



Electric energy boost

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EcoReport

March 2013

Time for smart thinking

A special report on smart grids



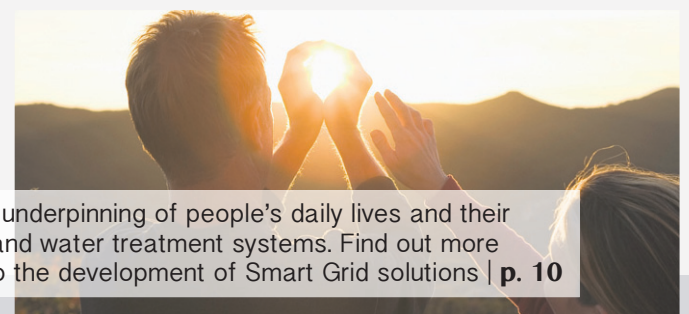
LYONSDOWN

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Hitachi provides infrastructure products and services that form the underpinning of people's daily lives and their communities, such as railway vehicles, control systems, elevators and water treatment systems. Find out more about Hitachi's Social Innovation business and how it contributes to the development of Smart Grid solutions | **p. 10**



Opening shots Baroness Verma



FACING the twin challenges of climate change and an increasingly volatile global energy market requires tough and determined action. On top of these issues, a fifth of our ageing power stations – including coal and nuclear power plants – are due to close over the next decade. Without action, we risk a higher chance of blackouts across the nation.

Through the Electricity Market Reform programme, the coalition government is transforming the way the UK creates and generates energy to help keep our lights on in a way that is both affordable and secure.

Our new electricity mix is going to be diverse and low-carbon with nuclear and renewable sources – such as wind and solar – playing an increasing role.

This approach will lead us away from depending on imported energy and will eventually offer customers better value for money.

However, to do all this in a way that keeps our energy bills down requires us all to be smarter about the way we use our power.

Applying “smart” technologies to the energy system, such as smart meters, will help squeeze more value out of our energy assets so that we all pay less and

We must get more out of our energy assets so consumers pay less

empower consumers to manage their energy use.

We plan for every household and small business in Great Britain to have a smart meter installed by 2019. This will give consumers up-to-date information on their energy use, expressed clearly in pounds and pence.

Smart meters will also allow people to avoid wasting energy and money on bills as well as helping to reduce carbon emissions.

More accurate billing data will enable energy suppliers to offer their customers a more efficient and better informed service.

Suppliers will no longer need to send a meter reader to the consumer's home to take note of their meter usage.

Better information and control will also enable the energy industry to help consumers and communities to save money and connect to local energy generation. Innovation to connect local wind-generated electricity to the energy grid network on the Orkney Islands, for example, has allowed the community to benefit from an extra 20 megawatts of renewable wind generation – enough to power more than 10,000 homes.

We know that innovation will be crucial as we seek a smarter way of managing our energy. We want the UK to lead the world in this field. The Smart Grid Forum recently estimated that applying the right smart solutions could deliver billions of pounds of savings for the consumer compared with the status quo.

That's why we are providing funding, including Ofgem's Low Carbon Networks Fund worth more than £500m available to support smart grid trials for new technologies and approaches.

The coalition's ambitious plans to reform the electricity market – including the electrification of domestic transport – presents some tremendous opportunities for economic growth and the creation of new jobs and new industries.

As we seek to decarbonise the energy system, it is vital our energy grid works effectively to deliver power to homes. Smarter systems will be vital to achieving this.

Baroness Verma is Parliamentary Under Secretary of State for Energy and Climate Change

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Innovation is crucial to finding a smarter way to manage our energy



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Can smart grid solve all of our energy problems?

By Bonnie Gardiner

LIMITED resources, economic hurdles and continual power cuts – the prospect of depleting our energy supply has so far been unfathomable for most, but not for the UK energy industry.

Ofgem chief executive Alistair Buchanan has predicted the UK would face a narrowing energy supply as early as 2015, while falls in national power production capacity are expected to cause a rise in energy imports and costs.

The controversial Energy Market Reform is attempting to drag the nation’s energy policy and infrastructure into the 21st century, while financial support such as the Low Carbon Investment Fund aims to help upgrade the national grid and ensure we play our part in meeting the EU’s 20-20-20 goals [20 per cent increase in energy efficiency, 20 per cent reduction of CO₂ emissions, and 20 per cent renewables by 2020].

To create and implement a smart grid, the energy industry must become incredibly flexible in order to collaborate and combine smarter energy production, smarter distribution and smarter energy storage. Yet while the government looks to reform energy policy, experts agree that the biggest potential for transformative change is on the demand side.

A key item on the smart grid agenda is the use of smart meters – a major energy infrastructure project that will see the replacement or upgrading of more than 50m domestic and non-domestic electricity and gas meters by December 2019.

Smart metering will revolutionise the availability and use of consumption data, while empowering consumers, cutting costs, and providing more options for users and providers to accommodate peaks and troughs in demands. Yet there are even more significant elements to intelligent meters that will ultimately lead to more sustainable consumption patterns.

“There’s what people think of as pure smart metering functionality, but there’s also grid functionality already in the meter,” explains David Green, business development director at SmartReach. “These measurements that the energy meters take will not just be consumption, but also power quality – and that’s much more interesting to the distribution network operator to be able to balance the load on the network.”

Smart metering can also be used to integrate the growing number of embedded renewable generators, such as windmills and solar panels. Electricity gathered from separate micro-generation equipment can then be injected back into the centralised distribution network.

By incorporating micro-generation, Gaynor Hartnell, chief executive of the UK Renewable Energy Association (REA) said she envisages smart meters doing much for the take-up of renewable energy sources, and vice versa.

“The need for decentralised power creates the need



Image: Viridor

REA chief executive Gaynor Hartnell at Viridor’s landfill gas power plant at Rignuir, Glasgow in 2011

for the smart grid in connection with smart meters and, then as more renewables connect up to it, it will continue to provide the smart grid with a raison d’etre,” she says.

Along with a reduction in carbon emissions, Hartnell stresses that energy security, efficient waste disposal/recycling and various economic benefits are also key motivators towards the take-up of renewables.

“Renewables are forms of energy that you can harvest from the environment, with no resulting waste or pollution. They aren’t going to run out,” she says. “We wouldn’t be dependent on imports where we may be on the end of a long supply line. So renewables are uniquely good for energy security.”

Enhanced energy security would also mean more money spent within the UK, boosting the economy as well as employment levels, meaning the uptake of renewables as a direct response to smart grid will greatly benefit consumers, the environment as well as society as a whole.

Renewables are uniquely good for energy security

EcoReport

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Proven technology: essential for smart success

Benefits of smart metering rely on technology and user experience

INDUSTRY VIEW

We are close to the start of the nationwide rollout of smart metering. Legacy meters will be replaced by new, smart electricity and gas meters at a rate of 30,000 a day – that's almost one million per month.

The appealing vision for each household and small business is that smart meters will help consumers and owners gain a much better understanding of energy consumption; to control and reduce the energy that they use.

Smart meters should also deliver billions of pounds in savings for utilities from automated, accurate billing and improved processes. It is anticipated that a large part of this will be passed onto consumers.

At the same time, the introduction of smart meters into people's homes marks a fundamental shift in the relationship between utilities with their customers. Today, most people only come into direct contact with utilities when they experience a fault, have a query or want to make a complaint.

From 2014, the installation of smart meters into homes presents a golden opportunity for utilities to both spend time with individual consumers and start delivering improved services. The point of installation can be seen as a "moment of truth". A convenient experience, with technology that works from day one, will be a key part of increasing consumers' trust and satisfaction with utilities.

On the other hand, dissatisfaction will only increase if people have to wait at home for multiple installation visits, or if the technology doesn't deliver the expected quality of service.

Communication challenge

Smart meters rely on the two-way communication of data yet, especially in Great Britain, meters are often located deep inside buildings in positions that existing public networks find difficult to reach.

Using communications technology with poor or uncertain coverage makes it harder to connect meters. During mass roll-out, this could make smart meter installation slower, more complicated and less convenient for millions of households. The resulting, unbudgeted costs would hit utilities and their customers and adversely impact the business case for smart metering as well as risking programme delays, consumer dissatisfaction and negative media coverage.

These risks can be minimised by learning from international experience,



The SmartReach trials included densely populated areas of Glasgow, above

where the overwhelming majority of implementations have used dedicated networks that are purpose-built to connect to smart meters and grid devices.

But international experience is not enough, especially given the unique challenges of the British market. It's also vital to ensure that the selected communications technology is proven to be suitable for British conditions. Recent trials (see the box out below) have shown that a dedicated communication network, using a single long-range radio technology, can connect to more than 99 per cent of meters across Great Britain with one installation visit. This could lead to lower costs and a better consumer experience if repeated at scale during mass roll-out.

The alternative, using an unproven solution, would introduce unnecessary risks of roll-out delays, dissatisfied consumers and failure to deliver the anticipated levels of cost and energy savings.

Don't overcomplicate

As a disruptive technology that will be installed for the first time into millions of homes, smart metering also introduces uncertainty at multiple levels, for example:

- How quickly and effectively can smart meters be rolled out?
- To what extent consumers will embrace them and reap the benefits?

Why would we want to add to this uncertainty by introducing overly complex or unproven smart metering

communications technology?

