Unifying the EU energy community

Dalia Grybauskaitė, President of Lithuania, on the benefits of stronger collaboration

Reconnecting with customers
Rebuilding consumer trust to secure the future

Bringing new energy to transmission
Powerlink Queensland CEO Merryn York on a sector in transformation

Generation mix
Future-proofing coal
China could lead in CCS
Hydrogen: hype or opportunity?
Re-energize, reconnect
There are challenges for utilities at both ends of the value chain – to create a sustainable generation mix and put customers at the heart of strategy.

New technology and evolving customer expectations continue to transform the daily business of running utilities – from how they generate and transmit power, to how they serve customers.

A key factor now reshaping the whole business, from supply to demand, is the desire for our energy to be clean. To achieve this, utilities need to diversify generation, to include more renewable energy as cost-effectively as possible. Utilities also need to offer customers a portfolio of power choices, backed by excellent service. Although customers tend to agree that clean energy is desirable, in many geographies they haven’t even begun to pay what energy really costs.

Utilities must therefore engage closely with buyers of energy – not just to ensure that they provide what customers really want, but to educate them in how to be responsible energy users.

Addressing clean energy needs within a diversified generation mix, while keeping costs as low as possible, is a theme explored from diverse angles in this issue of Utilities Unbundled.

We consider the best route to turn coal into a cleaner, more sustainable source of power, with views from North America, Europe and China (see “Future-proofing coal,” page 25 and “China could lead in CCS,” page 52). We investigate how innovations in hydrogen production and storage could offer new revenue streams and clean energy solutions (page 22). E.ON’s Dr. Cord Landsmann assesses new approaches to funding wind power (page 20) and Andrew Jamieson, CEO of the new UK Offshore Renewable Energy Catapult, explains his hopes to incubate innovation and make offshore renewables bankable (page 45).

Turning to the other end of the value chain, our lead feature (page 10) explores the forces that are putting relationships with customers under stress and presents an action plan to help capture new opportunities in the energy retail market. We talk to utilities about their approaches to building relationships with customers, service innovation and new underpinning technology, drawing on examples of leading practice from other sectors. Reconnecting with consumers is not just a marketing ploy: it is a vital part of survival. Utilities are on a long journey of transformation, and they need to bring energy buyers with them.

I’ve greatly enjoyed charting power and utility trends as lead editor of Utilities Unbundled since its inception in 2006. The intervening years have seen the sector transform, from one where national boundaries and state-owned structures dominated, to today’s truly global, highly commercial environment.

This is the last issue I will oversee: as I hand over the reins to a new editor, I’d like to thank the many contributors – utility leaders, regulators, industry commentators and politicians – who have generously given us their time and insight. I’m greatly looking forward to working on new challenges in the sector as it continues to evolve.
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www.ey.com/powerandutilities

ED None
Watching brief on power and utility projects worldwide

UK
Carbon price floor is further blow to single EU energy market
The UK’s plan to introduce a floor price for carbon from April 2013 is being seen as a sign of fragmentation across Europe’s energy markets. The floor price aims to encourage investment in low-carbon energy by topping up the price of carbon allowances generated by the European Union Emissions Trading Scheme (EU ETS). The stated aim of the policy is to ensure that the price paid for carbon by electricity producers in the UK is around £15.70 (US$23.9)/tonne CO₂ in 2013, rising in a straight line to £30 (US$45.7)/tonne CO₂ in 2020 and £70 (US$106.6)/tonne CO₂ in 2030. The approach could be copied by other countries seeking to curb carbon emissions and lacking faith in the EU ETS; it has already attracted positive comment from some German market commentators. However, critics have pointed out that it could lead to a loss of competitiveness for UK businesses.

Lithuania
New underwater power link by 2015
The Lithuanian Government has approved construction of the 700 MW NordBalt electricity interconnection between Lithuania and Sweden. The third-longest underwater power link in the world, it will integrate the electricity market of Lithuania and the Baltic States with the Nordic and European Union (EU) electricity markets. The link will improve competition and provide alternative sources of power supply. The €520m (US$679.5m) project, co-financed by the EU, is expected to be completed by the end of 2015. See page 39 for a personal view of EU energy challenges by Lithuania’s President, Dalia Grybauskaitė.

North America
US transmission spending to peak in 2013
The Edison Electric Institute (EEI) expects its members to spend US$15.1b on transmission in 2013, up from US$11.1b in 2011. Though spending has climbed consistently since 2007, a dip is expected in 2014 and 2015. This is attributed to the impact of demand-side management and energy efficiency measures on load growth, as well as ongoing economic slowdown. Continued high investment in transmission is needed to maintain security of supply at a time when U.S. Environmental Protection Agency (EPA) regulations prompt more coal plant retirements and greater contributions from renewable energy sources.

Brazil
Power diversification key to energy security
Concerns about energy security have forced Brazil to continue diversifying its generating mix away from hydropower, which currently accounts for around two-thirds of the installed 121,000 MW total capacity. A fall in dam capacities in late 2012 to early 2013 impacted hydro, forcing distributors into costly spot purchases of backup thermal power. Construction of at least 3,000 MW of thermal plants and expected wind power growth of 1,500 MW will account for more than half of the country’s targeted capacity expansion of 8,500 MW in 2013. For more on Brazil, see page 29.

Africa
African power sector lures foreign investors
Ongoing market reform and opportunities to increase power capacity in countries including Nigeria have prompted a spate of foreign investments in Africa. South Africa is collaborating with foreign players including Spain-based ACS, to develop several solar and wind power projects. Separately, hydro power projects in Nigeria, Tanzania and Zambia are attracting foreign firms such as Sinohydro and Electrobras, while North Africa is seeing an influx of investment by companies from India, Portugal and China to develop and upgrade transmission and distribution grids.
Market monitor

CIS

Russia’s South Stream project gathers pace
Gazprom, in partnership with Italy’s Eni, France’s EDF and Germany’s Wintershall, began construction of the South Stream gas pipeline in December 2012. The pipeline will have the capacity to deliver up to 63 billion cubic meters (bcm) of Russian gas a year to central and southern Europe via the Black Sea, bypassing Ukraine. This project arose following price conflicts between 2006 and 2009 over the Ukrainian gas transit system (GTS), which led to disruptions in Russia’s gas exports to Europe. Earlier in 2012, Russia announced completion of the Nord Stream gas pipeline which will transport Russian gas to Germany.

Austria

Green power discounts boost competition
Austria’s largest food discounter, Hofer, has revitalized competition in the electricity market. Its quota of 5,000 green energy contracts from green power company Öko Strom AG sold out in three weeks. This is significant because only 1% to 2% of Austrian households switch electricity supplier each month. Prior to Hofer’s discounted offer, certified green electricity was sold at a premium to regular tariffs. Austrian energy regulator E-Control has repeatedly flagged a lack of cheaper energy promotions. Now it hopes that direct sales initiatives will encourage greater competition in the domestic electricity market.

Japan

Prospects for nuclear revival with tougher standards
Japan’s backing for the Liberal Democratic Party (LDP) in its late 2012 general elections brings hope of a nuclear energy revival. Shinzo Abe, the country’s new Prime Minister, indicated his support for new nuclear power construction. The Prime Minister’s comments come at a time when the country’s gas imports have hit record highs, leading to a heavy financial impact on Japanese utilities. This new stance contrasts with the previous ruling government, which had proposed a total nuclear phaseout by 2030, citing safety concerns. Meanwhile, Japan’s nuclear safety regulator has introduced tougher nuclear facility standards from July 2013.

Southeast Asia

Nuclear renaissance
Countries in Southeast Asia are renewing their nuclear development plans, following an extended moratorium on new nuclear construction in the aftermath of the Fukushima incident. Nuclear renaissance is being driven by a combination of factors including rising thirst for energy in the region, a shortage of domestic natural gas supply, high costs of natural and liquefied natural gas (LNG) imports and the need to reduce reliance on high-emission fossil fuel-based power. China, which suspended construction of new nuclear power plants (NPP) in 2011, lifted the ban in late 2012. It has now resumed construction of a “fourth generation” NPP, expected to be its biggest nuclear facility. Vietnam is conducting feasibility studies for two NPPs which may go into construction in 2014. Malaysia Nuclear Power Corp. is reportedly conducting feasibility studies for its first NPP.

Middle East

UAE state energy utility expands global footprint
UAE’s state-owned energy company, Abu Dhabi National Energy Company (TAQA), is on an overseas acquisition spree. It has acquired an undisclosed stake in Indian hydroelectric developer Himachal Sarang Power Limited (HSPL), that it plans to extend to 100%. This follows a 50% acquisition in a Minnesota wind power project from France’s EDF and a US$12b investment in power generation projects in Turkey. In December 2012, TAQA also acquired a 53% stake in an oil block in the Kurdistan region of Iraq. The acquisition of the hydro and wind assets will help to build the company’s renewable energy stream, while the oil block acquisition will enable TAQA to gain a firmer foothold in the Middle East and North Africa region.
Big ticket power and utility transactions and healthy indicators have established a robust platform for mergers and acquisitions (M&A) in 2013. 

Joseph Fontana reports.

**The big picture**

**Robust platform**

A growing momentum of transactions took hold in Q1 2013, with seven deals over the US$1b mark. Despite this, deal value decreased from US$27.6b in Q4 2012 to US$25.3b in Q1 2013.

Europe is a hub of activity, accounting for 51% (US$13b) of total deal value as utilities divest transmission and distribution (T&D) assets and reinvest in emerging markets. In the US, the shift from competitive generation assets to regulated assets continues. Asia-Pacific deal value more than doubled in Q1 2013 to reach US$6.1b, driven largely by a significant rise in renewable energy transactions.

**Capital is on the move.** Cross-border M&A transactions were up 49% (US$3.2b) quarter-on-quarter, driven by a need to secure energy supplies, expand market share and add stable cash flows.

**Action on privatizations**

Long-anticipated movement on Turkey’s privatization took place with the sale of four power distribution grids. This bodes well for 2013, with privatizations in the Czech Republic and Greece poised to take place. Once a few of these deals cross the line, momentum will really take off.

**Outlook**

Expect robust M&A to begin in 2013 and continue over several years with a continued theme of portfolio management. Chinese state-owned power and utility companies and Japanese trading houses are likely to be at the front of the queue for prized regulated assets; this could be a record year for outbound investment from China. Watch for tightening supply dynamics in certain markets to support power prices in the US. The new era of cheap natural gas in the US presents opportunities for market players with different views on the future price of natural gas. Look for private equity to be active in 2013.

Source: Ernst & Young analysis
Close up

As divestment programs fuel M&A activity, are P&Us doing enough to unlock value?

Ian Whitlock reports.

Divestment and privatization programs are the strongest contributor to deal activity in Europe. Unfortunately, we see power and utility companies leaving value on the table in the rush to “just get rid of it.” We believe utilities need to think more broadly about potential buyers and pay more attention to “dressing” their assets for sale.

A broader mindset on buyers

We have seen increasing numbers of financial buyers involved in divestitures, with several private equity (PE), infrastructure and pension funds seizing the opportunity to invest in assets with predictable cash flows. In one of the highest value transactions in Q1 2013, European utility Net4Gas was bought by European PE and Canadian infrastructure funds (Allianz Capital Partners GmbH and Borealis Infrastructure Management Inc.) for US$2b.

Similarly, E.ON’s US$3.7b sale of Open Grid Europe GmbH to a consortium led by Australia-based PE firm Macquarie and Veolia’s sale of UK-regulated water activities to Infracapital Partners LP for US$1.9b demonstrate financial buyer interest in European utility divestments. Dutch pension funds have also been active players.

Sellers should recognize that buyers can come from anywhere, not just outside their sector but outside their industry and geography as well. It pays to consider potential buyers’ regulatory regimes and investment profiles from the outset, to maximize your chances of a successful sale that achieves the highest value for shareholders.

“Dressing” assets for sale

The two key principles to adopt in divestitures are separation and clarity – separating out the asset from the rest of the business, and clarifying which risks relate to the divestiture. Reduce uncertainty in the buyer’s mind, or they could walk away and choose from hundreds of other assets.

To dress assets for sale, we believe power and utility companies would benefit from dedicating more time to:

• The carve out: the divested asset needs to be carved out from the parent business at a detailed level – including services shared by both (e.g., IT, HR) – to show the financial impact of separation. A detailed standalone business model that shows what’s in and what’s out of the transaction (including particular plants, offices, vendor contracts, employees and so on) will enable buyers to value the business, while helping sellers rationalize their own value chain.

• Telling the equity story: most P&U companies would benefit from more time preparing their equity story – that is, the story that attracts potential new investors to the business. View the sale from the buyer’s perspective and provide comprehensive, consistent data on business strategies, operational performance and communication plans. What’s needed is sell-side due diligence that anticipates buyers’ questions and describes an asset’s value and growth potential.

Careful preparation that focuses on building a strong equity story and clear carve out models will help companies extract greater value, increase speed to close and minimize disruptions to the core business.

“To get the most from their assets, utilities need to think more broadly about buyers, and pay more attention to ‘dressing’ their assets for sale.”

Ian Whitlock, Ernst & Young

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Reconnecting
Utilities must improve their relationship with customers to survive in the future – or risk losing out to opportunistic new competitors who could demand higher margins.

