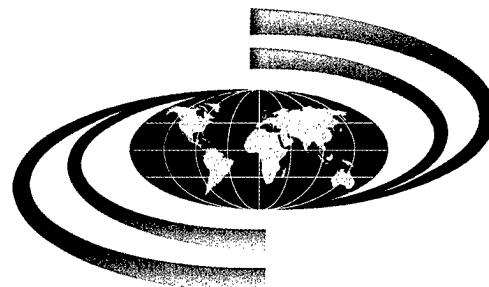


CLEAN

COAL

GLOBAL
OPPORTUNITIES
FOR SMALL
BUSINESSES



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U.S. Department of Energy
Office of Coal & Power Import and Export
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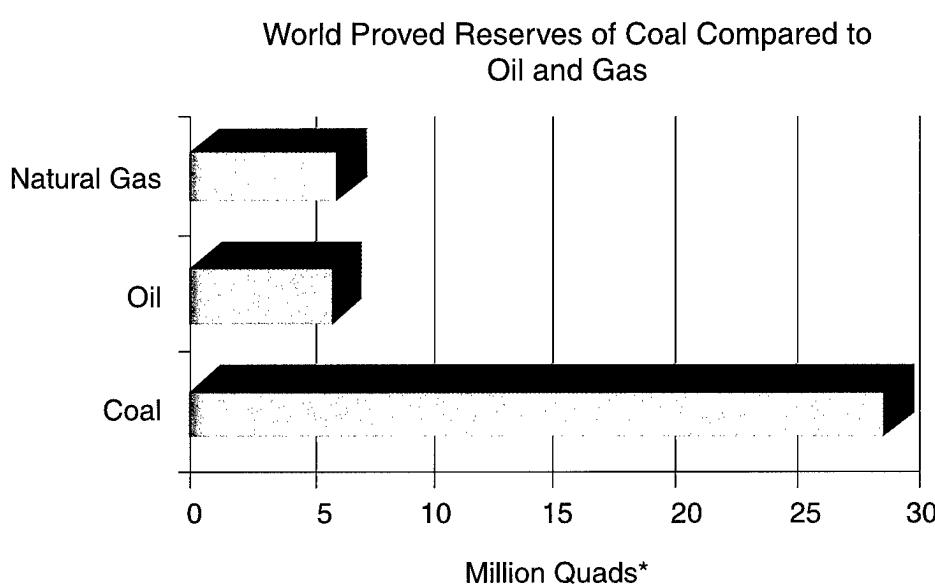
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GROWING GLOBAL DEMAND FOR CLEAN COAL

Coal is the world's most plentiful fossil fuel. It is found on every continent and recoverable reserves are sufficient to last well into the 22nd century. A quarter of the primary energy consumed worldwide comes from coal. More than a third of the world's electricity is produced in coal-fired power plants. These shares are projected to continue through 2015. Worldwide coal reserves are more than double those of oil and natural gas combined (see graph below).

Abundant and typically inexpensive, coal is a key domestic energy resource in many countries. Coal is the least-expensive fossil fuel for many countries. Today, as economies grow and energy needs increase throughout the world, the demand for coal is expected to rise. Currently, more than 5 billion tons of coal are consumed each year worldwide. By 2015, coal consumption is expected to be between 6.2 and 8.7 billion tons.

This projected increase in coal use comes at a time when worldwide concern about environmental issues is growing. Unfortunately, uncontrolled use of coal leads to large emissions of pollutants that can harm human health, cause material damage and degrade the natural environment. In response, many countries are developing and enforcing strict environmental standards. Moreover, international development institutions such as the World Bank and regional development banks now link project funding to compliance with environmental standards.



Source: EIA International Energy Outlook, 1996

* A Quad equals 1 quadrillion Btu

This parallel growth in coal demand and environmental concern has spurred interest in technologies that burn coal with greater efficiency and with lower emissions. Clean Coal Technologies (CCTs) will ensure that continued use of the world's most abundant energy resource is compatible with a cleaner, healthier environment.

Increasing interest in CCTs opens the door for American small businesses to provide services and equipment for the clean and efficient use of coal. Key players in most coal-related projects are typically large equipment manufacturers, power project developers, utilities, governments, and multinational corporations. At the same time, the complexity and scale of many of these projects creates niche markets for small American businesses with high-value products and services.

From information technology, control systems, and specialized components to management practices, financial services, and personnel training methods, small U.S. companies boast some of the highest value products and services in the world. As a result, American companies are in a prime position to take advantage of global niche markets for CCTs.

Small firms, however, often lack the awareness of the market, the presence, capital and human resources necessary to take advantage of these global opportunities. Further, they are often unaware that the products and services that they provide — typically for other applications — can be utilized in many CCT-related applications.

Identifying and establishing contacts with customers in other countries can be time-consuming and expensive. Selling in international markets typically requires establishing relationships with those customers and sometimes other key players. This guide is designed to provide U.S. small businesses with an overview of potential international market opportunities related to CCTs and to provide initial guidance on how to cost-effectively enter that growing global market.

What are Clean Coal Technologies?

The term "Clean Coal Technologies" (or "CCTs") refers to a new generation of coal utilization technologies at various stages of development that are cleaner and more efficient than the earlier generation of conventional coal-using technologies.

Largely developed in the United States in response to environmental concerns about air pollution, commercial CCTs have been developed to offer improved pollution control, higher thermal efficiencies, lower fuel costs and greater fuel flexibility. CCTs are designed to produce power or thermal energy from coal more efficiently than prior coal utilization processes while minimizing environmental impacts. These technologies enable coal utilization to be extremely clean — greatly reducing concerns about many pollutants and dramatically reducing the emission of greenhouse gases. These technologies present exciting export opportunities to U.S. companies, including many small businesses.

Four basic types of CCTs are used:

1. Precombustion technologies clean the coal before it is burned. Removal of ash-causing matter, sulfur, and other trace minerals from the raw coal lessens the need for pollutant control during or after combustion. It also increases the amount of available energy from a delivered volume of coal. Removing matter that does not add to coal's heating value also lowers costs for transporting the coal, maintaining equipment and cleaning the exhaust gases.

2. Combustion technologies remove pollutants inside the combustor or boiler where the coal burns. These technologies control combustion so that fewer pollutants are emitted in the exhaust gases. Fluidized bed combustion technology, for example, mixes a sorbent chemical, such as limestone, in with the coal to remove sulfur oxides in the combustion process. Other combustion technologies control the fuel-air mixture and combustion temperature to limit the formation of nitrogen oxide.

3. Post-combustion technologies reduce the amount of particulate, sulfur oxides and nitrogen oxides in the equipment leading to the stack. Baghouses and electrostatic precipitators capture

particulates, flue gas desulfurization systems limit sulfur emissions, and selected catalytic reduction units minimize nitrogen oxide emissions. Several innovative technologies developed by the U.S. Department of Energy (U.S. DOE) Clean Coal Technology Demonstration Program capture multiple pollutants.