SmartReach's trials have shown how it's possible to connect to smart meters wherever they are using a single communications network. Adopting such an approach nationwide would save IT integration costs and should reduce the time and expense involved in training smart meter installers. It would also simplify the supply chain, by removing the need to store and transport multiple variants of communications "hubs" [the equipment that goes into each home to connect smart meters to the network].

Flexible for the future

Given its vital importance in securing a sustainable energy future, the smart metering communications network should be viewed as part of our Critical National Infrastructure (CNI). It must be resilient and designed to be always available. Confidence in the roll-out can therefore be increased if the smart metering communications network is delivered by organisations with a strong CNI heritage.

A dedicated, proven, flexible and resilient communications network is also better suited to meet potential smart grid and smart water metering requirements, increasing the long-term value it can deliver.

David Green, Business Development Director, SmartReach
Find out more about SmartReach's smart metering trials:

www.smartreach.com/trials/home

Proven to connect smart meters across Great Britain

SmartReach has run a series of trials with utilities to demonstrate the suitability of its long-range radio solution to connect to more than 99 per cent of smart meters, wherever they are located, with a single installation visit.

The trials in Scotland, Ipswich and Reading spanned a diverse range of geographies, building types and meter locations.

The key findings from the trials were that the SmartReach solution connected 99 per cent of meters first time, at the existing meter location, including:

- Urban, suburban and rural areas
- All property types, from high rise flats to terraced houses
- All meter locations, including deep indoors, under stairs and in basements

The Scotland trial incorporated two areas presenting very different communications challenges. Lochwinnoch is only 20 miles from Glasgow but is the type of rural location that alternative communications networks find hard-to-reach. Densely populated Glasgow presents a different kind of communications challenge,

with meters located deep inside buildings, including basements.

Talking about the Scottish trial, Andrew Ward, ScottishPower's operations director said: "This highly successful trial with SmartReach has shown how almost all smart meters, even in hard to reach locations, can be successfully connected with a single installation visit using its long-range radio communications solution alone. If this were rolled out at scale it could provide a more convenient experience for millions of consumers and lower installation costs."

Image: BMW

Who says hybrids can't be sexy?



By Bonnie Gardiner

UK businesses are being encouraged to add electric vehicles to company car schemes and vehicle fleets in a bid to cut costs and help meet sustainability targets.

The British Electrotechnical and Allied Manufacturers Association (BEAMA), which represents more than 300 companies, is collaborating with UK and international governing bodies to develop more efficient low-carbon transportation as well as helping make the switch to electric vehicles more accessible.

Growing concern over the environmental impact of petrol-based transport has led to renewed interest in an electric infrastructure, with public and private transport attempting to provide a new system with the grid that is safe, futureproof and smart.

The appeal of low-carbon transport is also growing in the business world since the government introduced a company car tax in 2002 relating to a car's CO₂ emissions. However, despite this – and generous incentives of £5,000 discounts per car – only 3,200 electric vehicles have been sold over the past two years in the UK.

But businesses would do well to take advantage.

The Energy Saving Trust, funded by the Office for Low Emission Vehicles (OLEV), demonstrated how businesses that switch to electric or plug-in hybrid vehicles could reduce their fleet fuel costs by 75 per cent with the recent Plug-in Fleets Initiative.

The initiative also found that those

organisations that operate vehicles with mileage below 80 miles per day would find that a pure electric vehicle fleet would meet their needs on a single overnight charge.

The European directive on clean fuels, unveiled in January, recognised three major barriers to electric vehicle adoption – the cost of the vehicle, the acceptability of the vehicles, and its perceived lack of charging points.

Manufacturers are keen to tear down market barriers in order to meet new targets on overall emissions from the cars they sell, meaning they need a portfolio of high-efficiency hybrids and electric vehicles. More and more battery-powered cars are driving into the market, with top brands producing entirely new and far more capable vehicles such as the Ford Focus Electric or the BMW hybrids i3 and i8.

Lack of time

More charging points for electric cars are also being discussed so that business fleets can work to their capacity, with the OLEV working on an initiative to get more charging points in public places and at homes.

But the main issue for business fleets looking at electric vehicles is a lack of time, according to Rodney Turtle, strategic marketing director for Schneider Electric, and member of BEAMA's Electric Vehicle Infrastructure Project.

“One of the issues that you get with fleets, particularly those used for business purposes such as parcel delivery groups and public transport, is that those vehicles need to be able to run for eight hours. So it's less about range and it's more about time,”

says Turtle. “They don't have four hours to break off in the middle of the day to charge their vehicles.”

Such issues are likely to be a catalyst for new services that wrap around the electric vehicle, with a growing demand for more accessible delivery and maintenance.

“If you've got all these charging points appearing, you would want a national register of charge points,” says Turtle. “You'd want a way of booking your slot at your charge point, as well as ways to make payment and billing easy. Those things are now slowly emerging.”

More fast chargers may also one day show up on the UK motorway network, but Turtle explains that, because most service stations along the motorway network are independent operators, there is not yet a suitable business model. However, in 2010, power and automation technology specialists ABB partnered with BP to roll out a network of DC rapid chargers at BP petrol stations in Europe, with the first five locations for the scheme in Benelux (Belgium, Netherlands and Luxemburg) – an unexpected move for an oil company.

“I don't know what attitude the oil companies will take to it because, as you can imagine, they want to continue to sell diesel and petrol. Obviously they can't resist the future, but they don't want to encourage its arrival,” says Turtle.

Above: vehicles such as the BMW i8 could bring hybrids to the mass market

Below: Transport Secretary Patrick McLoughlin



The adoption is expected to be slow, but it's nothing new for the industry, which has already undergone several market changes over the years.

“If you look at diesel vehicles when they first came in, there weren't many sold; everyone thought they were like tractors,” explains Turtle. “But then you got the new turbo diesels coming in which were much more efficient, and now most company car fleets are diesel.”

Maturing market

BEAMA is calling on the government to keep up subsidies in electric vehicles until the market matures, and welcomes the recent £37m package from Transport Secretary Patrick McLoughlin who last month announced a subsidy for homes and businesses that fit vehicle plug-in points.

The industry is also keeping an eye on the national policy framework to ensure that the number of charging points grows in tandem with the number of vehicles in public, in the workplace and in the home environment.

But, despite the challenges, Turtle feels the main game-changer will be the development of more efficient vehicles as the technology catches up with the industry goals, which in turn will produce something much more affordable for businesses in the long-run.

“Even if it costs a bit in terms of the acquisition – if you get a good BMW electric hybrid that is efficient for businesses from a tax point of view, with cheaper running costs – I'm sure it'll gain some traction and some penetration of the market,” he says.



Doubts over Green Deal

THE Department of Energy and Climate Change (DECC) this month revealed that 1,803 people had their properties assessed for a Green Deal loan between January and February.

Energy and climate change secretary Ed Davey, above, has said the initiative was off to an excellent start, however the Labour party and other industry officials are more sceptical, particularly as no data was released to show which assessments are being led into successful loans.

Figures also reveal that none of the assessments were on businesses, though the DECC expect the non-domestic market will take longer to build, as enterprise assessments often take longer to arrange and carry out than domestic ones.

Public mindset is a barrier to green energy creation

By Bonnie Gardiner

PUBLIC attitudes to changing energy infrastructure have become a significant hurdle for the UK energy industry, prompting new research into the public's perception and understanding.

Efforts to decarbonise current energy systems will have weighty consequences for the public as they must adapt to new systems and patterns. As such, industry researchers now say understanding public ideas of energy systems is important to minimise concerns, while identifying and anticipating potential problems early on.

Numerous surveys on public attitudes have shown that there is a growing general approval of renewables, particularly solar and wind power.

However, a 2009 study by Research Councils UK explains that positive attitudes are not always translated into acceptance of renewable energy developments by local communities, with greater personal psychological and sociological issues still at play such as the threat and/or disruption of places to which people are attached.

"The problems come with the occasion of site-specific developments," explains

Dr Paul Upham, co-writer of the 2009 study and senior research fellow at Leeds University.

"It's generally a case of visual intrusion, or effects on landscape," adds Upham.

When approaching these issues, the study advises that mitigating this response may not always be possible, but there are a variety of strategic ways to approach wary communities.

"The general advice is to inform and consult early – to be willing to make small changes and to explain why you do what you're doing," says Upham. "Alternatively, compensation is also an option that is probably under-explored."

Perceived risk

The challenge is to change these mindsets, where the new development is seen as enhancing an area or system rather than posing a threat to it.

"In the case where there is a perceived risk – to environment and people – then the nature of the messenger matters," says Upham. "The degree of trust in the messenger is key, as well as the involvement of trust in third parties, for example, academics, consultants, even NGOs."

The industry is focused on mitigating



There is a growing approval of solar

this problem, but Upham, who last year co-authored a book, *Low-Carbon Energy Controversies*, notes that objection should also be regarded as a sign of a functioning democracy.

"It is not something you want to eliminate; you just want to be able to deal with it," he says. "People's rights are enshrined in law – and that's right – but at the same time you want this infrastructure to be rolled out. It's a difficult problem."

The promise of new technology options will not be fully realised unless these are configured in a socially acceptable way.

Community support for renewables

NEW infrastructure developments in the UK energy industry are more likely to be met with objections from communities, current cases show.

The complexity of issues can vary from case to case, and the scope of public objection will vary depending on the location and the size of the development.

A large proposal currently underway is the Sheringham Shoal development of 88 3MW turbines, located 25km from the Norfolk coast.

