

Gridline

Winter 2010

SMART VISION

Energy revolution
in the home

THE SKY'S THE LIMIT

Repowering the UK's first
commercial wind farm

ON THE GALLOPS

Racehorse trainer
Kim Bailey

Undoing THE PAST

How National Grid is cleaning
up contaminated land

PLUS: PROJECT ROUND-UP,
BIOGAS MILESTONE, WIN
AN UNUSUAL ESCAPE



Welcome to Gridline



A warm welcome to the Winter issue of Gridline. Season's greetings and a prosperous New Year to all our readers.

Our main feature on page 8 examines how smart meters could help all of us to become more energy efficient in the home.

They could also be a vital element of any future 'smart grid' – in which microgeneration by individuals and businesses, smart appliances, renewable energy and electric vehicles all interconnect in a flexible, intelligent network.

On page 12, we revisit the UK's first commercial onshore wind farm at Delabole, in North Cornwall, which was commissioned nearly 20 years ago.

Electricity grantor Martin Edwards explains how the wind farm has recently repowered to take advantage of new technology that enables the turbines to harvest yet more renewable energy from the wind.

On page 14, we profile the work of the Land Regeneration team – part of National Grid Property – who are responsible for remediating contaminated land, including former gas works. Head of the team Nicola Paton explains how tackling this legacy of past industrial times is also an opportunity to regenerate the urban landscape.

Turn to page 16 to read about racehorse trainer Kim Bailey – who rents his training yard in the Cotswolds from gas grantor the Hon Mark Vestey. Recently, National Grid has been constructing part of the Wormington to Sapperton gas pipeline on the estate.

As always, there's a chance to win a great prize in our photo competition on page 20 – this time a one-night stay at 'an unusual escape' courtesy of Smartbox™. Could be the perfect antidote to another frenetic Christmas!

Angela Todd

Editor, Gridline



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National Grid's Land and Development Group

The Land and Development Group is responsible for acquiring all rights and permissions from statutory authorities and landowners needed to install, operate and maintain National Grid's electricity and gas transmission networks. The Group acts as the main interface for landowners who have gas and electricity equipment installed on their land. Your local contacts are listed below.

Electricity and gas

- North-west and Scotland **0161 776 0706**
- South-east **01268 642 091**
- South-west **01452 316 059**
- East **0113 290 8235**.

Wayleave payments

- For information on wayleave payments, telephone the payments helpline on **0800 389 5113**.

Electricity emergency

- Emergency calls to report pylon damage to National Grid can be made on **0800 404 090**. Note the tower's number – found just below the property plate – to help crews locate it.

Electric and magnetic fields

- For information on electric and magnetic fields, call the EMF information line on **08457 023 270** (local call rate). Website: www.emfs.info.

Gas emergency

- **0800 111 999**.

Dial before you dig

- Before carrying out any work in the vicinity of gas pipelines, overhead power lines or underground electric cables, you should contact Plant Protection on **0800 688 588** so that searches can be made to determine the exact position of any National Grid assets.



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Get in touch

Please contact us if:

- You have any news that you think would be of interest to other grantors
- You think your business or hobby would make a good article
- You have any suggestions for topics you would like to see covered in Gridline.

Gridline is produced by Summersault Communications, 23-25 Waterloo Place, Warwick Street, Leamington Spa, Warwickshire CV32 5LA.

To contact Gridline, phone 01926 656 325, email gridline@uk.ngrid.com or write to the address above.

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Turn to page 20 for the results of last issue's photo competition

ONCE IN A LIFETIME WIN FOR COUNTY DURHAM GRANTOR

Congratulations to gas and electricity grantor Rosemary Cleminson of Bowbank House Farm, near Spennymoor in County Durham, who is the winner of our £150 Jessops gift card competition in the last issue.

"I'm 75 years of age and can honestly say it's the first time I've ever won a competition in my life," said Rosemary. "It really is a wonderful surprise."

Rosemary entered the competition because her granddaughter is keen on photography. "I'm sure she will be able to put the gift card to very good use," she said.



For more information

Tel: 01926 656 325

email: gridline@uk.ngrid.com

www.nationalgrid.com

Newsline

The latest news from **National Grid** and its nationwide grantor network



IN THE PIPELINE: New regime highlights the need to connect new sources of energy and tackle climate change

New framework shapes the future

NATIONAL GRID IS CONSULTING with stakeholders – including grantors – as part of its engagement with the new RIIO regulatory framework introduced by Ofgem (Office of the Gas and Electricity Markets).

National Grid is regulated because gas and electricity transmission networks are natural monopolies – in other words it's not viable for anyone to set up a rival infrastructure.

Ofgem will soon be carrying out a price control review, the result of which will be to set National Grid's revenues for the period 2013 to 2021.

The RIIO model offers real incentives to

energy companies that innovate and run their networks to better meet the needs of consumers and industrial network users, while supporting the delivery of sustainable, low carbon networks.

There's also a focus on revenue being tied to the delivery of certain outputs – including safety, network reliability, environmental impact, and meeting the needs of customers.

“Stakeholder engagement has a much bigger role now,” commented Paul Whittaker, UK director of regulation, National Grid. “So we've already started asking our various stakeholders what services and levels of performance

they want from us in the future.”

National Grid's consultation process includes workshops on how stakeholders can influence the company's business plans, helping to shape how it delivers to customers over the coming decade.

For more information, and to find out how to get involved, please visit www.nationalgrid.com/talkingnetworks.

“ Stakeholder engagement has a much bigger role now ”

One minute interview

Will Bridges, consents officer south-east



Background: I joined National Grid in August 2009, after working as a chartered town planner.

Current focus: King's Lynn and East Thurrock overhead power line connections.

What's the best thing about the job?

Being so closely involved with projects that are critical to meeting the UK energy challenge.

Family matters: I grew up in Northamptonshire. I'm married with a two-and-a-half-year-old daughter.

Dream job: Professional rugby player, preferably for Northampton Saints. The hours are comparatively short, you get paid handsome wages and it would keep me fit!

Leisure time: Watching the Saints and walking our two retired greyhounds.

Most overused phrase: 'Absolutely'.

Not a lot of people know that: I've donated bone marrow twice through the Anthony Nolan charity.

Favourite film: The Shawshank Redemption.

What would be your first purchase if you won the lottery? My house from the bank!

SAFETY IN FOCUS

Dial before you dig

A NUMBER OF incidents have occurred recently as a result of unauthorised construction or other works within the easement strip of high-pressure gas pipelines.

When constructing a new pipeline, National Grid requires

landowners to enter into a permanent contract which confers certain legal rights and obligations on all parties to ensure the safe operation of the pipeline. The width of an easement strip normally depends on pipeline diameter.

Remember

- You are obliged to take all reasonable precautions to avoid damaging the pipeline
- Do not stack materials on top of the pipeline
- Do not do anything that could reduce the depth of the soil above the pipeline
- Do not erect any building or other structure over the easement strip without prior consent from National Grid
- Do not plant any trees or bushes without prior consent
- Do ensure that all contractors or other third parties on your land are aware of the location of gas pipelines.

