“Our energy system is at the heart of our whole economic infrastructure. We want to support our economy and give it every advantage that we possibly can from an energy standpoint.”

Anne Pramaggiore, Commonwealth Edison
Highly disruptive forces have converged on the US utility sector in recent years and it feels like we are at a critical juncture. 2013 was the second year in a row when the country’s top 50 utilities underperformed the broader US market. Low energy commodity prices, sluggish demand, urgent needs for significant capital investment and regulators demanding higher quality at lower cost are all creating headaches. The emergence of new market entrants – from solar start-ups to technology powerhouses – accelerates the case for change as a matter of survival.

In this issue of **Utilities Unbundled** we’re exploring significant US trends around generation and regulation that will have a big domestic impact (see pages 4 and 8). Looking wider, we discuss how other changes affecting retailing, customer strategy and collaboration with aid agencies could ripple out from the US to influence commercial viability and operations around the world.

Although US demand for electricity is currently stagnant, US utilities could be in for a retail bonanza if low energy prices attract big-scale manufacturing back to the country. At the same time, it’s possible that European utilities could see their industrial customer base slashed if manufacturers relocate to the States en masse. US and European industry bodies EEI and Eurelectric present their perspectives on the issue on page 24.

We’ve been discussing customer strategy with ComEd’s Anne Pramaggiore, US Utility CEO of the Year. Her views on new technology and strategies to improve customer service will resonate with utility leaders, regardless of location (page 18).

Staying with customers, “nudging” – persuading, rather than telling, people to change their behavior – has been a big policy innovation in the last few years. Cloud software company Opower has wielded this discipline with significant success, starting in the US and expanding into the UK and Japan. The company explains its evolving approach to motivating utility customers to change their energy use on page 14.

We continue our series of features on the water-energy nexus in an interview with the World Bank (page 40). The Bank’s Thirsty Energy projects in South Africa, China, Morocco and Brazil, and its collaboration with private utilities, are geared to helping the energy community share knowledge on managing scarce resources. It will be fascinating to see how developments in difficult and testing locations ripple through to influence mature market approaches in years to come.

We welcome your views on all the topics covered here; contact details for our authors are listed throughout.

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1. **Risky business: a closer look at total shareholder return in the US power and utilities sector**, EY 2014. In 2013 the S&P 500 produced a total shareholder return (TSR) of 32.4% while the largest 50 US utilities by market capitalization registered a TSR of only 14.3%.

2. The first article in the series was published in **Utilities Unbundled #16**, June 2014.
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Winning in the pure-play era

Hybrid utilities, with a mix of regulated utility operations and merchant generation assets, have struggled to find their place in the US power and utility sector. So how will the hybrid utility evolve?

Report by Joseph Fontana
Not so long ago, many people in the US utility sector considered holding a portfolio of regulated and unregulated assets to be the best business model around. But that was then. After nearly a decade of mostly disappointing results, at least a dozen US hybrid utilities have spun off their undervalued merchant assets in the last two years.

So is this hybrid model a thing of the past? And if so, who will come out on top in a new, leaner, pure-play environment?

**No satisfaction**

A number of factors have led utility executives to re-evaluate the hybrid model, according to Paul Farr, President of PPL Energy Supply and future President and CEO of Talen Energy (see inset box).

Perhaps the biggest driver of divestitures has been the skepticism of investors about placing any significant value in the competitive generation businesses of utilities. As a consequence, the sum of these separate businesses has been less than their value on a stand-alone basis, according to Farr.

To try to stay competitive, hybrids have tended to starve their merchant assets, which makes them less competitive with independent power producers.

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**PPL and Riverstone create latest US independent power producer**

Talen Energy is a new generation business that will be formed by spinning off PPL Energy Supply to PPL shareholders and merging it with the generation portfolio of energy-focused private equity firm Riverstone Holdings.

When the transaction is complete, Talen Energy will become the newest publicly traded independent power producer in the US, with 15,320 MW of power generation.

At PPL, Farr says, investors had discounted the value of the firm’s merchant assets to zero. “We were trading at a relatively material discount to the sum-of-the-parts value we should have been trading at. We were frustrated by our valuation,” he says.

Persistently low natural gas prices are one reason that merchant assets have underperformed, reducing the value of merchant power while increasing the desirability of regulated business.

But the fault is not just in the markets, according to Farr. A variety of structural issues also hurt hybrid performance. For instance, the need of many traditional utilities to generate a high dividend impeded investment and that, in turn, encouraged hybrid utility executives to underinvest in merchant generation and shift more capital to regulated assets.

The size of the typical hybrid utility’s organization has also created challenges for the profitable operation of their generation divisions. Today’s hybrid utility is scaled to primarily meet the needs of its regulated divisions, which may have millions of customers, extensive regulatory reporting and thousands of employees.

Although a generation business is simpler (with only a handful of customers, far fewer regulatory reporting requirements and a smaller workforce to meet its operational requirements), the generation divisions of hybrid utilities bear a portion of the costs associated with the larger organization. With generation businesses earning thinner margins than just a few years ago, the profitability of generation divisions has been significantly burdened by this higher cost structure.

“We use, for the most part, the same HR systems, the same supply chain systems, the same financial systems and the same work management systems,” Farr says. “And you have the same IT governance oversight. You have the same internal audit oversight, the same external auditor oversight, the same committee of the board looks over both.”

“There’s a natural tendency to replicate what’s good for the utility over to the merchant business. And that really can’t be the way that you operate that business. You layer all that in, and unless you change the paradigm, it’s very difficult to make meaningful cost reductions,” he says.

To try to stay competitive, hybrids have tended to starve their merchant assets, which makes them less competitive with independent power producers: “We were maintaining a high cost base but decreasing the amount of generation, which is the opposite of what our peers that are IPPs are doing – driving costs down and increasing scale,” says Farr.

In the end, the combination just didn’t make sense: “The business models are different. The risk profiles are different.
The balance sheets and ratings are different. And the investor expectations are different,” Farr says. “From my perspective, and I can’t divine solutions for everybody, it makes complete sense to have these businesses be structurally separate and in different veins of ownership for investors. Let investors make the decisions on how much merchant exposure they want, or how much regulated-utility exposure they want,” he says.

What’s next?
Looking ahead, Farr argues, both sets of pure-play companies should be better off than they have been. On the merchant side, the ability to reduce the cost structure will make it better able to weather periods of low power prices, and also, without the need to pay out utility-style dividends, it will be able to respond more quickly to opportunities as they emerge. The regulated side will also benefit by being exactly what the investors expect.

The power mix will change too, he believes, but not to the extent some predict. Farr argues that although distributed power will play a bigger role than it does today, utility-scale power plants will continue to be necessary.

Over time, he believes that merchant generation companies will find themselves in an increasingly strong position relative to their regulated cousins. Unlike regulated utilities, the new merchant players will be able to respond to changes and shifts in price because higher cost structures and regulated profits make model adjustments more difficult for regulated utilities.

A changing mix
Farr won’t say which fuel types he favors for Talen Energy, but he does believe that there will be less coal-fired power and less nuclear power in the future and more reliance on natural gas.

Regulatory uncertainty about carbon rules will continue to drive down the use of coal by US generators, he says, and deregulated players will shy away from nuclear. “I think, by definition, it’s going to be very difficult to impossible to build nuclear in deregulated markets. There are a couple of regulated markets where new nuclear is being built. But in the end we’re going to see more nuclear retire – because of obsolescence, life-extension technical issues, or because of locational issues – than will be built,” says Farr.

The drift away from coal and nuclear power may lead instead to an over-reliance on gas, in Farr’s view. “I think from the customer and market volatility perspectives, going with a singular (on the thermal side) fuel resource is going to have repercussions that aren’t well thought through today and may create risk to the system that has to be addressed,” he says.

If, in 10 years, 75% to 80% of the fossil fuel used for power is natural gas, he warns that the country could be exposing itself to a new set of supply risks. “Think about the impact on reliability, from a gas pipeline perspective, if there’s ever a problem in the middle of summer, or in the middle of winter for home heating, with availability of gas to run all this generation. Think what the reliability implications could be if we ever had serious problems with the major pipelines,” Farr warns.

“But that, from a short-term pricing and short-term policy decision-making perspective, is what the market is telling the companies to do: build more gas.”