This development stands to make a substantial contribution to UK energy supply, but is perceived by many as a potential eyesore.

By contrast, a 500kw proposal in Dunbar, Scotland involving one turbine, one sixth of the size of a more typical offshore 3MW turbine, is asking for community support. The public response in Dunbar has been positive, with the majority of local people in favour the wind turbines.

ExpertInsight

Big data to put customers in control

Utilities that use data to share the benefits will overcome smart meter taboos

INDUSTRY VIEW

Big data is no longer just the domain of big technology companies; it's now a tool for every business. Companies are using big data to extract operational benefits and commercial advantage. However, when a significant part of that data is personal data, it's natural for consumers to be cynical or suspicious of a company's motives – and it doesn't take much for them to push back.

The smart meter programme is a prime example and it's only part of the huge investment that will transform the energy industry. Smart meters will see utilities collecting tens of thousands of times more customer data a month than they've done before, but if the benefit for customers is just an accurate bill, don't expect a parade. They won't be pushing back on the data per se, consumers are often happy to share

their data but only if they get something in return. Just look at the success of Sainsbury's Nectar card, airmiles, Boots Advantage and Tesco's Clubcard.

But big data is defined by more than just customer data. It's a combination of the "three Vs" – volume, velocity and variety of data sources, so on its own, smart meter data will only provide a certain level of information and insight as it only represents volume. However, installing a smart meter is the start and it's an opportunity to change the relationship with a customer significantly. By using big data, utilities can put the customer in control, increase transparency and give insight into everyday energy use to help families make smart decisions for a more efficient life.

Understanding data can be the key to energy efficiency

Left: Mary Turner

Of course real people don't want to spend time poring over complex data; they just want to know simply how this helps them.

Individual insight

But combining the data from millions of smart meters and meshing it over time with third-party data, such as demographics, housing stock, energy efficiency measures and weather, gives real insight both at an individual and a macro level. It's the comparison

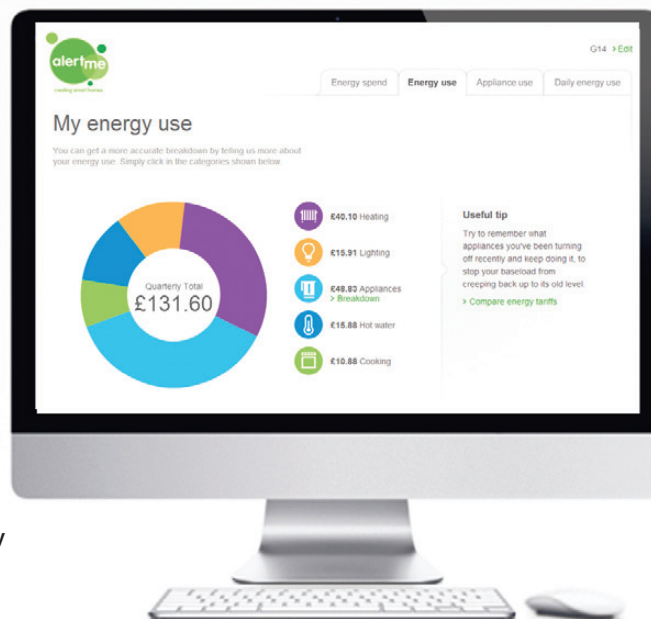
Combining data from millions of smart meters and meshing with third-party data gives real insight

and context that makes it personally relevant and reveals real insight for the utility and the customer.

The utility is able to use diagnostics to identify trends in order to develop more appropriate new products and services while the same data can be used to help the customer identify where they are wasting energy or point to easy measures that will make a big difference to their bills – such as improving insulation.

This sort of customer engagement is a vital step for the retail energy market because energy prices are only headed in one direction. When tariffs are much the same, a utility that can help its customers become more efficient with little or no effort will make those customers happier, more informed and probably more loyal. That's the real benefit of big data.

Mary Turner is CEO of AlertMe
www.alertme.com



British firms look for eastern promise

UK Trade and Investment (UKTI) is hosting a five-day trip to China for British companies hoping to explore business opportunities in smart grid investments.

British technology, advanced manufacturing and ICT companies have been invited to explore a new major business sector being created in China with the construction of a “strong, smart grid”.

The new grid, which involves the entire Chinese power network, is in the second construction phase of an 11-year deployment plan, with £150bn to be invested up until 2015.

The project includes increasing generation and transmission capacity, nationwide installation of smart meters, large-scale renewable energy integration, and the building of large substations.

Safe and sound tech is key

By Bonnie Gardiner

COMMUNICATION networks are showing strong progress in the run-up to the smart meter roll-out to ensure that both industry and consumers reap the full benefits of the new technology.

New “smart” technologies for domestic and business properties will have greater functionality than earlier automated meter-reading systems, by introducing a level of control for users on the grid and providing granular data in real-time to the distribution companies. This will allow better capability for meeting the peaks and troughs in demand.

“Sometimes people think of smart metering as just giving meter reads,” says David Green, business development director for communications solution group, SmartReach. “But if you consider that it is actually a control network that is going to assist and protect the distribution network, then it’s a piece of critical national infrastructure.”

The communications task for the deployment of smart meters is one that has proven challenging. Organisations are spending a great deal of time and money undergoing trials with energy retailers in various areas and building types to prove that their systems are safe, reliable and capable of reaching all UK meters in their existing locations.



Systems must be able to work in all locations, high and low

“This is incredibly important because when smart metering is reaching its full roll-out, the industry will be installing more than 30,000 meters a day,” says Green. “If you think about the logistics of making appointments and getting people to stay at home and getting the equipment deployed and installed, it’s an incredibly challenging programme. The one thing that can be done on the communication side is to make sure that, when all of that has happened, the communications will work first time, every time.”

On the energy provider side, organisations such as IBM are working with energy

retailers and utility companies to provide intelligent analytics, giving an insight into how to define and take advantage of data collated. Meanwhile, both IBM and SmartReach are involved in a number of projects around the UK that focus on ways to use that data to inform and educate customers, as well as influence how they will change their energy usage patterns.

“What we’ve been focused on is trying to make people aware of what’s coming, and to make sure that the experience is as good as possible,” says Green. “The data itself doesn’t save anything though...to benefit from this, people have to be engaged.”

ExpertInsight

Hitting the renewables target

Why community energy storage is going to be key

INDUSTRY VIEW

By 2020, according to government targets, renewable energy will make up 15 per cent of the UK’s energy supply. As part of this, the government introduced feed-in tariffs, a scheme that pays people for creating their own “green electricity” and so push solar power to become one of the fastest-growing renewables sector.

While the integration of renewable sources such as solar is a critical step to reaching our low-carbon economy ambitions, our electricity grid was built for another century, before things such as datacenters and computers.

The solution lies in creating a modern smart grid. However, the root of the problem is the current grid’s centralised model which is often limited to a one-way power flow. This is preventing the two-way distribution of power back on to the grid that is required to incorporate alternative energy.

More to the point, unlike the systems used at a power plant, you cannot simply switch the sun on when there are peaks in energy demand. Therefore, for renewables to provide efficient energy supply and for an effective grid to run, the energy needs to be managed and, more importantly, stored. In the UK, energy storage has been recognised by Ofgem as a viable solution with Imperial College, London reporting that it could generate savings of up to £10bn a year.

Reliable backup

Community Energy Storage (CES), a battery-based system that positions discrete amounts of utility-controlled storage at the grid’s edge, has been a recent innovation in the energy sector. CES provides far-reaching benefits including reliable backup power for communities, integration of renewable energy sources and better voltage control. Fundamental efficiency gains can also be achieved through power factor correction.

Adding a variety of low-carbon technologies such as solar photovoltaics and electric vehicles to the network can necessitate building a bigger network to cope with the demand, although such network reinforcements can be costly with associated long lead times. CES provides asset relief through peak shaving, enabling utilities to defer capital expenditures for major sub-station and distribution system upgrades.

Spread demand

We recently worked with Scottish and Southern Energy Power Distribution (SSEPD) on a pilot community energy storage project. Based at the SSEPD eco-home project, Zero Carbon Homes, in Slough. The pilot consists of three 25kWh lithium-ion batteries connected at a strategic point on the low voltage network. The batteries are being utilised to spread demand and generation loads at different times throughout the day.

During the pilot, SSEPD will model and analyse the benefits that energy storage can provide to a low voltage network. The project aims to provide further evidence that community energy storage can perform the same function as a traditional reinforcement and hence there is an economic case for installing energy storage systems.

With the potential to use renewable power more reliably, efficiently and intelligently, we envisage that communities could benefit from taking a microcosmic approach to resource management.

We have developed an array of cutting-edge technologies to generate low carbon energy but now it’s the storage of electricity which will revolutionise the way we feed it in to our grid.

