

United States

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1 Policy and law

What is the government policy and legislative framework for the electricity sector?

No single government body sets government policy for the electricity sector. The federal government, which regulates wholesale markets, follows a generally pro-competitive policy. The competition reforms that transformed the US electricity sector represent the latest chapter in three decades of restructuring, deregulation, and regulatory reforms that affected utility sectors of the economy historically subject to price regulation. Retail sales are regulated by the states. Several states have adopted choice programmes intended to introduce competition among retail suppliers of electricity. While some states have delayed or suspended retail choice plans amid concerns that deregulation may not benefit end-use consumers, retail choice is thriving in other states, such as New York.

US Congress

The Energy Policy Act of 2005 (EPA 2005) represents the most significant change in US energy policy since the Federal Power Act of 1935 (FPA) and the Natural Gas Act of 1938 (NGA). EPA 2005 granted the Federal Energy Regulatory Commission (FERC) the authority to issue rules to (i) prevent market manipulation in wholesale power and gas markets, and in electric transmission and gas transportation services; (ii) assess enhanced civil penalties for violations of the FPA and other energy statutes; (iii) oversee mandatory reliability standards governing the nation's electricity grid; and (iv) approve the siting of transmission facilities, traditionally a matter of state or local jurisdiction, under certain limited circumstances.

Federal administrative agencies

Federal administrative agencies are tasked with implementing energy legislation passed by the US Congress. The mission of the US Department of Energy (DoE) is to 'ensure America's security and prosperity by addressing its energy, environmental and nuclear challenges through transformative science and technology solutions' (www.energy.gov/mission). FERC, an independent regulatory agency within the DoE, is the principal economic and policy regulator at the federal level for the electric power industry. FERC is charged with implementing, administering and enforcing most of the provisions of EPA 2005, FPA, NGA and other statutes regulating the electric utility industry.

States

Beginning in the 1990s, a number of states undertook measures to require or encourage vertically integrated utilities to disaggregate into separate generation, transmission or distribution entities. Also, participation in independent system operators (ISOs) or regional transmission organisations (RTOs) was encouraged at the federal level and in some states. The American Public Power Association's (APPA) most current data indicates that 16 states and the District of Columbia have active retail choice programmes in the electric sector (APPA, Retail Electric Rates in Deregulated and Regulated States: 2016 Update, http://appanet.files.cms-plus.com/PDFs/Regulated_versus_Deregulated_Rates_Report.pdf).

2 Organisation of the market

What is the organisational structure for the generation, transmission, distribution and sale of power?

According to the most recent data compiled by the APPA, the US electric industry is composed of 3,302 electricity providers, including 2,012 publicly owned utilities, 876 cooperatives, 187 investor-owned utilities, 218 power marketers, and nine federal utilities (APPA, 2016-2017 *Annual Directory & Statistical Report*). Together, those utilities combine to serve almost 149 million customers, with investor-owned utilities serving the largest share at approximately 68 per cent of the total customers.

The private sector includes traditional utilities that are vertically integrated, generation-owning companies and power marketers, and transmission or distribution 'wires-only' companies. These companies may be privately owned or publicly traded. The public sector includes municipally owned utilities, public power districts, state agencies, irrigation districts and other government organisations, and at the federal level, the Tennessee Valley Authority (TVA) and federal power marketing administrations. Rural electric cooperatives, formed by residents, operate in 47 states and comprise about 11 per cent of total US kilowatt-hour sales and revenue (www.nreca.coop/about-electric-cooperatives/co-op-facts-figures/).

Generation

According to the Energy Information Administration's (EIA, part of DoE) most recent statistics, net generation of electric power increased slightly by 0.03 per cent in 2016, to 4,079,079 kWh, as compared to 4,077,601 kWh in 2015, and as of May 2017, net generation of electric power has decreased approximately 2.53 per cent from June 2015 levels (www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_1_1).

The primary energy sources for generating electric power in the US are fossil fuels such as coal and natural gas, with limited use of oil. Fossil fuels accounted for slightly more than 65 per cent of energy consumption in the US in 2016. The predominant fuel source is now natural gas (supplanting coal), accounting for 33.8 per cent of total net generation in 2016. Domestic production of crude oil and natural gas has been facilitated by ongoing improvements in extraction technologies and resultant low prices. Crude oil production has increased sharply since 2008. In 2015, the US produced 9.4 million barrels per day, a number that approaching the record high (set in 1970) of 9.6 million barrels per day. EIA, however, predicts that domestic crude oil production will soon level off and eventually decline after 2020. Development of natural gas resources has also steadily grown, with a predicted 61 per cent increase in production between 2014 and 2040 (www.eia.gov/beta/aeo/#/?id=13-AEO2016). Generation from renewable energy sources including hydroelectric continues to rise, accounting for nearly 15 per cent of total US net generation in 2016. In fact, through the first six months of 2016, generation from renewable sources exceeded levels from previous years in every month (www.eia.gov/todayinenergy/detail.cfm?id=27672).

EIA has predicted that total US electricity consumption will increase at an average annual rate of 0.9 per cent in the next two decades, but that energy intensity (measured as energy use per person and per dollar of GDP) will actually decline (www.eia.gov/forecasts/aeo/).

sector_energydemand_all.cfm#declines). This forecast is based on the assumption that the US population will increase by 0.9 per cent per year and the GDP will increase at an average annual rate of 2.5 per cent per year. The projected decline in energy use per capita reflects anticipated gains in energy efficiency of appliances and vehicles, an economic shift away from energy-intensive manufacturing, and the retirement of less efficient generators.

Power sales

Power marketers do not generate, transmit or distribute electricity, but are classified as public utilities under the FPA because they sell electricity at wholesale. In addition to the numerous privately owned power marketers, there are four federally owned power marketing administrations that market and sell the power produced at federal hydroelectric and nuclear plants. The APPA reported in its *2015-2016 Annual Directory and Statistical Report* that sales of energy to ultimate consumers by power marketers equal 20.2 per cent of total sales (www.publicpower.org/files/PDFs/USElectricUtilityIndustryStatistics.pdf).

Transmission

The US bulk power transmission system is composed of facilities that are privately, publicly, federally or cooperatively owned that form all or parts of three electric networks (power grids): the Eastern Interconnection that stretches from central Canada to the Atlantic coast (excluding Quebec), south to Florida and west to the Rockies (excluding much of Texas); the Western Interconnection that stretches from western Canada south to Mexico and east over the Rockies to the Great Plains; and the Electric Reliability Council of Texas (ERCOT) that serves a large portion of Texas.

Historically, transmission lines owned by private-sector companies were part of a vertically integrated utility. In 1996, FERC issued Order No. 888, requiring each public utility subject to FERC's jurisdiction to:

- file an open-access transmission tariff (OATT) declaring the terms and conditions for using its transmission system; and
- functionally unbundle its services.

FERC has encouraged the development of ISOs and RTOs as independent transmission providers within a region. These entities are formed by utilities that transfer operational control – but not ownership – of their transmission assets to the ISO or RTO, which is then responsible for operating the regional transmission grid and administering wholesale markets. Today, two-thirds of electricity consumers in the US are served within markets administered by seven ISOs or RTOs: the PJM Interconnection, the Midcontinent ISO, the Southwest Power Pool, the New York ISO, ISO New England, ERCOT and the California ISO. In addition, on 1 November 2014, the California ISO and PacifiCorp launched the Energy Imbalance Market (EIM), which is a real-time energy balancing authority with the overall goal of dispatching least-cost energy on a real-time basis across the EIM market. The California ISO EIM continues to expand, as Las Vegas-based NV Energy began participating in October 2015, utilities in Washington and Arizona recently began participating in October 2016, and Idaho Power expects to begin participating in the EIM market in 2018. Moreover, several other western utilities have expressed interest in joining the EIM, including the Los Angeles Department of Water and Power – the largest municipal utility in America, serving approximately 4 million customers – recently announcing plans to enter into the EIM as soon as 2019.

One of the responsibilities of ISOs and RTOs, as well as other transmission providers, is to maintain the operation of the grid. Pursuant to EAct 2005, FERC certified the North American Electric Reliability Corporation (NERC) as the nation's Electric Reliability Organisation (ERO) to develop and enforce mandatory reliability requirements to address medium- and long-term reliability concerns, subject to FERC oversight and enforcement. Today, enforcement of electric reliability standards, including the protection of critical energy infrastructure, is a major focus of the ERO and of FERC, which may impose penalties of up to US\$1 million a day on transmission or generation owners and operators and certain other regulated entities for a violation of mandatory reliability standards. See question 12 for further discussion on reliability.

Regulation of electricity utilities – power generation

3 Authorisation to construct and operate generation facilities

What authorisations are required to construct and operate generation facilities?

The siting and construction of electric generation, transmission and distribution facilities has historically been a state and local process, although EAct 2005 altered this traditional arrangement by vesting limited transmission siting authority with FERC in certain cases. In making siting decisions, state public utility commissions (PUCs) consider environmental, public health and economic factors. The PUCs exercise their authority in conjunction with state environmental agencies or local zoning boards. A few states have a siting board or commission that provides a single forum where an electric utility or independent developer can obtain all necessary authorisations to construct electric facilities. Other states have not consolidated the siting process, and electric utilities or independent developers in those states are required to obtain the necessary permits separately from each of the relevant state and local agencies. State and local permits required for the construction of electric generation facilities include air permits and water use or discharge permits from the state environmental commission, and zoning and building permits from local commissions.

Regulated utilities are required to obtain a certificate of public convenience and necessity from the relevant PUC for the construction of generation, transmission and distribution facilities that will be subject to cost-base rate regulation. Except in limited circumstances where the relevant state commission refuses to act on an application for a year, or does not have jurisdiction to act (as in the case of certain federally designated National Transmission Corridors), no federal certificate of public convenience or necessity is available from FERC for the siting and construction of electric generation, transmission or distribution facilities under part II of the FPA.