Report by Yunus Ozler.
Utilities around the world provide us with essential energy every day. But despite their constant presence in our lives, the last decade has seen a steady decline in customers’ perception of the value they offer. Utilities are commonly perceived as faceless machines that prioritize profits over quality of service and value for money. They score poorly in consumer satisfaction surveys, falling behind other sectors, and the relationship between them and their customers is typically distant and characterized by a lack of trust.¹

Now, forces are at work that will further challenge the strength of relationships with customers:
- **Energy prices**, already a common source of dissatisfaction and mistrust, will continue to rise – pushed up by infrastructure investment needs² and the cost of decarbonization
- **Smart metering** rollout will raise customers’ expectations of a “smarter” service from utilities
- Customers will be more energy efficiency conscious, seeking propositions that will reduce consumption
- Changes in **regulation and policy** are likely to encourage competition from new niche utility entrants and other sectors against traditional vertically integrated utilities
- Advances in **digital technology** will make it easier for consumers to compare offers and find new ways to buy power through different channels
- **Intermediaries** will continue to offer price comparison and the “cheapest” product that customers seek
- **Stronger brands** from other sectors – with better customer, innovation and marketing skills – might aim to “own the home” and consider getting involved in bundled energy supply

There’s danger to the bottom line here, either through loss of valuable customers in competitive markets, or erosion of the rate case in monopoly markets. At worst, utilities could find themselves stranded – providing low-margin, white-labeled commodity products, while new intermediaries take over the customer relationships and seize all the opportunities for profit. New business opportunities could range from offering high-margin energy services, to bundling different utility products, to providing great customer service at a higher price.

Utilities must take action to reconnect – to win back customer trust by understanding and delivering on customer needs; adopting new technology-based approaches; and building the capabilities required to survive in a “smarter” world.

But how do you build this new relationship? What new behaviors must utilities adopt and what decisions must they make? This article presents an action plan to help capture the customer opportunity in the energy retail market.

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1. In Utilities we Trust? Ernst & Young, Franklin Covey, YouGov Survey (UK), March 2013; The rise of smart customers, Ernst & Young worldwide survey reports 2010 and 2011 – available via www.ey.com/smart.
Reset the overall customer experience

Get the basics right to rebuild trust

You could say that this is not a major transformational effort. Many of the factors that drag down levels of customer satisfaction are associated with processes that utilities can get right, such as providing clear tariff information; getting meter reading right and providing accurate and clear bills; charging and collecting payments; and improving customer service (see Figure 1).

Making sure these fundamentals are done right will go a long way to rebuilding trust (see Figure 2) – but utilities need to be honest about where they may be failing to:

- Demonstrate openness, transparency and fairness
- Communicate changes clearly and proactively
- Act fast to resolve problems in a reliable and consistent way
- Empower customers to make their own decisions
- Deliver what customers expect, every single time, along the customer journey

Figure 1. Why have customers lost trust in utilities?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price increases while making profits</td>
<td>57%</td>
</tr>
<tr>
<td>Complex tariffs</td>
<td>31%</td>
</tr>
<tr>
<td>Not understanding basis of prices</td>
<td>30%</td>
</tr>
<tr>
<td>Lack of consumption reduction advice</td>
<td>21%</td>
</tr>
<tr>
<td>Poor customer service</td>
<td>21%</td>
</tr>
<tr>
<td>Unclear bill format</td>
<td>17%</td>
</tr>
<tr>
<td>Incorrect billing</td>
<td>12%</td>
</tr>
<tr>
<td>Poor online services</td>
<td>9%</td>
</tr>
</tbody>
</table>

Source: Ernst & Young, Franklin Covey, YouGov Survey (UK), March 2013
“Based on feedback from customers, we have redefined our vision for the future based on two key elements: ‘being trusted’ and ‘exploring new solutions’.”

Cristian Acquistapace, E.ON Italy

Listen to feedback
Cristian Acquistapace, Director of Marketing and Customer Interaction at E.ON Italy, says acting on customer feedback and giving people consistency is fundamental to gaining trust and ensuring a long-term relationship.

His team initiated a customer-centricity program five years ago. They use feedback from an extensive biannual survey to understand what is influencing customers’ perceptions and to drive change. “Our frontline teams continuously measure customer feedback at key interaction points, and we run a continuous improvement program to translate feedback into actions that customers can see,” he says.

In common with many utilities, E.ON has already moved from improving single customer interactions to redesigning customer journeys — all the events and experiences customers go through to reach a particular goal — such as signing up for a service, or metering and billing enquiries.

“Based on feedback from customers, we have redefined our vision for the future based on two key elements, ‘being trusted’ and ‘exploring new solutions.’ These are being cascaded through all functions at E.ON Italy, so that everyone can contribute to fulfill the vision,” says Acquistapace.

Invest in people
Paul Clark of Ernst & Young’s Advisory Services practice advises companies in many sectors on customer service reform. He believes employee engagement is the primary factor that makes a difference: “It’s an area where utilities are still falling down,” he says. “It can be hard to find an agent who seems engaged with what they are doing, truly connected on a brand level to the organization they are representing.

“The big telcos only saw the customer experience change when they put as much time into their employees as they did into their customers. This means defining the employee journey to the same level of granularity and clarity — from joining the company, to how agents were rewarded, recognized and empowered. Only then did the agents really start to deliver to the brand characteristics.”

Lynda Clayton, Customer Service Director at UK supplier ScottishPower, overhauled training at customer service centers to put the emphasis on problem solving.

“Our agents have the autonomy to make decisions and ‘own’ a query through to resolution,” she says. “They do their utmost to handle a problem themselves. Where they can’t, there’s a streamlined process to make sure that the customer doesn’t get lost in the middle. Agents use a ‘promise tracker’ to keep commitments they make to customers.

“For us, it’s now less about the inbound calls, and more about the outbound. It’s no longer good enough to wait for the customer to realize there is an issue and contact you. It’s about continually trying to reach out and build a relationship, make offers, keep people up to date,” she says.

Educate customers
Getting more involved in motivating customers to plan and control their energy use — converting them from “passive light switchers” to engaged, well-informed customers who know the value of using energy wisely — offers unique opportunities to strengthen relationships.

E.ON Italy’s stance, says Acquistapace, is “being innovative and green oriented. We want to support customers and help them profit from the change in the energy world, focusing on energy efficiency services.”

Clayton highlights another critical part of education: managing expectations on prices. ScottishPower’s customers have access to clear information via the web that shows the factors that feed into the bill.

“This is not about trying to distract from the fact that profits can be made and this is a business,” she says. “But we show the impact of factors like changing wholesale energy prices, distribution and transportation costs, and our green energy and efficiency obligations.
In the future, this will be mandated, but it’s something we wanted to do anyway as part of improving transparency and trust. It doesn’t harm us to be ahead of the game.”

**Could utilities inspire loyalty – like leading lifestyle brands?**

If all of the above happens, Clark thinks utilities could follow the branding route taken by the telecoms industry. “The leading telcos developed brands around key characteristics like listening to customers, collaboration and engaging employees, which turned them from utility providers into a lifestyle choice. The impact on customer loyalty is significant. People choose these telcos to say something about themselves, as much as to get the best tariff.

“giffgaff (a UK mobile telecoms provider), for example, has been highly successful in inspiring customer loyalty by creating a reward system which incentivizes customers to help solve each other’s problems. They’ve recognized that human beings are both competitive and naturally collaborative. It’s a logical next step to get customers more involved. Power utilities could find that territory interesting,” says Clark.

Newcomers could have an advantage over traditional utilities in this respect, in that they are free from the legacy of mistrust. One option is for utilities to create their own new brands. Clark highlights New Zealand online energy company Powershop – owned by Meridian – which has succeeded by presenting a fresh face to the world and turning power consumption into a retail experience. “They offer a green product, a lifestyle product, or you can buy a whole year’s worth of power at once,” says Clark. “Customers have clarity on prices and control to make their own decisions about what, when and how to buy. Presenting this through a fresh, consumer-focused

*Source: Ernst & Young analysis*

“giffgaff ... incentivizes customers to help solve each others’ problems ... . It’s a logical next step to get customers more involved. Power utilities could find that territory interesting.”

Paul Clark, Ernst & Young

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**Figure 2. Keep customers happy: get the basics right and focus on loyalty**

<table>
<thead>
<tr>
<th>Get the basics right</th>
<th>Because customers expect it</th>
<th>Champion self-service</th>
<th>Because customers like to be empowered</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Simple customer journeys especially when moving house</td>
<td><strong>Because customers like</strong></td>
<td>• Provide online and mobile access to customers' accounts – e.g., live consumption data</td>
<td><strong>Because customers like</strong></td>
</tr>
<tr>
<td>• Clear tariffs, accurate bills and easy payments</td>
<td><strong>to be noticed</strong></td>
<td>• Help them with co-browsing and live chat options</td>
<td><strong>to problem-solve</strong></td>
</tr>
<tr>
<td>• Helpful customer service, with staff empowered to take ownership of customer issues from contact to completion</td>
<td></td>
<td>• Reward them for using self-help resources</td>
<td></td>
</tr>
<tr>
<td>• Customer account management and seamless service for “multiple product” buyers</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Anticipate customer needs</th>
<th>Because customers like to be noticed</th>
<th>Six ways utilities can keep customers happy</th>
<th>Because customers like to problem-solve</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Listen to customers and understand their expectations</td>
<td><strong>Because</strong></td>
<td><strong>Six ways utilities can keep customers happy</strong></td>
<td><strong>Because customers like to problem-solve</strong></td>
</tr>
<tr>
<td>• Predict what they’re likely to do and offer them what they need</td>
<td><strong>customers like to</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Be proactive in resolving issues and offering valuable customers the best products</td>
<td><strong>be noticed</strong></td>
<td><strong>Six ways utilities can keep customers happy</strong></td>
<td><strong>Because customers like to problem-solve</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Use data well</th>
<th>Because it gives customers confidence and transparency</th>
<th>Because customers should know you value them</th>
<th>Focus on loyalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Be transparent with customer data, tariffs and billing</td>
<td><strong>Because</strong></td>
<td><strong>Because customers should know you value them</strong></td>
<td><strong>Focus on loyalty</strong></td>
</tr>
<tr>
<td>• Use information to demonstrate fairness – e.g., by suggesting a better tariff</td>
<td><strong>it gives customers confidence and transparency</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Use what you know to provide customers the most suitable channels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ensure security; balance privacy and personalization</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Ernst & Young analysis
brand with an attractive online site linked to social networks has been highly effective. They have a 98% customer satisfaction level, and a third of their customers have ‘Liked’ them on Facebook.”

“Non-negotiable values”
Acquistapace sums up the challenge of resetting the relationship with customers: “Their perception of value is based on price, branding and service. Every part of the company – front and back office alike – has to be committed to delivering on those non-negotiable values.”

Clayton also looks outside the sector for inspiration: “I like what telecoms companies are doing in terms of proactive product offering and customer retention. The way they package their offers is simple, but powerful. It’s worked with me: because my phone provider is proactive in checking I get value for money, I don’t often think about switching. This is the type of loyalty that we, as energy suppliers, can also strive for.”

“... because my phone provider is proactive in checking I get value for money, I don’t often think about switching. This is the type of loyalty that we, as energy providers, can also strive for.”

Lynda Clayton, ScottishPower

Offer new, innovative services around the core energy product
Utilities have three main choices in the products and services they offer. They can play the scale game and be the lowest cost possible supplier; they can play the scope game and offer a wide choice of services to their customers; or they can do both.

Whatever the future shape of the industry, it’s clear that margins from selling energy commodities alone are likely to drop – unless utilities focus on growing at scale, and cutting fixed and variable costs.

Those choosing to focus on scope and become service providers will have multiple opportunities, from green energy and renewables to smart appliances, electric vehicles and home security.

It is possible that the telecom sector’s mobile virtual network operator (MVNO) type of business model could be applied to energy retail. Customer-centric companies in other sectors (especially mainstream retail) could establish intermediary energy businesses, buying energy from the wholesale market and selling it to customers. Co-operative Energy in the UK is an emerging, simple example of this approach. Meanwhile smart meters will enable energy audits and energy usage monitoring to be bundled in with energy supply, and could even stretch to offering internet shopping for energy-saving appliances.

Energy retailers therefore need to protect their own revenues and prepare to do battle with their peers in the sector, as well as the new, unconventional names that are likely to enter it. This may mean:

• Creating new options and channels for customers to buy power
• Creating their own range of energy services to create cross- and up-selling opportunities
• Forming alliances with new intermediaries – such as telcos, retailers or price comparison sites who provide utility-type services including energy as part of their range of products
To tap into these markets, customer trust is absolutely essential. In extending what they offer customers, lack of engagement and customer trust will be the biggest obstacles for utilities to overcome. Historically, customers haven’t taken great interest in their power supply, as long as it works. But marketing businesses will be able to use new internet applications that promote home energy savings as the basis to engage much more closely with customers and sell in other profitable services.

Acquistapace sums up what’s driving change in Europe: “The behavior of customers is changing. New media and social networks make our customers more acknowledged, empowered and therefore more demanding. New decentralized energy solutions, enabling them to become more efficient consumers, are increasing and enriching their interest in new services and products. They’re much more conscious of the possibilities for change and improvement in services.”

His view is that maintaining a business model based on pure sales of power and gas won’t be enough in the future. E.ON Italy will stay within energy and energy services, but is expanding its range by developing new communication and customer care channels for mobile and smart TV, as well as bundling the sales of power and gas with efficient energy solutions such as rooftop solar photovoltaic (PV) installation.

Utilities have advantage in the race to “dominate the home”

One route ahead for utilities is to provide services that control and monitor an increasingly automated home and also offer integrated home services to their customers.

Many sectors will vie with them to do this: “There will be a race and it’s anyone’s guess who will succeed,” says Clark. “The question is, do utilities want to ‘own the home’? Energy retailers are already the biggest customer-facing organizations, with millions of customers. By preparing themselves now to read and capitalize on data from smart meters, they will be in a better position than most to become involved profitably in the home space, however they choose to do it.”

Build capabilities to survive in a “smarter” world

Use data/technology to anticipate customer behaviors and preferences

As smart metering takes hold, we’ll move from a monthly or quarterly energy bill transaction to a constant stream of data with usage monitored every half hour. As customers increasingly seek unconventional supply arrangements – for example net metering – traditional meter-to-cash solutions will become unfit for purpose. As the volume of data multiplies, utilities will need enhanced analytical capability to ensure the right answers are in the right place, on time.

