Reforming Energy Assistance to the Post-Planned Economies

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Reforming the energy sectors of post-planned economies will play a decisive role in shaping the economic and environmental futures of these countries. Energy sector reform can help ease the difficult transitions to market systems and can reduce the magnitude of such environmental threats as acid rain, global warming, and nuclear accidents. This paper evaluates U.S. and multilateral programs which were designed to support energy reform in these countries, and recommends measures to improve them. First, the author describes the advantages of energy efficiency as a policy option, based on its prospects for remedying both economic and environmental crises. He then presents four case studies of energy assistance programs in order to show the strengths and shortcomings of previous attempts. Finally, the author offers recommendations based on the case studies on how best to implement energy assistance policy, including both the development of policy goals and the selection of programs which will offer the greatest likelihood for achieving them.

Introduction

High stakes ride on the success of energy reform in the post-communist countries. Energy transitions underway in Eastern Europe, the former Soviet Union, and China will affect the risks of global warming, nuclear accidents, plutonium diversion, and confrontation between superpowers with vast arsenals of destruction. Making energy efficiency a priority could improve the prospects for those changes.

In Russia, for example, the best chance for stabilizing the macroeconomic crisis is to earn foreign exchange through increasing energy exports. Russian oil production has dropped by almost 4 million barrels of oil per day since 1988.[1] Reviving and exporting this production would in five years pay Russia's total foreign debt of $75 billion. While the one-third decline in oil production cannot be fully reversed.[2] Russia's energy-efficiency potential could offset the loss of export potential.[3] Efficiency can thus play a major role in facilitating Russia's transition to a market economy.

Efficiency is vital in every post-planned economy for households and enterprises adjusting to higher energy prices. Some Poles, for example, now find that one-quarter of their household income is required to pay their heating bills. Factories in Ukraine suddenly face energy costs four times their previous share of total production costs .

The question in China is not whether energy-related carbon dioxide emissions rise, but whether they will triple or merely double. The success of energy-efficiency measures will largely determine the result.

Delivering efficiency offers the West the opportunity to achieve multiple foreign policy objectives—market reform, disarmament, climate change mitigation, consumer relief—with very low cost assistance measures. Each formerly planned economy ranks near the top of any list of energy-intensive nations.[4] Basic energy-efficiency technologies ranging from insulation to steam traps to heat meters are lacking, as are the services and infrastructure for making and delivering these products and devices. Western cooperation can help make these available by transferring the policies that help promote them and by fostering private sector business to help deliver them.[5]

Western cooperation in the formerly planned economies, however, has been frustrating for both donor and recipient. By some accounts, assistance efforts are missing a historic opportunity to achieve goals vital to the interests of both East and West.[6]

The problem is not necessarily money. The U.S. Agency for International Development has disbursed finding for technical assistance in Central and Eastern Europe

totalling $80 million over the past four years. Over $90 million in technical energy assistance has been authorized by the U.S. government for the former Soviet Union. The United States also offers programs to promote U.S. energy sector investments and exports. The Trade and Development Agency has provided feasibility study funds for a few dozen energy projects. The ExIm Bank has in Russia alone made over $2 billion in credits available for oil and gas projects.

The World Bank has committed $3 billion in energy project loans in Central and Eastern Europe and is expected to lend between $0.5 and $1 billion in the energy sector in the Newly Independent States each year for the next several years. With small exceptions, World Bank lending has been for power supply rehabilitation or privatization, fuel switching, and oil and gas development. The same is true of its multi-billion dollar loan portfolio in China, where it lends over one-half billion dollars per year for power sector development.[7]

The European Bank for Reconstruction and Development has been slow to lend, but has nonetheless committed $800 million to the energy sector in Central and Eastern Europe and has co-financed a World Bank oil development project in Siberia with a $250 million loan. The International Finance Corporation, the private sector branch of the World Bank, has increasingly sought power sector and oil and gas development projects. [8]

The dominant emphasis of most energy assistance initiatives has been energy supply. The Vancouver Summit assistance package was typical. President Clinton pledged $500 million to Russia in technical assistance, of which $38 million was for energy. Of that amount, nuclear power and oil were allocated 40 percent and 33 percent of the funds, respectively. Energy efficiency was allotted 5 percent. The $2 billion ExIm guarantee is exclusively for oil and gas. At this writing, no ExIm program exists for demand-side investment. This lack of balance between demand-side and supply-side efforts is striking because the target nation, with the world's largest potential for energy efficiency, has been aptly described as "the Saudi Arabia of energy efficiency."[9]

What explains the over-balance on the supply-side of the energy agenda? Is the oft-cited efficiency potential in the former Soviet Union and Eastern European region simply not real? Are the agencies charged with delivering assistance lacking in leadership and technical expertise? Or is there some other explanation?

