most cost-effective and lowest carbon alternative to diesel for HGVs. Following the success of our site at Leyland, we are expanding our refuelling infrastructure nationwide to help fleet operators save money, cut carbon and clean up our air."

NGV Network
welcomes
three new
members

The Natural Gas Vehicle Network is delighted to welcome three new members in 2018. The companies who have joined are:

Sainsbury's



Sainsbury's need little introduction and operate natural gas vehicles in their fleet.

SGN manage the network that distributes natural and green gas to 5.9 million homes and businesses across Scotland and the south of England.

Gasrec Ltd supply liquefied natural gas and CNG fuel for road transport. They also build and manage 'open-access' stations as well as dedicated on-site facilities.

This takes membership of the group to fourteen. With other companies showing interest in joining too, 2018 is gearing up to be a really positive year.

NGV Network members comprise: British Compressed Gases Association (BCGA), Cadent, Calor Gas Limited, CNG Fuels Ltd, CNG Services Ltd, Element Energy, Gasrec, Iveco Ltd, National Grid Gas (Transmission) plc, Northern Gas Networks Ltd, Sainsbury's Supermarkets Ltd, SGN, UKOOG, Wales & West Utilities Ltd

ICOM News

In 2017 the Department for Business, Energy and Industrial Strategy (BEIS) noted: "Heat networks form an important part of our plan to reduce carbon and cut heating bills for customers (domestic and commercial). They are one of the most cost-effective ways of reducing carbon emissions from heating, and their efficiency and carbon-saving potential increases as they grow and connect to each other."

In its Clean Growth Strategy, BEIS has also stated an intention to build and extend heat networks across the country. So, clearly, heat networks have a key role to play in reducing the UK's carbon emissions. The UK Government is also making funding available to help local authorities through the Heat Networks Investment Project.

Unfortunately, heat networks (aka district heating) have had something of a chequered past in the UK. However, when heat networks don't perform as hoped, the cause is usually down to the design of the system. It's therefore important that our industry provides the necessary design support to specifiers to ensure optimum performance.

End-to-end approach

Achieving optimum performance for a heat network requires a whole system approach, from the efficiency of the central plant and associated thermal storage through to the heat interface units (HIUs) in the heated spaces.

There are also calls to design systems for operation with lower flow and return water temperatures than are traditional in the UK.

Better networking for carbon reduction



Image courtesy of the Association of Decentralised Energy

For example, the Chartered Institution of Building Services Engineers (CIBSE) AM12 'Combined Heat and Power for Buildings' recommends operating temperatures for radiator circuits to be no more than 70°C flow and 40°C return for new district heating systems/heat networks. The recommended maximum return temperature from instantaneous domestic hot water heat exchangers is 25°C.

Lower operating temperatures are also recommended in the Heat Networks Code of Practice, jointly developed by CIBSE and the Association for Decentralised Energy (ADE).

System overview

Most heat networks being installed in the UK use a central plant room, often using a combination of heat sources that include CHP, gas, oil or biomass boilers, heat pumps and solar thermal.

Where a mix of heat sources is in use the design should account for the differing performance characteristics of each type of plant and seek to optimise each. Care must also be taken to ensure that none of the plant is oversized.

A typical example would be sizing the CHP to meet base heat loads, with sufficient thermal

storage capacity for use in the summer for domestic hot water or to drive an absorption chiller for comfort cooling.

In the winter, when the base load is higher, a biomass boiler might be used to back the CHP up, with responsive heat sources such as modulating gas boilers to meet peak loads whilst maintaining constant flow temperatures.

Where the energy centre is providing domestic hot water as well as space heating, there may also be benefits to including calorifiers or heat exchangers feeding into buffer vessels.

A key benefit of using central energy centres in this way is that new, low carbon heat sources can be introduced relatively easily in the future without disruption to the spaces being heated. In some locations, energy centres may also be able to take advantage of nearby waste energy sources from industry or waste incineration.

Centralisation of heat sources also simplifies routine maintenance, compared to accessing individual boilers in each space/apartment.

HIUs and sub-stations

Hot water from the central plant room, to be used for space heating and hot water, will usually be controlled and metered through an HIU in each space. HIUs can vary considerably in performance so it's important to ensure the HIU design will maintain consistent temperatures and pressures throughout the building and can adjust to variable demand.

Where several buildings are involved there may also be variation between the heating systems in each building, so there may also be a need for a sub-station (heat transfer station) in each building connected to the network.

Summary

Given all of the factors considered above it is clear that every aspect of heat networks, from central plant through to HIUs in each space, must be considered and optimised in the design. This reinforces the important role that ICOM members can play in delivering the UK's energy and carbon requirements.



President's Column

Success for new EUA forum for stakeholders

I was really pleased with the success of the recent Low Carbon Gas Consultative Forum, which brought stakeholders from across the industry together in one room at EUA's offices in February. This sort of forum is what EUA is all about and at the very heart of the benefits of membership.

