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Material Sustainability Issues for the North American Electric Power Industry

Results of Research with Electric Power Companies and Stakeholders in the United States and Canada

2013 TECHNICAL REPORT

Material Sustainability Issues for the North American Electric Power Industry

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Abstract

This report presents results of research regarding sustainability issues faced by the electric power industry. Specifically, the research effort was directed toward identifying which sustainability issues affecting the power companies in North America are considered to be the most relevant, or material, and gathering perspectives on those issues from the industry and its stakeholders.

The research team collected information from three sources: direct interviews with utility managers and stakeholder representatives, a literature search, and an electronic survey completed by 134 electric power company managers and 160 stakeholders at government, private sector, non-profit, environmental, and academic organizations.

Fifteen issues, identified during the interviews and literature search as being most material to sustainability, were grouped into the "three pillars" (environmental, social, and economic) of sustainability. In the electronic survey, respondents were asked a series of questions regarding the fifteen issues, as well as questions about transparency and reporting of sustainability priorities and metrics.

To EPRI's knowledge, the project represents the most extensive effort to date to acquire this type of information, which has potential value for advancing corporate strategies regarding sustainability.

Keywords
Sustainability
Materiality issues
Environmental stewardship

Executive Summary

The research effort underlying this report represents a comprehensive step toward identifying and understanding the key sustainability issues facing the electric power industry. EPRI is not aware of a similar level of effort having been expended for the industry to date, and the results are potentially of great value for understanding the issues that are most material to the industry and gauging the anticipated importance of these issues over the next five years.

Based on discussions with the EPRI Energy Sustainability Interest Group, and on a literature review and stakeholder interviews, 15 sustainability issues were identified as being most material to sustainability for the electric power industry. In addition, an electronic survey was completed by 134 electric power company managers and 160 stakeholders from government, investor, private sector, non-profit, environmental, and academic organizations. This survey collected more specific input related to the material issues identified during the interviews and literature review.

Survey respondents were asked why the issues are important and whether the importance of the issues would increase or decrease over time. They were also asked which measuring and reporting activities were most important and which types of organizations respondents trusted for industry-wide benchmarking, reporting, or ranking.

Electric utility and stakeholder perspectives on sustainability in this report are grouped into the "three pillars" of sustainability: environmental, social, and economic. The discussion of each of these three areas contains observations made during interviews as well as results of some of the survey questions.

Study results indicate that sustainability is a top or very high priority for more than 58% of utilities in the survey. The primary stated motivations for assigning this high level of importance include sustainability being a core value for the organization (71% of companies), the strengthening of corporate reputation (67% of companies), and the managing of regulatory or operational risk (66% of companies). The study team found strong alignment around the most fundamental sustainability concerns, not only within the industry but also among stakeholders. The level of concern about these issues varied by geographic region, stakeholder profile (agency, academic, environmental group, and so on), and utility profile (generation type, ownership, location). However, the most relevant

overall set of sustainability concerns across North America became clear in this study and are embodied in the 15 issues described in this report.

There was strong consensus that the material issues identified in this effort—especially water availability, greenhouse gas emissions, and skilled workforce availability—can be expected to grow in importance over the next five years. On the other hand, utilities and stakeholders were not in clear alignment regarding the type of organization that should lead benchmarking and sustainability reporting efforts—whether it should be the U.S. government, independent organizations, or industry associations.

It is clear that difficult tradeoffs will need to be balanced as the electric utility industry advances toward sustainability, while still meeting its core mandate of providing affordable, reliable, and safe electricity. This effort is an important first step toward establishing a shared understanding between utilities and stakeholders that can support collaboration and future positive outcomes.

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Section 1: Introduction

Background

The core mandate of electric power companies is to provide safe, reliable, and affordable power. They must do this while also addressing the three pillars of sustainability and transitioning to a more modern fleet.

Electric power companies face unique challenges and tradeoffs regarding sustainability. While adhering to their core mandate of providing safe, reliable, and affordable electric power, they must at the same time undertake the challenge of updating their operations to include innovative technologies and addressing emerging national security issues. Further, the industry must respond to challenges to improve its economic, environmental, and social sustainability performance. The challenge for electric power companies to simultaneously address the myriad of issues is indeed formidable. Figure 1-1 illustrates the three pillars of sustainability in the context of the electric power industry's core mandate.

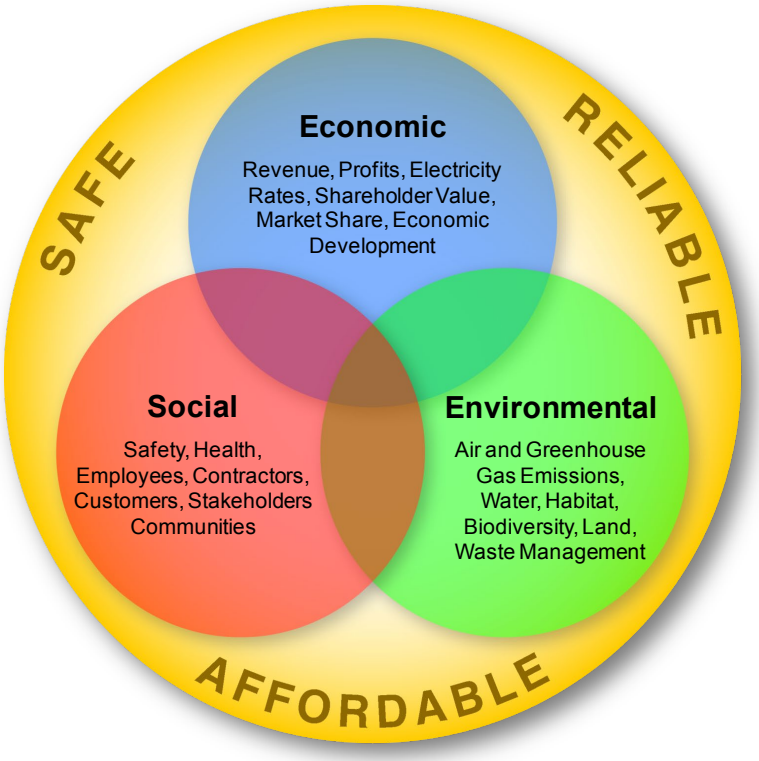

Figure 1-1
The Industry's Core Mandate and the Three Pillars of Sustainability

A lack of consensus exists on how to determine and prioritize sustainability objectives in the electric power industry.

Many electric power companies are publishing sustainability reports or otherwise including sustainability considerations in their corporate reports, on their websites, and in other corporate communications. A lack of consensus exists, however, on how to identify and prioritize sustainability objectives, how to measure sustainability performance, and how to articulate and communicate the value of these efforts to stakeholders.

The EPRI Energy Sustainability Interest Group

The EPRI Energy Sustainability Interest Group provides a collective forum for electric utilities to identify and address sustainability issues important to the electric power industry.

EPRI's Energy Sustainability Interest Group (referred to hereafter in this report as *the Interest Group*) was formed in 2008 to provide a collaborative forum for EPRI members to discuss and address issues related to sustainability. Twice-monthly webcasts and a number of workshops have provided opportunities for member companies to engage with each other and with sustainability experts throughout the world, as well as with voluntary reporting organizations such as the Global Reporting Initiative, the Carbon Disclosure Project, and others. The group has continued to expand in size and scope, and in 2012 had 35 members, primarily in the United States, with assets totaling over $800 billion. The 2012 interest group member organizations are shown in Figure 1-2, and the group's collective reach is shown in Figure 1-3.