To provide the basis for discussion, this paper first presents a brief introduction to energy-efficiency potential in the post-planned economies. It then reviews selected case histories of energy technical assistance projects to examine ways to improve the delivery of assistance. Finally, the paper suggests some initial reforms for improving the practice of delivering energy assistance, especially regarding constraints on energy-efficiency investment.

The Potential for Efficiency

Energy demand in the post-planned economies—the former Soviet Union, Eastern Europe, and China–totalled over 100 exajoules (EJ) in 1993.[10] This sum is almost one-third of global energy use. The United States, by comparison, used about 85 EJ.[11]

The energy savings potential in the FSU is over 15 exajoules (15 quads, or 7.5 million barrels of oil equivalent per day), although only half of this may be recoverable. The largest savings are available in the energy conversion and industrial sectors.[12]

The energy-efficiency potential in Eastern Europe amounts to 10-25 percent of current energy use. The lower end of the range represents the "profitable potential, " which has been defined as efficiency opportunities with an Internal Rate of Return exceeding 18 percent. The higher end of the range represents savings that can be achieved at less than the marginal cost of energy. With regional consumption at about 16 EJ, this means that up to 4 EJ of savings is available. The annual carbon emissions reduction that would be achieved by capturing this potential would total 80 million tons.[13]

Coal supplies three-quarters of China's energy. China's economy has grown explosively, averaging 9 percent per year since the economic reforms were initiated in 1978. That means China's economy has grown by 250 percent in the last 15 years. Astonishingly, China's energy use has grown "only" half as fast.[14] Still, coal production doubled from 620 million tons in 1978 to over 1.1 billion tons last year, an increase in coal production equal to total coal use in Russia.

China now ranks second in global energy-related carbon emissions. Plausible projections suggest that China could triple its carbon emissions of about 620 tons per year by 2025. With work, that figure could be held to a serious, but more manageable, doubling.[15]

The market for efficiency is illustrated here with a brief summary of the profitable energy-efficiency potential in Poland. Most post-communist countries have similar demand-side needs and constraints, and the Polish case provides a fair picture of the general situation.

This summary draws on a study[16] by the Polish Foundation for Energy Efficiency (FEWE) which evaluated the

internal rate of return on 16 technologies for energy-efficiency in the industrial, power generation, and buildings sectors, and screened them for profitability. The criterion for inclusion in the sum of the efficiency potential was a minimum internal rate of return of 18 percent. Energy prices were taken at their 1992 levels, which has the effect of underestimating the savings potential. The price of industrial and steam coal is assumed to be $35 per ton, while industrial and residential electricity is assumed to cost $0.04 and $0.049 per kilowatt hour, respectively.

The so-called technical potential totals about one exajoule, or one-fifth of 1991 primary energy consumption. That figure, of course, is not particularly illuminating because it says little about the practicality of implementation of the technical options. FEWE estimates the profitable, achievable potential for efficiency in Poland to be about 10 percent of 1991 demand, or over 0.4 exajoules. This, of course, also begs many questions about finance and constraints.

The most profitable technologies identified by FEWE include:

- Steam traps: IRR = > 335 percent
- Polish gas residential boilers: IRR = > 210 percent
- Low pressure sodium street lighting: IRR = > 155 percent
- Industrial electric motors: IRR = > 55 percent
- Heat meters and controls: IRR = > 40 percent
- Compact fluorescent lights: IRR = > 18 percent
- Gas turbines for coal bed methane and biogas: IRR = > 18 percent.

Technologies not deemed highly profitable with current prices but attractive with future prices (at western European levels) include all sixteen technologies considered, except fluorescent lamps in multiple mountings, low-emissivity windows, integrated coal gasification power stations, diesel combined cycle generation, municipal solid waste power stations, and atmospheric fluidized bed coal combustion.

The value of profitable energy savings with current prices totals over $2 billion per year-in Poland alone. Much of this value, however, will go unrealized due to a host of institutional constraints.

Despite the attractiveness of efficiency, few major investments have been made in delivering energy efficiency in Eastern Europe, the former Soviet Union, or China. Opportunities within virtually every application—from steam traps to turbines—go begging.

These problems can be highlighted with case studies which illustrate the nature of the shortcomings typical in assistance, drawing on experience in Poland, the Czech Republic, and Russia.