There are a number of projects being undertaken across the industry all aimed at reducing the carbon emissions of gas - from biomethane injection to full scale hydrogen conversion.

Last year, two of EUA's biggest members suggested a forum be set up so that member companies (and possibly others) could get a more detailed insight into these projects and also what other developments are taking place across the industry, such as new Government thinking.

The forum provided an opportunity to engage informally with stakeholders across gas heating, distribution, supply chain and transport and discuss current and future developments. It enabled the participants to speak in a more unified and co-ordinated manner and attendees heard from:

- **Cadent on the HyDeploy Project**, an energy trial to establish the potential for blending hydrogen, up to 20%, into the normal gas supply to reduce carbon dioxide (CO2) emissions.

- **Wales & West Utilities with updates on their FREEDOM Project**, a £5.2m project

to evaluate Hybrid Heating Systems. It is the first collaborative future of energy project between electricity and gas networks (Western Power Distribution, the electricity distribution network operator and Wales & West Utilities). 75 hybrid heating systems have been installed in residential properties in Bridgend, South Wales. (see more about this project on pages 18 & 19 of this issue.)

- **Worcester Bosch shared work they are doing around Hydrogen Compatible Boilers**

The forum is chaired by EUA and it is envisaged that meetings will be held quarterly and provide an opportunity for informal presentations and discussions to take place around projects or topics that the wider industry will find helpful.

It will also allow for greater message discipline around the gas industry; enable engagement to take place earlier between participants and help raise awareness across the industry and supply chain.

Keep an eye out in EUA Communications for details of the next meeting. If you wish to discuss any ideas further with a member of EUA staff or find out more please

feel free to contact EUA Chief Executive, Mike Foster

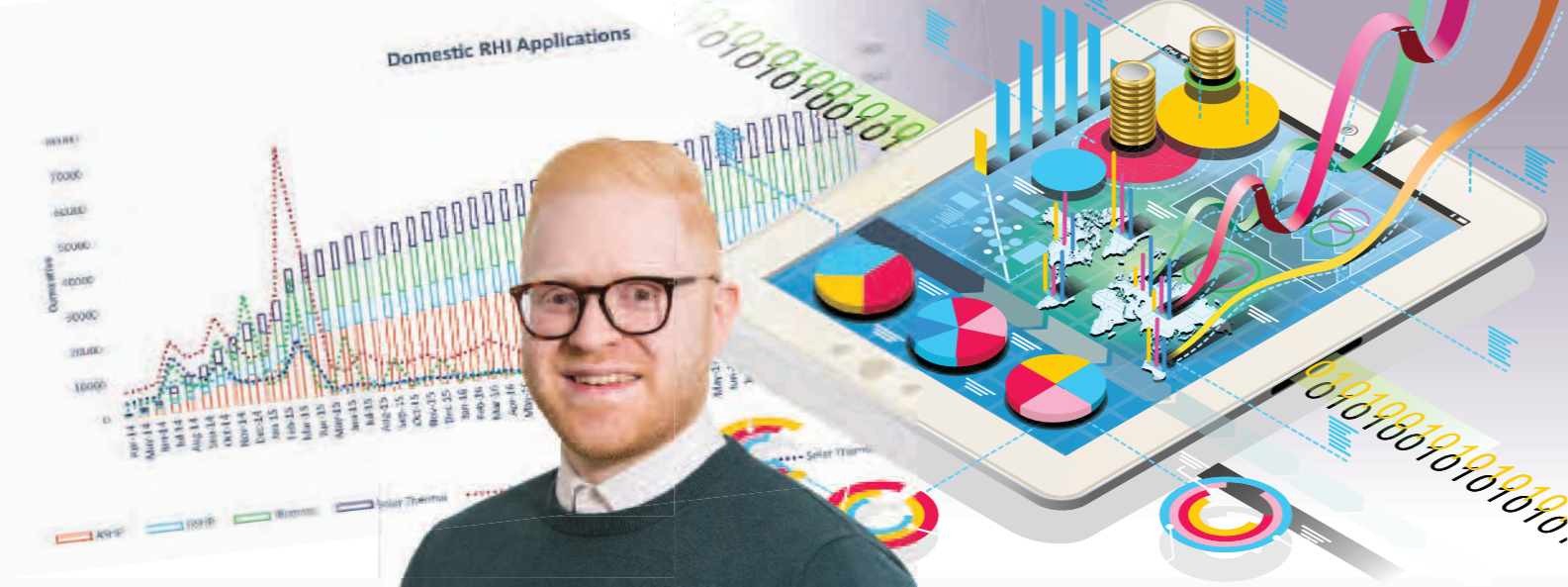
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Andrew is Marketing Director for all Baxi businesses in UK and Ireland.

Andrew was EUA President from 9 May 2017 to 15 May 2018



M E E T T H E T E A M

Sunny Parekh is EUA's Economist...