Meanwhile, there is a view in the market that the technology-savvy companies are waiting for utility companies to do the hard work of installing smart meters in homes and businesses. Once that happens on a big scale and the data starts to flow, a flood of innovation will drive new customer needs: in other words, “smart will wake up the beast.” Customers will expect utilities to be “smarter” – if not, they will go to new technology players to fulfill their needs.

Using analytics for targeting and retention

If you are struggling with analytics now, and still pulling data together from a number of different systems, you will be seriously hampered when smart meters bump up the volume. It’s therefore important to build strong data and technology capabilities now.

“Organizations do struggle if they haven’t had access to good data, and suddenly get a huge amount,” says Clark. “But rather than starting from the data and trying to work out what to do with it, my advice is to start with your business goals and identify what specific items of data you need to achieve them. Concentrate on information that enables you to change your strategy.
“For example, utilities will want to look at segmentation and targeting. Some of the best exponents are the big supermarkets: utilities could learn from the way they ‘slice and dice’ information on consumer purchasing.”

However, Clark thinks data security is a key issue, given the lack of customer trust. “Customers like to be treated as individuals and will tend to favor personalization over privacy. But are they going to be happy that utilities have all this information? Do they trust them to keep it secure? Achieving that balance is something that utilities need to confront head-on.”

Acquistapace agrees that the change from simple customer management to more sophisticated customer engagement requires new skills and new technologies. “Access to good customer insight is the key. The increasing number of touch points with customers requires a new IT strategy which enables the business to be proactive and reactive.

“We analyze data from a wide range of sources including CRM and billing systems, the web and mobile channels. Our customer intelligence and propensity model then helps us to understand what customers need,” he says.

At ScottishPower, recent consolidation down to one platform is making it easier to use analytics to improve accuracy, target products correctly and minimize churn, says Clayton: “We look at customers’ purchasing and consumption trends and their preferred channels of interaction. Coupled with what we know from external agencies and demographic information, we build a detailed profile of their preferences, to tailor what we offer them.

“We’re also able to build a typical profile of customers that may be in danger of leaving. When these are flagged it triggers a process of interaction and offers to encourage them to stay with us.”

She says the company’s new integrated system will improve consistency: “Whether customers come through on the web, via a call center, or on the phone, they’ll get a standardized service. The core operating system, validation and the business rules that a call center agent sees will be exactly the same engine that sits behind the customer website. This gives us more agility in offering new products and services: we can spread them across all of our channels quickly because they will all operate in the same way.”

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Paul Clark, Ernst & Young

Cristian joined E.ON in 2005. He has more than 12 years of experience in the utility market, with roles in sales, marketing, operations, control and strategy. Cristian has a degree in Engineering with a master’s in Corporate Development.
Future of utilities

Restoring customer relationships to secure the future

To battle the combined forces of capital investment needs, rising tariffs, regulatory backing for competition and alternative energy solutions, now more than ever utilities need to invest in their customer capabilities.

Unhappy customers will directly impact returns and customer retention. Without an extended portfolio of services and solutions, a reputation for great customer service, and the ability to leverage existing and new technologies to enhance satisfaction, utilities risk becoming marginalized “zombie businesses” — left behind as others thrive.

Utilities are still in many ways the most credible owners of energy customers, especially given their expertise in wholesale energy trading, pricing, running large scale businesses and managing metering and billing. But the chinks in their armor are the existing loss of trust, slow adoption of digital technology and lack of investment in building up “smarter” capabilities.

Past developments in other service-led sectors — for example telecoms (fixed line and broadband), media, mainstream retail and the financial industry — demonstrate how fast traditional lines of business can erode with the advent of changing customer expectations and new technology. Utilities may well be one of the next sectors to face a complete business model reinvention, to give customers what they need and secure the future.

Lynda Clayton
Customer Service Director
ScottishPower

With a background in managing contact center and field-based operations across customer service and sales disciplines, Lynda Clayton is currently managing an ongoing program of customer technology change at ScottishPower. She has worked in the energy industry for 14 years and joined ScottishPower in 1999. Lynda recently graduated from the University of Warwick with an MBA in Global Energy.

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Using social media to get closer to customers

Building capability in social media will require a technology and mindset shift for utilities.

A study of utilities’ use of social media (i.e., Facebook, Twitter, YouTube, LinkedIn and blogs) published by the research company Pike (now Navigant Research) in 2012 found that the proportion of customers using social media to interact with utilities was relatively small, at 11%. The report noted that contact was predominantly about billing issues, or seeking information about a service or program.

However, the Pike report anticipates that global use of these media will increase over 10-fold up to 2017. The report concluded that: “Two-thirds of all respondents use some type of social media, indicating that utilities should investigate it as a way to increase interaction and raise satisfaction.” Utilities taking a proactive approach will be better placed as growth continues.

For Clayton, ScottishPower’s Twitter and Facebook presence has powerful potential, “particularly as a service channel – for example it could be invaluable in supporting people through power outages when people can still use their mobiles. Apart from two-way customer service uses, there’s great scope for customer-to-customer forums to solve problems and queries. Clearly, it can also be very powerful from a negative point of view when a customer complains. But if you react at speed, you can even turn that into a positive interaction, which might then touch hundreds of thousands of people.”

Dr. Cord Landsmann is the CFO of E.ON Climate & Renewables, E.ON’s global unit responsible for activities in industrial-scale renewables. He has worked in the energy sector for 14 years.

Offshore wind requires a lot of capital, at a time when utility balance sheets are constrained. Dr. Cord Landsmann, CFO for E.ON Climate & Renewables, explains how pension and infrastructure funds are increasingly looking to invest directly in wind.
I’ve seen a real shift in financing over the last 18 months, from banks to pension funds and infrastructure funds. We expect E.ON’s average annual gross investment in renewables to be €1.3b to €1.5b (US$1.7b to US$1.9b); of this we will fund €0.8b to €1b (US$1b to US$1.3b) ourselves and look to third-party investors for €500m (US$652m).

What makes projects “bankable”?

On any wind project, the risk profile drops sharply once it becomes operational — and this is when we bring in investors. In my experience, pension and infrastructure funds want four things:

1. **Reliable, long-term partners:** they want a company with a proven track record, offering low-risk, cash-yield investments over 15 to 20 years. For them, investing in wind is about buying into a whole new asset class. They want to be educated on the risk profile.

2. **Projects with operational data:** they want to know what the technology is doing, not what it can do. They want assets they can touch. Our six offshore wind farms have two years of operational data. And I can show investors real performance information on every E.ON wind farm worldwide on my Blackberry®.

3. **The best technology:** investors ask what kind of turbines we’re using, how we select them, etc. They need reassurance that the company has a rigorous process in place.

4. **Stable regulatory regime:** any hint of retroactive subsidy cuts, such as in Spain, is an absolute no-go for investment. We must have confidence that government commitments to subsidies are firm in order to go ahead with such long-term investments.

What the industry needs is to create fit-for-purpose financial vehicles that meet these criteria. At E.ON, we aren’t taking an M&A approach with take-it-or-leave-it auctions. We use a partnership model with build-own-transfer (BOT) contracts. So we carry the development and construction risk and seek investors to share risks during the operational phase.

To make BOT contracts work, frank – and often time-consuming – discussions are needed about which risks to put in which party’s pocket.

“To make BOT contracts work, frank – and often time-consuming – discussions are needed about which risks to put in which party’s pocket.”

**Dr. Cord Landsmann,**
E.ON Climate and Renewables

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**Technology**

The latest quarterly global CAI report illustrates the new tactics that policymakers are deploying to create green growth, such as capacity auctions in which future power purchase projects and generation licenses are awarded through a competitive process.

Rising stars include South Africa (16th place) with 28 renewables projects signed in 2012; Morocco (23rd) with a US$1b PPA for the first phase of its concentrating solar power plant in Ouarzazate; and Chile (36th), which plans to build South America’s largest solar plant.

Despite the challenges of a weak global economy, the outlook for 2013 is more positive, with offshore wind predicted to grow significantly.

Ernst & Young relaunched the CAI in May 2013; for the latest developments go to www.ey.com/recai

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**Ernst & Young’s**

**Renewable energy country attractiveness indices (CAI)**

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**Getting costs down**

Offshore wind is still developing, with new wind turbines, foundations, logistics and offshore vessels coming onto the market. But, like the renewables sector as a whole, wind needs to reduce its dependence on subsidies. E.ON’s offshore wind strategy targets 40% cost reductions by 2015. As CFO, I don’t sign off any projects unless they meet these targets.

Approximately 85% of an offshore wind project’s costs have been incurred by the time it’s operational. We believe lowering capex costs through standardization will be a key area for savings. For example, right now water depth and consistency of the seabed determine the choice of foundation. There is no universal foundation type suitable for all kinds of seabed conditions, so first we select the site and then build an offshore wind solution to suit it.

In future, we may flip this around. We may build a standard foundation and then seek the right sites to install it. We need to work jointly on ideas and cost reduction. We need to be innovative.

I tell my people all the time, “There is no Plan B.” We have big ambitions and we have to succeed.
Hydrogen: Hype or Opportunity?

As the costs to produce and store hydrogen fall, new concepts such as “trigeneration” at combined heat, hydrogen and power plants (CHHP) are putting hydrogen on the agenda for many utilities.

Report by Brad Hartnett.

Recent developments suggest new possibilities – and utility revenue streams – from hydrogen-related investments:

1. **Rapid growth.** “There was a perception that hydrogen fuel cells were too futuristic and cost prohibitive. This is changing. In the last 12 months we’ve seen 35% growth – with more than 20,000 units shipped worldwide,” says Dr. Sunita Satyapal, the Director of the U.S. Department of Energy’s (DOE) Fuel Cell Technologies Office. The highest growth worldwide has come from stationary fuel cells, the type that can eventually be used by utilities.

2. **Falling costs.** “We’ve seen about an 80% cost reduction in certain types of fuel cells in the last decade,” confirms Dr. Satyapal. The cost of a transportation fuel cell system is about US$47/kW when projected at high manufacturing volumes and is on track to achieving US$30/kW, which is competitive with gasoline engines. Stationary fuel cell costs have been slashed by over two thirds, from nearly US$10,000/kW in 2003 to roughly US$3,000/kW in 2011.¹

3. **Efficient storage.** On-board storage of hydrogen in fuel cell vehicles is improving. Developments in the transportation sector are interrelated to the power sector, as public adoption of fuel cell electric vehicles could create additional revenue streams from combined heat, hydrogen and power plants (see “Trigeneration,” page 24). What’s more, hydrogen can be produced from diverse, domestic sources – including natural gas, coal, renewables and nuclear energy – which widens the appeal for utilities.

Is hydrogen the key to unlocking renewables?
A classic problem with renewables is intermittency – generation varies according to time of day, season and weather conditions. To date there are no cost-effective or widely applicable solutions for storing surplus solar, wind or wave power.

But what if it became economical to convert surplus renewable energy into hydrogen, then feed it back into the grid when it is needed, or to sell the hydrogen for fuel cell electric vehicle applications? The production of hydrogen would then be a clean energy “storage” solution.

This isn’t theoretical. It’s being piloted around the world at the moment. In Germany, E.ON is piloting a “Power-to-Gas” 2 MW wind to hydrogen system. Surplus renewable energy will be used to produce hydrogen and store it in Germany’s existing natural gas pipeline network. Construction began in Falkenhagen in August 2012; the pilot is expected to be operational in 2013.

In the US, the DOE is running a small-scale demonstration project in Colorado with the National Renewable Energy Lab and Xcel Energy. Its goal is to improve the efficiency of producing hydrogen from wind and solar power; part of this includes optimizing the direct coupling of renewable energy with electrolyzers to produce hydrogen.

And in Ohio, FirstEnergy is running a multiyear test of a 1 MW mobile fuel cell unit, with Canada’s Ballard Power Systems. The 54-foot unit is housed in a tractor trailer, and is considered the world’s largest proton exchange membrane hydrogen-powered fuel cell generator. Its only by-products are heat and water.

“The [trigeneration] plant demonstrates how utilities could achieve synergies with the transportation sector. The key will be how much we’ve reduced the cost of hydrogen production.”

Dr. Sunita Satyapal
U.S. Department of Energy’s Fuel Cell Technologies Office
Trigeneration

The DOE is also exploring the concept of trigeneration, where hydrogen is produced from methane as a by-product from a high-temperature process inside a fuel cell. DOE has partnered with Air Products, FuelCell Energy, the California Air Resources Board, the South Coast Air Quality Management District, the Orange County Sanitation District (OCSD) and the University of California, Irvine to develop and demonstrate the world’s first trigeneration fuel cell and hydrogen energy station in Fountain Valley, California (see photo page 23).

The station uses biogas from OCSD’s wastewater treatment plant to drive a fuel cell that generates approximately 250kW of power. Air Products’ patented system removes carbon monoxide, carbon dioxide and water, and produces enough high-purity hydrogen to supply up to 50 fuel cell electric vehicles a day. When the system is placed in stand-by mode, the plant stops producing hydrogen to enable maximum power generation by the fuel cell.

“As fuel cells begin to achieve price parity with other forms of power generation, utilities may consider hydrogen production as an additional source of revenue,” says Edward Heydorn, Business Development Manager in the Hydrogen Energy Systems group at Air Products.

The road to commercialization

Air Products sees two key milestones to achieving the commercialization of trigeneration. “First, we need to scale up the system. Getting larger throughputs for electricity and hydrogen will help meet cost targets,” says Heydorn. “Second, the hydrogen production process needs to be optimized. We are investigating technologies that take less power from the fuel cell system and lower the cost of separation.”