4. Conversion technologies bypass the combustion process altogether, changing coal into a clean gas or liquid that can be used as a fuel. In a gasification process, coal is converted to a fuel gas that is similar to natural gas and can be burned in a gas turbine. Conversion allows pollutants in the coal to be removed economically and effectively prior to combustion.

Clean Coal Technologies are Commercial Now

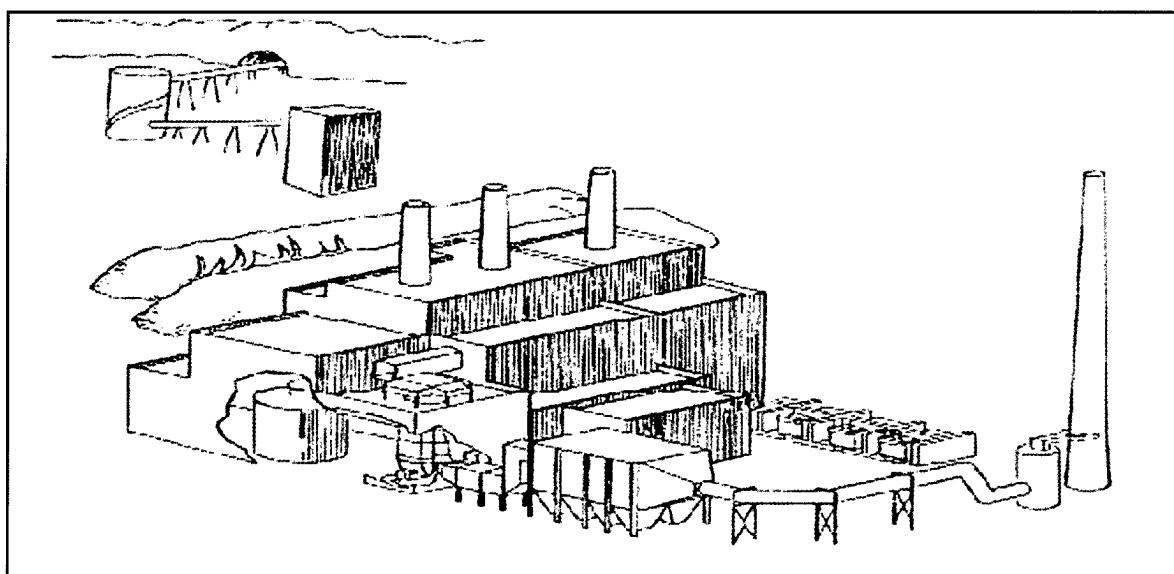
Today's clean coal technologies offer viable environmental solutions for a diverse range of applications. They are already in commercial use throughout the world. For example, power generators can install flue gas desulfurization units ("FGD" units or "scrubbers") on power plants to comply with air emission standards. Scrubbers have been highly effective in improving air quality.

Concern in many countries focuses on older power plants that may not have the space to install scrubbers. Some plants may have limited remaining life expectancies and such an expenditure could not be justified; others no longer have the physical space to install a scrubber. For these plants, absent new technologies, the only option may be retirement at a time when the need for reliable electric power is increasing.

For many of these plants, some of the newer commercial clean coal technologies offer an attractive solution. Moreover, with increasing concern about nitrogen oxide (NO_x) emissions, CCTs that reduce NO_x emissions may offer environmental benefits that cannot be achieved by conventional scrubbers.

Clean coal technologies can also be used in industrial and commercial applications. A variety of commercial technologies have been developed to meet these needs.

Reduced emissions are only one of many benefits that may come from these new technologies. The reliability of future electric power supplies is the key benefit of using these advanced commercial technologies. Today's CCTs have been proven in a wide range of commercial applications.



Coal can be cleaned at several points in its "fuel chain" - at the preparation plant, inside the combustor, or at the stack. Another category of clean coal technology replaces the traditional coal combustor with a coal gasifier or other conversion process.

Clean Coal Technologies for New Power Plants

New power plants are needed throughout the world to meet the growing needs for electric generating capacity. CCTs can be used in many countries to meet growing demand for efficient and clean coal-fired plants.

The feasibility of a specific CCT depends largely on a plant's operating requirements. Design issues include capacity, available coal types, space constraints, construction and operating costs, and emission levels. Commercial CCTs offer a menu of options that can be matched to the requirements of a new plant. Coal cleaning techniques, combustion technologies and pollution control equipment can be used independently or together to comply with emission limits and cost constraints.

Clean Coal Technologies for Retrofit and Repowering

CCTs are not only applicable to new power generation projects. Many countries have coal-fired power plants that require upgrading to improve plant economic or environmental performance. Two broad classes of upgrade options are available. **Retrofit options** involve installing modern pollution control devices without making major changes in plant design. **Repowering options** replace all or part of the power generation system with a new, more modern system. Several clean coal technologies provide attractive retrofit and repowering options. The table on the following page provides summary descriptions of retrofit and repowering options as well as the pollutants that they help to reduce.

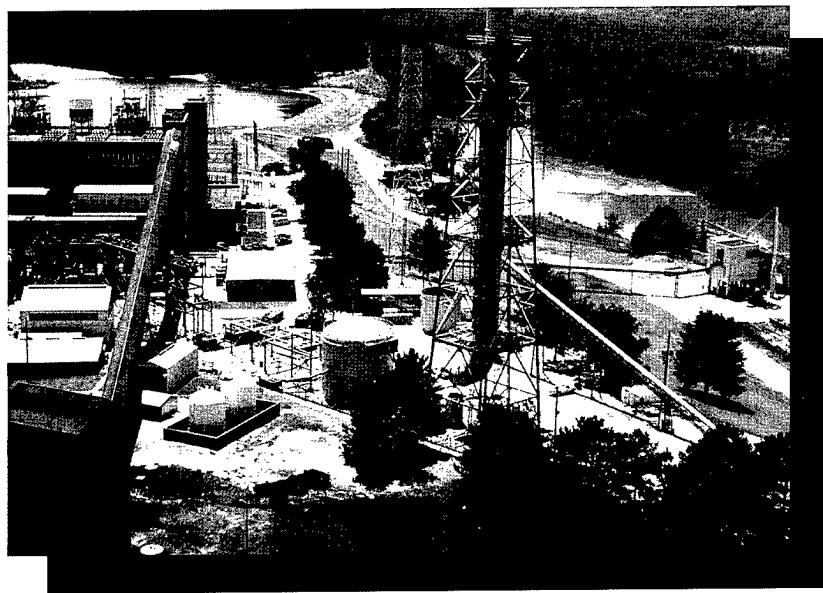
Retrofit Options. Retrofits are a cost-effective way to improve the environmental performance of a power plant. While retrofits generally do not improve performance as much as repowering, they offer cost-effective pollution-reduction measures with

significantly less impact on plant operation. They also require much less plant downtime than repowering efforts.

Retrofits are often the most practical method for complying with tightened emissions regulations. In response to the need for low-cost pollution measures, many U.S. companies have worked with coal-fired power plants throughout the world to install retrofit equipment.

Repowering Options. Repowering technologies replace a major component of an existing plant — such as the boiler — with new power generating equipment while retaining other portions of the plant, such as the feedwater and condensate systems.