For more information...

i National Grid Plant Protection, National Grid, Block 1, Floor 2, Brick Kiln St, Hinckley, LE10 ONA. Email: plantprotection@uk.ngrid.com

News IN BRIEF



SUPPORT FOR CANAL FESTIVAL

National Grid sponsored the Angel Canal Festival at the City Road Basin on Regent's Canal, in Islington, North London. Activities included a canal-related arts competition and short plays featuring historical characters associated with the canal. National Grid recently refurbished cable-cooling systems between substations at St John's Wood, City Road and West Ham, using barges to help carry out the work.

SPECIAL OLYMPICS AWARD

National Grid has won the Corporation of the Year award at the Beyond Sports Awards 2010 for its impressive partnership with Special Olympics GB, which provides year-round sports training and competition for people with learning disabilities. Julian Buttery, head of UK community relations, National Grid said: "It's fantastic recognition for the hundreds of volunteers in our company, the athletes, coaches, families and volunteers of Special Olympics GB."



Power house

THE ABSENCE OF windows and its sheer bulk attracts the curiosity of many a motorist negotiating Sheffield's inner-relief road.

The imposing concrete structure is, in fact, National Grid's Sheffield City substation, which provides energy to the city's 547,000 residents.

Now this award-winning 1960s modernist building is one of a number of key buildings and structures in the city that the council is illuminating using architectural lighting, to

mark Urban Design Week.

"It's unusual for a substation to be so close to a city centre – hence the need to build a well-designed structure," commented Les Adams, maintenance delivery electricity manager, National Grid.

"The floodlighting will make it even more of a landmark in the city."

A key focus of the scheme's design was low energy consumption. The 100,000 light emitting diodes (LEDs) have a lifespan of 20-25 years.

Land officers help out in historic country park

One good turn deserves another. So when the National Trust allowed National Grid contractors access through part of its Lyme Park estate in Cheshire, to reach a tower that needed refurbishment, it seemed only right to give something back.

“The existing access to the site was over a Napoleonic-era bridge that has a five-tonne weight restriction, and so finding an alternative route for heavy plant movements was critical,” explained Joanne Booth, lands officer north-west and Scotland. “As a gesture of thanks to the National Trust, we volunteered to spend a day clearing out invasive rhododendrons.”

Rhododendrons can carry a disease known as sudden oak death that affects several species of native tree.

“It would be disastrous if the disease took hold in the woods here, which date back to medieval times,” said Emily Ball, head warden at Lyme Park.

“We have just three full-time staff to look after 1,400 acres, so the help we received from National Grid made a real difference.”

PITCHING IN: Lands officers during the volunteer day



GREEN GAS: Workers make final adjustments to the anaerobic digestion tanks

Brewing up a revolution

How biogas from brewery waste is helping to meet the nation’s energy needs

NATIONAL GRID STARTED TO receive the first quantities of biogas in October from a groundbreaking anaerobic digestion plant in Suffolk.

In partnership with British Gas and National Grid, Adnams Bio Energy will initially generate up to 4.8 million kilowatt-hours per year – enough to heat around 235 homes for a year.

“It’s the first purpose-built plant of its kind in the UK to generate biomethane from food and brewery waste and inject it into the grid,” commented Dave Tilley, manager of sustainable gas group, National Grid.

The anaerobic digestion plant at Adnams brewery in Southwold will generate enough renewable gas to power the brewery, and run its fleet of delivery lorries, while still leaving up to 60 per cent of the output for injection into the grid.

The scheme will cut carbon emissions by reducing the need for fossil fuels to heat

homes and, by diverting waste from landfill, it will also reduce the production of methane – a potent greenhouse gas. Another by-product, a liquid organic fertiliser, can also be used in the barley-growing process.

“We take climate change very seriously,” said Adnams chief executive Andy Wood. “We believe that fossil fuel costs are going to rise, and that the polluter will pay, so as well as meeting our environmental aims, this makes sound business sense.”

National Grid has installed pressure-reduction equipment, odorant injection and gas-control quality equipment, as well as remote-control monitoring equipment. A connection has also been provided to a three-inch gas main that runs close to the site.

It’s a fact National Grid estimates that 15 per cent of UK gas demand could be met from renewable gas

Project watch

A round-up of recently completed, current and forthcoming projects around the country

HACKNEY 400KV SUBSTATION WORKS

WHEN: October 2007-November 2010

WHY: National Grid has completed works at Hackney substation to reinforce the network and provide additional load capacity for the 2012 Olympics, and the regeneration of Stratford and East London.

WHAT: A new 400kV GIS substation has been built within the site of the existing National Grid 275kV substation. The substation connects a double-circuit 275kV overhead power line from Tottenham substation, and two 400kV circuits carried under the Olympic site in a cable tunnel constructed in 2008. The project team worked closely with Hackney Council and local residents to manage noise and traffic management issues associated with operating in an urbanised location. Future works include a new 12.5km electric cable tunnel connection from Hackney to St John's Wood.

ST JOHN'S WOOD TO WEST HAM CABLE-COOLING PROJECT

WHEN: January 2010-April 2011

WHY: National Grid is refurbishing the existing cable-cooling system on two 400kV circuits between high-voltage substations at St John's Wood and West Ham in North London.

WHAT: The 400kV cables are buried in troughs under the Regent's and Hertford Union Canal towpaths; the cooling water is extracted from the canal, screened and distributed in pipes running above the cables by pumps located in eight pumping stations. The refurbishment also includes work on two header tank buildings, three valve houses, seven outlets and a cable tunnel.

A1(M) GAS PIPELINE DIVERSION

WHEN: April-September 2010

WHY: National Grid has diverted a section of high-pressure gas pipeline as part of a major upgrade to the A1 trunk road by the Highways Agency between Dishforth and Barton in Yorkshire. The road is being converted to a three-lane motorway to ease traffic congestion and improve safety on the route, which carries up to 50,000 vehicles a day.