DOE’s Dr. Satyapal says, “Although it’s early days, the plant demonstrates how utilities could achieve synergies with the transportation sector. The key will be how much we’ve reduced the cost of hydrogen production.”

Hydrogen costs from the OCSD station work out at US$6 to US$8 per kilogram utilizing current separation technology, with estimates falling to US$3 to US$5 per kilogram based on next generation, electrochemical separation processes. DOE is targeting a cost range of US$2 to US$4 per gallon gasoline equivalent (approximately US$2 to US$4 per kilogram).

What this means for utilities

“For utilities, it’s really about finding the right match for the application: matching demand with resource availability and capacity,” says Dr. Satyapal. “Hydrogen scales well for long storage times and large amounts of energy. The cost proposition works best when you have high-energy capacity applications.”

Given this, it appears hydrogen is making the transition from hype to opportunity. Utilities stand to benefit from its capacity to serve as both a solution to renewable energy storage and a potential revenue stream.

Dr. Sunita Satyapal

Director
U.S. Department of Energy’s Fuel Cell Technologies Office

Dr. Satyapal is responsible for approximately US$100m per year in hydrogen and fuel cell research, development and demonstration activities. She has more than 20 years of experience in the field, and has authored numerous publications and 10 US patents.

Edward Heydorn

Business Development Manager
Air Products and Chemicals, Inc

As part of his responsibilities, Edward Heydorn serves as Program Manager for the combined heat, hydrogen and power (CHHP) demonstration at Orange County (CA) Sanitation District.

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Coal-fired power plants are a major source of greenhouse gas (GHG) emissions, but continue to be a critical component of the generation mix. So what is being done to future-proof coal?

Report by Keith Harrison.

Coal is a relatively cheap and plentiful source of fuel for power generation. But its combustion emits nitrous oxides (NOx), sulfur oxides (SOx) and carbon dioxide (CO$_2$). So what is being done to reduce these, in particular CO$_2$?

Carbon Capture and Storage (CCS) is recognized worldwide as an increasingly viable solution for reducing emissions. Capture technologies for separating emissions during power generation include:

- Precombustion: treating the fuel before combustion, e.g., Integrated Gasification Combined Cycle, which gasifies coal and extracts pollutants before combustion (considered more expensive than conventional coal plants)
- Postcombustion: treating the waste gases after combustion (which can be done as a retrofit)
- Oxy-fuel: burning the coal in an oxygen atmosphere by using an air separation plant

However, with the price of carbon at an all-time low, questions remain over the technology’s commercial potential. If the end goal is reduced GHG emissions, should utilities be focusing on improving the efficiency of coal-fired plants instead of investing in CCS?

World’s first commercial CCS plant

Canada’s SaskPower is building the world’s first full-scale CCS plant in Estevan, Saskatchewan. This project will transform the aging coal-fired Unit #3 at Boundary Dam Power Station, producing 110 MW of base-load electricity with postcombustion capture of one million tonnes per year of CO$_2$ emissions. Robert Watson, SaskPower’s President and CEO, explains why the company chose CCS. “We plan to increase gas in our generation mix, but don’t want to become solely reliant on it. And we are sitting, literally sitting, on a 300-year supply of lignite coal right by our Boundary Dam plant.”

Two other factors sealed the business case for CCS: geology and government funding. Saskatchewan has the ideal geology for storing CO$_2$ as well as significant heavy oil reserves, which CO$_2$ can help to extract through Enhanced Oil Recovery (EOR). “We received around US$240m from the Canadian government, and signed a long-term agreement with Cenovus Energy to buy our liquefied CO$_2$ to use for EOR,” says Watson. In addition there will be no transport costs, as Cenovus Energy will pick up the CO$_2$ from Boundary Dam.

Though the value of the 10-year deal with Cenovus Energy has not been disclosed, there is a carbon tax of nearly US$30 per tonne of CO$_2$ in the province of British
Columbia. This seems to be the “sweet spot” for tipping the business case in favor of future CCS investment. In 2014, SaskPower will bring its Carbon Capture Test Facility online, which will enable companies to test CCS technologies and help find the cost reductions needed to commercialize CCS.

End goal: better efficiency
Some believe it would be more effective to focus on the efficiency of coal-fired plants than invest in CCS. Dr. Franz-Josef Wodopia is a Vice President of the European Association for Coal and Lignite (EURACOAL), which represents the European coal industry. He says that by focusing on “end-of-pipe” technology, optimization of the combustion process and efficiency, “Germany was able to reduce CO₂ emissions in the energy sector by some 92% from 1990 to 2011. In that period, we also reduced NOₓ emissions by more than 80%.

“At present, the worldwide average efficiency of a coal-fired plant is 30%. Using commercial technology widely employed in the EU, coal-fired plants can achieve efficiencies of 38%, which would cut CO₂ emissions by 21%. Highly efficient modern coal plants achieve efficiencies of 45%, resulting in a 33% reduction of CO₂ emissions. These percentages become even more important when you consider the ‘energy penalty’ of CCS, which reduces efficiency by an average of 7% to 12%,” says Dr. Wodopia.

What’s happening in China?
It is clear that no significant worldwide reductions in CO₂ are possible without take-up by the world’s top three coal-consuming countries: China (46% of 2010 coal consumption), the US (13%) and India (9%).

As Dr. Wodopia points out, the gap between coal use in Asia and the rest of the world is widening: “Nearly 1,200 new coal-fired power plants are expected in Asia. China and India together represent 76% of the proposed new coal power capacity.”

Germany reduced CO₂ emissions in the energy sector by some 92% from 1990 to 2011 and NOₓ emissions by more than 80%, without CCS.

Robert Watson
President and CEO
SaskPower

Robert Watson joined SaskPower in August 2010, following a number of executive positions in the Canadian communications industry. He currently serves as a Board member for the Conference Board of Canada, the Canadian Electricity Association and the Canadian Nuclear Association.

Dr. Franz-Josef Wodopia
Vice President
EURACOAL

Dr. Franz-Josef Wodopia serves as a Vice President of EURACOAL and as Chief Executive of the German Coal Association. He has a PhD in Economics and worked for a number of years as a scientific staff member in the German mining and energy sectors. He held a chair in economics for engineers and is now an honorary professor at Georg Agricola University of Applied Sciences in Bochum, Germany.


Chinese Academy of Sciences, estimates that “China has spent close to US$353m on CCS, of which US$322m is from corporations and only US$31m is from the government.”

Obstacles to commercialization of CCS

From the evidence, it is clear that carbon price is key to the success of CCS. “The problem in Europe is that CCS does not pay,” says Dr. Wodopia. “The European Emissions Trading System should be the primary incentive to invest in CCS. If the price was €40 to €75 per tonne of CO₂, then it would be rational to invest in CCS, but in February 2013 the actual price was €4 per tonne. Should carbon prices rise enough to stimulate investment in CCS, this would also lead to unacceptable increases in energy prices for European consumers.”

Carbon price is key to the success of CCS.

Dr. Wodopia says cost, combined with a lack of public acceptance and legislative support, are holding up programs in Europe. The EU failed to meet its 2007 commitment of having at least 12 CCS demonstration plants up and running by 2015. “Vattenfall had to shelve its US$1.9b Jänschwalde project due to public resistance around storing CO₂. Legislation is positively anti-CCS in Germany.”

This holds true in other geographies. “Price and an inadequate regulatory framework are the two biggest factors restricting the progression of CCS technologies in China,” says Li.

Putting coal in its proper context

Coal will be a key factor in power generation around the world for the foreseeable future. Reducing the environmental impact of coal-fired generation remains a priority, whether it is done through more efficient plants or CCS.

Utilities and researchers alike see the need to commercialize CCS technology and lower costs. And as CCS continues to evolve into a commercially viable solution, SaskPower’s CCS plant demonstrates what can be done when the conditions are right.

For breakthroughs in CCS technology and learning over the next five years, look to China and North America.

For breakthroughs in CCS technology and learning over the next five years, look to China (see “China could lead in CCS,” page 52) and North America. China has to combat emissions from industry as well as coal-fired generation, and the economics are more favorable in terms of new build CCS versus retrofitting the technology to existing plants. In North America, long-term demand for coal power continues and a number of CCS projects are taking shape.

Europe is expected to continue to lag, though the UK’s US$1.5b CCS Commercialization Competition shows that the potential is still there. In March 2013, the UK selected two preferred bidders – Peterhead Project in Aberdeenshire, Scotland (Shell and SSE), and the White Rose Project in Yorkshire, England (Alstom, Drax Power, BOC and National Grid).³

For countries without the scale of new build or promising geologies, improving the efficiency of existing coal-fired plants could be a viable alternative while the economics of CCS remain unattractive. For these utilities, educating customers and the public on the costs of abandoning coal and what is being done to reduce GHG emissions will help to reduce the stigma of “dirty coal” and place the future of coal in its proper context.

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Do the right thing

In the midst of transformation, utilities are running various change programs and projects – and not always seeing a return on investment. Our risk-based portfolio management approach helps companies focus their efforts on “doing the right thing” and “doing things right.”

Turning risk into results

What are the top 10 risks and opportunities for power and utility companies now and in the future? And how are leading companies making the most of these to drive growth?

Super power

Superannuation investors may be almost the perfect match for Australia's P&U assets – if significant barriers can be overcome. But most potential investors will need to partner with experienced advisors to successfully navigate this complex market.

Turning the tide

Japan's water sector is struggling to cope with increasing urbanization and a stalling economy. Reforms may open up opportunities for private investment although international utilities will need to be well prepared before they dive in.

Divesting for value

Divestment programs continue to make a significant contribution to deal activity in Europe's power and utilities sector. But obtaining optimum value from these deals requires adequate preparation, especially around building an equity story and carve-out models.

Doing business in a low-carbon world

A carbon-constrained future will demand that power and utility companies completely rethink the way they do business. But there are opportunities as well as challenges, for those companies prepared to take a proactive approach.

Rethinking controls

Many power and utility companies view their control processes as cumbersome and costly. Smart P&Us know that streamlining their controls process will drive down expenses and add value to the business.

Capital on the move

Our latest Power transactions and trends report reveals that portfolio management continues to dominate, as utilities deleverge from volatility and increase their footprint in high growth markets. Get ready for a robust M&A climate in 2013.
As Brazil grows, its energy needs will grow too. Britaldo Soares, CEO of AES Brasil, a major utility and generation company, says meeting those needs will require a portfolio approach to power investment and teamwork between the government and the energy sector.

Meeting Brazil’s POWERchallenge
It takes a lot of energy to power Brazil now and it will take a whole lot more: as our GDP grows at 4% per year, the Brazilian energy sector needs to add the capacity to generate 5 GW per year over the next decade (see Figure 1).

Adding that much capacity is a challenge. However, Brazil has made a number of structural changes over the past 10 years that make me confident that the industry will make it happen. Notwithstanding the government’s recent decision to cut power rates as a way to stimulate the economy, I believe the industry is well positioned to add the capacity the country needs.

The regulatory framework put in place in 2003 and 2004 provided much more clarity for power producers, and at the same time made the sector more attractive to investors. That framework liberalized Brazil’s energy market, giving power producers and investors the assurance they need to invest in new capacity and infrastructure.

A portfolio approach
This is the kind of clarity that is particularly important now because the country needs not just to add more capacity to meet its future needs, but also a better balance in its portfolio of generation assets. Historically, Brazilian electric utilities have always leaned heavily on hydropower, which even now supplies around 70% of Brazilian electricity. Clean, renewable and local hydropower has some obvious environmental and geopolitical advantages; however, we believe Brazilian electricity producers will need to diversify their energy sources more, largely because forecasters now believe that global warming will make future water levels more uncertain. Adding more dispatchability to the system will enhance security and flexibility.

To supplement the hydro facilities, AES plans to develop wind resources. However, the variation of wind by time of day and season could still leave some occasionally significant shortfalls in supply. To cover demand requirements during those seasons and times of day when the wind dies down or the rivers aren’t full, gas-fired thermal plants will also be necessary.

Natural gas has three key advantages from our perspective. First, it can further enhance the balance of our portfolio, adding schedulable resources that are not subject to external conditions. Second, Brazil recently found some major natural gas resources, so there should not be a shortage of supply in the future. Third, it comes at a lower environmental cost than many other hydrocarbons, and emits considerably less CO₂ than coal, for example, so it doesn’t completely undo the environmental advantages of the rest of the portfolio.
Working together

Even with that in mind, challenges remain. One of the biggest will be to link sources of natural gas with generation plants. This is not always easy to get right. Right now, for example, a 640 MW thermal plant near the Argentine border has been idle for more than four years as we wait for a natural gas supply to come.

By definition, deeper cross-border energy integration would help Brazil and our neighbors, and not just by giving Argentina a convenient market for its shale gas. Eventually, after Brazil’s recent gas discoveries go online in 2015–2016, we could help our neighbors grow too, by enabling them to profit from our own economies of supply and scale.

Another major hurdle is sector policy consistency in the long run. Business always needs stability before it can make a real investment, but assurance that the rules of the game are stable is particularly important for energy producers. A decision on a major generation project or some transmission lines may have repercussions not only on one utility’s future, but on a region’s economic development for the next 40 or 50 years.

In the end, building the Brazilian power system requires the same kind of team effort we are seeing now in the lead-up to the World Cup in 2014 and the Olympics in 2016. The Brazilian Government has organized a working group of government agencies, companies and non-governmental organizations to create a world-class power grid for these events. We have been working together closely over the past few years to strengthen the system to the point where we will be able to support the power requirements needed to host the world’s two most popular sporting events.

None of this should be adversarial. Investors and shareholders want a return on their investments – we are investing US$160m in games-related transmission and distribution capacity upgrades over this next year alone – and we all want to contribute to the success of the games, and to the social and economic growth of Brazil.

