

Programs To Assist Energy Efficiency 5

The political and economic transition in Central and Eastern Europe (CEE) has been accompanied by a proliferation of international activity aimed at ameliorating the region's energy and environmental problems. One United Nations report cited 14 multilateral organizations and initiatives supporting energy programs, and the United States, the European Community (EC), and several other Western countries have bilateral energy assistance programs.¹ The objectives of these energy programs are diverse and vary by recipient country. The emphasis overall has been on energy price reform, restructuring the energy sectors, and the rehabilitation and modernization of energy supply infrastructure. Much less has been done on the demand side, on end-use energy efficiency projects, or promotion of integrated resource planning and other planning techniques that support energy efficiency.

However, the human resource and institutional capacity for increasing the scope of energy efficiency programs is getting more developed each year, supported at relatively low cost by U.S. and European programs. Multilateral donors are indicating that greater resources will be available for energy efficiency, partly in support of initiatives to reduce emissions of greenhouse gases, but also in recognition of the major gap between projected needs for energy investment in Central and Eastern Europe and the limited availability of financing over the mid term. As energy prices continue to rise, regulatory frameworks become more established, and economies grow, the demand for energy efficiency technologies and services will increase, perhaps dramatically. The United States has substantial resources,

¹U.N. Economic and Social Council, Economic Commission for Europe, *Multilateral Assistance to Economies in Transition in the Field of Energy: A Preliminary Overview and Evaluation*, Aug. 28, 1992, p. 9.



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ranging from export promotion and financing to research and development (R&D), that could be mobilized more effectively and productively to support the transfer of energy efficiency technologies and services on commercial and noncommercial terms.

This chapter describes the energy efficiency aspects of U.S. and other energy assistance programs in Central and Eastern Europe. But first, the chapter provides an overview of energy assistance efforts and trade and investment opportunities.

THE ENERGY ASSISTANCE EFFORTS

There have been several transitions in the Western energy assistance effort during the relatively brief period that it has been underway. In the first year, circa late 1989-90, energy assistance was largely ad hoc while Western governments and multilateral organizations struggled to research the East's energy systems and prescribe anew energy policy framework organized around market principles. The first major step in this process was energy price increases and plans for energy sector restructuring and privatization in Poland, and later Hungary and the Czech and Slovak Republics, as conditions for World Bank structural adjustment loans. Bilateral assistance at this point was fragmentary. Indeed, energy was initially subsumed under the environment, which had captured world attention and was more of a priority for the Western assistance effort. The first U.S. energy project focused on installing scrubbers on a powerplant in Krakow, Poland, and the EC did not begin developing a distinct energy program until 1991.

In 1990-91, attention was galvanized by the economic impact on Central Europe of rising oil and gas prices and shortages as the Soviet Union raised the prices of its energy exports and then failed to make deliveries and as energy markets responded to the Persian Gulf crisis. This prompted some rapid emergency energy initiatives by the United States and the EC, which included end-use energy efficiency as one of the short-term means for ameliorating the problem.

Since 1991, there has been an expansion in energy assistance in Central Europe and the Baltics by the World Bank, the European Bank for Reconstruction and Development (EBRD), and other bilateral donors. Energy assistance has focused on the rehabilitation and modernization of energy supply infrastructure, primarily in the power sector and in district heating, natural gas, and energy efficiency. In 1992, Russia and the other newly independent states (MS) have also begun to receive energy assistance focused on reviving oil and gas production and nuclear power safety. Also, there has been a sustained effort to create a Europe-wide (West and East) binding legal and regulatory framework for energy, the European Energy Charter, that is likely to be substantially completed in 1993.

Western donors have funded many types of energy projects on varying scales. The World Bank and other multilateral donors have financed over \$1 billion in large energy-sector projects.² Bilateral donors with more limited resources, including the United States and the EC, provide technical assistance, training, and limited equipment. While the scope of the bilateral programs is difficult to ascertain, they probably total between \$150 and \$200 million.³

² Joerg-Uwe Richter, "Energy Issues in Central and Eastern Europe: Considerations for International Financial Institutions," *Energy Journal*, vol. 13, No. 3, 1992; and Bernard Montfort and Harold E. Wachman, "The World Bank Support for Energy Sector Transformation in Central and Eastern Europe," (World Bank, July 1992).

³ As discussed below, U.S. energy assistance is about \$100 million over 1990-94; European Community energy assistance is estimated at \$41.5 million over 1990-92. With no verification, up to another \$50 million is assumed for bilateral European and Japanese energy assistance. See U.N. Economic and Social Council Commission for Europe, *Multilateral Assistance to Economies in Transition in the Field of Energy: A Preliminary Overview and Evaluation*, Aug. 28, 1992.

devoted around \$15 to \$20 million⁴ to support demand-side energy efficiency, through energy policy and pricing reform, management training, and joint venture promotion.

TRADE AND INVESTMENT OPPORTUNITIES

As described in previous chapters, there are immense opportunities for energy efficiency in Central and Eastern Europe. One estimate of the potential market for energy efficient industrial products is \$20 billion and estimates of the cost of energy sector modernization, primarily in the power sector, generally run into the hundreds of billions of dollars over the coming years.⁵

Despite several programs that support trade and investment in the region, the United States is not currently well positioned to do business in the energy efficiency area. The power sector has attracted a number of U.S. firms, such as Westinghouse and Bechtel. General Electric and Honeywell also have investments and operations in the region as do several energy and environmental consulting firms, such as Booz-Allen Hamilton and Coopers & Lybrand. Also, equipment purchases from U.S. firms under U.S. energy assistance projects have stimulated some follow-on business activity. However, there are major barriers to increased exports of U.S. energy efficiency technologies and services to Central and Eastern Europe. The U.S. energy efficiency industry, composed largely of small and medium-sized firms, is only now mobilizing to export. Central and Eastern Europe lacks capital, is a distant market, and presents persistent economic and political uncertainties—even to large firms. On the positive side, Central and Eastern European

countries are very receptive to U.S. businesses and desirous of U.S. technologies. Moreover, there are strong cultural and ethnic linkages between the United States and Central and Eastern Europe.

The U.S. Government does have several programs for export and investment promotion, financing, and insurance that support firms doing business in the region. Some of these programs are targeted at smaller firms, but the energy efficiency industry has not heretofore been supported in this fashion. Also, U.S. export assistance programs have generally not been particularly accessible to, or perhaps well understood by, smaller firms. There have also been concerns that U.S. financing programs do not have adequate resources, nor provide sufficient long-term financing and insurance to support effectively U.S. firms exporting capital goods and energy services to Central and Eastern Europe.⁶ There is a U.S. Department of Energy (DOE) program under consideration—the Committee for Energy Efficiency, Commerce and Trade (COEECT)—as well as several nongovernmental organizations that could assist in creating a more coherent export strategy for the U.S. energy efficiency industry.

By far the largest sources of public financing for energy projects and investments are the multilateral and regional development banks—the World Bank Group and the EBRD. These banks have committed about 10 times as much to energy projects in the region as has the United States, but primarily to energy supply infrastructure. The Global Environment Facility (GEF) is another multilateral source of financing that will

⁴The estimate for industrial energy efficiency is from Alliance to Save Energy, *Business Opportunities in Eastern Europe for Energy-Efficient Industrial Products*, (Washington, DC: Alliance to Save Energy, January 1992). Investment requirements for energy sector rehabilitation could run as high as \$120 to \$150 billion over 1991 to 2000, according to Joerg-Uwe Richter, 'Energy Issues in Central and Eastern Europe: Considerations for International Financial Institutions,' *The Energy Journal*, vol. 13, No. 3, p. 270.

⁶It should be noted that U.S. export assistance programs are less supportive of smaller firms and have less resources than do those of many European countries and Japan. European firms also have the advantage of proximity to Central and Eastern Europe.

⁷An annual report to Congress under the SEED Act, compiled by the Department of State, provides an inventory of the U.S. and multilateral programs. See Department of State, *Report on FY 1990 Actions Mandated Under the SEED Act of 1989* (January 1991); Department of State, *SEED Act Implementation Report, Fiscal Year 1991* (Jan. 31, 1992).

Box 5-A-Legislation and Funding for U.S. Assistance to Central and Eastern Europe

U.S. assistance to Central and Eastern Europe is mandated under two major pieces of framework legislation, the **Support for East European Democracy (SEED) Act of 1969 (PL 101-179)**, and the Freedom for Russia and Emerging Eurasian Democracies and Open Markets (FREEDOM) Support Act of 1992 (PL 102-51 1). Funds for the assistance effort have also been appropriated under other foreign aid bills as well as reprogrammed by some agencies.

The SEED Act was passed by the Congress and approved by the Administration in November 1969, and authorized \$930 million for fiscal years 1990-92. Foreign aid appropriations for fiscal year 1990 included \$659 million for Poland and Hungary. Amid much debate over the appropriate scope of U.S. assistance, Congress provided about \$370 million in assistance for fiscal year 1991, along with \$70 million for the newly forming European Bank for Reconstruction and Development (EBRD) and \$3 million for Romania. In September 1991, Congress reprogrammed \$11 million in aid to start SEED programs in the Baltic% Congress failed to authorize fiscal year 1992 foreign aid, and funding was appropriated under a Continuing Resolution which made \$370 million available for the entire region. **The Foreign Appropriations Act of 1993 (PL 102-391), signed on Oct. 6, 1992, provides \$400 million in assistance in fiscal year 1993 for Central Europe and the Baltics.**

Assistance to the Newly Independent States (NIS), and in particular to Russia began in 1990 with the extension of credits for imports of U.S. agricultural commodities followed by pledges of additional aid and the use of Defense Department appropriations for destruction of weapons and other uses. About \$460 million was appropriated up to mid-1992 for humanitarian and technical assistance. An additional \$417 million was appropriated for the NIS in the Foreign Appropriations Act of 1993.