Repowering projects are typically more extensive than retrofits and require a longer period of plant inactivity to upgrade or replace large equipment like boilers, turbines, and economizers. Repowering is an attractive option when coal-fired plants reach the end of their useful lives, typically 25 to 40 years after construction. After years of operation, plant equipment wears to the point where routine maintenance is insufficient to ensure reliable performance. Plants may also need to improve their environmental performance with boiler upgrades. Although pollution control is a key benefit of repowering, a repowered plant can also produce more power — sometimes twice as much or more — than



Flue gas desulfurization equipment, shown here at a plant under construction, eliminates most sulfur oxide emissions.

Clean Coal Technologies – Retrofit and Repowering Applications

Method	Pollutant Reduced	Description
Retrofit—Combustion Methods		
Gas Reburning	Nitrogen Oxide	Increases the fuel to air ratio above the combustion zone promoting the conversion of NO _x to nitrogen. Minimizes NO _x emissions.
Low-NO _x Burners	Nitrogen Oxide	Promotes a low flame temperature and decreases turbulence around the flame to limit NO _x formation.
Overfire Air (OFA)	Nitrogen Oxide	Introduces air above the combustion zone which keeps the combustion temperature low and promotes the conversion of NO _x to nitrogen.
Retrofit—Post-Combustion Methods		
Electrostatic Precipitators (ESPs)	Particulates	Charges ash particles using an electric field then pulls them onto an oppositely charged collection surface.
Bag Houses	Particulates	Uses a fabric or polymer filter to capture solid particles.
Flue Gas Desulfurization (FGD)	Sulfur Dioxide	Adds a chemical such as limestone into the flue gas to absorb sulfur dioxide.
Sorbent Injection	Sulfur Dioxide	Injects a chemical with the coal in the boiler to absorb sulfur during combustion.
Selective Non-Catalytic Reduction (SNCR)	Nitrogen Oxide	Injects urea or ammonia into the exhaust gases to convert NO _x to nitrogen and water vapor.
Selective Catalytic Reduction (SCR)	Nitrogen Oxide	Injects ammonia into the exhaust gases to convert NO _x to nitrogen and water vapor.
Repowering Methods		
Atmospheric Fluidized Bed Combustion (AFBC)	Nitrogen Oxide; Sulfur Dioxide; Carbon Dioxide	Combines a sorbent with coal in the combustion bed and forces air up through the mixture. Boiler pressure remains roughly atmospheric.
Pressurized Fluidized Bed Combustion (PFBC)	Nitrogen Oxide; Sulfur Dioxide; Carbon Dioxide	Similar to AFBC except that the boiler pressure is kept between 6 and 16 times atmospheric. The exhaust gases can therefore power a separate turbine.
Integrated Gasification Combined Cycle (IGCC)	Sulfur Dioxide; Carbon Dioxide	Relies on coal gasification to provide a fuel gas which is burned in a combustion turbine. The heat of the exhaust gases in turn generate steam which can power a separate turbine.

the original plant. This can extend a plant's lifetime by 20 to 30 years and make repowering a cost-effective alternative to building a new plant.

Repowering projects exploit the advantages of using standardized, shop-fabricated components. A modular, packaged approach minimizes the costly, customized, on-site construction typical of most conventional technologies. Several U.S. companies, for example, have shared their experience in repowering technologies with coal-fired power plants in several countries in Central Europe, including Poland and the Czech Republic.

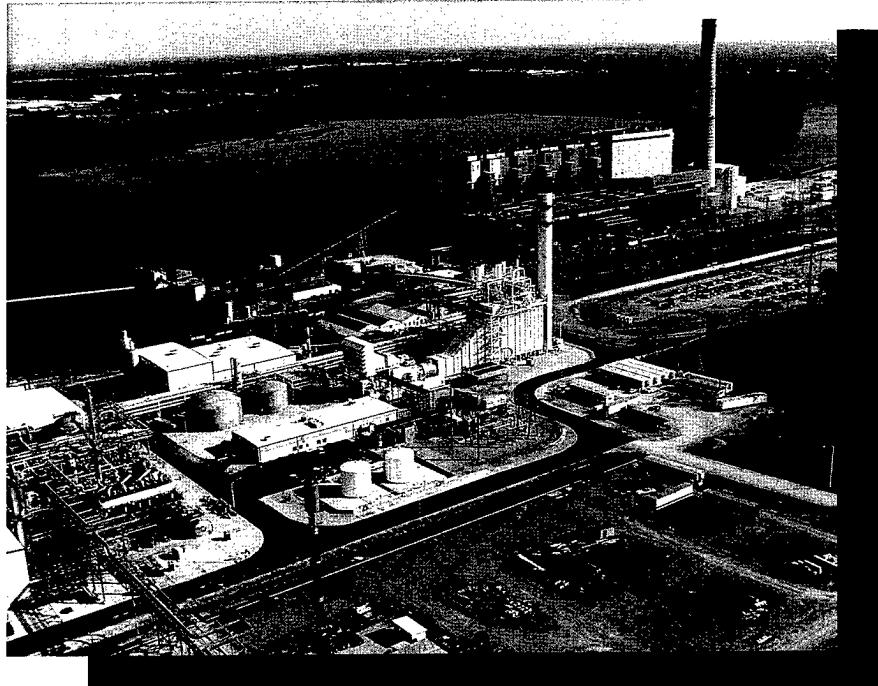
Clean Coal Technologies for Industrial, Commercial, and Domestic Applications

CCTs can be used for more than power generation. Each year throughout the world, over 2.2 billion tons of coal are used for industrial, commercial and domestic applications. Coal is used for a variety of manufacturing processes including steel and cement production, and can be a valuable raw material for products such as perfume, dyes, insecticides, and medicines. Clean coal technologies can improve both the thermal efficiency and the environmental performance of these diverse applications. For example, in many industrial applications, energy costs are a significant portion of total operating costs. The efficiency improvements offered by clean coal technologies can help to decrease energy costs for the industrial application, a definite economic advantage.

Coal-fired boilers are often used to sequentially generate steam for both electricity and heat for industrial or domestic use. This application is known as "cogeneration." In a coal-fired cogeneration system, steam is generated in a coal-fired boiler then expanded through a turbine which powers an electric generator. The remaining heat energy in the

steam exhausted from the turbine is recovered and used in nearby industrial plants or district heating systems. In many cases, this dual use of steam increases the thermal efficiency of a cogeneration plant to above 60 percent. In district heating applications in Central Europe, for example, coal-fired cogeneration plants are usually located in highly populated areas. The operation of these plants without pollution control equipment can severely impact the health of the surrounding community. Clean coal technologies are well-suited to enhance the environmental performance of coal-fired cogeneration plants.

In many countries, coal also provides direct heat for homes and buildings. A number of countries also burn coal for cooking purposes. The environmental consequences of uncontrolled coal use can be substantial. Most smaller coal furnaces and stoves do not have pollution control capabilities and the cumulative effect of many domestic heaters is the emission of large amounts of particulate matter as well as sulfur and nitrogen oxides. Coal preparation technologies combined with briquetting can significantly reduce the pollution that results from this type of coal use.