A short digression on China is in order: Assistance to that key nation is virtually forbidden. While the Environmental Protection Agency conducts some work on coal bed methane and the Department of Energy does significant work in "clean" coal and minor work on efficiency, AID and other assistance agencies cannot work in China. They have long been prevented from doing so because of conflict over China's family planning policies and more recently over human rights. This fact demonstrates a common problem in assistance efforts: policy practice does not match policy goals. Not only does withholding assistance diminish chances of reducing greenhouse gas emissions growth in China or capturing markets for U.S. businesses, it undercuts the budding private sector, a main source of strength for economic and political reform.

Cases in Project Selection and Implementation

Integrated Resource Planning

The electric utility sector in post-planned economies is a high priority for economic and environmental reform. Electric power use is inefficient while supply systems themselves rank among the dirtiest in the world. The challenge in this sector is daunting because billions of dollars would be required to clean up and make efficient the production and use of electricity, while the most fundamental institutions for regulating and governing near-monopolies must be created. Post-planned economies are developing from scratch the system of regulatory practice that all western nations take for granted. Even if a competitive supply market is created for electricity supply, the state must provide at least a rudimentary regulatory framework because access to the distribution network is inherently limited.

It was hoped that Central Europe and the former Soviet Union could incorporate mechanisms for demand-side management while making the transition to market mechanisms. Specifically, it was hoped that Integrated Resource Planning (IRP) could be used to put energy-efficiency

options on a par with supply-side measures. IRP could help provide a framework of incentives and practices for delivering energy efficiency through electric and district heating utilities.

Initial attempts to introduce and transfer Integrated Resource Planning into Eastern Europe were led by NGO groups without official support. First efforts were initiated in 1991 by Marc Ledbetter then of the American Council for an Energy-Efficient Economy (ACEEE) with foundation funding and the logistical support of energy-efficiency centers in Poland (FEWE) and the Czech Republic (SEV-En). ACEEE and the centers organized the first series of workshops in Central Europe to introduce IRP to utility and distribution company officials, bringing DOE national laboratory and private sector experts for two weeks and translating a handbook on the design and implementation of IRP. As a result, the Polish government issued in October 1991 a statement endorsing the concept of IRP.

Concurrent with these developments, however, certain bilateral and multilateral assistance confused the issue. A major project was initiated in Poland at the request of the World Bank and funded by the British Know-How Fund to restructure the electric utility industry. A British consulting firm conducted the work and helped persuade the Polish authorities to adopt the British model of electric industry structure, complete with its disincentives for end-use energy efficiency improvements. That is, competition was created for supplying electric power, but no provision was made to encourage utility participation in the acquisition of cost-effective demand-side resources.

AID subsequently became interested in promoting IRP, and offered three types of support. One program was the U.S.-Eastern European Utility Partnership Program (UPP). This effort was part of the "Electric Power Systems and Related Fuel Supply" project, which was funded at a total of $5.7 million.

One problem with the partnership approach will be obvious to IRP experts: the utilities involved have very different performance records in implementing IRP in their own systems. New England Electric System and Central Maine Power, for example, have admirable records in this regard, but Houston and Southern have committed few resources to this field. The consequences of this choice are serious:

- Houston Electric discouraged CEZ, the Czech Utility, from considering IRP, citing cost, the take-back effect, and low per capita consumption as reasons.[17]

- The Southern Company, in Poland, has had little or no interaction with the Polish utilities on this subject. Thus, one key electric utility program sponsored by AID in Central Europe has in two important countries had a negligible or negative impact on the transfer of the demand-side management part of electric utility reform.[18] In fairness, however, the partnership program has not produced stunning successes in IRP even when utilities with stronger records have been involved. The main difference is that they have not discouraged acquisition of efficiency as a resource.

AID also paid a consulting firm to study the potential of IRP in Poland and to launch a pilot project in coordination with the World Bank. The project was intended to support the Government of Poland and the Polish Power Grid Company restructure the Polish electric utility sector. The report, however, produced surprising results: the potential for electric energy-efficiency potential by the year 2000 was estimated to be only 1-2 percent of current capacity. These results were inconsistent with most studies of the potential for efficient electric power use in Poland, and they implicitly imply that demand-side management is not a priority for the government of Poland or for its citizen-consumers. Key assumptions were arbitrary and had the effect of skewing the results to demonstrate a low potential for efficiency.[19] One result could be that Polish authorities will conclude that demand-side management is not worth much time or money.

Power sector assistance in the Czech Republic inevitably becomes entangled with a decision to complete the controversial Temelin nuclear power plant. The plant's completion will be made possible by a U.S. ExIm Bank loan guarantee of $350 million for a Westinghouse joint venture with a Czech firm.