In April 1992, the Bush Administration proposed the FREEDOM Support Act, framework legislation that defines the U.S. policy toward the NIS, provides authority for assistance programs, and proposes a number of trade measures (other provisions of the FREEDOM Support Act, such as new financing for the International Monetary Fund, have been approved under the foreign appropriations bill). The Senate cleared the FREEDOM Support Act with modifications in June 1992 and the House in October 1992. The Act authorizes \$410 million in assistance to the NIS.

SOURCES: Congressional Research Service, selected briefs; Congressional Quarterly.

ture. The Global Environment Facility (GEF) is another multilateral source of financing that will increasingly fund environmentally sound energy projects, including energy efficiency.

U.S. PROGRAMS

| Legislative and Policy Framework and Objectives

U.S. Government activities in Central and Eastern Europe are authorized under the Support

for East European Democracy (SEED) Act of 1989 and the Freedom for Russia and Emerging Eurasian Democracies and Open Markets (FREEDOM) Support Act of 1992. (See box 5-A.) A number of government agencies have also undertaken activities in the region using appropriations from their own budgets.⁷ Assistance has been predicated on progress toward political pluralism, economic reform, human rights, and improvement in relations with the United States.*

⁷An annual report to Congress under the SEED Act, compiled by the Department of State, provides an inventory of the U.S. and multilateral programs. See Department of State, *Report on FY 1990 Actions Mandated Under the SEED Act of 1989* (January 1991); Department of State, *SEED Act Implementation Report, Fiscal Year 1991* (Jan. 31, 1992).

⁸Under the SEED Act, Poland and Hungary were eligible for assistance in fiscal year 1990, and Albania, **Bulgaria, CSFR, Estonia, Latvia, Lithuania**, Romania, and Yugoslavia in fiscal year 1991.

Parallel to the assistance effort, the United States has been negotiating agreements to enhance trade and investment. The countries in the region are eligible for the General System of Preferences (GSP) and Most Favored Nation (MFN) status. There are also a number of bilateral treaties that protect U.S. companies that export or invest in the region, providing protection for intellectual property rights, transfer of profits, security of investments, legal rights, and in some cases liability.

The SEED Act programs were initially organized as what the General Accounting Office (GAO) has characterized as a "short-term experimental economic assistance approach" based on three primary assumptions: assistance would only be required for a 5-year transition period; allocation of funding would take place on a regional, rather than country-specific basis; and the programs would be managed centrally in Washington with limited authority granted to in-country personnel.⁹ This reflected a U.S. decision that the assistance programs were not the beginning of a long-term traditional aid program. The regional approach was adopted in theory to allow for program flexibility and responsiveness as the political situation changed in the region, and also to limit the Agency for International Development (AID) contracting requirements given the many actors and projects involved.¹⁰ However, the GAO, which conducted its evaluation in 1991 and early 1992, found that these characteristics had hampered the assistance effort in some ways. The regional approach made it difficult for assistance recipients to plan and prioritize proposals, and recipients sometimes did not feel that aid was tailored to each country appropriately. The lack of country missions and in-country personnel created coordination problems. Rather than sustained projects, U.S. assistance often funded many short-term consulting missions that pro-

vided no sustained support to the recipient country.¹¹ In the past year or so, efforts have been made to fund more long-term projects and to address some of these concerns.

| Objectives and Coordination for U.S. Energy Assistance

The U.S. energy assistance program in Central and Eastern Europe has a range of objectives encompassing most sectors of the region's energy systems----energy production, oil and gas distribution systems, electric power, and end-uses in industry and buildings-and their environmental impacts. Projects have included policy and technical assistance, a sectoral adjustment grant to support energy price increases, human resource and institution building, and business development. The approaches to energy issues are also diverse, reflecting the different priorities and objectives of the U.S. Government agencies involved and somewhat different offices within those agencies.

Within several large framework projects described below, many smaller projects have been undertaken, ranging in size from several hundred thousand to several million dollars. Some specific energy activities have been mandated, notably \$30 million in the SEED Act for energy and environmental projects in Krakow, Poland, but the implementing agencies have generally had flexibility in setting priorities for the additional \$70 million in energy assistance disbursed or planned for Central European countries and the Baltics, and \$15.6 million currently reprogrammed out of AID's Economic Support Funds in fiscal year 1992 to begin non-nuclear energy programs in Russia.

AID disburses energy assistance to Central and Eastern Europe, in cooperation with DOE and the Nuclear Regulatory Commission (NRC). DOE

⁹General Accounting Office, *Poland and Hungary: Economic Transition and U.S. Assistance*, GAO/NSIAD-92-102, May 1992, p. 26.

¹⁰ Department of State, *SEED Act Implementation Report, Fiscal Year 1991*, supra note 7, p. 2.

¹¹GAO, *Poland and Hungary*, supra note 9, pp. 28-36.

and EPA have also undertaken limited activities with their own appropriations. A number of other agencies are involved in support for trade and investment in energy goods and services in the region, including the Department of Commerce (DOC), the Export-Import Bank of the United States (Eximbank), the Overseas Private Investment Corp. (OPIC), and the Trade and Development Agency (TDA).¹²

Some initial coordination problems between the agencies over the allocation of energy funding were lessened through the formation of a State Department-led interagency Energy and Environment Working Group. The interagency working group no longer formally meets, but its members convene to discuss specific projects.¹³

There is also coordination and some joint projects with multilateral organizations and bilateral energy programs. Energy policy in Central and Eastern Europe has been developed on a consultative basis between Western multilateral and bilateral assistance programs and recipient governments. AID, DOE, the World Bank, the International Energy Agency (IEA), and others have collaborated on policy missions. For example, AID, the World Bank and the United Kingdom are currently collaborating on a power sector restructuring project in Poland.

Like the other SEED Act programs, the energy assistance effort has been developed largely on a regional basis. GAO reports that in at least one instance this approach caused some confusion among energy officials in the region, and made it difficult for them to plan around U.S. assistance.¹⁴ However, GAO also notes that lack of organization and other problems within recipient countries has made absorption of aid difficult. More re-

cently, as the energy situation has become somewhat more defined, U.S. energy projects are beginning to be developed on a country-specific basis. AID is coordinating this effort, and a number of country-specific projects are underway (see table 5-1).¹⁵

| Federal Agencies Involved in Foreign Assistance for Energy

The major implementing agencies for non-nuclear energy assistance to Central and Eastern Europe—AID and DOE—have different institutional objectives that reflect their organizational structure and changing perceptions of their mission. AID is the primary U.S. Government agency involved in foreign assistance for energy. It is responsible for developing and implementing the energy assistance programs. AID's East European energy programs are managed by the Bureau for Europe in the Energy and Infrastructure Division, in coordination with the AID representative in each country. This organizational structure is a departure from traditional AID project management and reflects the U.S. Government's short-term approach to economic assistance in Central and Eastern Europe.

AID has been criticized for not having a clear energy policy, not supporting energy efficiency and renewable energy more consistently, and not devoting enough resources to energy in general. AID has been directed by Congress in recent years to increase its support for energy efficiency and renewable energy.¹⁶ Energy efficiency has been a fairly major priority in Central and Eastern Europe. The energy assistance program in this region is designed to recognize the linkage between broader economic and energy sector

¹² The U.S. Trade and Development Program (TDP) became the TDA on October 28, 1992.

¹³ General Accounting Office, *East European Energy—U.S. Business Opportunities in and Assistance to Poland's Energy Sector*, Report to the Chairman, Committee on Energy and Natural Resources, U.S. Senate, GAO/NSIAD-91-206, May 1991, pp. 33-34.

¹⁴ GAO, *Poland and Hungary*, *supra* note 9, p. 32.

¹⁵ Personal communication, Robert Ichord, Chief, Energy and Infrastructure, Europe Bureau, Agency for International Development.

¹⁶ U.S. Congress, Office of Technology Assessment (OTA), *Fueling Development: Energy Technologies for Developing Countries*, OTA-E-516 (Washington, DC: U.S. Government Printing Office, April 1992), pp. 264-265.