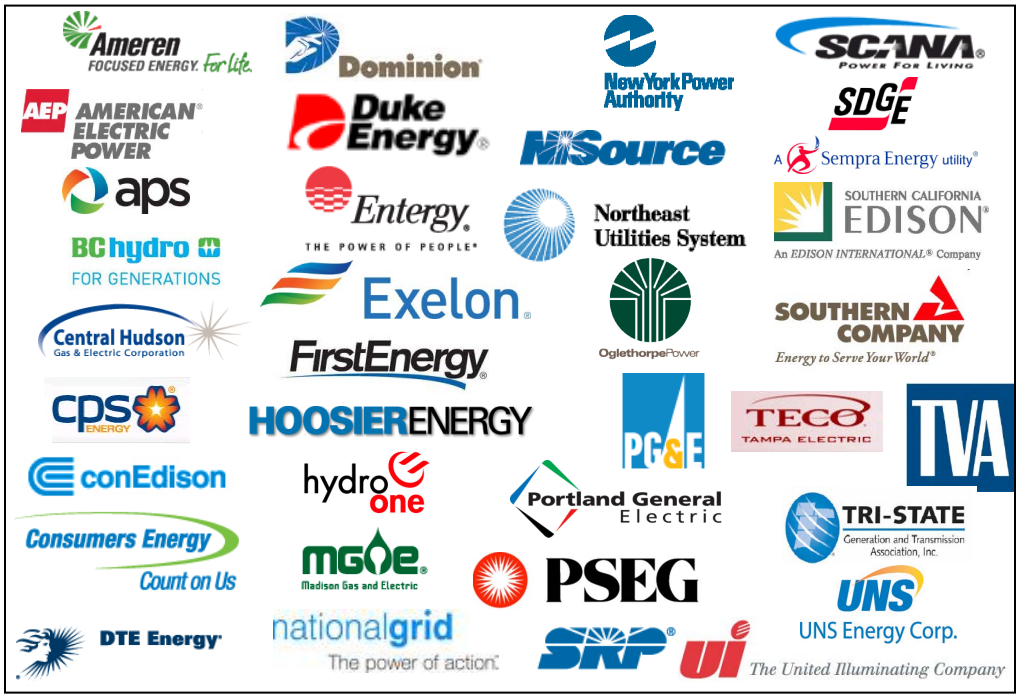

Figure 1-2
Energy Sustainability Interest Group Member Organizations in 2012

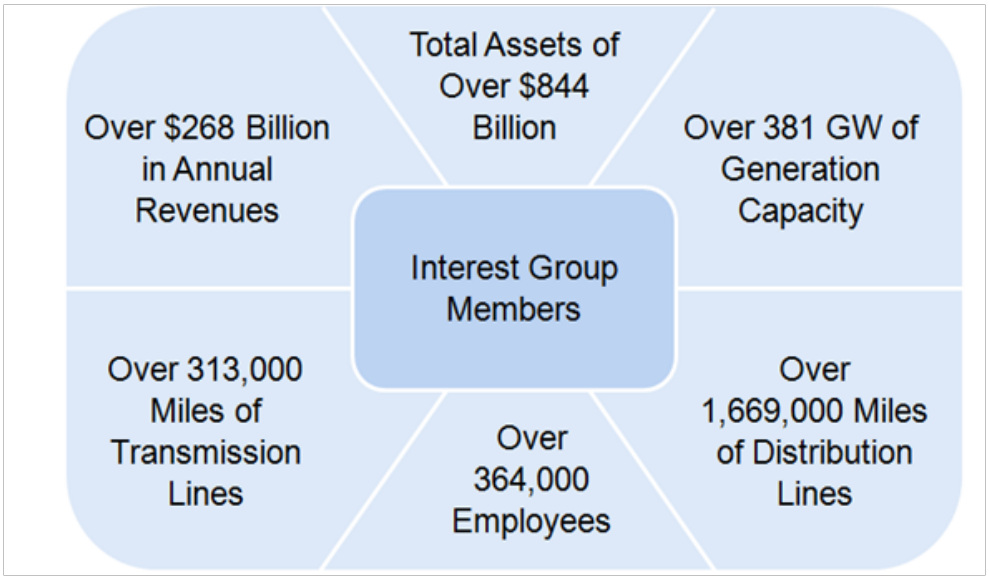

Figure 1-3
Energy Sustainability Interest Group Collective Assets in 2012

The Materiality Assessment Project

The goal of the materiality assessment project is to identify and define sustainability-related materiality issues for the electric power industry.

One of the key projects for the Interest Group in 2012 was to develop a more strategic approach to identifying sustainability priorities that are material for the electric power industry. For the purposes of this report, a "material" sustainability issue is an environmental, social, and/or economic issue that has the potential to impact the long-term viability of electric utilities and/or their stakeholders. Importantly, this is different from but related to financial materiality, which is a threshold for influencing the economic decisions of investors. Material sustainability issues reflect a wider range of stakeholders and are not limited to topics that have a significant financial impact on the organization.

The Interest Group asked EPRI to conduct an analysis assessing the relative materiality of sustainability issues for the electric power industry in the United States. The original objective of the project was to quantify the relative ranking of sustainability priorities for the industry as well as for identified stakeholders. This ranking would result in a "Materiality Matrix" that could compare the prioritization of issues between stakeholders and the industry. Through a process of utility and stakeholder interviews and through close collaboration with the Interest Group, a survey was developed and distributed broadly throughout the United States and to a few international utilities. The survey collected ranking responses for issues from both stakeholders and industry managers and attempted to show this prioritization on a single graphic with the collective industry ranking on the x-axis and the collective stakeholder ranking on the y-axis.

Due to unforeseen project design considerations, this initial attempt to rank material issues on an industry-wide basis was unable to achieve a reliable result. Although the methods used to develop a Materiality Matrix were adapted from

methods that have been successfully applied elsewhere on a company-specific basis, the approach was not appropriate for an entire industry, ultimately because the results could not be verified or validated for the entire industry. Not only was the ranking of issues within the industry difficult to verify with members of the Interest Group, we found wide variability in how stakeholders ranked issues, whether they were government organizations, customers, environmental advocacy groups, universities, or others. The study lacked the necessary methods to verify the results of both the industry and the stakeholder responses. In retrospect, it was recognized that because the ranking of material issues is inherently company specific due to local economic, social, and environmental conditions, issuing an industry-wide ranking that accurately reflects all companies and stakeholders prioritizations was not a realistic undertaking with the methods at hand. Although this initial effort did not produce reliable results in terms of an industry-level ranking of material issues, it has provided important insights into the material issues themselves, as well as valuable perspectives on achieving sustainability in the electric power industry.

The identification of key sustainability issues for the electric power industry represents an important contribution to the dialogue about the sustainability challenges facing the electric power industry. **It is important to note that all of the material issues identified in this report are considered to be high priorities for electric power companies. Further, this is simply an initial attempt to define and categorize material issues; consolidation and refinement will likely be needed going forward.**

Section 2: Materiality Assessment Approach and Methodology

Approach

The goal of the project was to identify the most relevant, material issues of sustainability for the electric power industry. A key component of the project was to gather the perspectives of electric power company managers as well as a cross-section of the major electric power industry stakeholders. The 2012 Interest Group was involved in the project at all stages. The Interest Group members provided overall guidance, and the project was discussed during webcasts and at workshops in 2012.

Methodology

Data was collected and analyzed from literature reviews as well as interviews and survey responses from electric power company staff and stakeholders.

The project methodology involved three separate activities: an extensive literature review; interviews with electric power companies, sustainability practitioners, and industry stakeholders; and an electronic survey. Interest Group members helped develop interview and survey questions, participated in interviews and took the survey, and provided stakeholder contacts.

One of the primary objectives of the literature review and the interviews was to identify the set of key material issues that are relevant to the electric power industry. The project used an approach to identifying issues that considered a "three pillars" definition of sustainability. This allowed the project team to develop a set of material sustainability issues that leveraged a definition of sustainability along environmental, social, and economic dimensions. The three research methods are discussed in more detail below.

Literature Review

The objective of the literature review was to determine which sustainability-related issues were covered most prevalently in a wide variety of publications. One of the primary sources of information was sustainability and corporate responsibility reports published by U.S., Canadian, European, and Chinese electric power companies. Other publications consulted included academic articles and reports published by government organizations, advocacy groups, think tanks, financial institutions, and industry thought leaders, including the Global Reporting Initiative, Dow Jones, the National Association for

Environmental Management, the Global Environmental Management Initiative, and the Union of Concerned Scientists. For a full list of references consulted, see Appendix D.

In addition, the project team mined information from a 2011 EPRI report entitled "Sustainability Priorities in the Electric Power Industry: What Sustainability Reports Are Communicating to the Public and Shareholders.[1]" That study reviewed how the industry portrays its sustainability priorities through corporate reporting. The project studied the corporate sustainability reports of 25 electric companies chosen based on their performance in the Dow Jones Sustainability Index (DJSI) and the Carbon Disclosure Project (CDP) and their participation in the 2011 EPRI Energy Sustainability Interest Group. The study considered key performance indicators (KPIs) as a proxy for identifying the priority issues for each company. A total of 124 unique KPIs were identified and subsequently grouped into 23 priority issues. Figure 2-1 shows the 23 priority issues and the number of companies with at least one KPI in the issue area. EPRI and its members retrospectively questioned whether using KPIs and even corporate sustainability reports was an appropriate proxy for estimating the importance of sustainability issues, given that some sustainability priorities do not have readily reportable metrics/KPIs associated with them. The effort was nonetheless extremely useful for cataloging the various issues discussed across many sustainability reports in the industry.

[1] *Sustainability Priorities in the Electric Power Industry: What Sustainability Reports Are Communicating to the Public and Shareholders*. EPRI, Palo Alto, CA: 2011. 1024556.

