Appendix 4-1
Case Studies

OTA conducted several case studies of U.S. businesses that have tried to transfer energy efficient technologies to CEE. These case studies illustrate the problems businesses face when working in CEE, and provide some evidence of the effectiveness of Federal programs to assist U.S. businesses. The case studies are:

. A medium-size privately held U.S. company's efforts to export steam traps, devices to improve the efficiency of steam systems, to Bulgaria.

. A U.S. home-building firm's efforts to build single-family housing in St. Petersburg—the first such housing to be built in 70 years.

. A small U.S. company's efforts to set up a joint venture with a Slovakian firm to manufacture and market energy efficient devices for industry.

• A large U.S.-based multinational's efforts to retrofit district heating systems in Moscow.

Case Study 1

Export of Steam Traps to Bulgaria

INTRODUCTION

A steam trap removes condensate, air, and carbon dioxide from steam systems, thereby helping to ensure high efficiency. Although steam systems are typically installed with steam traps, poorly designed traps often fail prematurely, leading to expensive steam leaks. Replacing a worn or defective trap with a high-quality trap often results in significant energy savings with rapid payback periods. Armstrong International, a U.S.-based manufacturer of equipment for industrial and commercial users of steam, manufactures and markets a complete line of steam traps, including the energy efficient inverted bucket steam trap. Armstrong is currently marketing its steam traps in Bulgaria and is working to expand its sales network throughout Central and Eastern Europe (CEE).

HISTORY OF INVOLVEMENT

Armstrong first became exposed to business opportunities in CEE through an unplanned encounter with the USAID Emergency Energy Program. An AID consultant doing energy audits in CEE contacted Armstrong for educational materials on steam energy conservation to provide to Bulgarian industrialists. AID ordered several educational videotapes from Armstrong, and within a few months ordered **90** inverted bucket steam traps. This equipment order, which specified shipment to addresses in Bulgaria and Poland, piqued the interest of Armstrong sales representatives.

Douglas Bless, Armstrong's Vice President for Sales, then arranged a visit to Bulgaria to look for a sales representative. Bless contracted with Christian Spassov, a scientist at the University of Sofia who had done energy audits for AID, to market Armstrong steam traps in Bulgaria. Within a short time Spassov sold $200,000 worth of steam traps, bought a truck and hired installers, and enjoyed steadily increasing sales.

MARKETING ARRANGEMENTS

Armstrong uses the same approach with Spassov as with their U.S. distributors. They sell him steam traps at the wholesale price and he resells them at the retail price, retaining the price difference as profit. Armstrong receives payment from Spassov in U.S. dollars and has not had to compromise its margins. While recognizing the importance of Spassov's entrepreneurial and technical skills, Bless attributes the strong sales performance of his company's steam traps in Bulgaria to their combination of low initial cost (approx. $120) and high energy savings. He estimates that, at prevailing world energy prices, the initial investment in their steam traps can be recouped within 3 to 4 months.

NEXT STEPS

Bless is currently seeking representatives in other countries in the region, hoping to find others like Spassov, with the combination of technical compe-

tence and entrepreneurial abilities needed to market and service Armstrong's products. The company is currently in the process of sifting through correspondence from numerous companies in CEE that have been exposed to Armstrong's products through the USAID program and want to represent these products in their countries. These potential distributors cite strong demand for Armstrongs products. Bless explains: "If you get to the right people in management at these companies, they understand the importance of energy efficiency, and our product, a quality steam trap, is just unavailable to them right now in their region.

KEY ISSUES: FINANCING AND STANDARDS

While Armstrong has enjoyed encouraging sales of its steam traps based on their rapid payback, it finds that many potential customers want the product but need help in financing the purchase. This situation became apparent during meetings in Hungary and Bulgaria, where local managers explained that they understood the financial gains they could achieve by investing in energy saving equipment, but simply did not have enough up-front cash to buy the equipment. Armstrong is currently exploring arrangements in which a bank purchases the equipment and has it installed, and then the plant pays the bank, over time, from the cash made available through the energy savings.

