

Lowering Emissions (or Minimizing Climate Impact): Energy Efficiency and Renewable Energy



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.

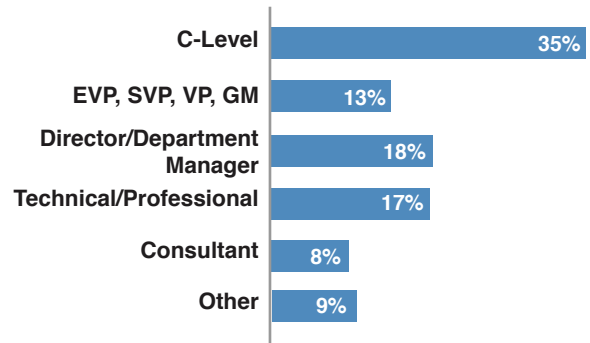
This white paper, “Lowering Emissions (or Minimizing Climate Impact) Through Energy Efficiency and Renewable Energy” reviews a portion of the research and provides analysis and insights on the topic of energy efficiency and the future of renewable energy. It is part of a series of white papers for C-level 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.

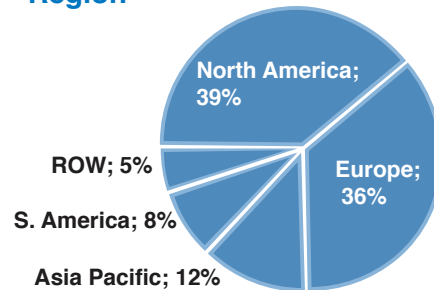
This research project was funded by a grant from ABB, and was performed by Bloomberg Businessweek Research Services. The editorial department of Bloomberg Businessweek was not involved in this project. For more information about this project, please contact Bloomberg Businessweek Research Services at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

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

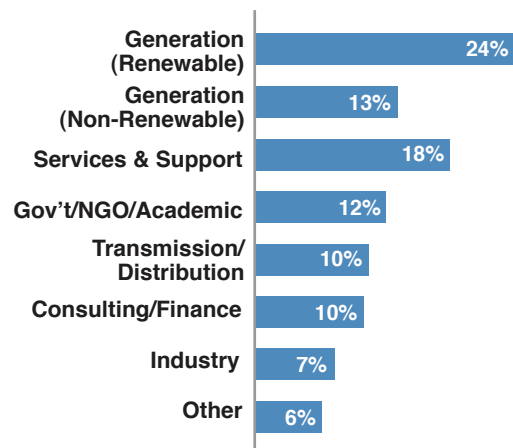
Titles



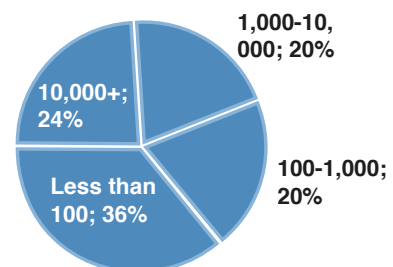
Region



Primary Business



Company Size (Employees)



Introduction

In working to limit the long-term concentration of greenhouse gases in the atmosphere, the largest opportunity for change is expected to be through increasing energy efficiency. In fact, energy industry shareholders expect efficiency to account for over half of the total reduction potential by 2030.¹ Another twenty percent of the contribution is expected to come from switching to renewable energy sources such as water, wind, and sun, thus reducing dependence on fossil fuels.

According to experts surveyed, given the projected growth in energy demand around the world and the urgency of addressing the climate challenge, enhancing energy efficiency and increasing renewable energy may require more than free market forces. Considering entrenched consumer behaviors as well as the high costs of developing and implementing new programs, it is likely that public policy will play a major role in the adoption of new practices and technologies.²

Signaling a Change

“Energy intensity” is defined as the energy use per unit of gross domestic product (GDP). According to the IEA (International Energy Agency), the U.S. uses .36 kWh of electricity to generate US\$1 of GDP, while Japan and Germany are more efficient. On the other hand many of the emerging markets have a long way to go. For instance, China uses 1.2 kWh, India 0.8 kWh, and the Middle East 0.7 kWh to generate the same GDP output, against a global average of 0.46 kWh.

As the energy industry seeks to adopt and deploy clean and renewable technologies, it is increasingly calling on governments to take steps to encourage a reduction of energy demand. Such steps are expected

to promote economic growth, create jobs, and cut greenhouse gas emissions. The majority of industry experts surveyed also expressed the importance of environmental stewardship, with only 20% in favor of relaxing environmental standards.

