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THE WORLD BANK

Climate Change and the World Bank Group

Phase I: An Evaluation of World Bank Win-Win Energy Policy Reforms

Evaluation Summary

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INDEPENDENT EVALUATION GROUP

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—Evaluation Summary—

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The World Bank
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Photo credits—*Front cover:* A coal-run power plant in Tangshan, China, in China's Hebei Province, on December 9, 2005. Reproduced by permission from Corbis; photo © Jason Lee/Reuters/Corbis. *Back cover:* A natural gas flaring tower at Pemex's Dos Bocas petroleum-exporting complex, Mexico. Reproduced by permission of Corbis; photo © Keith Dannemiller/Corbis.

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Foreword

Scientific consensus warns that climate change threatens to derail development, while business-as-usual development threatens to destabilize the climate. The World Bank Group has awakened to the challenge of disarming these interlocking risks. But in doing so, it has to confront areas of possible tension:

- Between a country-focused operational model and support for global public goods
- Between a global role encompassing developed countries and its focus on developing nations
- Among greenhouse gas mitigation, climate adaptation, and near-term growth.

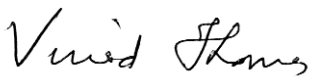
Win-win policies in energy pricing and in non-price energy efficiency have the potential to reconcile national and global goals. They can help countries meet a good part of their incremental energy needs at low cost, while freeing up funds for social protection and increasing resilience to international energy price shocks. About a fifth of the baseline global increase in energy-related CO_2 emissions could be reduced by 2030 through efficiency measures that pay for themselves, in the developing world alone.

Policy reforms are needed to unlock these benefits. Energy price reform is seldom easy, but 2008 market conditions showed the unsustainability of energy subsidies, and the Bank is well placed to help. Analytic and financial support can promote socially beneficial and politically feasible options—for instance, redirection of poorly targeted energy subsidies to social protection. The Bank's investments in energy efficiency have often been effective, but they have been modest, with little emphasis on policies. There is change, however, including a recent ramp-up in International Finance Corporation investments. Countries are receptive, and Bank Group leadership could make a difference to this up-to-now under-prioritized area.

Win-win policies will not be enough to meet clients' energy needs or to decouple development from emissions. The UN Framework Convention on Climate Change stresses developed countries' responsibilities to reduce their own emissions and to provide financial and technological support to developing countries. Relevant to this is Bank Group experience in using concessional and carbon finance to support clean energy technologies—the subject of the second phase of the climate evaluation. IEG is also assessing forest sector experience that bears on reduced emissions from deforestation.

The Bank has had limited direct experience in adaptation, although efforts in disaster prevention and weather index insurance are cases that suggest consonance with near-term development goals. Adaptation is the subject of the climate evaluation's third phase.

The World Bank Group has a vital role in addressing the interlinked problems of development and climate change. IEG's three-year program of evaluation is designed to assist the Bank Group as it formulates and implements an operational strategy in this critical area.



Vinod Thomas
Director-General, Evaluation

Indonesian motorists line up for gasoline in Bogor. Photo ©Dadang Tri/Reuters/Corbis, reproduced by permission.

Executive Summary

Policy Reforms

Climate change threatens to derail development, even as development pumps ever-greater quantities of carbon dioxide into an atmosphere already polluted with two centuries of Western emissions. The World Bank, with a newly-articulated Strategic Framework on Development and Climate Change, must confront these entangled threats in helping its clients to carve out a sustainable growth path.

But this is known territory—many of the climate change policies under discussion have close analogues in the past. This phase of the evaluation, focused on the World Bank (and not the International Finance Corporation or the Multilateral Investment Guarantee Agency), assesses the World Bank's experience with key win-win *policies* in the energy sector—policies that combine gains at the country level with globally beneficial greenhouse gas (GHG) reductions. The next phase will look across the entire World Bank Group at *project-level* experience in promoting technologies for renewable energy and energy efficiency and at some issues related to climate change in the Bank's transport and forestry portfolios.

Within the range of win-win policies, this report examines two that have long been discussed but are more relevant than ever in light of record energy prices: removal of energy subsidies and promotion of end-user energy efficiency. Energy subsidies are expensive, damage the climate, and disproportionately benefit the well-off. Their reduction can encourage energy efficiency, increase the attractiveness of renewable energy, and allow more resources to flow to poor people and to investments in cleaner power. Though subsidy reduction is never easy, the Bank has a record of accomplishment in this area, especially in the transition countries. About a quarter of Bank energy projects included attention to price reform. Improvements in the design and implementation of social safety nets can help to rationalize energy prices while protecting the poor.

End-user energy efficiency has long been viewed as a win-win approach with great potential for reducing emissions. It becomes increasingly attractive as the costs of constructing and fueling power plants rise. About 5 percent of the Bank's energy commitments *by value* (about 10 percent *by number*) have gone to specific efficiency efforts, including end-user efficiency and district heating. Including a broader range of projects identified by management as supporting supply-side energy efficiency would boost the proportion above 20 percent by number. Few projects tackled regulatory issues related to end-user efficiency, though the Bank has invested in some technical assistance and analytical work. This historical lack of emphasis on energy efficiency is not unique to the Bank and reflects the complexity of pursuing end-user efficiency, a pervasive set of biases that favor electricity supply over efficiency, inadequate investments in learning, and inattention to energy systems in the wake of power sector reform.

The record levels of energy prices in 2008, although they have been relaxed, provide an impetus for the Bank and its clients to choose more sustainable long-term trajectories of growth. The mid-2008 oil price was equivalent to the 2006 price, plus a $135 per ton tax on carbon dioxide—the kind of level that energy modelers say is necessary for long-term climate stabilization. To help clients cope with the burden of these prices, and take advantage of the signals they send for sustainability, the Bank can do four things:

1. It can make promotion of energy efficiency a priority, using efficiency investments and policies to adjust to higher prices and constructing economies that are more resilient.
2. It can assist countries in removing subsidies by helping to design and finance programs that protect the poor and help others adjust to higher prices.
3. It can promote a systems approach to energy.
4. And it can motivate and inform these actions, internally and externally, by supporting better measurement of energy use, expenditures, and impacts.

Goals and Scope

This evaluation is the first of a series that seeks lessons from the World Bank Group's experience on how to carve out a sustainable growth path. The World Bank Group has never had an explicit corporate strategy on climate change against which evaluative assessments could be made. However, a premise of this evaluation series is that many of the climate-oriented policies and investments under discussion have close analogues in the past, and thus can be assessed, whether or not they were explicitly oriented to climate change mitigation.

This report, which introduces the series, focuses on the World Bank (International Bank for Reconstruction and Development and International Development Association) and not on the International Finance Corporation (IFC) or the Multilateral Investment Guarantee Agency (MIGA). It assesses its experience with key win-win *policies* in the energy sector: removal of energy subsidies and promotion of end-user energy efficiency. The next phase looks at the expanding project-level experience of the Bank and the IFC in promoting technologies for renewable energy and energy efficiency; it also addresses the role of carbon finance. A parallel study examines the role of forests in climate mitigation. The climate evaluation's final phase will look at adaptation to climate change.

Motivation

Operationally, the World Bank has pursued three broad lines of action in promoting the mitigation of GHG emissions, the main contributor to climate change. First, it has mobilized concessional finance from the Global Environment Facility (GEF) and carbon finance from the Clean Development Mechanism (CDM) to promote renewable energy and other GHG-reducing activities. Second, and to a much more limited extent, it has used GEF funds to stimulate the development of noncommercial technologies. Third, and the subject of this evaluation, it has supported win-win policies and projects—sometimes with an explicit climate motivation, often without. These actions not only provide global benefits in reducing GHGs, but also pay for themselves in purely domestic side benefits such as reduced fuel expenditure or improved air quality. The win-win designation obscures the costs that these policies may impose on particular groups, even while benefiting a nation as a whole. This presents challenges for design and implementation.

Two sets of win-win policies are perennial topics of discussion in the energy sector: reduction in subsidies and energy-efficiency policies, particularly those relating to end-user efficiency. This report looks at these, and at another apparently win-win topic: gas flaring. Flaring is interesting because of its magnitude, the links to pricing policy and to carbon finance, and the existence of a World Bank–led initiative to reduce flaring.

Findings

Development spurs emissions.

A 1 percent increase in per capita income induces—on average and with exceptions—a 1

percent increase in GHG emissions. Hence, to the extent that the World Bank is successful in supporting broad-based growth, it will aggravate climate change.