Another concern facing Armstrong is competition from West European, particularly German, companies that have been aggressively marketing similar products in the region. The situation is complicated by the fact that German firms use a different system of engineering measurements and standards than do American companies. If American companies were required to convert to the German standards system, they would have to modify their designs, adding significantly to the cost of their products and making them less competitive. For this reason, Bless stresses the importance of early market presence on the part of U.S. companies to promote the adoption of U.S. engineering standards and to create a preference for American equipment. Aside from the standards issue, Bless senses a preference in the region for doing business with American firms, particularly those associated with U.S. Government-sponsored programs, based on admiration for the U.S. Government.

ROLE OF GOVERNMENT PROGRAMS

Bless stresses the role of the AID program in getting Armstrong involved in the CEE market:

> We had been thinking that someday this is going to be a great market. USAID as a true catalyst launch[ed] this program. . .we have sold $200,000 worth of equipment and are now fully engaged in the whole region due to this success. . .we are on our way now. I think that other U.S. manufacturers can benefit from this program.

Case Study 2

Export of Prefabricated Housing and Related Technology to Russia

INTRODUCTION

Ryland Building Systems, a U.S. manufacturer of prefabricated housing units, is in the process of transferring improved building technologies to Russia. These technologies, such as insulation utilizing advanced materials; caulking and weatherstripping techniques to minimize heat losses; and the use of multiple-pane, low emissivity windows; are being transferred through modernization of a house fabrication facility in Siberia and through a joint venture with a Russian contractor to build a housing development in St. Petersburg.

INITIAL INVOLVEMENT: FACTORY MODERNIZATION

Ryland first became exposed to the Russian housing industry in 1990, when it was invited to look at a housing factory in Western Siberia. After visiting the factory, Ed Grachik of Ryland observed:

> The [existing] equipment was of Swedish origin, about 10 years old, and the problem was that they had not maintained it. In most cases they had bought maybe two pieces of a given type of equipment, and only one was running because they had taken parts off of one to keep the other ruining. The equipment was rather sophisticated, in our minds too sophisticated for what they were trying to do.

Ryland has made plans to set up a new factory, provide training, and then turn the factory over to the Russians. They have, however, been unable to implement their plans due to the Siberian company's inability to obtain the needed hard currency, The project has been put before the Russian government, which has so far been unwilling to authorize the expenditure of hard currency needed to finance the project,

CURRENT PROJECT: BUILDING HOUSES IN ST. PETERSBURG

While working on the Siberian project, Ryland came in contact with a Russian group involved in fabricating precast concrete building components and providing civil engineering services to the construction industry in St. Petersburg (formerly Leningrad). Ryland joined with this group to form a joint venture, called Ryland St. Petersburg, to build houses in St. Petersburg. The venture has obtained a building site on which it plans to build 23 townhouses of approximately 2,000 square ft. each, with a basement and garage at ground level and two floors of living space. Approximately 80 to 90 percent of the materials and prefabricated components will be shipped from the United States. The windows and some other components are being sourced from Finland, and a small amount of local materials will be used, such as stucco for the exteriors, The foundation

work has already begun, and Ryland hopes to have the models open in the Spring of 1993.

MARKETING PLANS

Ryland plans to market the townhouses to Western companies that have established offices in the area and to the small number of Russians who have the hard currency to buy them. Recognizing that the majority of the local population will not be able to afford houses made of materials exported from the United States, Ryland views the current phase of the venture as a training period and is working toward incorporating local materials, identifying local contractors, and establishing incountry manufacturing facilities.

DIFFERENCES IN TECHNOLOGY

Differences in construction materials and technology have led to concerns about the thermal performance of the houses. The Russians, accustomed to masonry walls 12-16 inches in thickness, have reacted with skepticism when confronted with a 5-inch thick frame wall of equal insulation value. "The first reaction is 'that's no good, ' and we try to explain to them that it is better, " says Grachik, who has also expended considerable effort educating Russians on the importance of minimizing air leakage through windows and doors. The houses exported by Ryland will incorporate triple-pane windows from Finland and other design features to improve the air-tightness of the house. Ryland expects energy efficiency, along with overall construction quality, to be a major selling point for its houses.

COMPLICATIONS

Ryland has experienced difficulty in getting its designs approved by local inspectors, due in part to unfamiliar materials and construction techniques. The process is further complicated by the fact that these townhouses will be the frost private houses to be built in St, Petersburg in 70 years. Ryland, with the help of its venture partner, has managed to convince Russian authorities of the soundness of its designs by demonstrating adherence to U.S. and international standards.