**Table 5-1—U.S. Energy Assistance to Central Europe:
Summary of Major Current Project Areas by Selected Country**

Poland

- Power Sector Restructuring, Privatization and Management**
 - Multi-donor Energy Restructuring Program (with the World Bank, European Community, and United Kingdom)
 - Private Power Program and Electricity Tariff Reform
 - Utility Partnership Program
- Energy Efficiency and Demand Side Management**
 - Energy Efficiency Centers (Warsaw and Katowice)
 - Demand Side Management and integrated Resource Planning
- Krakow Environmental Improvement**
 - Skawina Power Plant Retrofit
 - Low Emissions Program
- U.S. Energy Business Development**
 - Regional Business Development Officer

Czech and Slovak Republics

- Energy Efficiency and Environmental improvement**
 - Development of Private Energy Services and Equipment Companies
 - Energy Efficiency Center (Prague) and Business Network Development
 - Energy/Environment Pilot Projects in Cesky Krumlov, Plzen, Ostrava, Bratislava
 - Oil Desulphurization and Natural Gas Substitution
- Power Sector Restructuring and Privatization**
 - Utility Partnership Program
 - Power System Regulatory and Organization Reform
- Nuclear Safety**
 - Nuclear Power Plant Operational Safety improvement
 - Regulatory Systems Improvement
- U.S. Energy Business Development**
 - Capital Development initiative (CDI) Energy Business Development

Hungary

- Energy Efficiency**
 - Training and Support to Private Hungarian Energy Service Companies
- Energy Sector Restructuring and Management**
 - Utility Partnership Program
 - Power Sector Reorganization, Privatization and Finance
 - Development of New Mining Office
- Nuclear Safety**
 - improve Plant Operation and Maintenance
 - improve Regulatory and inspection Systems
- U.S. Energy Business Development**
 - CD Energy Business Development

Baltics

- Energy Pricing and Efficiency**
 - Regional Electricity Price Reform
 - Demand Side Management and Energy Efficiency
 - Power Sector Restructuring/Management**
 - Utility Partnership Program
 - Electricity Sector Restructuring
 - Nuclear Safety**
 - Nuclear Safety in Lithuania
-

SOURCE: U.S. Agency for international Development

reforms and the achievement of energy efficiency in both supply and demand sectors.

The program's overall objectives include the decontrol of energy prices, energy sector restructuring, export promotion, pollution control, and nuclear safety. AID uses a number of mechanisms to implement program objectives: competitively selected contracts, a cooperative agreement with the U.S. Energy Association (USEA), interagency agreements with DOE, NRC, and the Department of Interior, and a grant to the International Energy Agency. Specific energy efficiency projects funded by AID, such as the Emergency Energy Project and Regional Energy Efficiency Project, are described later.

DOE's activities in Central and Eastern Europe are also diverse and reflect the different objectives and capabilities of the offices within the agency. DOE has developed a strategy toward the region, with the overall program goals being to assist in maintaining a balanced and mixed supply of energy at reasonable prices and with reliability of supply; and to support the production, transport, and use of energy in ways that least damage the environment. Program elements include political and economic analysis, development of information systems, technical assistance, export promotion, and financing. DOE's activities are coordinated through an internal working group. Current projects focus on energy efficiency, fossil energy, and nuclear safety.¹⁷

Through its Office of Conservation and Renewable Energy and the Office of Industrial Technologies, DOE has supported several innovative projects, including three highly regarded energy efficiency centers and an energy efficiency export promotion program. An important element in DOE's future energy efficiency activities in the region is its efforts to expand export promotion of U.S. technologies and services. Under the Energy Policy Act of 1992 (PL

102-486), DOE is authorized to administer, in cooperation with AID, a program to promote exports of energy technologies that can reduce emissions of greenhouse gases, with funding of \$100 million annually.

EPA has also been seeking to expand its international activities, heretofore primarily confined to policy consultations and joint research programs, in the area of technology transfer and export promotion. Under the SEED Act, EPA has developed a number of environmental projects in Central and Eastern Europe, managed through its Office of International Activities. Its energy activities in the region have focused on renewable energy, particularly in the recovery and use of coal-bed methane, sealing leaks in natural gas pipelines, and supporting the energy efficiency centers, reflecting its domestic experience in these areas. EPA currently plans to increase its renewable energy activities in Central and Eastern Europe; its successful voluntary energy efficiency programs in the United States—such as “Green Lights” for lighting, “Energy Star” for computers, “Golden Carrot” for refrigerators—are planned for replication in Western Europe, and could also be expanded elsewhere.¹⁸

| Assistance for Energy Efficiency

Energy efficiency has been a major component of the U.S. energy assistance program in Central and Eastern Europe. Policy and technical assistance and limited equipment purchases relating to energy efficiency have been undertaken in the context of three primary projects: Emergency Energy, Regional Energy Efficiency, and the Krakow Clean Fossil Fuel and Energy Efficiency Project. These projects have a combined budget of about \$66 million, of which roughly one-third is devoted directly to energy efficiency.

¹⁷ U.S. Department of Energy, “Strategy For Eastern Europe: Scope Paper” (intend draft).

¹⁸ EPA, *The Climate is Right for Action: Voluntary Programs To Reduce Greenhouse Gas Emissions*, EPA 400-K-92-005, October 1992.

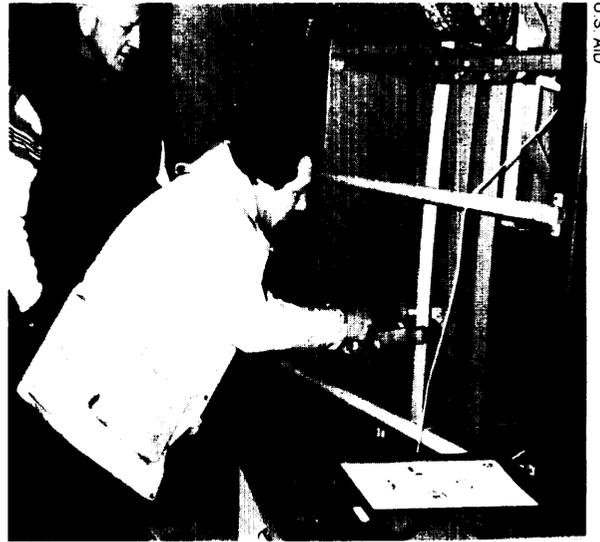
EMERGENCY ENERGY

The Emergency Energy Project is an AID-managed \$11.75 million project largely undertaken in 1991 in response to the perceived threat to Central European energy supplies and economies from increases in oil prices due to the Persian Gulf crisis and the decline in Russian oil deliveries. The project was developed by a joint team of representatives from AID, DOE, the Department of State, and U.S. industry in consultation with recipient governments in Poland, Hungary, the Czech and Slovak Republics, Bulgaria, Romania, and Yugoslavia. Its objectives were to improve industrial and oil refinery energy efficiency, oil purchasing practices, and the analytical basis for energy price reform.¹⁹

The industrial energy efficiency component of the project undertook energy audits in 52 industrial facilities in 9 countries. AID reports that it provided \$1.5 million in energy efficiency equipment purchased from U.S. firms. As a result of the equipment and management measures, AID estimates that energy savings are \$16 million/year. The project also stimulated local firms and consultants that were subcontracted to assist in the audits. Follow-on workshops, in the region and in the United States, and studies based on the audit findings also served to promote the project results and business opportunities.²⁰ Other measures to improve energy efficiency included audits in more than 20 oil refineries, energy pricing seminars for senior managers and policy makers, and development of economic models to assist in price reform.

REGIONAL ENERGY EFFICIENCY

The Regional Energy Efficiency Project is a 4-year, \$34 million AID project initiated in 1991 and carried out through competitively awarded contracts. The project is implemented by a



Measuring electrical efficiency at a Yugoslav paper plant using U.S. equipment.

number of agencies and covers a broad set of activities, which include:

- rationalization and decontrol of energy prices;
- restructuring the energy sector and promotion of energy efficiency and the privatization of energy companies;
- promotion of U.S. investment, joint ventures, and technology transfer;
- reduction of environmental pollution;
- improving nuclear safety; and
- integration of energy systems with Western Europe and international energy markets.²¹

The major project element devoted to energy efficiency is the ‘Energy Pricing, Energy Efficiency, and Energy Sector Restructuring’ component (\$6.4 million) begun in June 1992, that provides technical assistance, training, and low cost energy efficiency equipment to public and private sector entities, through AID-managed contracts. The project will assist in promoting

¹⁹ USAID, ‘Emergency Energy’ (Project Summary and Progress Report, 1992).

²⁰ The Alliance to Save Energy’s study, *Business Opportunities in Eastern Europe for Energy-Efficient Industrial Products*, *supra* note 5, is based on this project.

²¹ USAID, ‘Region- Energy Efficiency’ (Project Summary and Progress Report, 1992).

competition in energy markets through further price reforms and the establishment of regulatory frameworks. It will also aim to stimulate energy efficiency and the development of private energy service and equipment supply companies linked with U.S. firms.²²

Other major project elements include the “Electric Power Systems and Related Fuel Supply” component (\$5.7 million), that will, among other objectives, provide technical assistance and training in the management of electric generation, transmission and distribution systems, and conduct feasibility studies for the efficiency improvement and rehabilitation of power plants. Some of these activities will be carried out by AID-managed contracts in collaboration with the World Bank, EC, and the United Kingdom.²³

Under this project, AID has also entered into a cooperative agreement with USEA to form the U.S.-Eastern European Utility Partnership Program (UPP). Begun in October 1991, UPP brings together electric utilities in the United States and Central and Eastern Europe for activities focused largely on management issues but including also art annual regulatory systems seminar and dissemination of information and software resources. The Program has received wide support from the U.S. utility industry, including the Edison Electric Institute, Electric Power Research Institute, and the North American Reliability Council. U.S. utilities will share the costs of the program, contributing \$1 million, or one-fifth of the program’s budget.²⁴

The first partnership was formed between New England Electric Systems and a Hungarian power

company in April 1992, and others are being developed between Commonwealth Edison and the Polish Power Grid, Houston Lighting and Power and the Czech Power Co. (CEZ), Southern Co. and the Slovak Power Utility (SEP), and Central Maine Power and the Bulgarian National Electric Co. Further partnerships are planned with the Baltics and Romania. AID also reports that over 20 companies have expressed interest in joining the partnership program.²⁵

Another component of the Regional Energy Efficiency Project provides funds to DOE for: 1) promotion of cleaner and more efficient combustion of coal; and 2) end-use efficiency and renewable energy, including support for and establishment of energy efficiency centers. The coal assistance is managed by DOE’s Fossil Energy Office and the energy efficiency/renewable work by Pacific Northwest Laboratories (PNL) under the DOE Renewable Energy Office.