After studying for a bachelor's degree in Economics at Nottingham Trent University then a Masters in Economics at the University of Birmingham, Sunny joined the EUA team in 2017.

Sunny is a self-confessed number lover and his role enables him to utilise his analytical and numerical mind (his key strengths he says) and apply it to real life decisions and scenarios, supporting members in their business decisions - the best part of the job. His career path became clear in his mid-teens when his curiosity about how the world around him worked at a social and fiscal level became clearer through his study of Economics. He wanted to know more!

Being EUA's Economist finds him engaging in wide and varied activities day to day. Sunny runs EUA's statistics scheme across four divisions (HHIC, HWA, ICOM and MARC). Alongside collating manufacturer sales and reporting total market size, he has to undertake regular market analysis, including identifying trends and making

inferences with respect to future movements and how this might affect members' businesses as well as EUA's direction of travel. He keeps a very close watch on all aspects of energy policy and wider economic trends in order to keep members abreast of any developments or changes.

Sunny's key member facing output is the Monthly Economic report. It is a one stop shop of economic insight into the energy and utilities industry and the wider economy. The report summarises various statistics, from industry sales to the housing market and the progress of Government schemes such as the Energy Company Obligation (ECO), Renewable Heat Incentive (RHI) and Feed in Tariffs (FITs), as well as up to date figures on various macroeconomic indicators. As the report is issued on a monthly basis it helps members make better informed business decisions. The report is ever evolving in order to be able to tailor it to members requirements and their business interests.

A significant part of his role is the support he provides to EUA's External Affairs function. Sunny's provision of economic analysis on Government consultations and any other lobbying/external affairs work EUA engages in is key to the department.

Further to this he regularly attends member meetings to present an industry and economic update.

If you would like to receive EUA's Economic Report and do not currently do so, please let Sunny or any member of staff know. It is available to all members of EUA, HHIC, HWA, NGVN, Utility Networks, or ICOM. If you have any questions for Sunny please feel free to get in touch with him sunny@eua.org.uk

Why the GDPR?

The EU believes that a unified set of rules and standards will allow citizens more control over their personal information and despite Brexit, the UK will uphold the GDPR.

Organisations that trade in the EU, whether based there or not, must comply with these rules. It will transform the way organisations across the EU approach data privacy and the penalties they will be subjected to for misusing data.

What is the GDPR?

The GDPR enables individuals to better control their personal data. Organisations must have clear consent to collect and use data and any request for consent must be made in an intelligible and easily accessible way using clear language. It must be as easy to withdraw consent as to give it. GDPR provides:

Individuals with more access to their own data
A right to data portability
A 'right to be forgotten'
Individuals with the right to know when their information has been hacked

The GDPR and business-to-business communications

The GDPR applies wherever you are using 'personal data'. This means if you can identify an individual either directly or indirectly, the GDPR will apply - even if they are acting in a professional capacity. So, for example, if you have the name and number of a business contact, or their email address identifies them (eg initials.lastname@company.com), the GDPR will apply.

GDPR OVERVIEW

EU DATA PROTECTION REFORM

The General Data Protection Regulation (GDPR) is a new privacy law to protect personal data. The GDPR applies in the UK from 25th May 2018, replacing the 1995 Data Protection Directive.

There are six lawful bases for processing data under GDPR: Consent, Contract, Legal obligation, Vital interests, Public task or Legitimate interests. At least one must apply whenever personal data is used.

Who is responsible?

GDPR is a company-wide responsibility.

Legal - current contracts will need to be revised and updated, while future contracts need to be built on the new regulations. Any suppliers to a business will need to be compliant with robust systems too.

Sales and marketing - will be at the front line of dealing with customer data. It is no longer enough to rely on pre-ticked boxes or customers who fail to unsubscribe from marketing material. Businesses will need to target consumers who have 'opted in' to receive that material.

Finance/IT - new data breach notification systems need to be in place to report any issues. Internal software will need to be easy to use and data should be accessible in the event a request for data is received. Privacy will be paramount, therefore systems will need to be in place to prevent, or minimise the likelihood of data breaches, such as authentication or encryption.

HR - the new regulations will enhance the rights of employees, giving them greater protection over their data. Companies will need to be as transparent with employee data as with customer data. Staff and contractors will require:
- An Employee Privacy statement - prepared and issued to all employees including any

casual staff as well as contractors or consultants - not forgetting staff who are on long-term sick, maternity or other leave
- A subject access request procedure - include in staff handbook
- A data breach policy - include in staff handbook
- A contract amendment letter

There are a lot of myths and misinformation about what you need to do so be sure to take advice. The Information Commissioners Office website has a wealth of information, guidance and training documents: www.ico.org.uk

The HR Dept at Camden House can provide appropriate documents and guidance on becoming compliant. Contact Tracey Hudson (tracey@hrdept.co.uk) for more information.