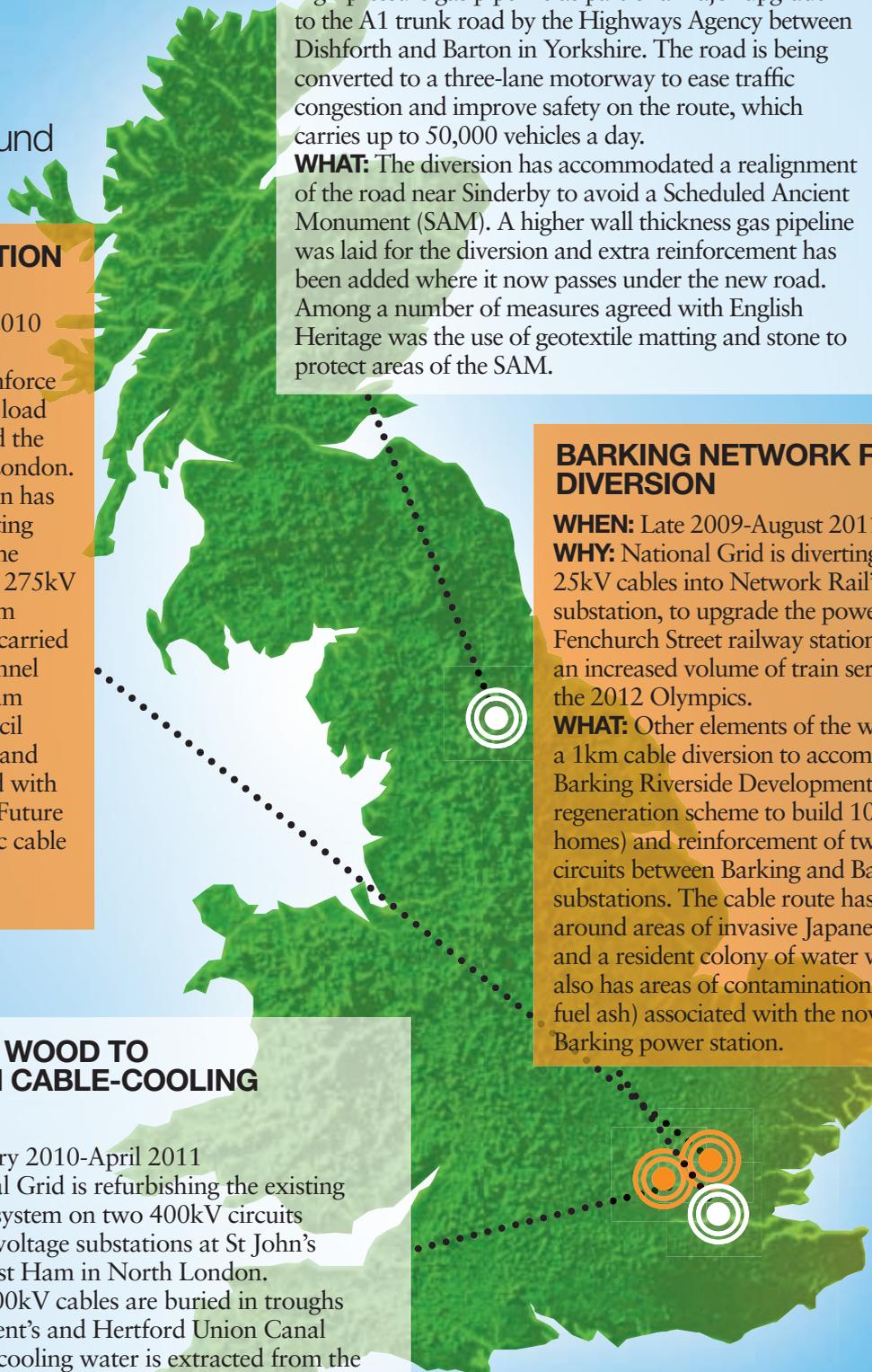
WHAT: The diversion has accommodated a realignment of the road near Sinderby to avoid a Scheduled Ancient Monument (SAM). A higher wall thickness gas pipeline was laid for the diversion and extra reinforcement has been added where it now passes under the new road. Among a number of measures agreed with English Heritage was the use of geotextile matting and stone to protect areas of the SAM.

BARKING NETWORK RAIL DIVERSION

WHEN: Late 2009-August 2011

WHY: National Grid is diverting two 25kV cables into Network Rail's Essex Road substation, to upgrade the power supply to Fenchurch Street railway station, and enable an increased volume of train services during the 2012 Olympics.

WHAT: Other elements of the work include a 1km cable diversion to accommodate the Barking Riverside Development (a brownfield regeneration scheme to build 10,800 new homes) and reinforcement of two 33kV circuits between Barking and Barking West substations. The cable route has skirted around areas of invasive Japanese Knotweed, and a resident colony of water voles. The site also has areas of contamination (pulverised fuel ash) associated with the now-demolished Barking power station.



SYSTEM BALANCING

Signals sent via smart meters to cut energy use at times of high demand can reduce the need for expensive high-carbon power plants to meet peaks in demand.

RENEWABLE ENERGY

Shifting demand patterns in the home to meet the available supply of electricity can help manage the variability of wind and other renewables.

CONTROLLING ENERGY

The current cost of power can be checked before using appliances, while the in-home display can also act as a reminder to switch off appliances on standby.

MICROGENERATION

Small-scale wind turbines and solar panels generate low-carbon power for the home. Smart meters measure and export surplus electricity to the grid.

SMART APPLIANCES

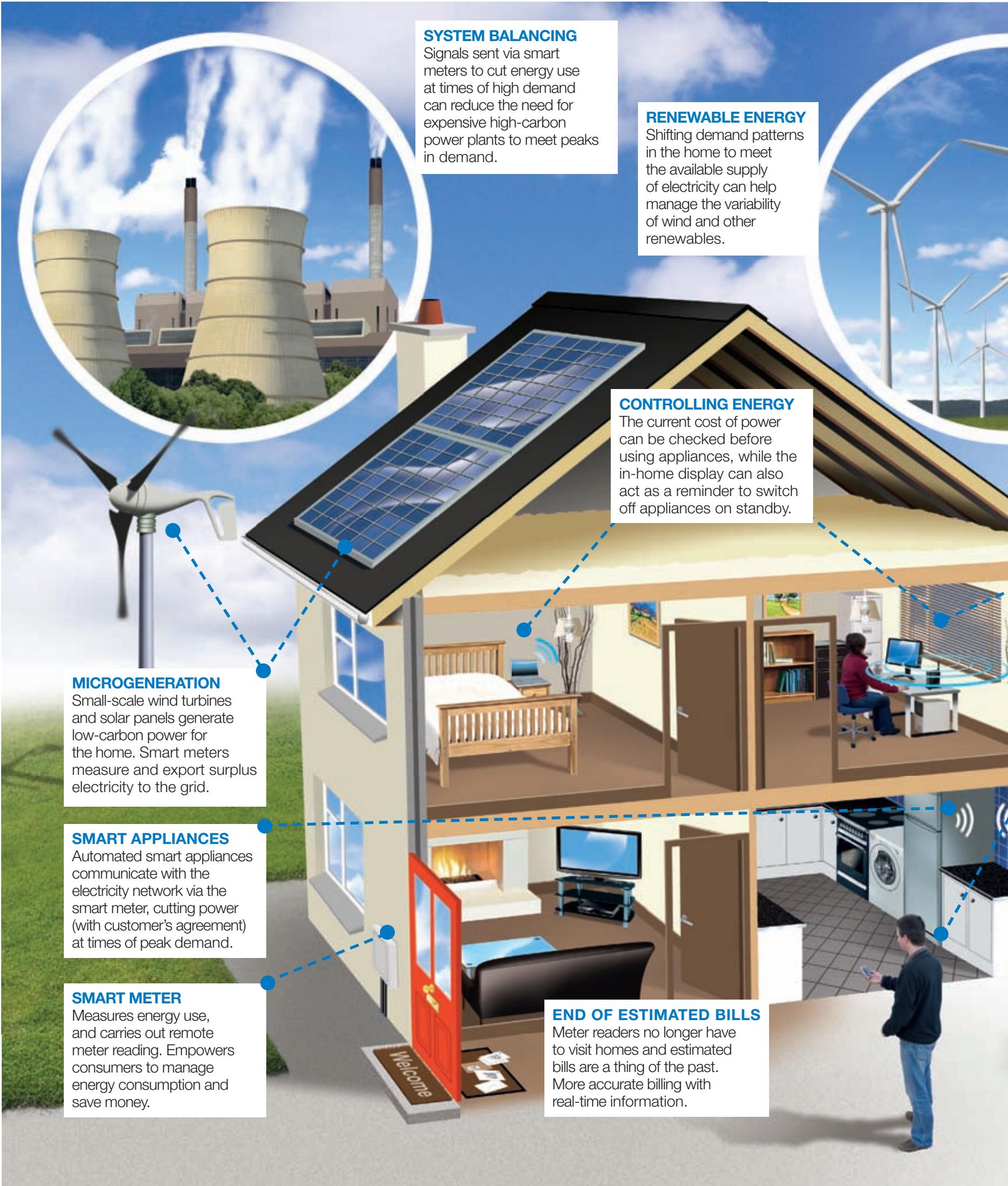
Automated smart appliances communicate with the electricity network via the smart meter, cutting power (with customer's agreement) at times of peak demand.

