The World Resources Institute's Comments on the World Bank Energy Strategy

1. Where do you think the help of the World Bank Group (WBG) in the energy sector in developing countries is most needed?

Although the Bank's lending to the energy sector has increased in recent years, its resources are small compared to developing countries' needs. The value that the Bank can and should add is in helping developing countries find low carbon paths to achieve equitable, low carbon development, alleviate poverty, and more importantly provide all forms of support needed to assist the client nations in making the transition.

The Strategy should strive to provide better energy services to all the people of developing countries, with a strong emphasis on the efficiency, environmental and social benefits of the energy sector, and not simply to provide more energy to power economic growth for a select few.

To do so, a paradigm shift is required in the Bank's policies and regulations as well as in its support to build institutional capacity and to strengthen governance. By supporting such measures, the WBG can align both public and private investment in the energy sector with sustainable development outcomes. To determine which policies are most effective, the WBG must engage stakeholders in policy, planning and regulatory processes.

We see the following issues as key areas where the WBG can support developing countries:[1]

Policies and Regulations

- *Long-term integrated energy planning*
- *Policies and regulations encouraging energy efficiency*
- *Policies and regulations to promote renewable energy*
- *Providing access to energy for the poor*
- *Pricing structures that encourage efficiency and reduce consumption*
- *Subsidy reforms to reveal true cost of fossil fuels and promote the viability of sustainable energy options*

Institutional Capacity and Governance

- *Capacity building of executive agencies on sustainable electricity*

[1] The full report, *Investing in a Sustainable Future: Multilateral Development Banks' Investment in Energy Policy*, is available at http://www.iisd.org/pdf/2009/bali_2_copenhagen_invest_mdbs.pdf.

- *Regulatory agency capacity to oversee implementation of sustainable electricity policy*
- *Utility capacity to promote energy efficiency and renewable energy*
- *Transparency of policy, planning and regulatory processes for electricity*
- *Stakeholder engagement in policy, planning and regulatory processes*

The WBG has acknowledged the failures of its past efforts to support privatization-oriented policy reforms in the energy sector in developing countries, and the need to tailor policy solutions to local contexts. It has recently placed increasing emphasis on so-called "public-private partnerships" as means to attract investment in energy. However, while the Bank has recognized the importance of improving governance of the sector, concrete steps must be taken (Nakhooda, 2007).

It is critical to increase transparency and create an open, inclusive and participatory process to discuss what policy measures will best meet a particular country's needs. More attention needs to be given to the processes by which new policies and regulatory measures are put in place and operationalized, rather than the prescription of predetermined policies and measures (Nakhooda, 2007).

More specifically, the Strategy should emphasize promoting the capacity of institutions to practice transparency. In particular, greater disclosure of "technical issues" is essential, even if these issues may be considered too "technical" for the general public to understand. Similarly, greater disclosure and transparency about the basis for public-private partnerships are needed to ensure that long-term public interests are upheld. Greater public debate and scrutiny of such technical issues can make trade-offs between interests transparent, and help avert costly deadlocks.

Furthermore, the Strategy should emphasize sustained efforts to build the capacity of effectively functioning independent regulators in the energy sector. Independent regulatory systems can create enhance transparency, participation, credibility and predictability of key decisions in the energy sector. It is vital to ensure that regulators practice transparency and proactively address public interest concerns, particularly through greater stakeholder engagement and by creating meaningful space for engaging the public.

The mandate and capacity of regulators to deal with sustainable development challenges such as environmental sustainability and social equity needs particular attention, as these institutions will play an increasingly important role in facilitating clean and sustainable energy provision and use. Special institutional mechanisms to include stakeholders and socio-economically weaker groups in the regulatory process (for example, through appointing capable consumer representatives) are important means to this end.

References:

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Nakhooda, S. and Ballesteros, A. R. (2009). *Investing in a Sustainable Future: Multilateral Development Banks' Investment in Energy Policy*. International Institute for Sustainable Development and World Resources Institute. Available at: http://www.iisd.org/pdf/2009/bali_2_copenhagen_invest_mdbs.pdf.

2. Does the proposed approach adequately address the needs of the poor and marginalized? If not, how could it be strengthened?