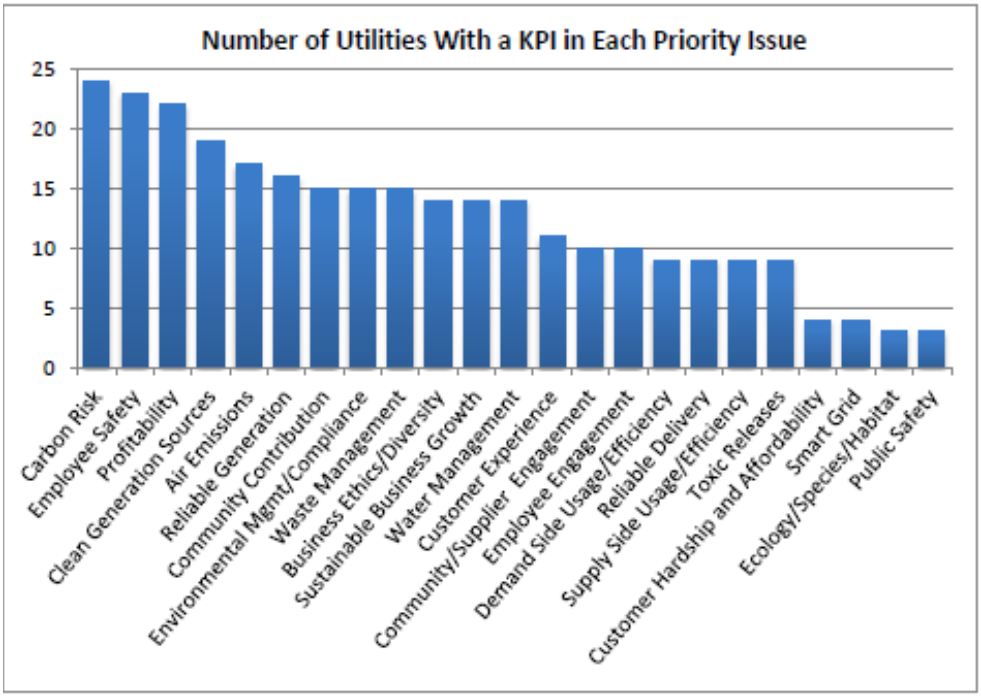

Figure 2-1
Sustainability Priority Issues Ranked by Number of Companies with a KPI in Each Issue Area (from EPRI report 1024556)

Interviews with Electric Power Companies and Stakeholders

Concurrently with the literature review, interviews were conducted with electric utilities, sustainability practitioners, and industry stakeholders. An objective of these interviews was to validate the list of material issues the project was developing and identify potential gaps. Interviews were conducted with vice presidents, directors, and other senior managers responsible for sustainability in 25 electric power companies. In addition to assessing the working list of material sustainability issues, the interviews with these individuals probed how utilities have evolved their approach to sustainability, what their highest priorities are today and why, what actions these utilities are taking with regard to material sustainability issues, how they integrate sustainability into their decision making processes, and what stakeholder groups the study should include.

Ten individuals from nine stakeholder organizations were interviewed, including one investor, two large customers (rate payers), two environmental advocacy groups, one social advocacy group, one public utility commission (PUC), one labor union, and one trade group. Interviews with the stakeholders focused on the material sustainability issues that matter to their organizations and how they believe utilities might address these material sustainability issues. While these stakeholders represent significant knowledge and experience related to sustainability and are a good cross-section of stakeholder types, it has been noted that increasing the number of stakeholder interviews would enhance the value of the research.

Validation and Synthesis of Information from the Literature Review and Interviews

Insights generated during the literature review and interviews were shared with the members of the Interest Group to validate and clarify the synthesis of the emerging observations. Once these activities were completed, the project team used the information to synthesize the list of material issues and their definitions and to develop the electronic surveys.

Electric Power Company and Stakeholder Surveys

Two unique survey instruments were developed: one for electric power companies and the other for stakeholders. The two surveys had parallel structures and involved several sets of questions. The surveys listed, and supplied definitions for, the sustainability issues that were identified based on the literature review and on the interviews with electric power companies and stakeholders.

The surveys were sent to all 112 companies participating in EPRI's Environment Sector research programs, to stakeholders identified by EPRI, and to stakeholders identified by members of the Interest Group.

The respondents were asked a series of questions about the material issues, why the issues are important, and how their importance will change over time. Respondents were also asked questions regarding reporting and transparency and which types of organizations they most trusted to lead benchmarking and reporting initiatives. More detailed information about the survey can be found in Appendix A.

Section 3: Primary Study Results

Based on interviews and a literature search, the project team synthesized and presented an aggregate list of 15 material sustainability issues cutting across the three pillars of sustainability for the electric power industry. During this effort the project team considered a significant number of issues related to sustainability tracked by electric utilities, including the 23 issues identified in the EPRI report cited previously, *Sustainability Priorities in the Electric Power Industry: What Sustainability Reports Are Communicating to the Public and Shareholders*. Some of those 23 issues were not included in the final list of 15 because they were consolidated into similar issue areas or were not consistently referenced across multiple utilities and stakeholders. A few issues, such as energy efficiency, supply chain management, and voluntary reporting, were considered to be strategies for achieving sustainability goals, rather than material issues themselves. It is possible that the resulting list of 15 issues has omissions that will need to be added in the future as challenges evolve and results of this report are discussed. Further, particular companies may have region-specific issues or priorities that are not captured by this industry-wide compilation. **Therefore, the issues included in the final list should be viewed as high-priority issues across the electric power industry during the time period of this study.**

Table 3-1 shows the 15 material sustainability issues grouped in accordance with the three pillars of sustainability. Table 3-2 contains the definitions of the 15 issues that were provided to survey respondents.

Table 3-1
Fifteen Material Sustainability Issues Grouped by Sustainability Pillars

Sustainability Pillar	Issues
Environmental	1. Greenhouse gas emissions 2. Reductions of other air emissions 3. Water quality 4. Water availability 5. Habitat protection and biodiversity 6. Waste management
Social	7. Public safety and health 8. Employee safety and health 9. Job satisfaction 10. Community support and economic development 11. Engagement and collaboration
Economic	12. Energy reliability 13. Energy affordability 14. Skilled workforce availability 15. Economic viability of electric utilities

Table 3-2
Sustainability Issue Definitions

Sustainability Issue	Definition
Greenhouse gas emissions	Reduction of greenhouse gas emissions by the electric utility industry, including CO_2, methane, and SF_6
Reductions of other air emissions	Reduction of air emissions other than greenhouse gases by the electric utility industry, including NO_x, SO_x, mercury, and particulate emissions
Water quality	Minimizing the impact of producing electricity on water quality, in terms of chemical, nutrient, and thermal pollution
Water availability	Ensuring the short- and long-term availability of water for electricity generation and all other users
Habitat protection and biodiversity	Preserving natural habitats and the species that depend upon them
Waste management	Preventing and minimizing the impact of waste generated by electric utilities on the environment and public health
Public safety and health	Preventing accidents and minimizing the impact of electricity generation, transmission, and distribution on long-term public health
Employee safety and health	Safety of employees and contractors of utilities
Job satisfaction	Maintaining a workforce that is satisfied with their work and working environment
Community support and economic development	Contributions by electric utilities to their communities through procurement decisions, philanthropy, and volunteerism
Engagement and collaboration	The value of transparency and involvement of stakeholders in the decision-making process
Energy reliability	Ensuring uninterrupted supply of electricity for all consumers
Energy affordability	Ensuring total electricity bills are at levels that are affordable for consumers
Skilled workforce availability	Maintaining a workforce with the required size and skill profile
Economic viability of utilities	Long-term financial viability of electric utilities and sustainability of the business model

Summary of Outreach Effort from Interviews and Survey

The interviews and surveys were completed primarily with sustainability managers who have a comprehensive view of their organizations, from both the utilities and stakeholder organizations. Table 3-3 provides a numerical summary of the individuals and organizations who were interviewed, who received the survey, and who responded to the survey. More detailed information about the survey response rates and segmentation can be found in Appendices B and C.

Table 3-3
Summary of Interview and Stakeholder Outreach and Response

	Electric Power Companies	Stakeholders
Interviews conducted	37 individuals in 25 organizations	10 individuals in 9 organizations
Survey sent to	112 organizations	2,250 organizations
Survey responses received from	134 individuals in 43 organizations	160 individuals in 142 organizations
Survey participation rate	38% of organizations	6% of organizations

Section 4: Perspectives on Sustainability

This section provides the perspectives of electric power companies and stakeholders on identifying, managing, and prioritizing sustainability issues, as collected through interviews and survey results.