But there is no significant trade-off between climate change mitigation and energy access for the poorest.

Basic electricity services for the world's unconnected households, under the most unfavorable assumptions, would add only a third of a percent to global GHG emissions, and much less if renewable energy and efficient light bulbs could be deployed. The welfare benefits of electricity access are on the order of $0.50 to $1 per kilowatt-hour, while a stringent valuation of the corresponding carbon damages, in a worst-case scenario, is a few cents per kilowatt-hour.

Country policies can shape a low-carbon growth path.

Although there is a strong link between per capita income and energy-related GHG emissions, there is a sevenfold variation between the most and least emissions-intensive countries at a given income level. Reliance on hydropower is part of the story behind these differences, but fuel pricing is another. High subsidizers—those whose diesel prices are less than half the world market rate—emit about twice as much per capita as other countries with similar income levels. And countries with long-standing fuel taxes, such as the United Kingdom, have evolved more energy-efficient transport and land use.

Energy subsidies are large, burdensome, regressive, and damage the climate.

The International Energy Agency's 2005 estimate of a quarter-trillion dollars in subsidies each year outside the Organisation for Economic Co-operation and Development (OECD) may understate the current situation. While poor people receive some of these benefits, overall the benefits are skewed to wealthier groups and often dwarf more progressive public expenditure. Fuel subsidies alone are 2 to 7.5 times as large as public spending on health in Bangladesh, Ecuador, the Arab Republic of Egypt, India, Indonesia, Morocco, Pakistan, Turkmenistan, República Bolivariana de Venezuela, and the Republic of Yemen. At the same time, subsidies encourage inefficient, carbon-intensive use of energy and build constituencies for this inefficiency.

The Bank has supported more than 250 operations for energy pricing reform.

Success has been achieved in the transition countries—in Romania and Ukraine, for example, where energy prices were adjusted toward market levels, and the intensity of carbon dioxide emissions dropped substantially. Subsidy removal can threaten the poor, however. Recent efforts to assess poverty and welfare impacts systematically appear to have informed the design and implementation of price reform efforts, though not necessarily with direct Bank involvement. Examples include Ghana and Indonesia, where compensatory measures were deployed in connection with fuel price rises.

The Bank has rarely coordinated efficiency improvements with subsidy reductions to lighten the immediate adjustment burden on energy users.

An exception is the China Heat Reform and Building Efficiency Project, which links improved insulation with heat pricing. A growing number of projects sponsor nationwide distribution of compact fluorescent light bulbs, but this has been done in response to power shortages (Rwanda, Uganda) or to stanch utility losses (Argentina, Vietnam), rather than to facilitate subsidy reduction.

Despite emphasis on energy efficiency in Bank statements and in Country Assistance Strategies (CASs), the volume and policy orientation of IBRD/IDA efficiency lending has been modest.

Although the IFC has recently increased its investments in energy-efficiency projects, World Bank commitments for efficiency have been about 5 percent by value of energy finance over 1991–2007. This includes investments in demand-side efficiency and district heating, and

may also include some supply-side efficiency investments. By this definition, about 1 in 10 projects by number involve energy efficiency. Including a broader range of projects identified by management as supporting supply-side energy efficiency would boost the proportion above 20 percent by number over the period 1998–2007. Globally only about 34 projects undertaken over the 1996–2007 period had components oriented to demand-side energy-efficiency policy. Among these, many attempts to promote efficiency have had limited success because the Bank has engaged with utilities, which have limited incentives to restrict electricity sales.

There are several reasons why end-user energy-efficiency projects, and especially policy-oriented projects, appear to be under-emphasized in the Bank's portfolio.

The Bank has carried out some successful and innovative efficiency projects. But internal Bank incentives work against these projects because they are often small in scale, demanding of staff time and preparation funds, and may require persistent client engagement over a period of years. There is a general tendency to prefer investments in power generation, which are visible and easily understood, over investments in efficiency, which are less visible, involve human behavior rather than electrical engineering, and whose efficacy is harder to measure. A general neglect of rigorous monitoring and evaluation reinforces the negative view of efficiency.

The Bank-hosted Global Gas Flaring Reduction Partnership (GGFR) has fostered dialogue on gas flaring, but it is difficult to assess its impact on flaring activity to date.

Associated gas (a by-product of oil production) is often wastefully vented or flared, adding more than 400 million tons of carbon dioxide equivalent to the atmosphere annually, or about 1 percent of global emissions. A modestly funded public-private partnership, the GGFR has succeeded in highlighting the issue, promoting dialogue, securing agreement on a voluntary standard for flaring reduction, and sponsoring useful diagnostic studies. But only four member countries have adopted the standard. The GGFR has emphasized carbon finance as a remedy for flaring, but the use of project-level carbon finance is a mere bandage for policy ailments that require a more fundamental cure.

Recommendations

In mid-2008, real energy prices were at a record high. While this is burdensome for energy users, it opens an opportunity for the Bank to support clients in making a transition to a long-term sustainable growth path that is resilient to energy price volatility, entails less local environmental damage, and is a nationally appropriate contribution to global mitigation efforts.

Clearly the World Bank needs to focus its efforts strategically on areas of its comparative advantage. This would include supporting the provision of public goods and promoting policy and institutional reform at the country level. Furthermore, the Bank can achieve the greatest leverage by promoting policies that catalyze private sector investments in renewable energy and energy efficiency, including those supported by IFC and MIGA.

The analysis in this report supports the following recommendations:

Systematically promote the removal of energy subsidies, easing social and political economy concerns by providing technical assistance and policy advice to help reforming client countries find effective solutions, and analytical work demonstrating the cost and distributional impact of removal of such subsidies and of building effective, broad-based safety nets.

Energy price reform can endanger poor people and arouse the opposition of groups used to low prices, thereby posing political risks. But failure to reform can be worse, diverting public funds from investments that fight poverty and fostering an inefficient economy increasingly exposed to energy shocks. And reform need not be undertaken overnight. The Bank can provide assistance

in charting and financing adjustment paths that are politically, socially, and environmentally sustainable. Factoring political economy into the design of reforms and supporting better-targeted, more effective social protection systems will be elements of this approach.

Emphasize policies that induce improvement in energy efficiency as a way of reducing the burden of the transition to market-based energy prices.

Historically, energy efficiency has received rhetorical support but garnered only a small share of financial support or policy attention. This is beginning to change with such moves as China's commitment to drastically reduce its energy intensity and India's Energy Conservation Act. But the Bank can do much more to help clients pursue this agenda. If a real reorientation to energy efficiency and renewable energy is to occur, the Bank's internal incentive system needs to be reshaped. Instead of targeting dollar growth in lending for energy efficiency (which may skew effort away from the high-leverage, low-cost interventions), it needs to find indicators that more directly reflect energy savings and harness them to country strategies and project decisions. It needs also to patiently support longer, more staff-intensive analysis and technical assistance activities. Increased funding for preparation, policy dialogue, analysis, and technical assistance is required.

Promote a systems approach by providing incentives to address climate change issues through cross-sectoral approaches and teams at the country level, and structured interaction between the Energy and Environment Sector Boards.

To tackle problems of climate change mitigation and adaptation, the Bank and its clients need to think, organize, and act beyond the facility level, and outside subsectoral and sectoral confines. One avenue for this is through greater attention to systemwide energy planning. Integrated resource planning, once in vogue, has been largely abandoned in the wake of power sector privatization and unbundling. Yet current planning methods are inadequate in integrating considerations of end-use efficiency and in balancing the risks of volatile fuel prices and weather-sensitive electricity output from wind and hydropower plants. Water management, urban management, and social safety nets are other areas where cross-sectoral collaboration is essential to promoting win-win policies and programs.

Invest more in improving metrics and monitoring for motivation and learning—at the global, country, and project levels.

Good information can motivate and guide action.

First, building on the Bank's current collaboration with the International Energy Agency on energy efficiency indicators, the Bank could set up an Energy Scoreboard that will regularly compile up-to-date standardized information on energy prices, collection rates, subsidies, policies, and performance data at the national, subnational, and project levels. Borrowers could use indicators for benchmarking; in the design and implementation of country strategies, including sectoral and cross-sectoral policies; and in assessing Bank performance.

Second, more rigorous economic and environmental assessment is needed for energy investments and those that release or prevent carbon emissions. These assessments should draw on energy prices collected for the Scoreboard; account for externalities, including the net impact on GHG emissions; and account for price volatility. Investment projects should also be assessed, qualitatively, on a diffusion index, which would indicate the expected catalytic effect of the investment in subsequent similar projects. It is desirable to complement project-based analysis with assessment of indirect and policy-related impacts, which could be much larger.