As highlighted in the Strategy, access to energy services is essential to improving the livelihoods of the poor and marginalized. The Strategy should specifically address how access to energy services can help lift people out of poverty, and how energy development can infringe on the human rights of the poor. For example, energy planning should be based on a participatory assessment of how energy can help resolve communities' concerns regarding health, education, water, sanitation, productivity and other development challenges. Energy planning should also occur in a way that avoids harm and discrimination against the poorest and most vulnerable communities. This also requires participatory, sector-wide impact assessments during upstream policy planning. By the time that project proponents consider impacts at the project level, the government may have already taken decisions that will infringe on communities' rights. By involving stakeholders from the earliest stages of energy planning, governments can ensure that access to energy is a means, rather than an end, to poverty alleviation (Herbertson et al., 2010).

However, to provide access to the poor, the Strategy must also ensure that price structures benefit the poor. To ensure that prices are affordable for the poor, the Strategy should emphasize pricing structures that encourage efficiency and reduce consumption, while protecting the poorest segments of society from adverse impacts**.** For example, traditional block tariff systems encourage consumers to use more electricity because energy use is discounted as it increases. An "inverted" or rising block tariff system has the opposite effect because it offers the first block of energy at a low rate, but increases rates as more energy is consumed. Therefore, it incentivizes lower energy use, which benefits the poor because they are low energy-consumers (Nakhooda and Ballesteros, 2009).

The WBG should focus on communities affected by energy sector projects by building the capacity of its public and private sector clients to ensure the free, prior and informed consent of these communities. The Bank must lead the development and implementation of innovative regulatory frameworks and private sector norms and standards in order to protect the rights of communities and ensure that they receive full benefits from energy sector development. The Bank's Safeguards and Performance Standards can be enhanced to this purpose, with a focus on improving implementation in practice. The recommendations of the Extractive Industries Review should be revisited in this context.

References:

Herbertson, K., Thompson, K., Goodland., R., (2010). *A Roadmap for Integrating Human Rights into the World Bank Group. World Resources Institute*, Washington D.C. Available at: http://www.wri.org/publication/roadmap-for-integrating-human-rights-into-world-bank-group.

Nakhooda, S. and Ballesteros, A. R. (2009). *Investing in a Sustainable Future: Multilateral Development Banks' Investment in Energy Policy*. International Institute for Sustainable Development and World Resources Institute. Available at: http://www.iisd.org/pdf/2009/bali_2_copenhagen_invest_mdbs.pdf.

3. Does the proposed approach strike the right balance between meeting the needs and priorities of low-income countries and those of middle-income countries?

It is important to distinguish between low-income countries and middle-income countries because the very poorest countries have less capacity. However, while the World Resources Institute (WRI) welcomes the difference between the lowest-income and middle-income countries, we believe that even smaller, poorer and more vulnerable countries deserve to be given the opportunity to explore low carbon development options. By ensuring that governments and their citizens have access to information about the full range of energy options available to them, all countries are in a better position to make decisions that balance priorities with respect to poverty alleviation and low carbon development.

As such, we recommend placing greater emphasis in the Strategy on the ways that low carbon development can benefit low income countries; for example, by attracting private investment, accessing low carbon development funds, and improving energy decision-making through greater access to information and public participation.

4. Where there are trade-offs between meeting the local energy needs of individual countries and reducing global greenhouse gas emissions, what principles should the World Bank Group follow in resolving these trade-offs?

The WBG's interventions should emphasize issues of governance at the national level, as well as the transparency and inclusiveness of the processes by which trade-offs have been considered by stakeholders within countries.

Before the WBG can define principles to resolve trade-offs between reducing global warming and addressing local energy needs, it must first analyze and assess what the trade-offs actually consist of.

Thermal and hydro power projects, for example, are both highly dependent on water availability and contributors to climate change through greenhouse gas (GHG) emissions (Sauer *et al.*, 2010). When considering water scarcity, regions that require the most electricity are often uncertain of their future water supplies (Sauer *et al.*, 2010). For example, in South and Southeast Asia, 74 GW, over half of existing and planned capacity for major power companies, are located in areas that are considered to be stressed or water scarce (Sauer *et al.*, 2010). Climate change will only compound these water scarcity issues. India is facing critical water shortages in the next decade, while Malaysia, Thailand, the Philippines and Vietnam will face localized water pollution and shortages, with climatic patters shifting towards longer dry seasons with more concentrated rainfall periods (Sauer *et al.*, 2010).

