

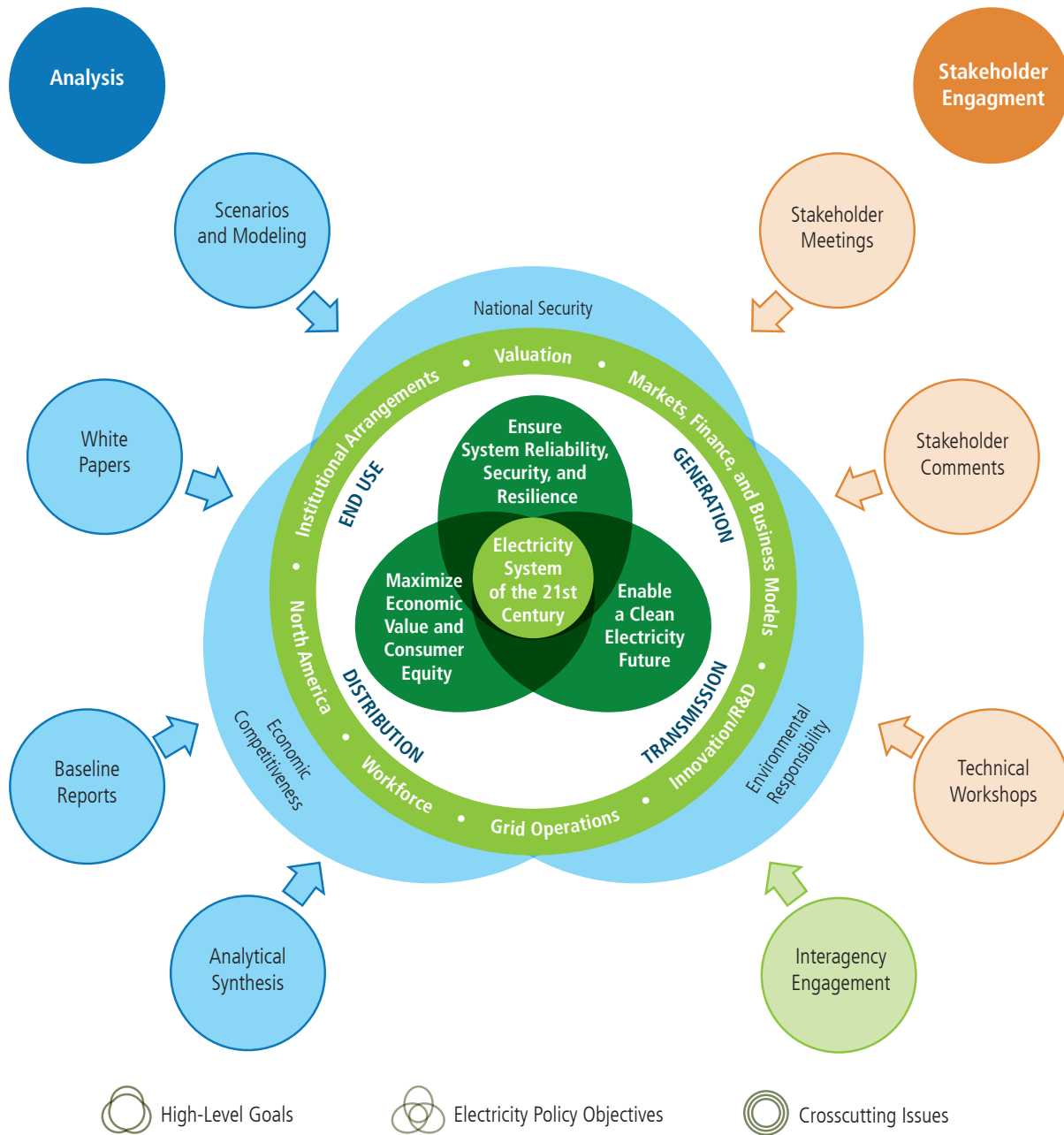
## *Chapter VIII*

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# **ANALYTICAL AND STAKEHOLDER PROCESS**

This chapter describes the analyses and stakeholder engagement process that provided the substantive basis for this second installment of the Quadrennial Energy Review (QER 1.2). The first section describes the analytical work carried out for the QER 1.2, including baselines, models, topical reports, and white papers. The second section describes how the QER 1.2 process included engagement with a broad range of stakeholders across the Nation, through technical workshops, seven formal public stakeholder meetings, and the collection and consideration of public comments. This chapter is intended to document the process of developing the QER 1.2 and to provide transparency on the methods used to develop the material in the report.