A FERC licence must be obtained under part I of the FPA for the construction of hydroelectric facilities on navigable waters. Construction affecting federal lands may also require authorisation from agencies such as the Bureau of Land Management, the US Forest Service or the National Park Service. The US Army Corps of Engineers reviews projects affecting wetlands or navigable waters. Nuclear facilities must be licensed by the US Nuclear Regulatory Commission (NRC). The Bureau of Ocean Energy Management and the Bureau of Safety and Environmental Enforcement within the Department of the Interior are responsible for offshore oil and gas lease sales and offshore renewable energy development.

4 Grid connection policies

What are the policies with respect to connection of generation to the transmission grid?

FERC-jurisdictional transmission providers are required to provide interconnection service under the terms of an OATT. Generators have the right to request interconnection services separately from transmission services.

In response to complaints by generators that interconnection procedures were being used by some transmission providers in a discriminatory manner, FERC implemented rules to standardise agreements and procedures for generators and required FERC-jurisdictional transmission providers to interconnect generators to the grid in a non-discriminatory manner. Under the standard interconnection procedures, generators are required to pay the full cost of any interconnection facilities up front (from the generator to the point of interconnection) and network transmission facilities (beyond the point of interconnection) necessary to connect the generator with the transmission grid. The generator is reimbursed for the cost of any network transmission facilities through credits for future transmission service on the grid. ISOs and RTOs have the flexibility to propose changes to the standard interconnection agreement and procedures, as well as to the procedures for recovering interconnection costs. For example, ISOs and RTOs may seek authorisation to allocate the costs of network upgrades to the generator requesting the upgrades (in exchange for granting capacity rights on the transmission system). FERC does not regulate local distribution facilities, but has authority to regulate the rates, terms and conditions of any wholesale sales transaction using such a facility. See question 11 for further discussion.

To encourage development of new generation, FERC issued Order No. 807, easing the requirement for certain generator owners and operators to have an OATT on file with FERC for public utilities who are subject to those regulations solely because they own or operate Interconnection Customer Interconnection Facilities (ICIF), ie, those that own generator tie lines. Previously, an ICIF owner must have either had on file an OATT or received a case-by-case waiver of the OATT requirement, and also was obligated to provide interconnection service to other generators that sought to interconnect to the grid using its ICIF. To ease the regulatory burden on new generation developers, the new rule grants a blanket waiver of all OATT and other open access requirements to any public utility that is subject to those requirements solely because it owns, controls, or operates an ICIF, including entities that do not sell electricity. In addition, the rule provides a 'safe harbour' period for five years in which there would be a rebuttable presumption that the ICIF owner has definitive plans to use its capacity and therefore are not required to provide interconnection service to other generators seeking to interconnect generation in the same location during the safe harbour period.

5 Alternative energy sources

Does government policy or legislation encourage power generation based on alternative energy sources such as renewable energies or combined heat and power?

Yes. Legislation passed and signed into law by the president in 2009, the American Recovery and Reinvestment Act of 2009 (Recovery Act), contains provisions for direct spending, tax credits and loan guarantee programmes designed to promote development of renewable energy projects. The Recovery Act extended the production tax credit (PTC) on renewable energy systems, while also offering expansions on and alternatives for PTCs (<http://energy.gov/savings/renewable-electricity-production-tax-credit-ptc>). The PTC is available for most renewable energy systems for facilities that have commenced construction before 1 January 2017. In December 2015, the relevant laws were amended to further extend the PTC for wind facilities to include those for which construction begins before 1 January 2020, but this extension was accompanied by a phase-out of the PTC for wind facilities over a four-year period. Where construction of a wind facility begins prior to 1 January 2017, the full PTC is available. For wind facilities where construction is commenced after 2016 and before 2020, the PTC available is reduced by 20 per cent for facilities with construction beginning in 2017, by 40 per cent where construction is commenced in 2018, and by 60 per cent for facilities begun in 2019.

Solar facilities are eligible for an investment tax credit (ITC) in which, as an alternative to the PTC, a project developer may elect a grant equal to a percentage of the facility's tax basis, so long as the facility is depreciable and amortisable and placed into service before 1 January 2022. The ITC applies in the year in which the qualifying property is placed in service and is a credit equal to a percentage of the taxpayer's tax basis in certain qualifying investments. For solar facilities placed in service by 2020, the credit is 26 per cent, and 22 per cent for facilities placed in service by 2021. A solar facility for which construction commences before 1 January 2022 but which is placed in service after 31 December 2021 is eligible only for a 10 per cent ITC.

The DoE Office of Energy Efficiency and Renewable Energy (EERE) is the focal point for several alternative energy programmes, including the biomass programme, the geothermal technologies programme, the solar energies technologies programme, the hydrogen, fuel cells and infrastructure technologies programme, and the wind and hydropower technologies programme (www.eere.energy.gov). The EERE provides a variety of forms of financial assistance for the research and development of renewable energy, including grants, laboratory subcontracts, and cooperative research and development agreements (www1.eere.energy.gov/financing/types_assistance.html). Moreover, as of August 2017, 29 states plus the District of Columbia and three US Territories have adopted renewable portfolio standards that require electricity providers to obtain a minimum percentage of their power from renewable energy resources by a certain date, and eight others (and one US territory) have set voluntary goals for adopting renewable energy resources (<http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2014/11/Renewable-Portfolio-Standards.pdf>). As of March 2015, 20 of these states include combined heat and power (CHP)

and/or waste heat recovery as an eligible resource (https://www.epa.gov/sites/production/files/2015-07/documents/portfolio_standards_and_the_promotion_of_combined_heat_and_power.pdf).

Cogeneration and small power production purchase and sale requirements

EPAct 2005 amended the mandatory purchase and sale requirements of the Public Utility Regulatory Policies Act (PURPA). Historically, electric utilities were obligated to purchase or sell electric energy from or to a facility that is an existing qualifying cogeneration or small power production facility (QF). However, if the QF is selling in a market that meets certain criteria established by FERC, that purchase obligation may be terminated. In 2006 FERC issued Order No. 688, which permits the termination of the requirement that an electric utility enter into new contracts to sell energy to or purchase energy from a QF after the electric utility files for such relief from FERC, and FERC makes appropriate findings. Several utilities have successfully pursued relief under Order No. 688. These changes do not affect pre-existing contracts or obligations.

6 Climate change

What impact will government policy on climate change have on the types of resources that are used to meet electricity demand and on the cost and amount of power that is consumed?

Federal and state climate change policies promoting carbon-free energy sources are more likely to have an impact on the types of resource used to meet US electricity demand in the medium- or long-term time frame than in the short term. The US electric industry's reliance on fossil fuels (particularly coal) to meet rising energy demands is driven primarily by cost considerations: coal, for many years, has been a cheap and plentiful domestic fuel source. That dynamic is shifting, however, as the influx of low variable-cost renewable projects and the continued development of shale gas resources (and the resultant low natural gas prices) have narrowed the energy cost advantages of coal generation, particularly for older, less efficient coal units. Although recent federal and state legislative initiatives have provided down payments toward the creation of cost-competitive renewable energy technologies, the large-scale deployment of these technologies is still hampered by variability of resources such as wind, the need for additional backbone transmission capacity between regions, and the lack of storage capacity.

Other proposed state and federal legislation (for example, cap-and-trade schemes) and foreign policy initiatives could impose additional costs on electricity generators using carbon-rich fossil fuels. In general, legislative proposals and environmental regulations are likely to impose greater costs on the energy that is consumed. State or federal governments could subsidise renewable energy and carbon mitigation initiatives by surcharges on electricity generation or consumption. Compliance costs incurred by utilities arising from state or international cap-and-trade legislation, federal regulations, or state regulation of vehicular carbon emissions would be passed on through every transaction involving electricity.

The Environmental Protection Agency (EPA) is the chief US agency tasked with issuing regulations under the Clean Air Act (CAA) regarding pollutants and carbon dioxide emissions from power generation sources. For instance, new and existing coal-fired plants may be incentivised or required to have carbon capture and sequestration (CCS) capabilities. In 2011 the EPA issued the Cross-State Air Pollution Rule under the Clean Air Act that requires coal companies in 28 states to reduce emissions of sulphur dioxide and nitrogen dioxide by 73 per cent and 54 per cent, respectively, from 2005 levels by 2014. The rule was controversial, with many in the coal industry claiming that it will be cost-prohibitive to obtain and install the CCS technology necessary to meet the standard. As a result, the coal industry warns that coal generating facilities will be forced to prematurely shut down. In April 2014, the US Supreme Court upheld the EPA rule, affirming EPA's authority to regulate existing power plants for greenhouse gases so long as they are being regulated for other pollutants as well.

The issue of how to properly account for compliance costs of pollution reduction was at the heart of another recent US Supreme Court case. There, the US Supreme Court remanded an EPA rule setting limits on mercury and other toxic pollutants from power plants, ruling

that the EPA violated the CAA by failing to consider costs when deciding whether to set those emissions limits in the first place, although the EPA did eventually undertake a cost-benefit analysis when subsequently deciding how to regulate. As the EPA continues to issue new regulations related to pollution and climate change, whether and how to account for compliance costs will remain a key issue.

Perhaps the largest and most impactful regulatory initiative pertaining to climate change concerns the regulation of carbon dioxide emission limits from existing power plants. In June 2013, the US president ordered the EPA to create the first ever carbon emissions limit for existing power plants, stating that the US should lead the world in a 'coordinated assault' on climate change (www.whitehouse.gov/the-press-office/2013/06/25/remarks-president-climate-change). In August 2015, pursuant to the president's directive, the EPA promulgated its final regulations under part 111(d) of the CAA, which is known as the Clean Power Plan (CPP). In general, the CPP establishes broad carbon-dioxide emission targets for coal- and natural-gas fired power plants intended to cut CO₂ emissions by 32 per cent by 2030, leaving the states (excluding Vermont, Hawaii, Alaska, and the District of Columbia) to choose from a variety of methods – such as renewable energies, efficiency improvements, or participating in an emission credit trading programme – to develop a plan to meet individual targets. The CPP calls for states to submit their emissions reduction plan for EPA review by 2018 and to demonstrate initial compliance by 2022. A state must meet a final emissions goal starting in 2030.