SMART METER

Measures energy use, and carries out remote meter reading. Empowers consumers to manage energy consumption and save money.

END OF ESTIMATED BILLS

Meter readers no longer have to visit homes and estimated bills are a thing of the past. More accurate billing with real-time information.





Getting smart about energy

GREATER CONVENIENCE

Householders can track energy consumption in the most convenient way for them – for example, via the Internet or mobile phone.



IN-HOME DISPLAY

The in-home display gives real-time information on energy consumption and a breakdown of historical energy use and costs. Also indicates the most energy-intensive appliances.

ELECTRIC VEHICLES

Electric vehicles charge overnight on cheapest off-peak tariff and, in the longer term, could act as storage capacity to feed electricity back to the grid.



BACK OFFICE

Companies operating the grid spot problems earlier, reroute power and get more from the existing network, helping to reduce operating costs.

Fitting all homes with smart meters will prepare the ground for a potential revolution in the way energy is generated, supplied and consumed

TWO YEARS AGO, THE UK government announced that gas and electricity smart meters would be rolled out by energy suppliers to every household in the country by the end of 2020, signalling the start of the biggest energy change in the home since the conversion to North Sea gas in the 1970s.

The coalition government is keen to further accelerate the roll-out, ensuring that 85 per cent of existing meters are changed and new smart meters are installed by 2017.

The challenge is formidable – involving the replacement of 48 million gas and electricity meters and associated communications equipment in 27 million homes across the country.

“In future, virtually all our electricity

generation will be from clean energy sources such as renewables, nuclear or fossil fuel plants fitted with carbon capture and storage,” said Adam Lloyd, senior strategy analyst, National Grid, who is pulling together the company’s response to a consultation process on smart meters by energy regulator Ofgem.

“However, to meet climate change targets, alongside investment in renewables, there also needs to be an increased focus on energy efficiency,” he said. “By showing people how much energy – and money – is being consumed, smart meters should help reduce consumption or shift it away from times of peak demand.”

But research commissioned by price comparison site USwitch recently found that only four in 10 consumers know what a smart meter is, while 35 per cent had heard of them but didn’t know what they do.

So what exactly are they? “A smart meter is basically a device with advanced two-way communications that enable meter readings to be taken remotely by the energy supplier without a physical visit to the premises,” said Adam.

An in-home display, placed in a convenient area of the home, provides real-time information on how much energy is being used at any given time, how much it is costing and how much

carbon that equates to. A wireless home area network (HAN) facilitates communication between devices in the household, and a wide area network (WAN) communicates data to the supplier.

Rather than receive an estimated bill, often months after the actual energy usage, people will receive a bill based on actual usage, enabling them to compare historical information on energy use and costs.

“Of course, having a smart meter installed doesn’t mean individuals will necessarily act on the information presented,” said Adam. “That’s why it’s critical to provide information about how people can reduce bills and be smarter in their energy use.”

Benefits to suppliers include reduced back-office costs associated with not having to carry out physical meter readings and reduced complaints arising from inaccurate billing.

In conjunction with a ‘smarter’ grid, the electricity distribution companies that deliver power to homes will get more detailed information about supply and demand, assisting in the timely replacement of equipment and reducing the incidence of localised power outages.

“A lot of focus has been on electricity rather than gas smart meters, because the balancing dynamics in electricity are minute by minute,” said Adam. “Gas can

be stored in the network and is not delivered in real time in the same way that electricity works end to end at the flick of a switch.

“But a lot of the network monitoring benefits apply equally to gas, and while the feedback to consumers from a gas smart meter will be less instant, it will still be more accurate and up to date.”

The proposal is that a new industry body, the Data Communications Company (DCC) will identify and procure the most cost-effective solutions for smart metering data management and communications over the WAN. No decision has yet been taken on the solution for this critical home to back-office function (whether cellular or long-range radio).

“Interoperability is the buzz word,” said Adam. “That means ensuring that gas and electricity meters from different suppliers are able to talk to each other through a common HAN network in the home, and that, for example, if you change energy supplier, the smart meter still works.”

Other areas being looked at include how vulnerable customers are protected from the possibility of remote disconnection, data security issues and the code of practice that will be required for meter installers.

The government plans to start the phased roll-out of smart meters in 2012 after discussions on regulatory issues and functionality have ended

£17.8 billion

anticipated cost savings from smart meters by 2030 (DECC)

26%

the amount of energy usage and CO₂ emissions contributed by households

– but before the DCC is established. Smart meters will also be a key enabler in the evolution of a smart grid – a modernised, integrated electricity grid with a larger capacity and ability to manage greater fluctuations in supply and demand, while maintaining security of supply.

“The smart meter is all about the consumer-facing bits, while the smart grid relates to the network-facing solutions needed to accommodate renewable energy and electric vehicles,” explained Adam. “It’s about the intelligent communications systems, sensors and storage devices that will balance the new sources of energy and consumption.”

The traditional grid model consists of large generators feeding into transmission networks which, in turn, serve the distribution power lines that deliver energy to the home. But in the future, there will be more distributed generation, more renewable generation, such as wind and solar, and two-way networks that receive as well as deliver reliable power.

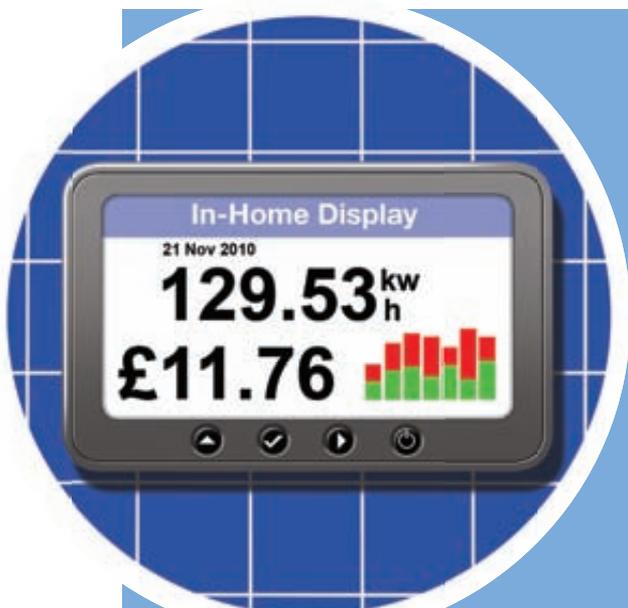
Over time, additional layers of information and communication technologies will be added, enabling even more dynamic real-time flows of information and interaction.