Figure 8-1. Inputs to QER 1.2



This figure shows the analytical, stakeholder, and interagency efforts underpinning the QER 1.2.

## Systems Analysis

The Administration-wide Quadrennial Energy Review (QER) is intended to enable the Federal Government to translate policy goals into a set of analytically based, integrated actions over a 4-year planning horizon. The White House Domestic Policy Council and Office of Science and Technology Policy jointly chair the interagency QER Task Force, while the Secretary of Energy provides an Executive Secretariat in the Department of Energy’s (DOE’s) Office of Energy Policy and Systems Analysis (EPSA). The QER involves

a multi-agency review process, and more than 20 executive departments and agencies<sup>a</sup> play key roles in developing and implementing policies proposed in the QER. Unlike other Federal quadrennial review processes where analysis is done every 4 years, the QER is conducted through installments to allow for granular analysis of key energy subsectors. Serving as Secretariat, EPSA is responsible for coordinating activities related to the preparation of the report, including commissioning an extensive suite of policy analysis focused on the electricity system (Figure 8-1).

QER 1.2's analysis was completed over many months through the following methods:

- Commissioning five baseline reports to provide an overview of the current state of the electricity system
- Commissioning analyses, modeling, synthesis, and white papers from U.S. National Laboratories, energy consultants, and analytics firms
- Convening technical workshops with relevant stakeholders and producing write-ups of findings and stakeholder viewpoints
- Performing analysis and modeling within EPSA, in collaboration with partners across DOE and other Federal agencies, to generate analysis, policy working papers, and reports
- Meeting with EPSA and staff-level agency representatives and experts on the findings and recommendations proposed in QER 1.2.

## Crosscutting Analysis

This section provides examples of major external analyses commissioned by EPSA that support the findings and recommendations within QER 1.2. The descriptions below categorize the analyses (with the caveat that most QER 1.2 analyses are crosscutting in nature and apply to more than one energy objective or sector).

### Baselines

A series of EPSA baselines were developed to provide an overview of elements of the electricity system. These baselines helped inform QER 1.2 and focused on the following issue areas: generation, distribution, end use, markets, and climate and environment.<sup>b</sup> These baseline analyses identify major historical trends in the electricity sector and reflect the workings, characteristics, and issues of the current electricity system. These baselines provide a foundation for the analysis of systems and policy recommendations that form QER 1.2.

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<sup>a</sup> The members of the Task Force include: (1) the Department of State; (2) the Department of the Treasury; (3) the Department of Defense; (4) the Department of the Interior; (5) the Department of Agriculture; (6) the Department of Commerce; (7) the Department of Labor; (8) the Department of Health and Human Services; (9) the Department of Housing and Urban Development; (10) the Department of Transportation; (11) the Department of Energy; (12) the Department of Veterans Affairs; (13) the Department of Homeland Security; (14) the Office of Management and Budget; (15) the National Economic Council; (16) the National Security Staff; (17) the Council on Environmental Quality; (18) the Council of Economic Advisers; (19) the Environmental Protection Agency; (20) the Small Business Administration; (21) the Army Corps of Engineers; (22) the National Science Foundation; and (23) such agencies and offices as the President may designate.

<sup>b</sup> The environmental baseline was divided into four volumes in the following categories: Greenhouse Gas Emissions, Solid Waste and Decommissioning, Energy-Water Nexus, and Environmental Quality.