The \$20 million “Krakow Clean Fossil Fuel and Energy Efficiency Project” assists in reducing Krakow’s air pollution problems by improving the efficiency of the city’s district heating system and energy use in buildings. Phase I (\$5.5 million) of this project has involved technology assessments and feasibility studies; in phase II (\$14.5 million), DOE will jointly fund commercial joint ventures to provide the fuels and technologies prescribed.²⁶ Other technical assistance projects include several focused on improving energy efficiency in the Krakow Polish-American Children’s Hospital and in the buildings sector generally in Plzen and Cesky -

²² SYCOM, a energy service firm that is a joint venture of Bechtel Corporation and Pacific Gas and Electric, is a member of the consortium implementing this project. U.S. Agency for International Development, Bureau for Europe, “New Eastern and Central Europe Energy Contract” Apr. 24, 1992.

²³ USAID, “Regional Energy Efficiency,” *supra* note 21.

²⁴ USAID/U.S. Energy Association, *U.S.-Eastern European Utility partnership program: Status Report, October 1991-May 1992*; USAID, “Regional Energy Efficiency,” *supra* note 21.

²⁵ USAID, “Regional Energy Efficiency,” *supra* note 21.

²⁶ USAID, “Krakow: Skawina Retrofit and Clean Fossil Fuel and Energy Efficiency” (project *Summary and Progress Report, 1992*).

Krumlow in the Czech Republic, and in Bulgaria.²⁷

One of the more innovative and cost-effective energy efficiency assistance projects has been the establishment of three private, nonprofit centers for energy efficiency: the Polish Foundation for Energy Efficiency (FEWE), with offices in Warsaw and Katowice, founded in 1991; the Czech and Slovak Center for Energy Efficiency located in Prague (SEVEn), founded in 1990; and the Moscow Center for Energy Efficiency (CENef), founded in 1992. A center is also planned for Bulgaria. The centers are staffed by local energy efficiency experts (between 5 and 10 in each center) with assistance from U.S. experts. They receive rather limited U.S. seed funding (a total of \$400,000 in fiscal year 1991; \$600,000 in fiscal year 1992), and are intended to become self sustaining within 3 years.²⁸

The center's activities are focused in four main categories: policy research and development, private business venture development, training and demonstration projects, and public education and information services. The centers have conducted seminars for local and national government policy makers on management, planning, and standards for energy efficiency and have acted as advocates for implementing such programs. The centers are also serving as clearinghouses for information on energy efficiency technologies. As a follow-on to the center's promotion of integrated resource planning (IRP), DOE is also planning to provide U.S. IRP experts to Poland and the Czech and Slovak Republics in 1993.

DOE and the energy efficiency centers also attempt to promote business development, which will be discussed below in the section on trade and investment.



U.S. AID

U.S. equipment provided to measure boiler efficiency at the Loz, Poland district heating plant.

ACTIVITIES IN THE NEWLY INDEPENDENT STATES

Energy assistance efforts for the NIS began in mid- 1992, with a \$15.6 million effort that included energy efficiency audits and followup purchases of equipment in district heating plants in Russia, Khazakistan, Belarus, Armenia, Ukraine, and Kyrgyzstan.²⁹ The initial energy priorities, if not emergencies, facing the NIS are nuclear power safety and reviving oil and gas production. It is not clear at this time what major funding for energy efficiency is likely over the coming years.

BILATERAL ENERGY COOPERATION AGREEMENTS

DOE has begun to establish formal institutional ties with countries in Central and Eastern Europe relating to energy cooperation. Terms of Reference have been concluded with the Ministry of Trade and Industry in Hungary that provide for, among other things, assistance in developing an energy information system and evaluating approaches to energy regulation. Energy cooperation with Russia and the other newly independent

²⁷ Pacific Northwest Laboratories, *Annual Report—Program for Energy Efficiency Assistance: Eastern Europe and Newly Independent States*, pp. 11-12.

²⁸ *Ibid.*, pp. 5-6.

²⁹ Other program areas are nuclear safety, oil and gas production, electric power pricing and privatization, and coal mine safety. USAID, "Factsheet: USAID Energy Program in the New Independent States (NIS) of the Former Soviet Union," June 30, 1992.

states has also been initiated. U.S.-U.S.S.R. energy cooperation was focused on nuclear power, although an agreement on exchanges in the power sector was in effect from 1973 to the mid-1980s. Under DOE auspices, the United States and the Russian Federation signed a framework Agreement on Scientific and Technical Cooperation in the Field of Fuel and Energy in June 1992. The Agreement provides for data exchanges, joint projects, and private sector contacts in a number of energy areas, including energy efficiency and renewable. The Agreement establishes a U. S.-Russian Joint Committee, which will meet once annually organized by DOE and the Ministry of Fuels and Energy of the Russian Federation.

Research and Development

The U.S. energy assistance program currently lacks a consistent R&D (and demonstration) component that would allow emerging energy efficiency technologies to be developed in accordance with opportunities in Central and Eastern Europe.

Science and Technology (S&T) Agreements have been signed with Poland (renewed in 1987), Hungary (1989), Czechoslovakia (1991), and Yugoslavia (suspended). The agreements are administered by the Bureau of Oceans and International Environmental and Scientific Affairs (OES) in the Department of State. Funding for activities under the agreements are appropriated through the Department of State budget, and augmented by participating government agencies. The S&T funds support add-on costs of bilateral cooperation, and do not serve as primary sources of funding for domestic research.³⁰ Energy typically makes up about one-tenth of the S&T budget. In 1990, seminars were held in Poland on the U.S. experience with energy

conservation under the U.S.-Poland S&T Agreement.

In Russia and the other newly independent states, previous science and technology agreements are being reassessed, and efforts have been underway to support the existing science and technology infrastructure and assist in conversion from military applications. The United States has been instrumental in establishing the International Science and Technology Center headquartered in Moscow. The United States, Canada, Sweden, and Ukraine have also signed an agreement to establish a Science and Technology center in Kiev. Energy and environment are expected to be priorities for the center.³¹

| Trade and Investment Programs

U.S. programs in Central and Eastern Europe have been strongly oriented toward private sector development and U.S. trade and investment. DOC, AID, and DOE have programs devoted to facilitating U.S. business opportunities generally as well as in the energy sector, including some of the projects discussed above, such as energy efficiency centers. The autonomous U.S. export assistance and investment agencies—Eximbank, OPIC, and TDA—are also active in most countries in Central and Eastern Europe, providing pre-export assistance, such as for feasibility studies, export financing, and insurance and guarantees to cover political and economic risks.

The American Business Initiative (ABI), a 4-year, \$46 million interagency initiative involving Commerce, AID, TDA, and OPIC, is the framework for some of these activities and also assists in coordination. ABI's six programs, including the Capital Development Initiative (discussed later), targets five industry sectors that are key to economic reform and growth. They are energy, environment, telecommunications, hous-

³⁰ Finding for the S&T agreements is minimal. Total funding for all the agreements in FY 1991 was \$4.5 million. *SEED Act Implementation Report, Fiscal Year 1991*, supra note 7, p. 17.

³¹ U.S. Department of State, Office of the Assistant Secretary "U.S., Canada, Sweden and Ukraine Initial Agreement Establishing Science and Technology Center in Kiev" (Press Release, June 2, 1992).

ing, agriculture, and agribusiness. The United States has also provided the capital for “Enterprise Funds” in Poland, Hungary, and the Czech and Slovak republics which can assist in business development.

As discussed below, these programs have provided a framework for trade and investment in energy technologies and services that improve efficiency, although heretofore primarily in the power sector and for larger firms. Eximbank has supported a number of energy sector exports to Poland and Hungary. U.S. firms have also invested in companies that produce energy equipment with OPIC coverage—including General Electric Co., which purchased the Hungarian lighting manufacturer, Tungsram, and Magne-Tek, Inc.

However, the smaller firms that typify the market for end-use energy efficiency products and services—henceforth the energy efficiency industry—have not done much business in the region. This is in great part due to this industry’s orientation toward the U.S. domestic market and lack of systematic organization for exporting.³² Efforts to organize the industry for export are in the nascent stages, through nongovernmental organizations, such as the Alliance to Save Energy and the International Institute for Energy Conservation, a newly forming export council for the energy efficiency industry, and forthcoming efforts under proposed DOE-coordinated COEECT.

It should be noted that there are factors that could affect the ability of the energy efficiency industry to mobilize for exporting. Recent studies by OTA, GAO, and others have cited, among other factors, poor coordination among U.S.

export assistance programs and no overarching export strategy, limited access for small and medium-sized businesses, and inadequate resources and excessive restrictions compared to major U.S. competitors.³³ Some of these issues will be examined in more depth below.

PROMOTION OF TRADE AND INVESTMENT

There is an extensive framework of activities to promote trade and investment in Central and Eastern Europe, supported by DOC, AID, TDA, and OPIC, and including market information systems, business development centers, trade missions, and fairs. DOC has promoted opportunities for power sector and other energy (e.g., buildings technologies) equipment exports, while DOE and the energy efficiency centers have attempted to target the energy efficiency industry.