Some high-ranking officials of the Czech Republic privately maintain that the U.S. government exerted undue pressure on the Czech government to continue operation of the plant and to ensure that Westinghouse be selected to do the work. Credible evidence may exist to support this claim, but is not publicly available. There may have been no cause and effect relationship between the discouragement of demand-side management through one program and the encouragement of an American-backed project to expand supply on the other. But there appears to have been a conflict between two competing objectives of the U.S. government-to promote efficiency and environmental protection on one hand, and to promote U.S. exports on the other.

We draw three conclusions from the above examples:

Official assistance has diminished the prospects for energy efficiency through IRP in at least two major circumstances.

- Assistance is characterized by important internal inconsistencies and competing objectives.

- NGOs responded faster and more effectively to the need for assistance in electric sector energy-efficiency programs than did official players.[20]

It is fair to ask whether the Eastern European experience has been used to improve subsequent IRP assistance efforts in Russia. The program in Russia bears many of the same organizational characteristics—reliance on utility partners without strong experience in IRP and on U.S. consulting firms. A commitment was made to involve local experts in a IRP program designed to introduce and develop the concept in Moscow and the North Caucasus region. Difficulties in procurement—in providing funding to local experts-has delayed their participation by more than a year.[21] The work by U.S. consultants continues.

AID's procurement problems are well known, and Administrator Brian Atwood has initiated an effort to reform. Procurement, however, was not the only difficulty in Russian IRP. The project, and the Russian program more generally, has suffered from lack of clarity regarding who at AID is in charge of the program. At this writing, no AID officer has apparent responsibility for the IRP project, and the person who once had nominal control has left the agency but is managing most AID energy work on a day-to-day basis as a staffer in an AID consulting firm in Moscow.

The problems with AID's IRP work appear to be systemic. They suggest the need for clearer lines of management, procurement reform, and greater participation on the part of both local and American NGO experts.[22]

Skawina Clean Coal Project

The Bush Administration launched a major effort to demonstrate U.S. clean coal technology at the Skawina Power Station in Krakow, Poland. The project was initially slated as a $20 million effort to reduce pollution levels in Krakow, which is a city of significant historical, cultural, and tourist value. Krakow's burden of particulate emissions and acid rain have caused great harm to both the historic artifacts of the city and the health of its population.

The Skawina project quickly became a "scrubber retrofit project," which Polish environmentalists criticized because they felt it failed to address pollution in the city. It was estimated that the $20 million project would reduce particulate emissions by less than 1 percent in the city, and that it would have negligible effect on the acid rain problem. Environmentalists, including the Polish Ecology Club, argued that U.S. assistance instead be applied to promote fuel-switching to natural gas, elimination of "low-level sources" of particulate, primarily neighborhood-scale boilers, by connecting them to the district heating system, and energy conservation. Fuel-switching to gas could have eliminated much of this problem, and efficiency improvements alone could have cut emissions by 20 percent or more, based on the results of a major demonstration project.[23]

Approximately $3 million of project funds was reallocated to include an energy-efficiency demonstration project. This project demonstrated that investing in heat exchangers, heat meters, valves, controls, weatherstripping, radiant reflectors, and insulation could produce energy savings of 20-30 percent in the buildings.[24] The project, though it was far less well-funded, offered much greater potential for reducing air pollution in Krakow, the ostensible purpose of the overall demonstration project.

Meanwhile, AID funds provided to the Department of Energy were used to pay for a $7.6 million scrubber, which was built by Airpol, a company based in New Jersey. The remaining finds-about $10 million—were used to provide matching funding for American-Polish joint ventures in clean coal technology in Krakow. A "Program Opportunity Notice" was published that made matching funds available for U.S. investors on a dollar-for-dollar basis.

The results of the competition were disappointing to Krakow environmentalists. All but one of the awards went to supply-side projects. The only efficiency-related project awarded was for installation of controls in the power plant and distribution system of the district heating facility in Krakow. No funds were awarded for switching to gas or for demand-side management projects. AID notes that no applications were made for these projects. The author's reading of that notice, however, suggests that demand-side projects were implicitly discouraged.

One could draw several conclusions from the Skawina project:

- The project was oriented from the outset to supply-side, end-of-the-pipe solutions.

- Criticism by local NGOS produced a useful reorientation of the project by AID and DOE to include an energy-efficiency component.

- Follow-through on the project was nevertheless primarily supply-side oriented, and has been the subject of intense criticism on the part of Polish environmentalists.