However, following the 2016 US presidential election, the CPP faces an uncertain future under a new presidential administration that campaigned on rescinding it, as well as from court challenges initiated shortly after the EPA issued the CPP in October 2015. Since February 2016, the US Supreme Court has stayed implementation of the CPP while challengers litigate the Plan's merits at the US Court of Appeals for the DC Circuit. The lower court heard oral arguments in the case in September 2016. Recently, however, the DC Circuit granted a request from the EPA to delay issuing any ruling in the case while the EPA considers if it will issue a rule rescinding the CPP. However, any ruling either on the merits or remanding the case back to the EPA may be appealed to the US Supreme Court. Moreover, in March 2017, the president issued an Executive Order requiring the EPA to review the CPP so as to consider whether to 'suspend, revise, or rescind' it. Importantly, even if the EPA rescinds the CPP, the EPA has not proposed revoking its 2009 'endangerment finding' – a determination that greenhouse gases, including carbon dioxide, are a threat to human health – and as such, the EPA must regulate greenhouse gases under the statutory directive of the CAA.

Even without the CPP, the development of renewable resources is expected to continue. The increased integration of renewable resources into the electric grid, however, raises issues around grid reliability. In general, FERC and NERC are tasked with maintaining reliability for the Bulk Electric System. As generating capacity from coal-fired resources decreases, developing suitable replacement generation and transmission resources sufficient to maintain capacity and meet electricity demand, particularly during peak usage periods, could cause significant reliability problems. Moreover, as most renewable generation resources, such as wind and solar sources, are in remote locations, additional transmission infrastructure must be constructed. Energy storage resources may also be needed to ensure reliability, such that sufficient capacity can be deployed during times of peak usage, as generation of variable resources inherently fluctuate.

In addition, a number of utilities have closed or announced plans to shut down certain, mostly older, less efficient, coal power plants. Meanwhile, the US export of coal continues to decline, with exports falling for the fourth consecutive year in 2016 to 60.3 million short tons, which is almost 14 million short tons lower than in 2015 and less than half of the record volume of coal exported in 2012 (www.eia.gov/todayinenergy/detail.php?id=30332). However, despite this decrease, given the overall amount of US coal exports, some wonder if it makes sense to limit the domestic use of coal only to ship it elsewhere to be consumed.

7 Storage

Does the regulatory framework support electricity storage including research and development of storage solutions?

Most direct support for development of commercial energy storage resources has occurred at the state level. For instance, California

adopted in 2014 a mandate to require utilities to create 1.3 gigawatts of energy storage capacity by 2022. Federal legislation has primarily been focused on research and development of innovative storage technologies that are not yet ready for private investment. For instance, in 2007, Congress passed the America COMPETES Act, which established the Advanced Research Projects Agency within the DoE (ARPA-E) to fund research and development of new innovative technologies including storage. In addition, recently, legislation was introduced by several US senators to establish an income tax credit for businesses and home use of energy storage (www.heinrich.senate.gov/press-releases/heinrich-introduces-bipartisan-bill-to-create-tax-credit-for-energy-storage). In the CPP, EPA noted the potential for energy storage to assist with the integration of renewable resources into the grid, but did not include energy storage resources as a way to reach pollution reduction targets.

From a regulatory perspective, FERC, in recent years, has issued several rules that, while not specifically aimed at energy storage resources, accommodate and encourage participation of non-traditional resources, including energy storage resources, in the wholesale energy markets. For instance, in 2011, FERC issued Order No. 755, requiring RTOs and ISOs to implement a 'pay for performance' compensation structure for frequency regulation service. Though not specifically aimed at energy storage resources, the intention of Order No. 755 was to ensure that flexible resources were receiving adequate compensation in the wholesale electric markets. In 2013, FERC issued Order No. 784, requiring all public utility transmission providers to have in their OATT a statement that it will take into account the speed and accuracy of regulation resources, as well as amended its accounting regulations to improve the accounting for and reporting of transactions associated with energy storage resources. Other FERC orders since, such as those concerning small generator interconnection policies and frequency response, also are intended to ensure RTO and ISO rules do not discriminate against newer technologies. Most recently, in April 2016, FERC commenced an informational proceeding to examine 'whether barriers exist to the participation of electric storage resources in the capacity, energy, and ancillary service markets potentially leading to unjust and unreasonable wholesale rates' (www.ferc.gov/industries/electric/indus-act/rto/A-4-Presentation.pdf). In some RTO/ISO markets, steps have been taken to revise market rules to improve the ability of storage resources to participate; for example, recently FERC approved changes to the California Independent System Operator Inc. (CAISO) tariff allow market participants to submit state of charge as a bidding parameter, allowing storage providers flexibility in their offers. However, in an order issued in February 2017, FERC affirmed that market rules in MISO do not accommodate the unique physical and operational characteristics of energy storage resources. Other RTO/ISO markets, namely PJM and ISO New England, have identified disparities in the barriers to entry for storage resources (eg, penalties that are disproportionate to those for traditional resources due to technological characteristics).

8 Government policy

Does government policy encourage or discourage development of new nuclear power plants? How?

Historically, government policy has encouraged the development of new nuclear power plants. In 2010 the DoE launched a nuclear power programme in an attempt to jump-start the proposed construction of new nuclear plants by co-funding with the nuclear industry efforts to evaluate and bring new technologies to market. This included utilising a new NRC licensing process intended to streamline NRC approval of such projects. The DoE also put in place a Generation IV Nuclear Energy Systems initiative, which aims to develop new plant designs that minimise waste and are safer and more proliferation-resistant than today's nuclear plant designs (www.nuclear.energy.gov/genIV/neGenIV1.html). EPAct 2005 also encouraged the construction of new nuclear plants by establishing a production tax credit. Under that plan, operators of the first 6,000MW of capacity from new nuclear power plants that are placed in service before 2021 will receive a production tax credit of 1.8 cents per kWh during the first eight years of the plant's operation.

The US DoE Loan Guarantee Program was designed to promote development of the nuclear power industry through loan guarantees for the construction of new nuclear power plants in the US. These loan guarantees help developers of new nuclear plants in the US to obtain

favourable financing terms, which is of critical importance when constructing plants with a projected price tag in the range of US\$7 to US\$10 billion per unit. Indeed, many companies that are considering building new plants have publicly stated that, absent a federal loan guarantee, they will not be able to finance and build their proposed projects. Seventeen companies building 21 nuclear units have applied for the guarantees. To date, a conditional loan guarantee of US\$8.33 billion has been granted to the developers of two nuclear units in Georgia. The DoE's Loan Guarantee Program also has earmarked an additional US\$4 billion for the construction of new uranium enrichment facilities in the US. Access to additional supplies of enriched uranium fuel will be critical to support the development of new nuclear plants in the US. In May 2010, the DoE announced that it would grant a conditional loan guarantee of US\$2 billion for the construction of a uranium enrichment plant in Idaho. In December 2014, the DoE Loan Guarantee Program issued a solicitation for an additional US\$12.5 billion in available loan guarantees to support the construction of new large or small nuclear reactors, or provide upgrades to existing facilities, including US\$2 billion set aside for uranium conversion or enrichment projects.

Since the Fukushima nuclear reactor crisis in March 2011, however, development of nuclear power plants in the US has slowed, particularly with respect to licensing of new power plants or the relicensing of existing plants. Following an August 2012 decision by the US Court of Appeals for the DC Circuit ruling that the NRC did not sufficiently examine proper storage of nuclear waste in its regulations, the NRC suspended new licensing and licensing renewal for nuclear plants until a full reassessment of nuclear waste storage was completed. In September 2014, the NRC issued its new rule and resumed licensing decisions. The NRC's new rule was upheld in a June 2016 decision by the US Court of Appeals for the DC Circuit. Additionally, in August 2013, the US Court of Appeals for the DC Circuit ordered the NRC to make a key decision regarding a proposed nuclear waste disposal site in Yucca Valley, NV, stating that the NRC did not have the legal authority to continue to delay making a decision regarding the licensing of the project (www.cnn.com/2013/08/13/us/nevada-yucca-mountain-order). That process remains ongoing, with DoE and NRC working to develop an Environmental Impact Statement. In August 2017, the NRC voted 2-1 to proceed with the 'information-gathering stage' of Yucca Mountain, enabling DoE to move forward on the licensing process. Whether and when this site becomes operational impacts the licensing and relicensing of nuclear power plants, as those decisions may require a permanent storage and disposal site for nuclear waste.

A new hurdle facing nuclear power is the relative low price of other energy resources, such as natural gas and subsidisation of renewable resources, which combine to reduce the economic viability of nuclear generation. In May 2014, for example, several nuclear power facilities failed to be selected to sell energy into a capacity market run by PJM Interconnection, Inc (PJM) because the price offered in the capacity market was insufficient to cover the costs of the nuclear facilities. As a result, the nuclear facilities must either cease production or find private purchasers and some utilities have announced that they will close certain nuclear plants. For instance, Exelon Corporation, operator of the largest nuclear fleet in the US, announced it was permanently closing two facilities in Illinois, citing the fact that the facilities had lost \$800 million over the last seven years (www.nytimes.com/2016/06/03/business/exelon-to-close-2-nuclear-plants-in-illinois.html?_r=0). It remains to be seen, however, whether changes to capacity auctions that seek to reward high-performing generating units, such as those planned for the PJM and ISO New England markets, will benefit nuclear power generators.

In July 2016, New York adopted a proposal that would allow nuclear facilities in the state to earn Zero Emission Credits (ZECs) as part of New York's renewable energy standard. The ZECs would be calculated using a formula that uses the expected power costs in the region and the federal government's calculation of the social price on carbon used by federal agencies use in rulemaking. Utilities in the state would then be required to purchase a pro rata share of ZECs, thus providing a value for the emissions-free energy produced by nuclear facilities. The result of this proposal was immediate – a New York nuclear facility that had been slated to close was purchased by a buyer that agreed to keep the facility open. Illinois passed legislation providing for similar credits in 2016. To date, legal challenges to the credits have failed and several additional states, including Ohio, Pennsylvania, New Jersey, and Connecticut, are considering similar initiatives.