The added burden of water-intensive power generation technologies does not only have a huge impact on local communities, but also presents a liability for investors as water scarcity issues are compounded by deregulated markets that offer very little protection to shareholders in the event of an outage or load loss, which ultimately leads to revenue loss and increased costs (Sauer *et al.*, 2010). Although technology can mitigate these risks – through advanced cooling systems, for example – many such solutions imply higher costs or efficiency trade-offs (Sauer *et al.*, 2010).

To address this issue and to accurately assess the cost of hydro and thermal energy, the WBG must integrate current and future water risks into its evaluation of power generation projects. To do so, the WBG can begin by following the analysis outlined below:[2]

- ***Sensitivity analysis****: For power plants dependent on freshwater resources, conduct a plant-level sensitivity analysis of internal rate of return impacts of outages and load losses. This will reveal which companies have the highest financial risk tied to disruptions.*
- ***Scenario analysis****: Develop scenarios around water availability at the river basin level for each plant based on future projections (if available) or key risk factors present at the local level. When combined with the sensitivity analysis above, this provides insight into which plants are most at risk from water constraints and the potential magnitude of financial impact.*

[2] The full report, *Over Heating Financial Risks from Water Constraints on Power Generation in Asia India, Malaysia, Philippines, Thailand, Vietnam,* is available at: http://www.wri.org/publication/over-heating-asia.

- ***Management quality analysis**: Assess and rank companies based on the ability of corporate initiatives, including comprehensive water management strategies.*

Along with the costs of water risks, the WBG must internalize the costs related to climate change before it can begin to assess trade-offs. The impacts of climate change will be felt worldwide, with developing countries receiving the brunt of the burden. On average, developing countries are at a geographic disadvantage, already experiencing warmer temperatures and suffering from higher rainfall variability than developed countries (Stern, 2006). It is clear climate change is an externality the WBG must take into account in order to accurately assess where trade-offs lie. Therefore, the WBG should account for GHG emissions associated with its energy investments.

The WRI believes GHG accounting should be put into place for all energy sector investments within the next 6 months. The World Bank must make good on its 2007 commitment to integrate GHG accounting into its operations. Well-established, robust methodologies exist to support GHG accounting in the energy sector. Other tools, such as carbon shadow pricing to integrate climate change related costs into energy projects and programs, should be explored without further delay.

Internationally recognized methodologies such as the WRI-WBCSD GHG Protocol should be used to ensure consistency, comparability, and credibility in the quantification of emissions and mitigation data. The WBG should take the following steps to incorporate GHG accounting into its lending practices[3]: :

- ***Addressing the following investment and service areas:***
  - *Proprietary investments (both equity and debt)*
  - *Investments (e.g., funds) managed on behalf of others*
  - *Financial services provided to clients, such as underwriting and advisory*
- ***Defining an inventory's scope using the principle of relevance***
- ***Using the GHG inventory:***
  - *Calculating aggregate inventory numbers*
  - *Reporting the final GHG inventory*
  - *Using the emissions inventory*

We would reiterate the critical importance of ensuring the transparency of the GHG accounting and shadow pricing analysis performed, and of making this analysis publicly available so that the

[3] The full report, *Accounting for Risk: Conceptualizing a Robust Greenhouse Gas Inventory for Financial Institutions*, can be found at: http://www.wri.org/publication/accounting-for-risk.

options can be understood by national and international stakeholders. This should be framed as a concrete approach to promote transparency, to encourage transformative thinking, and to identify and support investment alternatives that could lead to significant emission reductions.

Furthermore, the incorporation of GHG accounting should not be construed as a requirement, or a new conditionality that lowers carbon investments will always be chosen. Instead it can prompt developing member countries to explore a suite of energy options, including local indigenous renewable energy resources that can also meet their energy needs. In cases where the lower carbon option would entail higher costs, GHG accounting could provide a justification for financing incremental costs, through specialized climate-related trust funds or other international sources that would make the higher-cost option possible. Furthermore, although capital cost for lower carbon options may initially be higher, the long-term economic, social and environmental benefits cannot be ignored.