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Sea of Change

The success of offshore wind



The Crown Estate recently reported the busiest year yet for the Offshore Wind sector.

Its 6th annual Offshore Wind Operational Report tracked the progress in the development of offshore wind resources throughout 2017, with four new wind-farms becoming fully operational taking the total to 33, amounting to 1,762 turbines and supplying the electricity needs of 5.3 million homes.

The data builds a picture of a maturing sector, with a broadening investor pool and increasing number of financial investors, including energy/infrastructure funds and pension funds demonstrating a growing appetite for the sector.

Huib den Rooijen, Director of Energy, Minerals & Infrastructure at The Crown Estate summarised: "2017 has been a milestone year

for the UK offshore wind sector, the busiest yet for construction, and delivering more electricity than ever before. This latest report showcases an increasingly mature sector... with record low bid prices for future projects creating jobs opportunities across the country."

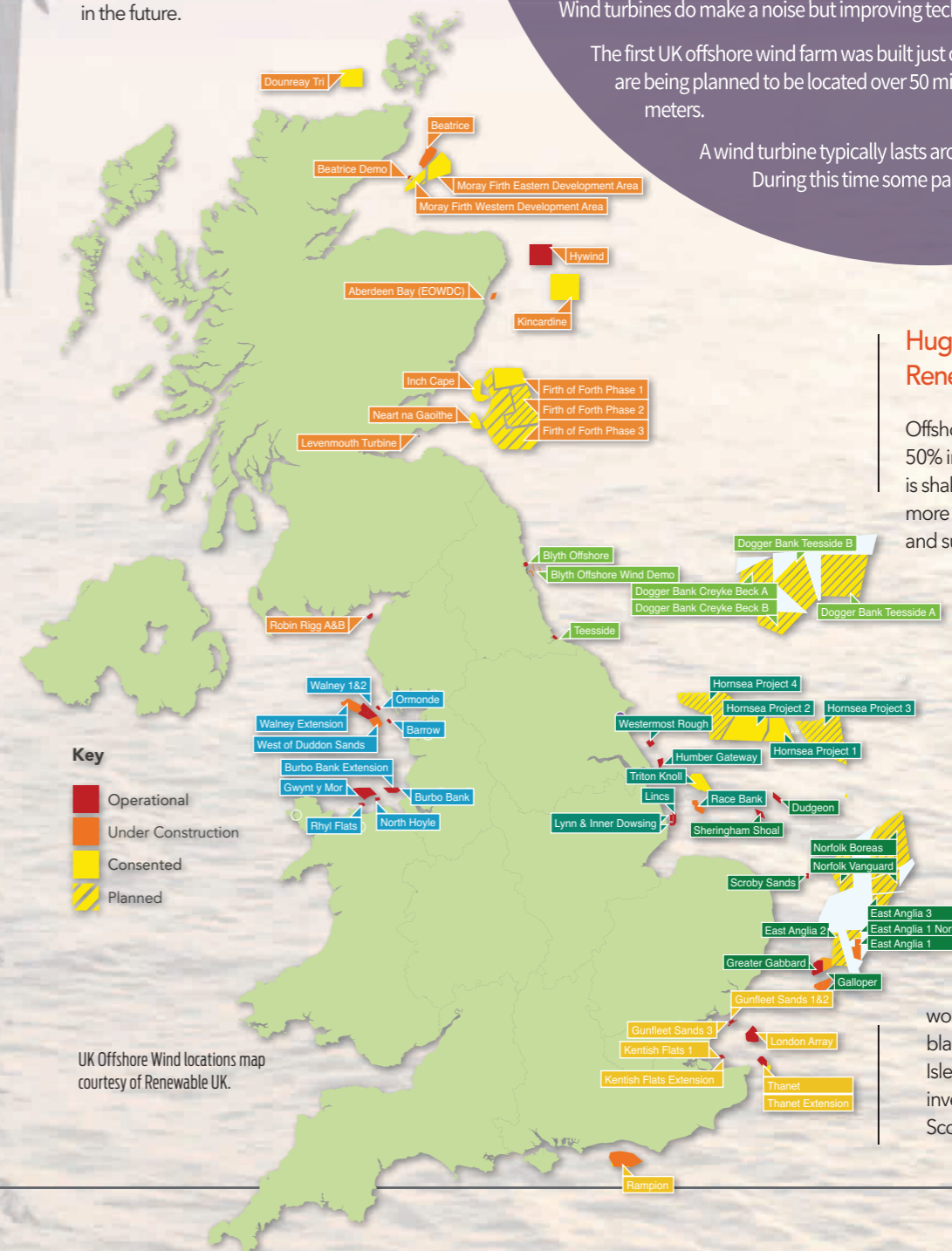
Offshore wind is now an essential part of the UK's current energy mix. It generates 5% of UK electricity and is expected to generate 10% by 2020. By 2030, it has the potential to supply over a third of the UK's power needs. As the largest offshore wind market globally, the large amounts of investment the UK sector is attracting is supporting a growing domestic supply chain and places the UK as a global leader in offshore wind.