Britaldo Soares, AES Brasil

“... building the Brazilian power system requires the same kind of team effort we are seeing now in the lead-up to the World Cup in 2014 and the Olympics in 2016.”

Figure 1. Meeting Brazil’s electricity demand

Sources: Business Monitor International, Ernst & Young analysis

*Compounded average annual growth rate
Canada’s clean machine expands

Canada has a long history of producing clean energy. Four leading companies are continuing this tradition at home and abroad with growing investments in the hydroelectric and renewable energy space.

Report by Derek Purchase.

Nova Scotia, Canada relies mostly on fossil fuel sourced electricity to power its economy. Now, two Canadian utilities are teaming up to build a new hydroelectric power development that will bring clean power from Muskrat Falls, Labrador to Nova Scotia via a subsea transmission link.

Naicor Energy of St. John’s and Emera Inc. of Halifax are partnering on a hydroelectric power and transmission project in eastern Canada that will generate and transmit renewable energy to the Atlantic provinces and northeastern United States.

The historic US$7.6b project will include an 824 MW capacity hydroelectric facility at Muskrat Falls on the lower Churchill River; a roughly 1,100 km transmission link from Labrador to the island of Newfoundland; and an undersea Maritime Link from Newfoundland to Nova Scotia, which can deliver up to 500 MW of power to the rest of eastern Canada and the northeastern United States (see Figure 1, page 33).

The primary market for Muskrat power will be Newfoundland and Labrador – enabling the shutdown of an oil-fired generation facility, making the province’s system 98% clean and meeting future load growth. When the turbines start spinning sometime around 2017, 40% of the output will replace the 500 MW Holyrood oil-fired generating station in Newfoundland. Another 40% of the output will be available for use in Newfoundland and Labrador, or for export to the Maritimes and northeastern United States.

Emera has formed Emera Newfoundland & Labrador (ENL) to develop the Maritime Link. In return for ENL’s investment of 20% of overall project costs and an opportunity to take an equity position in...
the Labrador-Island Transmission Link, Nalcor is providing 20% of the output from Muskrat Falls for 35 years. Emera is also providing transmission rights over the Maritime Link, through Nova Scotia and New Brunswick and congestion rights into New England.

**Lowest cost solution**

The projects enable Nalcor, Newfoundland and Labrador’s energy corporation to develop a prime hydroelectric asset at a time when it is trying to make a shift toward more renewable energy. At the same time, a Canadian Government loan guarantee is an added incentive that reduces the cost of borrowing by hundreds of millions of dollars.

“Muskrat Falls and the transmission link to Newfoundland is our lowest cost electricity generation option,” says Gilbert Bennett, Vice President for the Lower Churchill Project with Nalcor. “It also represents a cornerstone of the provinces’ renewable energy plan.”

The project will help Emera meet stringent federal government emission requirements and support Nova Scotia’s goal to generate 40% of its power from renewables by 2020.

“The good news is once you invest the capital then we don’t pay an escalating cost per megawatt hour – we don’t pay any cost per megawatt hour.”

— Nancy G. Tower
Emera Newfoundland and Labrador

“When faced with these carbon reductions and renewable targets we did need to find a renewable energy solution to replace coal generation in Nova Scotia,” says Nancy Tower, CEO of ENL. “You can only put so much wind on the system. The Maritime Link is the lowest cost alternative to meeting Nova Scotia’s greenhouse gas and renewable energy requirements.”

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**Figure 1. The Muskrat Falls project**

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**Figure 1. The Muskrat Falls project**

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Nancy was appointed Executive Vice President of Business Development for Emera and CEO of ENL in May 2011. Prior to this role, Nancy served as Executive Vice President and Chief Financial Officer for Emera.
Challenges – but rewards ahead

The project has had some challenges. According to Bennett, gaining the support of various stakeholders at the federal, provincial and public level over many years was necessary to move it forward into construction. “Bringing forward a regional project was an important consideration in gaining buy-in at the national level,” he says. Public outreach efforts have also paid off: “A recent poll in the province showed that 63% of the population either strongly support or support the project,” he adds.

High on Emera’s list is finding the right talent to build and manage the project. The labor market in eastern Canada is tight, “especially for people with big project experience and particularly in Newfoundland and Labrador where there are a number of major oil and mining projects underway,” Tower says. “We’ve found some very good people but it takes some time and takes some effort.”

She notes that this deal locks Emera’s price for years to come. “The good news is once you invest the capital then we don’t pay an escalating cost per megawatt hour – we don’t pay any cost per megawatt hour,” says Tower.

There is an important strategic advantage as well for Nalcor and Emera: the deal creates a power loop that links the Atlantic provinces. The Maritime Link transmission system can deliver up to 500 MW of high-voltage direct current electricity from Newfoundland to Nova Scotia, while at the same time creating a new export route for Labrador power. “For the first time in history the island of Newfoundland will be connected electrically to the rest of North America,” says Tower.

Emera’s Maritime Link project is currently going through a regulatory review with the Nova Scotia Utilities and Review Board (UARB), which will determine if it is the lowest cost long-term option for Nova Scotia customers. If approved by the UARB, the impact on ratepayers in Nova Scotia should be minimal with estimates of a less than 1% increase per year on the average bill over five years for a clean and price-stable power source. In Newfoundland, with power from Muskrat Falls, electricity rates will stabilize, increasing just over 1% per year between 2016 and 2030 for residential customers.

In Bennett’s view, the Nalcor and Emera partnership creates significant value through complementary approaches and objectives. “We have a project that benefits both of us,” he says, “and I think that’s an important aspect of an effective long-term working relationship.”

Emera is already considering next steps in its plans to access more renewable energy. Tower says that Newfoundland and Labrador has the potential to produce an additional 6,000 MW of hydroelectric power and 5,000 MW of wind. “We’d love to partner with Nalcor again. ... This really opens up the electricity market in this area and will create opportunities for both Emera and Nalcor in the region.”

“We have a project that benefits both of us and I think that’s an important aspect of an effective long-term working relationship.”

Gilbert Bennett, Nalcor Energy

Gilbert is the Vice President of the Lower Churchill Project. He joined the company in May 2005 and is currently leading the development of the Muskrat Falls Project.
Robertson sees a lot of growth ahead. “In the Independent Power Producer (IPP) space, we have a billion dollar pipeline of contracted opportunities over the next four or five years that we will continue to complete,” he says.

Robertson argues that running both regulated and deregulated businesses gives Algonquin the best of both worlds. “I like to think that with a 50/50 split, we get the benefit of the stability that comes from the utility side, but also get the sizzling upside that comes from the IPP space both in Canada and the US,” he says.

**Fast and steady wins the race**

Enthusiasm for clean energy may be relatively new on Wall Street but not for Brookfield: the Toronto company has been in the hydroelectric business for 100 years.

With experience like that, it’s no wonder that Brookfield Renewable Energy Partners has grown into the largest pure-play renewable power company in the world. It owns 5,800 MW of capacity, including US$17b of hydroelectric and wind assets at 209 facilities in Canada, the United States and Brazil. Eighty-five percent is hydro, and Sachin Shah, Brookfield Renewable’s CFO, sees distinct advantages in this balance.

“Hydro assets provide more optionality and flexibility in that they can deliver power when it is needed or provide a storage capability for future needs,” Shah says. Hydro assets are also long-lived, according to Shah: with proper maintenance, a hydroelectric station can last 100 years or longer.

Best of all, there’s a lot of it around. “Contrary to what a lot of people believe, hydro is not a small asset class,” says Shah. Hydropower already supplies 16% of the world’s electricity but a 2012 International Energy Administration report estimates that current global hydropower capacity may double by 2050, up to 2,000 GW.

Shah is equally bullish about Brookfield’s markets, particularly Brazil, where it has operated for over 50 years. And no wonder: power demand grew by 4.5% compound annual growth rate (CAGR) over the last 10 years – and a rising middle class is expected to double it over the next 20. “Brazil is a market we like a lot and we’re considered a local company there,” he says.

Beyond Brazil, which already contributes 25% of the company’s revenue, Shah sees potential ahead in Latin America because of its untapped hydro resources, and Europe because of its longtime support for renewable energy. But perhaps Brookfield’s most important resource is its own track record for growth – since 1999 invested capital has grown by an impressive 25% CAGR to reach US$8b.

“Contrary to what a lot of people believe, hydro is not a small asset class.”

Sachin Shah joined the corporate finance team of Brookfield Asset Management in 2002 and most recently served as its Managing Partner, Finance. In February 2011, he was appointed CFO of Brookfield Renewable.
When Superstorm Sandy slammed into the US Eastern Seaboard last October, as many as 10 million people lost their electricity. Thousands of miles of distribution systems and many transformers were knocked offline, and 24 states suffered damage.

Largely through the efforts of the utility industry’s Mutual Assistance Program, a crew of almost 70,000 was mobilized prior to, during and right after the storm subsided to restore service knocked out by up to 80 mph winds and severe flooding. Just one day later, this army of utility responders had restored service to half the customers who had lost power. However, the impact was so severe that it took weeks before electricity was restored to some customers in heavily damaged and remote areas.

“The frequency and the severity of the storms are really increasing and that’s what’s concerning us. These are no longer storms that impact a million people. These are storms that impact 5 to 10 million people,” warns Owens, whose responsibilities include coordinating the power industry’s national response through the Mutual Assistance Program.

Following Sandy, Owens says that the nation’s electric power industry has put together a plan that focuses on five essential elements for responding to future mega-storms.

1. **Form a stronger partnership with government.** In the case of Sandy, the devastation was so widespread that crews and equipment had to be airlifted in from as far away as California and Canada, which meant a need for waivers from the U.S. Department of Transportation and the states to expedite crews and equipment across state lines.
“There needs to be a very clear and compelling partnership between private industry and the federal government with specific roles identified,” he says. In particular, the government needs to be aware that electric utilities play an important role in responding to disasters: “There needs to be consideration to the critical roles that electric utilities play and the need for electric utilities to be considered to be a top priority responder.”

2. Consider the best ways to harden the system. “The utility industry continues to look for ways to improve system reliability, including preventative maintenance while the sun shines. Utilities also are assessing the need for hardening their electric system and looking at an array of options that include undergrounding and advanced technologies, including smart grids and related systems,” says Owens. But burying power lines is very expensive and there are areas where undergrounding didn’t enhance resiliency. A number of New York City substations flooded after Sandy. “You have to be very careful about how you make those decisions,” he says.

3. Analyze interdependencies with other industries. “As we begin to digitize our network, we’re growing more dependent upon other infrastructures such as pipelines and so forth to make our business work,” says Owens. “We’re working more closely with them as a result. That’s very, very critical. The telecommunications industry is an example – we need to work closely with them and they need to acknowledge that back-up power supply systems may be necessary in light of the frequency and the severity and the duration of these storms.”

And the worries go beyond wires: utilities typically keep an inventory of fuel (for repair trucks and other fleet vehicles), but local filling stations may be suffering from outages themselves. “Making sure that we have back-up generators or the physical connection/capability to hook them up at some of the gas stations and other areas is critically important,” Owens says.

continued on page 38

Hedging for stormy weather

Tim Andriesen has held his current position at CME Group since 2009. He is responsible for developing and executing the global business strategy for the company’s benchmark agricultural commodities, including an array of grain, oilseed, livestock, dairy and other risk management products, as well as alternative investment products such as weather derivatives.

In addition to physical and logistical measures, utilities are also looking at innovative financial tools to hedge against the impacts of hurricanes and extreme weather events.

Utilities routinely hedge load forecast risk through heating and cooling degree day contracts, but a growing suite of weather derivatives based on snowfall, rainfall, and hurricane incidence and strength could help utilities implement more effective risk management strategies.

“You can’t predict or manage the weather but you can manage the financial impact of the weather,” says Tim Andriesen, Managing Director of Agricultural Commodities and Alternative Investments for CME Group. Furthermore, standardized contracts traded on the CME futures exchange “allow market participants to receive additional value in greater price transparency and credit risk mitigation,” says Andriesen.

For hurricane preparedness, for instance, Andriesen sees value for utilities in using hurricane derivatives as part of a strategy to complement insurance coverage and protect against the cost of a hurricane’s impact on grid operations and infrastructure. Unlike insurance, the payoff of a derivative increases according to the severity of the event and there are no settlement delays due to damage assessment and dispute resolution.

Despite the advantages, he still sees an awareness gap regarding the use of weather derivatives, especially outside of the trading business. “The challenge that we have is helping people to understand how to use these products to manage the financial consequences of the weather and how to tie that to the specific challenges that their organizations have,” says Andriesen.
“These are no longer storms that impact a million people. These are storms that impact 5 to 10 million people.”

David K. Owens, EEI

4. **Look carefully at the system’s overall resiliency.** “We’re entering a period in our industry where a lot of people are going to retire. So we need to look at ways to strengthen the mutual assistance program with the right skill sets. The sharing of resources, the sharing of people and the sharing of equipment – that’s got to be a top priority,” says Owens.

Smart meters should help: “If you have a smart meter, the utility has two-way communication with the customer, which improves our response time to outages,” says Owens. “Some utilities have stated that the smart meter has improved their restoration efforts as much as 30%.”

Protecting the grid against cyber-attacks is another priority. According to Owens, the industry is currently working with government to make sure that the increased vulnerabilities these new networks create will be made secure.

5. **Improve the ability to conduct real time communication.** “Probably the biggest challenge we have as an industry today is that the world works in real-time. And after two days of no electric service, customers get very, very impatient,” he says.

“We get that. Communicating with customers about why the power is out and when it will come back is critically important in today’s society. ... We’re continually working to improve our communication in this new era of technology and social media.”