Third, monitoring and evaluation of energy interventions continue to need more attention. Large-scale distribution of compact fluorescent light bulbs is one example of an intervention that is well suited to impact analysis and where a timely analysis could be important in informing massive scale-up activities.

Gas flaring and pipeline equipment, SASOL Pipeline, Sub-Saharan Africa. Photo courtesy of SASOL/IFC.

Management Response

Management welcomes the evaluation by the Independent Evaluation Group (IEG) of some of the World Bank's experience with "win-win" energy policy reforms, which constitute an important but not exhaustive set of activities within the wider suite of World Bank Group efforts on the energy front.

It is useful to take stock of progress on the win-win reforms as defined by IEG, as they are an important element of the World Bank Group's vision to contribute to inclusive and sustainable globalization—to help reduce poverty, enhance growth with care for the environment, and expand individual opportunity. In this context, management particularly would welcome the promised second phase of IEG's evaluation, covering the expanding project-level experience of the Bank and International Finance Corporation (IFC) in promoting renewable energy, energy efficiency, and carbon finance, the absence of which precludes a comprehensive assessment of the focus and success of World Bank Group efforts on the energy front.

Overview of Response

Management concurs with several aspects of IEG's main findings, many of which reinforce important messages already captured in the Bank's energy sector practices or in the findings from Bank economic and sector work, internal reviews and self-evaluation, and emerging lessons from operational experience across the World Bank Group. At the same time, management takes issue with the evaluation scope of IEG's report; its definition of win-win energy opportunities; the gaps in evaluated areas; and the use, in certain cases, of findings to draw overly broad conclusions or recommendations, such as promoting the use of integrated resource planning by regulators of supply-side energy entities. Therefore, in several respects, management differs with IEG's findings and recommendations.

Key Issues of Agreement and Divergence

This management response first outlines the areas in which management broadly agrees with the analysis in the review, noting, however, areas where IEG could have given a fuller account of efforts the World Bank has made or is making. It then discusses areas in which management believes that IEG has drawn conclusions from an analysis based on limited coverage or that do not fully take into account the underlying context.

Areas of Agreement

Management agrees with the importance of energy efficiency and energy pricing in the Bank's work and the need for strong collaboration across sectors on energy policy issues. However, management believes that the report does not adequately reflect the considerable work the Bank has undertaken to address energy efficiency. The Bank's strong involvement in energy efficiency began in the late 1970s/early 1980s in response to oil price shocks. Although interest in energy efficiency languished after the subsequent fall in oil prices, it was rekindled in the early 1990s when Eastern European and former Soviet Union countries became active borrowers. During the 1990s, the Bank supported energy efficiency reforms in Europe and Central Asia Region countries through a combination of technical assistance, policy loans, and investment projects.[1] The role of energy efficiency was further reinforced by the Bank's *Fuel for Thought* (World Bank: Washington, DC, 2000), which pushed for market-based approaches to energy efficiency.

Post-Bonn Efforts. The World Bank Group has followed-up on its commitment made at the 2004 Bonn International Conference on Renewable Energy to increase annual energy efficiency and new renewable energy lending by 20 percent, starting in fiscal year 2005. Indeed, average fiscal 2005-07 energy-efficiency commitments have more than doubled compared with the previous three-year period. The World Bank continues to scale-up energy efficiency work in the energy sector. Staffing-up to increase the skills base is well under way in both the anchor and operational units. Energy efficiency specialists have been/are being hired by Regional units, Carbon Finance, and the Energy Sector Management Assistance Program (ESMAP).

Areas of Divergence

Management believes that IEG has drawn conclusions from an analysis based on limited coverage or that do not fully take into account the underlying context. Management is concerned that limitations on both definitions and the scope of IEG's report open the way to mischaracterization of the extent and impact of World Bank Group effort on energy efficiency.

Circumscribed Scope. The evaluation scope of IEG's report is circumscribed, incorporating only International Bank for Reconstruction and Development (IBRD) and International Development Association (IDA) energy-efficiency policy, energy pricing, and gas flaring initiatives, while excluding IFC's substantive role (except, very occasionally, at the margins). Management observes that excluding IFC programs and activities that target the key private sector role in promoting energy efficiency is a major shortcoming. IFC activities encompass a range of initiatives (such as the Efficient Lighting Initiative) and sustainability advisory services. By focusing piecemeal on Bank policy experience and deferring project-level experience to a second phase of review, IEG has not taken into account that the efforts of each of the World Bank Group's components are intended to complement one another and build on respective comparative advantages and synergies, and it has precluded a comprehensive evaluation of the energy efficiency experience in the World Bank Group. As a result, management observes that some of the report's Phase 1 findings paint an incomplete picture of World Bank and World Bank Group efforts on the energy front.

Definition of Win-Win. IEG's report uses a narrow definition of win-win energy opportunities. Management is concerned that the report focuses on, and draws conclusions from, one dimension of energy efficiency (end-user energy efficiency), while not adequately incorporating other important win-win energy opportunities, in particular, supply-side energy efficiency (which covers power plant rehabilitation to improve efficiency and also electricity transmission and distribution system loss reduction), renewable energy, and fuel switching.

Indicator. The IEG report uses an indicator that is limited to "specific efficiency efforts, including end-user efficiency and district heating." This opens the way to conclusions and perceptions that may be misleading, including that only about 1 in 10 World Bank energy projects involves energy efficiency. However, as noted in the IEG report, "including a broader range of projects identified by management as supporting supply-side energy efficiency would boost the proportion above 20 percent by number."[2]

Management, and certainly the clients of the World Bank Group, would have benefited from a more comprehensive analysis and an indicator that included all energy supply-side efficiency, technical assistance, and development policy lending, as well as IFC investments in energy efficiency.

Management Action Record. Management's specific responses to IEG recommendations are outlined in the attached draft management action record.

Notes

1. The Bank's energy efficiency work in the 1990s was guided by the 1993 policy paper, "Energy Efficiency and Conservation in the Developing World: The World Bank's Role." (World Bank: Washington, DC, 1993) and the companion, "Power & Efficiency—Status Report

on the Bank's Policy and IFC's Activities" (Joint World Bank/IFC seminar, July 7, 1994).

2. Management notes that the definitions underlying the figures it shared with IEG reflect, as well as energy efficiency captured by IEG, all World Bank lending for (i) supply-side energy-efficiency measures, including power generation plant rehabilitation, transmission and distribution loss reduction, and energy sector technical assistance with pricing covenants, and (ii) development policy lending with energy price reform.

On this basis, IEG observes that it may need to revise the language in order to describe more precisely the measures cited in the report and the differences between them. IEG acknowledges that alternative definitions of energy efficiency are possible. IEG has reported the proportion of energy efficiency projects using both stricter and broader definitions. The latter used the management-supplied information to calculate the proportion of projects incorporating plant rehabilitation and transmission and distribution measures. IEG has reported, separately, the proportion of projects involving price reform.