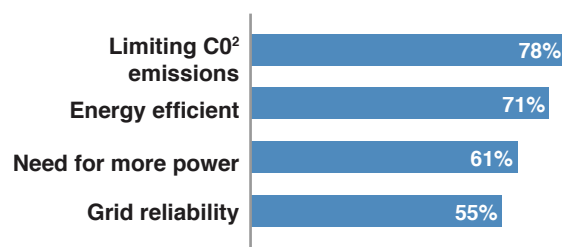
These developments are taking place within the context of what is known as the “decarbonization” of the world’s energy system. Limiting the release of carbon dioxide into the atmosphere is gradually becoming an important tool on the energy supply side. But doing so will not necessarily be easy. Seventy-eight percent of energy stakeholders indicated that limiting CO² emissions will be a big challenge over the next 10 years (See Chart 1).

As more people around the world improve their standards of living and incorporate electronic devices into their everyday lives, ever more energy will be required. It will become all the more important to increase efficiency and provide clean power to meet this growing demand.

CHART 1

Question:

On a scale of 1 to 5, with 1 meaning not a challenge at all and 5 meaning a big challenge, how much of a challenge are the following potential challenges facing the world’s energy and power industry over the next 10 years? (Percent saying “5 or 4”)



¹ International Energy Agency, *World Energy Outlook Executive Summary 2009*, http://www.worldenergyoutlook.org/docs/weo2009/WEO2009_es_english.pdf.

² “Aggressively Promote Energy Efficiency,” Institute for 21st Century Energy, http://www.energyxxi.org/issues/Improve_Energy_Efficiency.aspx.

Energy “Prime” Time

The creation, delivery, and consumption of energy have made the industry around it the largest in the world. Despite this fact, it still requires government involvement to guide—and prime—that market. Any efforts that involve end-users in the market must ultimately involve policy changes.

“Consumption reduction” or “demand-side management” is considered to be another important potential contributor. Fifty-four percent of energy industry stakeholders indicate that the best opportunities for efficiency improvements along the energy supply chain lie with energy consumers—a higher percentage than those who think efficiencies can be found in generation, transmission, or distribution.

Energy industry experts surveyed identify the relatively low price of energy as being the single largest barrier to improved energy efficiency. Thirty-one percent think low energy prices are hindering the adoption of energy efficiency technologies and behaviors, while 22%

think it is the lack of incentives that is impeding the growth of energy efficiency (See Chart 2).

When it comes to incentives, experts often highlight two top priorities: the creation of energy efficiency standards for appliances and equipment, and the removal of subsidies and tax breaks that actually promote consumption. Indeed, some thought leaders even propose that energy efficiency could become a competitive advantage, suggesting that “industry leaders will be able to capture the significant financial benefits of efficiency and perhaps even create entirely new markets.”³ Either way, the government must play its part in priming the pump.

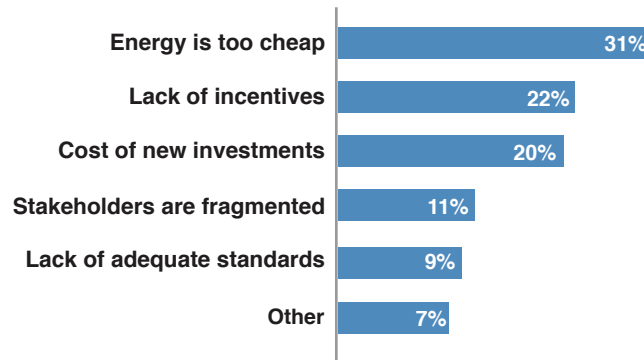
Picking Policy Winners

Energy industry stakeholders overwhelmingly believe that government incentives can assist in developing alternative energy sources. Experts favor the use of in-

CHART 2

Question:

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



³Diana Farrell and Jaana K. Remes, eds., “How the World Should Invest in Energy Efficiency,” *The McKinsey Quarterly* (July 2008), http://besustainable.pbworks.com/f/McKinsey+Quarterly_How+the+world+should+invest+in+energy+efficiency.pdf.

centives for companies to develop alternative energy sources (35%) over incentives to end-users to use renewable sources (32%). Only 14% of energy industry stakeholders indicate that governments should leave development of alternative energy sources to market forces (See Chart 3).

Government intervention can take the form of minimum efficiency standards, tax-based initiatives, loans, or other mechanisms. Many of those surveyed favored a broad range of options. Public policy initiatives that focus on smart grid technology received the highest levels of support. “Smart grid technology” actually encompasses a wide range of technologies working together to make delivery more efficient. Many of the technologies leverage automation (for meter readings, voltage monitoring, and outage notification), while others incorporate remote capabilities for better management of energy demand and response.⁴