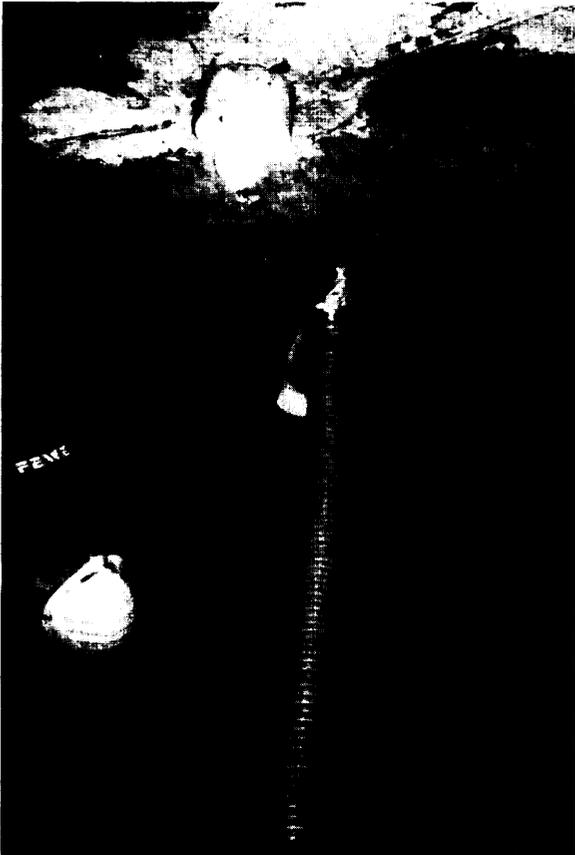
DOC has a number of programs providing information, promoting exports, and creating a U.S. presence in the region. The Eastern European Business Information Center (EEBIC) acts as a clearinghouse on trade and investment opportunities for U.S. businesses. The EEBIC publishes the *Eastern Europe Business Bulletin*, on a monthly and sometimes bimonthly basis, which includes general information on trade and investment as well as specific business opportunities in the energy sector and in energy equipment. It also produces the occasional publication, *Eastern Europe Looks for Partners*, which provides information on joint ventures in specific sectors. To speed access to these services and others, the EEBIC has an automated fax delivery system, EEBICFLASH.

Commerce established a similar program in June 1992 for the newly independent states, the

³² Russell Sturm, Deidre Lord, and Lynn Wagner, *Seizing the Moment: Global Opportunities for the U.S. Energy Efficiency Industry, A Report of the Office of Energy Conservation and Renewables*, U.S. Department of Energy, October 1992.

³³ Examples from this growing literature include: Office of Technology Assessment, *Competing Economies: America, Europe, and the Pacific Rim*, OTA-ITE-498 (Washington, DC: U.S. Government Printing Office, October 1991); William E. Nothdurft, *Going Global: How Europe Helps Small Firms Export* (Washington, DC: The Brookings Institution, 1992); and James Altschul, *The Export Finance Crisis* (Washington, DC: Economic Strategy Institute, July 1992). The General Accounting Office has published several reports on export assistance programs, including Export **Promotion: A Comparison of Programs in Five Industrialized Countries**, GAO/GGD-92-97, June 1992, and *Export Promotion Federal Programs Lack Organizational and Funding Cohesiveness*, GAO/NSIAD-92-49, January 1992.

Larry Markel



U.S. machinery and tools are used to insulate apartment building in Krakow, Poland. (AID Project)

Business Information Service for the Newly Independent States (BISNIS). Like the EEBIC, BISNIS provides a monthly newsletter, marketing plans, and other information of use to potential exporters.

The U.S. and Foreign Commercial Service undertakes export promotion activities in the region. Electric power technologies are promoted as a "best prospect" for U.S. trade. Commerce has sponsored several trade missions promoting energy and environmental goods and services, including energy efficiency technologies.

More focused **activities on the** energy efficiency industry are currently being undertaken under the DOE/PNL project, Energy Efficiency Assistance program for Eastern Europe and Newly Independent States. This effort is focused on utilizing the capabilities of the energy efficiency centers, and includes creating U.S. liaison support between the centers and U.S. companies, developing an Automated Eastern Europe and Newly Independent States Information System, and other business development activities. For example, the Czech and Slovak center, SEVEN, is initiating a series of Energy Efficiency Business Weeks. The frost was held November 30 to December 4, 1992. The project estimates that 50 U.S. firms have been provided assistance.³⁴ (See table 5-2.)

PRE-EXPORT FINANCING

A number of U.S. Government agencies provide financial assistance for prefeasibility and feasibility studies, training and other services that can assist in the export of U.S. energy efficiency goods and services, including TDA, Eximbank, OPIC, AID and the small International Fund for Renewable Energy and Energy Efficiency (IFREEE). By assisting U.S. firms in the early stages of project development, these programs can help position the firms for follow-on exports.

The TDA is the major source of financing for feasibility studies in Central and Eastern Europe, and also provides consulting services, training programs, and other project planning services, and identifies development projects that offer large export potential. The TDA is a relatively small program, funded at \$35 million in fiscal years 1991 and 1992, but it has a strong record in stimulating follow-on U.S. exports.³⁵ Energy and natural resource projects have made up the largest share of TDA's projects and obligations in recent years. TDA activities in Central Europe include

³⁴ Pacific Northwest Laboratories, *Annual Report—Program for Energy Efficiency Assistance*, *supra* note 27, PP. 7-9.

³⁵ United States Trade and Development Program (TDP), *Congressional/ Presentation, Fiscal Year 1993*; TDP, "The Trade and Development program in Central and Eastern Europe" (October 1992).

Table 5-2—Support for U.S. Firms by Energy Efficiency Centers

Type of Energy Efficiency Product	CENE ^f	SEVEN ^b	FEWe ^c
Energy Efficiency Technologies.	6	26	8
Insulation & Energy Efficient Construction Materials.	2	8	1
Cogeneration Equipment.	3	11	5
Renewable Energy Technologies.	3	13	5
Energy Conservation Services (DSM, ^e IRP, ^d and others).	2	18	15
Coalbed Methane Technologies.	1	NA	20
Cement Technologies.	1	NA	2

a) Center for Energy Efficiency (Moscow)
b) Center for Energy Efficiency (Prague)
c) The Polish Foundation for Energy Efficiency
d) Demand-side management
e) Integrated resource planning

NA - Not applicable.

SOURCE: Battelle Pacific Northwest Labs, *Annual Report-Program for Energy Efficiency Assistance*.

several feasibility studies for rehabilitating thermal power plants and modernizing electric power transmission systems, and support for a conference on U.S. electric power technologies.

Eximbank and OPIC also provide financing for feasibility studies. Under the American Business Initiative, OPIC can offer project development assistance for up to 50 percent, or 75 percent for small businesses, of the cost of feasibility studies and business development plans,³⁶

The AID-managed Capital Development Initiative (CDI) (\$10-15 million) is another effort to assist U.S. firms in trade and investment under the American Business Initiative. The CDI is focused on Poland, Hungary, the Czech Republic, and the Slovak Republic, but includes also the Baltics and other Eastern European countries outside the NIS. U.S. consulting firms paired with Eastern European counterparts have been retained by AID to manage the CDI, and assist U.S. companies in identifying and pursuing investment opportunities. Energy is one of the initial components of the CDI, with management by ICF Resources, a Virginia-based firm. The CDI also provides a Development Cost Support Fund that can grant up

to 50 percent or \$500,000 toward the preparation of a project for investment financing.³⁷

There are a number of other small energy preproject assistance programs that could provide support for energy efficiency projects in Central and Eastern Europe. AID supports an Energy Project Development Fund, which can provide up to 50 percent of funding for prefeasibility and feasibility studies. The fund is devoted to financing energy projects that can demonstrate environmental benefits, and to assisting U.S. companies in trade and investment. The IFREEE, a nonprofit Washington-based corporation funded by AID, DOE, EPA and the Rockefeller Foundation, attempts to facilitate access to private and public financing for industries in the renewable energy, energy efficiency, and natural gas sectors. The first year's programs have focused on renewable energy projects, but some energy efficiency projects are in the pipeline.

EXPORT FINANCING AND INSURANCE

U.S. export financing and insurance programs play an important role in facilitating trade and investment in Central and Eastern Europe, given the current constraints on commercial financing

³⁶ USAID, "American Business and Private Sector Development Initiative" (Project Summary and Progress Report, 1992).

³⁷ Ibid.

and the risks of doing business in the region. Eximbank's programs are designed to support exports that would not otherwise attract private sector financing, by offering loans with longer term maturities, providing export credit insurance, and countering export credit subsidies of foreign governments. The Foreign Credit Insurance Association (FCIA), a private sector consortium affiliated with Eximbank, provides insurance for Eximbank loans. OPIC offers political risk insurance, financing through direct loans and/or loan guarantees, and loan services to U.S. private investors. Both Eximbank and OPIC support energy firms extensively, including smaller renewable energy companies.

Eximbank exposure in Poland, Hungary, and Czechoslovakia as of fiscal year 1991 was about \$377.6 million, most of which is in Poland.³⁸ This includes loans and guarantees to support power sector exports to Poland and Hungary.³⁹ Companies doing business with Hungary and the Czech and Slovak republics now have access to medium-term insurance and long-term loans and guarantees; loans and guarantees to Poland are limited to 5 year-s amortization and 7-year total term.⁴⁰ Loans, guarantees, and insurance to other countries in the region are on a more restricted basis. Table 5-3 summarizes the limitations of Eximbank programs in Central and Eastern Europe as of November 1991.