Value of the Materiality Assessment

Before taking the survey, utility interviewees were asked how the results of the materiality assessment project would be of value to them. Some of the responses included:

- "We as an industry don't have a way to measure ourselves; therefore, everyone comes up with ways to measure us on their own. I see this effort as a way to rigorously define what the material areas and metrics are, and to then be able to measure it and report on it over time," (from a sustainability executive at a large midwestern utility).
- "There are so many priorities we are all juggling. We're really looking forward to looking at the broader network to understand what stakeholders see," (from a sustainability manager at a large western utility).
- "It would be useful in building more internal consensus to help champion important sustainability issues," (from an environmental resource manager at a large northeastern utility).
- "If we can say 'here's what all your peers are doing' and show the value of sustainability programs, then that is helpful and interesting," (from an environmental manager at a small western utility).
- "I am looking for views from peers on measurement and quantification, best practice review, and some output to understand what priorities and metrics are important and what their process should be," (from an environmental manager at a medium-sized midwestern utility).

Utilities hope the EPRI materiality assessment study will help them define sustainability priorities as well as gain insights from their peers.

Importance of Sustainability

The survey asked utility respondents how important managing sustainability is to their CEOs. Respondents had to choose one of five possible answers. Of the 134 responses, 58% indicated that sustainability was an important priority for their CEOs, as shown in Figure 4-1. It is important to note that the responses to this question were received from utility managers, not the CEOs themselves.

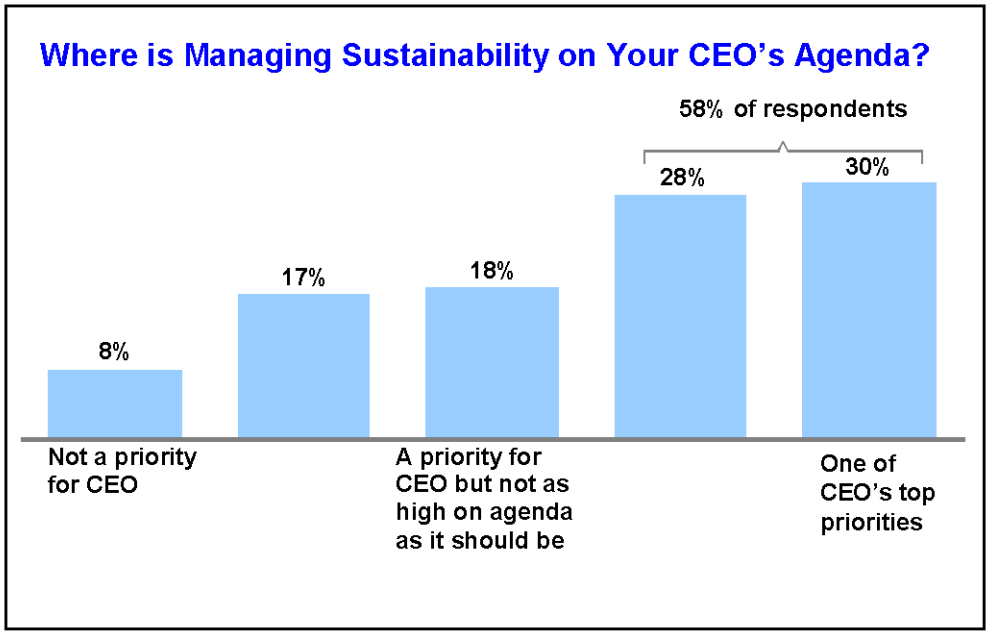

Figure 4-1
Sustainability as a Priority for CEOs

The utility survey also asked respondents to indicate why consideration of sustainability was important to their company. Respondents were given a list of six choices:

- It presents opportunities to increase revenues (by offering new products or services or by entering new markets).
- It presents opportunities to decrease costs (in operating the utility and in procurement).
- It presents opportunities to manage regulatory risk and/or operational risk.
- It presents opportunities to strengthen corporate reputation and stakeholder engagement.
- It supports our core values.
- Other.

The aggregated responses to this question are shown in Figure 4-2. Percentages shown are based on 134 responses from utility managers. The survey did not allow for the "Other" category to be further defined.

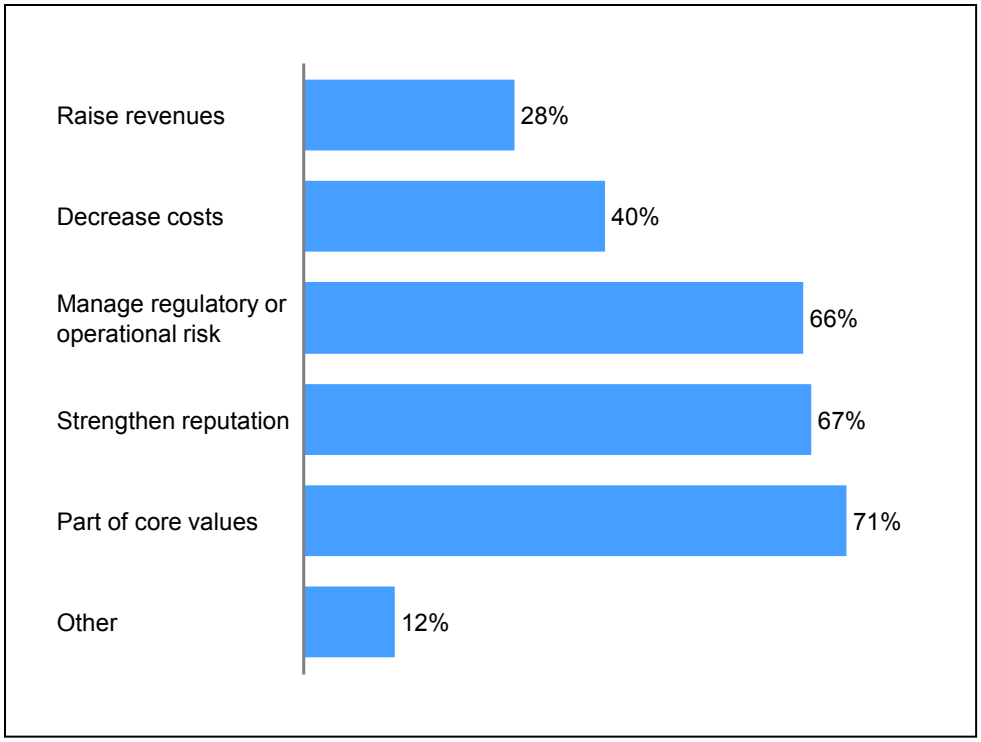

Figure 4-2
Why Utilities Value Sustainability

Perspectives Related to the Fifteen Sustainability Issues

As discussed, the fifteen issues have been grouped into the three sustainability pillars of environmental, financial, and social sustainability, as shown in Table 3-1. It should be noted that assigning some of the issues to particular categories is a somewhat subjective exercise, but for the purposes of this assessment, each issue was assigned to only one of the three pillars.

Environmental Sustainability

The importance of environmental stewardship was mentioned frequently during utility interviews.

The interviews indicate that electric power companies are committed to reducing their environmental impact for multiple reasons, including regulatory compliance, inherent concern over the environment, and to support public relations:

- "We need to be environmental stewards for future generations," (from an interviewee at a utility serving the Midwest and the Northeast).
- "All corporate decisions are framed in the context of environmental stewardship and ethical business conduct," (from a sustainability manager at a northeastern utility).

- "Environmental stewardship requires voluntarily going above and beyond environmental requirements," (from an interviewee at a small midwestern utility).
- "The value is to create a culture within the operation such that operators become the stewards for environmental issues as part of the operation. This could be seen as the goal of our program," (from a northeastern utility).
- "Environmental stewardship is about preserving assets and resources, and improving them so they can be handed on and maintained for the company for long-run profitability," (from an environmental manager at a large midwestern utility).

Environmental sustainability was also important to many of the stakeholders who were interviewed. Some of their comments include:

- "I am very concerned about environmental issues such as climate change and water," (from a large customer).
- "When it comes to sustainability, carbon is at the top of the list, as well as other pollutants including mercury, and water quality and quantity," (from an interviewee at an environmental advocacy group).
- "When I'm thinking about sustainability, I'm not thinking about the economics. I'm thinking about carbon and water," (from an environmental advocate).
- "One of the biggest issues affecting the sustainability of the industry right now is environmental regulations," (from an interviewee at a trade association).

Greenhouse Gas Emissions

Greenhouse gas emissions were an important environmental issue to both electric power companies and their stakeholders.

Reducing greenhouse gas emissions was linked to the issue of climate change for both stakeholders and utilities. It was the issue mentioned most often by stakeholders during interviews. Some of the stakeholder comments include:

- "Climate change—both mitigation and adaptation issues—is by far the most important issue for utilities," (from a large investor).
- "Climate change is the most important issue, followed by water and the reliability of electricity," (from a customer).
- "My organization has a very aggressive climate change agenda," (from a state regulator).