The Wabash River Coal Gasification Repowering Project demonstrates the added capacity and improved operating efficiency available from IGCC repowering efforts.

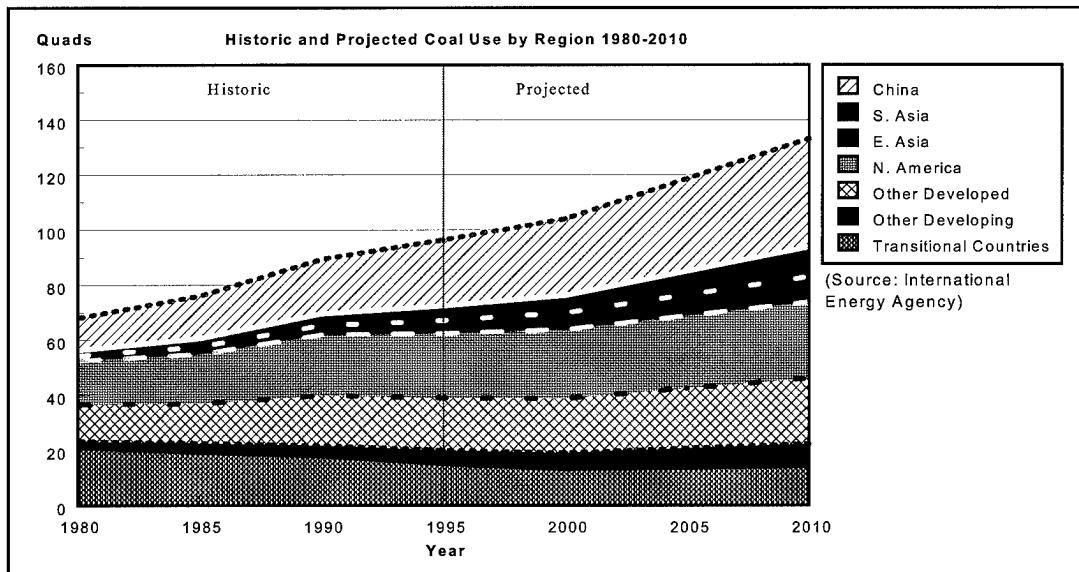
SMALL BUSINESS OPPORTUNITIES

Clean coal technologies are typically built as part of a large construction project — power plant, factory or even a new community. Small businesses can participate in numerous aspects of these projects from planning through construction and operation.

Market Size

The potential market for clean coal technologies is huge. In electric power alone, a recent U.S. Department of Energy study estimated that \$734 billion will be spent on coal-fired power generation worldwide between 1995 and 2010. Much of the growth will be concentrated in developing and transitional countries. A large market for CCTs also exists in other sectors. Several regions are ranked as the world's most promising CCT import markets: China; South Asia (primarily India and Pakistan); East Asia (excluding China); and the Transitional Countries (Central Europe and the Newly Independent States of the former Soviet Union).

China is the world's largest coal consumer, and forecasts indicate that China will increase its consumption of coal by more than a billion short tons by 2010 — nearly doubling the current level of domestic consumption. This increase in coal consumption will be accompanied by an increase in demand for technologies for burning coal cost-effectively, efficiently and cleanly. In South and East Asia, rapid economic growth coupled with substantial indigenous coal supplies combine to create a large potential market for CCTs. In Central Europe and the Newly Independent States, the challenge will be to mitigate the damage of decades of environmental neglect without adding to already-considerable economic disruption. Though the situation varies, all these countries share the basic need to use coal cleanly and efficiently. Moreover, the market is not limited to just these countries; coal is used throughout the world.



Most of the countries in high-potential CCT markets are highly dependent on coal as an energy source, and coal is widely used for many purposes — not just power generation. Power generation, consisting of new plant construction, retrofits to existing plants, follow on support for replacement repairs, and other upgrades, however, is often a major component of the mix. Clean coal technologies and related products and services could bring substantial improvements in efficiency and environmental performance for these countries.

Benefits to Users

Clean coal technologies create global benefits as well as benefits to the customer and host country. One key benefit is efficient, cost-effective, coal-fired power generation that may meet even the strictest environmental standards. For example, reductions in sulfur oxide and nitrogen oxide emissions enable power plant operators and owners to avoid the strict pollution penalties that many governments are beginning to enforce. CCTs also use less water, produce lower quantities of waste products, and create more reusable by-products.

Using clean coal for power generation can keep fuel costs low. Technologies such as fluidized bed combustion (FBC) and integrated gasification combined cycle (IGCC), allow plants to operate at high efficiencies, extracting 45 to 50 percent of the available energy from coal. In contrast, conventional plants extract roughly 33 percent of the available energy from coal. The combination of low resource costs, increased efficiency, and environmentally safe operations allows owners and operators to watch their bottom line while providing clean energy to their users.

As a relatively new technology, CCTs may have higher capital costs than plants with no controls. This higher capital cost is often offset, however, by lower fuel costs where they increase efficiency or allow a less-expensive coal to be used. In addition, as the technologies mature, the incremental capital costs are expected to decline.

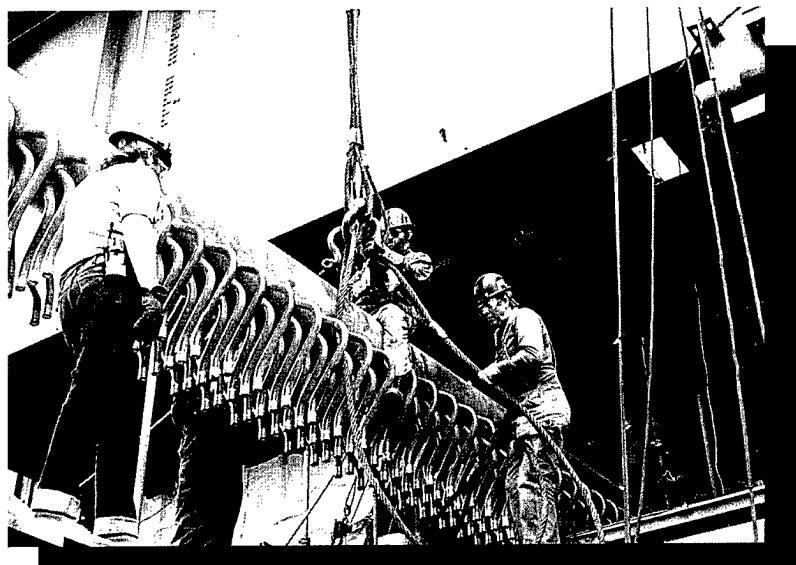
Aside from the environmental and efficiency advantages, nearly all CCT projects utilize local labor and supplies, thus boosting the local economy. CCTs help make electrification economically feasible in countries with developing economies. Electrification offers economic and job growth, an increase in industrial efficiency and domestic output, and an improved quality of life.

CCTs can also facilitate the use of local coal resources enabling continued self-reliance on domestic energy resources. These benefits have created substantial interest in CCTs in countries with rapidly-developing economies and domestic coal resources. These countries now provide the largest potential market for CCT and related product exports.