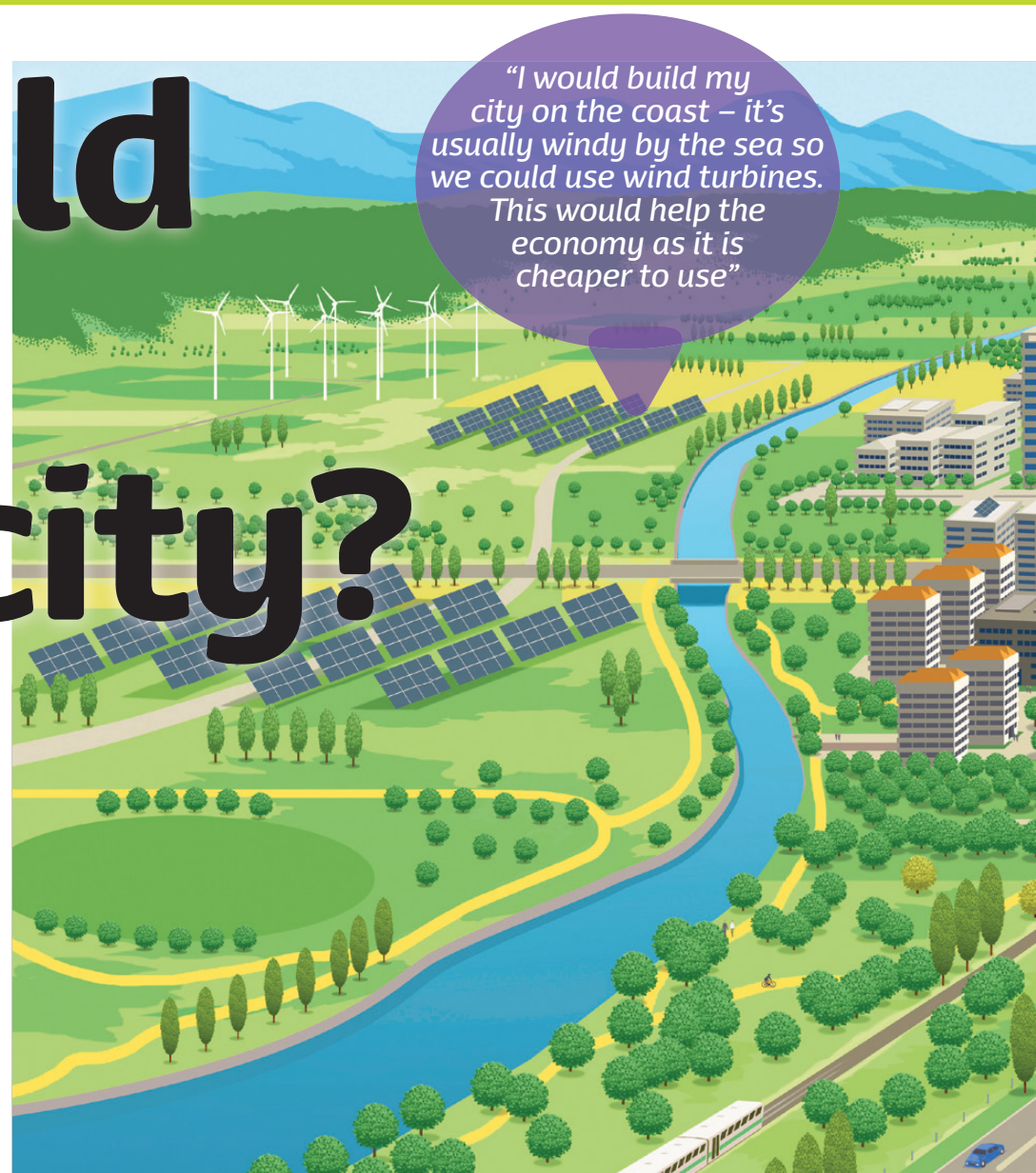
Andrew Jones is managing director, S&C Electric Europe
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Zero Carbon Homes project in Slough



How would you build a future city?

*With the propensity for emerging technologies on the horizon, the world is changing. Carbon-heavy options are being replaced, waste and pollution are recycled as energy, and a whole range of smart solutions are being implemented to maintain the health of a city, its environment and, of course, its inhabitants. With all these epic shifts taking place, what will the cities of the future look like? **Bonnie Gardiner** finds out...*



Vince Cable Secretary of State for Business, Innovation and Skills



Future cities are already becoming a reality as the government is approaching this as one of its Catapult schemes.

I have just confirmed that the future cities centre will be based in London linked to a demonstrator in Glasgow which will concentrate on supplying advanced technology to urban systems.

This is a growing market, with an estimated annual global value of £200bn by 2030.

The Catapult will explore new ways to tackle congestion, for example making cities more comfortable, efficient and business friendly.

Mark Elborne CEO of GE UK



Behind all the innovations that will shape future cities is the increasing integration of the digital world with the world of machines.

This deeper meshing has the potential to bring about a fundamental change to our daily lives from where we live to where we work. By delivering greater speed and efficiency to industries as diverse as construction, transport, power generation, lighting, and health care delivery, innovations across these fields will shape the cities of the future.

GE refers to this as the industrial internet. With smarter, better-integrated machines – and by harnessing the power of physics-based analytics – people will become better connected.

This will put them in a position to carry out tasks that was previously impossible to do remotely, such as filling up the fridge, switching on the washing machine or watering the garden.

Whether you live in the UK, the US, China, Africa or Kazakhstan, it is digital integration that will change the way you live in the future.

Matthew Pencharz London mayoral adviser



London's population will reach more than 9m by 2020. That's another 700,000 people – and electricity demand is still rising between 1 and 4 per cent a year, making it the perfect laboratory for smart city innovation for cheaper, greener energy.

The mayor is driving smart innovation and investment to manage demand more efficiently with smart grids and is determined to see more of the capital's energy generated locally to deliver lower cost and lower carbon energy, as well as taking pressure off the national grid.

Through the planning system and being the first to apply for a "junior electricity licence", which will allow smaller generators to sell their excess electricity at a much better rate, the mayor is de-risking the investment in London's energy infrastructure.

With London's mix of new developments and older infrastructure to retrofit, smart city innovation can be tested to deliver a more secure, more affordable and more environmental energy future.

Crucially, what can be delivered in London can be scaled up and delivered anywhere in the UK.

Steve Rayner Co-director of Oxford Programme for the Future of Cities



Thus far, the sustainable cities agenda has largely focused on how to further reduce "inevitable" damage. In my opinion, the next step in envisaging future cities is to focus on how cities could actually

improve the environment at the same time as enriching the lives of their inhabitants.

I would aim to mimic some of the most exciting developments occurring at the moment, as cutting-edge architects and engineers are rediscovering traditional technologies, and realising them using the latest computer aided design technologies and modern high-tech materials.

Examples include floating communities in the Netherlands, emulating the traditional floating villages of Southeast Asia, while Norman Foster's Masdar project sees an adaptation of traditional middle-eastern wind towers is being used to divert breezes above rooftop level to cool buildings.

This blend of traditional wisdom and contemporary technical capacity may change the face of the city over the next 50 years as radically as the motor car did between 1910 and 1960.

Mike Cavenett Communications manager for the London Cycling Campaign



We believe sustainable transport will have a key role in the cities of the future.

Cycling as a mass transport improves public health, reduces congestion, puts more money in people's pockets, offers a high return on investment for transit authorities, and means fewer deaths and serious injuries on our roads.

There's a compelling case for making our city streets safe and inviting for everyone to walk and cycle.

The experience of the most successful cycling nations – Denmark and the Netherlands, for example – shows that separating cyclists and motorists on busy roads is the only way to encourage mass cycling, otherwise the

majority are understandably too scared to ride in close proximity to fast-moving traffic.

Putting in place segregated cycling facilities on main roads, while also calming and reducing motor traffic on residential and shopping streets means all city-dwellers, including children, and other groups such as the elderly who currently rarely cycle, have genuine transport choices.

The city of the future certainly won't be car-free, but it'll feature a much more equitable balance between cars and sustainable transport, with benefits for everyone.

George Kervin Evans 12-year-old boy



The most important thing in my city would be open space so children will have somewhere to go. Because if it gets too crowded, most people would just stay inside.