Electric power companies also mentioned climate change in the context of greenhouse gas emissions frequently during interviews:

- "Climate change is an area we've devoted quite a bit of time to, especially with disclosure," (from an interviewee at a large western utility).
- "Reducing our CO_2 emissions is important, and we were a member of the Chicago Climate Exchange," (from an interviewee at a midwestern utility).

- "Reducing greenhouse gases is important to my company, even though we don't burn significant amounts of coal," (from an interviewee at a northwestern electric power company).

Utilities agreed with stakeholders that reducing greenhouse gas emissions will become more important in the next five years. Interviews with utility managers found that prioritization of greenhouse gas emissions as a sustainability issue depends heavily on regulatory context. In the absence of strong climate regulation or incentives, many managers did not anticipate making proactive efforts to reduce greenhouse gas emissions. They expressed interest in gauging regulators' attitudes because of the uncertainty around how climate policy poses regulatory risk.

The survey results show that an electric utility's focus on reducing greenhouse gas emissions varied by geography and power generation portfolio. Companies in the Northeast and West placed slightly more emphasis on greenhouse gas reduction than did companies in the South and Midwest.

The interviews also suggest that many stakeholders believe that electric power companies should be focusing more heavily on renewable power generation to help reduce greenhouse gas emissions. Electric power companies more frequently mentioned shifting toward nuclear power and pursuing activities that would reduce emissions in their current generation portfolios, especially supporting R&D to reduce emissions of fossil-fuel power generation, participating in carbon credit markets, and increasing the energy efficiency of current operations.

Water Availability

Water availability is the issue expected to increase the most in relative importance, compared to any other material issue, over the next five years.

Water availability was another environmental issue that was commented on frequently by both stakeholders and utilities. One stakeholder from an environmental advocacy organization commented that "water is an issue both in terms of quality and quantity. We are looking at conflicts and avoidance of water/energy collisions and how the water supply demand picture will change over time."

Utility interviews included the following general comments:

- "Water is becoming a huge issue. I think we are beginning to realize the importance of the water/energy nexus as an industry," (from an interviewee at a large midwestern utility).
- "Water availability is an issue for us—we have done three years of reporting to the Carbon Disclosure Project related to water," (from an interviewee at a western electric power company).
- "Water conservation is becoming increasingly important," (from an interviewee at a southwest utility).

Perhaps more than any other issue, water availability is a local issue. In some regions drought conditions can threaten electricity production. At the same time,

the Great Lakes region and the Ohio River Basin enjoy high availability of fresh water. Notably, more than any other issue in the survey, stakeholders and the industry expect water availability to grow in importance over the next five years.

Other Environmental Issues

Air emissions other than greenhouse gases were mentioned in interviews primarily in a regulatory context, which is not surprising considering that the electric power industry has faced increasingly stringent emissions regulations over the last several decades.

Water quality, habitat protection, and waste management were also mentioned frequently as being important, during both utility and stakeholder interviews.

Social and Economic Sustainability

Social and economic issues were frequently mentioned together during the interviews. It was not possible to draw a clear line between these two pillars during the interview or through survey input. Input on social and economic issues is therefore combined here into one discussion.

Safety—for both the public and employees—is an extremely high priority for electric power companies.

Of the social sustainability issues, two were clearly most important based on the interviews: 1) employee safety and health and 2) public safety and health. Some of the comments on these two issues include:

- "Our highest priority is safety and health for employees, contractors, and the public," (from a sustainability manager at a large midwestern utility).
- "Public and employee safety is our highest priority," (from a sustainability manager at a large western electric power company).
- "Safety is a basic part of our operations, but more recently it's been thought of as a sustainability issue," (from an interviewee at a large southern electric power company).

Community support and economic development was mentioned frequently during utility interviews.

The other social issue mentioned most frequently in utility interviews was community support and economic development:

- "We want to be a strategic partner in building communities," (from an interviewee at a medium-sized northeastern utility).
- "One of our priorities is community health and environmental justice: where our plants are located, how many jobs are being created, educational opportunities, unemployment rate, high school graduation rate," (from a manager of corporate sustainability at a large northeastern utility).
- "We try to invest in smaller, women-owned, minority-owned local suppliers," (from a sustainability manager at a large western utility).

Job satisfaction for employees and engagement and collaboration with stakeholders was mentioned occasionally in interviews with electric power

company employees, but not as frequently as safety and health or as frequently as community support and economic development.

All four issues that fall under economic sustainability—energy reliability, energy affordability, skilled workforce availability, and the economic viability of electric utilities—are considered to be high priorities for electric power companies, as discussed below. The economic issues that were mentioned most frequently in utility interviews were electricity reliability and affordability, although these issues were frequently linked with safety:

Electric power company interviewees frequently linked energy affordability and reliability with safety.

- "The challenge as a utility is in finding the right balance between safe, reliable, and resilient," (from an executive in charge of corporate strategy and environmental affairs at a northeastern utility).
- "The fundamentals of the business are safe, reliable, and affordable gas and electricity. We start there," (from a sustainability manager at a large western utility).
- "As a cooperative, responsibility is about safety, reliability, and affordability," (from an environmental manager at a midwestern cooperative).

Challenges mentioned in the interviews were the investments needed in grid reliability to ensure affordability and the potential impact of environmental regulations on affordability and reliability.

Electricity reliability was frequently mentioned by stakeholders.

Reliability was also mentioned frequently in stakeholder interviews:

- "Reliability is extremely high on our list of priorities. Even though the source of electricity is reliable, grid problems are becoming apparent as the infrastructure is put under strain," (from a large customer).
- "Reliability, reliability, reliability are first, second, and third. That's all people care about," (from a large labor union).

The issue of affordability generated less consensus. Utilities and the private sector almost universally identified it as a core concern; government agencies and social non-profits suggested it as lower in importance; and environmental groups and academics put much less emphasis on maintaining current energy costs. This may reflect an opinion voiced in several stakeholder interviews that the current price charged for electricity does not capture the social and environmental costs associated with power consumption. Of course, affordability does not equate to low rates, as customer energy efficiency can have a substantial impact on lowering overall electricity bills, even at higher rates. As one California utility manager said, "Our rates may be higher [than in other parts of the country], but our bills are lower."

Skilled workforce availability was often mentioned in utility interviews. Many utility executives expressed concern about the industry's high level of retirement-eligible employees and highlighted the importance of programs to build the pipeline of skilled, job-ready workers:

The availability of a skilled workforce is a high priority for utilities, and some also mentioned the importance of a diverse workforce.

- "We are focusing on workforce development to ensure that the right skills are in place, and that we are prepared for industry changes," (from an interviewee at a large midwestern utility).
- "We need a steady pipeline of people going into these jobs. We are working with a lot of community colleges, jobs boards, and other stakeholders to train people for jobs in this sector," (from an interviewee at a large western utility).

The private sector and social non-profits also said that this issue was important for electric utilities to address. One interviewee from a large labor union noted, "You're replacing people with 40 years of experience with people just coming in the door. In the past you always had a pipeline and the system was in balance. But there was a long period—up to 10 years in some companies—where there was no hiring, so that creates a huge gap."

The economic viability of electric utilities is being challenged by reduced demand for electricity and the cost of complying with environmental regulations.

In recent years the economic viability of electric utilities has become a growing concern for many in the industry. National demand for electricity has flattened, due to the slow economic recovery and greater energy efficiency. At the same time, mounting interest in distributed generation could disrupt the basic economic model for financing the transmission and distribution infrastructure. Many utility executives also expressed concern about the potential impact of environmental regulations under consideration:

- "We are in an unprecedented era of regulation, potentially threatening the future use of our generation resources," (from a sustainability manager in a rural electric cooperative).
- "What do we do about coal? What kind of capital are we willing to spend to maintain these plants? Is this a sustainability decision or an economic decision? If you anticipate the regulatory changes to come, the sustainability issues become an economic issue," (from an interviewee at a large southern utility).

Utilities also showed interest in making more fundamental changes to their revenue model, including real-time pricing and "decoupling" of sales and revenue. *Decoupling* refers to a rate adjustment mechanism that separates ("decouples") a utility's fixed cost recovery from the amount of electricity it sells. While decoupling has existed in several states for decades and has seen wider adoption recently, many places have not yet embraced the concept. In interviews, both utility executives and environmental groups emphasized the importance of aligning utilities' incentives with energy efficiency programs in order to realize the fullest benefit from those programs.