Management Action Record

Recommendation	Management Response
Systematically promote the removal of energy subsidies, easing social and political economy concerns by providing technical assistance and policy advice to help reforming client countries find effective solutions, and analytical work demonstrating the cost and distributional impact of removal of such subsidies and of building effective, broad-based safety nets.	***Agreed; work is already ongoing.***
Energy price reform, never easy or painless, can pose social and political economy risks in client countries. But the Bank can help provoke and promote reforms by providing clients with assistance in charting and financing adjustment paths that are politically, socially, and environmentally sustainable.	The Bank continues to work with client countries to address the issue of energy subsidies. Technical assistance and policy advice are provided, as requested by our client countries. The Bank focuses on the legal and regulatory mechanisms needed to support sustainable energy pricing reforms.
One way to do this is for the Bank to continue to develop and share knowledge on the use of cash transfer systems or other social protection programs as potentially superior alternatives to fuel subsidies in assisting the poor. This would include systematic analyses of the distributional impact of energy subsidies. Timely monitoring and analysis of energy use and expenditure, at the household and firm levels, will also be important in policy design, in securing public support, and in detecting and repairing holes in the safety net.	Energy staff will continue to work with Poverty Reduction and Economic Management Network and Human Development Network staff (for example, *Guidance for Responses from the Human Development Sectors to Rising Food and Fuel Prices,* World Bank, HDN: Washington, DC, 2008) to develop and apply social safety nets, including cash transfers, designed to protect the poor from the impact of energy price adjustments. A regulatory thematic group has been established in the Bank to foster dissemination of lessons learned. These lessons will be applied, taking into account the unique circumstances in client countries. When requested, the Bank provides support to enable countries to monitor and analyze energy use so that findings can be applied to their energy policies.
Emphasize policies that induce improvement in energy efficiency as a way of reducing the burden of transition to market-based energy prices.	***Partially agreed; work is already ongoing.***
Cost-reflective prices for energy boost the returns to efficiency, but the Bank should support country policies that allow households and firms to exploit efficiency opportunities. Conversely, the deployment of energy-efficient equipment such as compact fluorescent lights can be used as a device for cushioning the impact of price increases. The Bank should explore innovative ways to finance efficiency (and renewable energy) investments in the face of fuel price volatility.	The Bank has established an Energy Efficiency for Sustainable Development program to help guide and scale-up energy efficiency activities. It is implementing the first step of this program, to increase the staffing with energy efficiency experience, in ESMAP, the Energy Anchor Unit, and the Regions. This effort is complemented by a learning program developed by the Bank's energy efficiency thematic group, under the oversight of the Energy and Mining Sector Board. Another step is the development of programs and projects at the country/policy level, the industry level, and the equipment level to ensure that a broad-based implementation program evolves.

Management Action Record

Recommendation	Management Response
	To foster World Bank Group support for energy efficiency, the draft "Development and Climate Change: A Strategic Framework for Climate Change and Development" (World Bank: Washington, DC, 2008) has proposed an initiative to screen the project pipeline for energy efficiency potential early in the project design phase. The Bank is working with the donor community to: (i) increase the financial support needed to intensify energy efficiency efforts; (ii) increase low-cost funding to support energy efficiency and renewable energy programs; and (iii) broaden the support from partners in implementing a renewable energy and energy efficiency program.
In order to strengthen internal incentives toward promotion of energy efficiency, the Bank should develop appropriate metrics, such as indicators that more directly reflect energy savings, instead of dollar growth targets in lending for energy efficiency (which may distort effort away from the high-leverage, low-cost interventions). These indicators, in turn, need to be harnessed to country strategies and project decisions. All of these efforts are likely to call for increased funding for preparation, policy dialogue, analysis, and technical assistance rather than lending.	In terms of internal incentives, the discussion on developing appropriate metrics has been ongoing with International Energy Agency and with UN Energy, but to date it has been inconclusive. Given the inconclusive nature of the discussion to date, management is not prepared to agree with establishing new metrics that focus solely on energy efficiency. The World Bank Group has committed to accelerate lending for new renewable energy and energy efficiency to 30 percent per annum over the next three years, a 50 percent increase over the 2004 Bonn commitment (which it has consistently met since that time).
Promote a systems approach by providing incentives to address climate change issues through cross-sectoral approaches, teams at the country level, and structured interaction between the Energy and Environment Sector Boards.	***Partially agreed; work is already ongoing.***
Helping clients reform will require a systems view, such as looking at the power system as a whole; looking at energy subsidies as just one, undesirable, part of a social protection system; and looking at the connections between water and power management. To be effective the Bank needs to break down sectoral silos and encourage cross-sector approaches and teams. This will require championship by country directors and vice-presidents, to promote incentives such as supporting capacity building for power system regulators in integrated resource planning, and using the Clean Technology Fund to support public systems that will catalyze widespread investments.	The Bank will continue to use a system-wide approach in reviewing projects and programs. Most Regions and many country teams have already created climate change teams of staff from several sectors to promote synergies, and are developing cross-sectoral business strategies to integrate climate change considerations. The World Bank Group established a Climate Change Management Group as a focal point to discuss cross-sectoral issues and promote synergies. The Bank supports regulatory capacity building, drawing on lessons learned from successful cases accomplished to date. On the basis of previous experience, management disagrees with the proposed use of integrated resource planning, as it is unconvinced

Management Action Record

Recommendation	Management Response
Structured interaction of the Energy and Environment Sector Boards, initiated with ad hoc groups to address specific cross-sectoral challenges, could move the Bank closer toward mainstreaming sustainable development.	of the effectiveness of the use of integrated resource planning by either supply-side entities or their regulators. However, the Bank supports the use of broad-based planning tools by policy makers to support the implementation of policies in the legal and regulatory framework. The Bank is currently considering large-scale responses to demand-side issues using new funding for low-carbon technologies when the funds become available. The merging of infrastructure and environment into a common vice-presidency has facilitated interaction at the sector boards and thematic working groups.
Invest more in improving metrics and monitoring for motivation and learning at the global, country, and project levels. Good information can motivate and guide action. One particularly useful global initiative for the World Bank would be to collaborate with the International Energy Agency or other partners to set up an Energy Scorecard that would compile up-to-date and regular standardized information on efficiency indicators, energy prices, policies, and subsidies at the national and sectoral levels. Indicators could be used by borrowers for benchmarking; in the design and implementation of country strategies, including sectoral and cross-sectoral policies; and in assessing Bank performance in assisting countries. At the national level, the Bank should support integration of household and firm surveys with energy consumption and access information to lay the foundation for assessing impacts of price rises and mitigatory measures, as well as planning for improved access. At the project level, the Bank should invest in rapid-feedback monitoring and impact evaluation of efficiency projects and policies.	***Partially agreed; work is already ongoing.*** The Bank has been working with the International Energy Agency on collecting energy efficiency–related information in pilot countries for two years, with limited success. Management does not commit to the idea of establishing a centrally maintained Energy Scorecard. Rather, the focus of our efforts is now on helping client countries establish their capacity to undertake the data collection exercise in a manner that targets both effective implementation and related policy-making guidance. Without this capacity and country willingness to participate in and lead this initiative, it will not be sustained. The Bank is also looking into possible new, innovative knowledge-sharing mechanisms to facilitate sharing lessons learned. The Bank lacks the resources to maintain a comprehensive and reliable database on energy policies, prices, subsidies, and energy efficiency at the national level. Regional organizations provide part of this information, which the Bank selectively draws upon, depending on the information's reliability. The Bank, with ESMAP support, has led in improving Living Standards Measurement Survey (LSMS) instruments for increased collection of energy data as part of LSMS surveys. The Bank will include rapid-feedback and monitoring and impact evaluation of efficiency projects when requested by our borrowers.

Chairperson's Summary: Committee on Development Effectiveness (CODE)

On August 27, 2008, the Committee on Development Effectiveness (CODE) met to consider the report entitled *Climate Change and the World Bank Group—Phase I: An Evaluation of World Bank Win-Win Energy Policy Reform* prepared by the Independent Evaluation Group (IEG), together with the draft management response.

Background

On December 17, 2007, the Committee considered a study entitled *The Welfare Impact of Rural Electrification: A Reassessment of the Costs and Benefits*, prepared by IEG. The Committee considered the IEG report *Supporting Environmental Sustainability—An Evaluation of World Bank Group Experience,* 1990–2007, and draft management response on June 18, 2008. Recently, the Committee discussed the draft *Strategic Framework on Climate Change for the World Bank Group* at its meeting of August 6, 2008.

IEG Evaluation

IEG introduced the current evaluation report as part of a phased series on climate change. Subsequent phases will address issues of clean technology investments, carbon finance, and adaptation, and will look across the World Bank Group. This Phase I evaluation assessed the World Bank's experience with key win-win policies in the energy sector—those that combine gains at the country level with globally beneficial greenhouse gas (GHG) reductions. The analysis of this report supported the following recommendations:

- Systematically promote the removal of energy subsidies, easing social and political economy concerns by providing technical assistance and policy advice to help reforming client countries find effective, broad-based safety nets.
- Emphasize policies that induce improvements in energy efficiency as a way of reducing the burden of transition to market-based energy prices.
- Promote a systems approach by providing incentives to address climate change issues through cross-sectoral approaches and teams at the country level and structured interaction between the energy and environment sector boards.
- Invest more in improving metrics and monitoring for motivation and learning at the global, country, and project levels.

Draft Management Response

Management agreed with the importance of energy efficiency and energy pricing in the Bank's work and the need for collaboration across sectors on energy policy issues. At the same time, management believes that IEG has drawn conclusions from an incomplete analysis based on limited coverage and that do not fully take into account the underlying context. Management expressed concerns that the IEG report does not cover the full range of the World Bank Group's programs and activities (for example, assisting the private sector in promoting energy efficiency) and that it focuses on one subset of win-win energy opportunities and

excludes others, such as energy conservation, load management, and supply-side efficiency investments, as well as renewable energies and fuel switching.