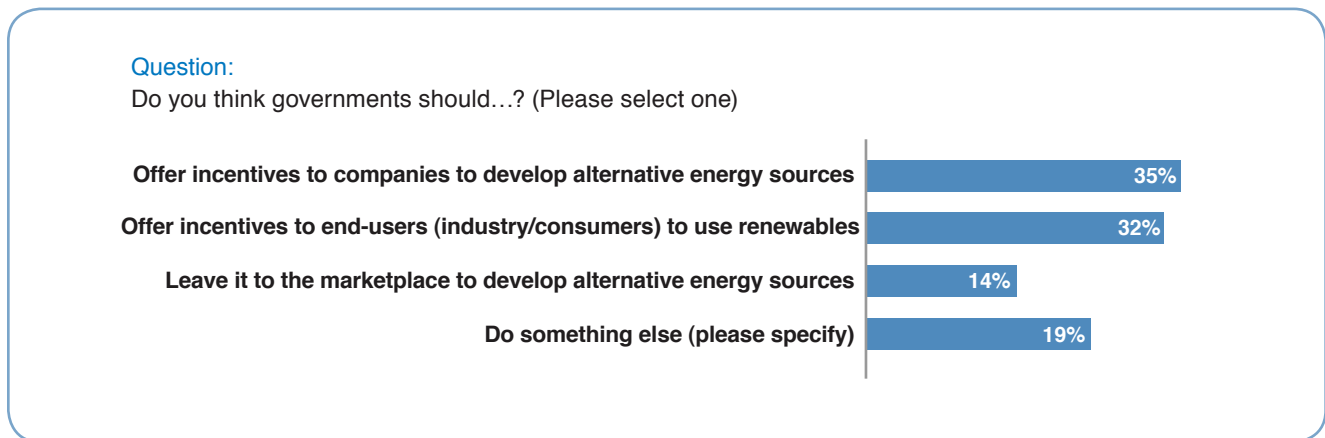
In one example of government action, the Obama administration in 2009 promoted the compensation smart grid projects for up to 25% of the cost of initial investment.⁵ In addition to outright funding, industry leaders are calling for tax incentives to encourage development, such as credits for energy storage and

accelerated depreciation for meters.⁶ Ninety-two percent of the energy industry experts surveyed favor initiatives that improve control and management through smart grid technology, and 89% favor initiatives that incentivize the development of the grid. The support for further development of the smart grid is indicative of the belief that it will increase the efficiency and reliability of the entire electricity chain as well as promote a reduction in greenhouse house emissions.

Methods to incentivize energy efficiency measures are highly supported by industry stakeholders: 87% favor initiatives that increase funding for energy efficiency measures and 84% want requirements for minimum energy efficiency standards for all products. When experts were asked who should be required to conserve energy, eight in ten felt that both the industry players and consumers were responsible. Despite this “shared responsibility,” when it comes to adopting energy efficient practices the energy industry stakeholders believe they need to be incentivized to change their behavior.

In the United States, the federal government in 2009 unveiled significant benefits to the housing market on the basis of energy efficiency. For example, homeown-

CHART 3



⁴ “Smart Grid Could Create 280,000 Smart Jobs,” David Ehrlich, GigaOM, Jan. 6, 2009, <http://gigaom.com/cleantech/smart-grid-could-create-280000-smart-jobs/>.

⁵ Ibid.

⁶ “Smart Grid’s Long and Winding Road: An interview with Katherine Hamilton of the GridWise Alliance,” Amy Hsuan, Greentech Media, October 28, 2010, <http://www.greentechmedia.com/articles/read/smartgrids-long-and-winding-road/>.

ers who plan on making energy saving home improvements are granted 5% larger mortgages by the Department of Housing and Urban Development. Additionally, the House of Representatives passed the American Clean Energy and Security Act, which contains incentives for federal agencies and consumers to construct more efficient buildings.⁷

According to a 2010 paper produced by international advisory firm KPMG, worldwide government stimulus sustained investment in renewable energy in spite of the economic downturn. Globally, governments have funneled more than US\$400 billion toward the creation