Expected Trends in Importance of Issues

There are three issues that are expected to increase in importance over the next five years more than all other issues for both utilities and stakeholders: water availability (overall the issue expected to increase most in importance), greenhouse gas emissions, and skilled workforce availability. Several utility executives expressed concern in interviews that the ongoing drought and recent legislative debates on carbon controls could affect their businesses substantially in

Water availability, greenhouse gas emissions, and skilled workforce availability are the issues expected to increase most in importance.

the near future. Only one issue, waste management, was expected to decrease in importance, and that opinion was expressed by stakeholders but not by utilities, who expected the issue to grow slightly in importance. The responses to this question in the survey are shown in Figure 4-3.

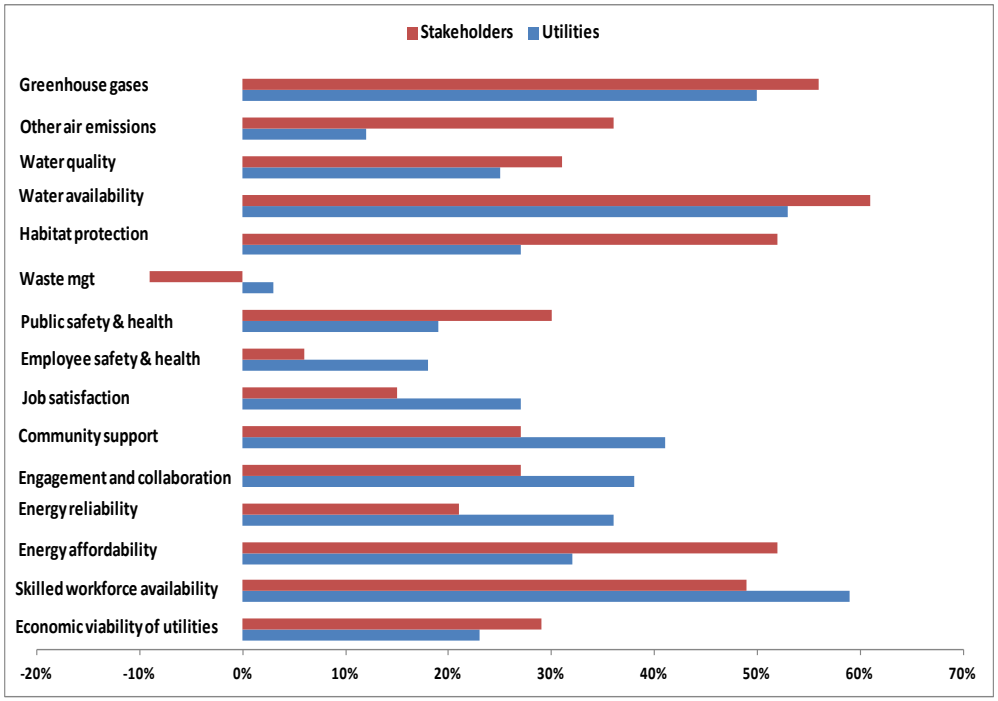

Figure 4-3
Percentage of Survey Respondents Who Expect Issue to Increase in Importance Over the Next Five Years

Transparency and Reporting

Utility and stakeholders were strongly aligned on the most important aspects of sustainability reporting.

Both surveys asked a series of questions about which reporting and transparency activities and behaviors were important. Utilities and stakeholders were very well aligned in this area. The top six activities for both groups are shown in Table 4-1.

Table 4-1
Top Six Reporting or Metric Activities for Utilities and Stakeholders

Reporting or Metric Activity	% of Respondents Agreeing	
	Utilities	Stakeholders
Report metrics in terms of trends (i.e., current data displayed with previous years' data)	86%	90%
Report metrics in simple and brief terms in order to make them accessible and understandable to laypersons	89%	88%
Self-reported metrics should be easily benchmarked against peers	88%	85%
Publicly set goals on sustainability metrics and report progress on these tracks	77%	87%
Report metrics in terms of the total impact (absolute values)	54%	66%
Report on the environmental and social impact of their customers (customer energy use, for example)	50%	65%

Results from a question about which types of organizations are trusted the most for leading benchmarking, reporting, and/or ranking initiatives yielded different opinions from utilities and stakeholders, as shown in Table 4-2.

Table 4-2
Trust in Types of Organizations Leading Benchmarking and Reporting Initiatives

Type of Organization	Utilities	Stakeholders
Industry associations	42%	20%
Government	21%	32%
Independent organizations (non-profit or other private organizations)	37%	48%

Electric power companies were also asked to evaluate the resources their organizations invest in the reporting and communication of sustainability-related metrics. Although approximately half of respondents believe their organizations invest the right amount of resources, over 40% believe their organizations should invest more. The responses to this question are shown in Table 4-3.

Table 4-3
Evaluation of Resources Spent Reporting and Communicating Sustainability-Related Metrics

Description of Resources Invested	Responses
We invest ***too many*** resources on sustainability reporting and communication	4%
We invest ***just the right amount*** of resources on sustainability reporting and communication	55%
We ***don't invest enough*** resources on sustainability reporting and communication	41%

Section 5: The Challenge of Balancing Goals

There is a fundamental challenge in meeting sustainability targets in the electric power industry. The industry provides a critical service that we in the modern world depend on for our livelihoods, education, and health. Without a dependable supply of electricity that is safe to use and widely affordable, we would not be able to continue our modern way of life. It is critical to recognize the difficult tradeoffs that utilities face in meeting layers of complex goals. The interview and survey results pointed to these challenges.

Utility managers frequently noted the balancing act required in prioritizing environmental issues with other high-priority issues.

Several interviews with utility managers and stakeholders highlighted a tradeoff between energy reliability and affordability on the one hand, and environmental issues, such as greenhouse gas emissions, on the other. Some utility managers acknowledged that when environmental objectives clash with affordability or reliability, their decisions are primarily driven by regulatory compliance and their mandate to provide safe, affordable, and reliable electricity. In addition, activities to reduce greenhouse gas emissions or water impacts, especially activities involving renewable technologies or closed-cycle cooling, would require substantial utility investments, perhaps increasing overall costs. A sampling of comments from utility managers illustrates these challenges:

- "There is a tight-wire act between environmental concerns, customers, employees, and financial obligations," (from a northeastern utility).
- "At the end of the day, if we are not delivering safe, affordable, and reliable electricity, nothing else matters," (from a west coast utility).
- "We try to apply a sustainability filter. It's about getting the right balances and asking the right questions, as well as facing the tradeoffs between our own economic viability, customer prices, and our environmental footprint," (from a sustainability manager at a large southern utility).

Section 6: Scope and Limitations

The scope and limitations of this research need to be considered in order to appropriately apply the results.

This effort to examine sustainability material issues in the electric power industry is an initial step in informing utilities and stakeholders on each other's priorities as all groups wrestle with defining and advancing a collective goal. It will serve as a basis for discussions that can make it easier to understand and reconcile different points of view. However, there are inherent limitations of this effort that need to be fully considered before the results are utilized for strategic planning, as follows:

1. The interview and survey responses represent a snapshot of a diverse set of opinions from a limited number of individuals working in electric power companies or in organizations that can be considered stakeholders of the electric power industry. Although some questions asked respondents to express opinions about their organization's viewpoints and priorities, the responses may not have been reviewed or verified by the organizations with which these individuals are affiliated. The opinions expressed should therefore be construed as individual opinions and not necessarily representative of an entire organization.

2. The results are limited to the time period of the project. Interviews were conducted during July through September of 2012, and the electronic survey was open for three weeks in October of 2012. Opinions expressed were likely influenced by the social, political, economic, and environmental conditions during the project period. Different opinions might have been expressed, for example, if the survey had been executed after a major storm event, political election, or national crisis.

3. The survey and interviews focused on operations in the United States and parts of Canada. The results of this study may not apply internationally.

4. Those who responded to the survey may not be an accurate cross section of either the industry or stakeholders in the United States. Details on the respondents are provided in Appendix B and C.

5. The survey respondents did not receive any information in advance about the survey questions, and with the exception of the definitions of the 15 material issues, the survey did not provide any other clarifying information.

6. This effort identified the “material issues,” not the “actions” to achieve progress. For example, energy efficiency is not listed as a material issue, because it is a strategy for addressing greenhouse gas emissions, affordability, and other issues. Similarly, supply chain management and optimization is a means to address an issue, rather than an issue itself.

Section 7: Conclusions

This report documents a first comprehensive attempt to identify, categorize, and define material issues related to sustainability in the electric power industry. Indeed, it is a challenge to simplify an overwhelmingly complex topic into its most basic and relevant issues. While many individual issues and actions were reviewed and discussed during the course of this effort, the project team was able to consolidate the list into the top 15 most material issues and organize them under three aspects of sustainability: social, economic, and environmental.