Therefore, the best way to resolve potential trade-offs is to develop a framework of decision criteria that the WBG will use to assess different energy projects and programs while making funding decisions. This framework should consider the full lifecycle costs of a project and apply models that look beyond current prices and accurately factor in future cost developments, such as rising fossil fuel costs. It should also try to account for the effects of funding decisions the WBG makes today. For example, if the WBG supports a larger number of fossil fuel based projects, fossil fuel demand and prices are likely to increase.

The framework should go beyond cost considerations and also look at:

- *Supply security. If the future price of the fuel needed for a given project is subject to uncertainty, this needs to be reflected in the overall assessment, particularly if the fuel would have to be imported by countries with limited foreign reserves. A supply security assessment would also consider intermittency issues raised by some renewable technologies.*
- *Health impacts*
- *Environmental impacts (including water risks and shadow pricing for carbon as discussed above)*
- *Economic impacts on local communities, including the potential to create local employment*
- *Contribution to the development and transfer of technology in response to the technology needs of the client country*

Analyzing trade-offs at the individual project level is not enough, however. With its large portfolio of energy investments, the WBG could have a transformational impact on energy options available to developing countries, so that, in a few years, they are no longer forced to make hard decisions between meeting energy demands and reducing emissions. Through investment decisions across its entire portfolio, the WBG could thus actively contribute to minimizing trade-offs in the future.

Today, GHG-intensive energy sources seem like the cheapest and easiest option in many instances. But the costs of alternative energy sources continue to fall. This is related to the fact that the markets for these technologies are emerging or transitional, where higher demand does not lead to higher prices in the medium- to long-run. Instead, higher demand leads to price decreases, due to learning and innovation, economies of scale and increased global competition. This development continues until the emerging market transitions into a mature market with larger demand and lower prices (IEA, 2009).

The concept of "learning rates" is often used to capture the effect of increasing volumes ("learning by doing") and increasing investment in research and development ("learning by research") on prices in energy technologies. Learning rates for wind power have been calculated as a 14.2% decrease in cost for every doubling of installed capacity and an 18.0% decrease in costs for every doubling of R&D expenditures. For solar PV power, the respective numbers are 18.4% for learning by doing and 14.3% for learning by research (Kobos et. al, 2006). The effects of learning by doing and learning by research are both needed, as they are not easily substituted (Jamasb, 2007). Empirical data for the United States, collected by the Department of Energy, also confirms impressive cost reduction in PV technology as manufacturing capacity expanded (Table 1).

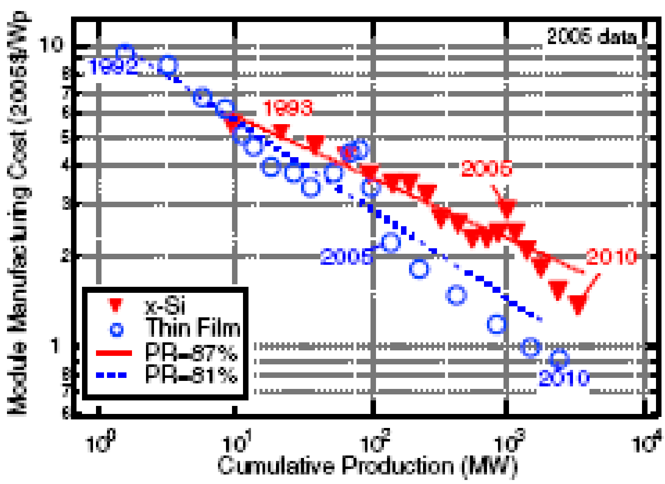


Table 1: US Module Manufacturing Cost and Cumulative Production

Source: US Department of Energy (2006): DOE Solar Energy Technologies program FY2006 Annual Report, page 74.

The learning rates for certain zero-carbon technologies show that if the WBG were to invest in these energy sources, cost would fall quickly. The effect on "learning by research' would only be indirect, since the WBG does not focus on support for research; however, increased demand is likely to incentivize increased private investment in research. On the other hand, the "learning by doing" effect of increased WBG investment would be direct and very significant. The effect is likely to be particularly high if new energy technologies were deployed in many WBG client countries, as this could generate valuable lessons of how the technologies work best in different circumstances.

For the WBG to have this transformational impact, changes are needed at the level of its overall energy portfolio. The WBG would have to set itself a target to increase the share of a mix of clean technologies in its portfolio. This implies choosing technologies that can be considered particularly promising, based on an assessment of maturity of the technology, potential for further cost reductions, applicability in a number of client countries, and potential to generate stable and affordable energy as part of an energy system.