Renewable UK's 'Offshore Wind Regenerating Regions - Investment and Innovation in the UK' report last November clearly outlined

how the sector is benefitting manufacturing and how the wider supply chain is building successful economies and supporting a large number of skilled jobs. Alongside supply chain activity in the UK, companies are also taking advantage of opportunities to export components, services and knowledge across the world, including China, the USA, Taiwan, Denmark, The Netherlands, France and India.

Innovation in the offshore wind sector is happening at an extreme pace; developers are expecting to install 15MW turbines in the future, nearly double the capacity of the largest models currently installed at 8MW. Greater efficiency of commissioning and project management during the power up phase and handover to operations has supported a fivefold increase between 2015 and 2017. Transmission cables using 66kV high voltage technology instead of 33kV are being installed, enabling increasing power transmission back to

shore, and new types of foundation technology being developed will drive further cost reductions. Innovation by the industry is happening rapidly, promising wider investment opportunities and lower costs still, in the future.



10 offshore wind facts

Wind turbines are complicated with as many as 8,000 different components.

Wind turbine towers are made of steel or concrete, generally painted light grey to be inconspicuous in most lighting conditions and finished in matt to reduce reflected light.

Blades are made of fibreglass, reinforced polyester or wood-epoxy and are light grey.

Wind turbine blades average over 50 metres (160 feet) long - bigger than the London Eye, and turbine towers average over 80 metres (260 feet) tall.

Most modern wind turbines have 3 blades which can reach speeds at the tip of over 200mph.

Wind turbines do kill birds but the deaths are much lower than those caused by windows, tall buildings, power lines and cats.

Wind farms generate electricity about 80 to 85 per cent of the time. With gains in electricity storage technology the problem of intermittency could go away.

Wind turbines do make a noise but improving technology is creating ever-quieter blades.

The first UK offshore wind farm was built just one mile off the coast. Today, projects are being planned to be located over 50 miles out and in water depths of up to 45 meters.

A wind turbine typically lasts around 20-25 years.

During this time some parts may need replacing.

Hugh McNeal, CEO of Renewable UK:

Offshore wind has fallen in cost by nearly 50% in just two and a half years. The industry is shaking up existing markets and creating more skilled jobs in a vibrant supply chain and successfully exporting to markets across the globe. What has been achieved is extraordinary and it is truly a British success-story.

I have been lucky enough to see at first hand the development of this sector over the last decade, witnessing how small companies have grown into international players. I have also watched parts of the country becoming known for their expertise in offshore wind. From the Humber taking its place as a global powerhouse for offshore wind, to the North East of England leading the world in cable technology expertise; from blade manufacture taking place on the Isle of Wight to innovation in Blyth and investment in fabrication facilities in Scotland.