## Key Reports and Studies

QER 1.2 drew from multiple studies of the electricity system, including but not limited to the following:

**Table 8-1. List of Chapter-Specific Analyses for QER 1.2<sup>c</sup>**

Title	Performer
<b>Context and Scope</b>	
Accelerate Energy Productivity 2030	NREL
Principles for Creating and Evaluating Electric System Reliability Plans in the 21st Century	NREL, PNNL, ORNL
Cyber Threat and Vulnerability Analysis of the U.S. Electric Sector	INL
Energy Supply Chain Vulnerabilities: Framework and Case Study	ANL, ORNL, INL
Modernizing the Electric Distribution Utility to Support the Clean Energy Economy	EPSA
Harmonizing the Electricity Sectors across North America	RFF
Electricity Distribution System Baseline Report	PNNL
Electricity Generation Baseline Report	NREL, INL, NETL
Residential Electricity Bill Savings Opportunities from Distributed Electric Storage	EPSA
Establishing the Playing Field: Surveying Clean Energy-Related Economic Development Policy across the States	NREL
<b>Security, System Resilience, and Reliability</b>	
Assessing Cost and Benefits of Investments in Climate Resilience	ORNL
Utility Risk-Mitigation Strategies	Deloitte
Scoping Analytical Tools and Methods for Vulnerability Analysis of Linked Electricity Generation and River Basin Systems	ORNL
Guide to Cybersecurity, Resilience, and Reliability for Small and Under-Resourced Utilities	NREL
Resilience of the U.S. Electricity System: A Multi-Hazard Perspective	ORNL, LANL, ANL, SNL, PNNL, BNL
Front-Line Resilience Perspectives: The Electric Grid	ANL
<b>Clean Electricity Future</b>	
Energy Efficiency under Alternative Carbon Policies: Incentives, Measurement, and Interregional Effects	NREL
Evaluating the CO <sub>2</sub> Emissions Reduction Potential and Cost of Power Sector Re-Dispatch	NREL
Literature Review of Studies That Include an 80% Reduction in GHGs by 2050	Energetics
Characterizing Energy Efficiency in Low-Income Communities	LBNL
Environment Baseline Vol. 4: Energy-Water Nexus	EPSA
Advanced Water Metering Infrastructure	NREL, INL, NETL

<sup>c</sup> Acronyms used in Table 8-1 include the following: NREL – National Renewable Energy Laboratory; PNNL – Pacific Northwest National Laboratory; ORNL – Oak Ridge National Laboratory; INL – Idaho National Laboratory; ANL – Argonne National Laboratory; EPSC – Office of Energy Policy and Systems Analysis; RFF – Resources for the Future; NETL – National Energy Technology Laboratory; LANL – Los Alamos National Laboratory; SNL – Sandia National Laboratories; BNL – Brookhaven National Laboratory; CO<sub>2</sub> – carbon dioxide; GHGs – greenhouse gases; LBNL – Lawrence Berkeley National Laboratory.

Title	Performer
<b>Economic Value and Consumer Equity</b>	
Energy Tax Policy	EPSA
Characterization of Regional Electric Markets	Pace Global
Review of the Economics Literature on U.S. Electricity Restructuring	University of California, Davis
DER and Rate Financial Analysis	EPSA
Recovery of Utility Fixed Costs: Utility, Consumer, Environmental, and Economist Perspectives	LBNL
Fixed-Cost Allocations and Rate-Making Instruments to Address Distributed Energy Resources	EPSA

The QER commissioned multiple studies across the electricity system, including but not limited to these reports for specific chapters.

## Technical Workshops

As part of the crosscutting analysis conducted for QER 1.2, the QER Task Force flagged some topics deemed particularly complex for technical workshops to discuss further with stakeholders and industry experts. Technical workshops convened subject matter experts and relevant stakeholders to provide expert insights on various elements of the electricity system through the intensive analytical approach of these 1-day and 2-day symposia. Each technical workshop featured a roster of subject matter experts from industry, academia, the National Laboratories, and other relevant organizations.

Below are details about the topics, dates, and locations of the technical workshops that DOE held to inform QER 1.2:

### **Technical Workshop on Electricity and Information and Communication Technologies Convergence** *June 15, 2015 – Washington, D.C.*

DOE hosted a technical workshop to understand stakeholder issues on electricity and information and communications technology (ICT). The workshop sought to inform the completion of the Pacific Northwest National Laboratory white paper commissioned by DOE: *The Emerging Interdependence of the Electric Power Grid and Information and Communication Technology*. The second focus of the workshop was to elicit additional electricity and ICT research and policy analysis topics for potential examination within DOE. The workshop included participants from utilities, industry stakeholders, energy associations, and regulators.

The goal of this meeting was to leverage the inherent synergies between DOE’s research and policy functions and gather expert input. Specifically, this workshop concerned the current status of deployment of electricity and ICT infrastructure, as well as trends and developments in market places, technologies, and regulations.