Mechanisms to secure financing for the incremental cost incurred at the early stages of this transformational approach are needed. While it can be expected that prices will decrease, the first projects will be relatively expensive. These costs should be seen as an investment that will benefit all countries and therefore should not be covered by the host countries of those first projects, i.e., would have to be funded by grants or something similar.

When tracking the progress towards a decarbonized energy portfolio, the WBG should use indicators that allow for continuous improvement. It should not only aim for a share of X percent of low-carbon energies in 2020 or an average of GHG emissions per unit of power produced throughout its portfolio, but also for a yearly improvement by Y percent for both of these indicators.

References:

IEA Photovoltaic Power Systems Program (2009). *Promotional Drivers for Grid-Connected PV*. IEA, Paris and Haas, R. (2002). *Market deployment strategies for PV systems in the built environment. An evaluation of incentives, support programmes and marketing activities*. IEA PVPS Report 7-06:2002. IEA, Paris.

Jamasb, T. (2007). "Technical Changes Theory and Learning Curves: Patterns of Progress in Electricity Generation Technologies." *The Energy Journal* 28(3): 51-71.

Kobos, P.H., J.D. Erickson, and T.E. Drennen (2006). "Technological learning and renewable energy costs; implications for US renewable energy policy." *Energy Policy* 34: 1645-1658.

Sauer et al. (2010). *Over Heating Financial Risks from Water Constraints on Power Generation in Asia India, Malaysia, Philippines, Thailand, Vietnam*. World Resources Institute, Washington D.C.

Stern, Nicholas et al. (2006). *Stern Review on Economics of Climate Change*. HM Treasury.

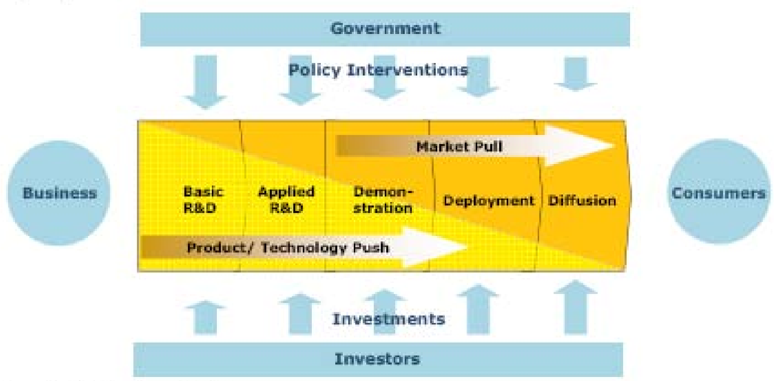
United States Department of Energy (2006). DOE Solar Energy Technologies rogram FY2006 Annual Report, 74.

WRI-WBCSD (2004). “A Corporate Accounting and Reporting Standard.” WRI-WBCSD. Washington DC. Available at: http://www.ghgprotocol.org/files/ghg-protocol-revised.pdf.

5. What role should the World Bank Group play in promoting new technologies and/or helping to transfer existing technologies to new markets, and how much weight should the World Bank Group give to each?

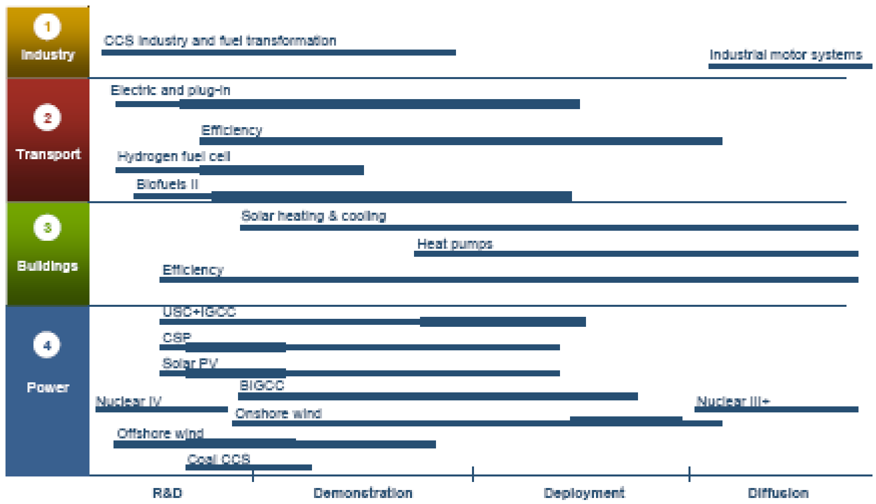
When thinking about technological innovation, opposing “new” and “existing” technologies is too simplistic. Technological innovation is a complex process that moves through different stages (Figure 1). “New technologies” would presumably refer to technologies that are still at very early stages in the innovation chain: in the lab or applied in early, small demonstration projects. “Existing technologies” on the other hand could be understood as referring to mature and fully competitive technologies that are commercially deployed at scale. However, for many technologies needed to meet the energy requirements of the poor while reducing GHGs, the crucial stages are between research and commercialization/diffusion. It is at those intermediary stages that technologies either get stuck or are deployed at an increasingly larger scale, while significant innovation and improvements still occur.