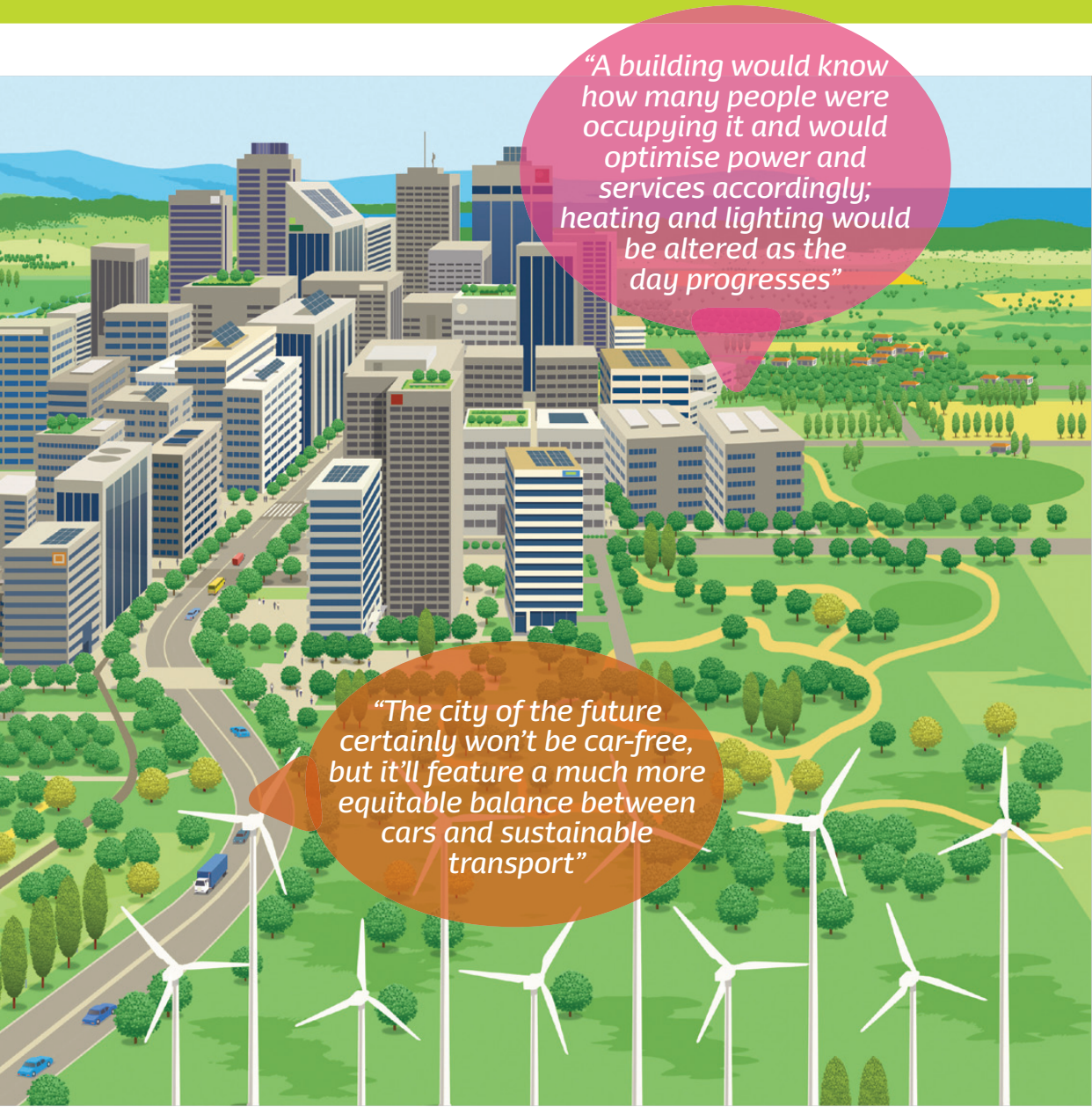
I would build my city on the coast so we could build tidal barrages to harness the power of the sea. It is also usually windy by the sea so we could use wind turbines as well. This would help the economy as it is cheaper to use.

My city would not be a big city so there would be more space and less pollution. Alongside the roads there would be plenty of cycle routes for people to get around. There would also be buses.

I would not want any of the houses to be too big, so the place would look nicer.

There would not be any big shopping centres either – just smaller shops where people could get to know each other better. This would be better for the community.

I think that children should live near their schools so they can walk to school, this would also help people get to know each other better.



Laurence Carpanini
Director of smart metering and smart grid, IBM UK and Ireland

Is this what a future city might include?

The key focus for IBM when building cities is data. It's about enabling cities to gather more high-quality data, in a more timely fashion.

The pervasiveness and low cost of existing devices and sensors within a smart grid – such as gas, electricity and water meters – offers the ability to measure, sense and understand the condition of virtually anything. The resulting

data, in combination with ever-increasing processing power, provides the core for analytics that can derive insight and intelligence to allow us to optimise and control services within cities.

For example, smart buildings would use this data to analyse the amount of energy and services that they use. A building would know how many people were occupying it and would optimise power and services accordingly; heating and lighting would be altered as the day progresses; energy consumption would make the best use of local renewable energy sources.


BEST of the
BLOGS

By Jay Allen, web assistant
▶ Editor's pick
Greenbiz, greenbiz.com/engage/blogs

A website that connects a variety of blogs and bloggers together, GreenBiz is a comprehensive and informative eco business resource. It covers current and future issues surrounding the business environment, with articles from experts on topics ranging from climate change to energy wastage. Offers a real diversity of opinion.




Environmental Economics
www.env-econ.net

 Shrewd businesses always need thorough knowledge of the economic landscape regarding natural resources. American professors Tim Haab and John Whitehead provide daily industry-wide updates and in-depth analysis.


Sustainability in Business Association
sustainabilitybusinessassoc.wordpress.com

 An interactive community hub for all businesses and organisations. This Australian forum keeps all business leaders in the know on the latest events, conferences, news and practices to help keep costs to a minimum while protecting the environment in the process.

Gtrends Unleashed
gtrendsunleashed.com

 A hugely useful business blog with a wealth of resources on achieving sustainability. Whatever your industry, Gtrends Unleashed caters for pretty much everyone. It also delivers up-to-date news on the latest eco-friendly business trends.

Ecopreneurist
ecopreneurist.com

 This is one for any entrepreneur out there with an interest in green businesses and investments. Run by eco and social entrepreneurs, Ecopreneurist provides expert guidance for anyone looking to launch their own business with an emphasis on eco-friendliness.

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The future is smart

Smart grids can secure affordable and efficient energy

INDUSTRY VIEW

Few people ever think about the network or grid of power cables that connects us all to the power stations that produce our electricity, or how the system is operated. Yet this grid plays a vital role in providing a reliable and affordable electricity supply.

There is a great deal of talk right now about smart grid and smart meters, but still confusion about what these terms actually mean. Smart meters are just that; our existing electricity meters are going to be replaced by new meters that can be read automatically, have more functionality and, most importantly, can exchange data with our electricity supplier.

The smart grid is a much bigger concept in which smart meters will play one part.

Our existing grid's design is underpinned by two principles. The first is that all electricity is generated by power stations at the top of the supply

chain, and it travels down to customers through the grid. The second is that power generation is controllable but the demand for electricity is not.

Time to get smart

Neither of these principles will apply in the future, which is why we now need to make our current grid 'smart'. Firstly, we want to connect electricity generation at all levels of the grid – whether from homes or large power stations.

Secondly, a low-carbon mix of diverse electricity generation including renewables, fossil fuels and nuclear will be much more expensive to construct and operate if we don't use the opportunities technology now brings to flex demand. This greater flexibility requires the whole electricity system to have much more intelligent control in order to connect new generators efficiently and match electricity demand and supply on a minute-by-minute basis.

An example of demand

response that is being adopted is to automatically schedule equipment, such as supermarket freezers, to avoid running during short peaks of high electricity demand. Commercial users can be rewarded for such services to balance the grid.

A smart grid will also reduce the need for extra underground cables, power lines, and generating equipment by optimising their use. This will become increasingly important as many of us drive electric cars or keep our homes warm with heat pumps.

Development of this smart grid will take several decades. The rollout of smart meters later this decade will be just part of this transformation.

By the

2030s, when it begins to be fully functional, the smart grid will allow the integration of all the low-carbon technologies needed to achieve national energy security and environmental targets in a cost-efficient way.

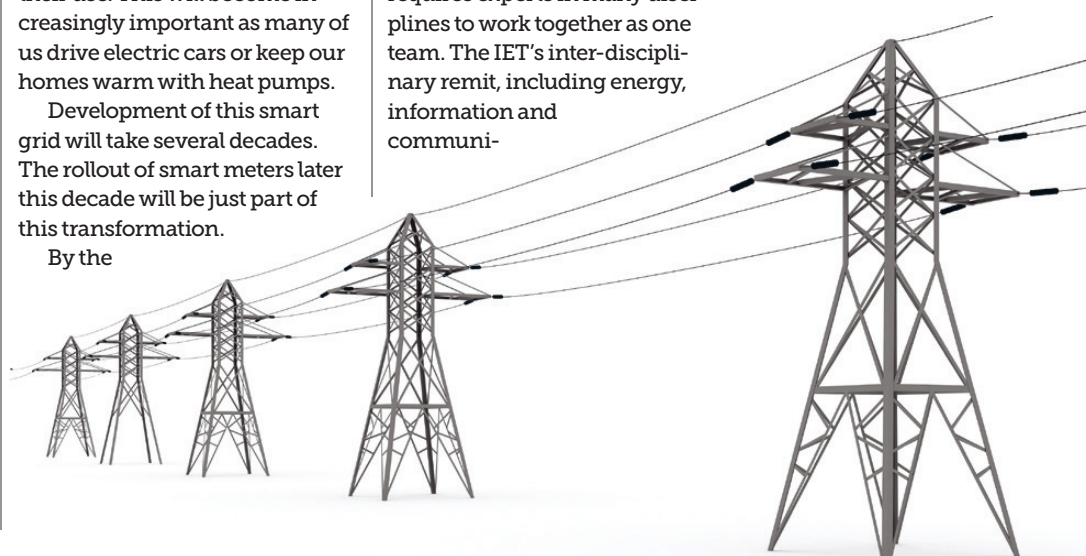
Work together

IET President, Professor Andy Hopper, highlights the fact that engineering the smart grid requires experts in many disciplines to work together as one team. The IET's inter-disciplinary remit, including energy, information and communi-

cations technologies, transport, manufacturing and the built environment, enables professionals to share the knowledge needed to design the infrastructure of the future.

The IET has a new briefing on smart grids, entitled "What is a Smart Grid?" which can be seen on the IET's website.

www.theiet.org



How can clean and reliable energy be made available to the UK consumer?

INDUSTRY VIEW

As the UK government invests in a new energy reform promoting Smart Grids, Kiyoshi Yamamoto, Managing Director of Hitachi Europe Ltd. and Andres Larriera, Head of Smart Cities Energy Group, explain how their company can provide high-quality social infrastructure solutions.

Why should Hitachi, a Japanese company, be designing and building smart grids in Europe?

Developing smart grid infrastructure in Europe is one of our objectives to increase the company's strength on the global stage.