Overall Conclusions

The Committee commended IEG for an excellent report, which members found very informative, and acknowledged that the trade-offs of undertaking the evaluation in appropriate, sequenced parts as had been outlined and agreed in the Approach Paper. Nevertheless, it was essential that strategic communication be carefully designed to avoid misleading or unfair interpretations of the findings. The plan for a capstone paper covering all three phases was endorsed. There was strong support for deepening the Bank's engagement with clients on energy pricing policies, though there was recognition that it is a complex issue encompassing economic, environmental, social, and political aspects that were likely to vary country by country and over time. The Bank could play a useful role in sharing best practices and distilling lessons of experience, particularly on energy taxes and subsidies and on pricing policies for renewable energy to help countries institute socially and environmentally sustainable pricing.

The general sentiment was for greater emphasis than hitherto on energy pricing policy, and energy efficiency in a broad sense. In this regard, the issues of external institutional incentives and internal incentives resonated with several attendees who recommended that management pay greater attention to this matter, including one suggestion to consider organizational changes (noting parenthetically that this issue's relevance goes well beyond the energy sector). While noting management's point about dividing labor appropriately with other agencies such as the International Energy Agency (IEA), the broad sentiment at the meeting was supportive of IEG's recommendations that the Bank be more involved in developing metrics and performance indicators. Indeed, several speakers added that analytical and design work in this regard should be at a global level, encompassing developed countries as well. Thus, the World Bank Group could play a very useful role in making high-quality information and a balanced monitoring framework for a global public good.

Next Steps

The report is the first of a three-part IEG evaluation on Climate Change and the World Bank Group, and focuses on IBRD-IDA experience. In response to the Committee's request, IEG committed to clarify the scope, content, and context of the Phase I report as part of its preparation for publication. This includes clarifying how it fits in the three-phase evaluation by IEG (where the second phase will look at the World Bank Group's project-level experience in promoting technologies for renewable energy, energy efficiency, and transport; and the third phase will look at adaptation issues). IEG also committed to prepare a capstone paper summarizing the three phases at the conclusion of the series; the Committee will consider whether or not to recommend this paper for a full Board discussion.

Main Issues Raised at the Meeting

The principal issues discussed were the following:

Scope of IEG Report

Some speakers would have liked to have seen immediate treatment (in the current phase) of a broader range of topics, including energy conservation and energy access; supply-side in addition to demand-side efficiency; discussion of new and additional financing, particularly for technology and equipment; discussion of additional energy sources, including biofuel or nuclear; coverage and targeted analysis of Bank support for adaptation; and extension of the evaluation beyond energy to forestry, transport, and agriculture issues. One member agreed with IEG's recommendations but felt that further thought should be given on how to implement them.

IEG's definition of win-win (or no-regret) policies and projects offering potential gains at the country level aligned to global interest (for example, reduction in GHG) drew some comments. One member felt the report could

have expanded this concept to consider environmental taxation and subsidies for renewable energy. Some others underscored that the paper should have given more emphasis to the principle of "common but differentiated responsibilities and respective capacities" in emissions and in additional financing, rather than focusing on savings from removal of subsidies. In this regard, a member noted that the poorest countries, which emit only a tiny fraction of the per capita emissions of developed countries, will be disproportionately affected by climate change. At the same time, the need to address subsidy reductions and energy efficiency in developed countries was raised by another speaker.

Some members stressed the importance of broadening the evaluation to World Bank Group activities, including synergies between institutions. One speaker considered that the structure of IEG's proposed suite of climate-related analyses would be incomplete without explicitly addressing the GHG implications of the Bank Group's engagements to help developing countries reform their power sectors. This speaker suggested that IEG should evaluate the positive and negative links between different power sector reforms and low-carbon electricity services as part of the second phase of its climate evaluation. IEG said that Phase I focused mainly on the World Bank, but the next phase will certainly include the International Finance Corporation and the Multilateral Investment Guarantee Agency. A few members suggested an appropriate communication strategy for disseminating the IEG three-phased review in a comprehensive manner to avoid misunderstandings. As suggested by some speakers, IEG agreed to highlight, during the dissemination of each phase of the report, that it is part of a broader review.

Bank's Assistance

The Bank was encouraged to deepen its engagement with countries through policy dialogue and to support them to pursue appropriate regulatory and institutional settings. Some speakers stressed the importance of adjusting the internal (for staff and management) and external (countries, Bank, and development partners) institutional incentive system. However, they also cautioned about the need to consider political economy considerations, as well as market failure and institutional constraints in client countries. A question was raised about the adequacy of the Bank's resources as well as organizational and operational capabilities to address the challenges of policy dialogue and reforms. In addition, one member stressed the need to balance the emphasis between software (price reform and regulatory framework) and hardware (energy-efficiency equipment). Management affirmed the Bank's internal capacity to provide a full package: 200 experts in thematic teams and cross-sectoral teams in the Regions, offering not only lending but also technical assistance, as well as social safety nets and policy advice.

Subsidies and Energy Pricing

There was general consensus on the need to be mindful of the political challenges of subsidies and pricing reforms, as well as economic and social dimensions at the national and regional levels. Speakers agreed that more emphasis should be given to removal of energy subsidies and were not surprised by IEG findings that subsidies were a poorly monitored drag on the economies of developing countries. They also stressed the importance of supporting energy pricing reform, an area recommended by IEG for greater emphasis. On price reform, the importance of diversity of reform packages to address country-specific circumstances; of a gradual approach to complement progress in institutional development; of finding windows of opportunity for analytical work and policy dialogue to motivate reform; and of client ownership were noted. It was also added that the adjustment of prices to market level should take into account vulnerable groups in relation to the other interests vested in the society, and the need for appropriate compensation systems.

Speakers encouraged the Bank to disseminate lessons learned, good practices, and guidelines, as well as more analytic work on implementing various reforms including fiscal sustainability, cross-subsidization, distributional impact, and cap-and-trade schemes. Management indicated

that the Bank uses a number of instruments to appreciate the political economy, such as Poverty and Social Impact Analyses. Management also noted that the Organisation for Economic Co-operation and Development (OECD) has done work on best practices on environmental taxation and cap-and-trade that the Bank is using in its analysis. Some speakers stressed the importance of addressing energy subsidies analysis and energy pricing reform in the new Strategic Framework on Climate Change and Development (SFCCD), which management indicated would be addressed in the full SFCCD paper.

Efficiency Policies

Some speakers agreed with IEG on the need for the Bank to systematically encourage more energy-efficiency activities in client countries. Management agreed, and stated that the full range of interventions, including the supply side of energy efficiency (loss reduction in distribution, transmission, and generation), and alternatives such as buses and public transportation systems need to be taken into account, depending on the country-specific circumstances. While acknowledging the importance of supply-side efficiency, IEG stressed that demand-side efficiency measures have been viewed by recent studies as offering the largest opportunities for energy savings and emissions reductions—larger than those offered by supply-side measures. Demand-side and end-use efficiency require policy attention because of underlying market failures and have been repeatedly stressed in Bank policy documents.

Metrics and Monitoring

Several speakers concurred with IEG's recommendation that the Bank should work toward developing appropriate metrics, while recognizing management's point that data collection would be costly. A few speakers pointed to a 1999 ESMAP "scorecard" publication as precedent. Additionally, some speakers stressed the need for the Bank to play an advocacy role in promoting a more balanced global monitoring mechanism by including indicators such as mobilizing financial and technological support to developing countries, while the political sensitivities and technical complexities of carbon accounting were acknowledged. Management indicated that it does not commit to developing and maintaining a database of this type, but it will work to develop indicators and help countries to establish capacity. Management noted that the Bank works together with the OECD, EUROSTAT, and multilateral development banks, and supports specialized agencies such as the IEA and UN, trying to help them formulate better indicators.

Global Gas Flaring Reduction Partnership (GGFRP)

A few speakers noted that the Bank has played an advocacy role in promoting reduction of gas flaring, but that adherence to the initiative has been below expectations. Questions were raised on whether there was a lack of interaction between the GGFRP and Bank's business or lack of competitiveness of the Bank's financial instruments.