The design of future projects of this type could be improved by involving in a central and substantive manner local experts and stakeholders. In particular, local experts could have helped design a project that addressed the need to demonstrate institutional design for investment and intervention to solve air pollution and energy utilization problems—as opposed to a straightforward technical demonstration.

The Gore-Chernomyrdin Commission

The Gore-Chernomyrdin Commission on Energy and Space can be taken for both positive and negative examples of appropriate goal-setting and project selection. The energy projects selected under this umbrella include initiatives to open new Russian oil and gas resources to American firms, shutting down the Tomsk and Krasnoyarsk plutonium production reactors and replacing them with non-nuclear sources, and a memorandum of cooperation on energy efficiency. Projects were selected hastily with interagency but no outside review. Project selection received considerable attention from the White House.

The Gore-Chernomyrdin projects can be assessed for their effectiveness in matching energy assistance options to strategic objectives and specific goals. (See Figure 1) The purpose of the overall effort was to ensure the success of the changes underway in Russia in order to minimize the return to Cold War hostility and military competition. Additional priorities included access to Russian business opportunities in nuclear power and oil and gas development, promotion of energy efficiency, increasing hard currency earnings from energy exports, reducing the risk of nuclear accidents, and promoting the conversion of the defense industry to civilian production.

How well have these goals been served? The record is mixed. Major emphasis was placed on winning a waiver on the liability of U.S. nuclear firms working to upgrade the dangerous Russian RBMK nuclear reactors. Many environmentalists have questioned the wisdom of trying to upgrade the safety of those reactors, advocating a position of shutting them down as quickly as possible. Advocates of the safety assistance effort argued that the Russian nuclear industry was not going to shut down the reactors, and therefore it was wisest to help make them as safe as possible. A third position is possible–that held by the author—which is that while safety of the RBMKs may be a worthy goal, it was not critical to the success of democratic and economic reforms because the power could be more easily replaced or conserved than the reactors could be salvaged. Moreover, placing a high priority on a liability waiver for working on the RBMKs served only one U.S. objective, and it would not rank first on many lists of priorities. It seems likely that the real driver for this project was the fear of the western nuclear industry

Project	Market Reform	Security	Environment
Nuclear Liability Waiver	Low	Low	Moderate
Plutonium Reactor Replacement (Tomsk)	High	High	High
Radiation Health Effects Study	Low	Low	Low
Nuclear Materials Accounting & Control	Low	High	Moderate
Energy and Environment Commodity Import Program	High	Moderate	High
Model Retail Gasoline Corporation	Low	None	Low
Oil and Gas Technology Center	Moderate	Low	Moderate
Advanced Coal Fired Technology	Low	Low	Moderate
Bilateral Cooperation on Efficiency Policy	High	Moderate	High

NOTE: This ranking is meant to illustrate the concept of qualitative ranking in priority-setting exercises. The rankings are the subjective opinions of the author. In a formal process, rankings would be produced by panels of experts or peers, and the rankings would be justified with ordinal values and written explanations that could be reviewed by interested parties.

Figure 1. Gore-Chernomyrdin Commission Projects Priority Ranking by Strategic Goal: An Illustration

that another RBMK accident would be the end of the nuclear industry everywhere.[25]

Some of the Gore-Chernomyrdin projects satisfy more than one objective. For example, the replacement of plutonium production reactors has been coupled with the introduction of a new clean-burning, energy-efficient power source—aeroderivative gas turbines. These engines will be manufactured in a Russian military aircraft factory, and could thus contribute to the conversion of a military industry to peaceful uses. Because the main objective—eliminating the production and separation of weapons-grade plutonium—is of vital importance to global security, the project would pass almost any screening test. Likewise, control of and accounting for nuclear materials would seem to be a priority.

In contrast, it is difficult to see the justification for a "model retail gasoline corporation." The stated purpose of this project is to introduce American marketing techniques. But the project would not increase exports of Russian energy, reduce greenhouse gas emissions, or provide a social safety net.

Similarly, improving coal-fired technology would seem justified in the best of all possible worlds because particulate emissions are a problem in some regions. However, coal supplies only a fifth of Russia's energy, and oil and gas would appear to be much higher priorities.

The World Bank Experience

The debate on the value and role of the World Bank in supporting economic reform in transition economies was renewed in October 1993 by Czech Prime Minister Vaclav Klaus. In a speech to a Bretton Woods meeting, Klaus praised the Bank for its contribution to structural adjustment in the Czech Republic through its lending for that purpose. Klaus then announced that the Czech government believes that the World Bank's project lending is a diversion and not useful, and that his government will no longer provide sovereign guarantees for Bank project lending.[26]

Klaus' comments effectively ended World Bank involvement in the Czech Republic because the Bank's charter requires sovereign guarantees. His speech led to the abrupt termination of $400 million in project loans the World Bank had pending for immediate use.