Regulation of electricity utilities – transmission

9 Authorisations to construct and operate transmission networks

What authorisations are required to construct and operate transmission networks?

Construction

Construction of transmission facilities is primarily a state-regulated function, but federal authorities have jurisdiction over siting on federal lands, and multi-state projects may require the authorisation of several states. Historically, this fragmented system for siting new power lines, in addition to other factors such as regulatory uncertainty on the state and federal levels associated with transmission cost recovery, has been a significant barrier to the development of new transmission in the US. EPAct 2005 provides tools to facilitate new construction and improvements to the existing transmission infrastructure.

EPAct 2005 directed the DoE to conduct a nationwide study of electric transmission congestion and identify areas in which transmission capacity constraints or congestion adversely affects consumers and designate such areas as national interest electric transmission corridors (NIETCs). The most recent draft nationwide electric transmission congestion study was published in August, 2014, but it did not propose nor designate any new NIETCs. EPAct 2005 gave FERC supplemental permitting authority to ensure timely construction of transmission facilities to remedy transmission congestion in those corridors. The DoE initially designated two such corridors in 2007, but the US Court of Appeals for the Ninth Circuit vacated and remanded the designations to the DoE for further proceedings in February 2011 (www.ca9.uscourts.gov/datastore/opinions/2011/02/01/08-71074.pdf). DoE announced that it will collaborate with FERC to prepare drafts of transmission congestion studies and environmental analyses for proposed NIETCs in the future (energy.gov/articles/doe-and-ferc-joint-public-statement-back-stop-siting). In addition, the US Court of Appeals for the Fourth Circuit limited FERC's supplemental backstop siting authority, ruling that it applied only in situations where a state refuses to act on a permit application or imposes uneconomic conditions, but determined FERC lacked the authority to overrule a state denial of a permit application. Thus, a state may be able to circumvent FERC backstop siting authority by properly denying an application (www.ferc.gov/legal/court-cases/opinions/2009/07_1651.P_opinion.pdf).

EPAct 2005 also provides a mechanism for the private use of the eminent domain power of the US government, where necessary, to obtain property for transmission infrastructure projects. In addition, EPAct 2005 requires that the federal government identify rights of way across federal lands that can be made available for siting electric transmission.

On 21 July 2011, FERC issued Order No. 1000, a final rule on Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities (www.ferc.gov/whats-new/comm-meet/2011/072111/E-6.pdf). The goal of Order No. 1000 is to ensure more reliable transmission service at just and reasonable rates. Order No. 1000 lays out certain requirements for coordinating transmission planning and allocating transmission costs so that transmission planners seek the most efficient and cost-effective way to meet needs in their respective regions and between regions. The implementation of Order No. 1000 is left largely to public utility transmission planners, which were directed to submit compliance filings in October 2012. The process of review, clarification, and refiling is largely still underway for most transmission planners and as a result, the impact of the order is still evolving. In 2016, FERC convened a technical conference to assess the progress of implementing Order No. 1000.

Operation

FERC issued a series of orders, beginning with Order No. 890, which were intended to eliminate the broad discretion that transmission providers had in calculating available transfer capacity (ATC), increasing non-discriminatory access to the grid and ensuring that customers are treated fairly in seeking alternative power supplies. Since Order No. 890-A, transmission providers have implemented new service options for long-term firm point-to-point customers and adopted modifications to other services. Instead of denying a long-term request for point-to-point service because as little as one hour of service is unavailable

in the course of a year, transmission providers are now required to consider their ability to offer a modified form of planning redispatch or a new conditional firm option to accommodate the request. This increases opportunities to utilise transmission efficiently by eliminating artificial barriers to the use of the grid. This standardisation reduces the potential for undue discrimination, increases transparency, and reduces confusion in the industry that resulted from the prior lack of consistency.

Also, FERC regulations require the posting of ATC values associated with a particular path, not available flowgate capacity values associated with a flowgate. With respect to energy and generation imbalance charges, a transmission provider must post the availability of generator imbalance service and seek imbalance service from other sources in a manner that is reasonable in light of the transmission provider's operations and the needs of its imbalance customers. FERC also limited rollover rights to contracts with a minimum term of five years. In Order No. 890-B, FERC reiterated that a power purchase agreement must meet all of the requirements for designation as a network resource in order to be designated by the network customer or transmission provider's merchant functions.

10 Eligibility to obtain transmission services

Who is eligible to obtain transmission services and what requirements must be met to obtain access?

See questions 3 and 11.

11 Government transmission policy

Are there any government measures to encourage or otherwise require the expansion of the transmission grid?

Pursuant to EPCRA 2005, FERC has established incentive-based rate treatments to encourage investment in and expansion of the US's aging transmission infrastructure. FERC Order No. 679, issued in 2006, includes a number of key provisions to promote transmission investment, including:

- incentive rates of return on equity for new investment by public utilities (both traditional utilities and stand-alone transmission companies);
- a higher rate of return on equity for utilities that join or continue to be members of transmission organisations (for example, RTOs and ISOs); and
- various advantageous accounting methods, including:
 - full recovery of prudently incurred construction work in progress, pre-operation costs, and costs of abandoned facilities;
 - use of hypothetical capital structures for ratemaking purposes;
 - accumulated deferred income taxes for stand-alone transmission companies;
 - adjustments to book value for stand-alone transmission company sales or purchases;
 - accelerated depreciation; and
 - deferred cost recovery for utilities with retail rate freezes.

In Order No. 679 and Order No. 679-A, FERC extended incentive rate treatments to all utilities joining ISOs or RTOs, irrespective of the date they join. However, this incentive does not apply to the transmission rate base that has already been built, as the incentive's purpose is to attract new investment in transmission.

12 Rates and terms for transmission services

Who determines the rates and terms for the provision of transmission services and what legal standard does that entity apply?

FERC has jurisdiction over unbundled transmission services (including transmission services provided over low-voltage facilities) provided by public utilities to wholesale customers or to retail customers with direct access. The states have jurisdiction over bundled retail service (namely, a combined generation and delivery product sold to retail customers) where direct access is not available. Court decisions and the interconnectivity of the transmission grid in the continental US have led to an expansive view of what constitutes transmission service in interstate commerce in all areas of the US except Alaska, Hawaii and

ERCOT. The FPA, however, reserves to the states jurisdiction over the local distribution of electricity.

FERC-jurisdictional utilities offering transmission services must do so under FERC-approved tariffs. Order No. 888 required jurisdictional electric utilities to submit pro forma OATTs that functionally unbundled transmission operations and services, and set forth rates for transmission and ancillary services. In 2007, FERC issued Order No. 890, which modified the pro forma OATT to better remedy undue discrimination by, among other things, providing greater transparency and consistency in the calculation of available transmission capacity, and requiring coordinated open transmission planning between regions.

Transmission providers are also required to maintain an open-access, same-time information system (OASIS) to publish information with respect to their transmission systems, including services, rates, and available transmission capacity as well as business rules, practices, and standards that relate to transmission services provided under the pro forma OATT.

Finally, the FPA empowers FERC to review rates and terms of transmission services to ensure that they are just and reasonable and not unduly discriminatory or preferential. Generally, tariffs and contracts for transmission services must be filed with FERC before service commences to allow an opportunity for Commission review, as well as public notice and comment. Because transmission services are a natural monopoly, Order No. 888 envisions that FERC will determine whether a particular tariff is just and reasonable via a traditional cost-of-service ratemaking inquiry that balances ratepayers and the utilities' financial interests to realise a rate within the zone of reasonableness. Tariffs can be challenged for being unjust, unreasonable, unlawful, or discriminatory.

EPCRA 2005 authorises FERC to require transmission providers not subject to its jurisdiction to provide open access to their transmission system at terms and conditions comparable to those the unregulated entity provides to itself. An unregulated entity may be exempt from this requirement if it sells less than 4 million MWh of electricity annually or if it does not own or operate the transmission facilities needed to operate an interconnected system. However, many of these regulated entities already provide open access based on reciprocity agreements with transmission providers.

13 Entities responsible for grid reliability

Which entities are responsible for the reliability of the transmission grid and what are their powers and responsibilities?

Since 1968, NERC has operated as the primary entity responsible for assuring the reliability of the grid. NERC was founded by the electric utility industry to develop and promote rules and protocols to enhance the reliability of the bulk power electric system in North America through a voluntary, self-regulatory process. EPCRA 2005 added section 215 to the FPA, which provides for the creation of an ERO to be the organisation responsible for establishing and enforcing reliability standards for the bulk power system in North America. In 2006, FERC certified NERC as the ERO. The ERO oversees an enforcement programme that includes compliance audit monitoring and reliability readiness review.

In 2007, FERC strengthened the reliability regime by approving mandatory reliability standards for the bulk electric system proposed by the ERO, approving delegation agreements between the ERO and eight regional entities and creating a new internal Office of Electric Reliability. The mandatory reliability standards apply to entities designated by NERC as users, owners, and operators of the bulk electric system. Both monetary and non-monetary penalties may be imposed for violations of these standards. In July 2014, a revised definition of the bulk electric system went into effect. The new definition expands the scope of facilities that form part of the bulk electric system to facilities operated at or above 100kV, thereby covering entities that own or control these facilities with certain limited exceptions. However, in March 2015, FERC gave approval for NERC to develop a new risk-based assessment and registration initiative intended to reduce regulatory burden and align compliance obligations with issues that pose a greater potential impact to reliability. Additional proposed NERC reliability initiatives include developing standards to minimise potential

disruption from geomagnetic disturbance events as well as to create cyber security standards to protect operational infrastructure.