Paul Farr, PPL Energy Supply

President, PPL Energy Supply and forthcoming CEO, Talen Energy

Paul Farr has over 20 years of experience in the energy business and has been with PPL since 1998. He has considerable experience in operations and finance; early in his PPL career he served as CFO for PPL Montana. Paul has been PPL Corporation’s CFO since 2007 and was instrumental in the company’s transformation through the acquisition of LG&E-KU in Kentucky and WPD Midlands in England.

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“This new era of managed competition is likely to generate not only more transmission line development, but additional complexity.”

Linda H. Blair, ITC Holdings Corp.
Get ready for FERC 1000

A new competitive era is beginning for power networks in the US. Utilities should prepare for a major shift, says ITC’s Linda Blair.

Report by Jamie Schafer and Mike Juchno

Ready or not, FERC Order 1000 is here to stay. The recent unanimous decision by the U.S. Court of Appeals for the District of Columbia to uphold the regulation means that the long debate over its wisdom is mostly over and a new era of network planning will soon begin.

The Federal Energy Regulatory Commission’s (FERC’s) rule creates a new mandate for regional power planning and sets the ground rules for a much more competitive transmission market. While the new order comes with its own challenges for the energy industry and for regional regulators, some industry players are beginning to think that it will ultimately be good news for consumers and those power companies that are prepared to compete.

“This new era of managed competition is likely to generate not only more transmission line development, but additional complexity,” says Linda H. Blair, Executive Vice President and Chief Business Officer of ITC Holdings Corp.

A new era

FERC Order 1000 is the regulatory foundation for what will become the US’s fifth-generation power network and reflects regulators’ perception of the country’s changing power priorities and capabilities.

When the US first electrified, utilities generated power locally for consumption by local customers. Over the first half of the 20th century, engineers developed the means to transfer electricity between systems and major metropolitan markets, and as a result, many of these networks grew and consolidated into larger and larger grids.

Following the enormous 1965 blackout that knocked out power for 30 million people on the Eastern Seaboard, regulators and utility executives worked to create more links between power grids to make the entire system more stable – and they did.

In the 1990s and into the early 2000s, containing cost became the next major challenge to the power system. Regulators again redesigned the network as a way to achieve this objective, by deregulating the sale of surplus power as a way to hold costs down and serve as an incentive to create additional supply. As utilities started to buy and sell electricity from each other and a wholesale market developed, it often became more economical for a utility that needed more energy to buy another utility’s surplus electricity than build new power plants to serve its own customers or run older inefficient plants.

Today, regulators are looking at coping with another change in mandate, to produce not only more power, but cleaner power. This will ultimately mean the conversion of fuel sources and the shutdown of high carbon-emitting power plants. We also see a massive shift ahead from the old fashioned “mom-and-pop” utilities we have known to companies that can integrate power from a variety of sources, including distributed resources.

Meeting this challenge will require a fifth-generation power network that revamps
one part of the power system that’s remained largely unchanged throughout all of these other developments. Despite the overall tendency in the nation’s electric system toward grid consolidation and wholesale contracts, transmission line ownership remains fragmented. Even today, the high-voltage transmission lines in the US have more than 500 owners. The regulatory picture is similarly divided as electricity generation continues to be regulated on a largely state-by-state basis, and each state operates by a different set of rules, regulations and planning criteria.

Historically, all transmission was planned and initiated by the local transmission owner, which had no requirement or mandate to think about or plan the system on a broader regional basis. But that’s not what’s needed now. To meet this latest challenge, FERC commissioners saw the need for a regional power infrastructure that will give producers and users a high degree of flexibility and accommodate the integration of a variety of power sources.

FERC recognized that the current planning process was inadequate. It mandated that a process should be put in place that would allow for regional planning that wasn’t determined primarily by the local transmission owner.

The FERC commissioners also recognized that although a regional plan would be useful, such a plan would likely be dead on arrival unless there was a similar level of consensus regarding who’s going to pay for what and when. That’s why a second component of FERC’s order provides for regional cost allocation of regional transmission projects. Regional transmission organizations, or the entities that are involved in developing these regional plans, will need to develop a method that allocates development costs according to the level of anticipated benefit.

However, perhaps the most significant requirement of FERC 1000 is the elimination of the right of first refusal. Projects approved by the regional board and subject to regional cost allocation won’t be automatically given to the local utility, but will instead be put out for competitive bid — a crucial change likely to transform the US power transmission business and one that will be closely watched by regulators in many countries who are looking for new ways to stimulate private sector investment in their electricity infrastructure.

More power, more competition

Executives at ITC, a major player in the transmission business, see big challenges ahead for transmission companies and regional regulators. “Until now, the incumbent transmission company generally built any new lines that were needed. Now, 20 different companies might compete for the right to build the same project,” says Blair.

Not only is that a challenge for the transmission companies, but for the regulator as well, Blair warns, noting that the regional authority that picks the winner will have to evaluate every entrant on the basis of a complex scorecard that will include engineering design, project management approach, long-term operations and maintenance capabilities, rate analysis and financial strength.

This level of complexity will be a new experience for most state utility commissions, who in the past have only dealt with their highly regulated local players. “There is a lot of uncharted territory regarding how these operations will work and how that will play out,” Blair says.
At ITC, Blair’s first concern is keeping up with the opportunities. “The biggest concern for us is that at the same time as the geographical opportunity widens, another important constraint is also likely to grow for my company and the transmission industry generally: time. We currently operate in a business and in a sector where years can pass from conception of a project to the time you actually see electrons flow on it – already, many major transmission projects can take the better part of five years or longer to come to fruition.”

In addition, since renewable development depends on additional transmission infrastructure – which typically carries a longer lead time – the planning of transmission needs to be closely coordinated with the growth in renewable generation, Blair notes.

Given that some rules of the road are yet to be developed and that more legal challenges are likely before FERC 1000 assumes its final form, Blair believes that time is likely to become an even more pressing constraint over the next few years.

“We are fairly certain that many of our peers in the transmission business will face significant challenges because of this rule. However, we feel it also offers huge opportunities to companies able to scale their offerings,” Blair says.

The ITC strategist believes that FERC 1000 opens the door for transmission companies to invest in projects that go far beyond most transmission companies’ traditional regional footprints. “As one of the largest transmission operators in the country, we view the chance to play a bigger role in building America’s fifth-generation network as a huge opportunity.”

Blair has no doubt that customers will eventually reap the benefit of this competitive transmission development process. “That's what competition is all about, and that's why we expect to see ingenuity, creativity and calculated risks become an even bigger part of transmission investment.”

Since 2007, Linda Blair has overseen ITC’s regulated operating companies and essential business support functions, including regulatory strategy, federal and state legislative affairs, community and government affairs, human resources, marketing and communications. Ms. Blair was formerly Senior Vice President of Business Strategy for ITC. Prior to that role, she was Manager of Transmission Policy and Business Planning for DTE Energy before the sale of DTE’s transmission assets to ITC.
Navigating the shale gale

The US gas boom is forcing global traders and utilities to try new paths.

Report by Abdullah Khan

In 2008, 21% of the electricity in the US was generated by natural gas and 48% by coal. Five years later, natural gas’s share had climbed to 27%, while coal’s share had slipped to 39%, and the balance is expected to continue to shift in favor of natural gas.

As significant as this coal-to-gas switching has been, it may be only the beginning of the changes wrought by the shale gas boom. Within the next several years, the US is expected to emerge as a net exporter of liquefied natural gas (LNG), bringing a welcome new supply of energy to Europe and Asia – markets traditionally dominated by Russian and Middle Eastern supplies.

Now, as the boom goes global, traders and energy company executives everywhere are scrambling to grab the fresh opportunities created by this rising supply of cheaper, cleaner hydrocarbons and will need to address the challenges that come with doing business in new market configurations across the US.

US LNG is shifting gear

Some US facilities originally designed to accept foreign LNG into the North American market are being reconfigured as export terminals. The first entrants to the LNG export market are expected to be the Cameron LNG project and Cheniere Energy Inc.’s Sabine Pass export plant, both located in Louisiana. The Sabine Pass plant, currently under construction, is scheduled to begin fuel shipments in late 2015. Cheniere’s contracted
“As the shale boom goes global, traders and energy company executives everywhere are scrambling to grab the fresh opportunities created by this rising supply of cheaper, cleaner hydrocarbons.”