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Unifying the EU energy community

As Lithuania prepares to take over the EU Council Presidency in July 2013, Dalia Grybauskaitė, President of Lithuania, presents a personal view of priorities for energy within the EU and across the Baltics.
Governments all over the world face two main challenges in the energy sector:

- Timely replacement of outdated, inefficient energy infrastructure to improve cost efficiency, diversity and security of energy supply and reduce our carbon footprint.
- Lack of appropriate funds for the major turnaround we need in energy production and transmission assets — including the need to improve integration between countries and markets.

We have to admit that the EU is not an exception here. Member countries are struggling to find the best alternatives for further development of energy. At the same time, there's not enough collaboration between different countries to find joint solutions.

Which energy mix fits the EU dimension best? Who should pay for the implementation of new technologies and solutions? Is the European Union Emission Trading System (EU ETS) the most efficient measure to fulfill our CO₂ emissions reduction targets?

These are tough questions and there isn't one clear solution. It's vital that EU members work hand in hand to successfully implement the measures set out in the EU's Third Energy Package, 2020 Energy Strategy and 2050 Roadmap.

Focus on funding for physical interconnection

As the world’s largest regional energy market — with over 500 million customers — the EU continues to suffer from market fragmentation. This impacts the region’s competitiveness against other large scale economies of the world, such as the US and China.

As a counter measure, EU Member States decided to implement the single EU energy market, which was declared one of the major priorities in its 2020 Energy Strategy. It is obvious that this goal can only be achieved once the required physical power and gas connections between different EU regions have been established.

One of the key prerequisites for timely implementation of these strategic projects is the availability of funding. As the EU Council President, Lithuania will be placing emphasis on further discussions around sufficient allocation of financing to energy transmission infrastructure development in the 2014 to 2020 financial window.

Making energy decisions together

More and more countries in the EU understand the benefits of a joint position in dealing with major primary energy suppliers. In this context, Lithuania will put every effort into ensuring that the development of the EU position in relation to its neighbors is based on mutual benefits, rather than on one-sided short-term gains which limit further progress of productive collaboration.

Energy diversification is a key goal for Lithuania and the Baltics

Energy supply diversification is one of the major goals Lithuania is seeking, while synchronizing the Baltic energy systems with Western European electricity networks is the key goal for the whole Baltic region.

The Lithuanian Government is in the process of updating its energy strategy, analyzing several potential scenarios.

It has already been announced that one of the major components of the country’s future energy strategy is the LNG terminal in Klaipėda — already in the preparatory phase and due to be operational in 2015. Lithuania’s LNG terminal would significantly contribute to increased LNG market liquidity in the region.

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Dalia Grybauskaitė

President of Lithuania

Since her election as President of Lithuania in 2009, Dalia Grybauskaitė’s efforts to ensure economic stability and energy independence, as well as to establish good relationships between Lithuania and its European neighbors, have been widely recognized. In May 2013, she was awarded The International Charlemagne Prize in recognition of her “exceptional endeavors for deeper integration in the EU and for finding solutions for the current crisis.”
As a parallel process contributing to increased security of supply, the connection of the Lithuanian and Polish natural gas systems is strongly supported by Lithuania’s Government. This project has already received support from European Commission officials as well as potential support from Trans-European Energy Networks Fund. In addition, the construction of power links to Poland and Sweden is already in progress. It’s expected that these projects would allow Lithuania and the Baltic region as a whole to capitalize on the benefits of the common EU power market by 2016.

Decisions on projects – for instance the Visaginas Nuclear Power Plant, which involves protracted political debate and several major stakeholders – can’t be made quickly. But the Baltic States and our European neighbors need to work together to create a self-sufficient power system in the region.

Aside from conventional energy project development, increased usage of locally available energy sources – for example biomass – can and should also contribute to reducing the region’s dependency on expensive imported energy sources.

Coordination is key
Taking into account the latest developments, it’s quite clear that to achieve the best possible results all these initiatives have to be coordinated in an efficient and effective manner.

According to the estimates, the implementation of Lithuania’s energy independence-related projects may well cost some €6b to €7b (US$7.8b to US$9b) up to 2020 – a significant investment which has to be spent wisely, taking into account geopolitical, economic and affordability factors.

“It’s vital that EU members work hand in hand to successfully implement the measures set out in the EU’s Third Energy Package, 2020 Energy Strategy and 2050 Roadmap.”

Dalia Grybauskaitė, President of Lithuania
When green and red newspaper ads appeared in Abu Dhabi in January 2012, asking “Are you in the green or the red?” residents had no idea who was behind the campaign. A month later, red and green posters appeared.

It was in March that the full story was revealed in a redesigned utility bill that showed customers for the first time:

- Whether their water and electricity consumption falls into an “ideal consumption” band (green tick) or the “above ideal consumption” band (red exclamation point).
- The amount by which the government subsidizes water and electricity bills.

This campaign was led by the Regulation and Supervision Bureau (RSB), the independent regulator of the water, wastewater and electricity sector in the Emirate of Abu Dhabi, together with Abu Dhabi Distribution Company and Al Ain Distribution Company. To promote the new bills, the whole water and electricity supply business was redesigned.

It proved to be a huge success. When the RSB commissioned an independent survey by YouGov in mid-2012, 76% of those polled remembered the new utility bill. More importantly, 46% said they had taken steps to reduce waste, particularly with water.

The drive for sustainability
“The UAE is a country housing millions in an inhospitable environment. The government recognizes that and is actively promoting sustainability,” says Nick Carter, Director General of the RSB. “It is known for its pioneering work on renewable energy projects, for example Masdar City, a test bed for new technologies.”

Water has a high intrinsic cost in the UAE. Nearly all of its drinking water comes from desalination, which requires energy to produce and carries environmental consequences.

Until recently, the true cost of water has not been visible to consumers. The government subsidies up to 85% of water and electricity bills for nationals and up to 50% for expats. “Five years ago, information on subsidies was not in the public domain,” says Carter. “Now it’s printed on every bill.”

A multipronged approach
While the public face of the campaign was a redesigned bill, an enormous amount of work was required from the utilities to

In common with other arid Gulf States, the United Arab Emirates (UAE) consumes high quantities of power and water. But thanks to a sustainability campaign, people are using less.

Report by Jo Rowbotham.
are you in the green or the red?

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bring it about. Beyond ensuring integrity of data, a major challenge when working with any utility, the work included:

- **Segmenting customer data:** beyond identifying industrial, commercial, government and domestic customers, the utilities segmented domestic customers based on whether they lived in flats or villas as consumption patterns are very different. Targets for “ideal” and “above ideal” consumption were then set for different user groups.

- **New billing systems:** a new front-end system was built to improve flexibility and allow bills to be produced in real time instead of preprinted batch runs.

- **Oracle upgrade:** enabled open-item accounting which provided greater flexibility within the billing system.

- **New file servers in the distribution company:** provided greater capacity, especially with the production of print-maps to support the front-end upgrade.

- **Public relations training:** call center staff were trained to deal with queries about the new bills, and spokespersons received media training.

- **Design:** a specialist bill design company was commissioned to rethink the bill from the customer's perspective, to be simpler, easier to understand and more visually appealing. The new bills look the same online and in print, in English and in Arabic, and use icons to cut across language barriers and build awareness of the different services.

  “As a result of this work, our utilities have highly transparent, accurate information on precisely what their cost to serve customers is. We have one of the most flexible billing and information utility systems in the world, which can provide tailored messaging on consumption.”

**One year on**

In Abu Dhabi, 95% of customers have smart meters for electricity and nearly 75% have water meters. The RSB will analyze consumption patterns in a sample of over 1,000 homes to gain further insights on consumption patterns, particularly on a year-on-year basis.

“We already know there’s a huge swing in seasonal demand driven mainly by air conditioning, from 4 GW of peak use in winter to 10 GW in summer. This means that for a number of months each year, we have large amounts of generation plant sitting idle so any measures to shift demand in peak times will create huge savings for utilities in terms of stranded assets.”

The 2012 campaign was just one piece of the larger jigsaw of demand side management (DSM). “Our strategy is to provide a range of DSM projects involving customers, collect highly accurate consumption data and provide robust information to customers through our Waterwise and Powerwise offices,” says Carter. “It is a broad front strategy.”

Nick Carter, Regulation and Supervision Bureau (RSB), Abu Dhabi

Nick Carter joined the RSB in 2001. Prior to that, he worked with the water and electricity unbundling team for Abu Dhabi in 1998, and in 1999 was appointed Deputy Chairman and Managing Director of Abu Dhabi Distribution Company and Board Member of the local transmission company (TRANSCO). Carter previously held a number of executive-level positions in London Electricity and Southern Electricity in the UK.

Nick Carter,
Director General
Regulation and Supervision Bureau (RSB), Abu Dhabi

“Five years ago, information on subsidies was not in the public domain. Now it’s printed on every bill.”

Nick Carter, Regulation and Supervision Bureau, Abu Dhabi
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http://performance.ey.com

Power transactions and trends Q1 2013
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The latest issue of T Magazine explores how tax risk and controversy have changed in the wake of the financial crisis. We look at emerging risk areas, explore how the relationship between companies and their external stakeholders is evolving, and find out how companies are identifying and managing risk.
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Andrew Jamieson, CEO of the UK’s new Offshore Renewable Energy Catapult, believes pooling R&D and leading innovation will speed offshore renewable energy on its way to commercialization.
A round the world – notably in the UK – there are exciting pockets of bespoke innovation in offshore renewable wind, wave and tidal energy generation. Individually these enterprises may lack the influence to make the industry and investors pay sufficient attention. By pulling together, they could transform and accelerate this class of energy generation worldwide.

My role as CEO of the UK Offshore Renewable Energy Catapult – a new government-sponsored body which will house over 100 industry experts – is to create a catalyst for technology innovation, to get businesses collaborating. Our goal is to incubate nascent technologies and de-risk renewable innovations, to turn them into investable market opportunities.

“Our goal is to incubate nascent technologies and de-risk renewable innovations, to turn them into investable market opportunities.”

Andrew Jamieson, UK Offshore Renewable Energy Catapult

The value in renewable offshore energy is often overlooked by investors. It doesn’t just reside in large scale turbines. There are significant value-creating opportunities in foundations, cabling and switchgear as well as technology deployment and support services. Value-creating opportunities for new and existing UK businesses could mirror the development of the oil and gas sector. When that began in the UK, the market was dominated by foreign majors. Now, UK expert technology and services in oil and gas are exported around the world. I see an equivalent opportunity now in offshore renewable energy.

Creating commercially viable offshore renewable technology is not (always) rocket science. Nothing in this industry presents an insurmountable challenge. With steady policy objectives, and an organized, united marketplace where people learn and share (mistakes included) rather than innovate in isolation, we can deliver a stable, confident sector where investors can participate in earlier stages of development.

Transforming potential

Offshore wind already has investors’ attention, largely because of their familiarity with onshore wind farms. Ostensibly, it’s the same principle as onshore, but in a marine environment. This makes the funding concept easier to grasp.

Meanwhile, tidal and wave technologies are a step away from “commercial proving.” More predictable than wind generation, tidal, with its twice-daily generating peaks, has the potential to transform global energy supply. Wave power also offers great possibilities.

But their journey to market has been difficult. Investors tend to be milestone focused and risk-averse: they want proof of concept before they put up the financing to scale up new concepts. Having begun the journey 10 years ago, only now are industrial heavyweights like GE and Alstom bringing wave and tidal generation to the cusp of commercialization.

Imagine what could have been achieved with greater upfront collaboration between the industry, government and financiers. That’s exactly what the Catapult program is about. It is designed to take the UK’s skill in research and development and technology and to foster innovations through to successful market execution and beyond. Backed by £1b (US$1.52b) in public and private sector funding, seven Catapults are being established in priority sectors with the potential to deliver the most value back to the economy in terms of job creation and commercial up-sides.

These initiatives are uniting technologists, engineers, academics, utilities, large corporations and supply chain component manufacturers in centers of excellence to bring new technologies to market. My organization will work with other agencies including the Carbon Trust; NAREC on its testing of 100-meter wind turbine blades; The European Marine Energy Centre (EMEC) on testing marine devices in Orkney; and the up and coming Wavehub equivalent in the south west. We will endeavor to make their initiatives industry-wide priorities and commercial possibilities.

As I see it, we are drawing on creative talent to design, develop and test innovations so that we can present financiers with something more compelling and tangible than hard-to-
Regional reports: EMEIA

grasp concepts on sheets of paper. We will deliver evidence to create deeper market understanding of projects and related risks, giving investors confidence earlier in the capital funding process.

There are similar Catapult set-ups around the world, notably in Europe and the US. We aim to work closely with them, collaborating not competing, to unleash the potential of pooled rather than fragmented invention.

**Offshore politics**

Delivering maximum potential from offshore generation is not the job of one institution or individual. It is a triangular responsibility between government (to provide leadership and confidence), the supply chain (to innovate and deliver) and developers and owners of utilities (to demonstrate commitment to renewables).

The Catapult requires everyone to step into the center, make decisions, lead and direct, to provide reassurance that there is genuine cross-industry and political support for renewable programs. It is the stake in the ground from which stability and confidence to participate and invest in offshore generation can flow.

**Delivering economic value**

Right now, the balance of offshore generation and marine technology expertise sits in the UK and Europe, which is strongly promoting wind, wave and tidal industries. Inevitably, those European skills, services, products and intellectual capital will be exported around the world. As pockets of innovation come together to create commercially viable offshore solutions, there will be standardization. Multiple designs for offshore wind farms, or turbine foundations for sea beds, will be whittled down to just three or four top-performing types. Within that, innovation will flourish, enabling the best to get better, faster or more efficient; allowing entry to new market participants and job creation; and ultimately delivering reductions in the cost of offshore renewable energy to the consumer.

The types of technology and their deployment in renewable offshore energy offer tremendous value for UK businesses, worth hundreds of millions if not billions. The Offshore Renewable Energy Catapult is poised to play a leading role in delivering that value — and that’s a very exciting place to be.