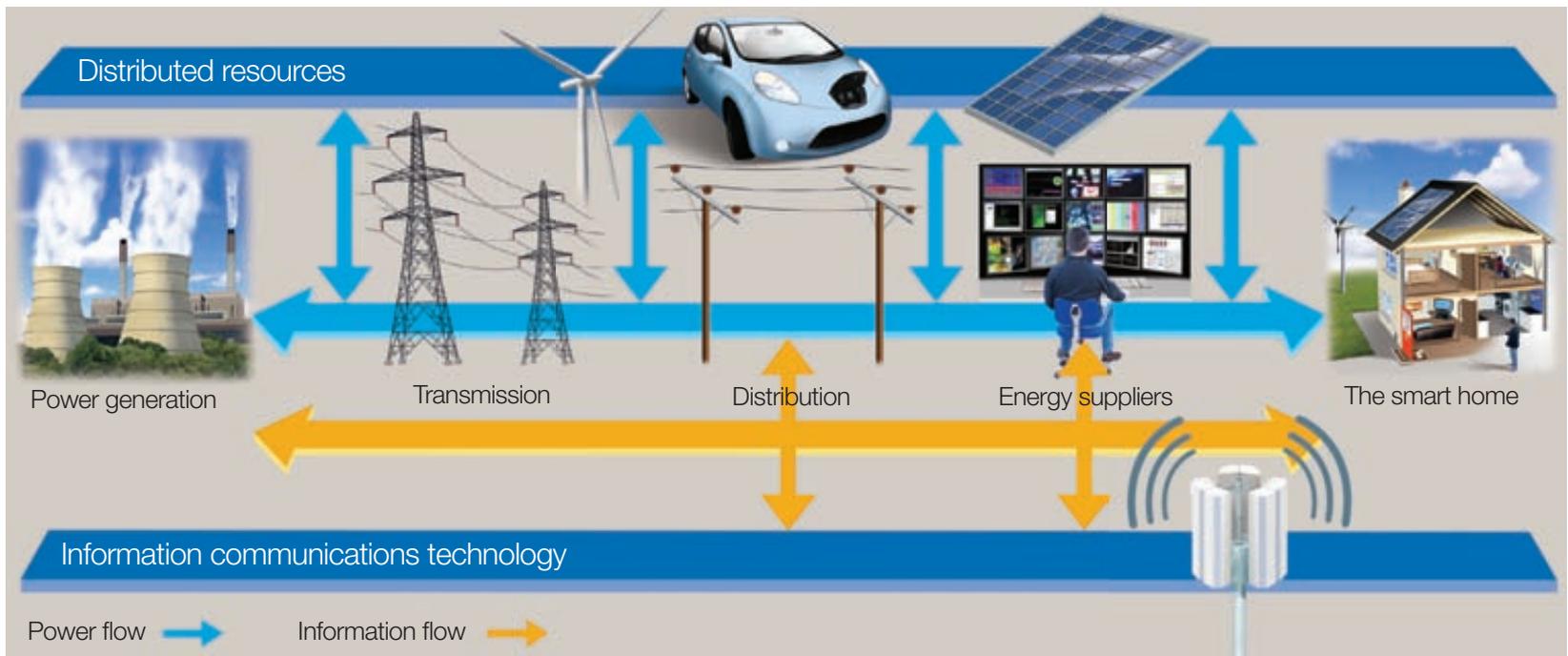
So how will consumers interact with the smart grid? Varying tariffs could be offered throughout the day, reflecting the amount of supply available, and consumers rewarded for using more electricity at off-peak times when renewable sources are

Smart meter trial feedback

“When you see real-time usage of electricity and gas on your in-house display, it makes you more aware about how turning off the lights or switching off the standby feature on your PC and TV can save electricity and money.”

“Having historical data on your bill is great for budgeting. Normally when you get a bill it’s historical – you just have to pay it. But being able to review real-time usage enables you to be much more proactive to reduce your costs.”





The smart grid

producing a lot of power. Or they might opt for packages that allow appliances to be turned off and on automatically and remotely.

“Trials abroad have involved sending pricing signals to IHDs in advance of ‘critical peak’ days, warning homeowners they will pay more for their electricity, and so enabling them to proactively limit energy consumption,” said Adam.

Appliances could also be programmed to run when a home produces its own electricity through microgeneration (ie solar panels or wind turbines). The smart meter would measure the amount of extra energy generated and enable any surplus to be sold back to the grid.

Since April 2010, financial support from feed-in tariffs has made investment in small-scale renewables attractive. Monitoring and control of these generation flows will be key where large amounts of distributed (local) generation are concentrated.

With the increasing reliance on intermittent sources of renewable power, such as wind, to meet carbon reduction targets, the complexity of balancing supply and demand on a real-time basis increases.

With millions of homes participating in this kind of ‘demand side management’ via smart meters,

OnStream’s revolutionary new product

Some 2,000 smart meters developed by OnStream – National Grid’s non-regulated competitive gas and electricity metering business – are being trialled by energy suppliers including Scottish and Southern Energy. The new smart meter has a number of unique features not currently found on any other smart meter, including:

- The lowest power consumption of any meter on the market today (even less than a traditional ‘dumb’ meter)
- Ability to communicate with smart appliances as they become available
- Stand-alone gas and electricity meters – previously smart gas meters relied on electricity meters to transit their information
- A roaming SIM enables the meters to pick up the strongest nearby mobile network to transmit information from any location. Previously smart meters were restricted to one mobile network, hampering installation of meters if the signal for that network wasn’t strong enough.

these troughs and peaks could be smoothed out, helping to maintain the second-by-second balance between supply and demand.

It may even be possible to integrate the recharging of electric vehicles to synchronise with a home’s own microgeneration or to ensure it occurs during low tariff (low carbon) periods.

Further into the future, energy

storage capacity in vehicle batteries may be used to meet demand on the grid as required.

Many experts say that information technology is about to have a similar impact on energy infrastructure as the Internet had on communications.

Expect to hear more about smart meters and smart grids as the country embarks on the transition to a low-carbon economy.

For more information...

i on the smart meter roll-out, go to www.ofgem.gov.uk/E-SERVE/SM/Pages/sm.aspx. To find out more about OnStream smart meters, go to www.onstream.co.uk.