In addition, the replacement of coal-fired, nuclear, or other conventional generation resources with natural gas-fired or variable energy resources stands to impact grid reliability. As such, grid operators, such as RTO and ISOs, will likely need to develop approaches to effectively manage capacity during hours of peak demand, as well as manage overgeneration during off-peak hours. For instance, PJM, the RTO tasked with administering the transmission grid and energy and capacity markets for the Mid-Atlantic region, recently implemented a revised auction model for capacity called the Capacity Performance Resource model, intended to improve overall reliability. The new model was created after the 'Polar Vortex' in the winter of 2014 in which natural gas shortages resulted in the failure of multiple generating units. The Capacity Performance Resources structure contains bonus and penalty payments that are structured to provide greater assurance that energy and reserves will be available during instances of peak demand created as a result of emergency operating conditions. In addition, technological developments, such as improvements to grid forecasting and the development of smart grid technology, will likely assist grid operators in providing the flexibility needed to address the challenges presented by variable resources and decreased generation capacity from more traditional resources.

Regulation of electricity utilities – distribution

14 Authorisation to construct and operate distribution networks

What authorisations are required to construct and operate distribution networks?

Similar to generation siting, distribution is regulated primarily at the state level.

15 Access to the distribution grid

Who is eligible to obtain access to the distribution network and what requirements must be met to obtain access?

Specific procedures for connection to the distribution grid vary from state to state. However, state laws generally provide that distributors cannot deny service that is in the public interest.

16 Government distribution network policy

Are there any governmental measures to encourage or otherwise require the expansion of the distribution network?

Specific governmental measures to encourage or require the expansion of the distribution network vary by state.

17 Rates and terms for distribution services

Who determines the rates or terms for the provision of distribution services and what legal standard does that entity apply?

FERC has jurisdiction over transmission of electric energy in interstate commerce by public utilities, regardless of the voltage level of the delivery facilities. Section 201 of the FPA reserves regulatory authority over all facilities used in the local distribution of electricity to the state utility commissions. FERC in Order No. 888 promulgated a seven-factor functional test for the case-by-case determination of the jurisdictional separation between FERC-jurisdictional interstate transmission service (including service over low-voltage distribution lines) and state-jurisdictional local distribution service, and FERC generally defers to the states' application of this test. The functional test looks at the proximity of the facilities to retail customers; whether the facilities are radial in character; whether power flows into or out of the facilities; whether power entering the facilities is transported to another market; whether power is consumed in a defined area; whether the facilities include meters to measure power flow into the facilities; and the voltage of the power flowing through the facilities.

FERC determines the rates, terms, and conditions of transmission service in interstate commerce (including service over low-voltage facilities) under the FPA's just and reasonable standard based on cost-of-service principles. Where retail customers buy electricity from a wholesale provider, and the electricity is then delivered over

distribution facilities by the load-serving entity, the state determines the rates, terms, and conditions of such distribution service. Because distribution services are considered to be a natural monopoly, state public utility commissions generally review tariffs for distribution services proposed by the utilities via a traditional cost-of-service ratemaking inquiry. State utility commissions generally approve the tariffs submitted by utilities if they are just and reasonable. The tariffs offered by various utilities will typically vary, even within a state.

Regulation of electricity utilities – sales of power

18 Approval to sell power

What authorisations are required for the sale of power to customers and which authorities grant such approvals?

FERC has jurisdiction over sales of power at wholesale in interstate commerce other than sales by federal or state governmental bodies and rural cooperatives that are indebted to the Rural Utilities Service (RUS) or cooperatives that sell less than 4 million MWh of electricity per year. Retail sales of electricity are regulated at the state level, with variation from state to state.

19 Power sales tariffs

Is there any tariff or other regulation regarding power sales?

Tariffs and contracts pursuant to which public utilities sell power generally must be filed with FERC (wholesale sales) or the applicable state PUC (retail sales) before service commences to allow the applicable regulatory entity an opportunity for review, as well as for public notice and comment. Under the FPA, FERC has jurisdiction over wholesale rate-making and is charged with assuring the rates, terms, and conditions pursuant to which public utilities offer wholesale power sales are 'just and reasonable'.

FERC permits wholesale sales of power at market-based rates if the seller demonstrates a lack of market power by passing a series of horizontal and vertical market screens. FERC has commenced investigations to determine whether utilities should retain their authority to sell power at market-based rates after finding that certain utilities did not pass at least one of the screening tests. In response, several utilities voluntarily agreed to implement cost-based rate caps in the areas where FERC found a presumption of market power and revoked the market-based rate authority of a utility.

Sellers of wholesale power that have applied for and received FERC approval to sell power pursuant to a market-based rate tariff can thereafter enter into new power sales contracts and transactions without filing the contracts before commencing service. Instead, such sellers file quarterly reports of their power sales contracts and transactions under their market-based rate tariff. In the absence of a showing of a lack of market power, FERC regulates the rates for wholesale sales under cost-of-service rate-making principles, and each new contract must be filed with FERC before the commencement of service.

Unlike the situation with respect to transmission tariffs, FERC does not generally dictate specific non-price terms and conditions in wholesale power sales contracts but does dictate specific non-price terms and conditions in the market-based rate tariff. The regulatory structure allows complaints to be filed challenging contracts or reported power sales transactions as being unjust, unreasonable, unlawful or discriminatory.

Retail sales are regulated at state level, with significant variation from state to state. In the absence of a competitive retail market, retail rates are typically established based on cost of service.

20 Rates for wholesale of power

Who determines the rates for sales of wholesale power and what standard does that entity apply?

Section 201 of the FPA grants FERC exclusive regulatory authority over the wholesale sale of electricity in interstate commerce by jurisdictional entities. The state utility commissions retain regulatory authority over wholesale sales of electricity by purely intrastate wholesale sales (in practice, this class is limited to wholesale sales in Alaska, Hawaii and ERCOT), as well as wholesale sales by non-jurisdictional entities such as rural electric cooperatives, municipal utilities, and state- or federally created utilities.

FERC's exclusive regulatory authority was reaffirmed in a recent decision by the US Supreme Court that invalidated a state incentive programme that provided a guaranteed income to new natural gas-fired generating facilities to ensure the facility would clear the wholesale capacity auction operated by the RTO. A unanimous US Supreme Court struck down the programme, finding that subsidy artificially suppressed wholesale power prices, and therefore infringed on FERC's exclusive authority to regulate wholesale sales of electricity in interstate commerce.

The FPA grants FERC authority over all jurisdictional wholesale sales of electricity to ensure that wholesale rates are just, reasonable and not unduly discriminatory or preferential. Although traditionally FERC had employed a cost-of-service ratemaking inquiry when reviewing wholesale rates to realise this statutory mandate, FERC has also allowed the market to determine wholesale power rates where it has found that the seller and its affiliates lack or have mitigated vertical or horizontal market power, and have adequately restricted affiliate transactions with captive customers. Once FERC approves a jurisdictional entity's generic market tariff, the jurisdictional entity is free to negotiate with other parties in the marketplace over the specific rate charged for the wholesale sale without having to seek FERC approval of the agreement before commencing service.

21 Public service obligations

To what extent are electricity utilities that sell power subject to public service obligations?

At the retail level, electric utilities have traditionally operated under an obligation to serve. In exchange for what is generally an exclusive service territory and an opportunity to recover prudently incurred expenses through cost-based rates, utilities are obliged to provide service to all customers in that service territory, as well as to plan adequately for the future needs of customers. In states that adopt retail competition, certain electric utilities may still retain an obligation to provide service to customers who do not select a competitive supplier.

FERC has recognised that wholesale electricity sales are generally governed by private contract, rather than by regulatory order or an express obligation to serve.

Regulatory authorities

22 Policy setting

Which authorities determine regulatory policy with respect to the electricity sector?

A number of governmental agencies are involved in different aspects of the regulatory policies governing electricity. At the federal level, Congress ultimately determines the direction of national energy policy through legislation, but it delegates broad authority to implement legislative mandates to FERC, the Department of Energy, and other administrative agencies. At the state level, electric utilities are regulated by PUCs.

23 Scope of authority

What is the scope of each regulator's authority?

FERC has authority to regulate sales of wholesale power and transmission in interstate commerce and to grant and administer licences for hydroelectric plants on navigable waters. Under the Public Utility Holding Company Act of 2005 (PUHCA 2005), FERC also has authority to grant exempt wholesale generator (EWG) status and foreign utility company (FUCO) status. FERC exercises authority under PURPA with respect to qualifying small power production facilities and cogeneration facilities (QFs).

FERC has jurisdiction over the disposition of assets subject to its jurisdiction, including through mergers, asset divestitures, corporate reorganisations and other transactions in which there is a change in the control of jurisdictional assets. FERC also has oversight authority with respect to the issuance of securities (except if regulated by a state) and interlocks among the officers and directors of public utilities and financial institutions, or the utility's suppliers of electrical equipment. Public utilities under FERC's jurisdiction are subject to various requirements with respect to accounting and record retention and are required to satisfy various reporting requirements.

Under PUHCA 2005, FERC has increased oversight over, and access to, the books and records of public utility holding companies and their subsidiaries and affiliates to the extent that such books and records pertain to FERC-jurisdictional rates or charges. Any service company in a holding company system providing non-power goods and services to an affiliated FERC-jurisdictional public utility or natural gas company must file annual reports disclosing detailed information about their businesses. Public utility holding companies may seek exemptions and waivers from these regulatory requirements. However, an automatic exemption from all of the requirements is available to companies that are holding companies solely with respect to ownership of EWGs, QFs or FUCOs. In addition, single-state holding companies are entitled to a waiver from some, but not all, of the requirements but must seek the waiver from FERC.

The NRC licenses the construction and operation of nuclear power plants and other nuclear facilities to ensure the protection of public health and safety. The Atomic Energy Act (AEA) governs the use of nuclear materials by both military and civilian entities, requires that all nuclear facilities be licensed, and establishes compensation for, and limits damages arising from, nuclear accidents. The NRC has developed detailed regulations and guidelines concerning all aspects of the operations of a nuclear power plant.