Abdullah Khan, EY

customers include Centrica, BG Group, Total, Korea Gas, GAIL and Gas Natural Fenosa. In June, the Cameron project, jointly owned by Sempra Energy, GDF Suez and a Japanese consortium, won final US approval to build a US$9b-US$10b export terminal, expected to become operational in 2018.2

The Louisiana facilities are likely just the beginning. Approximately 24 applications for LNG export projects are currently under review by the U.S. Department of Energy; several are currently in the permitting phase.

Foreign trading firms have begun to establish local operations in the US market. The trading arms of German energy companies, including E.ON Global Commodities, have recently launched US-based trading desks focused on natural gas, power and LNG capacity.3 Asian utilities, such as Chubu, Osaka and GAIL, are willing to develop trading capabilities to source gas in the US market to fuel the LNG liquefaction plants in which they hold contracted export capacities.

“Based on recent trends, it appears that major energy participants from across the globe are attempting to find or create ways to participate in the US shale revolution,” says Predrag “PJ” Popovic, Director, US Residential Gas at Direct Energy, Centrica plc’s North American subsidiary.

New locations and pipelines impact trading

Within the US, the location of the shale reserves is also changing a variety of trading patterns. The majority of natural gas flows in the US have historically moved from the Gulf of Mexico to the demand centers in the Northeast. The development of the Marcellus and Utica shale deposits in the northeastern US is expected to reverse this flow and have profound implications for the value of natural gas geographically and for regional pricing relationships.4 It is also leading to the construction of major pipeline projects, including the proposed Atlantic Coast Pipeline, a US$4.4b-US$5b joint venture between Dominion, Duke Energy, Piedmont Natural Gas and AGL Resources.5

“US shale production has exceeded the takeaway capacity available in many regions; this increases the potential for intermittent capacity issues, resulting in high basis differentials during peak demand months,” Popovic explains. “The US market will require a substantial investment in infrastructure build-out to accommodate production growth in the years ahead. In the interim, seasoned market participants are having to continuously adapt to changing dynamics across the US gas markets.”

“Volatility isn’t dead”

Low energy prices and new sources of natural gas supply are also creating opportunities for the revival of energy-intensive manufacturing and industry in multiple US regions (see Made in the USA, page 24) and Mexico. But shale is not free of challenges: the demand on natural gas for both heating and electricity generation in the US Northeast during the winter has led to severe price spikes over the last several years. This is good news for traders who can profit from the volatility, but a challenge for energy retailers and utilities seeking to hedge their fuel positions.

“We had been seeing a lack of liquidity in many regional markets as the onset of shale supplies depressed prices and contracted basis levels,” says Bryan Bonner of EY’s FAAS Commodities Markets practice. “Many participants had begun to doubt the viability of their trading activities. After the frigid winter and associated price volatility, there has been a renewed interest in risk management products and trading opportunities. Perhaps volatility isn’t dead.”

Meanwhile, shale gas is not the only shale hydrocarbon shifting global demand. US shale oil is also beginning to squeeze Saudi Arabian oil out of the US market and toward Asia – similar to the way West African oil was priced out of the US market a few years ago – according to a September 2014 International Energy Agency report. The continued implications of new shale finds, for the US and global markets as a whole, are converting what was once a theoretical concept into market opportunities for numerous participants.


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Harnessing the power of persuasion

Behavioral analytics holds enormous potential for utilities to better understand their customers. By partnering with utilities globally, Opower is focused on bringing this value to the market.

Report by Brad Hartnett

Over the last two decades, however, that’s changed. Deregulation, advances in renewable energy, oil and gas price volatility and concerns over global warming have transformed a highly predictable business into a prime candidate for technological disruption – with utilities at risk of being pushed aside by younger, nimbler players.

Some energy analysts predict that most utilities are doomed because they won’t be able to cope with all this complexity. However, executives at cloud software company Opower argue that traditional utilities still hold the most important asset of all: an established relationship with the energy consumer.

The rapid rise of the Arlington, Virginia, company suggests that the Opower executives may well be right. After only seven years in business, Opower now works with over 95 utilities and more than 50 million homes and small businesses in nine countries. It partners with some of the largest utilities in the world, including 28 of the top 50 in the US, E.ON in the UK, EDF in France and TEPCO in Japan.

Now valued at US$775m just a few months after its successful debut on NYSE in April, Opower is one of a number of new entrants to the power industry that see huge possibilities in offering the energy consumer more artificial intelligence, but perhaps the first to gain real traction in the market.

A joint effort of longtime friends Daniel Yates, a successful entrepreneur of educational software, and Alex Laskey, a political and policy advisor in Washington specialized in environmental issues, Opower began from a rented desk in San Francisco and has grown to a global company of more than 560 employees.
Initially, it offered utilities a compelling pitch: by combining data analytics with behavioral psychology, Opower’s software could persuade people to cut down on power voluntarily (see Utilities Unbundled #8, May 2010). Yates and Laskey found that rather than try to make people feel guilty about using power or giving them financial incentives to use less power, if they showed them that their neighbors conserved more power in comparison, then they would actually cut back by as much as 6%.

The friends built the company on the work of Robert Cialdini, a professor emeritus of psychology and marketing at Arizona State University and now chief scientist at Opower. The author of Influence: The Psychology of Persuasion, a 1984 best seller that outlined a theory of how people are persuaded, Cialdini found in a 2004 study of Californian energy consumers that appeals to conserve energy because their neighbors were conserving energy worked much better than appeals to conscience or the pocketbook.

As Laskey put it in a 2013 TED talk:1 “If something is inconvenient, even if we believe in it, moral suasion, financial incentives, don’t do much to move us — but social pressure, that’s powerful stuff.”

The idea worked: among their utility clients’ customers, average power use declined by 1.5%–3.5% — all without the installation of smart meters or other hardware. Already, Opower has saved consumers more than US$550m on energy bills — and has helped utility clients shave demand by more than five terawatts.

**Beyond efficiency**

In 2010, executives saw an opening beyond usage analytics. According to Roderick Morris, Senior Vice President of Marketing & Operations, clients began to ask for additional services that would help them meet their customers’ demands for more control and information about

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1. TED (Technology, Entertainment, Design) is a global conference series run by the non-profit Sapling Foundation. TED talks address a wide range of topics in the research and practice of science and culture, often through storytelling.

Source: Opower
their energy use, and to meet the challenge of rising competition due to distributed power generation and market deregulation.

Opower executives saw that their company was well-placed to give utilities the tools they needed to offer next-generation customer service, based on the insights gained from crunching its global data bank of past and present meter readings.

“All major trends were pointing toward utility customers being more and more central to the future success of utilities. And so for us, it made sense not to invest in any other part of the business beyond customer, but instead to go even deeper,” Morris says.

At the same time, they could see that other industries were raising consumers’ customer service expectations by using IT to improve the quality of their interactions with the company.

“If you look at the way consumers buy in retail, how they interact with their telecom provider, their retail bank, even how they purchase media or other goods, everything is becoming more personalized; everything is becoming more intelligent,” he says. “And the customer has an expectation not only that you are going to understand what they’re looking for, but that you are going to make their life easier and richer.”

The in-depth analytics Opower developed now help its clients identify little things that can make a big difference to consumers’ energy use and loyalty:

► In 2013, Baltimore Gas & Electric used Opower’s platform to send out telephone, email and text messages before a peak usage period, and succeeded in reducing consumption by 5%, first by warning customers that a peak usage day was coming, and then by providing personalized tips on how they could reduce usage based on each customer’s unique situation.

► Mercury NZ, a New Zealand utility, set up a personalized customer service center on the Web and cut down call center volume by 19%.

It’s no accident that Opower’s successes generally include the name of a utility. Opower executives aren’t among those power professionals who believe the traditional utility is on the way out. Morris argues that utilities still own the relationship with energy consumers: Opower’s customer surveys have found that 85% of consumers say they trust their utility to give them power information.

**Include versus exclude**

Unlike some new entrants providing beyond-the-meter services, Morris says Opower doesn’t see itself as disintermediating anybody. Instead, he argues that Opower is helping keep customers and utilities together through more responsive and intelligent customer service. “These companies are trying to take the utility out of the equation, actually, and we partner with utilities to help them be trusted energy advisors for their customers,” he explains.