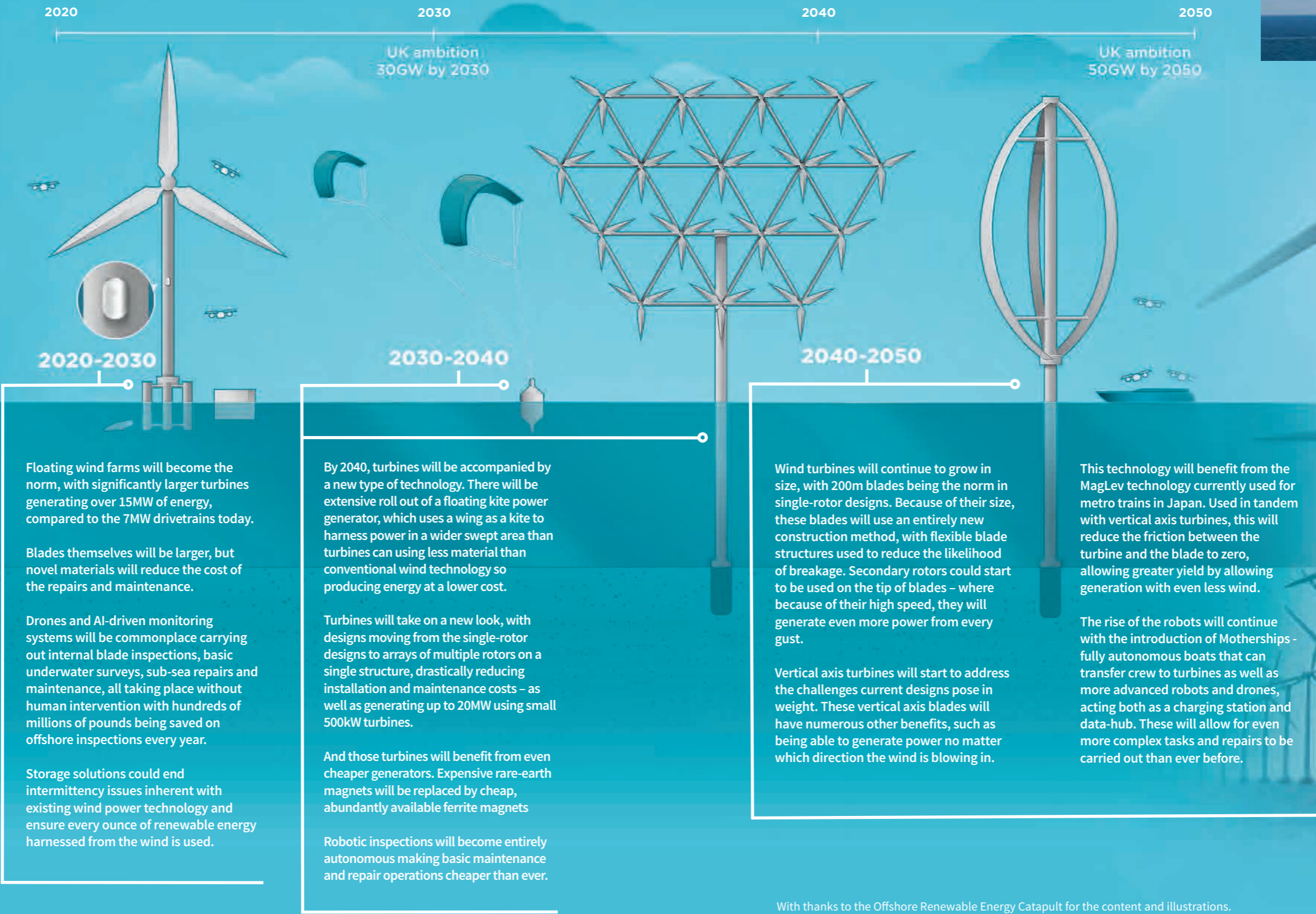
An explosion of innovation in the UK will transform how we think about wind turbines, according to work currently underway at the Offshore Renewable Energy (ORE) Catapult. Based on the Catapult's research and design taking place, their concepts for the future include autonomous robots servicing giant offshore wind turbines with tens of rotors and parachute-shaped kites.

Dr. Stephen Wyatt, Research and Innovation Director at ORE Catapult: "This is a very exciting time for the offshore wind industry. In line with the UK Government's Industrial and Clean Growth Strategies, the industry is currently working with Government to agree a transformational Sector Deal to enable additional capacity.

Technical capability has come on leaps and bounds in recent years and if we look back 12 years, very few people would have foreseen how far we've come with turbine technology and storage. Trends we're likely to see growing over the next two to three decades include:



How offshore wind could look by 2050



With thanks to the Offshore Renewable Energy Catapult for the content and illustrations.



Wales & West Utilities keep the gas flowing to a population of 7.5m people, heating 2.5m homes, powering businesses and keeping the lights on by transporting gas for electricity generation.

The gas network is a virtual energy battery, providing 58GWh of energy storage daily in Wales & the South West of England – equivalent to nearly 6 million Tesla Powerwalls.

Over recent years, the energy system has become greener, with a more integrated approach between gas and electricity, evidenced by around 2,000 combined heat and power (CHP) plants and 31 gas fired power stations connected to the network.

To continue delivering for customers, whilst meeting challenging environmental targets, it's long been clear that the decarbonisation of heat is essential. However, instead of this being at the forefront of the debate, decarbonisation of electricity has taken prime position – and commanded greater public interest.

In recent years, the untested assumption has been that the decarbonisation of heat would mean the end of the gas network and result in the electrification of heat. This would be an infrastructure challenge unprecedented in British history, many times larger than HS2 or Hinkley Point C. Even with the most optimistic assumptions on increased energy efficiency, it would need vast investment to deliver a reinforced electricity network and significant amounts of new generating capacity causing huge disruption in our communities. To the customer, the cost of contributing towards – not only the infrastructure required, but also the installation of new internal fixtures and fittings – would simply be astronomical.

All-electric simulations have recently been run for a number of areas using Wales & West Utilities' Pathfinder 2050 model, which firmly reveals the need for a mix of energy solutions. Even with extremely generous uplifts in development of intermittent power sources from wind, solar and tidal, all vehicles being electric and heat being provided through heat pumps alone, Swansea would need 34GWh of storage for just a few weeks in December 2030, equivalent to 17x Dinorwig hydro schemes or 265x Australian Tesla Mega Batteries.

Decarbonising Heat

The Freedom Project – Whole systems thinking



Hybrid heating systems

With more evidence being presented, it's now becoming clear that a holistic approach to energy is required to decarbonise heat and deliver a future energy system that is affordable, cost effective, secure and reliable – and sustainable too.