Jorge Familiar, Acting Chairperson

Statements by the External Review Panel: Climate Evaluation, Phase I

Geoffrey M. Heal
Paul Garrett Professor of Public Policy and Business Responsibility, Columbia University

Overall I think this is a very good report. It focuses on important issues that are ones where the Bank can make some difference. My comments are minor.

I think that the two main themes, removal of energy subsidies and improvement of energy efficiency, are critical issues in the context of developing countries (and rich countries too!) facing rising energy prices and threatened by climate change. We know from experience that neither is easy to achieve, but for both I feel sure that the benefits outweigh the costs and fully justify the efforts. I do think it is particularly important to stress, as the report does, that removing energy subsidies need not compromise the ability to get energy to the poorest in society more efficiently, and that the main beneficiaries of subsidies are often the middle and upper classes. I was struck by the numbers indicating that high subsidizers have much higher emissions per capita than others: not surprising, but the numbers are impressive.

The report refers several times in the early sections to a systems approach to energy. I am still not completely sure what is meant by this. I take it to mean looking simultaneously at all aspects of energy production and consumption and thinking through interactions and possible duplication and overlap, worrying more about joint heat and power schemes, and so on. It is likely that there are real gains in this area but I feel that this is something that should be spelled out more clearly.

I was impressed by the comment that the social benefits of providing power to the poorest greatly outweigh the social costs, even if power is provided in a way that generates greenhouse gases. These numbers should be more widely known. They are important in the global discussions on climate change and the role of the poor countries in mitigating this.

I like the suggestion of Energy Scorecards. These can provide a basis for benchmarking, often important in the policy-making context, and could also be useful in climate negotiations. Connected to this is the idea of carbon pricing of projects that emit CO_2, even when there is no legal requirement to purchase permits. Most major banks in the West now require this of their clients: U.S. banks, for example, require their clients to charge for carbon emissions in project evaluations even though there is no need to buy carbon permits. It would be natural for the Bank to do this too.

As the report mentions, emissions from deforestation are large and generated by developing countries: Brazil, Indonesia, and China are in the top four emitters, and for Brazil and Indonesia it is the case that most emissions come from deforestation. There is scope for a global win-win move if we implement one of the Reduced Emissions from Deforestation and Degradation (REDD) ideas now under discus-

sion, as this will not only reduce emissions but also lead to new development finance. The Bank's Prototype Carbon Fund is important in this context.

Again, in summary, I was impressed by the review: it seems to address very important issues, and does so clearly.

Thomas C. Heller

Lewis Talbot and Nadine Hearn Shelton Professor of International Legal Studies, Stanford University

My comments are intended to be useful and provocative, even though I understand that, as detailed in chapter 1, the segment of the overall projected IEG evaluation we have before us is very restricted. It deals with win-win opportunities and defers systematic consideration of major issues (like carbon markets) that are only alluded to in this initial treatment. Any criticism of findings or recommendations in these areas of work key to rating and reforming Bank Group performance is evidently unfair as premature. Still, I hope that these remarks on the incomplete work may contribute to shaping the entire final product.

I want to state immediately that I like the report and find its organization, analyses, and recommendations generally clear, well founded, and pertinent. I will describe below the main points that exemplify these contributions. After stressing my strong appreciation for the tenor and content the report already makes (part A), I would like to discuss an implicit issue that runs throughout that is troubling (part B.). The issue is that even a cursory history of the Bank Group's engagement, though admittedly indirect, with climate change since the early 1990s indicates the matters stressed in the report have been known to the Bank's actors and central to the Bank's agenda for this whole period. The unanswered question that runs through the report is why outcomes should be different now, and in years to come, than they have been in the past. As the report implies in chapter 7, box 7.1, what is needed most in the future elaboration of the entire IEG project is to clarify and elaborate, in the light of its recorded behavior, the Bank's comparative advantage in the field of climate change.

Part A. There are very many discrete elements of the report that I found coherent, enlightening, and innovatively put forward. It makes a very useful contribution to the literature on energy and climate that would well be read within and outside the Bank Group. I'll list areas of treatment that, in my view, reinforce this conclusion.

1. The initial chapters on the relationships among energy growth, carbon emissions, and economic growth are concise and precise statements of what we know about these essential matters. They stress the critical points for the Bank Group and other major actors in the climate/energy intersection that poverty reduction and energy growth are not directly in conflict, that carbon and energy intensity are partially functions of natural endowments and partially products of clear choices about economic development paths, and that wide variation between nations in carbon emission performance is in part a function of energy policy and pricing. (Although given different labor, capital, and energy endowments, as well as the lack of understanding of carbon dynamics during the period in which basic patterns of economic development and resource use were set, the province and maintenance of these policies may themselves be subject to alternative interpretations.)
2. The tabular and analytical work on the carbon tax equivalence of recent increases in resource prices is original and quite helpful.
3. The case against subsidies and its political dynamics in the emerging era of high commodity prices and resource rent transfers summarizes well a mass of (fragmented) data clearly and deals nicely with the lack of basis for pushing these policies forward in the name of the poor, much better aided through other policy means.
4. The scale of the economic opportunities to reduce waste through energy efficiency and thereby avoid the construction of additional

carbon-intensive generation is restated, but with apt attention directed to the gap between the technical and engineering potential of improving both economic and environmental performance and the far weaker experience of closing this gap. There are many particular and original observations throughout the report, based on case studies of the Bank Group's energy-efficiency program record, (see #6 below) that contribute to the political economy or organizational theory explanations why energy-efficiency gains are often ignored in practice.

5. The report is very informative in describing how WB concentrations of loans and investments in specific dimensions of broad project categories. For example, in the area of energy efficiency, the bulk of projects and funds are placed in supply-side efficiency (equipment). Even in the limited set of projects aimed at managing demand- side efficiency (DSM), there is more emphasis given to technology (for example, CFL bulbs) than policy reforms (tariff decoupling—though it is shown that Bank Group electricity pricing reform should have a positive impact on the demand for energy-efficiency measures of all types). In the area of codes and standards, the emphasis is more on the elaboration and enactment of codes than on their monitoring or enforcement. Equally important, there are allusions to the role of organizational structures and incentives in producing these concentrations.
6. The report is replete with valuable and original observations that reflect the IEG author's substantial knowledge of the sectors and programs under review. They often stand in contrast to the lack of quality evaluation in other Bank Group processes designed to yield ongoing increases in the productivity of investment. These observations most often are made in the course of case or project studies. Examples include:
   a. DSM projects may often be undertaken as economical by utilities in developing countries that are forced by subsidized pricing to realize losses in some retail services.
   b. In many cases there are serious questions about the causal impacts of Bank Group projects. Brazilian gains in conservation and energy efficiency in the 2001 drought period were more likely attributable to learning during mandatory rationing than codes or other policy reforms. Eastern European price reforms were more likely due to wide systemic movement toward markets than specific policy measures.
   c. Even in cases where the economies of energy efficiency seem clear, subsidies to compact fluorescent lighting (ILUMEX) were not sustainable learning instruments that led to changed behavior when terminated.
   d. The best energy-efficiency codes have little impact in the longer run without greater and sustained attention to monitoring and implementation capacity.
   e. Favorable organizational image (public relations) was a more effective cause of reproducible behavior than other policies or subsidies in EGAT's (Thailand) success with compact fluorescent lightbulbs, indicating the potential of properly incentivized utilities.
7. The report details well how and why what appear to be win-win investments, especially in the area of energy efficiency, do not eventuate in a great number of instances. The roster of reasons varies from an absence of core collective goods like information to the presence of intranational resource transfer that requires either compensation or regulatory expropriation. But the report also makes it clear that many of these collective gains are efficient at the national level and that international transfers may be an unwise use of scarce financial resources. With these insights, it would seem that it would by now, after many years of Bank Group investment in this area, be standard operating practice within the Group to have developed effective analytical tools to discriminate between what should be done nationally and what internationally. However, there is no case made in the evaluation that any such tools have been consistently applied as normal use. The lack of attention over the years of Bank Group experience raises concerns about the incentives within the Group to manage these issues as well as might be hoped.

Part B. Before explaining my questions about the implications of the report for defining the comparative advantage of the WB Group in the area of climate change, I want to list a number of specific criticisms of the record made in the Report itself that are both persuasive and tempered.