Was Klaus right? From an energy-efficiency perspective, it is difficult to make a case to the contrary. On one hand, the structural adjustment lending by the World Bank places pressure on nations to raise energy prices to market levels and to impose hard-budget constraints—making prices matter—on enterprises. Few policy measures have more effect on energy-conserving behavior.

On the other hand, even a cursory review of the Bank's energy lending in Eastern Europe reveals a portfolio that is monotonically supply-side. The fact that the Bank would follow its traditional supply-side orientation in this, the least energy-efficient region in the world, reveals much about the institution's nature. Demand-side projects may be too small in scale for a high-overhead institution such as the World Bank. Thus, from an energy-efficiency point of view, Klaus is probably correct.

But beyond efficiency, the Bank's difficulties are evident: less than one-fifth of the funds available for project lending in Central and Eastern Europe have been disbursed .27

Reassessing Assistance

Three major problems impede the effectiveness of assistance to the post-planned economies. First, goal-setting is a chaotic and flawed process. Goals for assistance are set in general terms, often from the top down, and left to civil servants to operatiomdize. Driven by the need for consensus, leaders tend to make goal-setting an exercise in writing all-inclusive lists. Thus, energy assistance to Russia, for example, includes goals for nuclear safety, oil and gas production, energy efficiency, coal mining safety and productivity, and environmental protection. The difficulty comes in matching limited resources for assistance to problems any one of which could easily consume all the money allotted.

Resources often get dissipated over a broad range of issues, leaving little money to accomplish major goals, and even poorly matching efforts to strategic goals. Because goals are set in general terms—such as "to improve the energy-efficiency of Eastern Europe"-implementors have wide latitude to choose whatever program they wish. Setting general goals is nonetheless vital, and one could easily identify a half-dozen or so key objectives, including:

- Macroeconomic stabilization
- Structural adjustment
- Defense conversion
- Greenhouse gas emissions reduction
- Nuclear accident/proliferation risk reduction
- Social safety net provision.

One could then match project proposals against these objectives to ensure that they serve national priorities. For example, one could ask whether helping Russia shut down the Tomsk plutonium production reactor and replacing it

with aeroderivative gas turbines and energy efficiency matches the objectives. And one would quickly see that it serves several objectives at once. On the other hand, a "model retail gasoline distribution chain" in Moscow seems to fulfill none of these major objectives. Yet, both projects are high-priority initiatives conducted under the auspices of the Gore-Chernomyrdin Commission on Energy and Space, chaired by Vice President Gore and Prime Minister Chernomyrdin.[28] (See Figure 1)

Second, assistance often is stymied by inappropriate choice of a "delivery vehicle" for energy projects. A delivery vehicle can be a technical demonstration project, a line of credit, a policy review, infrastructure-building, or information exchange. Technical assistance usually takes itself literally and develops technical demonstrations, leaving solutions to the hard institutional and financial problems to the private sector. That is, the demonstrations prove only that one can save energy with a specific technology, as long as the government is willing to pay for the test.

Third, existing procurement policy favors the status-quo. The problems are simple: the government imposes onerous procurement rules on bureaucrats in order to prevent waste, fraud, and abuse. However, the rules can be subverted and even used to the benefit of those who already have close working relationships with agency managers, and serve to slow acquisition of outside contractors by months and even years. Indeed, the procurement rules directly lead to the need for "indefinite quantities contracts" which give major contracts to firms whose main qualifications are doing as they are told. These mega-contracts reduce the ability of the government to be flexible and seek the best experts for the job. They make it especially difficult to use local experts, whose rates and costs may be difficult to certify and justify.

Recommendations

A number of fundamental problems plague energy assistance programs: lack of clear purpose, inappropriate selection of delivery mechanisms, and inept administration. A variety of causes underlies these problems including conflicting priorities, lack of adequate funding, lack of understanding of the reform process, lack of understanding of the local situation, misguided efforts to impose accountability, and lack of skill, experience, and training among persons delivering assistance.

Major reforms will be needed to make energy-efficiency assistance successful. Practical changes that policy makers could consider include:

- Encouraging peer review of project proposals to ensure consistency with stated goals and objectives.
- Reforming agencies' procurement processes to enable greater flexibility in the selection and use of experts.
- Balancing, or ending, World Bank project lending.
- Facilitating private sector lending.