WINDS OF CHANGE:

Martin Edwards with one of the four new wind turbines



New dawn at Delabole

A pioneering wind farm in Cornwall is taking advantage of new technology to contribute even more renewable energy to the grid

THE PROSPECTS FOR RENEWABLE energy have come a long way in the 19 years since the Edwards family established the UK's first commercial wind farm at Delabole, two and a half miles from the North Cornish coast.

Harnessing energy from wind is now a major component of the government's strategy to source 20 per cent of all energy requirements from renewables by 2020, with up to 40 per cent of electricity generation needing to come from green sources.

Wind farms are expected to contribute around 33GW of capacity by the end of the next decade, and a significant milestone was passed in September with the achievement of 5GW of installed capacity. Another 18GW is either consented, in construction, or in the planning system.

Having been first in the field, it's fitting that Delabole wind farm is now leading the UK into its second generation of onshore wind power, replacing the original 10 turbines with four larger machines.

The previous Danish-made turbines were commissioned in 1991 by farmer and National Grid grantor Peter Edwards, who sold the family's dairy herd of 150 cows – along with the quota – to help raise funds towards the £3.6 million investment.

Since 2002, Delabole wind farm has been owned by 100 per cent renewable electricity supplier Good Energy. Peter's son Martin is a director of the company and manages the site, while the Edwards family remain the biggest shareholders.

"The initial inspiration for a wind farm was a discussion within the family that there must be a better way to generate electricity than having a new nuclear power station in Cornwall, which was being talked about," recalled Martin.

Delabole has three major advantages – a convenient grid connection (the 11kV substation is just half a mile away), its position at an altitude of 800ft above sea level, and an average annual wind speed of 7.8 metres a second.

Good Energy has invested £11.8 million in the latest repowering project – including a £9.6 million loan from The Co-operative Bank. With a total combined capacity of 9.2MW, the wind farm can now supply 7,000-8,000 homes with electricity – more than double the previous output.

"Keeping local people aware of plans and consulting them at an early stage is



a key consideration for anyone thinking of constructing a wind farm,” said Martin. “The feedback we received was in favour of fewer, larger machines rather than a larger number of small turbines.”

The new German-made turbines were installed in September. Each tower is 63 metres high, topped by 30-metre rotor blades – with the whole assembly weighing in excess of 200 tons.

“Being twice the height of the previous machines, the new turbines can tap into higher wind speeds and generate more power, while the larger blades also harvest more wind from each rotation,” explained Martin.

“The control system in the nacelle housing at the top of each tower interacts with sensors to turn the rotors into the wind. It also alters the pitch of the blades, and the speed at which the rotors turn, ensuring the turbine is always running at an optimised state for the wind conditions.”

The gearbox-less design means the new turbines are quieter in operation; the lack of moving parts make them easier to maintain; and the turbines’ state-of-the-art ‘ring’ generator synchronises the power output automatically to the grid frequency of 50Hz.

“People sometimes say that wind is unreliable but actually it tends to blow when we most need it,” said Martin. “About 60 per cent of annual generation from wind – averaged over the long term – blows in winter when the demand for electricity is greatest.”

In addition to the electricity they produce, large-scale wind farms such as Delabole earn Renewables Obligation Certificates (ROCs) for each MWh of electricity generated. These can be sold to suppliers who are obliged to source a percentage of electricity (currently 10.4 per cent) from renewable sources.

Because Good Energy generates its own energy, any ROCs earned over and above the obligation, are sold to other suppliers who haven’t met their target. The Edwards family also receives a rent for the land on which the wind farm is built.

The old turbines, meanwhile, far from ending up on the scrapheap, are being refurbished and will start a new life generating power in Lithuania.

For more information...

i on all aspects of planning a wind farm or small-scale wind turbine, go to www.bwea.com – the website for RenewablesUK.

Location, location, location

- Annual average wind speeds of 6.5 metres per second or above make the most suitable (and profitable) sites
 - Hilltop or coastal locations are best, free from any large obstructions such as forestry blocks or sudden changes in landscape, which might cause turbulence and loss of wind speed
- Local authorities typically require 500-600 metres clearance from housing for larger schemes, and toppling distance plus a small safety margin for roads or power lines
 - The more cabling required for a grid connection, the more expensive the project
 - Remote locations without existing access roads have high construction costs
- Check with the MOD and Civil Aviation that a site won’t potentially interfere with radar or the safe operation of an airport in the vicinity.

Hitting a new peak

According to National Grid, production of electricity from wind reached a historical record on 6 September 2010, with around 10 per cent of all electricity delivered to consumers generated by the UK’s wind farms.



Reclaiming the past

National Grid is committed to tackling the legacy of the contaminated sites it owns, and returning them to beneficial use

MANAGING THE RISKS ASSOCIATED with contaminated land is the remit of the Land Regeneration team – part of National Grid Property. With a portfolio of more than 600 sites – including some 400 former gas works – it's a huge challenge.

The team also oversee the clean-up – or 'remediation' as it is termed – of contaminated land owned by National Grid's gas and electricity businesses.

"There are 750,000 acres of contaminated land in the UK, and remediation is a £1 billion industry," said Nicola Paton, head of the Land Regeneration team.

"National Grid accounts for just three per cent of this spend, but we punch well above our weight in terms of influence within the industry and government. The 11 consultancy firms and four remediation contractors who work with us include the leading experts in the field."

National Grid's portfolio of contaminated land was inherited from a time when the environmental impacts of many industrial processes were little understood.

Until replaced in the 1960s by natural gas, coal or 'town' gas was widely used for lighting, cooking and heating. Its production involved burning coal in an oxygen-starved environment, producing tars that were contaminated, especially with heavy metals.

"The historical legacy of these former gas works is a problem but it is also a tremendous opportunity," said Nicola.

"Removing or controlling contamination on a site unlocks its financial value and enables the Sales and Lettings team to recycle the land to a new use.

"Many sites are in inner-city areas, so they

contribute to the target that 60 per cent of all new housing is built on brownfield sites."

The key priority is that a site should no longer pose a hazard to health and the environment, which means reducing contamination to levels considered safe for the projected use of the land.

An industrial park would need less remediation than a housing estate where there is a higher risk of contaminated food being grown on site and consumed.

An initial desk study makes use of historical information to understand past uses of the land and assess the level of risk. The ensuing site investigation identifies the nature and extent of contamination, using trial pits and boreholes, as well as soil and groundwater sampling and analysis.

A Source – Pathway – Receptor risk assessment is used to identify a potential pollution linkage. Once a contaminant (the source) is found, investigations centre on whether there is a pathway (soil, air, water, etc) through which it can migrate to a receptor (human, water or ecosystem).

"The traditional approach to remediation was to 'dig and dump' contaminated material and import new soil," said Nicola. "But the industry today is highly regulated to ensure a more sustainable approach to the management of wastes."

A significant incentive to clean up and reuse a greater proportion of material on site is the withdrawal in 2012 of landfill exemptions for remediation schemes – raising the landfill cost by another £80 a ton.

"We already recycle more than 80 per cent of materials on location, but with this deadline in mind, we're prioritising those





Changing places

Land regeneration manager Naomi Regan, at a former gas works in Wallasey, where a bioremediation technology is being used to clean up the site.