Hitachi has always striven for the improvement of society through advanced technology, both in Japan and globally. Today, as society faces the challenges of increased pressure on limited resources, our commitment to creating a better world through innovation is more relevant than ever.

Our company's strategy is built upon social innovation as a way to provide high-quality social infrastructure solutions that will help our customers meet their own goals of sustainable growth. Our experience in power

Delivering smart grid solutions in Europe

systems and information technologies, two crucial elements for the delivery of future systems, will play a vital role in helping us achieve our goals, giving us the credibility and responsibility to answer today's need for smart grids.

What smart grid projects are Hitachi currently involved in?

Our London-based Smart Cities Energy Group, part of Hitachi Europe Ltd, serves the UK market through extensive collaboration with local organisations and leading academics on some of the most pressing energy-related challenges.

We are currently working with the Energy Technologies Institute on the design of smart energy systems. We recently achieved successful dynamic control voltage trials in partnership with Western Power Distribution under the Low Carbon Networks Fund, leading to a simple and cost-effective integration of renewable sources of electricity into local electricity distribution networks.

These projects have allowed Hitachi to grow local capabilities in the smart grid business while building on existing experience.

Our smart grid activity is paving

the way for widespread adoption of renewable energy in the UK. It is a perfect example of what Hitachi means by social innovation business, providing society with secure, reliable, sustainable and affordable energy thanks to advanced technology and innovation.

What are Hitachi's main priorities regarding the evolution of smart grids in Europe?

Today, a number of communities across Europe are looking to go smart and they need new ways to manage energy.

We want to partake in Europe's transition to a low-carbon economy, with increased energy efficiency and smart system management at its core.

In the UK, the deployment of innovative technologies will help distribution network operators manage the integration of renewable energies to existing infrastructures thus helping the British government meet its renewable targets for 2020.

Since our founding, we have helped build social infrastructures in Japan and worldwide. It is our ambition to contribute further to a sustainable society. By leveraging our cross-market



Hitachi: paving the way for renewable energy

experience, we aim to provide society with innovative yet realistic solutions to the wider challenges we all face.

smart.cities@hitachi-eu.com
www.hitachi.com/products/smartcity



UK is on track to meet 2020 energy challenge

By Bonnie Gardiner

THE UK needs to keep on track in order to meet renewables targets under the EU Renewable Energy Directive, according to the national Renewable Energy Association (REA).

As the UK consortium of the European Renewable Energy Council's (EREC) Keep on Track project, the REA reports that, despite some positive movements, the lukewarm approach currently being taken by UK government to renewable energy is undermining industry confidence.

The Keep on Track project is an intelligent energy scheme which aims to keep track of what member states are doing in terms of renewable energy to ensure they are progressing towards achieving their 2020 renewable energy targets.

Eurostat data from 2011 shows that the UK is currently performing well and should have met its 2012 target of 12 per cent renewables.

However, the EREC and the REA believe there are many issues making it difficult for the UK and other member states to "keep on track".

"If you look at the success in the first few years since the directive was agreed, we are pretty much on target," says

Mike Landy, REA Keep on Track UK project leader. "However, because that trajectory gets steeper with time, there's no cause for complacency."

Analysts reveal that UK investment in renewables has dropped off substantially since 2009, while industry confidence has been greatly shaken by a lack of clarity from the government.

"You could be forgiven for thinking the UK has two different energy policies; one driven by the department of energy and climate change and the other one driven by the chancellor in treasury," says Landy.

"Everything the chancellor says seems to imply a future dominated by gas, whereas clearly what we and the DECC are aiming for is to achieve the 16 per cent renewables."

Further insecurity is caused by abrupt regulatory and policy changes such as the 2010 review on the Renewables Obligation, along with the

"British industry is accused of taking a short-term view and aiming at short-term profit" – Landy

much anticipated Electricity Market Reform, which is due to completely replace the renewables obligation in 2017.

Aside from becoming a member of the REA, Landy says there are many ways that organisations can help and contribute towards improving the policy landscape.

"British industry is often accused of taking a very short-term view and just aiming at short-term profit," he says. "We'd encourage industry to work with communities,

because renewables are a set of dispersed technologies which on the whole have to be implemented on a local level."

EREC senior policy adviser Lucie Tesnière, left, has called for governments to realise that harmful behaviour, such as cuts to support schemes or delays on new projects will only make it more difficult for them in the last few years of the decade.

"What we hear echoed from all the national renewable energy associations is that government should introduce more stability and reliability in their support schemes," insists Tesnière. "It doesn't mean the targets should be higher, but that they should be stable and predictable, so that we know on good grounds that we can invest reliably."



ExpertInsight

Smart meters need a smart market

Britain's energy security is vital to the economy, says CGI's Rich Hampshire

INDUSTRY VIEW

Why is it vital that we establish a market that allows the information and communication infrastructure associated with smart meters to be used by multiple parties?

Britain's energy security and affordability exists in a global context.

The number of people benefiting from higher standards of living globally is projected to grow from around 2bn today to 5bn by 2030. Raising standards of living correlates with increased energy use. As energy use touches every part of our lives, we should expect global energy demand to boom.

If we are to continue to enjoy the levels of affordable and reliable energy supply we take for granted, we must revolutionise how we consume energy. That requires a more intelligent energy infrastructure.

Britain benefits from operating one of the world's most deregulated, unbundled and consistently competitive energy markets. The Smart Metering Implementation Programme will introduce an information and communication infrastructure that will help enable us to meet our energy needs. It is arguably the most ambitious programme of its type, with around 53m meters being installed in almost 30m homes and small businesses.

Yet one of the biggest challenges in deploying smart meters and grids is the least discussed. How we create a market infrastructure that simultaneously protects the competitive nature of the British energy market and delivers meaningful, new energy choices for consumers.

How will it support choices and competition for consumers and business?

In an unbundled energy market an effective market infrastructure reduces the complexity of the commercial arrangements between the multiplicity of market participants, removing cost and reducing barriers to competition.



Left: Rich Hampshire



Energy security can boost the economy

This helps to secure investment, stimulate innovation in low-carbon technologies and, ultimately, deliver consumers real choices. The government's own impact assessment shows a benefit of £1.7bn associated to consumers by being able to switch between suppliers more simply.

The guiding principle for any market infrastructure is that it should only be responsible for activities common to all market participants, and from which they can neither create differentiation nor achieve cost leadership. This maximises the value of the market.

In Britain, the creation of the Data & Communications Company at the heart of our smart-enabled energy market will provide this vital market infrastructure.

CGI's clients operating in simpler market structures often find it hard to understand how Britain's energy market works successfully. This means, even where other countries are further down the smart route, their lessons and experiences do not translate to the challenges we face in Britain. We should expect the world to look to our experiences to inform their thinking as they embrace the smart revolution, as happened following the opening of the market in 1998. This will create huge opportunities for British businesses to sell their expertise globally.

Success will do more than help to keep energy affordable. The affordability and reliability of energy is an important consideration for investors and businesses deciding where to base themselves. Britain's energy security is, in this way, fundamental to our economic prosperity.

Rich Hampshire is smart markets lead at CGI
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Industry must get smart to keep hackers from our data

By Bonnie Gardiner

THOUGH smart grid is being hailed as the future, privacy campaigners are warning of the potential for abuse – causing many to fear an upgrade to new smart metering technology.

The smart grid presents a great opportunity for society and the environment, with the ability to exploit advances in technology to better understand and manage energy usage. However, with most beneficial technological developments, it also presents opportunities to the malicious.

Protecting smart grid infrastructure from cyber threats is a high priority for government and industry, as it is essential to preventing outages and disruption to the energy supplies, as well as preventing theft of confidential information, money or services.

Tom Burton, head of cyber managed security services at SmartReach and BAE Systems Detica, explains that the problems



Who's watching your numbers?

exist not only for consumers but stand to negatively hit suppliers.

"In the case of cyber hacking, tariff information or meter-read data could be manipulated, leading to inaccurate billing and financial loss for supply companies, while they could also incur losses through fraud if pre-payment customers are able to falsify credit on their meters," explains Burton.

Central communication firms

handling the data gathered from smart meter technologies are working towards ensuring that there are no single points of failure along the line, so that there is no one particular way in which there could be a security breach.

According to Burton, effective management of security risk needs to balance two components – protective controls to boost network defences, and effective

monitoring to detect hackers and stop them in their tracks, including the follow-up application of multiple defence layers.

"The resulting secure-by-design approach means that where threats are identified, processes and systems will be reviewed to determine how best to address the threat," says Burton.

A strong cohesion between stakeholders is also considered essential to delivering adequate security, and the proposed Public Key Infrastructure (PKI) security arrangements aim to provide a robust method of end-to-end trust between parties.

Meanwhile, Burton assures that operating over all of these controls is an end-to-end monitoring service, with experts monitoring network traffic in an effort to identify and prevent Advanced Persistent Threats (APTs) now and into the future.

"Taking a holistic approach to these security risks is essential, as attackers will look for the chain's weakest link in order to achieve their desired objectives," says Burton.

ExpertInsight

Balancing supply and demand

Flexitricity's demand-response service provides energy across the grid

INDUSTRY VIEW

What's the government's top environmental priority? That's debatable, but "the establishment of a smart grid" headed the environment list in the May 2010 coalition agreement. And they really mean it. It's hard to get a government minister – or a shadow – through a meeting without some mention of this game-changing concept.