Market Participants

As the world's economies continue to grow, the market for CCTs will expand, providing opportunities for American businesses, large and small. Several types of companies play roles in CCT projects:

- **Project developers** invest in projects, manage the project as a business, and may also operate it. The independent power project concept, which began in the United States, has now spread worldwide.



Workers retrofitting a post-combustion clean coal technology at an existing power plant.

- **Architect, engineering, and construction firms** design and build projects, generally performing much of their services in the host country.
- **Equipment vendors** export high-value pieces of equipment which are often custom designed for the specific job.
- **Component vendors** supply relatively small parts, which are often standardized.
- **Service providers** offer a host of services during planning, construction, and operation.

Smaller companies can forge partnerships with such businesses to participate in international CCT projects. Benefits to the U.S. small business exporter include:

- Increased sales volume,
- Lower exporting costs,
- Efficient utilization of capital, and
- Improved return on investment.

American businesses have a strong market position in the international CCT industry. Spurred on by the Clean Coal Technology Demonstration Program beginning in 1986, American companies developed and commercialized some of the most innovative and cost-effective power generation systems, pollution control devices, industrial process applications, and coal preparation systems in the world. With clean coal technologies already demonstrated domestically, many of these companies are now marketing their products to foreign customers.

Small U.S. companies have an opportunity to do business in foreign markets, increasing their competitive edge. Advantages of many small American companies include state-of-the-art technology capability, solid management, a strong financial position, and a proven track record in both utility and industrial applications. For small businesses, opportunities to take part in international projects will come from customers in the United States who are involved in international project development.

Growth in international trade — coupled with active involvement in technology development — has put U.S. businesses in a good position to take advantage of increasing international demand for clean energy

use. With trade barriers falling around the world and a global trend towards privatization of major industries (especially power generation), it is easier than ever to enter foreign markets. Economic liberalization — most notably in developing countries — has opened the door for U.S. firms to sell their products and services to new markets. For example, in 1995 U.S. export growth was over 11 percent. Small businesses — which account for 97 percent of companies involved in direct exports but only 30 percent of total sales — have the largest potential for growth.

U.S. companies and others are increasingly involved in power projects abroad. Such interactions benefit U.S. companies as they develop positive international business relationships. Growing international trade has also made it easier for foreign companies to purchase products or subcontract work to smaller U.S.-based firms.

Project Development Cycle Defines the Opportunities

Most international clean coal technology projects are time-, labor-, and resource-intensive, often requiring the coordination of a wide variety of participants and taking several years to complete. These projects have three basic stages: (1) pre-construction, (2) construction, and (3) operation. Small businesses have opportunities in each of these stages.

Pre-Construction Planning. Before any significant investment is made in a major energy project, a series of studies — market, prefeasibility, feasibility, and design — are typically performed in order to identify and assess potential projects. These studies evaluate a project's technical, operational, and financial structure by addressing the market, technical, economic, and siting issues in the context of the specific application. Such studies may be performed on behalf of either the owner or operator of a potential site or potential investors. Participation in these studies is often the best method for companies to become involved early in a project and to demonstrate their interest to the potential customer. The earlier a company becomes actively involved in a project overseas, the greater the chance that its products or services will be chosen for the project.

The Table below lists several niche service areas where small businesses might get involved during the pre-construction planning stage.

Following the preliminary studies, if a potential customer decides to embark on the proposed project, a bidding and negotiation process is typically undertaken with potential major vendors. This process varies widely depending on the owner of the project; some potential customers use open bidding and others conduct this process in a more closed manner. Governments or private owners who are not subject to open bidding regulations may have less formal methods to select potential bidders. Often, those firms selected submit initial cost estimates and bidding negotiations are undertaken until a contract is awarded.

After a firm has been selected, similar negotiations take place for various subcontractors or suppliers; the first of which is finding a firm to develop the project plans.

While most bidders may be large companies, they often require project assistance — technical, financial, legal, or environmental. To meet this need, specialty firms — like those that take part in the pre-construction planning — are often subcontracted in

the design stages of the contract. Small businesses with relevant expertise may benefit from making project participants aware of their services. While most companies have many providers with whom they have worked on past projects, they are always looking for innovative firms who can supply better or less expensive products and services for their projects.

Construction. The construction stage of a clean coal technology project involves the building of the facility. The location of the plant, contract specifications, and participants dictate how the phase proceeds.

The construction phase typically involves the following types of companies:

- Construction management,
- Mechanical contractors,
- Electrical contractors,
- Procurement services,
- Field erection,
- Startup and testing, and
- Construction materials.

Niche Areas for Pre-Construction Planning	
Business Development	Export assistance, feasibility studies, market research, project development, public relations, resource evaluation, site selection, tender documents, training
Engineering/Construction	Architecture/design, civil and general engineering, contracting, procurement, rehabilitation
Financial Services	Accounting, appraisal, due diligence, economic analysis, financial advisory services, financial restructuring, insurance, investment banking
Software	Acoustic analysis, air quality analysis, CAD, charting/graphing, cost estimating, data management, electrical system analysis, energy consumption analysis, engineering design, fuel cost accounting, generator sizing, graphics/drawing, heat exchanger design, heat transfer analysis, job cost accounting, life cycle cost analysis, load calculation, network design/modeling, power flow analysis, pump performance and selection, security, statistical analysis, system design, thermal analysis, utility monitoring
Technical Support and Services	Atmospheric modeling, computer services, consulting services, environmental services, expert systems, facility operation/maintenance, fuels testing, geotechnical services, hydraulic modeling, inspection, site surveys, permitting, land survey, management consulting, plant testing, training

Opportunities for small American businesses vary from project to project. In many cases American companies cannot provide the inexpensive labor or resources that are available from competitors inside the host country who have access to resources in that country. Potentially significant roles for small American businesses, however, exist in many specialities. For example, providing high-value parts of larger components (see Text Box on page 18) is often an effective way for small businesses to play a role in these projects.

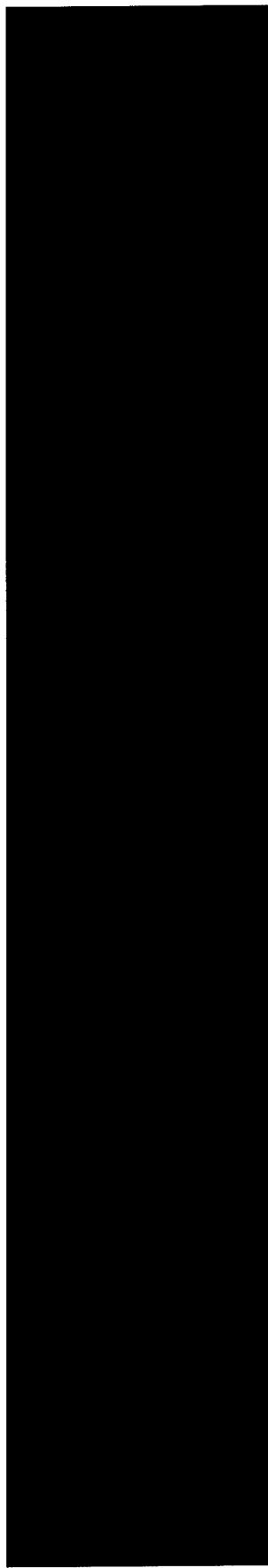
In some cases, a company can use its existing domestic facilities to build pre-fabricated components for the power plant before shipping them to the site. This is particularly effective for small businesses who lack the revenue needed to open new facilities abroad.