### **Electric Power in the United States and Canada: Opportunities for Regulatory Harmonization** *October 20, 2015 – Boise, Idaho* *October 27, 2015 – Albuquerque, New Mexico*

DOE sponsored a workshop hosted by Resources for the Future—in concert with the International Institute for Sustainable Development and Boise State University—looking at the electricity sectors in the United States and Canada. The workshop had several purposes: (1) to identify gaps, best practices, and inconsistencies with regulations and electricity system planning across the United States, Canada, and Mexico; (2) to inform the creation of legal, regulatory, and policy roadmaps for harmonizing regulations and planning; and (3) to bring together individuals who can help implement greater harmonization. The two workshops examined policies, regulations, and planning associated with the electricity sector, and within that sector, environmental regulations (for air pollution, greenhouse gases [GHGs], and renewables). They also examined the regulations

and processes associated with the operation and planning of the electricity system—including generation and transmission. DOE and Resources for the Future published a final paper summarizing the recommendations and observations of workshop participants in early 2016.

### **Low-Carbon Futures of the U.S. Energy System**

*January 14, 2016 – Washington, D.C.*

In 2009, and subsequently in 2014, the Administration set GHG-emissions reduction targets in the range of 17 percent below 2005 levels by 2020 and 26 to 28 percent below 2005 levels by 2025. Both of these goals are intended to put the United States on a path toward 80 percent decarbonization by 2050. DOE hosted a 1-day workshop to better understand possible pathways to achieving substantial economy-wide GHG emissions reductions by 2050.

Participants from academia, DOE, the National Laboratories, and other interested stakeholder groups met to discuss two main topics: (1) potential pathways for substantial GHG reductions in electricity generation, and (2) how future end-use demand for electricity might shape the scale of required GHG emissions reductions in the electric power sector. There were two primary goals for the workshop. The first goal was to identify a set of representative pathways (and elements of such pathways) toward substantial economy-wide reductions in GHG emissions by 2050. The second goal was to identify the key characteristics, challenges, opportunities, and requirements of different pathways. The workshop informed analysis of the transition to a cleaner, low-carbon electricity system for QER 1.2.

### **Electricity Use in Rural and Isolated Communities**

*February 8–9, 2016, Washington, D.C.*

The objective of this workshop was to help EPSA's public outreach efforts by focusing on communities with unique electricity challenges. The workshop explored challenges and opportunities for reducing electricity use and associated GHG emissions while improving electricity system reliability and resilience in rural and isolated communities. Although the statement of task mentioned design of microgrids for hospitals, universities, military bases, and other unified load centers, presenters covering microgrids were encouraged to describe potential applications serving isolated communities and towns in keeping with the theme of the workshop. The workshop assembled speakers from diverse locations that have rural or isolated energy issues, including Hawaii, Alaska, North Carolina, and Vermont, and they held expertise in many facets of electricity system design and operation. Speakers were encouraged to do the following: (1) identify and share best practices between rural and isolated electricity system users and operators, and (2) provide suggestions for Federal policies and research and development investments that could be implemented in both the near and long term.

### **The Future of Energy Efficiency**

*February 10, 2016 – Washington, D.C.*

This session, held at a meeting of the National Association of State Energy Offices, provided a discussion of the role of energy efficiency in response to the emerging electric system challenges and opportunities that DOE intends to address in QER 1.2. The purposes of this workshop were to focus on issues related to electricity end use and to explore the potential for energy efficiency moving forward; barriers and opportunities to overcome; system benefits and the costs of increased energy efficiency deployment; and what policies or methods can be deployed to meet evolving consumer needs, and how these needs can be met while creating a more efficient system. Key themes and areas of interest from the discussion included evolving trends in electricity demand; benefits and costs for energy efficiency in a more integrated grid; options for increasing consumer value/equity/access to services; the potential for greater electrification and decarbonization of the economy; data access and security issues; the improvement of methods for valuing energy efficiency; and opportunities for new services and business models.

## **The Future of U.S. Bulk Power Markets**

*March 4, 2016 – Washington, D.C.*

DOE, in coordination with Boston University's Institute for Sustainable Energy, hosted a technical workshop to gather input from current industry stakeholders on the future of the Nation's bulk power markets. The workshop also included distinct discussions on the state of transmission-planning efforts, essential reliability services (also known as ancillary services), and the potential for markets at the distribution-system level.