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**Andrew Jamieson**

**CEO**

UK Offshore Renewable Energy Catapult

Prior to becoming CEO of the UK Offshore Renewable Energy Catapult, Andrew held senior management and engineering roles with ScottishPower spanning 24 years. He has chaired/co-chaired numerous industry strategic reports for the UK Government and is also Chairman of the trade association RenewableUK.
Formed in 1995, Powerlink is the government-owned, sole electricity transmission operator for the state of Queensland, with a A$6b (US$6.17b) high-voltage network comprising 118 substations and 13,930 circuit kilometers of transmission lines.

In its almost two decades of operation, Powerlink has adapted to a booming population, increasing regulatory pressure and changing consumer behavior – while navigating the rapid evolution of Australia’s electricity industry. Responding to these changes has required a complete cultural shift, says CEO Merryn York.

What does the market want?
An engineer by training, York has spent more than 25 years in the electricity industry. Before becoming CEO in 2011, York was responsible for Powerlink’s network strategy and performance, giving her the hands-on experience with regulators and customers that is rare for someone in her position. She feels that Powerlink’s greatest challenge – and perhaps the secret to its success – is its ability to “focus on the right things.”

“It has been a real journey for us – first to adopt a commercial focus and, most importantly, to understand what our role is. What do customers want to receive from us? How do they wish to receive it – and what is it worth to them? And the whole industry in Australia is just so much more complicated than it used to be,” she says.

It’s all about the cost
Like most of the world’s utilities, Powerlink is operating within an environment of rising energy bills and increasing consumer and regulator pressure. So when asked about Powerlink’s number one challenge, York’s answer is not unexpected.

“It is all about the cost of electricity and for network businesses – in particular...
Regional reports: Asia-Pacific

Transmission network businesses like Powerlink – it is all about efficiency,” she says. “We are getting very clear signals from our stakeholders that they want us to be an efficient business that delivers efficient services. It is not about whether the process within the business is efficient – it’s whether the transmission service has actually delivered an efficient service to the people who want to get that service.”

With this in mind, Powerlink has recently revamped its forecasting process to consider how changing consumer behavior is impacting energy demand. “Technically we are only required to forecast once a year but we are now doing it twice a year to respond to an external environment that is perhaps not as predictable as it was,” says York.

**Regulation replaces competition**

Building better relationships with regulators and customers is another big priority for Powerlink. “We have an incentive-based regulatory framework but there are questions about whether this actually works or whether policymakers need more ‘hands on the levers’ to achieve the outcomes they want by controlling things more closely,” she says.

“From our point of view, it means we must think more about consumers – what they want, how they value our services and the cost/reliability trade-off for them. But a lot of consumers do not know anything about the electricity supply chain – they have no clue what Powerlink is or what role we play. So as well as research, part of this process will probably involve education.”

**Impact of CSG**

Going forward, one of Powerlink’s priorities will be responding to coal seam gas (CSG) mining in Queensland’s Surat and Bowen basins. “Providing the network to connect this CSG-driven demand is a big challenge that we are working hard to meet,” says York. “It will mean building a lot of substations and transmission lines, lots of interactions with land owners.”

But Queensland’s huge reserves of CSG – the largest in Australia – have the potential to reduce delivered power prices for consumers: “Because we have a fixed asset base, the extra demand from CSG projects will lower the transmission cost on a per megawatt hour basis for everyone else.”

Meeting the challenge of the CSG industry and other large-scale demand was partly behind Powerlink’s decision last year to divest its 41% stake in South Australia’s transmission business, ElectraNet: “We preferred to use those funds to build our own non-regulated businesses, particularly around CSG.”

**Refreshed and re-energized**

York says Powerlink needs to aim for solutions that are “fit for purpose” rather than technically “best-in-class.”

“We need to make sure we’re thinking about things in a way that is fit for purpose. ... Finding that balance between cost, reliability and efficient delivery of service is key.”

Merryn York
CEO
Powerlink Queensland

“I try to avoid that kind of terminology. We are a very technical organization and culturally people want to present the best technical solution,” she says. “But we need to make sure we’re thinking about things in a way that is fit for purpose and contemporary to the current environment we find ourselves in. “Finding that balance between cost, reliability and efficient delivery of service is key rather than always thinking about it from a best technical point of view.”

York says she and her executive team colleagues have been ready to work at achieving this “one person at a time.”

“We are talking directly to staff, explaining the changes affecting our organization, and how and why we’d like them to think differently,” she says.

Hardly an easy task but York admits she does not always live within her comfort zone: “One of my themes when I first came to this role was to refresh and re-energize. And I’ve always pushed myself and taken opportunities as they arise.”

As CEO, Merryn York has more than 20 years’ experience in the Queensland electricity industry. Her career encompasses experience in strategic business development and asset management to optimize the long-term return on investment, network planning, regulatory affairs, customer management and strategic development of the transmission network.
It could bring competitive pricing to the region’s natural gas but is an Asian gas trading hub just a pipe dream? Duncan Coneybeare spoke to Anne-Sophie Corbeau of the International Energy Agency (IEA) about the possibility of an Asian hub.

As demand skyrockets, Asia’s natural gas sector is tipped to be the world’s second biggest by 2015, according to the recent IEA report, Developing a Natural Gas Trading Hub in Asia: Obstacles and Opportunities. But long-term, oil-indexed contracts mean Asian utilities are paying up to five times as much for their gas as those in other parts of the world. As Asian utilities try to contract for gas that is priced against the US Henry Hub benchmark, calls are growing to consider a regional trading hub – most likely in Singapore – that could drive down prices and ensure a better energy mix for the region.

Flexibility and transparency
Anne-Sophie Corbeau, Senior Gas Expert at the IEA, says that market-led natural gas prices would offer both buyers and suppliers more flexibility and bring transparency and legitimacy to the sector, encouraging the confidence that is vital to attracting investment to this capital-intensive industry. But she cautions against any expectations that spot prices would always be lower than oil-indexed prices.

“The creation of a hub will not automatically lower prices – sometimes spot prices will be higher than an oil-linked gas price, simply because the market in Asia is very tight. But it would offer an alternative to always having contracts based on oil indexation,” says Corbeau. In the absence of such an alternative, it seems likely that Asian utilities will keep up their recent interest in signing Henry Hub-indexed contracts for North American gas.

“Hands off” from government
At present prospects for a competitive wholesale natural gas market in Asia remain limited unless governments begin prioritizing economic progress over state control. The establishment of any hub could require a series of institutional and structural reforms to create confidence among potential participants, particularly financial players. Citing “government willingness” as the biggest obstacle to a regional hub, Corbeau says that these reforms would require many Asian governments to adopt a more “hands off” approach to energy matters.

“To really see a liberalized gas market we need governments to shift from direct policymaking and market involvement to a role of monitoring the market and put in place an independent regulator or anti-trust agency,” says Corbeau.

She points out that this would also mean “unbundling” the natural gas market – separating transport from commercial activities, price deregulation at a wholesale level, and allowing nondiscriminatory access. A successful

“Without firm government commitment to a regional hub, Asian buyers can expect to continue to buy LNG based on oil indexation well into the future.”

Anne-Sophie Corbeau, IEA

Anne-Sophie Corbeau joined the IEA in March 2009 as Senior Gas Expert at the Gas, Coal, and Power Division (Office of Energy Markets and Security). She is responsible for managing research on global gas markets, with a particular focus on short- to medium-term development. She is the main author of the Medium Term Gas Market Report. Before taking up her current role, Corbeau worked at Cambridge Energy Research Associates as Associate Director in the European Gas team.
hub will also require sufficient network capacity and a competitive number of participants, including financial institutions.

A lack of liquidity will probably be an issue for a new hub, but Corbeau says this can be overcome: “Over time, more participants will be attracted to the market, including the financial players which are critical in providing liquidity.”

**Time and trust**

Time is perhaps the biggest factor in establishing an Asian hub. Building a natural gas trading hub in Europe took a solid decade and, despite having the advantage of learning from this experience, establishing an Asian hub is likely to take a similar period of time to overcome significant obstacles.

A new Asian hub that generates natural gas pricing based on true supply and demand factors, rather than oil indexation, could help gas stand its ground against competing energy sources, particularly coal, and ensure its future role in the region’s energy mix. But, as Corbeau says, “Time and trust is essential to the establishment of any hub. Without firm government commitment to a regional hub, Asian buyers can expect to continue to buy LNG based on oil indexation well into the future.”

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**Is Singapore the best candidate for a hub?**

Significant experience regulating energy commodity trade as one of Asia’s major oil trading hubs makes Singapore the most likely site of any future natural gas trading hub in the region. Geographically central to the South East Asian gas market, Singapore depends on LNG imports for about 80% of its power generation needs. The Singapore Government’s free market approach, separation of the sector’s commercial and transportation activities and investment in infrastructure (including terminals and storage) gives Singapore an edge over other contenders, such as China, the Republic of Korea and Japan (see Figure 1). A Singapore-based hub may seem small in size but, in a global market, its impact on pricing has the potential to extend far beyond its borders.

**Figure 1. Potential locations for an Asian gas trading hub**

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Source: Ernst & Young analysis
China has become a global leader in renewables – and it could do the same with carbon capture and storage (CCS).

Report by Duncan Coneybeare.

China is the top consumer of coal globally, and is building new coal-fired power plants faster than any other country in the world.¹ Given its deep coal resources, fossil fuels are expected to remain the dominant energy source. To reduce the environmental impact of coal, China is investigating a number of solutions, including CCS. With 11 projects at different stages of development (see Table 1), China is one of the global leaders in CCS. But insufficient government support means that businesses are bearing the majority of the costs of the pilot projects – which could limit the development of CCS in the country that could benefit from it the most.

Businesses picking up the tab for CCS

However, just as in other jurisdictions around the world (see “Future-proofing coal,” page 25), cost is proving to be a major obstacle. At present, support from the government is seen as being at an inadequate level and inconsistent. And with an immature carbon market, businesses are picking up the tab for CCS projects, says Dr. Di Zhou of the South China Sea Institute of Oceanology, Chinese Academy of Sciences.

Dr. Xi Liang, secretary of the China Low-carbon Energy Action Network (CLEAN) and lecturer in Business and Climate Change at the University of Edinburgh, believes change could happen quickly: “There is interest from large energy companies, but there’s a lack of financial incentive. The timescale for commercialization depends on the priority the government sets for CCS. If it receives the same amount of support as wind or solar, CCS will happen.”

Zhou agrees: “Our financial modelling for Guangdong province showed that

Table 1. Current large-scale integrated CCS projects in China

<table>
<thead>
<tr>
<th>Asset lifecycle stage</th>
<th>Project name</th>
<th>State/ district</th>
<th>Volume CO₂</th>
<th>Capture type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate</td>
<td>Huaineng GreenGen IGCC Project</td>
<td>Tianjin</td>
<td>2 Million tons per annum (Mtpa)</td>
<td>Precombustion</td>
</tr>
<tr>
<td>Evaluate</td>
<td>Sinopec Shengli Oil Field EOR Project</td>
<td>Shandong</td>
<td>1 Mtpa</td>
<td>Postcombustion</td>
</tr>
<tr>
<td>Identify</td>
<td>ShenHua/Dow Chemicals Coal to Chemicals Plant Project (Yulin)</td>
<td>Shaanxi</td>
<td>2–3 Mtpa</td>
<td>Industrial separation</td>
</tr>
<tr>
<td>Identify</td>
<td>Daqing Carbon Dioxide Capture and Storage Project</td>
<td>Heilongjiang</td>
<td>1 Mtpa</td>
<td>Oxyfuel combustion</td>
</tr>
<tr>
<td>Identify</td>
<td>Dongquan Taiyangzhou IGCC with CCS Project</td>
<td>Guangdong</td>
<td>1 Mtpa</td>
<td>Precombustion</td>
</tr>
<tr>
<td>Identify</td>
<td>Dongying Carbon Dioxide Capture and Storage Project</td>
<td>Shandong</td>
<td>1 Mtpa</td>
<td>Not decided</td>
</tr>
<tr>
<td>Identify</td>
<td>Jilin Oil Field EOR Project (Phase 2)</td>
<td>Jilin</td>
<td>0.8–1 Mtpa</td>
<td>Precombustion (gas processing)</td>
</tr>
<tr>
<td>Identify</td>
<td>Liaoningang IGCC with CCS Project</td>
<td>Jilin</td>
<td>1 Mtpa</td>
<td>Precombustion</td>
</tr>
<tr>
<td>Identify</td>
<td>Shanxi International Energy Group CCUS project</td>
<td>Shanxi</td>
<td>2–3 Mtpa</td>
<td>Oxyfuel combustion</td>
</tr>
<tr>
<td>Identify</td>
<td>ShenHua Ningxia Coal to Liquid Plant Project</td>
<td>Ningxia</td>
<td>2 Mtpa</td>
<td>Industrial separation</td>
</tr>
<tr>
<td>Identify</td>
<td>ShenHua Ordos CTL Project</td>
<td>Inner Mongolia</td>
<td>1 Mtpa</td>
<td>Industrial separation</td>
</tr>
</tbody>
</table>

Source: Global CCS Institute²


CCS-equipped coal-fired power plants will be cost competitive when the carbon price reaches US$32 to US$56 per ton of CO₂.

To commercially exploit the technology, “China must set a clear reduction target to drive forward carbon market developments,” says Professor Xiaochun Li of the Institute of Rock and Soil Mechanics, Chinese Academy of Sciences. Although CCS was included in the 12th Five-Year Plan (2011–2016), Li believes insufficient legislation for CCS is a key challenge, and that technology and legislation need to develop together to build confidence.

“The timescale for commercialization depends on the priority the government sets for CCS. If it receives the same amount of support as wind or solar, CCS will happen.”