State PUCs regulate terms and rates for retail sales and delivery of electricity. PUCs are charged with ensuring that the public has access to safe, reliable utility service at reasonable rates and, thus, also have authority over at least some aspects of the organisation and finances of public utilities. Many PUCs also have authority to make siting decisions for transmission lines and generation facilities. However, in other states, siting decisions are delegated to other agencies.

Many local governments operate municipal utilities to provide electric service to their local communities. While the majority of municipal utilities serve smaller communities, several large cities, such as Los Angeles, San Antonio, Seattle and Orlando, operate publicly owned electric utilities. City councils and boards of elected or appointed officials generally govern municipal utilities.

The RUS promotes electrification of rural America by providing financing to local cooperatives. Electric cooperatives are governed by their member customers through an elected board of directors. Cooperative boards set rates as well as determine the types of services available and other policies. PUCs regulate some aspects of cooperatives' activities in approximately 20 of the states in which cooperatives operate (The Regulatory Assistance Project, *Electricity Regulation in the US: A Guide*, page 24 (March 2011)). Rural cooperatives with loans outstanding from the RUS are also obliged to comply with various loan covenants and regulations that affect their operations. The TVA, formed in 1933 as a wholly owned corporation of the US government, generates and transmits power in seven south-eastern states. Under the Consolidated Appropriations Act of 2005, TVA is governed by a nine-member, part-time board, appointed by the president and confirmed by the Senate to serve staggered five-year terms (www.tva.com/abouttva/board/faq.htm).

The four federal power marketing administrations (PMAs) (the Bonneville, Southeastern, Southwestern and Western Area Power Administrations – the Alaska Power Administration was privatised in 1998) operate as agencies of the DoE. The PMAs do not own or operate generating facilities but market the power produced by federally owned hydro-facilities. Administrators of the PMAs have authority to set rates and must certify that rates are 'consistent with applicable law' and 'the lowest possible rate to customers consistent with sound business principles'.

24 Establishment of regulators

How is each regulator established and to what extent is it considered to be independent of the regulated business and of governmental officials?

FERC and NRC are each authorised to have five commissioners. The president nominates and Congress confirms commissioners for FERC and the NRC for staggered five-year terms. The president also appoints one commissioner to serve as chair of each commission. No more than three commissioners may belong to a single political party. Furthermore, FERC and NRC decisions are not subject to review by the president, Congress, the DoE or other agencies.

State PUCs vary in size, but generally have between three and seven commissioners. It is common to limit the number of commissioners who may be from a single political party. In most states, the governor appoints commissioners, with approval by the upper house of the state legislature, for staggered five- or six-year terms. In some states, commissioners are elected. The governor typically designates one commissioner to serve as chair of the commission, although in some states the commissioners select the chair. State commissioners are generally subject to restrictions similar to those of their federal counterparts with respect to employment, investments and ex parte communications.

25 Challenge and appeal of decisions

To what extent can decisions of the regulator be challenged or appealed, and to whom? What are the grounds and procedures for appeal?

Decisions by FERC can be challenged on both substantive and procedural grounds. Within 30 days of a final decision or order by FERC, a party to the proceeding (either the applicant or an intervenor) may file a request for rehearing with FERC. Within 60 days of issuance of the decision on rehearing, an aggrieved party may request a review of FERC decisions by a US Court of Appeals. In general, the Court of Appeals will not consider any objections not raised in the request for rehearing to FERC. US Supreme Court review is possible upon a showing of compelling cause (for example, a conflict between decisions of two or more circuits of the US Court of Appeals or often where a major rule issued by a federal agency is invalidated by a Court of Appeals). PUC decisions can also be challenged through judicial appeals in state courts, or if the decision violates federal law, a cause of action could be brought in federal court (subject to various limitations).

Acquisition and merger control – competition

26 Responsible bodies

Which bodies have the authority to approve or block mergers or other changes in control over businesses in the sector or acquisition of utility assets?

FERC approval is required before the disposition of any facilities subject to its jurisdiction under the FPA of a value in excess of US\$10 million, as well as direct or indirect mergers or consolidations of public utility facilities with those of any other person regardless of the value of the facilities. Facilities under FERC's jurisdiction under section 203 of the FPA include facilities used for transmission or sale of electric power in interstate commerce (including 'paper facilities' such as contracts for wholesale power sales) as well as generation assets used for wholesale sales. FERC review is required if there is a change in 'control' of jurisdictional facilities. In general, FERC will presume that a transfer of less than 10 per cent of a public utility's holdings is not a transfer of control.

Any holding company that owns an entity selling power at wholesale or transmitting electric energy must obtain FERC authorisation to acquire securities valued in excess of US\$10 million in any entity that sells at wholesale or transmits electric energy or to otherwise merge with any such entity with a value in excess of US\$10 million. In addition, the transfer of specific assets or licences may necessitate additional reviews. For example, the transfer of a nuclear generating facility requires NRC approval.

FERC has established blanket authorisations for a variety of transactions. For example, transactions in which a holding company that includes a transmitting utility or an electric utility seeks to acquire or take any security of a transmitting utility or company that owns, operates or controls only facilities used solely for transmission in intrastate commerce or sales of electric energy in intrastate commerce, or facilities used solely for local distribution or sales of electricity at retail, are automatically authorised. Transactions involving internal corporate reorganisations that do not present cross-subsidisation issues or involve a traditional public utility with captive customers or that owns transmission assets are also automatically authorised. Acquisitions by holding companies of non-voting securities do not require prior FERC authorisation. Acquisitions by holding companies of voting securities do not require prior FERC authorisation if, after the acquisition, the acquiring holding company will directly or indirectly own less than 10 per cent of the outstanding voting securities. Moreover, acquisitions by

holding companies of foreign utility companies do not require FERC authorisation except where the holding company or its affiliates has captive customers in the US, in which case the holding company must make certain representations that the transaction will not adversely affect such captive customers.

The Federal Trade Commission (FTC) and the Antitrust Division of the Department of Justice (DoJ) (collectively, the antitrust agencies) are the primary agencies with authority to enforce US antitrust and fair trade practice laws. The antitrust agencies can review the antitrust implications of proposed mergers and certain acquisitions of assets or securities in the electricity sector under the Hart-Scott-Rodino Antitrust Improvements Act of 1976 (HSR Act). Their authority is not specific to any one industry, but they, in addition to FERC and the states, may challenge in court anti-competitive practices in the electricity sector. The antitrust agencies' authority comes from laws including the HSR Act, the Federal Trade Commission Act (FTCA), the Clayton Act and the Sherman Act.

Finally, individual state regulatory bodies often must approve an acquisition or divestiture of utility companies or assets in that state, pursuant to state law. The procedures and standards for that review vary from one state to another.

27 Review of transfers of control

What criteria and procedures apply with respect to the review of mergers, acquisitions and other transfers of control? How long does it typically take to obtain a decision approving or blocking the transaction?

In considering an application to merge, acquire or transfer control of assets under section 203 of the FPA, FERC must determine whether the proposed transaction is in the public interest. As provided in FERC's merger policy statement in Order No. 592, such determination requires an evaluation of the proposal's effect on competition, rates and regulation. FERC must also consider whether proposed acquisitions will result in cross-subsidisation of any non-utility company in the same holding company system or in any pledge of utility assets for the benefit of any company in the same holding company system. FERC may approve an acquisition resulting in such cross-subsidisation or pledge of utility assets only if FERC determines that such cross-subsidisation or pledge will be consistent with the public interest.

With respect to assessing a proposed transaction's impact on competition under section 203 of the FPA, FERC's merger policy statement generally requires that applicants provide it with a competitive screen analysis (horizontal or vertical, as appropriate) showing the effect of the proposed disposition on relevant products in relevant geographical markets. The competitive screen analysis must:

- identify the relevant products (such as economic capacity and available economic capacity) and the geographical markets in which the competitive effects of the acquisition can be analysed;
- determine the market shares of all participating firms and the degree of concentration in the market, both before and after the proposed acquisition; and
- identify the market characteristics that will influence the ability of the combining entities to adversely affect competition, such as barriers to entry into the relevant market by other firms.

Market power is measured in part using the Herfindahl-Hirschman Index (HHI) measure of market concentration. The current DoJ and FTC guidelines have higher HHI thresholds than FERC for determining market concentration, making it less likely for a particular market to be deemed 'moderately concentrated' or 'highly concentrated' based on HHI alone. However, FERC's appendix A horizontal electric utility merger analysis does not follow the DoJ and FTC guidelines, but instead uses a more-stringent standard to measure market concentration.

FERC evaluates both the magnitude of increases in market power and overall post-transaction concentrations of market power to identify those transactions that are likely to have an adverse impact on competition. Applicants, however, are allowed to identify in their analysis other factors that may help to negate the presumption, such as benefits that the proposed acquisition will bring.

FERC will provide expedited consideration of completed applications for approval of transactions that are not contested, do not involve mergers and are consistent with FERC precedent, as well as uncontested

transactions involving a disposition of only transmission facilities under the functional control of a FERC-approved RTO or ISO; transactions that do not require a competitive screen analysis; and internal corporate reorganisations that do not present cross-subsidisation issues. For transactions that do not qualify for such expedited action, FERC is required to act within 180 days after the filing of an application, unless FERC determines there is good cause for requiring additional time, in which case the time for action may be extended up to 180 days. For example, FERC might extend the time frame for action if it finds that an evidentiary hearing is needed to determine whether the transaction is in the public interest.

The antitrust agencies may review the antitrust implications of mergers and certain acquisitions of assets or securities before those transactions are consummated under the HSR Act. The FTC promulgated a set of detailed rules that govern the pre-merger notification that must be filed in connection with such a transaction. A transaction subject to the HSR Act may not close before the expiry of the applicable waiting period, which is initially 30 days. If the antitrust agency decides to open a second-phase investigation, the waiting period will be extended until the 30th day following substantial compliance with a second request. If the reviewing antitrust agency determines that the transaction may harm competition in a relevant market, it may seek a preliminary injunction in a federal court, which would bar the consummation of the merger until the court (in a DoJ action) or the FTC (in an FTC action) has an opportunity to decide whether to seek a permanent injunction following a full trial. Such a preliminary injunction does not issue automatically; in deciding whether to preliminarily enjoin a merger, the courts give heavy consideration to whether the antitrust agency will eventually be able to prove its case at trial.