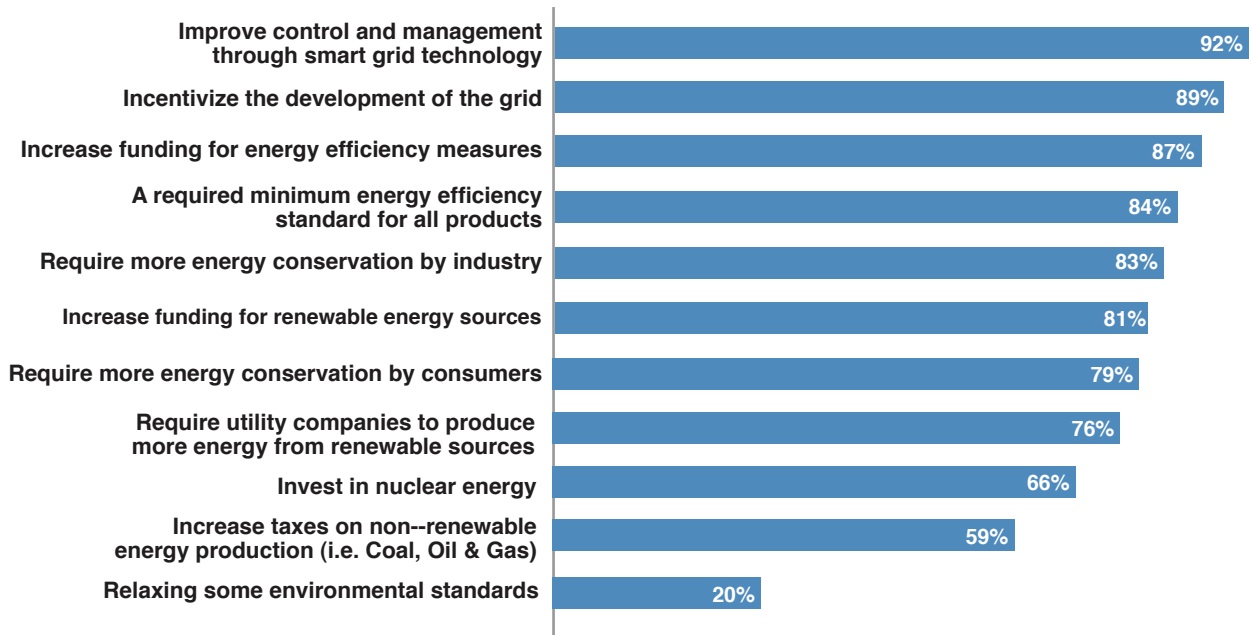
of green economies and climate change, with the U.S. and China spending the most. Policy is widely used as a tool to promote renewable energy generation, with at least 60 countries already using it. Germany, Spain, and the Scandinavian countries are some European examples where renewables and climate initiatives have been strongly supported by government policy and backed by financial incentives such as subsidies or tax reliefs.⁸

A broad range of tax incentives for renewable energy projects exist around the world. Often, more than one credit or incentive can be used at a time to maximize

CHART 4

Question:

Here are some possible government policies to address energy issues, please indicate whether you would favor or oppose each. (Percent "favor")



⁷ Kenneth R. Harney, "Energy Efficiency Incentives Likely to Grow," *Los Angeles Times*, July 26, 2009, <http://www.latimes.com/classified/realestate/news/la-fi-harney26-2009jul26,0,7738017.story>.

⁸ KPMG, *Taxes and Incentives for Renewable Energy*, 2010, <http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/Documents/ENR-Sustainability-Taxes-and-Incentives.pdf>.

a project's profitability. In addition, different structures may help to realize credits, such as a situation where there is no upfront income to utilize a credit. Of the experts surveyed for this white paper, 81% favored initiatives that increase funding for renewable energy sources. Seventy-six percent think it is a good idea to require utility companies to produce more energy from renewable sources, and 59% think taxes should be increased on non-renewable energy production.

and environmental factors indicate that a cleaner, more efficient energy system is needed sooner rather than later in order to stem the tide of climate change caused by rising emissions.

Looking ahead, there is every indication that the most important "fuel" of the future won't be a fuel at all—it will be improved energy efficiency. Reducing actual consumption with tools and technologies that already exist presents the best opportunity for cutting emissions.⁹

Moving Forward

For many in the energy industry, the case for increasing energy efficiency and increased contribution of renewable energy has never been stronger. Social, financial,

Copyright and Disclaimer Notices

Neither Bloomberg Businessweek, Bloomberg nor ABB makes any guarantees or warranties as to the accuracy or completeness of this report. Neither Bloomberg Businessweek, Bloomberg or ABB shall be liable to the user or anyone else for any inaccuracy, error or omission, regardless of cause, or for any damages resulting therefrom. In no event will Bloomberg Businessweek, Bloomberg, ABB, or any of their third-party licensors be liable for any indirect, special or consequential damages, including but not limited to lost time, lost money, lost profits or lost good will, whether in contract, tort, strict liability or otherwise, and whether or not such damages are foreseen or unforeseen with respect to any use of this document. This document, or any portion thereof, may not be reproduced, transmitted, introduced into a retrieval system or distributed without the written consent of Bloomberg and ABB.

© Copyright 2011 Bloomberg and ABB. All rights reserved.

The names of actual companies and products mentioned herein may be the trademarks of their respective owners.

ELECTRONIC VERSION AVAILABLE

To see or use an electronic copy of this document in PDF format, please visit:
www.abb.com/betterworld

⁹ International Energy Agency, "IEA Sees the First Early Signs of an Energy Technology Revolution Underway Across the Globe But Urges that Much More Needs to be Done to Achieve the Necessary Long-Term CO2 Cuts," press release, July 1, 2010, http://www.iea.org/press/pressdetail.asp?PRESS_REL_ID=395.



Power and productivity
for a better world™