1. 1. Although, there is increasing recent attention given to energy- efficiency support, especially by the IFC, when one considers the full spectrum of Bank Group investment in the energy/climate intersection (one in five projects have some connection to efficiency if a broader range of supply side measures is considered, the relative proportion of the project funding going to energy efficiency has been less than optimal. Within this class of under-funded activities, the relative proportion to demand side management is especially low in comparison to supply-side efficiency.
2. 2. The report presents a good compilation of the mixed record of effectiveness of many of the core programs in the World Bank portfolio. These include the large number of investments in power sector reform, gas flaring in general and the Global Gas Flaring Reduction Partnership in particular, and energy pricing reforms. There are patterns observable in the variation in effectiveness within these programs. For example, fuel price reforms have been less successful than electricity price reforms; Eastern Europe did better than large-scale fuel-producing nations. Moreover, the report notes very variable performance in project monitoring, analysis, and performance evaluation in the Bank's portfolio as well. (It is again surprising that there is as little systematic examination and learning from the variable record of performance as one would gather has occurred from a reading of the report's description of the materials to which it had access.)
3. There is good emphasis given in the report to the need for greater coordination across departments of the Bank Group to reduce intra-organizational stove-piping and the loss of potential benefits from a more comprehensive and systematic evaluation of the productivity of different investment options.

These three main themes form the logical and empirical basis for some of the key recommendations for reform. The first four recommendations are indisputable and well supported by the internal analysis of the report. These are: (1) focus on the removal of subsidies and provide targeted income compensation to the poor damaged thereby; (2) emphasize energy-efficiency opportunities and correct fuel and power prices to support these initiatives; (3) approach climate change systematically across the full range of World Bank country engagements because of the risk of perverse incentives under stove-piping; (4) improve the metrics and monitoring capacities to improve the information base on which such policy and program choices are made.

It is the fifth recommendation—that it would be better for the Bank toconcentrate on those areas of the Bank Group's competitive advantage, namely, promoting policy and institutional reform—that I think would benefit from clearer and more explicit elaboration in future work. I do not suggest this because I disagree with the recommendation. I agree wholeheartedly that the weak record of positive results of all of our institutions around global climate change is generally best explained by hard problems associated with the implementation, monitoring, evaluation, and reform of misgovernance. What seems to merit further development in the light of this perception is more empirical evidence or organizational analysis that it is the comparative advantage of the Bank Group to be the agent best positioned to improve the record with regard to these agreed institutional objectives.

Just as the report correctly emphasizes that the problems with the realization in practice of win-win opportunities in theory lie often in political economy and organizational behavior, it may be useful in framing the future completion of this IEG project to ask directly why the Bank Group, after some 15 years of programming in the climate/energy intersection, continues to operate with a suboptimal investment portfolio and highly inconsistent analysis based on an inadequate information base. Project assessment

has been narrow; carbon footprints have been haphazard; funding for renewables and energy efficiency has been generally low; implementation and monitoring are less attended than are normative prescriptions in policy-oriented activities. Are there systemic or institutional reasons that cause the persistence of these obvious and long-standing attributes of Bank Group practice? After initial experience with earlier programs that were subject to these same criticisms, why have there not been processes of systematic and sustained correction in later investment vintages? Would ongoing IEG work be more likely to induce positive change in the development in the Bank Group's program over time if there were more explicit discussion of the reasons that clarify why it has mainly stuck to a course that has long been subject to serious criticism?

We might here only speculate on types of organizational explanations that might be subjected to more intensive analysis to improve Bank Group practice by exposing the incentives that still are manifest in a relatively stagnant and problematic investment program. These might include arguments that an emphasis on normative economic prescription is too clear and too easy. This argument has been leveled at other dimensions of Bank Group programs by internal critics in areas including liberalization, privatization, and sectoral reforms. Related is the refrain that the path of transition from state-controlled to market-dominated economies was imagined as straightforward and technical, rather than profoundly political and conditioned by historical and institutional particularities in different countries. All of these claims could suggest the Bank Group has internal incentives to emphasize nonpolitical, often technical, remedies for poor growth performance; to stress upstream (technological) and normative solutions instead of downstream regulatory or behavioral or implementation problems because the latter are relatively more constrained by fundamental concerns about intrusion into political operations that impose larger sovereignty conflicts.

An alternative line of explanation might begin in organizational sociology. The report notes that many of the relatively less frequent elements of Bank Group programs, like DSM or particular types of renewable generation, have been carried on under the particular aegis of GEF funding or are championed by small expert teams marginal to the larger Bank system. This observation suggests the foundational proposition of organization theory that large organizations have a core mission and an attendant adapted culture that dominates their priorities and performance. Such organizations respond to threats from the environment by establishing marginal groups that mediate external demands without disturbing core operations. The Bank Group's core mission in this perspective is certainly to foster economic growth, with a strong amendment in the last decade to an express poverty alleviation orientation. This is reflected in an incentive system that concentrates on economic expansion and a commitment to short-run measures that bring poverty relief. Outcomes such as continued investment in energy infrastructure growth not necessarily constrained by environmental considerations (for example, coal plant investment) or technology diffusion rather than (longer-run) technology innovation would be expected in such an organizational culture explanation. (Conversely, focus on demand restriction might be less prized and reinforced by the facts that efficiency projects are complicated and staff-intensive, don't expend a lot of cash, and are less tangible and less prone to offer ceremonial occasions.)

These deeper issues of Bank organizational culture or internal incentives raise questions about what the report poses as the key issue going forward: what is the Bank Group's comparative advantage that should define its climate/energy strategy? With vast new resources coming onto the climate table, should primary responsibility be assigned to the Bank in allocating important segments of these resources given its own institutional incentives? These questions may be premature in terms of the various phases of the complete IEG evaluation project. Major issues are not yet examined. These include both the contested record of the Bank Group in expending many times the funds on fossil fuel

infrastructure financing than on noncarbon alternatives and the record of the Bank Group's carbon market initiatives. While the former is not at all addressed in the report, there are important anecdotal accounts of the latter.

Yet the preliminary work in the report also questions the Bank Group's early engagement with the CDM market in energy-efficiency financing, raising well-founded concerns about additionality if international funds are devoted to reducing costs of projects that are economically efficient at the national level. This is particularly true if continuing subsidies in retail prices reduce incentives for demand management. The report's chapter on gas flaring also analyses critically the Bank's use of CDM in cases where gas is not flared in the common cases where the regulated wholesale price of gas undercuts its collection and transmission, where electricity prices are held at levels too low to justify gas-fired generation, and where gas transportation projects that should be wholly economic at oil prices in excess of $40 per barrel do not take place because of risks of nonpayment from state-owned and run-off takers. These prospective questions, yet to receive comprehensive IEG analysis, may be seen as challenges to the conclusory proposition that the Bank Group should have a strong, though reformed, role in the growing world of carbon finance or climate policy.

In conclusion, at the end of discussing an excellent report, I wonder whether the report can best further the more effective resolution of such key climate change questions and help steer the Bank's internal evolution through more direct attention in the phases of the project to come to the issue of whether the Bank Group does have comparative advantages in climate in comparison to other potential climate institutions or to other public purposes the Bank Group might pursue.

Rajendra K. Pachauri

Chairman, Intergovernmental Panel on Climate Change; Director-General, Tata Energy Research Institute.

The report is comprehensive and reviews a range of World Bank activities that fit into an overall program related to climate change. Quite appropriately, the report traces the history and record of World Bank activities that are expected to have driven mitigation of greenhouse gas (GHG) emissions over the years. The emphasis on institutional changes and reform measures is quite appropriate, because in the operations of the World Bank these assume logical primacy and should lead to outcomes in developing countries ensuring higher levels of energy efficiency and reduced emissions of GHGs as a consequence. It may be mentioned that the Intergovernmental Panel on Climate Change (IPCC) in its Fourth Assessment Report (AR4) has very clearly emphasized the importance of placing a price on carbon as perhaps the most effective policy measure for promoting technological change and other actions that could result in reduced emissions of GHGs. Hence, the viewpoint of the Bank on the issue of subsidies and their removal as well as rational pricing for different applications constitutes an important set of priorities that over a period of time can bring about change in the right direction. Addressing the assessment of several co-benefits, including lower levels of air pollution at the local level with attendant health benefits, higher security of energy supply, and the like in relation to mitigation of GHGs would have provided another dimension of externalities which should be part of economic decision - making. This aspect has not been addressed adequately.