Smart grids are about smart customers. By adapting when they use electricity, customers can make better use of wind energy, or help out at short notice when electricity demand shoots up unexpectedly or when large power stations fail. This is demand response, and it's the smart grid's cornerstone.

In February last year, the traditional electricity industry had a duvet day. Blaming cold weather, seven gas-fired power stations failed to start, leaving the grid shorter than it had been in years. As demand

National Grid has issued more than 2,000 calls to Flexitricity for power

rose rapidly, National Grid signalled Edinburgh-based energy company Flexitricity to fill the growing gap.

About a second later, the first industrial site connected to Flexitricity had taken its load off the grid. Within minutes, flexible electricity loads across Britain had turned down, while district heating generators and standby generators had switched on. Within a couple of hours, it was largely over: other power stations were warmed and started, and life returned to normal.

Demand response

Although they are not always quite so dramatic, demand-response events are routine. Flexitricity launched Britain's first demand-response portfolio in 2008, managing flexible resources at industrial and commercial partner sites over secure networks from its 24-hour control room. Since then, National Grid has issued more than 2,000 calls to Flexitricity for additional power.

Most sites expect events once or twice a month. But some are an almost daily part of balancing supply and demand. Greenhouses, cold stores, datacentres, hospitals, offices, even an Olympic venue (during the Olympics) all participate, offering their capacity for occasional use by National Grid in

return for an attractive fee. The more flexible and lower-carbon the source, the more often National Grid uses it.

What National Grid is paying for is reserve capacity – somewhere to go when things go wrong. It doesn't need to buy this from demand response, but the alternative – keeping large power stations warm, or running them at reduced output so they can turn up when required – is wasteful. Gas power stations are efficient at full power, but per-unit emissions climb sharply if National Grid dials them back to provide reserve. Flexitricity's portfolio provides reserve capacity with no additional emissions – participating sites simply get on with their day jobs.

The smart grid doesn't yet reach domestic customers in significant numbers. But it's better that demand response is being honed by industry first. Industrial energy managers don't believe in free money – they know everything worth doing takes effort – and they put financial and environmental claims to the test.

Wind generation

One conservative estimate sees demand response reducing CO₂ emissions by 300 tonnes annually for every megawatt of



reserve provided. Today, 3,500 megawatts are needed, but the low-carbon economy will need more, to cover nuclear generators – which can drop output suddenly – and varying wind generation. That's reason enough for the smart grid to be the UK's top environmental objective.

Dr Alastair Martin is the chief strategy officer and founder of Flexitricity www.flexitricity.com

Business Reporter

Diary

Bonnie Gardiner



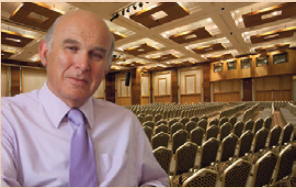
I attended the second day of Innovate UK 2013: the three-day event from the Technology Strategy Board and UK Trade & Investment held in March.

The multi-sector networking event was an impressive range of delegates – spread out over three entire exhibition floors – mingling with other organisations, academics and government representatives, each discussing their latest developments.

Displays included prototypes of electric vans, wiggling robotic arms, wind farm designs and new vegetable-growing techniques.

Seminars covered innovation,

health and agriculture, with industry specialists sharing insight and sparking debate while energy specific talks covered key issues such as open data, public perception and overcoming barriers to international investment. The ministerial keynote was covered by Vince Cable, below, who updated us on government schemes to drive up innovation.



Audience members voiced their concerns over progress and the growing emphasis being put on manufacturing over service-based sectors.

On how to enhance consumer engagement, Ben Todd of Arcola Energy notably encouraged reaching out to younger generations, claiming: “If you change the kids, you change everything.” Todd’s organisation, coupled with a theatre company, specialises in giving schoolchildren demonstrations about smart technology, providing tools and hosting workshops where students could see how challenging the task is.

● Serious concerns over the right to privacy and security have been raised in the US regarding smart meter technology.	One lineman at a Pennsylvania utility company is reported to have told an energy consultant that “smart meters are a plot by Obama to spy on us”.
Grassroots resistance groups have sprung up in at least 18 different US states, with this smart meter rebellion even supposedly uniting people from a range of political persuasions.	Meanwhile, former CIA director James Woolsey allegedly said that on security grounds alone, the new grid design is not so much a smart grid but rather a “really, really stupid grid”. Oh dear.

F1 gearing up for radical eco change

When people think of Formula One, the last thing they consider are terms like renewable energy or eco-friendly.

That could soon change for the UK, with London listed as a potential location to host a race in the inaugural Formula

E season in 2014, meaning we could see eco-friendly electric race cars competing on our streets.

On that same theme, Materials KTN, an organisation self-described as “ever keen to develop technologies from

every feasible source”, brought together a consortium to bid for the chance to adapt Formula One technology for use in a type of solar panel known as a Parabolic Trough Collector (PTC).

Racing cars and sustainability, a perfect match?

Boris wants you! Green-minded entrepreneurs could net £20,000 prize

In an effort to boost London’s green credentials, mayor Boris Johnson has launched another £20,000 competition to find tomorrow’s green entrepreneurs.

The repeated scheme has no doubt left many bright young academics grasping for original ideas to cut carbon emissions.

The winners, announced in June, are expected to have their ideas turned into reality with the additional chance of undertaking a paid internship with Siemens, who are sponsoring the award.

Boris can pass the mantle on to students as part of his pledge to achieve a 60 per cent reduction in carbon emissions by 2025.



● While David Cameron was playing cricket and poignantly reflecting at Jallianwala Bagh, the PM wasn’t the only Brit strengthening ties and business relationships with India.

A group of UK organisations involved in smart grid developments and power electronics recently went to Delhi for technical discussions and to establish business connections at an event called Riff-Stream#Delhi.

The trip focused on helping UK SMEs involved in smart grid technologies establish opportunities in India.

Not a bad move, as recent numbers from Bloomberg New Energy Finance indicate India is leading the world by green investment growth, earning \$10.3bn in 2011 – a 52 per cent increase year-on-year.

Got something for our diary?
Email diary@lyonsdown.co.uk

ExpertInsight

Leading the smart revolution

New metering technology brings new challenges

INDUSTRY VIEW

Many people are comparing it to the day, back in 1971, when Britain went decimal. Out went 12 pennies to a shilling and 20 bob to a quid and in came 100 pence to a pound. It was a huge change which affected everyone in the UK.

In very much the same way, the arrival of the Smart Meter Implementation Programme (SMIP), due between 2014 and 2019, will have a major impact on how we value and use energy in our everyday lives.

With a planned 53m smart meters and 22m comms modules to be installed in all homes and most public and private premises across the UK, the programme aims to help the consumer to use energy more efficiently. The idea is that data will be sent from the energy consumer to a centralised data hub, where it will



Consumers can better manage energy

be processed and sent to energy suppliers to efficiently manage the new “smart grid”. The data is also sent back to the consumer simultaneously to help efficiently manage energy consumption. Consumers will also use an in-home display or other additional energy monitoring technologies to assist further in the management of energy consumption.

And that’s where ANOVO (UK)

Ltd comes in. They understand that there are two key factors that will lead to a successful SMIP:

- That smart meter rollout deadlines are met.
- That the customer’s expectations are met and that their experience is a positive one.

ANOVO, through its centres of excellence around the UK, across Europe and in South America, offers the complete turnkey management solution within B2B and B2C markets.

ANOVO offers logistical and technical life cycle management services and operations for all digital components and products, consumer IT gadgetry, network infrastructure and terminals alike. To ensure that demand will be met, ANOVO has developed its SMIP solutions platform to assist all parties involved with the SMIP.

0778 3522319
tellme@anovo.com

A quick quiz to steer you through the times ahead

Q: What is it called when someone holds two conflicting attitudes about one product or experiences dissatisfaction against expectations which will need to be eradicated for a successful rollout of the UK’s Smart Meter Implementation Programme?
A: Cognitive dissonance (for which another term is “sour grapes!”).

Q: What is the Latin word for “to renew”?
A: ANOVO

Q: Which two words can be used to describe supply chain management, warehouse inventory management, storage, picking, data configuration, packing, labelling, forward dispatch, “remote” – direct access, online consignment tracking, activations, equipment maintenance and firmware upgrades, project management, field engineering and customer courtesy call?
A: Smart fulfilment.

Q: What happens when you combine call centre and web-based customer support with ANOVO’s “knowledge centre”?
A: Returns avoidance.

Q: Which two words define the following: first and second line customer support; returned material authentication, swap stock management, on-site engineering, customer data collection, return of old meters, comms modules, IHDs and legacy equipment; repair, refurbishment, decommissioning / Waste Electrical and Electronic Equipment (WEEE) compliance management, and regeneration.
A: Reverse logistics.

Q: What is the title of a hit single by the Beatles in the mid 1960s that is synonymous with ANOVO?
A: We can work it out.



EcoReport Zone

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Go green and solve problems with Eseye and M2M

Since our Shoebill device scooped the Home Energy Monitor award at this year's European Smart Metering Awards, we at Eseye have enjoyed a surge of interest in our green energy solutions, which are all enabled by machine-to-machine (M2M) technology.

M2M is vital to the future of environmentally friendly business solutions and Eseye is working with organisations across a range of industries to find more efficient ways of employing energy-saving solutions through robust devices and reliable connectivity.