Figure 1 | Innovation Chain



Source: Modified from Stern et al., 2006[6]

In order to reach the dual objectives of meeting developing countries’ energy needs and reducing global GHG emissions, the widespread deployment of a number of technologies, including renewable energy generation and energy efficiency technologies, is crucial. These technologies are at different stages of the innovation chain (Figure 2). As the World Bank Group Energy Strategy Approach paper (2009) rightly notes (para 47), a number of these technologies require significant technological breakthroughs. Additionally, the rate of deployment needs to be increased. Innovations move very slowly in the energy sector; a patent analysis of six sectors recently indicated that it currently takes an average of around 24 years for a patented technology to become widely used in subsequent innovations (Lee et al. 2009).



Source: Modified from IEA (2008)[7]

In order to spur further technological breakthroughs, cost decreases and wider deployment, the WBG should contemplate whether or not it has a role in increasing support to technologies in the demonstration and deployment phases. While support for R&D is not within the WBG's primary mandate, the Bank can play a decisive role in technological innovation by supporting demonstration projects and emerging technologies that are not yet widely applied. The WBG might have to reconsider its historic preference for not financing "pre-commercial" technologies, and replace the commercial/pre-commercial dichotomy with a more flexible approach.

The WBG should also consider the positive impact of crucial technologies on future prices and large-scale deployment. Technologies at the early deployment phase can usually be pushed along their learning curves quickly by increasing the demand for these technologies, which will lead to increased supply, economies of scale, increased competition, learning and innovation and ultimately rapidly falling prices. Lessons from the experiences of the Clean Technology Fund need to be harnessed.

References:

International Energy Agency (2008). "Energy Technology Perspectives: Scenarios and Strategies to 2050." OECD/IEA, Paris.

Lee, B., Iliev, I., and Preston, F. (2009) *Who owns our low carbon future? Intellectual property and energy technologies*. Chatham House, London.

Stern, Nicholas et al. (2006). Stern Review on the Economics of Climate Change. HM Treasury, 396, Figure 16.1.

World Bank Group (2009). "Energy Strategy Approach Paper." Available at: http://siteresources.worldbank.org/EXTESC/Resources/Approach-paper.pdf

6. *What other suggestions or comments do you have?*

Clear, measurable, and ambitious outputs, with targets and time frames for their achievements, are critically important to both (a) set clear priorities for the strategy and (b) help track progress periodically against a concrete set of markers, to which WBG management can suggest adjustments in course to respond to changing circumstances and knowledge.

The monitoring strategy should reflect on the lessons from the implementation of *Fuel for Thought.* It did include indicators and a monitoring plan, including specific indicators for particular regions, and immediate term outputs to achieve strategic objectives. In retrospect, however, there appears to have been little public disclosure of progress made in implementing the plan, and many of its strategic objectives do not appear to have been met. It is not clear that Country Assistance Strategies have adequately reflected the objectives of *Fuel for Thought*. In developing the new energy strategy the WBG should therefore specify:

- The processes and systems for incorporating the strategy into country and sector programming
- Which departments will be responsible for monitoring
- To whom and how often these departments will report
- A clear and accessible system for public reporting on progress made

References:

World Bank Group (2000). *Fuel for Thought*: *An Environmental Strategy for the Energy Sector.* Washington, DC: World Bank. Available at: http://go.worldbank.org/92RT0XPT30

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