Dr. Xi Liang, China Low-carbon Energy Action Network (CLEAN)

The question of storage

After cost, one of the biggest questions to answer is what to do with the captured CO₂. Lessons learned from Chinese demonstration projects highlight the need to consider CO₂ transport and storage from the onset. “A systemic assessment was not carried out on the Dongguan Taiyangzhou IGCC project. They hadn’t factored in the difficulties of installing pipelines in densely populated residential areas,” says Li.

Although captured CO₂ has been used for industrial application and food processing, these processes only use a small proportion of a power plant’s total CO₂ emissions. More promising is injecting CO₂ to assist with Enhanced Oil Recovery (EOR), says Li. “Two very successful EOR projects are China’s largest oil field, Daqing (CNPC), and the Jilin oil field (Sinopec). But EOR is still at least three to five years from commercialization.”

The alternative is to store CO₂ in deep underground geological formations. “Onshore storage in geological formations is the cheapest solution. Northern China has good onshore storage sites, but this is not the case in southeastern China,” says Zhou. “Offshore storage is more feasible in the southeast, but the cost is much higher. However, we are looking into using depleted oil or gas fields for offshore storage to reduce costs.”

Insuring against leakage

Safety risks arising from CO₂ leakage are a concern in China, but Zhou believes these can be mitigated. “CO₂ leakages are avoidable if the site is chosen carefully and possesses sound storage conditions. Natural gas and CO₂ underground reservoirs have existed for many years with no issues identified,” he says.

“Insurance and risk sharing may be part of the solution,” adds Liang. He collaborated with Andrew Voysey at University of Cambridge and a number of major insurance and energy companies on a pioneering study by ClimateWise into the commercial insurability of CO₂ leakage risks in Europe.

“For the CCS-specific liabilities identified by the EU CCS Directive, ‘off-the-shelf’ insurance solutions do not exist. We’ve shown how some of these risks can be insured, but others will need to be shared with governments,” says Liang.

Future of CCS

CCS success depends on many factors including government support, the right geological conditions for storage, EOR potential and a sound regulatory framework. Still, we have seen what happens when China decides to invest in a new technology – as it did with solar and wind, becoming the global leader in a matter of years.

“The key to determining the success or failure of CCS will be policymakers’ understanding of CCS and their willingness to put it at the forefront of emissions reduction,” agrees Zhou.

Professor Zhou leads the research project Guangdong CCS Readiness (GDCCSR). From 2003 to 2005 she was a lead author of the chapter entitled “Underground Geological Storage” in the IPCC special report Carbon Dioxide Capture and Storage. She has served as the Vice Director of the South China Sea Institute of Oceanology, Chinese Academy of Sciences, and as a standing member of the Guangdong Provincial Political Consultant Committee.

Dr. Xi Liang

Lecturer in Business and Climate Change
University of Edinburgh

Dr. Di Zhou

Professor at the South China Sea Institute of Oceanology
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Cho Hwan-eik has been President and CEO of KEPCO since December 2012. Previously, he held various South Korean Government posts related to industry, including Vice Minister of Industry in 2004, President of the Korea Trade Insurance Corporation in 2007 and President of the Korea Trade-Investment Promotion Agency from 2008.
With a focus on innovation, renewables and giving a voice to Asia, this year’s World Energy Congress is set to be the most dynamic in the forum’s history. Duncan Coneybeare spoke to Cho Hwan-eik, Chair of the Organizing Committee, about the highlights.

The 22nd World Energy Congress will be held from 13–17 October 2013 in Daegu, South Korea’s “green growth capital.” This year’s Congress is themed Securing Tomorrow’s Energy Today and will focus on what the World Energy Council refers to as the “energy trilemma”: ensuring affordable energy supplies to meet the needs of growing economies; avoiding supply disruptions and protecting energy security; and safeguarding our environment, particularly from the impacts of climate change.

Cho Hwan-eik, President and CEO of the Korea Electric Power Corporation (KEPCO), is Chair of the Organizing Committee for this year’s Congress. As Utilities Unbundled went to press, the Committee was working to add United Nations Secretary-General Ban Ki-Moon and President of the World Bank, Jim Yong Kim, to its list of key speakers.

Local issues, global relevance
Mr. Cho is keen for this year’s Congress to “lift up the voices of Asia” onto a world stage that has long been dominated by larger Western players. He suggests that South Korea’s four main energy challenges are relevant to universal issues that are currently being faced around the world:

1. The nuclear dilemma – Public resistance to nuclear power following the 2011 Fukushima accident is hampering the industry’s potential.

2. Imbalance of supply and demand – South Korea’s historically low electricity prices have led to overconsumption. Growing demand threatens to outstrip supply, making energy efficiency an urgent priority.

3. High dependency on fossil fuels – While South Korea has made efforts to promote alternative sources of energy, particularly solar and wind energy, these are not yet economically competitive against fossil fuels.

4. Globalization of electricity markets – South Korean utilities have expanded into overseas markets, constructing nuclear plants in the United Arab Emirates and other countries. South Korea is keen to make the most of opportunities to export this construction and technical expertise to other markets.

Technology is the solution
Mr. Cho says the Congress will highlight the role technology can play in solving these energy challenges, and there will be sessions focusing on shale gas, nuclear energy, and the potential for a Northeast Asia supergrid. He believes further innovation is critical if renewable energy is to become one of the world’s primary energy sources.

“If renewable energy is to gain wider popularity, technological innovation is needed. The fracking technology behind shale gas may lead this innovation,” he says.

Mr. Cho thinks innovative thinking and collaborative projects also have a role to play in addressing the current energy imbalance between developed and developing countries.

“The international community should develop coordination programs to plug the gap between energy-rich countries and energy-poor countries,” he says. “For example, countries are currently cooperating to develop renewable energy resources in the Sahara and Gobi deserts and build the necessary grid connections.

“I strongly believe that the energy sectors of many developed countries should export their technologies, skills and strategies regarding the construction of power plants to emerging countries. The Asian region has two-thirds of the world’s population but many energy-poor countries. We would like the Congress to reflect the perspective of many of these developing countries that are experiencing very dire situations in regards to their energy security.”

Cho Hwan-eik
World Energy Congress 2013

The 22nd World Energy Congress will be held in Daegu, South Korea from 13-17 October 2013. For more information or to register to attend, visit www.daegu2013.kr.
The Congress intends to award the “Tomorrow’s Energy Prize” to those papers that best address one of the Congress’s key themes regarding energy security, sustainability and social implications.

Safety, sustainability – and shale
Mr. Cho says the Congress’s programs around energy scenarios to 2050 will be one of the key presentations, covering the issues critical to future decisions regarding energy security. Naomi Hirose, CEO of Tokyo Electric Power Company (TEPCO), operator of the Fukushima nuclear plant, will be one of the speakers.

“Mr. Hirose will be announcing new safety steps in the weeks before the Congress and has agreed to a ‘hard talk’ session at the Congress in which he will explain the new measures,” says Mr. Cho.

Given its prominence on the energy stage, it is no surprise that several Congress sessions will focus on shale gas, which Mr. Cho says is “key to reviving the world economy.”

The Congress will also include an update on Sustainable Energy for All (SE4ALL), the United Nations initiative that aims to make sustainable energy a reality by 2030.

Rare opportunity to network and secure new business
With more than 5,000 participants including 100 young energy experts from 92 countries, energy ministers and other senior government officials from many countries, representatives from non-government organizations and industry leaders from all energy sectors, the 22nd World Energy Congress offers an unparalleled opportunity to get a picture of today’s energy sector while gaining a deep understanding of the critical issues that will determine its future.

“The Congress will give participants insight into energy trends, new technologies and development,” says Mr. Cho.

“It will also be an opportunity to build networks, secure business opportunities and gain access to new markets.”

Held for only the second time in East Asia, the themes of this year’s Congress ensure it promises to be as dynamic as its host region and, according to Mr. Cho, will be “the most meaningful and productive event in the energy sector.”

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New entrants to competitive energy markets could change the sector landscape in the next 10 years says Ian McCaig, CEO of UK energy company First Utility.

World energy economics and inexorably rising costs will undoubtedly force utilities into major behavioral change in the next decade. But an equally credible source of threat is the phalanx of keen, agile new entrants to energy retailing. They recognize the opportunities in combining smart meters, new technology, the desire for energy efficiency and the increasing popularity of distributed generation to create dynamic and responsive services that will win them serious market share.

Retail choice in energy is something that I believe must emerge across multiple markets. Certainly, a strongly recurring theme in conversations we have about the future of utilities is “increased choice for consumers.” And the more choice available, the more innovation and value consumers will demand.

Using their technology-based insight and specialist retail skills, new entrants to this sector are transforming energy commodities into value-added services, products and tariffs. We’re on a journey that could see a totally different landscape for competitive energy retail in the next 5 to 10 years.
Barriers to entry are shifting

My home market of the UK is an interesting case study of the potential for change. At present traditional utilities still dominate, with a handful of independent energy providers accounting for just 2% of the market. The key barrier for new entrants is the lack of liquidity in the wholesale energy market. Because a small number of vertically integrated utilities control generation, distribution and retailing, there's not much left to trade with. The consequence is that few financial players are willing to enter the market, and new entrants are at a disadvantage in terms of access to products and price competitiveness.

But pressure for change is building. Energy policy and regulation continue to encourage retail power and natural gas market competition. The UK regulator has proposed forcing utilities to sell 25% of their generated power, improving market liquidity and stimulating competition. While this is a positive move toward a more balanced, competitive retail energy market, more can be done.

Independent providers are now lobbying strongly for the imposition of self-supply restrictions (SSR) for incumbent UK utilities, to force them to trade more on the open market. A well-regulated SSR process would create liquidity and make it attractive for financial players to enter, stimulating innovation and greater price competition. It's too soon to say whether the UK regulator will approve an intervention like SSR, but allowing the big utilities to self-regulate obviously isn't working from a competitive standpoint.

Price shock will change behavior and create demand for competition

Security of supply is a concern for many countries, with the possibility of shortages being openly discussed. However, it seems that consumers are only just starting to grasp the link between a) the need for investment in energy production and delivery infrastructure, b) the inevitable resulting rise in energy bills and c) how they will need to change their behavior as a consequence.

“… in 10 years’ time, some of today’s incumbent retailers will have disappeared. ... Over the same period, I believe some independent providers will take their market share into double digits.”

Ian McCaig, First Utility
It is absolutely possible that the required generation and network infrastructure investment, commodity cost increases and the energy inefficiency of housing stock could conspire to push energy bills higher than mortgage payments in the near future, at least for some of us. That will certainly thrust energy to the fore for consumers and voters. The inevitable and continuing upward trend in prices will drive changes to policy, consumer behavior and the very nature of power and natural gas retailing.

To generalize briefly, for an example of how consumer behavior will change, let’s look at the UK again. As a society, many people there still think it’s fine to “run the house hot” and walk around in a T-shirt when it’s freezing outside. But it simply isn’t going to be sustainable to behave this way in future, and energy providers will have to help consumers to change.

We have to think hard about how we support consumers on that journey, to retain an affordable quality of life while acting sustainably. Many utilities still sell energy as a commodity and in my experience relatively few yet have the skills, focus or the technology to help customers solve energy problems like this. Five to ten years hence, the big competitive differentiator between energy providers will be their ability to deliver the best value from the least – or greatly reduced – consumption.

New entrants’ advantage – responding with agility

A key advantage that new entrants have in this environment is that they are unburdened by the legacy of traditional utility selling models. Incumbents tend to look from the inside out, based on what they have historically done. New entrants and independents tend to look at things firstly from the customer’s point of view. This makes them potentially more agile, innovative and hungry to foster change.

So for example, I think it unlikely that we will see major innovations from the big incumbent utilities in using smart data to help consumers cut energy use. To an extent, smart metering is something they have been mandated to do, not something they initiated. Some of the new independent providers, on the other hand, have an acute grasp of how to unlock consumer benefits through data.

Consumers don’t yet realize the level at which new entrants might use technology to show them how to save money. Even simple things like aligning heating to anticipated weather conditions, or intelligently feeding back information from smart meters to show people how they compare with their peers and spot unusual usage patterns, can be transformational.

As competitive markets develop (or are established) and consumers become more empowered, retailers will have to respond with more innovative approaches and service offerings. The consumer’s relationship with energy will continue to be more and more technology enabled, with energy control linked into broader home automation services. We will see increasing numbers of new entrants successfully delivering multi-utility propositions which add value to consumers by transparently bundling power, gas, energy advice, water, telecoms and media.

Transparency and trust will be key differentiators

Consumers need to feel their energy bill is something they have control and empowerment over. Their increasing awareness of energy consumption and affordability will be based on insights provided by energy companies or other retailers that show them how their behavior translates to the bill. Accurate measurement and clarity about value will be another major differentiator in future.

Which brings us to the question of trust. “Love brands” are never going to exist in the energy industry – it’s hard to envisage any energy company ever figuring as a consumer favorite. But new entrants will certainly be striving for a position where they are seen to stand for fairness, value for money and adding value to consumers’ financial lives. Free from the legacy of mistrust that burdens today’s traditional utilities, they will have a clear branding advantage.

All this leads me to the conclusion that, in 10 years’ time, some of today’s incumbent retailers will have disappeared. Hand on heart, several of the big utilities would probably prefer not to be in retailing: it’s the toughest end of the energy business and we are sure to see consolidations and mergers in the near future. Over the same period, I believe some independent providers will take their market share into double digits. Life for the utility will never be the same again.

Ian McCaig
CEO
First Utility

Ian started his career in the IT industry and then spent six years at Nokia, where he launched some of the world’s first 3G networks. Having joined lastminute.com in 2003, he was appointed Group CEO in 2006 and steered the company through its most successful years. In 2012, he took up his current position with First Utility, which is the UK’s largest independent energy supplier and a leader in smart metering technology and energy analytics.
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