Refinements and improvements in this analysis are expected and welcome, especially as the industry and stakeholders develop a shared understanding and collective acknowledgement of the tradeoffs at hand and work together to prioritize actions. Based on this research, it is clear that a one-size-fits-all approach does not apply to this industry. Consideration for regional, social, and organizational variability needs to be included as we collectively achieve goals. While there is still much collaboration and research needed to identify actions and achieve targets, this first step to clarify the material issues will provide strong foundations for future work.

Next Steps

EPRI will continue working with the Energy Sustainability Interest Group to advance understanding of the material issues, refine definitions of the issues, and develop specific, balanced, and measurable strategies. As part of the 2012 survey, both utility and stakeholder respondents were queried as to the possible activities and actions that could be taken to address the material issues. EPRI will continue to work with this input to advance the understanding of material issues in the industry and the specific actions that can be integrated into corporate sustainability strategies.

Appendix A: Detailed Survey Information

Survey Timing and Structure

The electronic survey was open between October 2 and October 23, 2012. Potential survey respondents were sent an e-mail inviting them to participate in an electronic survey.

Respondents were given a list of the 15 issues described earlier in the report, were asked to rank them as being of above average importance, average importance, or below average importance, and then were asked a series of questions based on the five issues they ranked as being of above average importance. (As discussed earlier, the results of the actual ranking effort itself did not produce reliable results and therefore were not included as part of this publication.)

Utility respondents were asked to identify why their top five issues were important to their companies. Respondents of both surveys were asked whether the importance of their top five issues will decrease, increase, or stay the same over the next five years.

Respondents were then asked to identify the most important activities electric power companies could take to address the five sustainability issues they rated as above average in importance. These had to be activities that utilities could undertake directly, not activities led by regulators, lawmakers, consumers, or others. The surveys identified 145 activities across the issues and asked respondents to rate them as having "above average potential," "average potential," or "below average potential" for addressing the issue. Each survey respondent selected from a list of 5–15 activities for each of his or her "above average" issues. For instance, the 15 activities listed for greenhouse gas reduction involved supporting technology R&D; adjusting the power generation portfolio; adapting the electricity grid to better accommodate renewable power; reducing fluctuations in energy demand; participating in market-based systems; and increasing energy efficiency. The results of the questions regarding activities are anticipated to be included in a separate EPRI report.

Next, questions were asked about the providing of publicly available sustainability reports, goals, and metrics; the specificity of metrics used and reported; and whether metrics should be reported in terms of trends and in ways that allow comparisons or benchmarking with other utilities. Another question asked which types of organizations respondents trusted for industry-wide benchmarking,

reporting, or ranking. The choices were industry associations; government; independent organizations (non-profit or other private organizations); or other, with an option to list the other type of organization. Respondents could choose all that applied.

Finally, information was collected on respondent organizations so that the responses could be segmented:

- For utilities, questions covered ownership structure (investor-owned vs. public or cooperative), region, generation portfolio, size, activity (generation, retail, T&D only, and so on) and regulatory environment.
- For stakeholders, questions covered type of organization (rate regulator, environmental regulator, advocacy group, customer or customer group, labor union, supplier, or academic/technician), scope (national or regional/local), size (number of employees), and attitude toward the electric power industry.

Survey Recipients

The electric power company survey was sent to the 112 electric power companies that participate in EPRI's Environment Sector, which includes 18 of the 20 largest electric utilities in North America (based on the number of customers served by the holding company representing the utility). Survey recipients were managers in several areas of electric power companies, including finance, operations, and sustainability or environmental roles. The companies that are members of the Interest Group also provided names of individuals in their organizations who should receive the survey.

Two major sources for potential participants in the stakeholder survey were identified:

- Participating utilities' contacts at organizations that influence their decisions. These included large rate payers, environmental advocacy organizations, regulatory agencies, academic organizations, and others.
- Contacts collected by EPRI through its research programs.

Utilities referred the majority of stakeholder respondents to the survey. This is appropriate to the survey objective of understanding the perspectives of the stakeholders that most influence utilities' decisions, but it means that the survey should not be misconstrued as representing the views of the general public or any specific group of experts. The stakeholder survey was sent to over 2,250 organizations with different interests, including government and regulators, the private sector, social and other non-profits, environmental advocacy groups, and academics.

134 survey responses were received from 43 electric power companies.

Electric Power Company Response Rate and Segmentation

In all, 134 responses were received from 43 electric power companies, with an average of three responses per company. The breakdown by company type of these responses is shown in Table A-1. When the survey data was analyzed, the

electric power company responses were weighted by number of customers served. For additional detail on electric power company respondents, see Appendix B.

Table A-1
Breakdown of Utility Responses

Type of Company	**Number of Companies**
Investor-owned utilities	29
Public/municipal utilities	9
Cooperative utilities	5
Responses by Role	**Number of Responses**
Operations	27
Sustainability or corporate social responsibility	66
Finance	5
Communications/community relations	8
Planning/strategy/policy/senior management	14
Other	14
Responses by Region (Some utilities counted in multiple regions)	**Number of Utilities**
West	43
South	48
Midwest	55
Northeast	20
Aggregate Capacity Represented	**Megawatts**
Coal	183,603
Natural gas	186,178
Nuclear	81,421
Hydro	46,635

Stakeholder Response Rate and Segmentation

160 survey responses were received from 142 stakeholder organizations.

In all, 160 responses were received from 142 stakeholder groups. The stakeholder groups were divided into four categories. A breakdown by category, indicating the types of organizations represented and the number of responses, is shown in Table A-2. For additional detail on electric power company respondents, see Appendix C.

Table A-2
Stakeholder Organizations and Numbers Responding

Category	Number of Organizations	Types of Organizations
Government agencies	29	• Public utility commissions • Environmental regulators • Other local government
Private sector	38	• Suppliers • Customers • Investors
Non-profits	41	• Social advocacy groups • Labor unions • Other non-profit
Environmentalists and academics	34	• Environmentalists • Academics

Response Segmentation Based on Geographical Region

To explore regional variations, the U.S. Census Bureau's division of the United States into four regions (West, South, Midwest, and Northeast) was used. Since only a few respondents were from Canadian utilities, these responses were allocated to the nearest U.S. region.

Appendix B: Participating Utilities

Utility Names
1. Alliant Energy
2. Ameren
3. American Electric Power
4. Basin Electric Power Coop
5. BC Hydro
6. Black Hills Corp.
7. Central Hudson Gas & Electric Corp.
8. Consolidated Edison, Inc.
9. Consumers Energy
10. Dairyland Power Cooperative
11. Dominion Resources, Inc.
12. DTE Energy
13. Duke Energy Corp.
14. Entergy
15. Eugene Water & Electric Board
16. Exelon Corporation
17. FirstEnergy
18. Great River Energy
19. Gulf Power Co.
20. Hoosier Energy Rural Electric Coop., Inc
21. Hydro One Networks, Inc.
22. JEA
23. Madison Gas & Electric Co.
24. National Grid (N.A. assets)
25. New York Power Authority
26. NextEra Energy Inc.
27. Northeast Utilities

Utility Names
28. Northern Indiana Public Service Co. (NIPSCo)
29. Oglethorpe Power Corp.
30. Omaha Public Power District
31. Pacific Gas & Electric Co.
32. PNM Resources
33. Portland General Electric Co.
34. Salt River Project
35. San Diego Gas & Electric Co.
36. Southern California Edison Co. (SCE)
37. Southern Company (Gulf Power Co. responses counted separately)
38. Tampa Electric Co.
39. Tennessee Valley Authority (TVA)
40. Tucson Electric Power Co.
41. United Illuminating Company
42. We Energies
43. Western Area Power Administration

Appendix C: Stakeholder Respondent Profiles

Stakeholder Segments

Stakeholder Segments	Responses
Government	**29**
Public utility commissions	3
Environmental regulators	16
Other government	10
Private sector	**38**
Suppliers	13
Fuel	1
Non-fuel	12
Customers	19
Investors	6
"Socially responsible" investors	4
Other investors	2
Environmental advocates and academics	**34**
Environmental advocacy	20
Academics	14
Other non-profit	**41**
Social advocacy	5
Unions	12
Other non-profit	24
Total	**142**

Scope of Stakeholder Organizations

Scope of Stakeholders	Responses
International	29
National	22
Regional	21
State	36
County/Municipal	34
Total	**142**