There has been some concern that Eximbank is too cautious in supporting exports to the region. Exports of capital goods, such as energy technologies, that require a large up-front investment for

long-term payback, require longer term financing and insurance. The Advisory Committee of Eximbank has recommended that the situation in Central and Eastern Europe requires "new and imaginative initiatives enabling Eximbank to identify the underlying strengths of these economies, and therefore making it possible for exporters to position themselves in these markets during their early development stage."⁴¹

U.S. direct investment in Central and Eastern Europe can help stimulate the local economies, facilitate private sector development, and provide avenues for transfer of technologies and management skills. In 1990 and 1991, OPIC provided insurance and loan guarantees to almost 50 firms ranging from small to large but with an emphasis on larger firms-to support investments in Central and Eastern Europe. These included firms producing renewable energy (methane recovery), refrigeration insulation, electric motors, and lighting products (General Electric Corp.). Total exposure in the region was \$550 million by the end of fiscal year 1991.⁴²

OPIC has also authorized a Central and Eastern Europe Growth Fund with a \$50 million investment guarantee, which is in the process of being capitalized. The Fund will invest in equity and debt securities of firms that have a sound financial condition, potential for growth, and can demonstrate positive developmental benefits.⁴³ OPIC has also authorized a \$100 million Environmental Investment Fund (also in the process of being capitalized), which will invest in projects in five

³⁸ Total exposure as of that year was almost \$27 billion. Export-Import Bank of the United States, *Annual Report, 1991*, pp.16-19.

³⁹ Eximbank provides a significant amount of insurance, loan and guarantee support for energy exports and investment, primarily in power generation and oil and gas sectors-almost \$2.9 billion in fiscal year 1991 and \$2.4 billion in fiscal year 1992, according to Export-Import Bank, Office of Public Affairs, "Eximbank's Loan and Guarantee Support For Energy Exports" (Oct. 22, 1992).

⁴⁰ Export-Import Bank of the United States, "Country Limitation Schedule: Special Conditions Pertaining to Eximbank Loan and Guarantee Programs and Export Credit Insurance" (Effective Nov. 15, 1992).

⁴¹ Export-Import Bank of the United States, *Report to the U.S. Congress on Export Credit Competition and the Export-Import Bank of the United States for the Period January 1, 1991 through December 31, 1991*, July 1992.

⁴² Overseas Private Investment Corporation, *1990 Annual Report and 1991 Annual Report*.

⁴³ OPIC, "Informational Summary: Central and Eastern European Growth Fund" (no date).

Table 5-3—Central and Eastern Europe-Eximbank Programs

	Short-term insurance	Medium-term insurance	Medium-term Loans/guarantees	Long-term
Albania	No	No	No	No
Bosnia	No	No	No	No
Bulgaria	Yes	No	No	No
Croatia	No	No	No	No
Czechoslovakia	Yes	Yes	Yes	Yes
Estonia	Yes	No	No	No
Hungary	Yes	Yes	Yes	Yes
Latvia	Yes	No	No	No
Lithuania	Yes	No	No	No
Poland	Yes	Yes	Yes	No
Romania	Yes	No	No	No
Slovenia	No	No	No	No
Yugoslavia	No	No	No	No
Armenia	No	No	No	No
Azerbaijan	No	No	No	No
Belarus	Yes	No	No	No
Georgia	No	No	No	No
Kazakhstan	Yes	No	No	No
Kyrgyzstan	No	No	No	No
Moldova	No	No	No	No
Russia	Yes	Yes	Yes	No
Tajikstan	No	No	No	No
Turkmenistan	No	No	No	No
Uzbekistan	Yes	No	No	No
Ukraine	Yes	No	No	No

SOURCE: Eximbank, July 27, 1992.

environmental sectors, including renewable and alternative energy.⁴⁴

Many of the firms in the U.S. energy efficiency industry are small and could have difficulty approaching Eximbank and OPIC, which tend to finance larger firms. Since 1986, Eximbank has been required to set aside 10 percent of its total budget authority to finance small business exports. In recent years, this target appears to have been met and sometimes exceeded.⁴⁵ Eximbank has taken a number of other steps recently to improve access to small businesses, including

increasing locations that can represent its programs at the State and local level, and forming a Small Business Group to assist in streamlining and improving its programs. The Small Business Administration (SBA) also provides export financing for small businesses through its Export Revolving Line of Credit, although this program has apparently not been widely used.⁴⁶

ENTERPRISE FUNDS

The Polish-American Enterprise Fund (1990), the Hungarian-American Enterprise Fund (1990)

⁴⁴ The other program areas for the Environmental Investment Fund are sustainable agriculture, forest management, ecotourism, and pollution prevention and abatement technologies. OPIC, "Informational Summary: The Environmental Investment Fund" (notate).

⁴⁵ There has been some ambiguity about Eximbank's rep® of its support for small business exports in that direct support was not distinguished from indirect support to small businesses that contracted to larger firms. The recent legislation for Eximbank reauthorization requires the bank to calculate only direct support for small business. General Accounting Office, *The U.S. Export-Import Bank: The Bank Provides Direct and Indirect Assistance to Small Businesses*, GGD-92-105, August 1992.

⁴⁶ General Accounting Office, *Export Promotion: Problems in the Small Business Administration's programs*, GGD-92-77, September 1992.

and the Czech and Slovak-American Enterprise Fund (1991) were established under the SEED Act to undertake a number of activities in support of private sector development, including making loans, grants, and equity investments, and sponsoring technical assistance and training. The funds emphasize the financing of firms in the recipient countries and joint ventures with U.S. firms, but will also finance U.S. companies doing business in the recipient countries. The funds are oriented to small and medium-sized firms. Anecdotal accounts suggest that the enterprise funds have not responded favorably to environmental and energy service companies.

The Polish and Hungarian funds were authorized at \$240 million and \$60 million, respectively, over fiscal years 1990-92. By fiscal year 1991, the Polish Fund was capitalized at \$104 million and the Hungarian Fund at \$26 million. The Czech and Slovak Fund was seeded with \$10 million in fiscal year 1991 and authorized for \$65 million. The funds may raise additional capital from the private sector and foundations.⁴⁷

U.S. Energy Efficiency Industry Export Potential

U.S. Government programs for trade and investment offer a wide array of resources for firms in the energy efficiency industry, including small firms, that could export to Central and Eastern Europe. However, the industry is not well organized to export, nor is there a government-wide strategy for mobilizing the industry. U.S. Government energy efficiency export activities have begun in limited fashion under the DOE coordinated Committee on Renewable Energy, Commerce and Trade (CORECT), established by Congress in 1984 to promote the use abroad of

U.S. renewable energy goods and services, but will be developed more extensively under the DOE Committee for Energy Efficiency, Commerce, and Trade (COEECT) program. COEECT, like CORECT, will be an interagency initiative with private sector participation, that mobilizes resources to assist in export of energy efficiency technologies and build a government-industry partnership.⁴⁸ Central and Eastern Europe is targeted as the initial priority market for COEECT, given the framework for business development already in place.

| State and Nongovernmental Activities

While the Federal Government is the largest U.S. funder of energy activities, a number of public utilities and private organizations have provided policy guidance and attempted to facilitate private sector involvement in energy efficiency.⁴⁹ Participants in the Utility partnership program noted earlier include the New England Electric Systems, Commonwealth Edison, Houston Light and Power, Southern Co., and Central Maine Power.

A number of nongovernmental organizations have programs focused on researching and implementing energy efficiency in Central and Eastern Europe, and also in mobilizing U.S. firms to export. The Alliance To Save Energy has been informally organizing energy efficiency industries to export under its World Export Program, including to Central and Eastern Europe, and has assessed business opportunities in industrial energy efficiency in the region.⁵⁰ The International Institute for Energy Conservation (IIEC) has recently opened an office in Brussels from which

⁴⁷ *SEED Act Implementation Report, Fiscal Year 1991*, *supra* note 7.

⁴⁸ An industry analysis prepared to support COEECT is Russell Sturm et al., *Seizing the Moment: Global Opportunities for the U.S. Energy Efficiency Industry*, *supra* note 32.

⁴⁹ The Citizens Democracy Corps publishes a compendium of U.S. nonprofit assistance that includes selected energy activities. Citizens Democracy Corps (CDC) Clearinghouse, *Compendium: U.S. Nonprofit Assistance to Central and Eastern Europe and the Commonwealth of Independent States* (3 vols.), (Washington DC: CDC, 1992).

⁵⁰ Alliance to Save Energy/International Institute for Energy Conservation, *A Resource Guide for Exporting Energy-Efficient Products* (Washington DC, 1991); and *Business Opportunities in Eastern Europe for Energy-Efficient Industrial Products*, *supra* note 5.

to assess projects in Central and Eastern Europe. The American Council for an Energy Efficient Economy (ACEEE) has supported the work of the energy efficiency centers in Central and Eastern Europe. The Natural Resources Defense Council (NRDC) is undertaking energy efficiency projects in Belarus and other republics. The Center for Clean Air Policy has established a State Energy and Environment Exchange Program in the Czech and Slovak Republics, from which projects in energy conservation and energy regulatory policy are planned. The Sister Cities program is exploring energy partnerships between a U.S. and Polish city.

