

A Smarter Energy Future



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Background and Methodology

BloombergBusinessweekResearchServices(BBWRS) launched a research program in September and October 2010 to determine the attitudes and opinions of energy industry executives and stakeholders with regard to the generation, distribution, and usage of global energy resources. The research program was designed to understand the future of the energy market and to evaluate opportunities and barriers that exist in adopting new energy technologies.

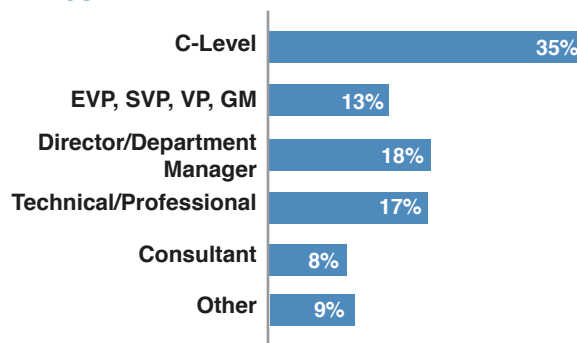
This white paper, “A Smarter Energy Future” reviews a portion of the research and provides analysis and insights on the topic of energy efficiency and the future of renewable energy. It is part of a series of white papers for C-level executives intended to facilitate sharing of the most important insights from the research.

The research program is an online survey of senior executives at leading large and midsize companies who are involved in the energy industry. These industry stakeholders include: energy producers (renewable/non-renewable), distributors, end users, consultants, and government/NGO officials working in energy policy. Overall, a total of 486 energy industry stakeholders across the globe were surveyed in this research program.

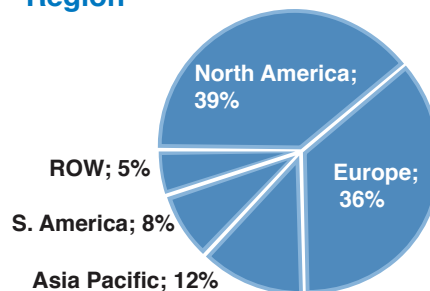
This research project was funded by a grant from ABB and was performed by Bloomberg Businessweek Research Services. The editorial department of Bloomberg Businessweek was not involved in this project. For more information about this project, please contact Bloomberg Businessweek Research Services at sgager@bloomberg.net.

To learn more about this research program, please visit: www.abb.com/betterworld

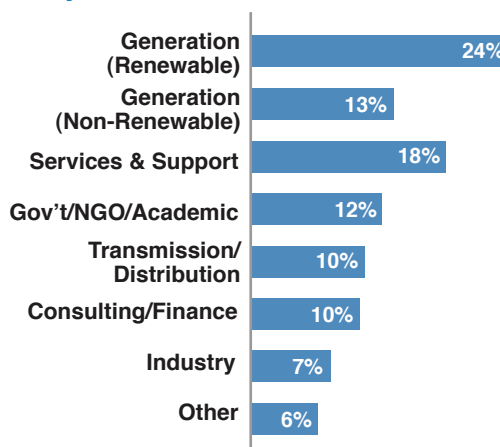
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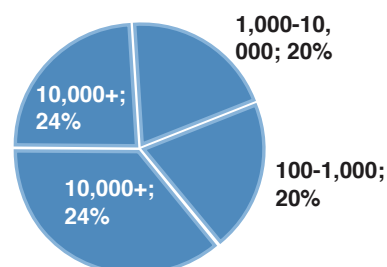
Region



Primary Business



Company Size (Employees)



Introduction

The global energy market is undergoing significant transformation as industry players, governments, and consumers seek and evaluate new ways of producing and consuming energy. Such changes are a necessary result of large-scale geopolitical and economic forces. These forces are creating robust growth on the demand side coupled with the arrival of market-ready technologies for renewable and efficient production on the supply side.

A re-energized energy system is anticipated to become cleaner, greener, and increasingly accessible to consumers around the world. Energy industry stakeholders foresee a system that will generate power using diversified energy sources and then distribute it through a “smart grid” that puts the consumer in control.