If the reviewing antitrust agency determines that the transaction may harm competition in a relevant market, such issues must be resolved before the transaction can proceed. In the electric sector, FERC (not the antitrust agencies) generally takes the lead in addressing any anti-competitive issues presented by a proposed transaction. Under the HSR Act, however, merging entities in such a situation often enter into a consent order with an antitrust agency under which the acquiring company agrees to divest a portion of its existing assets or of the assets it will be acquiring.

Finally, individual state regulatory bodies often must approve an acquisition or divestiture of utility companies or assets in that state, pursuant to state law. The procedures and standards for that review vary from one state to another.

28 Prevention and prosecution of anti-competitive practices

Which authorities have the power to prevent or prosecute anti-competitive or manipulative practices in the electricity sector?

The federal agencies that are primarily concerned with anti-competitive practices in the wholesale electricity sector are FTC, DoJ, FERC and the Commodity Futures Trading Commission (CFTC). State utility commissions and attorneys general ordinarily, but not exclusively, focus on such practices in the retail electric sector.

29 Determination of anti-competitive conduct

What substantive standards are applied to determine whether conduct is anti-competitive or manipulative?

FERC enforces compliance with tariffs or contracts in an effort to assure service is 'non-discriminatory' and charges are 'just and reasonable'. EPCRA 2005 amended the FPA to prohibit buyers or sellers of interstate wholesale electric energy or transmission services from knowingly providing a federal agency with false information or from using any manipulative or deceptive device or contrivance in violation of FERC regulations. Further, a seller of electric products and services applying for market-based rate authority must show it does not possess unmitigated market power in the affected markets.

The CFTC has authority to ensure futures and options markets operate fairly and orderly under the Commodity Exchange Act. This authority overlaps FERC's authority to the extent conduct involves trading and hedging activities of electricity and similar commodities. In 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act went into effect, which overhauled much of the US financial

regulatory system and conferred additional authority to the CFTC. Although the CFTC is still in the process of developing regulations, it has issued two final orders – the first in 2013 and the second in 2016 – exempting all RTO and ISO system operators from CFTC regulation (www.cftc.gov/PressRoom/PressReleases/pr7472-16). The exemption covers certain financial transmission rights, energy transactions, and forward capacity transactions sold pursuant to an RTO or ISO governing tariff if the transaction is related to the allocation of physical electric energy and carried out by an 'appropriate person', ie, those individuals or entities meeting certain sophistication or financial thresholds. However, the exemption does not apply to the CFTC's anti-fraud or anti-manipulation regulation.

The FTC has concurrent authority, pursuant to the FTCA, to enjoin 'unfair methods of competition'. The FTC's authority extends to acquisitions that tend to substantially lessen competition, as well as to price discrimination and other anti-competitive actions. The FTC also has authority to directly protect consumers from any 'unfair or deceptive' practice, defined as an act 'that causes or is likely to cause substantial injury to consumers that is not reasonably avoidable by consumers themselves and not outweighed by countervailing benefits to consumers and to competition'.

The FTC and the DoJ have concurrent power to prosecute violations of the other federal antitrust statutes. States and private parties may also bring actions under federal and state antitrust laws. This was recently reaffirmed by the US Supreme Court, which ruled that the federal Natural Gas Act does not pre-empt state antitrust laws, meaning a private party may bring state antitrust claims for alleged pipeline price manipulation.

Section 1 of the Sherman Act prohibits 'agreements, conspiracies or trusts in restraint of trade'. Under the Sherman Act, some agreements (such as agreements of horizontal price fixing or territorial division) are determined to be per se illegal because the conduct of the agreement is overwhelmingly considered to be harmful. Other agreements that might be, but not necessarily, harmful are analysed under the rule of reason, requiring the plaintiff to prove that the agreement caused economic harm. Section 2 of the Sherman Act prohibits monopolies, specifically targeting anti-competitive conduct that creates or maintains market domination. The Clayton Act bars certain types of price discrimination and tying arrangements when they lessen competition.

30 Preclusion and remedy of anti-competitive practices

What authority does the regulator (or regulators) have to preclude or remedy anti-competitive or manipulative practices?

If a proposed tariff or contract is found by FERC to be unjust and unreasonable, FERC will order mitigating revisions. FERC may require the sellers to refund the difference between the rates collected and the rates FERC determines are just and reasonable, beginning with the date the investigation was initiated. In order for a seller to be eligible to sell wholesale energy at market-based rates (instead of at cost-based rates), it must demonstrate to FERC that it and its affiliates lack (or have mitigated) market power. FERC can refuse to grant market-based rate (MBR) authority to an applicant that fails to show it does not possess market power. At any point, FERC has the authority to revoke market-based rate authority upon a determination that the seller possesses market power. In addition, FERC maintains the ability to revoke prior grants of MBR authority if the company's behaviour involves fraud, deception or misrepresentation.

Once initially granted MBR authority, sellers are required to take additional measures in order to maintain the market-based rate authority. For example, sellers that control more than 500MW of generation in any region of the country must file updates every three years in order to demonstrate their continued lack of market power. Also, such an electrical provider must notify FERC within 30 days of any significant change that might affect its qualification for market-based rates. Further, FERC has enacted market behaviour rules in order to govern sellers' conduct in the wholesale market. These rules address unit operations, communications, price reporting and record retention.

On an ongoing basis, FERC has authority under section 206 of the FPA to regulate markets and protect them against anti-competitive activity. Section 206 grants FERC authority to initiate an investigation, upon its own motion or third-party complaint, regarding whether any

rate charged by a utility for any transmission or sale is 'unjust, unreasonable, unduly discriminatory or preferential'.

EPA 2005 amended the FPA to allow for increases in the maximum penalty amounts for violations of the FPA. FERC is now able to assess civil penalties and fines of approximately US\$1 million or imprisonment for not more than five years, or both, for wilful and knowing violations, through acts or omissions, of any section of the FPA. Also, EPA 2005 provides for civil penalties of approximately US\$1 million per violation per day to be assessed for violations of regulations located in section II of the FPA after notice and the opportunity for a public hearing. While FERC has used its penalty authority sparingly in the past, FERC has been acting more forcefully on enforcement matters pursuant to its expanded authority. In Fiscal Year 2015, FERC's enforcement division obtained settlements to assess civil penalties in the amount of approximately US\$26.25 million for violations of the FPA and ordered disgorgement of unjust profits in the amount of approximately US\$1 million (www.ferc.gov/legal/staff-reports/2015/11-19-15-enforcement.pdf). Since 2007, FERC has assessed almost US\$645 million in civil penalties and over US\$302 million in disgorgement (not including several significant pending matters).

The FTCA authorises the FTC to issue 'cease and desist' orders requiring electric utilities to refrain from prohibited unfair trade practices and may assess civil penalties for violations, up to US\$11,000 per violation per day. Violations of sections 1 and 2 of the Sherman Act may result in fines up to US\$100 million for corporations, or by imprisonment of up to 10 years, or both. In addition, under the antitrust acts, private parties are able to bring enforcement actions to address unfair trade practices in the electric sector, including tying arrangements, price squeezes and denial of access to essential facilities.

International

31 Acquisitions by foreign companies

Are there any special requirements or limitations on acquisitions of interests in the electricity sector by foreign companies?

Several current or former US utilities are or have been owned by foreign parties. New investors should be mindful of current US regulatory and political attitudes toward foreign investment in the energy sector.

The Exon-Florio amendment to the Defence Production Act authorises the president of the US to block a transaction of foreign persons gaining control of a US business that threatened national security. The Foreign Investment and National Security Act of 2007 (FINSAs) confirms the broad range of energy and infrastructure transactions that may be covered, and intensifies the screening for certain transactions.

Exon-Florio is administered by the Committee on Foreign Investment in the US (CFIUS), an inter-agency committee chaired by the secretary of the Treasury and including the attorney general and secretaries of homeland security, commerce, defence, state and energy. CFIUS is responsible for reviewing proposed foreign investment transactions and making recommendations to the president.

FINSAs confirms that Exon-Florio applies to acquisitions of 'critical infrastructure'. This term has been defined as systems or assets so vital to the US that the incapacity or destruction of it would have a debilitating impact on national security. While the definition has been applied to ports and oil companies, it is now clear that electricity generating, transmission or distribution facilities would be considered critical infrastructure.

FINSAs formalises many CFIUS practices, including explicitly encouraging parties to notify and engage with CFIUS regarding a transaction in order to seek CFIUS clearance. FINSAs provides for a 30- to 45-day CFIUS review of covered transactions; reviews are mandatory for covered transactions involving foreign government-controlled entities.

For nuclear-generating facilities, the Atomic Energy Act generally bars the issuance of a reactor licence to a non-US person. For example, the NRC Atomic Safety and Licensing Board recently denied a licence for a proposed nuclear project in Maryland because it is 100 per cent owned by a foreign entity. Situations where a foreign company would be able to hold a licence include when it owns up to 50 per cent of an entity whose officers and employees responsible for special nuclear materials are US citizens, or when it owns a US subsidiary that will hold the licence, the foreign company's stock

is 'largely' owned by US citizens, and the subsidiary's officers and employees responsible for special nuclear materials are US citizens. The NRC has indicated it may relax this requirement in the future, as in May 2015 it ordered Commission staff to develop a regulatory guide that will use a 'graded approach' to assess and mitigate potential foreign ownership, control, or domination of US nuclear facilities (www.nei.org/News-Media/News/News-Archives/NRC-to-Use-Graded-Approach-on-Foreign-Ownership). In May 2016, the NRC issued a draft regulatory guide describing the acceptable methods for determining when a nuclear facility is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government (<https://www.federalregister.gov/articles/2016/05/26/2016-12546/foreign-ownership-control-or-domination-of-nuclear-power-and-non-power-production-or-utilization>).