Operation. Small American businesses also have opportunities in the operation of clean coal technology projects. Examples of operational services include: training, plant operation and maintenance, fuels supply and services, and plant testing. Many of these services can typically be provided by small businesses. In addition, operating facilities have ongoing needs for replacement parts and components. Plants are also continually being upgraded and improved. Many of the products and services needed for these replacements or upgrades are specialized and high-value and very appropriate opportunity targets for small businesses.

Operating facilities are a different market than new facilities since the facilities already exist. It therefore requires dealing with a different group of prospective customers (i.e., facility operators) and partners. Such services can also be offered on an ongoing or repetitive basis, which opens the possibility of long-term customer (or partnering) relationships. Such relationships take time, effort and a great deal of commitment to cultivate. The table below also lists several niche service areas where small businesses might get involved during both the construction and operation stages.

Niche Areas for Construction and Operation

Equipment	Balance of plant, boilers, burners, combustion engines, condensers, controls and instrumentation, cooling systems, emission control systems, fuel handling systems, gasifiers, generators, monitoring/measuring equipment, motor systems, pulverizers, scrubbers, stokers, switchgear, testing equipment, turbines, water treatment systems
Monitoring	Access control, communications systems, control network systems, failure analysis, flow measurement, maintenance, plant testing, surveillance systems, thermal performance
Specialized Products and Services	Accident investigation, cooling tower services, computer equipment, construction management, emergency control services, engineering support, erosion control, hazardous waste treatment systems and containment, operational management, procurement, project operation management, public relations, quality assurance, waste disposal, water treatment



SEIZING THE OPPORTUNITIES

While foreign markets may represent uncharted waters for many small businesses, the opportunities that they offer are often well worth the effort. In terms of potential growth, profits, extended product life cycles, and opportunities to improve competitiveness, the international marketplace is unparalleled.

Small businesses seeking to enter the export market should generally have three fundamental characteristics. First, the company should have a successful domestic operation to demonstrate its capabilities. Second, the company must be willing to commit time, people and capital to exporting — for the long-term. Finally, the company must be able to deal with possible differences between domestic and foreign markets that could complicate its operations.

Developing An Export Business Plan

Small businesses can begin to learn about exporting their product through inexpensive market research. A wealth of information is available from the U.S. Government, private sources in the U.S. and other countries and foreign governments. Sources of U.S. Government information are summarized on page 21, and in Appendix B. Periodicals also often contain vital information for small businesses looking to export. The Internet is another wealth of information both on exporting and on key markets. Export assistance centers located throughout the U.S. — as well as a variety of trade associations — can help small businesses with many of these initial evaluations (see Appendices D and E).

Using publicly-available information, small businesses can identify international projects, gain contact information for other firms — foreign or domestic — that may already be involved in the projects, and assess the competition.

Small businesses which meet these initial criteria should develop a clear, concise, and achievable export business plan. This business plan should address — at a minimum — the following factors as they apply to each foreign market:

- Potential for the product or service
 - Customer needs
 - Size of the market
 - Potential for growth
- Competition
 - Identity of competitors
 - Strengths and weaknesses

- Method of market entry and access
 - Individually
 - Through representation
 - As part of a team
- Key market considerations
 - Market drivers
 - Differences from domestic market
 - Country risks
- Unique advantages offered
 - High-value or proprietary technology
 - Special services
- Costs and risks
 - Compared to resources
 - Compared to alternative strategies.

It is particularly important to realistically assess what a small business has to offer in a foreign market compared to the competitors who are already there. Those small companies that are best positioned to enter the international marketplace are those with a specific advantage such as a high-value or proprietary product or a unique service.

Teaming partnerships can often provide a means of leveraging the limited resources of a small business entering the export market. Through teaming with complementary firms or with firms of the host country, a strategic partnership allows a small business to expand its resources and expertise without greatly increasing its expenditures. Firms already developing projects in a country, for example, can assist U.S. small businesses by providing additional contacts and local market intelligence that would otherwise be out of reach.

Competitors and Allies

The global market for CCTs is highly competitive. Numerous multinational corporations (both American and foreign) and local firms vie for its business. In many cases, individual companies may already have strong market positions in a prospective market. Before entering a market it is necessary to understand the competition.

For first-time exporters in particular, it is important to know which companies — if any — have already established a presence in the prospective market. Such information is helpful in determining whether to enter the market. It can also provide a model for how to conduct business overseas, assist with pricing strategies and provide potential contacts for partnering opportunities. In short, the experiences of competitors can provide guidance and invaluable lessons for a “new-to-exporting” small business.

Multinational Companies. Due to the large scale of most power projects, the majority of power project participants are large multinational companies with previous project experience and vast resources. They generally have the experience and financial resources needed to gain and sustain entry into foreign markets.

It is often difficult for U.S. firms — especially small businesses — to match the low prices offered by foreign competitors that receive significant government assistance. One challenge that small U.S. businesses face in foreign markets is the limited government financial assistance available to them compared to foreign companies. For example, in 1994 U.S. businesses received less than one-tenth of the governmental export assistance that Japanese businesses received; less than one-third of French competitors; and less than three-fourth's of German competitors.

Local Companies. Many of the materials, supplies and services used in large international construction projects typically come from local vendors. Such

MARKET RESEARCH ON THE INTERNET A STARTING POINT

The Fossil Energy International website which is part of the U.S. Department of Energy's Office of Coal and Power Import and Export is a good starting point for providing information on global clean coal technology markets:

<http://www.fe.doe.gov/int>

Similarly, DOE's Office of Fossil Energy's website provides both more information on CCTs and links to related sites:

<http://www.fe.doe.gov>

vendors are often the most cost-effective source and may be strong competition. Governments in the countries hosting these projects often operate the electric utility and must balance economic concerns with the desire to increase power production.

Viewing these projects as prime economic development opportunities, many governments require a certain share of local participation in domestic power projects. Not only does such a requirement serve to boost employment in the host country, but because of the cutting-edge nature of many of these projects, a high degree of technology transfer can result.

Local companies may also be less expensive than their foreign counterparts (including U.S.) due to lower labor, transportation, and equipment costs. As a result, local products and services tend to be more attractive to developers than similar products and services offered by American businesses. While no alternative is often available to the higher-tech equipment and technical services offered by non-local firms, other aspects of these projects are typically outsourced to local companies both to meet host country requirements and to lower overall project costs.