Participants from academia, industry associations, individual companies, public power, and state/Federal regulatory agencies were encouraged to discuss these topics and outline the major issues in their respective areas of expertise. The participants provided recommendations and feedback for ways in which DOE and the QER process could help alleviate those issues. The workshop ultimately informed the direction of subsequent analyses in support of QER 1.2, specifically with regard to transmission systems and resource adequacy constructs.

## **Workshop on Siting and Regulating Carbon Capture, Utilization, and Storage Infrastructure**

*April 8, 2016 – Washington, D.C.*

DOE sponsored a workshop to identify and promote best practices for siting and regulating carbon dioxide (CO<sub>2</sub>) infrastructure—including pipelines, enhanced oil recovery, and saline CO<sub>2</sub> storage sites. The purposes of this workshop were to foster communication and coordination, as well as to share lessons learned and best practices among states that are already involved in siting and regulating CO<sub>2</sub> infrastructure or that may have proposed future CO<sub>2</sub> infrastructure projects.

The workshop convened subject matter experts, industry representatives, Federal officials, and state agencies with jurisdiction over energy infrastructure planning, siting, and economic development. The aim of the workshop was to facilitate a knowledge exchange regarding CO<sub>2</sub> pipeline and storage-site infrastructure needs. The workshop also informed issues being addressed in QER 1.2, including discussions around CO<sub>2</sub>-enhanced oil recovery and other storage sites, which serve as infrastructure for entities capturing CO<sub>2</sub>.

## **Technical Workshop on Electricity Valuation**

*May 2–3, 2016 – Washington, D.C.*

DOE hosted a technical workshop to understand stakeholder issues relevant to the valuation of electricity system technologies, products, and services. The workshop sought to examine four major topics: (1) valuing electricity system components and attributes, (2) valuing technologies for contributions to power quality and reliability, (3) managing electricity risks, and (4) valuation within the distribution system.

The workshop included stakeholders from state and Federal regulatory agencies, electric utilities, technology developers and manufacturers, universities, the National Laboratories, industry associations for consumers, and electricity system operators. The opening session began with a presentation on a proposed valuation methodology. During the workshop, participants provided their views on issues that must be adequately resolved to support higher penetration levels for advanced or distributed energy technologies. Participants also discussed the challenges associated with methods to value and plan for their integration. The workshop informed and improved analysis commissioned on valuation for QER 1.2.

## **QER 1.2 Finance Workshop**

*June 1, 2016 – New York, New York*

As input to the QER 1.2, EPSA hosted a technical workshop to gather stakeholder views on power sector finance in the context of national energy objectives, a changing resource mix, and new technologies and business models. The discussion focused on financing required to deploy proven or advanced clean electricity technologies. Workshop participants included senior leaders from industry and investor communities, who were encouraged to provide examples of existing barriers and ideas on effective public policies and programs for U.S. electricity system modernization.



Participants emphasized that there is sufficient capital available for proven clean electricity projects with an identified revenue stream, but there is a revenue model problem for many projects and technologies. Some of the topics discussed included the potential role of grid-scale storage, challenges with large-scale nuclear, and the need for policy stability. Participants also encouraged a systems approach to modernization. They emphasized the need to provide assets with revenue streams (via price signals) for all services they provide to the grid so that asset valuations reflect their overall value to the system. The discussion included near-term, incremental changes to facilitate asset financing and deployment such as changes to the tax code, as well as longer-term policy and market changes such as incentive-based regulation, a clean capacity incentive, or pricing local reliability to provide an economic signal for customers to behave in ways that benefit the grid.

### **Technical Workshop on the Implications of Increasing Electric Sector Natural Gas Demand**

*June 7, 2016 – Washington, D.C.*

This workshop explored how medium- and long-term planning is evolving given the trend of increased use of natural gas in the electric power sector. While there are favorable economic and environmental benefits to increased use of natural gas in electricity, potential challenges in infrastructure compatibility and reliability arise, as well. Stakeholders from both the natural gas and electric sectors from different regions of the country convened at this workshop. Participants then shared the practices, tools, and metrics that they employ in order to understand the interdependency between the electric and natural gas industries, as well as the approaches that stakeholders have implemented to resolve challenges and leverage opportunities.