Other recent initiatives include a newly forming export council for energy efficiency technologies and services, and a proposal by the Atlantic Council to organize a World Council for Energy Efficiency that would assist the countries of Central and Eastern Europe, and the developing world, in accessing information on energy efficiency programs, technologies, and measures.⁵¹

MULTILATERAL PROGRAMS

A review of multilateral assistance in energy to Central and Eastern Europe found at least 14 multilateral organizations, institutions, lending agencies, and initiatives.⁵² Multilateral development banks, particularly the World Bank Group and the EBRD have provided the bulk of financing for energy projects in Central and Eastern Europe. The Global Environment Facility, now the interim financing mechanism for the Frame-

work Convention on Climate Change, will also become more active in financing energy projects with environmental benefits, including energy efficiency.⁵³ Other multilateral organizations, such as the IEA and the U.N. Economic Commission for Europe (UN ECE), have policy research and information systems programs that have been extended to Central and Eastern Europe. The activities of these organizations will be reviewed in this section.

Also reviewed below is the European Energy Charter, a European Community initiative, that has been developed on a multilateral basis, to create a legal and policy framework for energy trade and investment and international energy cooperation. The charter was conceived as a means to integrate Central and Eastern Europe in world energy markets.

A tentative UN ECE evaluation of the multilateral energy assistance programs (that included also the European Community programs) found that they had succeeded in avoiding duplication of effort, but also characterized the coordination as not very consistent. Energy programs are often announced to other donors after the fact. Multilateral lending was found to be "limited, slow, supply-oriented, and uneven." Alternative approaches to financing, such as shared savings agreements, energy service agreements, joint ventures, and third-party financing, were "not sufficiently propagated." The evaluation also recommended "multiplying small-scale develop-

⁵¹ The Council was proposed in The Atlantic Council, *Energy Technology Cooperation for Sustainable Economic Development*, Policy Paper Series, September 1992, p. 27.

⁵² U.N. Economic and Social Council, Economic Commission for Europe, *Multilateral Assistance to Economies in Transition in the Field of Energy*, supra note 1, p. 9.

⁵³ The Framework Convention on Climate Change was signed by the United States and over a hundred other countries in Rio de Janeiro in June 1992, and ratified by the U.S. Congress in October 1992. It could take several years to go into force internationally, which requires 50 countries to ratify. The convention is designed to begin a process of reducing emissions of greenhouse gases, of which the Central and Eastern European countries are major sources-particularly of carbon dioxide (CO₂) released by combustion of fossil fuels and methane or natural gas (CH₄) released from coal mines and leaks from natural gas systems. "United Nations Framework Convention on Climate Change," U.N. General Assembly, A/AC.237/18 (Part II)/Add.1, 15 May 1992. For a review of the scientific and technical issues involved in climate change policy, see OTA, *Changing By Degrees* (Washington, DC: U.S. Government Printing Office, 1991).

⁵⁴ U.N. Economic and Social Council, *Multilateral Assistance to Economies in Transition in the Field of Energy*, supra note 1.

ment assistance. . rather than financing a few large-scale projects. "54

The World Bank Group⁵⁵

The World Bank (IBRD) is the largest single funder of energy projects in Central and Eastern Europe, lending about \$2 billion from 1980 to 1991.⁵⁶ The Bank has had a major influence on energy sector reform in the region through conditions in its structural adjustment loans, including pricing reforms and restructuring and privatization of energy-sector enterprises. The Bank's major current energy projects in the region, totaling almost \$1 billion, focus on modernizing energy supply and conversion infrastructure, in district heating, natural gas, and in the power sector (box 5-B). There are no end-use efficiency projects currently being financed, although three smaller loans, totaling almost \$100 million, were provided to Hungary over the 1980s for industrial energy efficiency. The Bank also operates the Central and Eastern Europe Network for Regional Energy (CEENERGY), in coordination with the EC, United States, and the IEA, a program that seeks to facilitate technical assistance and preinvestment activities in high-priority areas. CEENERGY currently supports preliminary studies of energy efficiency in the context of analysis of energy-related environmental impacts .57

The Russian Federation became a member of the World Bank in June 1992, but the Bank has not yet begun project lending to Russia or the other countries of the NIS. A Bank review of Russian economic reform has identified the priority elements of an initial energy policy package, consisting of energy price reform and the development of a regulatory framework to stimulate investment in the oil and gas sectors.⁵⁸

While recognizing the potential for end-use efficiency in Central and Eastern Europe, the Bank has stressed energy pricing and regulatory reform as the primary means to encouraging greater efficiency. Overall, end-use efficiency has not been a significant element in Bank energy lending-as low as 1 percent according to one estimate.⁵⁹ In a previous study, OTA found that three primary factors militate against the finding of energy efficiency projects at the World Bank: first, they are more diverse and complex than conventional energy supply projects and harder to put into a project format for lending; second, results of energy efficiency initiatives are hard to forecast and incorporate into supply plans; and third, the past emphasis on traditional supply projects is difficult to change.⁶⁰

The Bank has taken some steps recently to increase its incorporation of energy efficiency in energy project development and lending. A strategy for energy conservation lending is under discussion, and supports better integration of

⁵⁴ U.N. Economic and Social Council, *Multilateral Assistance to Economies in Transition in the Field of Energy*, *supra* note 1.

⁵⁵ The World Bank Group consists of the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), and the Multilateral Investment Guarantee Agency (MIGA).

⁵⁶ In 1991, Bank energy lending to the region equaled 23 percent of its total energy lending. Lending commitments to Central and Eastern Europe (excluding the NIS) equaled 18 percent of overall Bank lending in fiscal year 1991. See Joerg-Uwe Richter, "Energy Issues in Central and Eastern Europe: Considerations for International Financial Institutions," *Energy Journal*, vol. 13, No. 3, 1992, pp. 274-277.

⁵⁷ Other priority areas for CEENERGY include: Soviet energy exports and their impact on Central and Eastern Europe; Petroleum Refining and Transport; Electrical Power Interconnection and Trade; and Natural Gas Trade. Montfort and Wackman, "The World Bank Support for Energy Sector Transformation in Central and Eastern Europe," pp. 15-16.

⁵⁸ The World Bank, *Russian Economic Reform: Crossing the Threshold of Structural Change* (Washington, DC: World Bank, September 1992), pp. 180-81.

⁵⁹ Michael Phillips, *The Least Cost Energy Path for Developing Countries: Energy Efficient Investments for the Multilateral Banks* (Washington DC: International Institute for Energy Conservation@ September 1991)

⁶⁰ OTA, *Fueling Development*, *supra* note 16, p. 268.

Box 5-B-Recent World Bank Energy Projects in Central and Eastern Europe**Poland****Structural Adjustment Loan (\$300 million/July 1991).**

Energy sector conditionality included decontrol of coal prices and phased removal of energy related subsidies and cross subsidization.

Energy Resource Development Project (\$250 million, World Bank; \$60 million, European Investment Bank; \$338 million, Polish government/June 1990).

Focused on increasing production and use of natural gas, this project also supported increases in gas prices and studies of restructuring and demonopolization in the gas, power, district heat, and coal subsectors.

Heat Supply Restructuring and Conservation Project (\$340 million, World Bank; \$50 million, EBRD/June 1991).

This project supports energy pricing reform and improves energy conservation in the district heating sector by rehabilitating existing infrastructure and introducing energy efficient equipment.

Cogeneration Privatization Project (Tentative loan amounts: \$85 million, World Bank; \$30 million, commercial banks/spring 1993).

Combined heat and power production will be introduced in Krakow.

Czech Republic and Slovak Republic**SAL Structural Adjustment Loan I (\$450 million/June 1991).**

Energy related conditionality included energy price reform, energy sector regulation, and introduction of an environmental plan.

Power and Environmental Improvement Project (\$246 million, World Bank; \$311.5 million, Czech Republic and Slovak Republic/May 1992).

Focused on reducing air pollution in Northern Bohemia, this project includes some efficiency improvements in the electric power sector, particularly in the transmission system.

Slovak Power Loan (in planning).

This project will improve thermal efficiency at a power plant.

Hungary

SAL Structural Adjustment Loan II (\$250 million/June 1991).

Energy related conditionality included energy price reform.

Energy/Environment Project (approximately \$125 million/spring 1993).

Focused on increasing natural gas supply, energy conservation, and environmental protection.

SOURCE: Bernard Montfort and Harold E. Wackman, "The World Bank Support for Energy Sector Transformation in Central and Eastern Europe" World Bank, July 1992).

energy efficiency issues at the early stages of the Bank's country policy dialogue, greater use of demand side management planning, and increased transfer of energy saving technology within sector and project work. The Energy Sector Management Assistance Program (ESMAP), a joint program of the World Bank and the U.N. Development Programme (UNDP) that

undertakes energy assessments of member countries and provides follow-up technical assistance, has been integrated more closely into Bank operations, and can provide support for institutional design, pricing policy, and regulatory issues in establishing an energy conservation strategy.⁶¹ Other programs that could have a greater influence on Bank energy efficiency

⁶¹Energy Sector Management Assistance Programme (ESMAP), "ESMAP: A Briefing Note," September 1992, and "Energy and the Environment: ESMAP Beyond UNCED," October 1992.

lending include the Financing Energy Services for Small-Scale Energy Users (FINESSE) program, begun in 1989 to provide financing for small energy loans, and IFREEE, which can support energy efficiency experts to assist in the design and financing of Bank projects.

The International Finance Corp. (IFC), the private sector lending arm of the World Bank Group, raises its share capital from member countries but provides loans and equity on strictly commercial rates. The IFC is also an implementing agency for the Global Environment Facility (GEF), discussed below, and is assisting in developing a GEF private sector program.