Forming Strategic Partnerships

A strategic partnership — business teaming between two entities sharing common identified goals and economic interests — is one way to overcome the obstacles that typically face small businesses. Such obstacles often include insufficient capital and a lack of export marketing and distribution experience and

INTELLECTUAL PROPERTY RIGHTS

One concern of businesses with advanced technologies is the potential loss of a proprietary technology to foreign competitors. Patent laws are designed to prevent intellectual property theft, but these laws and enforcement in other countries is not always as strong as in the United States. Companies with proprietary technologies need to carefully consider this issue and consult experts in intellectual property for the countries in which they are considering doing business.

contacts. Successful partnerships can be forged with foreign or domestic firms, small businesses or large corporations, other organizations or even government agencies. Strategic partnerships can help achieve the following objectives for each party:

- Leverage limited resources,
- Manage risks,
- Accelerate market entry,
- Improve credibility,
- Gain access to a technology or resources,
- Avoid regulatory constraints, and
- Gain market presence or knowledge.

Strategic partnerships allow two or more organizations with different but complementary capabilities to benefit from the other's strengths. The fundamental rule for business partnerships is that both sides must be better off working together than they would be working alone. Keeping in mind that half of all business partnerships do not succeed, it is imperative that both the pros and cons of the partnership are thoroughly examined prior to making a binding agreement.

In addition, business relationships are not static; they can change dramatically over time. As such, when involved in a partnership, a business must continuously ask itself:

- What is the other party contributing that we cannot provide?
- What do we contribute that the other party cannot achieve alone?
- What is each contribution worth?

Each partner should be prepared to modify or terminate the teaming arrangement when it is no longer useful.

Types of Partnerships. Teaming arrangements between small business and large companies may range as widely as the degree of cooperative activities (see Figure on page 16). The least formal relationship, *ad hoc*, one-time arrangement, allows a small business to provide a discrete product or service to the large firm. This may be repeated until the team works together multiple times. Joint ventures, and mergers and acquisitions are the most

FINDING POTENTIAL PARTNERS

The U.S. Department of Energy's Office of Coal and Power Import and Export provides a searchable Internet World Wide Web database with profiles of American companies which offer for export products or services relating to coal and its utilization.

The database offers a source of information about what U.S. companies offer to the international marketplace in the areas of coal and coal technologies. American companies are invited to submit their own information on line to this database. In addition, Appendix A lists the projects, participants and team members for DOE's Clean Coal Technology Demonstration Program. Many of these companies are listed on the World Wide Web database or have their own websites.

The database can be accessed on the World Wide Web at:

<http://www.fe.doe.gov/int/ccd>

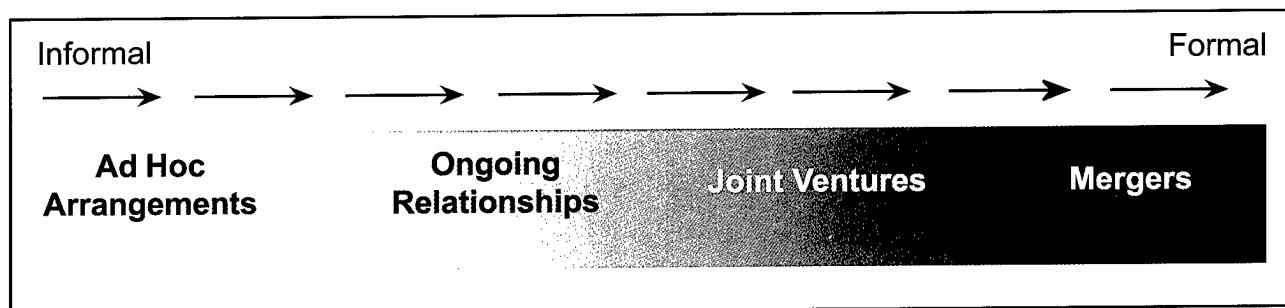
formal arrangements. In between, a range of ongoing cooperative relationships may be considered including licensing and distributor arrangements.

Whatever the arrangement, each team member must provide something of real value to all other members. They must recognize that sharing costs, risks, and returns is of the essence in such an arrangement. The allocation of these considerations defines the relationship.

For the most part, the types of partnering arrangements being addressed here consist of teaming arrangements for bidding on and conducting projects in foreign markets. In such cases, smaller businesses are typically suppliers or subcontractors to larger multinational companies or local companies in the foreign market. The idea is for the small business to become recognized as a preferred or regular supplier of goods and services. This requires that the small business understand and serve the needs of the prospective partner(s) in the target foreign markets. The small business provides a responsive, high-value, and cost-effective product or service to the larger or local company. In return, the partner provides market access through its relationship. Typically, this requires demonstration on the part of the small business that it can perform well in foreign markets and not just in the United States. This may be a challenge for "new-to-export" companies. Some foreign presence may be necessary, but this may be arranged for and leveraged by relationships (for example licensing or distributorships) with foreign companies. The key is to incorporate these relationships into the overall export business strategy.

How to Partner. The first step is to clearly define the goals of each potential partner. A detailed joint investigation should result in an achievable vision that highlights the common or complementary elements in corporate objectives and strategies, product and market analyses, and the personal ambitions and agendas of the company's principals. Such an analysis will help decide if a partnership is truly desirable, and will help create a clear and unified vision when negotiations begin.

Types of Partnering Relationships



A firm commitment to entering specific markets — and the reasons for doing so — must be discussed and agreed upon by all involved. It is also important to market a product or service that is successful domestically; it is extremely difficult to market or find partners to sell a product or service in this market without a demonstrable track record. In some cases, it may also be necessary to modify a product to better meet the needs of a particular foreign market.

Partners must trust each other, share confidential information and be committed to making the business venture work.

Choosing a Partner. Partnering is an investment in the future. As such — as with any other potential business investment — the prospective partners' advantages and disadvantages must be thoroughly examined. The common denominator of all partnerships is the belief that the partner can provide something that could not otherwise be provided as economically by one party alone. Strategic partners must be able to bring new value to the marketplace by combining their capabilities. Good organizational qualities in a potential partner include:

- Well organized,
- A long-term perspective,
- Common goals and vision,
- Willingness to share, and
- Flexibility and openness to compromise.

Equally important to a successful partnership is a high degree of mutual trust on both sides. Both partners must be comfortable with disclosing sensitive information to the other; withholding information relevant to the partnership will not only cause animosity, but can derail business operations. These characteristics suggest that experience with a potential ally can be quite useful when selecting partners. Prior experience lets each party build on already established respect and trust. It also makes critical joint planning easier.

In addition to these general characteristics, characteristics specific to the market opportunities must be also sought. These may include:

- An ongoing need for the small business's product and services,

- Complementary (and not competing) capabilities, and
- Access to the markets of interest.

Multinational Companies. Partnerships with large multinational companies can provide small businesses with vast resources that may otherwise be unattainable. Not only do the large companies have the financial backing to find and exploit major opportunities, they also have a high degree of export expertise as well as cultural understanding in a variety of overseas markets. Furthermore, larger companies often have well-developed marketing teams and distribution channels — not to mention name recognition — that can facilitate rapid market entry for new, otherwise unknown, products and services of small U.S. businesses.

Large companies that often undertake strategic teaming partnerships include architect, engineering and construction firms, project developers, equipment vendors and independent power producers. Since power projects often revolve around one major participant, it is in the best interest of small businesses to team with a partner already active in the project.