List of Participating Stakeholder Organizations

Stakeholder Organization Names
1. Adams REC
2. Applied Materials
3. Aquinas College
4. AREVA Inc.
5. Arizona Department of Water Resources
6. Arizona Investment Council
7. Arizona Municipal Water Users Association
8. Bank of America
9. BayCare Health System
10. BCBC
11. Birds of Prey
12. Black & Veatch
13. Black Hills Power
14. Boys & Girls Clubs of Fresno County
15. California Department of Fish and Game
16. California Institute of Technology
17. California Public Utilities Commission
18. CalPERS
19. Calvert Investments
20. CARB
21. Cardno JFNew
22. Carnegie Mellon University
23. Catalyst Paper
24. CBRE

Stakeholder Organization Names
25. Ceres
26. CH2M HILL
27. Chesapeake Bay Foundation
28. Citi
29. City of Charlotte
30. City of Plant City, Florida
31. Clean Air Partners
32. Community Foundation for Southeast Michigan
33. Conservation Resource Alliance
34. Corporate Wetlands Restoration Partnership
35. Council of Great Lakes Industries
36. County Soil & Water Conservation District
37. Cranbrook Institute of Science
38. Detroit Audubon Society
39. Detroit Regional Chamber
40. DNV KEMA Energy and Sustainability
41. DOST
42. EA Engineering
43. EartH2O
44. Earthmind
45. Ecological Society of America
46. Ecosphere Environmental Services
47. EN3 Professionals, LLC
48. Environmental Defense Fund
49. Ford Motor Co
50. Forest Trends
51. Fort McDowell Environmental Department
52. Gammage & Burnham Law Firm
53. General Dynamics
54. Grand Valley State University
55. Habitat for Humanity Greater San Francisco
56. International Brotherhood of Electrical Workers (IBEW) 57. IBEW Local 2 58. IBEW Local 457 59. IBEW Local 702

Stakeholder Organization Names
60. IBEW Local 703 61. IBEW Local 852 62. IBEW Local 238 63. IBEW Local 649 64. IBEW Local 66
65. ICF International
66. Ingersoll Rand
67. Iowa Utilities Board
68. Kentucky Waterways Alliance
69. Logan County Soil and Water Conservation District
70. Lowe's
71. Marshall University College of Science
72. Maryland Department of Agriculture
73. McCormick Taylor Inc.
74. Metropolitan Washington Council of Governments, Department of Environmental Programs
75. Michigan Department of Environmental Quality
76. Michigan Nature Association
77. Michigan Sea Grant
78. Michigan Townships Association
79. Midwest Coalition for Responsible Investment
80. Mitsubishi Corporation
81. Monroe Bank and Trust
82. MorningSide Community Organization
83. Nana
84. Natural Resources Defense Council
85. Nortown Community Development Corporation
86. Ohio EPA
87. Ohio River Foundation
88. Ohio University Russ College of Engineering – Civil Engineering
89. Oregon Environmental Council
90. Oregon Home Builders Association
91. ORSANCO
92. Pax World
93. Pima Association of Governments
94. Portland Business Alliance

Stakeholder Organization Names
95. Public Service Company of Colorado
96. PwC
97. Quebec Government
98. Raytheon Company
99. Resource Conservation and Forestry
100. Restoration Systems, LLC
101. Rocky Mountain Institute
102. Sandia National Laboratories
103. School District of Hillsborough County (Florida)
104. Sierra Club Michigan Chapter
105. SmartPower
106. Southeast Michigan Land Conservancy
107. Southern Illinois University Carbondale
108. Southwest Detroit Environmental Vision
109. Southwest Energy Efficiency Project
110. Southwire Company
111. State Agency, Minnesota
112. Sustainalytics
113. Tampa Palms Community Development District
114. Target Rock Advisors
115. THAW
116. The Climate Registry
117. The Greening of Detroit
118. The Nature Conservancy
119. The Okonite Company, Inc.
120. U.S. EPA 121. U.S. EPA, Region 10 122. U.S. EPA, Region 4
123. UCI Environmental Accountability
124. University of California, Santa Barbara
125. University of California
126. University of California, San Diego
127. University of Maryland
128. U.S. Forest Service, Research & Development Branch
129. U.S. Department of Agriculture – NRCS

Stakeholder Organization Names
130. Utah Association of Conservation Districts
131. Vulcan Materials Company
132. Wake Forest University
133. Warren/Conner Development Coalition
134. West Virginia Public Service Commission
135. Westar Energy Inc.
136. Western Resource Advocates
137. Wildlife Habitat Council
138. Wilson Company
139. Winrock International
140. Wisconsin Department of Natural Resources
141. Yale University
142. YMCA of Greater Toledo

Appendix D: Bibliography

1. AEP, "Transition: Accountability. Performance," *2012 Corporate Accountability Report*.

2. K. Averyt, J. Fisher, A. Huber-Lee, A. Lewis, J. Macknick, N. Madden, J. Rogers, and S. Tellinghuisen, *Freshwater Use by U.S. Power Plants: Electricity's Thirst for a Precious Resource.* Union of Concerned Scientists, Cambridge, MA, 2011.

3. R. Cavanagh and J. Howat. "Finding Common Ground Between Consumer and Environmental Advocates." ElectricityPolicy.com, 2012.

4. ConEdison, *2011 Sustainability Report*. ConEdison, 2011.

5. J. Creyts, A. Derkach, P. Farese, H. Granade, S. Nyquist, and K. Ostrowski, "Unlocking Energy Efficiency in the U.S. Economy." McKinsey & Company, 2009.

6. *Direct Energy Corporate Responsibility Highlight Report*. Direct Energy, 2011.

7. Dow Jones Sustainability Indices, "The Dow Jones Sustainability World Index Guide." Zurich: S&P Dow Jones Indices and SAM Indices, 2012.

8. *Duke Energy 2011-2012 Sustainability Report*. Duke Energy, 2012.

9. Entergy, "Measuring Our Progress. Economic, Environmental and Social Performance," *2011 Sustainability Report*. Entergy Corporation, 2012.

10. E.ON, *2011 Sustainability Report*. E.ON, 2012.

11. *Essent Corporate Responsibility Report 2011*. Essent, 2012.

12. Exelon Corporation, "Creating Value in Competitive Markets," *2011 Sustainability Report*. Exelon, 2012.

13. FirstEnergy, "Dedicated to Making a Positive Difference in Our Region's Quality of Life," *FirstEnergy Sustainability Report*. FirstEnergy, 2012.

14. Global Environmental Management Initiative, "Metrics Navigator." Washington, D.C., 2007.

15. Global Reporting Initiative, "Sustainability Reporting Guidelines & Electric Utilities Sector Supplement." Amsterdam, 2009.

16. GlobeScan and SustainAbility, "Global Expert Perspectives on the State of Sustainable Development," a presentation for the Regeneration Roadmap Initiative. Rio de Janeiro, June 15, 2012.

17. Integrys, "Real Differences," *Environmental Performance Report 2010*. Integrys, 2011.

18. Hawaiian Electric Company, *2011 Corporate Sustainability Report*. HECO, 2012.

19. Hydro Quebec, *Sustainability Report 2011*. Hydro Quebec, 2012.

20. The National Association for Environmental Management (NAEM), "Identifying Corporate EHS and Sustainability Metrics: What Companies are Tracking and Why," a report of the "Green Metrics That Matter" research initiative. Washington, D.C., 2011.

21. NextEra Energy, *Corporate Responsibility Report*. NextEra Energy, 2012.

22. NRG, "Sowing the Seeds of Sustainability," *NRG 2010 Corporate Responsibility Report*. NRG, 2011.

23. Pacific Gas and Electric, "PG&E's Sustainability Journey: Building a Stronger Foundation for the Future," *2011 Corporate Responsibility and Sustainability Report.* PG&E, 2012.

24. Roberts Environmental Center, Claremont McKenna College, "2011 Sustainability Reporting of the World's Largest Energy and Utilities Companies." Pacific Sustainability Index Scores: A Benchmarking Tool for Online Sustainability Reporting. Roberts Environmental Center, 2012.

25. R. Rudden and K. Rudden, "The Case for Sustainable Utility Investing." Target Rock Advisors, Hauppauge, NY, 2012.

26. Sempra Energy, "Listen, Plan, Act," *A Corporate Sustainability Report by Sempra Energy*, 2012.

27. F. Small and L. Frantzis, "The 21st Century Electric Utility: Positioning for a Low-Carbon Future." CERES, Boston, MA, 2010.

28. Southern Company, "Taking Action: Southern Company and Greenhouse Gases," 2012.

29. State Grid Corporation of China, *2010 Corporate Sustainability Report*. State Grid, 2011.

30. Tennessee Valley Authority, "Environmental Policy," 2008.

31. Tennessee Valley Authority, "2010 Review of TVA's 2008 Environmental Policy."

32. Tennessee Valley Authority, "FY2010 OMB Scorecard on Sustainability/Energy."

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