Clients see a variety of advantages to plugging into the Opower platform, according to Morris. “By providing customers with more proactive energy advice and information we’re helping utilities to achieve multiple objectives,” he adds. “They’re improving the customer experience and retaining customers in competitive markets; they’re meeting efficiency targets in regulated markets; and in all markets, they’re driving down cost-to-serve expenditures on things like peak demand or customer calls for high bills. And customers benefit from this because they have more control over their energy usage and access to tools that can help them lower their bills.”

Another incentive is that the insights keep getting better. Armed with a data
bank of more than 300 billion data points and counting from 50 million customers around the world, along with a constant stream of real-time data, Opower’s 100+ team of engineers and data scientists continue to scour the numbers for new relationships and new insights.

For example, they now target particular events in the customer life cycle that have the most impact on consumption, where a utility can capture a great deal of value in terms of customer experience. “We’ve now built products around specific customer interactions, for example, if a customer moves into a new home or if the customer’s on a path to a high bill or calling into a utility,” Morris says.

The upshot of all this effort, however, is not just greater efficiency, according to Morris, but higher customer satisfaction. “We’ve seen across our customer base that when utilities do this, when they provide proactive advice in a format that takes behavioral design and customer sentiment into account, you get happier customers,” he says. “And it helps the utility to become a trusted energy advisor to customers, improving satisfaction and, in competitive markets, brand loyalty. It also improves cross-sell of other products or services to customers, including solar panels.”

Finally, Opower’s work may be changing the way the utilities themselves see their relationship with their customers. “Utilities now realize that they can turn their customers into energy assets by proactively sharing more energy information and tools – and customers are eager for it,” continues Morris. “It’s up to utilities not to lose this strong position.”

Roderick Morris
Senior Vice President of Marketing & Operations, Opower

Roderick Morris took up his current role in 2010. He is Opower’s chief marketing officer and global leader of the company’s client operations P&L. Previously, Roderick was VP, Marketing at Vovici, a leading provider of customer feedback solutions. Prior to joining Vovici, Roderick was general manager for LexisNexis US Business Information Solutions. He has also worked for Bain & Company, Microsoft, Simmons & Company and the Corporate Executive Board.

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Opower ...
“Our customers will want apps that monitor price incentives for operating appliances at different times of day, so they can control energy consumption the way they want it – not the way their neighbor wants it.”

Anne Pramaggiore, ComEd
A colleague of mine once used a stark illustration to explain to legislators why ComEd was pushing so hard to build a smart grid in Illinois. He said: “OnStar\(^1\) can turn your car on from 50 miles away. But ComEd wouldn’t know that you’re out of power two blocks away, unless you called us.” It was a powerful picture of the amount of ground our industry had to cover to catch up in the digital world.

Our customers live a digital life; their experiences are based in the digital world. But three years ago, we had a wake-up call. At that time, ComEd wasn’t providing anything that matched that digital presence. Even before the summer of 2011, we recognized this. The massive storms we experienced that year underscored the point, however, highlighting major flaws in our customer communication. It wasn’t just the speed of the restoration process that our customers reacted to.

US utility Commonwealth Edison (ComEd) is on a mission to improve customer service. President and CEO Anne Pramaggiore says business and technology innovation, together with encouraging results from new crowdsourcing initiatives, hold promise.

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1. A system developed by General Motors and based on wireless and Global Positioning System (GPS) satellite technology, which provides in-vehicle safety, security and communications services.
Our communications efforts were almost entirely dependent on a call center and in the worst storms that year, we had 1.5 million calls in one week. Our exclusive information channel was overwhelmed. Customers simply couldn’t get through to find out what was happening to their power.

Customers, on their own volition, took to Twitter and put together their own virtual map of where the ComEd crews were. They were trying to make predictions about where the next crew would go, and how restoration was going to flow. That was a telling insight into what social media could do and what our customers needed. If we weren’t communicating with them, they would find a way to create information for themselves. In this digital world, they could essentially disintermediate us.

That experience spurred us to take a hard look at this element of our business. ComEd had been struggling along at the bottom of customer satisfaction rankings for several years, and this sequence of events put a fine point on things. It provided the drive for the significant changes we have made to our customer interactions in the years since. We were concerned that the existing technology and 100-year-old regulatory framework wouldn’t support the change we needed, so in 2011 we started pushing hard for adoption of an investment plan and regulatory change through the Smart Grid bill.

In 2012, when the Smart Grid bill was approved, we hit the ground running. We are making a capital investment of US$2.6b in building new, smart infrastructure which will benefit customers by improving reliability and resiliency. At the same time, we launched our “Premier Customer Experience” initiative to redefine how we interact with our customers. We started by enhancing our website and creating channels for customers to reach us by text, iPhone apps and Twitter.

**Shifting from the universal to the individual**

We see a major shift in how we think about customers – a transition away from ComEd as provider of a universal service, toward a “custom solution provider” mindset. Our customers want interaction on a much more individualized level. For example, our customers will want apps that monitor price incentives for operating appliances or air conditioning at different times of day, so they can control energy consumption the way they want it – not the way their neighbor wants it.

This is a huge cultural and business change for us. Most of the data and systems we have in utilities today are designed at a class or universal level. But social media channels give us an individual customer perspective and help us to understand what new solutions and options people want. This is information that we haven’t had before. It can be challenging to glean the value from all the massive exchange on Twitter and other social media platforms, but we are learning fast.

**New customer model prioritizes action**

Utilities have always invested to build up capacity and run the system, but we haven’t typically invested in monitoring whether the things we do on the customer side have impact beyond very rudimentary performance metrics. We have built an innovative customer impact
“People even approached me at social events to compliment me on our redesigned electric utility bill. How many times has that happened?”

Anne Pramaggiore, ComEd

model which allows us to measure the impact of any initiative we introduce on customer satisfaction, call center performance and prices. This helps us to prioritize changes.

Many of the changes we have introduced are characterized by offering flexibility and empowerment to our employees to address individual customer needs. For example, when dealing with distressed customers in arrears, our call center representatives were limited by company rules in providing relief to customers. Even in a hypothetical case where a customer had paid his or her entire bill except for one dollar, our customer service representatives couldn’t approve reconnection. So we created what we call “red rules and blue rules” – one set you cannot bend, but the others are flexible. Now, if a customer pays arrears to within a certain percentage, we’ll reconnect them, or our representative can waive the late fee. We’ve had a great response: our employees feel empowered, and we are resolving customer concerns more simply.

Another initiative we are piloting will enable customers to schedule appointments. At present, we have an 8- to 16-week work schedule and we decide when to fit customers in. But the pilot will test how we cope if the customer schedules work at a time that accommodates their schedule. It can be done: it’s just a question of changing our mindset and thinking about how the business relates to the customer.

Crowdsourcing opens up innovation

Consultation and collaboration have become key to our approach. For example, our leading project this year was a bill redesign for improved customer communication. In approaching the project, we asked customers to identify the most important information, what they liked about the bill and what was
not useful. We then crowdsourced\(^3\) and reached out to a group of online designers for redesign. We whittled down the 280 different proposals we received to a shortlist and then ran focus groups to reach the ultimate design.

As far as we know, we’re the first US utility to use crowdsourcing for this purpose, and the feedback on the new bills has been excellent. The latest report from the US market research company J.D. Power shows a 17-point improvement in our overall customer satisfaction ranking. Our impact model had forecast a 17-point improvement, so we felt confident that we were prioritizing the right initiative. We can directly associate this increase with the redesign.\(^4\) People even approached me at social events to compliment me on the new bill. How many times has that happened?

We are using a similar consultative approach for aspects of smart technology development. When it comes to introducing smart meters, there’s one obvious operational benefit to customers: meters help us restore power quicker. But in terms of empowering customers with more control and choices — meeting the customization need — we didn’t feel we had the roadmap. So we launched our Smart Grid Exchange, a forum where we are engaging with entrepreneurs and technologists such as NEST, GE and Simple Energy to develop ideas on what the future might look like for customer applications.

In summer 2014, the Exchange ran a competition for teams of college students to submit proposals to make meters useful on the customer side. We had over 40 submissions, some wonderful proposals and we are announcing the winning teams in October 2014.

Customers recognize change

As the modernization program continues under our Smart Grid law, our customer satisfaction numbers have improved steadily. Even when energy prices rose by 20% in the second quarter of 2014, the impact on our ratings was relatively small. This suggests that the work we’ve been doing in the last two years has sustainability and resilience. From our research, we know people recognize that something different is happening and they respond to the notion of the smart grid. They can see it’s more customer-oriented and that it’s a change for the better. Ultimately, we want to empower customers to take advantage of the technology that’s being presented to them.