### **Accelerate Energy Productivity 2030 Executive Review and Dialogue Session**

*June 28, 2016 – Washington, D.C.*

The purpose of this session was not only to provide input to DOE from key industry representatives but also to build upon the work done under the Accelerate Energy Productivity 2030 partnership between DOE, the Alliance to Save Energy, and the Council on Competitiveness. Through the partnership, energy productivity has become an increasingly influential way to drive meaningful policy deployment in the United States and abroad. This session followed the 2014 announcement of the initiative at the 2014 American Energy and Manufacturing Competitiveness (AEMC) Summit by Secretary of Energy Ernest Moniz and the release of *Accelerate Energy Productivity 2030: A Strategic Roadmap for American Energy Innovation, Economic Growth* at the 2015 AEMC. Representatives at the session provided input on several issues relevant to the QER 1.2, including increased deployment of electric vehicles; electric utility rate design that supports deployment of new technologies; regulatory consistency and certainty; improvement of electric consumer equity; ensuring a strong electric sector workforce; the role of states in driving energy productivity; the role of incentives and consumer awareness in promoting clean energy technology; the importance of public-private partnerships; and improved access to financing for energy efficiency.

## **QER Stakeholder Engagement**

In the Presidential Memorandum establishing the QER, President Obama directed the QER Task Force to “gather ideas and advice from state and local governments, tribes, large and small businesses, universities, National Laboratories, nongovernmental and labor organizations, consumers, and other stakeholders and interested parties.” The President also ordered the QER Task Force to “develop an integrated outreach strategy that relies on both traditional meetings and the use of information technology.”

In its role as Secretariat for the QER Task Force, EPSA undertook an open, transparent process for informing stakeholders of the purposes and scope of the QER 1.2.



This outreach process included the following:

- Informal meetings at DOE headquarters involving EPSA staff members and dozens of stakeholder groups from the electricity sector, such as academic researchers; local, state, and Federal governments; and regulatory agencies
- Briefings on the QER process at meetings with industry associations; groups of state officials; the offices of environmental groups; and with Members of Congress, their staffs, and the staffs of multiple relevant congressional committees
- A series of seven formal public stakeholder meetings, beginning in Washington, D.C., and extending to Boston, Massachusetts; Salt Lake City, Utah; Des Moines, Iowa; Austin, Texas; Los Angeles, California; and Atlanta, Georgia
- Special dialogues with officials in Canada and Mexico to discuss cross-border integration and international collaboration, given the extensive electricity integration that exists between the United States and Canada and opportunities present to increase integration between the United States and Mexico
- Speeches and briefings to interested groups in Washington, D.C., and across the country by the Secretary of Energy, the Director of the President's Office of Science and Technology Policy, other White House officials, and various members of DOE leadership
- The creation of a public comments portal to allow interested stakeholders and the general public to provide comments on individual stakeholder meetings, as well as outside experts to submit studies, reports, and data sets related to topics within the scope of the QER 1.2.

## Formal Public Stakeholder Meetings

The most visible effort to engage stakeholders during the QER 1.2 process was the series of seven public meetings held around the country from February to May 2016. These meetings provided opportunities for the Administration to fully consider the unique challenges and opportunities facing each of the many geographically diverse segments of our Nation's electricity system. The regions selected for QER 1.2 stakeholder meetings were based on wholesale market footprints as a convenient approach to capturing the Nation's regional electricity diversity, which is also characterized by differing resource mixes, state policies, and a host of other factors.

The mixture of panel discussions and a public comment period framed multi-stakeholder discourse around deliberative analytical questions in QER 1.2 relating to the intersection of electricity and its role in promoting economic competitiveness, energy security, and environmental responsibility. The Administration sought public input on key questions relating to possible Federal actions that would address the challenges and take full advantage of the opportunities of this changing system to meet the Nation's objectives of reliable, affordable, and clean electricity.