The Energy Balance

Energy demand actually decreased as a result of the global economic recession that began in 2008, however that is most likely an aberration.¹ Regardless, there is still a strong need for energy among OECD (Organization for Economic Co-operation and Development) countries. Developing nations too, will drive demand, as they continue to have an insatiable appetite for the economic lubricant that is energy.

The U.S. government’s Energy Information Administration (EIA), predicts that world energy consumption will increase by 49% between 2007 and 2035. It also predicts that total energy demand in less-developed, non-OECD countries will increase by 84%, compared with an increase of 14% in the developed world.² With such incredible growth on the horizon, it is essential that the energy system can respond to the ever-

changing market with improved levels of cleanliness and efficiency.

While there are many promising developments supporting the new energy system, there are indeed barriers on the road to acceptance and implementation. Not surprisingly, 31% of energy industry stakeholders identify the relatively low price of energy as being the single largest barrier to improving energy efficiency. The systemic lack of incentives is seen as the next-most-important barrier at 22%, with the cost of new investments (20%), fragmented stakeholders (11%), and a lack of adequate standards (9%) rounding out the list.

Energy experts surveyed believe that 20 years from now, most of the world’s energy production will continue to be generated from coal, gas, oil, and nuclear power, but that these sources will only make up 62% of the total, contributing far less than the 88% they did in 2009.

Perhaps one reason for this shift is that the balance between demand and supply is affected by growing global ecological concerns. An overwhelmingly high percentage of energy industry stakeholders (82%) indicate that environmental protection should be given priority, even if an increase in the cost of energy is necessary.

The experts suggest that a productive way to potentially reduce the negative environmental effects of energy production is by funding the creation of renewable energy projects, which are often more expensive than their traditional counterparts. A majority of energy industry stakeholders (54%) assert that renewable energy should be funded by a combination of price increases and government subsidies, with twice as

¹ U.S. Energy Information Administration, International Energy Outlook 2010, May 25, 2010, <http://www.eia.doe.gov/oiaf/ieo/highlights.html>.

² Ibid.

many saying they prefer price increases to government subsidies alone (20% vs. 10%).

Brain Power

Tomorrow's energy system is expected to be smarter and more agile. With the ability to monitor demand and respond by automatically balancing energy flow, the system will be able to deliver power more reliably and efficiently. Thought-leaders foresee consumers as active nodes on the grid, empowered to control their consumption with smart appliances and even being able to give and take energy depending on their needs.³

The implementation of "smart-grid" technology will enable greater energy efficiency while bringing renewable energy sources into the mix. In America, the grid faces serious congestion and bottlenecks, a result of poor infrastructure that has not kept pace with the capabilities of today's power generation. Even if energy producers are able to draw power from renewable sources such as wind, solar, and geothermal, the current grid may not be able to support the increased traffic. Improving grid intelligence means increased efficiency and cleaner power, advantages that are important to stakeholders on all sides of the equation around the world.⁴

When it comes to potential government initiatives around energy issues, industry stakeholders prefer programs that focus first on improving and incentivizing smart grid technology. Next in line are initiatives that deal with funding energy efficiency measures and setting minimum energy efficiency standards.

Ninety-two percent of those surveyed favor government incentives that improve control and management through smart grid technology, and 89% support incentivizing the development of the grid. An overwhelming majority—87%—would like to see an increase in funding for energy efficiency measures, with 84%

favoring the requirement of minimum energy efficiency standards for all products that require energy.

One reason that smart grid technology is such a strongly favored energy initiative is that energy industry

CHART 1

Question:

Some economies use energy much more efficiently than others. What do you see as the main barrier to energy efficiency? (Please select one)

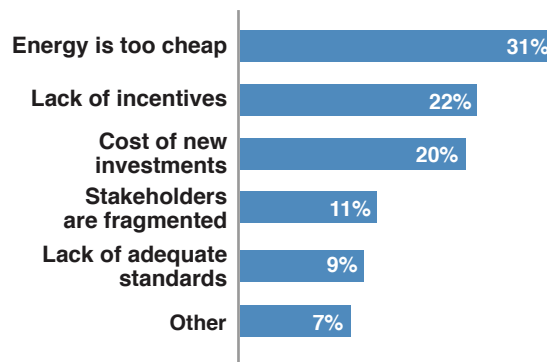
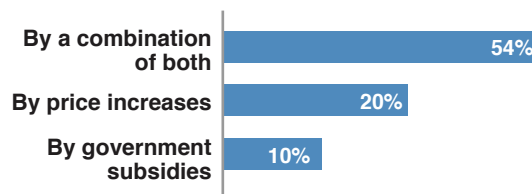