Changing culture is fundamental

Our energy system is the heart of our economic infrastructure. We want to support Chicago’s 21st century economy and give it every advantage that we possibly can from an energy standpoint.

We have many projects, but the foundation for everything is changing our culture. We could do all the projects, improve the grid and improve our customer technology, but if we don’t set in place the cultural architecture that promotes a different mindset about customer solutions — one that allows this to continue when current employees move on — it won’t be sustainable. So we are focused on how our people think about what we do every day. We are working on developing a sense of deep mission and purpose associated with what they do. If you can ensure that people in your organization have customers in mind first, are thinking about innovation, and accept that change will be the normal course going forward, you have a great advantage in moving into the future.

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3. Crowdsourcing was defined by Wired magazine as: “The act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call.” http://crowdsourcing.typepad.com/cs/2006/06/crowdsourcing_a.html accessed 1 September 2014.

4. The new bill format launched in March 2014, with the J.D. Power study in April/May showing clear improvement in our scores for overall customer satisfaction and billing.
We’ve asked a tremendous amount from our people over the past few years and the changes have not been easy.

We were in the legislature for two years, working on very tight schedules to secure the passage of the Smart Grid bill. This gave us the foundation that our operations people needed to support their work on grid modernization and storm restoration. Our operations team is working harder and making more grid changes than we’ve made in many years. We had our best reliability on record in 2013, and we’ve improved our storm restoration times 30% in the last 2.5 years, making over 100 process and technology changes.

Receiving the CEO of the Year award is a reflection of the entire company and their work—a confirmation that we are on the right path. Taking that kind of recognition and sharing it with the organization, when you’re asking for so much substantial change, is very rewarding.

Anne Pramaggiore
President and CEO, ComEd

Anne Pramaggiore joined ComEd in 1998 to work on the company’s transition to competitive energy markets. In her role as ComEd’s lead lawyer and as head of Regulatory Policy, she led major policy work around the restructuring of the Illinois electric industry. In 2009, she was appointed COO and led the company’s effort to set the legislative framework for ComEd’s smart grid build-out, a leading model nationally for modernizing one of the largest utility systems in the country. She was promoted to her current position in February 2012.
Cheap electricity and increased competitiveness are driving many American companies to “reshore” their manufacturing activities. What is the impact for the power and utilities sector in both the US and Europe?

Report by Jaideep Malik
Manufacturing comes home

Once in steep decline, US manufacturing is undergoing somewhat of a renaissance. Since 2010, the sector has added almost half a million new jobs, mostly in the Midwest and Northwest, with about 10% of these jobs driven by companies bringing production home – or “reshoring.” The trend looks set to continue, with experts predicting that reshoring could potentially add three million to five million new direct jobs in the US manufacturing sector by the end of the decade.

The move to reshore comes as the US asserts its competitiveness as a long-term manufacturing destination. Relatively stable labor costs, plentiful cheap natural resources, high productivity, a large domestic consumer market, strong commitment to R&D and the shale gas revolution are driving the country’s increasing attractiveness. At the same time, outsourcing is becoming less attractive amid rising wages in emerging markets, volatility in currency rates and increasing energy and transportation costs.

The resurgence in the US manufacturing sector – which accounts for about 25% of the country’s retail electricity sales – is a welcome boon for American utilities hit hard by low demand and slow growth over recent years.

Prices and policy drive US appeal

I know what you’re thinking: this is all about shale. And you would be right, at least partly. All that cheap natural gas has seen US energy prices tumble and increase the country’s attractiveness to a sector as energy intensive as manufacturing. But the switch from coal to gas-fired energy has also played a large part in the ability of US utilities to embark on huge capital expansion programs while still avoiding “rate shock” for customers.

Richard McMahon, Vice President of Energy Supply and Finance at the Edison Electric Institute (EEI), the body that
represents all US investor-owned electric companies, says that it is the resulting improvement of US energy infrastructure that is a big part of the appeal to manufacturers. “At the end of the day these companies want affordable, reliable and environmentally sound electricity, and in many cases they have pretty high power quality needs too. So the utilities are doing a lot in terms of investing in the transmission and distribution grid to make sure that the quality of power supply meets the needs of these new customers,” says McMahon.

And meeting those needs is inducing many US utilities to take a more proactive, customer-oriented approach than traditionally seen in the sector. Steve Kiesner, Director of EEI’s National Customer Markets, explains: “Utilities are getting in there and connecting with potential manufacturing customers at the early stages,” he says. “They are showing potential developers what land they have available, and the access to infrastructure, transmission lines and substations. They are being up-front about putting their best face forward and showing them where the opportunities lie within their markets.”

Utilities are also working to meet the requirements of many leading companies for a different type of energy mix. “Many high-tech firms such as Google and Apple are very insistent upon green energy, and so we are seeing utilities negotiate deals to supply energy that is, of course, reliable but also green,” says Kiesner. “For example, in North Carolina, which is a traditionally regulated state, there have been some agreements struck between Apple and Duke Energy to access solar energy.”

The Apple-Duke arrangement is actually about the siting of a data center for the technology giant – a deal that highlights the potential for US utilities to benefit from servicing the load that drives the digital economy, in parallel with the current manufacturing revival. With the

“As the business environment changes, we are seeing regulators and other stakeholders recognize that whatever they do to attract manufacturers will benefit their entire community.”

Steve Kiesner, EEI

Steve Kiesner leads EEI’s National Customer Markets Group, which assists its members in their business and policy activities with large customer segments, including the federal marketplace, national account customers and other customer groups. Before joining EEI in 1996, he worked for the Potomac Electric Power Company (Pepco) for seven years as customer representative for the federal government, including the White House, General Services Administration (GSA), Architect of the US Capitol, National Parks Service, Smithsonian Institution, FBI and several other federal agencies.
infrastructure already in place, many US states are now able to attract these energy-intensive data centers, as well as the distribution centers of big retailers, such as Amazon, Walmart and Target.

Both Kiesner and McMahon point out that, while utilities have worked hard to attract these commercial and industrial customers, a large part of the US manufacturing success is due to the efforts of regulators and governments to get behind it.

“As the business environment changes, we are seeing regulators and other stakeholders recognize that whatever they do to attract manufacturers will benefit their entire community,” explains Kiesner. “They recognize that industrial loads will mean more housing developments, as well as more commercial businesses to support the residential customers. ‘If you build it, they will come,’ is their philosophy. And I think this is a significant factor, especially in those markets that have really been impacted by the recession over the last few years.”

McMahon points to evidence that some regulators, including those in California, are taking different approaches to setting rates that consider the need to recover the true cost of building the level of infrastructure that commercial customers need. “We are seeing utilities get the regulatory support they need to continue this spend – the trends in requested ROEs and authorized ROEs are good,” he says.

“Healthy economics” needed in Europe

But as US regulators do what they can to help drive their country’s manufacturing resurgence, those in Europe are putting up roadblocks, according to Hans ten Berge, Secretary General at Eurelectric, the association for Europe’s electricity industry: “When I talk to the big consumers, they are not dissatisfied with the electricity prices we are offering – there is not much difference between the wholesale market prices of the US and Europe,” he says. “What they are dissatisfied with is the trend of European policymakers to add lots of levies and taxes. This means that the end price for the consumer is significantly higher than it is for the US consumer.”

So does the US manufacturing bonanza mean bust for the European sector? Not according to ten Berge, who points out that the trend toward the US is a sector-specific one rather than an en masse desertion. “In energy-intensive sectors such as the chemical and fertilizer industries, where a lot of gas is consumed, clearly shale gas is a factor. And if we look at the IT sector, the US is very competitive, and we are lagging behind. But I think we’ve got our winners in Europe also. Cars produced in Germany and furniture produced in Denmark are attractive to consumers because of their high quality. Do we fear competition in these industries? No.”

As increased energy efficiency in Europe drives down overall energy consumption, ten Berge believes European utilities will need to compete more upon their ability to deliver the reliable, uninterruptible supply of electricity that manufacturers need.

“In the future, the capacity value will be a much bigger driver of the electricity market than kilowatt hours. The value of the electricity industry is in the firmness of the product. A company which is producing steel wants around-the-clock, 24-hour reliable electricity. Solar energy
“The key difference between the two markets is Europe’s surcharges, which make our retail electricity prices much higher than in the US. The answer is: please get healthy economics into the utilities sector. Don’t subsidize and then take it back as a surcharge on the bill.”