Named Best Young Brownfield Professional at this year's Remediation Innovation Awards, Naomi has responsibility for the team's north-west 'patch'.

"These sites are often dismissed as eyesores but it shouldn't be forgotten that in the last century, town gas brought light and heating into thousands of homes and powered industry," she said. "Removing or controlling the contamination completes the circle, regenerating land so it can fulfil a useful purpose again."



COMEBACK: the site of a former gas works in Southampton is now a football stadium

areas of sites where the concentration of contamination means that landfill is the only solution," said Nicola.

While some remediation techniques treat contaminated soil or groundwater in situ, others are based on extracting it to the surface for treatment.

A well-established method is soil washing where contaminated soils are separated and cleaned, and the cleaned soil then reused as engineering fill on site.

At a recent project in Hull, another technique, called bioremediation, was employed using a huge tent – the size of a football pitch – to cover the site. The air was then heated and extra oxygen added to accelerate the natural process of bacterial degradation of toxins and contaminants.

At Partington, in Manchester, the team is pioneering the UK's first 'hub and cluster' project, having successfully campaigned for a change in regulations.

"Before, contaminants could only be treated on site, but for smaller sites or those with sensitive neighbours, this wasn't always an option," said Nicola. "Material went to landfill that could have been reused."

At Partington, four former gas works are sending contaminated material to a central treatment works. The soil is cleaned and then returned for reuse on the donor sites.

This year, the team also won an industry award for Best Low-carbon Remediation Technique for a project in Northampton.

"Solar panels were used to offset energy consumption, hydrocarbons in the soil were recycled as a fuel source and visitors travelled to the site by public transport," said Nicola.

"In fact, by taking more greenhouse gases out of the atmosphere than were emitted, the project ended up being carbon positive."

RIDING HIGH

Few people know more about the business of nurturing top racehorses than Cotswolds-based trainer Kim Bailey



UPHILL GALLOP:
Kim is a great advocate of training National Hunt racehorses on sloping terrain

OUT OF THE MIST EMERGES a string of horses blowing hard as they reach the top of the steep uphill gallop, their thundering hooves the only other sound to break the early morning silence.

Watching intently at the summit is National Hunt racehorse trainer Kim Bailey, who rents his training yard at Thorndale Farm Stables, near Andoversford, in the Cotswolds, from landowner (and National Grid grantor) the Hon Mark Vestey.

“I’m up here nearly every day and I never tire of the stunning views – it’s a great place to bring owners and other visitors,” said Kim.

Set in 1,000 acres of grazing land, the 36 stables in a converted barn are the equine equivalent of a five-star hotel. Facilities include a mechanical horse walker, schooling fences and a loose school where young horses are first introduced to going over jumps. The stables also have 30 acres of paddocks where horses can be turned out in any downtime between training.

The daily regime starts at around 6am when the stable lads tack up their allotted horses for the day’s scheduled exercises. During the morning, Kim oversees three or four lots of horses in sequence – each group exercising first on the gallops and then over schooling fences where they learn the key skills of jumping over hurdles and fences.

The gallops, which ascend nearly 300ft over four furlongs (about half a mile), have a special top surface consisting of a wax-impregnated synthetic material that retains its cushioning properties in all weathers. “I’ve always been a believer in hills for gallops and there’s no shortage of slopes around here,” said Kim.

Recently, the racehorses have shared part of the

estate with contractors working for National Grid, who are installing a section of the Wormington to Sapperton high-pressure gas pipeline.

“Some of the machines were huge and I was a bit concerned the horses might die of shock,” joked Kim. “But actually, it was fascinating to watch the efficient way in which the pipeline was laid and the ground reinstated. You won’t be able to tell it’s there soon.”

“All heavy plant movements were stopped whenever the horses were taken over the working width at the designated crossing, and the contractors even got used to opening and shutting the gates for us.”

Kim moved to Thorndale Farm in September 2006 after an unhappy spell at Preston Capes in Northampton, where first his all-weather gallop was washed away and then foot-and-mouth disease virtually closed him down.

Today, he’s well on the way to rebuilding his stable with around 40, mainly young, horses, which are showing considerable promise.

Kim specialises in training National Hunt racehorses that compete over hurdles (at least 3.5ft high) or fences (at least 4.5ft high). Courses can be anything from two to four and a half miles, as opposed to a maximum of two and a half miles in flat races. Values are considerably less than in flat racing because most racehorses are geldings, and so have no breed value.

Tuesday morning at Thorndale Farm is always a frenetic time at the yard as the deadline approaches for entering the coming weekend’s races. Kim and his team consult weather websites to check the going and make enquiries about potential rivals, before making a final decision on the horses they will run at various venues.

Race meetings are held year round, but the main season is from mid-October to late April when the softer ground is more suitable for jumping.

“I’ve always preferred the thrills and spills of





WORK IN PROGRESS: National Grid is currently working on a new 48-inch gas pipeline from Wormington to Sapperton, near the Cotswolds stables

jump racing, and I find the whole scene is more fun than flat racing,” said Kim. “It’s sometimes said that jump racing is a hobby and flat racing a business – although actually our prize money is nearly on a par at the moment and Paul Nicholls, the champion trainer over jumps, earned more than any flat trainer last year.”

Kim’s own career started with an apprenticeship in the jump yards of leading trainers Captain Tim Forster and Fred Rimmel.

After nearly 1,000 wins, he is currently the only trainer with victories in the ‘big three’. He won the Grand National with Mr Frisk in 1990 and then the Cheltenham Gold Cup–Champion Hurdle double with Master Oates and Alderbrook five years later.

Kim’s aim with his training is to create a safe, relaxed and professional environment where discipline is combined with an individual approach to each horse.

“All my horses are very different, with unique characters,” said Kim. “Animals can’t talk to you, but you build a rapport with them, and try to work around their quirks and foibles to produce the best you can with what you’ve got.

“Just like human athletes, some horses have stacks of ability but when the pressure is on they can’t deliver. My Gold Cup winner Master Oates hadn’t got the ability of other horses, but he could hold it all together until the finishing line – and only then would his head go down and he’d virtually collapse.”

But Kim believes that owning a racehorse shouldn’t just be about results. “We can’t guarantee winners every day, but we do everything to ensure owners are kept well informed and have fun from the ownership experience,” he said.

“Owners can visit and watch their horses being schooled at any time – and we encourage people thinking of getting into racing to give us a call, and to come to see what we do here.”

Sole ownership of a racehorse requires deep pockets. Besides the purchase price of a racehorse, which can be anything from £1,500 to £200,000, it costs £20,000 a year to keep a horse in training.

But there are less expensive ways to become involved – either by sharing the cost through a joint ownership or racing partnership, or by leasing, which is where you don’t actually own the horse but pay a share of the running costs for a defined period.

Kim points to his Have Fun Racing Partnership as an example of a cost-effective option. It gives 25 people the opportunity to have a part-share in



“Some horses have stacks of ability but when the pressure is on they can’t deliver”

a leased horse for just £25 a week, including all costs until May 2012.