Each meeting began with opening statements by the hosting Administration representatives, along with local, state, and national political leaders who participated at events in their parts of the country. Each meeting, with the exception of the kickoff meeting in Washington, D.C., had three panel discussions. The first two topics were the same for all regions (*Bulk Power Generation and Transmission Opportunities: How Can We Plan, Build, and Operate the Appropriate Amount for Future Needs?* and *Electricity Distribution and End-Use: How Do We Manage Challenges and Opportunities?*)—although content varied as there are significant regional differences. The third panel's topics were different for each session to highlight issues of regional importance. Each meeting concluded with an “open microphone” segment, during which members of the general public could make statements for the QER 1.2 record and had the opportunity to offer prepared presentations, studies, reports, and more for review by EPSA analysts and inclusion in the QER Library.

Federal Register notices announcing each formal public stakeholder meeting were published; these notices also were made available via the DOE QER website (<http://energy.gov/epsa/quadrennial-energy-review-qer>). DOE publicized the meetings by sending advisories to local media; using social media; and emailing state, local, and tribal governments, as well as representatives of energy stakeholders—both in the region of each meeting and in Washington, D.C.

In the interests of transparency and open government, court reporters produced a transcript for each meeting, and EPSA produced a summary of each meeting’s presentations and discussions. The transcripts and summaries, along with links to the live-streamed recordings and panelists’ prepared remarks and presentations, are available on the DOE QER website.

Following are details about the dates, topics, locations, and focus areas of the formal public stakeholder meetings organized by EPSA to inform QER 1.2 (Table 8-2).

**Table 8-2. List of QER 1.2 Formal Public Stakeholder Meetings (with Topic, Location, Date, and Administration Officials)<sup>d</sup>**

Location	Topic (Third Panel)	Date	Administration Chair(s) and Local/State/Congressional Officials
Washington, D.C.	Electricity: generation to end use	2/4/16	Secretary of Energy Ernest Moniz, Assistant to the President for Science and Technology Dr. John Holdren, Deputy Assistant to the President for Energy and Climate Change Dan Utech, and Representative Earl Blumenauer (D-OR)
Boston, MA	Resource adequacy	4/15/16	Secretary of Energy Ernest Moniz, Assistant to the President for Science and Technology Dr. John Holdren, and Governor Charlie Baker
Salt Lake City, UT	Cyber and physical security and resilience	4/25/16	Deputy Assistant to the President for Energy and Climate Change Dan Utech and Deputy Administrator of the USDA Rural Utilities Service Joshua Cohen
Des Moines, IA	Transmission development	5/6/16	Secretary of Energy Ernest Moniz, Governor Terry Branstad, Lieutenant Governor Kim Reynolds, Mayor T.M. Franklin Cownie, and USDA Rural Development Rural Business-Cooperative Service Administrator Sam Ridders
Austin, TX	New technologies and actors in the grid edge space	5/9/16	Secretary of Energy Ernest Moniz, USDA Deputy Under Secretary for Rural Development Lillian Salerno, and Mayor Steve Adler (Austin)
Los Angeles, CA	Generating and delivering electricity to meet GHG targets	5/10/16	Deputy Secretary of Energy Elizabeth Sherwood-Randall, USDA Rural Development Rural Business-Cooperative Service Administrator Sam Ridders, and Deputy Mayor for City Services Barbara Romero (Los Angeles)
Atlanta, GA	Financing new electricity infrastructure	5/24/16	Secretary of Energy Ernest Moniz and Deputy Administrator of the USDA Rural Utilities Service Joshua Cohen

Dates, topics, locations, and focus areas for the formal QER 1.2 Stakeholder Meetings.

<sup>d</sup> Acronyms used in Table 8-2 include the following: GHG—greenhouse gas; USDA—U.S. Department of Agriculture.

## **1. Washington, D.C., Kickoff Meeting**

*February 4, 2016*

The Washington, D.C., public stakeholder meeting served as the formal kickoff meeting for QER 1.2, an integrated study of the U.S. electricity system from generation through end use. The meeting included two main panel discussions and a public comment period focused on the challenges and opportunities facing the electricity sector and its key role in promoting economic competitiveness, energy security, and environmental responsibility.

## **2. Boston, Massachusetts**

*April 15, 2016*

The QER 1.2 public stakeholder meeting in Boston covered the footprint of the 21 states and District of Columbia that are, all or in part, in the regional transmission organization (RTO) PJM Interconnection, Independent System Operator (ISO) New England, or New York ISO. The third panel for the Boston public stakeholder meeting covered “Ensuring Resource Adequacy,” highlighting the proper design and operation of the eastern RTO/ISO markets—with Federal and state policies and consumer demand creating momentum for low-carbon options—as crucial.