Peer review of bilateral projects would help make goal setting more consistent and systematic. Personnel in assistance agencies often face pressure to choose projects that favor certain mayors or ministry officials in the host country. Picking the right partner is one of the arts of making assistance work, and the criticism here is not that the practice is in itself wrong but that it often takes precedence over basic mission objectives, A bad project that supports a "friend" can crowd out a better project. Peer review would provide a check on such impulses by screening projects that do not match more objective criteria.

Peer review would be moderately difficult but not impossible to impose. A certain amount of confidentiality is required in the development of projects, if only to protect the project leaders from a deluge of lobbyists wanting money. There is also the legal requirement that confidential information about procurement matters not be divulged in a way that would give any firms undue advantage in competing for contracts. The key to peer review would be to identify individuals inside and outside the government with the following characteristics: Expert knowledge of the subject; knowledge of the target region; and no conflict of interest in the procurement to come with the project. Peer reviewers will be setting policy, to some extent, and therefore should not be in a position to profit from their decisions. Outsider reviewers would be critical to the success of the process because the government agencies in charge of these matters by-and-large do not possess the requisite expertise. Jurisdictional considerations, moreover, compromise the judgement of agency reviewers.

Greater reliance on local experts is a vital concern. At a fundamental but non-quantifiable level, the use of western experts to set project policy and to manage projects creates a sense of inferiority and dependency that is destructive and counterproductive. Local experts throughout economies in transition rank among the world's best. For a variety of reasons, including the desire for intellectual integrity, flexibility, and higher pay, the best experts on both sides of the assistance coin are often outside the government.

Involving non-governmental local experts requires a new approach to procurement. Local experts cannot compete with American consulting firms when it comes to indefinite quantities contracts or large-scale requests for

proposals. Yet, if local experts are used as sub-contractors or sub-sub-contractors on specific projects, they typically are relegated to secondary or tertiary roles. They "do data" or run errands. Structuring projects and procurement so that they are flexible enough to test and utilize the skills and knowledge of local expertise should be a central aim of development assistance.

Reform of financial assistance should begin with the World Bank. Fundamental reform is preferable, as opposed to tack-on solutions such as trying to use Global Environment Facility funds to alter the Bank's behavior. Reform that is not central to the mission and incentives of an institution will probably not work. The World Bank's overhead structure does not lend itself to flexibility, so it may never be helpful on issues such as demand-side management that require creativity. If the policymaking institutions come to realize that the Bank's role on the supply side does more harm than good, then the logical course would be to restrict its lending programs to structural adjustment. A less radical course might be to set deadlines and quantitative goals for demand-side lending at the Bank and then, barring progress, implement the more fundamental reform.

An altogether new approach to development financing might serve efficiency well. This approach would provide funds for equity investment. Providing equity provides "recoursability" for financiers so that efficiency lending on a project financing basis can take place, especially in projects where the loans are to be secured only by project revenues. The ECOFUND in Poland, which created grant-making capital through a debt-for-environment swap may be the prototypical model. In addition, helping municipalities finance projects in district heating and buildings sector efficiency through municipal bond sales would provide significant funds and incentives for creating the energy-efficiency market.

Reform in the post-planned economies matters for global security, economic development, and environmental protection. The governments of the former Soviet Union, Central and Eastern Europe, and China have discovered that reform is hard and when it comes at all it comes when the cost of doing nothing greatly exceeds the cost of taking action. That time has also come for the western agencies whose job it is to make reform easier.

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5. The question of whether assistance can make a difference was thoroughly debated by an Office of Technology Assessment (OTA) panel advising the study *Fueling Reform: Energy and Environmental Technologies for the Former East Bloc* (Draft, January 1994). The consensus—and the position adopted by OTA, is that assistance can, indeed, make a difference, despite the fact that it may not yet be doing so.

6. The best assessments to date of energy assistance programs in Eastern Europe and the Former Soviet Union are Office of Technology Assessment, U.S. Congress, *Fueling Reform: Energy and Environmental Technologies for the Former Soviet Bloc*, Draft, 10 January 1994, and U.S. Congress, Office of Technology Assessment, *Energy Efficiency Technologies for Central and Eastern Europe*, OTA-E-562 (Washington, D.C., U.S. Government Printing Office, May 1993).

   The popular media have also begun to criticize assistance to the transition economies. See, for example, *CBS Evening News*, transcript, 25 May 1994.