The IFC's activities in Central and Eastern Europe have focused on providing technical support and financing for the privatization, restructuring, and modernization of state enterprises. A number of these enterprises are in energy-intensive industries—cement, glass, rail transport—or in energy products—lighting, insulation. In Poland, the IFC cofinanced the purchase of a manufacturer of lighting products by Philips, which will now produce energy-efficient lamps.⁶²

It has been proposed that the IFC integrate energy efficiency into its operations by providing technical assistance to firms and by conditioning financial assistance on energy audits.⁶³ These functions could be provided by the IFC's Technical and Environment Department, which currently conducts environmental impact assessments and promotes private sector involvement in environmental industries.

The World Bank Group also provides insurance for foreign investment through the Multilateral Investment Guarantee Agency (MIGA), which was established in 1988. MIGA also provides

technical and advisory assistance to create appropriate settings and programs for investment. Most countries in Central and Eastern Europe have become members of MIGA or are in the process of doing so. Through its Foreign Investment Advisory Service, MIGA has assessed investment incentives in several Central European countries.⁶⁴

| The Global Environmental Facility

The GEF was established in 1990 to finance energy and environmental projects that could show global environmental benefits but would not otherwise be commercially viable. Investment projects are implemented by the World Bank, technical assistance and research by the UNDP, and scientific research by UNEP. In its pilot phase, from 1990-93, the GEF has provided funding for investment and technical assistance in four areas: global warming, biodiversity, international waters, and ozone depletion. For the pilot phase, the GEF has pledged of about \$1.2 billion, which includes \$200 million of cofinancing and \$150 million from the United States of parallel financing.⁶⁵ A number of energy projects have been approved, primarily in the area of renewable energy. Energy efficiency projects are under consideration in the second and third phases of the GEF work program.

At the U.N. Conference on Environment and Development (UNCED) in June 1992, it was agreed that the GEF would move beyond the pilot phase and act as the interim financial mechanism for the Framework Convention on Climate Change. This will make the GEF a major potential source of financing for energy efficiency projects. In collaboration with the IFC, the GEF has also

⁶² IFC, *Annual Report 1992*; IFC, *IFC and the Environment: Annual Review 1992* (Washington, DC, 1992).

⁶³ Phillips, *The Least Cost Energy Path for Developing Countries*, supra note 59, p. 85.

⁶⁴ As of Oct. 30, 1992, Poland, Hungary, the Czech and Slovak Republics, Estonia and Azerbaijan were members of MIGA; the Russian Federation and most other Newly Independent States are in the process of fulfilling membership requirements. Multilateral Investment Guarantee Agency, *Annual Report 1992*.

⁶⁵ Global Environment Facility, "Report by the Chairman to the April 1992 Participant's Meeting: Part One, Main Report," March 1992, p. 13.

been working on increasing private sector access to its funds.

| The European Bank for Reconstruction and Development

The EBRD was formed by the United States and the EC to assist in the development of market economies and democratic systems in Central Eastern Europe. The Bank began operations in April 1991 and is both a development bank and a merchant bank: 60 percent of its funding must be to the private sector, with not more than 40 percent to public infrastructure or other projects. Its lending was \$353 million in 1991 and is estimated to be \$930 million in 1992. The United States has been the largest single donor to the Bank, contributing 10 percent of its capital stock (the U.S. contribution in 1991 was \$70 million). The EBRD currently plans to earmark 60 percent of its loans for Central Europe and the Baltics and 40 percent for the NIS.⁶⁶

The EBRD has cofinanced an energy sector loan in Poland with the World Bank and has several other energy projects in its "pipeline," including emergency energy loans to the Baltic states⁶⁷ and developing, with AID assistance, energy service company joint ventures. The EBRD's "Energy Operations Policy," completed in May 1992, states that the Bank's "overall objective will be to assist countries to reorient sector development away from a narrow focus on supply expansion to a broader 'least-cost' focus. . . in which projects to expand supplies are compared with alternatives to improve supply and end-use efficiencies. But the stated near-term priorities are heavily in conventional energy supply projects: repairing and rehabilitating existing supply

facilities, completing existing power sector projects, assisting countries in diversifying energy supply, and promoting private sector projects which "promote liberalization of supply." The Bank concludes that "the majority of operations are expected to provide finance to fuel industries and energy utilities." ⁶⁸

| The European Energy Charter

The European Energy Charter is a political declaration of principles, objectives, and actions that aims to create a new framework for cooperation, investment, and trade in energy across Europe and possibly across the world. The Charter was initiated by the EC with the major objective of integrating Central and Eastern Europe into world energy markets. Following several months of preparation, it was signed by 43 countries, including the United States, in December 1991, and several others since then. A legally binding "Basic Agreement" to the charter and additional protocols are currently under negotiation.⁶⁹

The Charter's objectives are organized around three functional areas: energy trade, international cooperation in the energy field, and energy efficiency and environmental protection. The first two of these include provisions to promote sounder legal frameworks for energy activities, access to energy resources, lower barriers to trade in energy goods and services, efficient management and use of energy resources, modernization of infrastructure, information exchanges, research and development, and policy consultation.⁷⁰

The objectives for energy efficiency and environmental protection include:

⁶⁶ European Bank for Reconstruction and Development, *organization*, March 1992.

⁶⁷ European Bank for Reconstruction and Development, *Procurement Opportunities*, No. 5, August 1992.

⁶⁸ Document of the European Bank for Reconstruction and Development, "Energy Operations Policy," March 1992, pp. 2-6.

⁶⁹ Richard Greenwood, "The European Energy Charter: A new framework for pan-European energy cooperation," *Energy in Europe*, No. 19, July 1992, pp. 69-72.

⁷⁰ "Concluding Document of the Hague Conference on The European Energy Charter," Dec. 16-17, 1991, The Hague, Netherlands.

- ensuring, in a cost-effective manner, consistency between relevant energy policies and environmental agreements and conventions;
- ensuring market-oriented price formation, including a fuller reflection of environmental costs and benefits;
- the use of transparent and equitable market-based instruments designed to achieve energy objectives and reduce environmental problems;
- the creation of framework conditions for the exchange of know-how regarding environmentally sound energy technologies and efficiency use of energy; and
- the creation of framework conditions for profitable investment in energy efficiency projects.

Negotiations over the “Basic Agreement,” that would provide a legal framework for energy trade and investment, and more detailed sector protocols—initially energy efficiency, nuclear power, and hydrocarbons—began in February 1992. The negotiations over the Basic Agreement, planned for completion by December 1992, have proven more difficult than expected and are anticipated to last into 1993.

| Other Multilateral Programs

A number of other multilateral organizations are supporting energy efficiency research and measures. The IEA, which normally confines its research to OECD member countries, has carried out energy assessments of Poland (1991) and Hungary (1992) and recommended a series of energy efficiency steps.⁷¹ The IEA also has programs of energy technology research and

development and demonstration and information sharing that are being slowly opened to participation by Central and Eastern European countries. For example, the IEA Center for the Analysis and Dissemination of Demonstrated Energy Technologies (CADDET) provides information about new energy technologies.

The UN ECE energy efficiency program for Europe, Energy Efficiency 2000, was launched in mid-1991, and included a particular emphasis on assistance to Central and Eastern Europe.⁷² The objectives of the program include promotion of trade, dissemination of information, technology assessments, and development of “demonstration zones” and pilot projects. Major undertakings have included a number of international meetings and trade fairs.⁷³ The UN ECE and the UNDP have also recently established the Eastern European Center for Energy Efficiency in Buildings in Sofia, Bulgaria. The center will assist in information exchange, training and promotion of building energy efficiency projects.

EUROPEAN AND JAPANESE PROGRAMS

European countries are very active in reforming the energy system in Central and Eastern Europe, both through the EC and on a bilateral basis. The EC is attempting to lay the foundation for a common European energy system with programs of policy and technical assistance, capacity building through a series of energy centers, and the European Energy Charter. Often supported by bilateral energy cooperation agreements, European firms, particularly from Germany and Scandinavia, have also been developing business opportunities in the energy sector

⁷¹ The IEA was established within the Organization for Economic Cooperation and Development (OECD) in 1974 (following the first oil crisis) to coordinate an international energy program focused on the stability of oil markets and steps that countries can take to reduce oil dependence, including energy conservation. IEA/OECD, *Poland: Energy Policies, 1990 Survey* (Paris, 1991); IEA/OECD, *Hungary: Energy Policies, 1991 Survey* (Paris, 1992).

⁷² The U.N. Economic Commission for Europe was created by the U.N. Economic and Social Council in 1947 to promote economic relations in the region. The United States is represented on the Commission.

⁷³ U.N. Economic Commission for Europe, *East-West Energy Efficiency*, ECE Emergu Series No. 10 (United Nations: New York, 1992), p. 48.

and in energy efficiency. European firms obviously have a geographic advantage over U.S. firms, and more consistent governmental and commercial relations. Several European countries and Japan also offer export promotion and financ-

ing in greater quantities and on better terms than the United States.⁷⁴

A discussion of specific EC and Japanese projects and funding will be provided in the final report of this study.

⁷⁴Office of Technology Assessment, *Competing Economies: America, Europe, and the Pacific Rim*. A forthcoming OTA study on U.S. environmental technologies and competitiveness will compare U.S. with Japanese and European trade promotion activities in the environmental and renewable energy sectors.