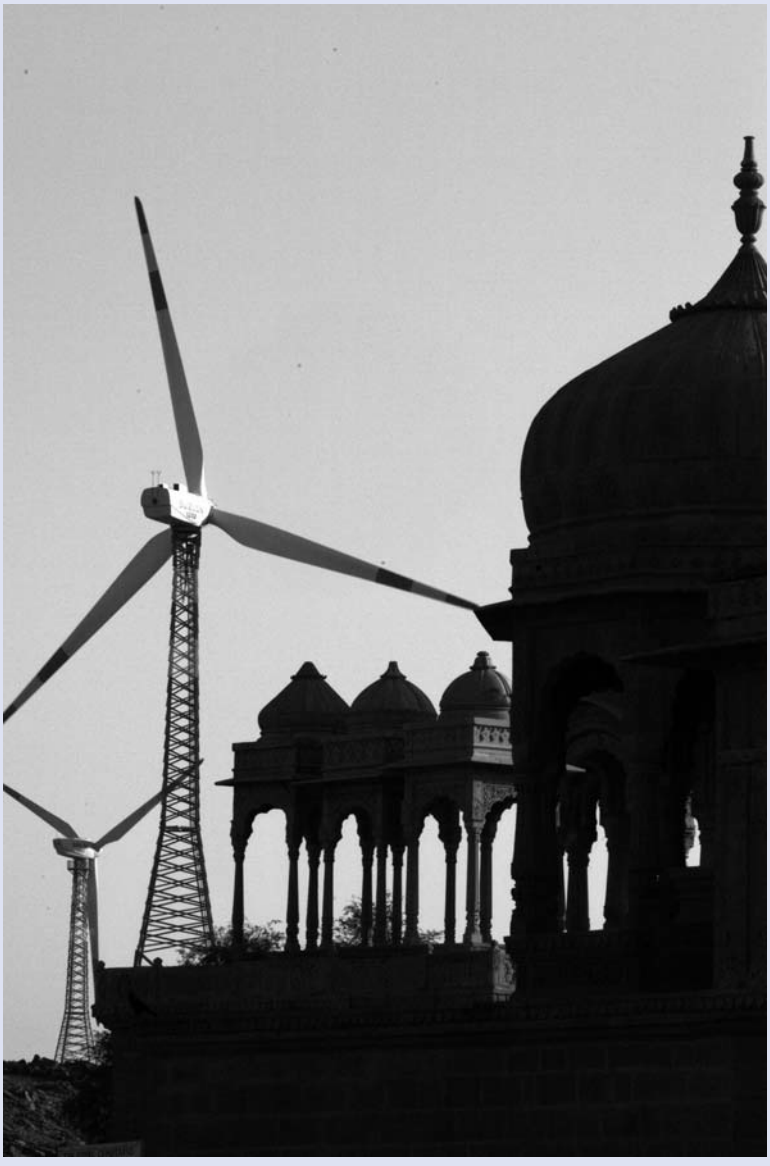
In my view, two additional aspects in preparing this report could have enhanced its value:

1. Research and development and technology issues for ensuring mitigation of greenhouse gases. While a number of technological innovations would generally flow from the developed to the developing countries, the need for customization of specific technologies to suit local conditions is an important aspect of technological change that perhaps deserved greater analysis and coverage in the report. This would also be justified by the fact that in several developing countries' technological capabilities have reached a level where they are making a significant difference

in bringing about efficiency improvements and reduced emissions of GHGs.

2. The second subject on which greater coverage and targeted analysis would have been useful relates to adaptation to the impacts of climate change. It is very clear that effective climate policy in every country of the world would require a combination of mitigation as well as adaptation, most effectively to be conceptualized and implemented by the same organizations and authorities handling both. By not covering adaptation measures in adequate detail and confining the report essentially to mitigation, this dimension has been a loss in terms of the value of what is presented in the report.

All in all, this is a useful document, which, I am sure, will not only help the Bank in developing its own climate change portfolio in the coming years but would also be of value to policy makers and analysts in both the developing as well as the developed world.



Wind turbines contrast with the architecture of the 300-year-old buildings of Bada Bagh, Rajasthan, India. Photo ©Jacqueline M. Koch/Corbis, reproduced by permission.

Glossary

Adaptation	Measures taken by societies and individuals to adapt to actual or expected adverse impacts on the environment, especially as the result of climate change.
Biodiversity	Short for biological diversity. Refers to the wealth of ecosystems in the biosphere, of species within ecosystems, and of genetic information within populations.
Carbon capture and storage	A technology for preventing the release of carbon dioxide to the atmosphere from thermal power plants by capturing the gas and storing it underground.
Carbon dioxide equivalent (CO_2e)	A standard unit for measuring the impact of a greenhouse gas on global warming. For instance, one ton of methane is considered equivalent in warming to 23 tons of carbon dioxide.
Carbon accounting (and/or carbon footprint)	Measurement of the gross or net impact on greenhouse gas emissions of an organization, project, or program.
Carbon fund	A fund set up for the purchase of carbon credits.
Carbon offset (or credit)	A financial instrument representing a reduction in greenhouse gas emissions (including gases other than carbon dioxide), used by purchasers to meet regulatory or voluntary limits on emissions.
Carbon shadow pricing	The practice of incorporating into the economic analysis of projects or programs an economic value associated with the external costs of greenhouse gas emissions or external benefits of emissions reduction.
Certified emission reduction	A carbon credit (measured in tons CO2e) for an emissions reduction associated with a Clean Development Mechanism project.
Clean Development Mechanism	"A mechanism under the Kyoto Protocol through which developed countries may finance greenhouse-gas emission reduction or removal projects in developing countries, and receive credits for doing so which they may apply towards meeting mandatory limits on their own emissions" (UNFCCC).
Climate change	Changes in climatic conditions and processes (including but not limited to warming) that go beyond natural climatic variability. When used in connection with mitigation, refers to human-induced changes.

Combined-cycle turbine	A relatively efficient technology for power generation from combustion, usually of natural gas.
Demand-side management	Actions or incentives, often directed by energy utilities to their customers, to reduce the level of energy demands (typically through efficiency measures) or change the timing of those demands.
District heating	Centralized system for the provision of steam heat to an urban neighborhood or district.
Ecosystem	The interacting system of a biological community and its nonliving environmental surroundings.
Emission	In this volume, emission primarily refers to the anthropogenic release of greenhouse gases, as from fossil fuel combustion or deforestation. Used also to refer to other kinds of air pollution from combustion, such as particulates and sulfur oxides.
Energy services company	A company that provides clients with some combination of assessment, financing, and implementation of options for increased efficiency of use and reduced expenditure on energy.
Environment	The sum of all external conditions affecting the life, development, and survival of an organism.
Environmental assessment	A process whose breadth, depth, and type of analysis depend on the proposed project. It evaluates a project's potential environmental risks and impacts in its area of influence and identifies ways of improving project design and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and by enhancing positive impacts.
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects (as defined in ISO 14001).
Environmental mainstreaming	The integration of environmental concerns into macroeconomic and sectoral interventions.
Environmental sustainability	Ensuring that the overall productivity of accumulated human and physical capital resulting from development actions more than compensates for the direct or indirect loss or degradation of the environment. Goal 7 of the UN Millennium Development Goals specifically refers to this, in part, as integrating the principles of sustainable development into country policies and programs and reversing loss of environmental resources.
Gas flaring	Burning of natural gas, usually when released as an unintended by-product of oil production.

Greenhouse gas	Gases whose atmospheric buildup contributes to global warming and climate change. Greenhouse gases regulated under the Kyoto Protocol are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.
Mitigation	Measures taken to reduce adverse impacts on the environment.
Netback price	Wellhead value of natural gas computed by netting transport costs from final market price.
Ozone-depleting substances	Manufactured chemical compounds that reduce the protective layer of ozone in the Earth's atmosphere. The Montreal Protocol, administered by the UN, maintains the list of ozone-depleting substances that are targeted for control, reduction, or phase-out.
Performance Standards	The eight Performance Standards establish requirements that the client is to meet in IFC-financed projects.
Safeguard policies	Policies designed specifically to ensure that the environmental (and social) impacts of projects supported by the Bank Group are considered during appraisal and preparation. The Bank's safeguard policies cover environmental assessment, natural habitats, pest management, indigenous peoples, cultural resources, involuntary resettlement, forests, dam safety, international waterways, and disputed areas.
Sustainable development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
Win-win policy	Here, a policy that provides net benefits both to the nation that adopts it and to the world at large. Individuals or groups may suffer losses under win-win policies, though in principle they could be compensated from the benefits. Also called no-regrets policy.

Indonesian motorists line up for gasoline in Bogor. Photo ©Dadang Tri/Reuters/Corbis, reproduced by permission.

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