CHART 2

Question:

Typically renewable sources of energy cost more than traditional sources. How should the difference be funded? (Please select one)



³ University of Southern Florida Power Center for Utility Explorations, *Project: Renewable SEEDS, The Smart Grid of the Future*, http://pcue.eng.usf.edu/Webpages/journal/SEEDS%20brochure_L3.pdf.

⁴ Larry Greenemeier, "Outdated Energy Infrastructure Holds Back Smart-Grid Future, Report Says," *Scientific American*, Feb 23, 2009, <http://www.scientificamerican.com/blog/post.cfm?id=outdated-energyinfrastructure-hold-2009-02-23>.

stakeholders believe the grid is critical to the future of electricity supply. Fully 81% of energy industry stakeholders indicate that smart grid technology is extremely, or very, important to the future of electricity supply and consumption.

As the smart grid is being developed, many forces—both positive and negative—play out to varying degrees. The biggest drivers of smart grid technology appear to be demand management and consumer choice (50%), the ability to manage multiple power generation sources (47%), and the integration of renewable energies (45%). However, there also appear to be major barriers impeding the adoption of smart grid technology, including regulations that don't reward operational efficiencies (63% "major barrier") and a lack of incentives for utilities to transform operations (58%).

While the push for a smart grid will be helped by the commercialization of high-technology products by private enterprise, energy industry stakeholders see an equally important role for government. The experts

surveyed are more likely to say that governments should provide incentives to drive usage of energy efficiency and renewable energy sources, and they favor incentives for companies to develop the technologies necessary to modernize the energy system (35%).

Moving Forward

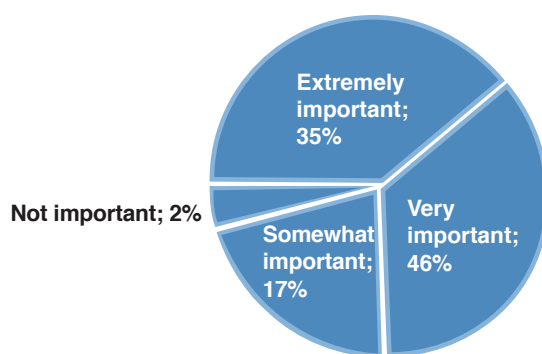
Energy efficiency and renewable energy are on the minds and agendas of industry executives, government policymakers, and well-informed consumers everywhere. Thought leaders around the globe are seeking ways to increase efficiency and ensure that the world has a sustainable energy supply in the future. Today, we struggle to use next-generation technology and energy supported by an outdated distribution system that buckles under the demands of the digital age.

As a result of these changes, a smarter, more robust electrical system of the future is being planned and built today. But bridging the gap between concept and

CHART 3

Question:

How important are "smart grid" technologies for the future of electricity supply and consumption? (Please select one)



reality will require the aid of government incentives to open the pathways for investment and deployment of new and enhanced technologies.

Governments do seem to be responding to the calls for action. In February 2009, U.S. Congress addressed the issue by setting aside money in the stimulus bill—\$4.5 billion for smart grid development.⁵ Similar momentum is occurring among governments around the world, as national energy policies align to create a better energy system for the planet as a whole.

The energy experts surveyed for this white paper believe that it's possible to create a smart grid that is more reliable and better serves the shifting needs of an energy-hungry world. To achieve this goal, government must apply the right incentives, consumers must be brought into the fold, and technology must be leveraged to its fullest effect.

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⁵ Greg Brown, "The Smart Grid: The Future is Now," *The Huffington Post*, June 30, 2010, http://www.huffingtonpost.com/greg-brown/the-smart-grid-the-future_b_631445.html.



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