Ryland's plans have also been complicated by land ownership considerations. Most land is still government owned and clear mechanisms for private ownership have yet to be established. The venture has negotiated a 99-year lease from the city for the current project, and is doing the same for a second joint venture in Moscow. Another problem is the absence of mortgage financing, which will likely put house purchases out of the reach of the general population.

ROLE OF GOVERNMENT PROGRAMS: TRADE DEVELOPMENT PROGRAM

Ryland has received a grant from the Trade and Development Program (TDP) to conduct a study on issues relevant to the development of the Russian housing market. The study includes development of a survey **to** determine what design parameters Russian people look for in a house. The TDP study will also help Ryland identify local materials and evaluate the feasibility of manufacturing in the country.

CONCLUSIONS

Grachik acknowledges the difficulties inherent in doing business in Russia, but believes that Ryland's current efforts have potential to pay off:

> Every day, it seems there is a different problem, but as a company we feel there is an opportunity there in the future. That's why we are spending our time, investing, doing things in anticipation that things will be more stable, and once that occurs there will be a large market for housing there. But in order to participate in that, you are going to need to have incountry manufacturing and construction capabilities, and that is what we are trying to develop right now.

Case Study 3

Joint Venture to Manufacture Industrial Energy Devices in Slovakia

INTRODUCTION

The *phase liner* reduces energy losses in electric motors by aligning the phase angle of current and voltage in the motor. The flue ***gas*** *controller* improves furnace, boiler, and water heater efficiency by reducing excess stack draft. Vertech International, a small U.S. company, is transferring these patented technologies to a manufacturing company in Bratislava, Slovakia and plans to market the devices throughout Eastern Europe and the former Soviet Union.

HISTORY OF INVOLVEMENT

In 1990 one of the principals in Vertech, Peg Kay, hired an agent to look for business opportunities in Central and Eastern Europe (CEE). The agent subsequently visited Elektroakustika, a manufacturer of audio equipment in Bratislava, which expressed interest in bringing in new technologies from the West. He relayed this information to Kay, and also reported that energy consumption was a major concern in the region, due to recent fuel price increases and environmental problems.

Vertech determined that the phase liner would be an appropriate device for Elektroakustika to manufacture. Vertech began negotiations with the U.S. patent holder for a licensing agreement covering manufacturing and distribution rights in Central and Eastern Europe (CEE). Vertech is now working out a joint venture agreement with Elektroakustika for the manufacture and distribution of energy saving products.

Vertech is also negotiating with the inventor of the flue gas controller, and is planning to submit a funding proposal to the Czech and Slovak American Enterprise Fund.

MARKETING PLANS

Vertech is currently working through incountry contacts to sell the products through their energy savings, using a concept called performance contracting. This concept enables the customer to finance the purchase of energy efficient products through future energy savings. An outside company arranges the financing, acquires and installs the equipment, and guarantees that future savings will cover any debt incurred by the customer. In effect, performance contracting accesses money that would otherwise go to the energy supplier, involves no up-front investment by the customer, and gives the vendor a chance to demonstrate the effectiveness of the product and services.

The Slovakian venture partner has also marketed the products to the Slovak Power Enterprise which has indicated a willingness to assist in marketing and possibly financial support.

KEY ISSUES: FINANCIAL REGULATIONS, BUSINESS SERVICES, AND ECONOMIC AND POLITICAL STABILITY

Financial regulations regarding foreign ventures at first appeared to be a problem, as there was a 55% tax on gross profits and a requirement for 30% government ownership in any company with foreign involvement. The ownership requirements have since been relaxed and foreign companies are now subject to the same tax treatment as domestic ones. In addition, in an effort to attract foreign investment, a tax holiday has been declared for foreign companies. Vertech has been assured by government authorities that currency conversion will not present a problem.

Vertech has been inconvenienced by the absence of a developed business service infrastructure in the region. Only one U.S. law firm has operations in Slovakia, and it serves mainly large businesses. Bookkeeping is complicated by the continued use of communist accounting systems and unfamiliarity with Western accounting practices. Banking services are limited, with check cashing often requiring up to 6 weeks.