Benefit from savings

Our award-winning Shoebill has had a significant impact on firms such as Unite, the UK's largest provider of student housing, which is now on track to make a 10 per cent energy saving thanks to the data delivered by the device.

In the wider field of social housing, we're not only helping low-income families keep costs down through energy monitoring, but with the Low Carbon Exchange we helped households generate significant savings through our reliable solar panel connectivity.

Of course it's not just in the UK that Eseye is working to help companies go greener. In Kenya, M2M is central



Eseye is working to help people go greener in Kenya

to the drive to bring cleaner, cost-effective energy to families living outside the reach of the grid. With Safaricom and mobile technology firm M-KOPA, Eseye developed a solution to make clean energy more accessible and affordable to rural Kenyans.

Using Eseye's product expertise and managed connectivity, M-KOPA was able to join the movement in Africa to help eradicate expensive and hazardous kerosene lamps.

Internet of things

M2M in itself is a green solution. By making things communicate, whether they're energy readers to smartphones or blood sugar monitors to hospital computers, the "internet of things" saves time, energy and even lives. At Eseye we pride ourselves on being pioneers of this truly exciting movement, where we solve everyday problems, every day.

www.eseye.com

Making sure your power stays on

Energy must be created and managed efficiently

The energy industry is changing faster than ever before and globally we are facing a number of challenges.

As the world population continues to rise so does the demand for energy. We must not only generate energy efficiently but also manage it and use it effectively, says Nick Thompson, MV marketing manager at Schneider Electric, the global specialist in energy management.

The smart grid is part of the solution; an electricity network that is equipped with the information, communications technology and control mechanisms to integrate the actions of all users connected to it. It has an innovative platform that has the intelligence to automate, measure and manage energy generation and consumption.

Smart grid includes a wide range of technologies and solutions such as: automatic network management, load aggregation, voltage control, dynamic line rating, condition monitoring, demand response and advanced communications architecture. These solutions already form part of many industrial and electrical applications and can be applied to improve the current network's performance through enhancing operations, improving power quality and stabilising supply.

At Schneider Electric we work hand-in-hand with utility companies to ensure the power stays on. When there is a fault, our smart grid solutions ensure the effects are mitigated against, swiftly and with as minimum disruption as possible. We also manage increased demand on the network and facilitate the integration of more renewable energy with our extensive open-ended smart grid solutions. As a result, energy companies and utilities can build a detailed understanding of the real-time configuration of the grid, thus managing it effectively.

www.schneider-electric.com/uk

In focus: participation in smart grid

The smart grid market in the UK has long been debated as a sub-topic within the managed energy and smart building industry.

The solution is enabled across the energy network from smart meters to energy company management tools, and large-scale elements such as connected homes and buildings that enable energy companies to plan demand, cost and bill effectively and create user information that is effective and useful.

This, in addition to managing the energy transmission and distribution network, will ensure large-scale integration challenges and inter-company demands



for information – at all times.

To achieve the latter, energy companies must deploy a pervasive and securely managed data transmission platform, as no single network will be able to support 100 per cent coverage.

The benefit that Wyless can bring is in bridging between the many suppliers of data transmission technology. This will then create a single, ubiquitous data interface delivered to other systems via standard API's and enhance

an energy company's integration by providing a single billing interface from whatever operational systems they require. Wyless can also provide energy companies with a management platform that enables remote management and control of devices upto and including the meter, which will inevitably improve the quality of service to the customer.

The Wyless managed services offering has been used with great success by our many customers operating in the water, gas, electricity and energy management markets globally.

Marketing@wyless.com

General George Patton

“If everyone is thinking alike, someone isn't thinking”



The debate

Commercial opportunities of smart grids



Dr Howard Porter
CEO
BEAMA

The smart grid provides significant market development opportunities for technology manufacturers and distributors in the UK. Building on the investment already made to roll-out 27m smart electricity meters, the smart grid will enable a more reliable and efficient electricity network.

Smart grids will facilitate the integration of low-carbon technologies – electric heat pumps, dynamic heat and hot water storage and EVs – and maximise benefits for the whole energy supply chain. Effective network load management using added value “smart” products will provide tariff-based benefits for consumers, improved network management and help the UK to manage its generation capacity in an electrified economy.

Fulfilling the innovation and export potential of the industry to develop smart grid solutions is a key priority for BEAMA.

www.beama.org.uk



George McGhee
Chief Executive
Ewgeco

The energy revolution is now a reality. If things don't change, demand will soon outstrip supply.

An immediate and effective reduction in energy usage is essential.

Ewgeco addresses this from a sustainable behavioural-change perspective, believing the ability to drive down demand lies not with technologists, but with the general public.

Give people relevant energy usage information in an engaging, timely fashion and they will in turn reduce consumption, saving money at home and in the workplace.

The building industry has been forward-thinking by developing the Code for Sustainable Homes (CSH), which has introduced an ecological rating system – with energy efficiency as a big part of this – recognising that energy display devices have a fundamental part to play.

www.ewgeco.com



Nigel Hughes
Director of Energy
Itron UK

At Itron, we believe the success of smart grids will be critical in the journey towards a low-carbon energy industry.

The way the world manages water and energy resources is increasingly in the spotlight and this will become more vital as we progress through this century. Use of smart metering systems, network monitoring sensors, communication technology and innovative software solutions will provide the ability to measure, manage, and analyse energy consumption and delivery data in real time and help conserve resources.

The commercial opportunities lie within extending this intelligence to create action and knowledge from data. This would improve the operation of the grids in terms of reliability, efficiency, and safety, for the benefit of consumers, utilities, and the environment.

www.itron.com



James Harbidge
Programme Manager
Intellect UK

Smart grids will generate major commercial opportunities which the UK must take advantage of – both to address our energy challenges and for our economic competitiveness.

The approaching nationwide deployment of smart meters will provide the infrastructure to help energy suppliers and network operators gain new insights into their operations. New markets will then develop around how to utilise this data and how to engage consumers with their energy. With a smart grid in place, opportunities for low carbon technologies including energy storage, micro-generation and electric vehicle infrastructure will be enabled.

As the UK's ICT trade association, Intellect is championing the role of technology as critical to developing a UK smart grid and helping accelerate the realisation of these opportunities.

www.intellectuk.org



Bob Oglesby
Managing Director
UPL

As the only remaining company bidding to build new nuclear capacity in the UK, EdF is currently locked in commercial negotiations with government.

Should these discussions fail, it's unlikely that there will be any new nuclear capacity in the UK for at least 10 to 12 years. Gas could potentially assist in bridging the gap as older capacity goes off-line but at significant risk to CO₂ targets enshrined in law. Demand management is one option to save the day, which points unerringly to smart grids and energy efficiency.

Smart metering and data, smart tariffs and smart energy management are set to make a critical contribution towards eliminating the risk of power shortages, reducing CO₂ and helping towards a greener economic recovery.

www.up-ltd.co.uk



Alan Aldridge
Executive Director, Energy Services and
Technology Association (ESTA)

If smart grids are to achieve their aim they must be designed with consumers in mind, helping them lower consumption – and bills.

Reducing overall demand will lower infrastructure investment and require fewer imports. ESTA, the industry body for energy management, has more than 100 members who are experts in designing and implementing energy management strategies. To succeed, smart grid system design must focus on benefits of energy efficiency technology, such as energy price signals to help consumers manage their usage effectively, reduce system loads through investment in energy-saving technologies for end-user applications and dynamic and flexible demand-side management to smooth demand and reduce the peak-time spikes.

Smart grids will only work if consumers engage with them and see benefits of doing so.

www.esta.org.uk



Alexander Schönfeldt
Director Sales & Marketing
Locamation

Taxpayers are right to question why today only a few companies are gaining profits from subsidised business. To make it beneficial for all stakeholders we should focus on the benefits for consumers.

The grid must become smart, with high performance enabling sustainable commercial opportunities. Make zero-emission houses and electrical vehicles active grid components and they will power themselves. Let grid companies fulfil demand response requirements so they can maintain their profit margins.

When most substations become automated to manage bidirectional power flow efficiently, safely and reliably to become the “internet” of the electricity network, consumers will start to seek more services they are willing to pay for. In this context, Locamation offers its SA Sensor Platform to run the future grid on.

www.locamation.com



Rob McNamara
Executive director
SmartGrid GB

Smart grid development is a race worth winning.

In addition to the benefits it will deliver to the wider energy system, it also represents a significant commercial opportunity.

Our research has found that smart grid development could cost £19bn less than traditional reinforcements to the grid over the period between 2012 to 2050 and could stimulate an export market in goods and services worth up to £5bn to the British economy.

At SmartGrid GB we believe that if we are going to seize these opportunities, key policy, regulatory and commercial barriers will have to be overcome.

Our membership comes from across the value chain and we are committed to providing a unique cross-industry perspective on how to make smart grid a reality.

www.smartgridgb.org

Efficient, flexible, and secure. *Welcome to the smarter grid.*

Efficient

Optimising the networks load management and grid efficiency.

Flexible

Integrating more green energy, and upgrading ageing networks in a cost-effective way.

Secure

Enhancing and protecting the automation network security, ensuring continuity of service to you.

At Schneider Electric™ we work hand-in-hand with your utility company to ensure your power stays on. By managing increased demand on the network, we facilitate the integration of more renewable energy with our extensive open-ended Smart Grid solutions helping you make the most of your energy.



Learn more about our Smart Grid solutions
and be entered to win a mini iPad!

Visit www.SEreply.com Key Code 33494p

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