At the heart of all of Wales & West Utilities' future of energy work, is the customer. They're not interested in how the energy gets to them, just that it delivers the service they want at a reasonable price. So working with partners Western Power Distribution (WPD) and PassivSystems on the first gas and electricity network future of energy project – the Freedom Project – brings the idea of energy network integration into the home.

A Freedom installation – of which there are 75 on trial in the 'living heat laboratory' in Bridgend, South Wales – integrates a gas boiler and electricity air source heat pump with a smart control system. These smart controls enable the switching between gas and electricity, based on the affordability and carbon intensity of each vector. When there's a surplus of low cost renewable electricity, the air source heat pump will be heating the home through electricity. Conversely, at times of low

renewable electricity generation, if it is very cold outside or when the electricity grid is operating at peak demand, the smart switching technology will direct the gas boiler and gas network to pick up the strain. This switching is based on the least cost and least carbon option, and takes advantage of existing infrastructure.

The gas network in this integrated energy system isn't the gas network of yesterday, but a network delivering for today's and tomorrow's customers. Working alongside partners across the UK, Wales & West Utilities are exploring the potential for the gas network to transport a range of renewable gases. Across the network, 18 biomethane sites have been connected with a 1.6TWh capacity – that's equivalent to the energy output potential of three Swansea Bay tidal lagoons.

Installation & engagement

75 installations were completed in 2017, with a focus on ensuring the portfolio of residential properties was representative of housing stock that will be around in 2050 and beyond.

- flats, bungalows, terraced, semi-detached and detached
- 1-5 bedroom homes
- from pre-1900 to new build
- split between privately owned and social tenanted

Participants in the trial were overwhelmingly positive about their existing boiler; however, once explained, nearly 90% of respondents found the idea of hybrid heating systems appealing or very appealing. Although reducing impact on the environment was considered very or extremely important when customers were surveyed; cost, reliability and comfort all rated as higher priorities.

Key learning

Smart controlled hybrid heating systems with a boiler running on natural gas offers lower cost and lower carbon domestic heat compared to electrified heat through ASHPs alone. They avoid inefficient and costly use of peaking generation to power an ASHP. Burning gas in the home at 93% efficiency is more carbon efficient than incurring 6% electricity network transmission losses after burning fossil fuel at coal (34% efficient, 937 gCO₂e/kWh) or gas peaking (28% efficient, 651 gCO₂e/kWh) power stations.

Freedom brings the potential of heat being sold as a service. Initial findings show that this may be achievable by the mid-2020s and indicate that the potential combined value of fuel arbitrage, domestic demand side response and frequency response services could avoid

initial capital outlay. This model requires a demand aggregator acting on behalf of heat consumers to exploit the value of flexibility from using two vectors and the storage in the gas network, while heat consumers – just like contract mobile phone users – avoid the upfront cost of the equipment.

The value between purchase of fuels and sale of heat could grow further by reducing heat demand in the home, with the aggregator and investor incentivised to install insulation measures which pay back at no further cost to the consumer. The 'leakiest' homes and those properties with higher occupancy and, therefore, higher heat demand, would attract the quickest financial return from lowering demand in a heat service world. With a higher proportion of fuel poor homes located off the gas grid, there's a strong case for hybridisation to be implemented now.

Supply chain opportunities

As for appliance manufacturers and gas engineers, hybrid heating systems present positive news. Freedom has identified a significant near-term potential for wide-scale installations in off-gas-grid areas. The opportunity is also presented to appliance manufacturers to develop both boilers and heat pumps for this system.

New build low carbon homes with improved energy efficiency and on-site renewable generation are still likely to need to import energy for heat and hot water in the winter and would also benefit from hybrid system installations and the value of fuel flexibility. Heating systems will benefit from the flexibility of having hot water storage, with opportunities for significant value from heat storage in the future when home heating is delivered as a service. Existing storage cylinders will need to be maintained and new homes would need to install cylinders (or innovative alternatives) to benefit from this flexibility value and limit household running costs. If heating cost savings are attractive enough, we could see the return of heat storage in homes where cylinders have been removed.

With heat being bought as a service, it is expected that these hybrid appliances would be subject to an annual asset management programme, which will secure regular work for heating engineers. With such a mass servicing programme, there would also be a positive impact on customer health and safety with regular maintenance of boilers.

Conclusions and next steps

Freedom will continue trials in all 75 homes using signals to switch between both appliances and further explore the potential for smart hybrid heating while looking at the potential for decarbonised domestic heat. Combining hybrid heating systems with decarbonised gases, like pure hydrogen cities, biomethane, BioSNG, synthesis gas and hydrogen blends, presents an affordable, flexible and secure pathway to low carbon, or even zero carbon, domestic heat in an increasingly integrated energy system.

Using heat pumps under smart hybrid controls could provide a significant benefit to the potential development of hydrogen cities by allowing consumers in such cities to benefit from the value of fuel flexibility while reducing the volume of hydrogen required via Steam Methane Reformation and volume of carbon dioxide needing to be stored or used.