   This paper does not pretend to be the first critique of the shortcomings of international assistance programs: the literature contains many earlier, worthy entries. The most influential recent examples include Michael Phillips, "The Least-Cost Energy Path for Developing Countries: Energy-Efficiency Investments

for the Multilateral Development Banks," International Institute for Energy Conservation, September 1991, and Bruce Rich, *Mortgaging the Earth* (Boston: Beacon Press, 1994).

7. Bob Taylor, China & Mongolia Division, World Bank, personal communication, 24 March 1994.

8. Office of Technology Assessment, *Fueling Reform.*

9. Igor Bashmakov, executive director of CENEf, the Center for Energy Efficiency in Moscow, coined this phrase.

10. *BP Annual Statistical Review,* British Petroleum Corporation, 1983. Figures include non-commercial fuel use in China.

11. *Monthly Energy Review,* Energy Information Administration, U.S. Department of Energy, Washington, D. C., March 1994.

12. See, for example, "Energy Conservation: The Main Factor for Reducing Greenhouse Gas Emissions in the Soviet Union," by Igor A. Bashmakov and V. P. Chupjatov, Energy Research Institute of the Soviet Academy of Sciences, Battelle, Pacific Northwest Laboratory, 1990; Energy and Environment: The Path of Co-Existence in Czechoslovakia, Jaroslav Marousek; SEVEn, Prague, June 1992; J. Michalik et al., "The Profitable Energy Efficiency Potential in Poland," Polish Foundation for Energy Efficiency, Katowice, April 1993.

13. Marie Kostalova, Jiri Suk, and Stanislav Kolar, "Reducing Greenhouse Gas Emissions in Czecho-Slovakia," Global Studies Program, Pacific Northwest Laboratory, PNL-SA-20399, 1992. Richard Baron, "Dynamic Cost Estimates of Carbon Dioxide Emissions Reduction in Eastern Europe and the Former Soviet Union: An Evaluation," Global Studies Program, Pacific Northwest Laboratory, 1991.

14. W. U. Chandler, "Assessing Carbon Emission Control Strategies: The Case of China," *Climatic Change 13:241-265,* 1989; China Energy Databook, 1992 Edition; (Revised November 1992); State Planning Commission of China, and Lawrence Berkeley Laboratory, p. II-5.

15. Jayant Sathaye, Lawrence Berkeley Laboratory.

16. Janusz Michalik, Slawomir Pasierb, Jerzy Piszczek, Michal Pyka, and Jan Surówka, "Evaluation of the Feasibility and Profitability of Implementing New Energy Conservation Technologies in Poland," Polish Foundation for Energy Efficiency (FEWE), Katowice, Poland, 4 May 1993.

17. U.S. Congress, Office of Technology Assessment, Advisory Panel Meeting, Washington, D.C., 17 January 1994.

18. AID also provided $350,000 to place two IRP experts for one year each at SEVEn and FEWE.

19. Unpublished comments of Tom Foley, Battelle Pacific Northwest Laboratory, for "An NGO Review of AID Programs," a workshop organized by Battelle in Washington in February 1994. The subject document was R.C.G. Hagler-Bailly, *Demand-Side Management in Poland: Assessment and Pilot Program,* December 1993.

20. The more positive result of the NGO work may be related to the fact that it was inherently easier because it involved introduction and promotion of the idea as opposed to implementation, which is always more difficult.

21. Personal communication with Cynthia Curnmis, Environmental Protection Agency, 18 March 1994.

22. The author would like to make clear that the lack of attention to European Union assistance programs in this article is by no means meant to imply better performance. The European Union's energy assistance programs have been at least as troubled as AID's.

23. T. Secrest et al., "An Assessment of the Buildings Sector Efficiency Resource for the City of Plzen, Czech Republic," Pacific Northwest Laboratory, December 1993.

24. Tom Secrest et al., "Energy Efficiency Demonstration Project in Krakow, Poland: Project Summary," Battelle, Pacific Northwest Laboratory, Draft, January 1994.

25. Robert Ebel, Center for Strategic and International Studies, Seminar on Nuclear Safety in the Former Soviet Union, Johns Hopkins University School of Advanced International Studies, 28 February 1994.

26. Vaclav Klaus, "Remarks of Czech Republic Prime Minister Vaclav Klaus to the Bretton Woods Committee," Washington, D.C., 15 October 1993; and Vaclav Klaus, "Interplay of Political and Economic Reform Measures in the Transformation of

Postcommunist Countries," Text for a Heritage Foundation address, Washington, D.C., 15 October 1993.

27. Personal communication with Tomas Sandomierski, International Finance Corporation, Warsaw, Poland, February 1994.

28. This project was one of the three top priorities for Deputy Secretary Bill White during his visit to Russia during March 1994.