Hans ten Berge, Eurelectric

is not an option for a customer that consumes 80% of its energy when the sun is not shining.”

But ten Berge admits competition will always come back to cost. “The key difference between the two markets is Europe’s surcharges, which make our retail electricity prices much higher than in the US. The answer is: please get healthy economics into the utilities sector. Don’t subsidize and then take it back as a surcharge on the bill. This is a very inefficient system, and that’s the root cause of our problem.”

**US gain, European pain?**

As energy efficiency drives down electricity demand growth in the US, the rejuvenation of the manufacturing sector may prove to be a wild card for many utilities. And as reshoring continues, other energy-intensive industrial customers, such as data and distribution centers, may further increase the size of the opportunities on offer. Making the most of these will require utilities to continue to innovate and ensure they are meeting the needs of increasingly sophisticated commercial customers, according to McMahon: “Customers’ needs are evolving, particularly in the area of on-site generation through solar installations and gas micro turbines. Now is the time to have a frank and open dialogue about these issues, desires and concerns.”

In Europe, the ability of utilities to compete with their US counterparts looks limited, without concerted efforts from policymakers, says ten Berge. “At the end of the day, if you want a competitive market, giving subsidies at the expense of 80% of customers won’t get you there fast. I think that this approach will go because it is an unaffordable route to the energy transition. But I’m afraid that we will have to feel the pain before we take the medicine.”

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**Hans ten Berge**

Secretary General, Eurelectric

Hans ten Berge served for several years as Chairman of Eurelectric’s Markets Committee before being appointed Secretary General in June 2007. Hans has worked at Exxon Chemie, Kemira Agro and ENECO Energie, where he was a member of the Board of Management until January 2006.
“Ofgem aims to protect consumers. But we are required by law to balance the interests of today’s consumers with those who haven’t even been born yet. So sustainability is inherent in our remit and a duty we can’t ignore.”

Adam Cooper, Ofgem
Protecting consumers
Like most energy regulators across the globe, Ofgem aims to protect consumers. But we are required by law to balance the interests of today’s consumers with those who haven’t even been born yet. So sustainability is something inherent in our remit and a duty we can’t ignore.

A key part of our role, therefore, is to enable the country to meet its climate and energy targets, which include:

► Meeting 15% of the UK’s final energy consumption from renewable sources by 2020
► Achieving an 80% reduction in greenhouse gas emissions by 2050, based on 1990 levels

Accomplishing this will take more than just adding renewable generation capacity: energy efficiency, demand-side management, new technologies and changing consumer behaviors will all be vital.

Ofgem is used to dealing with the implicit tensions that our statutory duties imply and balancing the “3 As” of affordability, availability and acceptability. But doing so in the current environment – a time of uncertainty, volatility and deep-rooted change – presents a unique challenge.

Minimizing damage from decisions
The simple fact is that we don’t know what the future’s going to be. We have to accept that the predictions we’re making now may – in all likelihood – be proved wrong. For example, take solar photovoltaic (PV). Few predicted the impact that PV is having on Europe’s energy markets. Back in 2008, the emphasis for renewables in Europe was primarily on developing wind capacity. But in the space of a few years, the penetration of PV has exceeded expectations and costs have fallen so dramatically that PV is now close to becoming an unsubsidized technology.

So how do we, as regulators, deal with this level of uncertainty? We try to minimize any future damage from our decisions, and we are as technology-neutral as possible. Our end goal is to enable markets to set prices effectively, so that markets and consumers can decide which technologies best meet their needs. We need to keep all the options open and not inadvertently rule things out.

Generation: moving from the Big 6 to the Big 60,000 and beyond
The profile of generation in the UK has already changed significantly. Microgeneration has taken off: Ofgem recently processed its 500,000th installation application. As former UK Energy and Climate Change Minister Greg Barker put it, we are moving from the “Big 6” generators to the “Big 60,000.”

Another example is transmission charging: in July, we announced changes to Ofgem’s methodology for calculating what companies pay to use the electricity transmission network. Charges have always been set to encourage the efficient use of transmission assets, which historically meant incentivizing generation as close as possible to the load.

But what about wind power assets? They have to be located where the wind is. On the other hand, such renewables tend to use the system less than traditional forms of generation and so they impose lower costs. The changes, therefore, more accurately reflect the costs that different generators put on the electricity network.

Building a more interconnected grid
The nature of renewables also means that we are going to need a more interconnected grid across the UK and across Europe. A more interconnected grid can overcome some of the intermittency issues from renewables. In addition, interconnected markets are more efficient: they offer greater liquidity, with power produced where it’s cheapest and transferred to the market that needs it. Pooling spare capacity across multiple countries in the European Union can also reduce the need for capacity payments to generators.

To illustrate the scale of investment we are looking at, Ofgem recently approved a US$2b transmission project in northern Scotland. This project will create a subsea electricity link that brings renewable energy further south. Without the UK’s ongoing focus on sustainability, the transmission link wouldn’t be built because the renewable generation driving the project simply wouldn’t be there.

Building public trust – essential for sustainable energy
In 2014, we referred the electricity market to the Competition and Markets Authority (CMA) for an investigation. Our principal aim in doing this was to clear the air, ensure there were no barriers to effective competition and increase...
consumer trust. Right now, competition just isn’t working as well as it should.

As it stands, how many consumers would allow their energy suppliers to turn their freezers off during times of peak demand to help balance the system, or trust their suppliers to reward them fairly for doing so? Very few. Rising profits at electricity companies and recent price hikes have intensified public distrust of suppliers.

Smart technology will be a game-changer for sustainability, enabling time-of-use tariffs and providing real granularity on energy use. It will allow for new, innovative business models to emerge. And it could be a catalyst for changing the way that we engage with energy – but only if consumers are willing to trust their energy suppliers to control their appliances and more. At the moment, this is too big an “if.”

**Building investors’ trust**

There is a huge need for investment to meet the targets we are all working toward, and Ofgem has a critical role to play in creating a stable regulatory environment that encourages investment. We follow good practice, work proactively with investors, flag issues as early as possible and de-risk what we can. A stable environment leads to cheaper finance for energy companies, which in turn leads to lower prices for consumers.

**Optimism for the future**

Building a sustainable approach to energy will take time, but I am hugely optimistic we will get there. In 2008, when UK climate change targets were originally set, the majority said: “No way, too much change is required; there’s not enough time.” Yet in 2014, the UK is on track to meet the 2020 carbon target.

There are other reasons for optimism. China and the US are getting on board with the need for global action on climate change. There are a great deal of innovation and fantastic new ideas coming along. At next year’s Paris climate change conference, it is vital for global buy-in to continue. We need the whole world to work together on climate change mitigation to succeed. ■

Adam Cooper

Head of Sustainable Energy Policy, Ofgem

Ofgem is the gas and electricity regulator for UK consumers. Adam Cooper leads on ensuring its work enables the transition to a low carbon energy system. He has over 10 years’ experience of regulation and competition policy at Ofgem and the UK’s Competition Commission.
Pressure on the tax team to perform is increasing in the P&U sector as it undergoes sweeping transformation. Tax heads at European utility Axpo Group and the US’s Southern Company describe how their approaches and skill sets are evolving.

Report by Ginny Norton, Mike Semes and Stefan Waldens
Tax directors have always been expected to manage global risks and capture value from tax-efficient operations as their businesses grow. The P&U tax team is also increasingly contributing its expertise across a huge range of strategic, fundraising, business and efficiency challenges in a rapidly transforming sector. Their role can only get tougher, given ongoing regulatory change and heightened scrutiny (see box, Rising pressure on P&U tax teams).

We asked two tax heads — Marc Linnenbaum of leading Swiss utility Axpo Group and Robert Morris of major US utility Southern Company — to outline their approach and priorities, from the tax impacts of changing generation strategy to major upcoming risks and opportunities. What changes do they anticipate in their working lives as the sector continues to transform?

Impact of changing generation

Naturally, tax doesn’t lead the changes facing the P&U sector, but it is critical to the success or failure of initiatives that address these changes. Utilities face big decisions on divestments and investments, restructuring, grants, raising capital and more. Tax teams have to ensure these decisions contain no “showstoppers” and are underpinned in a tax-efficient way that delivers certainty for the business.