A future balancing and switching between renewable gas and renewable electricity is indicating a vital breakthrough opportunity to decarbonise heat, with minimal impact of any kind – financial or otherwise, on customers.



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In this issue we talk to

Matthew Wright

Managing Director
of Ørsted

W hat does your career to date bring to your current role?



transmission and distribution business across six US states.

After 20 years in the electricity industry, I moved back to the UK where I joined the water sector with United Utilities as

Managing Director before joining Southern Water as Chief Executive - a position I held for six years before joining Ørsted. Gaining a mixture of commercial, operational and strategic experience throughout my time in the utilities sector has stood me in good stead for my current role - but the pace at which the renewables industry moves means that there is always something new to learn.

What has been your greatest achievement?

I would say that becoming a CEO was the fulfilment of a long-term career goal for me, so I had a great sense of achievement when I reached that stage. Since joining Ørsted, I have

already witnessed some pivotal moments for the company and the industry as a whole - with falling costs and advances in technologies across the renewable energy sector. What's truly exciting is that the UK is leading the world in deploying renewable technology, so I'm delighted to be at a company that is at the forefront of this shift.

Can you tell us a bit about the rebranding from Dong Energy to Ørsted?

The old name - which originally stood for Danish Oil and Natural Gas - had to go, particularly after we sold the oil and natural gas business! It was no longer a good description of who we are and who we want to be. The new name, Ørsted, honours the Danish scientist Hans Christian Ørsted, who discovered electromagnetism 200 years ago and helped to lay the foundations for the way we generate electricity today.

The rebranding for us was not just a name change but a repositioning of our company following a profound transformation. Over recent years, we have shifted away from being a traditional energy company based on fossil fuels, to one focused entirely on green energy. All the areas we are now active in - offshore wind, solar,

energy storage, demand side management and waste-to-energy - are all important in moving us a step closer to meeting our ambition. The new brand feels very much of the time and we have a real sense of purpose as an organisation, namely to create a world that runs entirely on green energy. I'd like to think that we have become a company that people are glad exists, with a clear purpose that the vast majority of people support. I think it also proves the point that you can have a positive message and purpose and still be a successful company.

You mentioned the company's wider involvement in bioenergy and waste-to-energy solutions. Please could you share a little more.

Energy storage, waste-to-energy and smart energy are all pieces of the jigsaw in a world that runs entirely on green energy. We recognise that offshore wind needs to be part of a system that is balanced with other forms of green energy technology, which is why we are exploring these different areas. It feels very natural for us to be exploring and investing in these technologies.

We are nearing completion of our world first bio-energy plant in Northwich. This pioneering project is a waste treatment facility which will separate recyclable materials from household waste and generate green electricity at the same time, using our patented Renescience technology. It will be the first full-scale bio-energy plant in the world capable of recycling household waste through a process using enzymes, mechanical sorting and anaerobic digestion.

In the area of storage, we've added a battery at our Burbo Bank offshore wind farm to help with grid integration & balancing and have recently launched a 20MW standalone storage project.



What future developments are we likely to see in the sector?

We are developing bigger projects and going further out to sea which obviously brings some new challenges, but is also helping to drive further innovation, reduce costs and foster new ways of thinking. For example, we've recently added new Service Operational Vessels (SOVs) to our fleet which are basically floating hotels that allow our technicians to stay out at sea for up to two weeks at a time rather than travelling a couple of hours to and from shore each day.

A changing energy landscape also raises challenges with integration into the existing grid network. That's why we're working alongside the National Grid to examine how offshore wind and other technologies can be better integrated into the system and how we can support grid balancing.

The great news is that offshore wind is already price competitive with conventional forms of energy generation, but without any of the harmful emissions and while we have perhaps realised the steeper part of the downward trend in costs, I think costs will continue to come down.

We are learning more and more with each new project. Bigger projects mean savings from

economies of scale and we're continuing to drive innovations in each part of the project lifecycle - construction, O&M and Asset Management. For example, we're able to leverage our existing operations and maintenance facilities to support new projects, which helps to drive down costs. New advances in turbine technology also allow us to deliver more megawatts per turbine.

The UK is leading the way in offshore wind and has a huge amount of potential to leverage



this leading position as the technology goes global. The industry is working together, and as a partner with the UK Government, to deliver its vision for the future of offshore wind.

A new sector plan will outline how the offshore wind industry can drive economic growth, attract huge investment to the UK and generate exports - all whilst generating clean and affordable energy. With the industry's ambitious target to triple its capacity to 30GW by 2030, we can expect to see yet more economic growth, more jobs and more opportunities for UK supply chain companies.



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GAS 2018

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Energy policy and regulations have to respond to these technology-driven trends that are creating empowered energy consumers and changing traditional models of demand and supply.

Hear about this and other issues at Gas 2018.



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