32 Authorisation to construct and operate interconnectors

What authorisations are required to construct and operate interconnectors?

No electric transmission lines crossing the US international border may be constructed or operated without a presidential permit. The secretary of energy (through the DoE's Office of Electricity Delivery and Energy Reliability) will issue a permit upon determining that the project is in the public interest. The two primary criteria used to determine if a proposed project is consistent with the public interest are the impact the proposed project would have on the operating reliability of the US electric power supply and the environmental consequences of proposed projects. The DoE must also obtain concurrence from the secretary of state and the secretary of defence before issuing a permit.

The FPA allows exports of electric energy unless the proposed export would impair the sufficiency of electric power supply within the US or would impede or tend to impede the coordinated use of the US power supply network. Based on these guidelines from the FPA, DoE (again through the Office of Electricity Delivery and Energy Reliability) grants authorisation to export electric energy if it determines that sufficient generating resources exist such that the exporter could sustain the export while still maintaining adequate generating resources to meet all firm supply obligations and the export would not cause operating parameters on regional transmission systems to fall outside of established industry criteria. The DoE must also comply with the National Environmental Policy Act (NEPA) before granting authorisation to export electric energy. No federal permit is required to import electricity into the US, and no federal permit is required to sell imported electricity, if the sale at issue takes place outside of interstate commerce.

33 Interconnector access and cross-border electricity supply

What rules apply to access to interconnectors and to cross-border electricity supply, especially interconnection issues?

Federal regulation of a sale for resale in interstate commerce of imported or domestic electricity will apply if title to the electricity changes hands at a point within the US. In this case, the seller must apply to FERC for approval of the rates, terms and conditions of the sale. There are two exceptions. First, in the event the sale for resale in interstate commerce of imported or domestic electricity is conducted by a US government-owned, US state-owned, or US municipally owned utility, or is conducted by a US Department of Agriculture Rural Utilities Service-financed rural electric cooperative, there will be no FERC regulation of the sale. Second, there will be no FERC regulation of retail sales of imported or domestic electricity. The state PUC may regulate the retail sales of electricity within its border.

Transactions between affiliates

34 Restrictions

What restrictions exist on transactions between electricity utilities and their affiliates?

In October 2008, FERC issued Order No. 717, which adopted significant changes to its standards of conduct governing relations between transmission providers for both electricity and natural gas and their affiliates. The rule concentrates on three principles as the way to

Update and trends

Emissions regulation

As noted above in question 6, the future of the CPP is uncertain in the face of legal and political opposition. However, even in the absence of the CPP, low natural gas prices and other environmental regulations will still likely result in the retirement of coal-fired generation and an increase in natural gas-fired generation, in turn increasing the demand for natural gas resources. As a result, natural gas prices could rise and there will be opportunities for the development of supporting infrastructure, such as extraction or transportation. Moreover, utilities will need to devote additional investment capital toward developing new generating capacity to replace the loss from the retirement of coal-fired plants. However, there may be some offset by a decreased demand in electricity as consumption becomes more efficient through technological advancements. Finally, the loss of coal-fired generating capacity raises reliability concerns.

Given that the EPA is not contemplating rescinding its 'endangerment' finding, even if the CPP does not go into effect, there is still likely to be a continued drive toward developing variable energy resources, including wind and solar generation. Variable resources entail reliability concerns as well. In general, as government environmental policy shifts generation capacity away from coal-fired generation toward natural gas-fired and variable resources, grid operators must be prepared to meet the challenges that will arise from having a more diverse mix of generating resources. Also, it will be incumbent on regulators at both the state and federal level to develop emissions regulations with reliability concerns in mind.

Wholesale market design considerations

In recent years, the combination of low natural gas prices, advancements in generating technology and flatter demand for electricity has shifted the economics against older, less efficient generating resources, including coal and nuclear sources, in the wholesale power markets. In addition, many states have enacted policies to further development of particular generating resources, such as renewables but also credits for nuclear facilities, which may have the effect of suppressing wholesale electricity prices.

In May 2017, FERC held a technical conference to explore this issue. On the one hand, states are passing legislation favouring development of certain kinds of generating resource over others (and, in the case of nuclear subsidies, the state legislation actually targets specific generating units). Doing so, however, may undermine the fundamental construct of the wholesale markets, which is based on principles of economic and operational efficiency in selection of generating resources, without regard to resource type. FERC's intent is to develop a framework within the wholesale market construct that both preserves the fundamental economic principles of the wholesale markets while allowing for states to support particular resource development. As a result, it is likely that the individual RTO/ISOs will explore changes to their market construct to balance the dynamic between wholesale electric markets and state policy prerogatives.

Cyber security

In December 2015, hackers successfully penetrated the computer network for the Ukrainian electric grid, opening circuit breakers and shutting off power to over 200,000 people for several hours. It was the first time a cyber attack on an electric grid resulted in physical disruptions.

Since the incident in the Ukraine, there has been increased focus on ensuring the US electric grid is adequately protected against similar sophisticated cyber attacks. Some reports estimate that a widespread hack of the US electric grid could cause as much as US\$1 trillion in damages. As grid modernisation efforts continue, older components of the transmission network will be replaced by more sophisticated

components that can be controlled over internet-connected networks and software. In addition, many utilities have replaced older meters at their customers' homes with new, digital smart meters, creating risk of cyber intrusion into the distribution network.

To that end, FERC, along with NERC, the US Department of Homeland Security, the US Department of Energy, and the National Institute for Standards and Technology, have commenced a number of initiatives aimed at increasing grid security. Further, in May 2017, the president issued an Executive Order on cybersecurity efforts, directing the Department of Energy and Department of Homeland Security to work with state and local government officials to assess vulnerabilities in the electric grid and the potential impact of an outage caused by cyber attack. In the face of constantly evolving cyber threats, government and utilities will need to continue developing preventative measures to secure the grid against cyber attacks while also devising contingency measures to minimise the impact of an attack, were one to occur.

Gas-electric coordination

There has been increased focus on coordination between the gas and electric industries as the share of gas-fired generation in the US generation mix has increased. On 16 April 2015, FERC issued a final rule revising its regulations to better coordinate the scheduling of wholesale natural gas and electricity markets to adjust for the increased reliance on natural gas for electric generation, a trend that is expected to continue. The new regulations are intended not only to improve scheduling between the two industries, but to provide additional scheduling flexibility to all shippers on interstate natural gas pipelines. Moreover, individual system operators, such as RTOs and ISOs, have undertaken operational and market actions, such as coordinating information exchange between interstate pipelines, enhancing offer flexibility, and requiring operational information on dual fuel capacity be provided to market operators. The efforts will likely increase as natural-gas fired resources become increasingly utilized as government environmental policies continue to result in the loss of coal-fired generation capacity.

Shale gas revolution

Based on current projections, the US is likely to become a net exporter of natural gas by 2017 (www.eia.gov/todayinenergy/detail.cfm?id=20992), particularly driven by the development of extraction methods from shale gas reservoirs, such as those in Texas, Pennsylvania, and North Dakota. However, many energy-related laws and regulations rest on the assumption that the US is a net importer. As a result, a number of US legislators have called for new laws on topics such as the trade deficit, the import and export of natural gas, and the reliance on importing fossil fuels from elsewhere around the world.

Demand Response

Another area of change concerns so-called 'Demand Response' and its continued development in different markets across the United States. Generally, Demand Response permits the operators of wholesale electricity markets to pay customers for the reduction in electricity consumption and then recoup those payments through adjustment to wholesale rates. To encourage participation in those markets by Demand Response resources, FERC issued Order No. 745, which required Demand Response to be compensated on an equivalent basis to wholesale generation. The US Supreme Court upheld Order No. 745, ruling that FERC had the authority to regulate Demand Response and the compensation structure was reasonable. The effect of the US Supreme Court's decision is to allow continued development of regional efforts to create and implement Demand Response initiatives.

prevent affiliate abuse. The main elements of this are the independent functioning rule, the no-conduit rule, and the transparency rule.

Independent functioning rule

FERC eliminated completely the concept of energy affiliates as well as the corporate separation approach to separating grid operators from marketing affiliates, two aspects of the old Order No. 2004 rules that had proved difficult to understand and enforce. Instead, the new rules are based on the employee functional approach that was first utilised in industry restructuring orders from the 1980s and 1990s. This approach focuses on an employee's actual function on the job rather than the employee's position in the organisation chart. Thus, whereas under

the former rules any employee of a marketing or energy affiliate was prohibited from interacting with transmission function employees, Order No. 717 limits the category of employees who must function independently from transmission operators to those who are actively and personally engaged on a day-to-day basis in marketing functions. By narrowing the focus in this manner, the rule provided needed clarity to supervisors, managers, and executives and allowed the free flow of the type of information needed for long-term planning.

No-conduit rule

The no-conduit rule prohibits a transmission provider from using anyone as a conduit for the disclosure of non-public transmission function

information to its marketing function employees. This rule covers both information and employees not falling within the scope of the independent functioning rule. For example, although there is no general requirement that lawyers employed by transmission providers need to function independently of the company's marketing function employees, lawyers must, nevertheless, avoid serving as a conduit for passing non-public transmission information to marketing function employees.

Transparency rule

Order No. 717 is also designed to promote transparency through the collection, reporting, and public posting requirements of information that may alert interested persons and FERC to potential acts of undue preference.

Reliability exception

Reflecting the importance of reliability, the order makes an exception to the independent functioning rule and the no-conduit rule for

the exchange of information 'pertaining to compliance with reliability standards approved by the Commission' and information 'necessary to maintain or restore operation of the transmission system or generating units, or that may affect the dispatch of generating units'.

35 Enforcement and sanctions

Who enforces the restrictions on utilities dealing with affiliates and what are the sanctions for non-compliance?

FERC has authority to impose penalties in the amount of US\$1 million per day per violation under sections 316 and 316A of the FPA or to use its rate authority to remedy affiliate abuse (as discussed more fully in question 29). Mechanisms for enforcement and remedies for violations of states' affiliate rules vary.

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