The way generation assets are changing is a good example. Governments are targeting cleaner energy and some countries have turned their backs on nuclear power. The resulting acquisitions, divestments and plant shutdowns are changing the shape of many energy businesses and are extremely expensive. Taxation aspects are central to these decisions, and if they are mishandled, there is a risk of leaving value on the table. Significant value resides in, for example:

- Due diligence on acquisitions — assessing inherent tax risks can identify potential deal-breakers and give buyers ammunition to negotiate hard on purchase prices
- Identifying opportunities to reduce taxation following a shutdown — e.g., on property, income and sales — to neutralize any negative financial impacts of change
- Funding acquisitions or new construction through tax-efficient vehicles such as yieldcos, real estate investment trusts (REITs) or master limited partnerships
- Realigning transfer pricing policy1 to the organization’s business model to reduce risk, ensure consistency and compliance, and support business decisions and incentives.

Southern Company — an Atlanta-based utility serving 4.4 million customers in
the southeastern US – is changing its generation portfolio in line with the US push for cleaner electricity. The company is building new nuclear and 21st century coal and developing renewables while expecting to retire 3,100 megawatts (MW) of coal- and oil-fired generation and convert 3,200 MW of coal-fired generation to natural gas.

“We’ve committed US$20b to building toward America’s energy future.2 With this large capital outlay, the tax department is constantly looking for ways to recover costs as quickly as possible, within the law,” comments Robert Morris. “Accelerated recovery benefits our customers, by minimizing the revenue requirements necessary to fund capital additions, and our shareholders, by supporting our return on investment. We look to optimize ownership structures and identify potential credits and any other tax benefits available.”

Southern Company subsidiary Georgia Power is building two new nuclear units near Augusta, with the first unit due to go online in 2017. “We’re constantly in dialogue about cost recovery, and reviewing legislation to make sure we know whether any future legislation could harm credits or capacity to recover cost,” says Morris. “We’re also constantly involved in assessing opportunities involving renewables: the accelerated depreciation and tax credits on these plants are critical in determining what we build or acquire.”

1. Transfer pricing is the price at which companies or divisions of multinational groups transact with each other.
2. This commitment includes two large capital projects: a nuclear construction project in Augusta, Georgia, and a carbon-capture project in Kemper County, Mississippi.

On a deal, as people pick up the phone and talk to us, we can either help to move a project along or decide that it doesn’t make sense from a tax standpoint … Because we get immediate feedback, the CAP program means that we no longer have to spend extensive time addressing issues with the IRS: we resolve things and move on.”

Robert Morris, Southern Company

In his current role, Robert Morris oversees corporate tax strategy at Southern Company, one of the US’s largest producers of electricity. With more than 30 years of accounting experience, Robert has also served as assistant comptroller and assistant secretary of Georgia Power, among numerous other management positions.
Axpo Group is Switzerland’s leading energy utility and has approximately 30 subsidiaries across Europe, including a range of independent power producers, energy trading companies, gas-fired plants and wind farms.

“We’re currently investing in renewable energy,” says Marc Linnenbaum, “and people comment to me that what they want to do in the business often involves dialing my number. Most big business decisions the company makes come through the tax department at some point – so we are woven tightly into the transformation that’s happening.”

Axpo is investing in wind parks across Europe – both on and offshore. Conducting tax due diligence when buying these operations can be highly complex. Wind parks are often owned by private equity (PE) funds, which often set up structures to maximize the return on the investment (such as debt push-down and management charges) that tend to reduce income for operating businesses.

Acquiring this sort of structure can carry much greater inherent tax risk, so the tax team needs absolute vigilance and expert knowledge of the industry they are buying into.

Dealing with tighter regulation and tax reform

Meanwhile, the regulatory and tax environment as a whole is set to be increasingly tough, both in Europe and the US.

“Our first priority as a tax department is to be involved in ongoing discussions about today’s developments and stay abreast of new public policy pressures that may arise,” comments Morris. “We actively engage in the legislative and regulatory processes, and we’re particularly interested in evolving environmental regulations, renewable energy growth and proposals that would impact our major capital projects.”

The G8 countries have initiated an OECD strategy to fight tax avoidance and developed a Base Erosion and Profit Shifting action plan (BEPS, see inset box) to identify potential areas of abuse or aggressive strategies. The recommendations are likely to significantly change tax regulation around the world. Companies will have to comply with much more stringent tax and transfer pricing rules in nearly all jurisdictions. Wide-ranging tax reform of this kind carries with it the threat of slowing business activity, cutting profits and damaging competitiveness.

Utilities around the world have some big hurdles coming up: political pressure on taxes from the OECD and the EU is likely to create additional administrative burdens and withholding taxes on dividend payments and interest payments. Tax leaders will have to wait for the final OECD decision before they know exactly what work they have to do. There’s likely to be a big additional burden from country-by-country reporting – not just paperwork, but new technology. The rules will be slightly different in every country, increasing the risks during the tax audit.

Despite the complexity, Linnenbaum’s basic attitude is typical of a sector that shuns aggressive tax-planning schemes. “Our goal is good corporate citizenship, by which I mean we pay taxes where we have our profits,” he says. “We look for optimization, not maximization – we don’t comb through every sentence of the rulebook looking for an interpretation that will cut tax. “Any tax scheme you set up has to reflect the reality of how the business is run. You have to ‘live the structure.’ Tax authorities are taking an increasingly joined-up approach, so in future you won’t just have to answer a question in Germany, but the same question in...
Belgium, Luxembourg or France – and you’ll need to have the same answer because the tax authorities are all talking to each other."

Morris notes that Southern Company is currently analyzing US tax reform proposals to see how they could impact the company, customers and shareholders. But he explains that closer coordination with the U.S. Internal Revenue Service (IRS) has already changed his team’s working life and delivered business benefits: “Our work with the IRS has evolved over the last few years and has been a great advantage.

“We were recently accepted into the Compliance Assurance Process (CAP), allowing audits that previously took years to complete to occur in real time. Under CAP, we work with IRS agents on site to resolve issues before filing the company’s return. This process allows us to be at the forefront of many industry issues, helping us develop strategic approaches with less uncertainty.

“For example, when we are doing a deal, as people pick up the phone and talk to us, we can either help to move a project along or decide that it doesn’t make sense from a tax standpoint. We’re able to do that quickly because we get immediate feedback. The CAP program means that we no longer have to spend extensive time addressing issues with the IRS: we resolve things and move on.”

**Tax teams on the front line**

Both Morris and Linnenbaum stress the real competitive advantage tax teams can add when they are fully integrated into business operations. They believe this is where tax executives need to be: supporting P&U competitiveness as the sector continues to transform.

Playing a greater role in risk management and intercompany effectiveness requires them to partner with other leaders in the business and encourage close interaction between the tax team and other business functions.

So does Morris believe the tax team’s profile is now representative of the real value that it can bring? “In the past, tax departments were islands by themselves, but I think we are now seen by senior management as partners in strategic decisions. Because tax is so critical to the things we do as a business, we need forward-looking people on our team who are equipped to openly and honestly discuss what makes sense with management.”

Linnenbaum shares this view: “I see my role as a value driver, not just in terms of deferring taxes and ETR, but in cash. Do it the right way, and you can save big costs without being aggressive. If you are in the project at the right time, explaining the rules, setting up loan agreements correctly, ensuring transfer pricing is understood, documentation and obligations are known, you can save a lot of money and reduce tax cash-out in future tax audits.

“Tax is a significant cost in every P&L, and I might be able to save several millions by positioning losses and profits within a tax group. Who else in our organization could get that kind of return on a single product?”

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Marc Linnenbaum
Head of International Tax, Axpo Group

With a background in tax consultancy and the banking sector, Marc Linnenbaum joined Axpo in 2009 as Managing Director of Axpo International SA, and was appointed Axpo Group Head of International Tax shortly afterward. Marc is responsible for all international corporate tax issues within the group.

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Marc Linnenbaum, Axpo Group

“**Most big business decisions the company makes come through the tax department at some point – we are tightly woven into the transformation that’s happening.**”

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Quenching energy’s thirst
There’s a new phrase cropping up more and more in the utilities industry: the water-energy nexus. It captures the entwined nature of the two sectors as producing energy is dependent on water and vice versa.