A cause close to his heart is the Help for Heroes Partnership, which he set up after former amateur jockey Guy Disney lost the lower part of one leg in Helmund, Afghanistan, where he was serving with the British Army.

“Guy had ridden for me in military races. I went to visit him in hospital and I was deeply moved by the spirit of the guys who just wanted to get over their injuries and get back out there. I’m not ashamed to say I came out, sat in my car and burst into tears.”

The partnership will be made up of a maximum of 100 shares each costing £5,000. The first £1,000 of each share goes directly to Help for Heroes, a charity raising funds to rehabilitate servicemen and women injured in the line of duty. The rest goes towards the purchase of the horses, training fees and other expenses.

One of Kim’s biggest headaches in the past has been keeping in touch with his owners on a day-to-day basis. But email has transformed the situation and through his ‘Bailey’s blog’ he provides daily updates on which horses have been schooled, together with photos, a few jokes to keep things interesting, and opinions about the racing scene.

“It’s actually become a bit of a cult blog and attracts around 60,000 hits a day, so I must be doing something right,” he joked.

Visit www.kimbaileyracing.com for more information.

Out&About

The latest news from **National Grid** and its nationwide grantor network

RARE BUTTERFLY

Rare marsh fritillary butterflies have been discovered by ecologists working on the Pembroke to Swansea overhead line steel replacement works.

The species receives a high degree of protection under Schedule 5 of the Wildlife and Countryside Act 1981, and the team have liaised closely with the Countryside Council for Wales (CCW) on their mitigation plan near the tower where the butterflies were located.



REVEALING FACTS ABOUT THE PAST

Roman and Iron Age treasures were unearthed during the Easington to Paull gas pipeline project in East Yorkshire.

The Iron Age and Roman finds were put on show at two archaeology events, attracting hundreds of visitors.

The finds include oyster shells (above), buried for centuries, indicating that the area was once a thriving Roman settlement, with locally harvested oysters the fast food of the age.

Picture Perfect

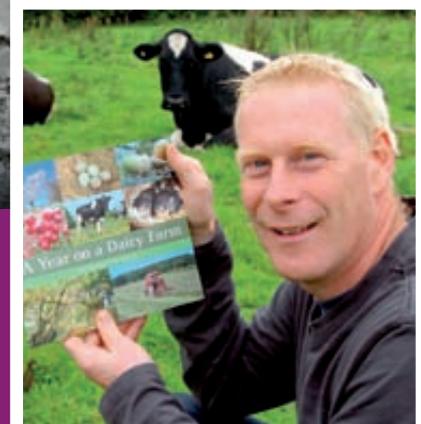
Cotswold-based electricity grantor Richard Cornock never expected to land a book deal as a result of purchasing a compact digital camera at his local supermarket, but that's exactly what happened.

"I bought the camera to compile a photographic record of the changing seasons as a Christmas present for my parents," said Richard, who runs the 140-acre New House Farm, in Tytherington, Gloucestershire, with his brother Tom and father Bill.

But having seen the fruits of his work, friends and family persuaded him to approach a publisher and, after just one email, Cotswold-based Amberley Publishing signed him up.

The stunning photographs in *A Year on a Dairy Farm* record the activities that take place through the seasons, as well as the animals that inhabit the changing landscape. Richard has also provided a commentary for the photos.

A percentage of the royalties for the book is being donated to The Royal Agricultural Benevolent Institution (RABI), a charity that supports members of the farming community facing hardship.



**WIN
WIN
WIN**

We have two copies of *A Year on a Dairy Farm* to give away. Simply send your name and address on a postcard to Gridline book competition, 23-25 Waterloo Place, Warwick Street, Leamington Spa, Warwickshire CV32 5LA to arrive by 9 February 2011. The two winners will be picked at random after that date.

New book gives inmates a fresh start

A new collection of children's books inspired by a real-life canine character and illustrations by prisoners on the Young Offenders Programme has received its official launch at Reading Prison.

The *Adventures of Basil the Spaniel*, a series of stories for prisoners to share with their families, is written by Helen Mahy, company secretary and general counsel of National Grid. Drawings by young offenders at six prisons inspired the illustrations.

National Grid pioneered the programme that offers training and work opportunities to offenders in 22 prisons. The reoffending rate for graduates of the programme is just seven per cent compared to the national average of 70 per cent. "One of the first pictures was drawn by an inmate at Reading," said Helen. "I'm really pleased that the books have enabled prisoners to channel their creative energies."



INSPIRED: Helen (left) at the launch with Dr Mary Harris, director of the programme

Last Word

Contact details
Tel: 01926 656 325
Email: gridline@uk.ngrid.com
Website: www.nationalgrid.com

Your chance to enter two great competitions

Photo competition



Congratulations to grantor James Beale from West Tilbury, Essex, who is the winner of last issue's photo competition on the theme of 'planes, trains and automobiles'. He took this great photo – entitled 'Going home' – of a commuter train rushing through a station.



Win £150 of photographic equipment

Enter this competition to win a £150 Jessops gift card.

Use the gift card in full or as part payment for goods purchased in more than 200 Jessops stores throughout the UK.

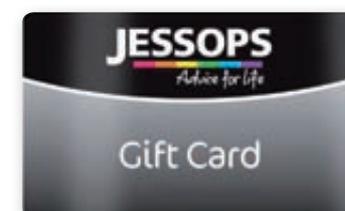
Choose from a wide range of items sold by Jessops – including digital cameras, digital photo frames, printers, flash guns, camera bags, lenses, binoculars... the list goes on.

Gift cards can currently only be used in Jessops high-street stores or via its Mail Order Sales Department.

To be in with a chance of winning a Jessops gift card, simply answer the following question correctly.

Q HOW MANY SMART METERS WILL BE FITTED IN UK HOMES BY 2020?

Send your answer to Gridline Jessops competition, 23-25 Waterloo Place, Warwick Street, Leamington Spa, Warwickshire CV32 5LA. Please note you must be a grantor to enter. Closing date is 9 February 2011.



Win a magical getaway!

Enter Gridline's competition to win a Smartbox™ Unusual Escape

WE'VE TEAMED UP WITH Smartbox™, the international leader in gift experiences, to offer the winner of this month's photo competition an Unusual Escape.

The winner will be able to choose from 80 one-night breaks, including breakfast and a welcome drink in unusual or picturesque accommodation across the UK and Ireland – giving you the perfect opportunity to take more photos.

The theme for this issue's competition is 'winter'. Just send in your selected photo for a chance to win this great prize.

Send your photo to Gridline Photo Competition, 23-25 Waterloo Place, Warwick Street, Leamington Spa, Warwickshire CV32 5LA, or email your photo to gridline@uk.ngrid.com. Closing date is 9 February 2011. Only grantors are eligible to enter. Regrettably prints cannot be returned.



GREAT GIFT IDEAS

Smartbox™ is the perfect gift for any occasion, with 14 themed boxes offering a variety of experiences, ranging from adrenalin-pumping activities to relaxing spa treatments and overnight escapes, available across the UK and Ireland. Search the Smartbox™ range at www.smartbox.com/uk.