## **3. Salt Lake City, Utah**

*April 25, 2016*

The Salt Lake City meeting covered the footprint of 13 of the 14 states (excluding California) that are, all or in part, in the Western Interconnection, and that are represented by the Western Electricity Coordinating Council. The third panel in the Salt Lake City public stakeholder meeting covered “Cyber/Physical Security and Resilience.”

## **4. Des Moines, Iowa**

*May 6, 2016*

The Des Moines meeting covered the footprint of the 20 states that are, all or in part, in the Southwest Power Pool and the Midcontinent ISO. The third panel in the Des Moines public stakeholder meeting covered “Transmission Development with an Evolving Generation Mix.”

## **5. Austin, Texas**

*May 9, 2016*

The Austin meeting covered the footprint of the State of Texas, grid operations, and the flow of energy—most of which is managed by the Electric Reliability Council of Texas. The third panel in the Austin public stakeholder meeting covered “New Technologies and Actors in the Grid Edge Space.”

## **6. Los Angeles, California**

*May 10, 2016*

The Los Angeles meeting covered the footprint of the State of California, grid operations, and the flow of energy—most of which is managed by the California ISO. The third panel for the Los Angeles public stakeholder meeting covered “Generating and Delivering Electricity in a High GHG-Reduction Environment.”

## **7. Atlanta, Georgia**

*May 24, 2016*

The Atlanta meeting covered the footprint of the 10 southeastern states that, all or in part, have bilateral wholesale electricity markets. The third panel for the Atlanta public stakeholder meeting covered “Financing New Electricity Infrastructure.”

## Comments Portal and QER Library

From the beginning of the QER 1.2 process, stakeholders and the general public were encouraged to offer suggestions, comments, insights, and criticisms on issues surrounding the electricity system. Public comments were collected through a web-based portal, which allowed stakeholders to share comments as well as studies, reports, data sets, and any additional materials from stakeholder organizations to help inform QER 1.2. All comments submitted to the portal are publicly available at <https://energy.gov/epsa/comments-second-installment-quadrennial-energy-review>.

EPSA received 295 total comments—including 215 total attachments comprising detailed reports and studies on behalf of trade associations, utilities, and energy companies; state and local governments; nonprofit organizations; and other stakeholders (totaling over 2,600 pages). EPSA reviewed each of the comments received. Insights and recommendations extracted from these comments and materials were grouped into multiple themes, namely issues with evolving generation mix; increased attention to cybersecurity and physical security; reliability needs during transformation; problems with organized wholesale markets; evolving transmission planning and investment; activity at distribution and end-use sector; valuation and rate reform; business models; evolving state and Federal regulations; and the Federal role.

## QER Interagency Engagement

As outlined by the QER Presidential Memorandum, the President identified more than 20 executive departments and agencies that play key roles in developing and implementing policies governing energy resources and consumption, as well as associated environmental impacts. The President directed the QER Secretariat (1) to develop a comprehensive and integrated review of energy policy, based on interagency dialogue and active engagement of external stakeholders, and (2) to make recommendations on what additional actions it believes would be appropriate. The findings and recommendations in QER 1.2 are based on Task Force deliberations, meetings with staff-level agency representatives and experts, and information provided to the Secretariat and the Task Force by external stakeholders.

Throughout the development of QER 1.2, the White House convened regular interagency meetings and worked closely with the agencies' leadership and staff. Member agencies collaborated to develop QER 1.2 by providing information on topics within their statutory and regulatory jurisdiction or areas of particular expertise related to energy infrastructure transmission, storage, and distribution. Agencies delivered studies, data, and other information to be considered in policy analysis and modeling; reviewed analysis and findings; and leveraged the work of other relevant Administration initiatives. Led by the Office of Science and Technology Policy and the Domestic Policy Council, they collaboratively developed policy recommendations. A series of roundtable discussions was held with representatives from key departments and agencies to ensure a transparent and inclusive process in the development of policy recommendations.

Interagency members also partnered with the Secretariat on the seven formal public stakeholder meetings, opening the events and setting the focus for the expert panels that followed.