The International Energy Agency (IEA) predicts water usage by energy companies will double by 2035 (from 66 billion cubic meters [bcm] in 2013 to 135 bcm annually by 2035). In fact, 90% of energy production is water intensive, including renewables; given the IEA’s current scenarios, the most water-intensive processes are coal-fired electricity and biofuel production.¹

To address this global challenge, the World Bank recently launched a new initiative, Thirsty Energy. “Thirsty Energy is helping the energy and water sectors to talk to each other more, to begin integrated planning and investment with improved modeling, to understand the trade-offs of potential solutions and to jointly define a way forward that makes sense for both sectors,” explains Charles Feinstein, Director of the World Bank’s Energy & Extractives Global Practice.

Widespread implications for utilities

The water-energy (and food) nexus affects utilities using fossil fuels and those planning for a low carbon future. It impacts those in developed and developing countries. “Utilities need to understand the entire context in terms of competition for increasingly stretched water resources,” says Dr. Diego Rodriguez, Senior Economist at the World Bank and the team leader for Thirsty Energy.

There’s also an impact on utilities’ bottom lines. “In developing countries, we see a lot of utilities saddled with the losses made by the water business, because the costs

Impact of water on the world’s top energy companies and power utilities

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<th>Energy Companies</th>
<th>Power Utility Companies</th>
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<td>Water is a substantive risk to business operations</td>
<td>- 82% of energy companies</td>
<td>- 73% of power utility companies</td>
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<td>Water-related business impacts in the past five years</td>
<td>- 59% of energy companies</td>
<td>- 67% of power utility companies</td>
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Source: CDP Global Water Report 2013

of energy used in water processes such as pumping, filtration and desalination are not internalized by the water utility. This creates a vicious cycle whereby state-owned energy utilities are continually trying to collect from water utilities, which also tend to be public enterprises, creating significant arrears and placing pressure on utility financing and public financial sustainability,” says Feinstein.

In the future, Feinstein hopes to see energy and water utilities much more aware of their interdependencies and planning to manage resources more efficiently. “We need to connect energy institutions with centers of excellence in water management and integrated water resource management.”

Thirsty Energy is working in partnership with four private companies – EDF, Abengoa, Alstom and Veolia – to improve awareness of the water-energy nexus, and is open to working with more. “Our partner companies help to provide a real-world context for discussions. When we start a dialogue with a particular country, our partners share their own experiences in implementing joint investments and explore various public policy mechanisms and incentives for a more integrated approach,” says Rodriguez. “They’re an important resource for knowledge transfer, in analyzing and making the necessary trade-offs between energy, water and agriculture. We also use some of their field data in our models.”

**The most pressing regions**

Thirsty Energy is initially focusing on four countries, each at different stages of addressing the water-energy nexus.

► **In South Africa**, Thirsty Energy is helping to develop a fully-integrated model of energy and water. The country had to curtail the output of some coal-fired plants some years ago due to water scarcity. Feinstein says South Africa is increasingly moving toward designing air-cooled steam cycles for power production to reduce overall water consumption, which represents a necessary cost and efficiency trade-off.

► “In China, water availability is becoming an absolute constraint on power production,” says Feinstein. “We are helping them to explicitly connect the energy planning and water planning dimensions in their next five-year plan. The country has a huge stock of coal-based power plants that consume significant amounts of water, many in water-stressed regions. Two of the three major shale gas basins in China are also located in water-scarce areas in the north of China, in Szechuan.”

► Advanced discussions are also taking place in Morocco, where an energy and water utility have merged recently. The new entity will be responsible for providing water and energy supply to a large part of the country. “Thirsty Energy held an initial workshop where, for the first time, the two central planning units of both sectors sat together to have a serious and more candid discussion on the challenges that they face,” says Rodriguez.
Initial discussions have taken place in Brazil, where there are growing concerns over climate change and climate variability on future planning scenarios, particularly in the Northeast, which is extremely dry.

Other countries where water is scarce and potentially a constraint on future development of significant non-conventional fossil resources are Mexico and Argentina. “Both will need to strike a very careful balance when it comes to the exploitation of shale oil and gas deposits,” says Feinstein.

Hydropower a key opportunity

In energy development, hydropower stands as an opportunity for the World Bank and its partners to actually transform energy sectors.

Myanmar illustrates some of the challenges of integrated water resource management. The Irrawaddy River is one of the largest and most valuable river systems in the world. It has enormous hydro-potential, but the river is also a lifeline for transporting goods and people, a much-needed supply for agriculture (which still represents the major livelihood of most Burmese), and where artisanal and traditional fishing takes place. The trade-offs between building dams for energy and the impact on transportation, agriculture and fishing will need to be considered very carefully.

“We need to connect energy institutions with centers of excellence in water management and integrated water resource management.”

Charles Feinstein, World Bank

Charles Feinstein

Director of Energy and Extractives Global Practice, World Bank

In his current role, Charles Feinstein is responsible for the operations and day-to-day management of the combined energy, mining and oil and gas investment, analytical and advisory portfolio. He is a recognized energy specialist and co-author of the World Bank’s pioneering environmental strategy for the energy sector paper “Fuel for Thought.”
Dr. Diego Rodriguez
Senior Economist, Water Global Practice, World Bank

Dr. Diego Rodriguez is the task team leader of Thirsty Energy, a new World Bank initiative on the quantification of the trade-offs of the water-energy nexus. He is also currently providing technical support to operational teams on the use of economic analysis in large water infrastructure investments.

“We are committed to ensuring that energy plans and investments make sense and are sustainable, that potential conflicts with other sectors are avoided, and that the financial structuring and engineering on projects is robust and solid.”

Dr. Diego Rodriguez, World Bank

Barriers: lack of communication, data transparency and trust

In many countries the water and energy ministries, or the water and energy utilities, do not necessarily talk to each other when it comes to serious decision-making. Nor do they make joint investments or joint, longer-term planning decisions. “This lack of effective communication is quite striking: each one has its own planning process and planning mechanisms and there is very limited interaction with each other. But we are already making good progress toward breaking down these barriers,” says Rodriguez.

Another barrier is data and analytical modeling. Rodriguez says there is often a reluctance to provide data on water and energy resource demand, usage and allocation. “Given these data gaps, many developing countries are using proxies or average numbers from studies in the developed world. But when data is gathered at the local level for specific plans, or specific utilities and operators,
the numbers do not match and the order of magnitude of the difference can be quite high.”

Thirsty Energy is addressing this challenge by promoting transparency in the energy and water sectors, supporting frank dialogue between the two sectors and being very clear about how the data will be used. “Our message is not that countries should not use water to generate power,” says Rodriguez. “Rather, that we are committed to ensuring that energy plans and investments make sense and are sustainable, that potential conflicts with other sectors are avoided, and that the financial structuring and engineering on projects is robust and solid.”

This issue of trust is fundamental to the challenges faced in addressing the water-energy nexus. Feinstein believes that is part of Thirsty Energy’s remit: “It’s part of our challenge, to reach out to high-level political decision-makers to raise awareness and help them understand that sharing information serves a good purpose.”

**Going forward**

As awareness of the interdependencies between water and energy grows, the World Bank sees a more connected future and is changing its own internal structure to reflect this. “Development challenges are increasingly intertwined and multisectoral by their very nature, and so are the solutions,” says Feinstein. “We can’t approach development problems in silos. We need to link up communities of practice and share technical knowledge.”

**The global challenge**

2.5 billion have unreliable or no access to electricity

2.8 billion live in areas of high water stress

The numbers do not match and the order of magnitude of the difference can be quite high.”

**Source:** WWAP 2012

**Source:** EIA 2012
Capital outlook
This new EY report provides detailed data on current power and utility asset valuations and deep insight into the underlying trends. We explore likely impacts for future transaction activity, highlighting the regions and sub-sectors we believe will be attractive to investors.

Benchmarking European power and utility asset impairments
EY has tracked asset impairments in 16 major European power and utility companies since 2010. Our latest study shows that of the €62.7b wiped off valuations from 2010 to 2013, more than half (€32b) occurred in 2013. Having faced a tough business environment last year – and with little sign of improvement so far in 2014 – European utilities that want to outperform the market will need to adapt to a new world shaped by declining demand for energy and a changing generation mix.

Renewables in mining: Futuristic or realistic?
With energy access becoming increasingly difficult and expensive in many regions, the role of renewables in mining is part of the solution.

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Risky business: a closer look at total shareholder return in the US power and utilities sector
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