In view of the division of Czechoslovakia, there is some concern over economic and political stability, notably potential economic conflict between the Czech and Slovak republics and potential ethnic unrest involving Slovakia and Hungary. Vertech views economic growth in the region as the key to avoiding such conflicts and believes that problems are likely to materialize only if the economies stagnate.

ROLE OF GOVERNMENT PROGRAMS

The venture has received much assistance from representatives of the Slovak embassy. A former principal in Vertech, Shirley Hansen, also reports having received valuable information and support from the Czech and Slovak-American Council of the U.S. Chamber of Commerce.

The group has also worked with SEVEn in Prague, one of three Energy Efficiency Centers set up to support energy efficiency related ventures in Eastern Europe, for assistance in marketing its products to utilities. SEVEn has been helpful in working with utilities and in explaining the merits of performance contracting to potential users.

Kay gives the Commerce Department's International Trade Administration much credit for being responsive and helpful in supplying information and statistics. She also feels that AID 'is doing shockingly good, but thinks their programs should focus more on small businesses and include Czechs and Slovaks in their meetings, claiming that they "would love to sit down with AID. " Kay explains, "culture clash problems exist when large companies try to establish a presence in Eastern Europe. Small companies give places like Slovakia a chance to grow their own manufacturing. '

The group's outlook is summed up by Hansen: "I think there is a lot of opportunity for U.S. companies to do a lot of good over there. "

Case Study 4

Improving the District Heating System in Moscow

INTRODUCTION

A *Fortichka is* a little window built within the frame of the surrounding larger window, and is used to regulate room temperature in a Russian apartment-if the apartment gets too hot, *the fortichka* is opened and the excess heat escapes. Honeywell Inc., manufacturers of home, building, and industrial controls, in cooperation with the Moscow City Council and a Russian-Honeywell joint venture, is working to find more cost-effective ways to regulate building temperature than by opening a window.

PROJECT DESCRIPTION

In the Tushino district of Moscow, Honeywell has initiated a retrofit of the region's district heating system. (Throughout Central and Eastern Europe (CEE), district heating is the predominate system in most urban areas. Most of these systems lack modem thermostat or boiler controls.) Honeywell estimates that installing modem boiler controls in the Tushino district alone, which consists of 350 buildings and over 20,000 apartments heated by four natural gas boiler plants, will result in natural gas savings of about 20 percent (this number is approximate, since total gas consumption in the Tushino District was not previously monitored). Installation of boiler controls represents the first stage in Honeywell's initiative. In the second stage, Honeywell will oversee the installation of a heat exchanger control system to capture and reclaim waste heat from combustion gases and other sources. With both control systems in place, there should be a 30 percent reduction in natural gas consumption. The final step in the pilot program outlined by Honeywell is to equip each individual flat with thermostats and meters so that tenants can control and be billed for their individual consumption. If all three stages were implemented, the resulting energy savings could be as high as 45 percent.

The combined cost for the first two stages in the Honeywell plan is an estimated $3 million. The three partners-Honeywell, the Moscow City Council, and Agrochem-have each agreed to donate $1 million for the project. In Honeywell's view, a major retrofit of the district heating systems in the former Soviet Union would result in enormous energy savings, and the potential revenues from the increased export of natural gas and other energy resources resulting from more efficient domestic use could go a long way toward fueling the process of structural change currently underway, In the Tushino District alone, one of 55 districts in Moscow, a 30 percent energy savings translates into about $2 million/year of natural gas saved (or available for export). There are about 1,000 such district heating systems in the FSU. The potential market and energy savings from gains in energy efficiency are enormous.

FINANCIAL ARRANGEMENTS

Honeywell is not a stranger to the Russian market. In 1988, representatives of the Fertilizer Ministry came to Honeywell with the idea of installing Honeywell's process controls in their fertilizer plants, which export their product for hard currency. A joint venture, *Sterch.* was formed and has completed retrofits on 22 fertilizer factories.

In retrofitting the district heating systems in the FSU, financial arrangements could be made in terms of the product saved--energy. Natural gas, for example, could be exported as payment for installation of management and control devices. Such a barter arrangement is difficult for an individual corporation to arrange; however, with the mediation of international lending organizations and government agencies, such large scale agreements can be an attractive option for capital-constrained CEE industries.