One reason a large company enters into such a business relationship is to link itself with a new, cutting-edge technology or service. Whether through a licensing arrangement or equity investment, a large company can capitalize on an innovation that a small business has to offer. In addition, many large multinational companies are involved in a variety of other — possibly similar — projects. Their far-reaching business can present future opportunities for the small business if the initial partnership goes well.

Local Companies. A strategic partnership with a local firm is often a necessity, even for a large multinational company. Such a partnership can provide contacts, market information, customer access and distribution channels that would be difficult to obtain otherwise.

From market knowledge to local access, there is often no substitute for local presence when attempting to enter an overseas CCT market. Also, with a partner in the host country, many of the difficulties that may arise regarding perceptions of foreign intrusion can be avoided. This type of

MARKET OPPORTUNITIES FOR SMALL BUSINESSES CASE STUDY

The immense market opportunities created by China's booming economy have trickled down to U.S. small businesses. Spectrum Fabrication, a 30-employee steel fabrication shop in Columbia, South Carolina, for example, is assembling equipment for a massive coal-fuel power plant in Dandong, China — an industrial center in the country's northeastern Liaoning province. The equipment is part of a stacker reclaimer, which transports coal from the stockyard to the power plant.

The companies working with Spectrum on the project include some major players in engineering and power plant construction. A partnership involving Westinghouse Electric, one of the world's largest power plant builders, is erecting the plant. Huaneng International Power Development Corp., one of China's largest power providers, will operate the 2,500 MW facility, which is scheduled for completion in 1998.

Spectrum's \$360,000 contract was brokered by an enterprising salesman in Chicago. He cold-called the Roberts and Schaefer Company, a large engineering firm that is part of the project. The Company needed a fabricator close to the Port of Charleston; although a change in plans switched the shipping point from Charleston to Houston, the Company decided to stick with Spectrum. The port was only one factor in determining the final decision; Spectrum also submitted a competitive bid, and their work was of high quality.

partnership can enable U.S. companies to join in projects with participation requirements or strict importing laws. Finally, a host country partner can significantly reduce labor and transportation costs for the small U.S. business, making the venture even more profitable.

Export Financing

The financing of exports differs from financing domestic operations in that several new factors must be taken into account:

- Currency convertibility,
- Import/export regulations and tariffs,
- Country-specific risks, and
- Differing legal systems and jurisdictions.

Beyond these factors, normal business considerations still apply. A wide variety of mechanisms and institutions have been developed to support extensive international trade of an astoundingly diverse array of products and services. Potential exporters need to become familiar with the various private and government export tools and institutions that can be of assistance.

Private institutions that facilitate export finance include commercial banks, private export finance companies, export trading and management companies, factoring houses, and forfeiting houses. In addition, the U.S. Government offers extensive assistance in the export finance area, as is described later. This assistance, for the most part, is targeted at filling gaps in trade finance that the private sector is not able to address (e.g., political risk insurance).

A commercial bank is usually a good place to start in looking for export finance. Typically, the larger commercial banks are more familiar with exporting. Although banks take a variety of factors into account when deciding whether to provide capital, all lenders look for certain characteristics. These characteristics include a request for a reasonable amount of credit, a sensible and achievable loan purpose, and confidence in the applicant's ability to perform. To this they often add various export-related factors such as those already described.

While banks can provide financial assistance for small business exporters, the difficulty in obtaining the necessary financing may be quite challenging. Only 75 of the more than 9,000 banks in the United States do a substantial amount of export financing,

making this avenue extremely competitive for all loan applicants. Moreover, small businesses often fall into a “lending gap” between small and large banks. Although small banks handle an increasing portion of small business financing, they often lack international expertise, especially concerning foreign trade. On the other hand, larger banks — which have various levels of foreign trade expertise — tend to deal only with larger transactions. Also, many of the fees a small business may be charged by a large bank could potentially be greater than the size of the desired loan, thus eliminating the utility of the loan.



U.S. GOVERNMENT ASSISTANCE

United States Government agencies have numerous programs available to assist small American businesses in export markets. This assistance may be broadly classified as either *export finance* or *export assistance*. Export finance activities provide funding or other financial services to exporters, typically as a supplement to private financing of exports. Export assistance involves a wide range of other activities. The table on page 22 illustrates the types of export finance and assistance available. Several Federal agencies provide each type of assistance.

Export Finance

The following list briefly describes the financing activities of key federal agencies providing export finance assistance to small businesses. Appendix B provides additional details and contact information.

U.S. Agency for International Development (USAID). The U.S. Agency for International Development is the principal agency implementing the U.S. Foreign Economic Assistance Program in nearly one hundred countries throughout the developing world through the commitment of loans or grants for projects in eligible USAID-recipient countries.

Export-Import Bank (Ex-Im). The Export-Import Bank is an independent U.S. Government agency that helps finance the sales of U.S. products and services overseas. Ex-Im assumes the risks that the private sector is unwilling or unable to accept. Ex-Im offers four broad support programs to U.S. exporters: guarantees for short-term working capital loans, export credit insurance, and medium- and long-term loans and guarantees. Two top priorities of the Bank include support for environmental goods and services and for small businesses. In 1995, 78 percent of Ex-Im transactions involved small businesses. Ex-Im has a specific program for limited recourse project finance.

Overseas Private Investment Corporation (OPIC). The Overseas Private Investment Corporation provides project finance assistance to overseas ventures with significant U.S. participation. OPIC direct loans typically range in size from \$500,000 to \$6 million, while OPIC loan guarantees range from \$2 to \$50 million. OPIC also provides investment insurance that protects U.S. investors, contractors, exporters, and financial institutions against currency inconvertibility, expropriation, and political violence.

Small Business Administration (SBA). The Small Business Administration provides a limited amount of financial support to small U.S. exporters. SBA financial assistance may only be used for facilities and equipment or as working capital. SBA offers assistance through three programs: the Regular Business Loan Program, the Export Revolving Line of Credit Program, and the International Trade Loan Program.

Export Assistance

Several Federal agencies can assist small business exports through a range of activities in the following areas:

- Collection and dissemination of market information in foreign countries.
- Door-opening programs to bring various CCTs and related products and services to the attention of foreign customers.
- Encouraging the formation of project teams by combining together several U.S. firms in order to gain further acceptance in the global marketplace.
- Cost sharing for feasibility studies and demonstration projects.
- Financial support to overcome fiscal constraints, ensure financial viability of the projects and eliminate financial risks.

The following list briefly describes Federal export assistance activities available to small businesses.

Appendix B provides additional details and contact information for each organization.

U.S. Agency for International Development (USAID). The U.S. Agency for International Development established the Center for Trade and International Investment Services (CTIS) to foster commercial linkages between the private sectors in USAID-assisted countries and the U.S. business community to stimulate private enterprise, technology transfer, and sustainable economic growth. CTIS acts as a central point of contact for U.S. and developing country entrepreneurs for information and counseling regarding USAID programs, policies and projects; procurement and contacting opportunities; and business information and opportunities generated by USAID's development activities. USAID also assists in market development, partner identification, transaction assistance, and financial support and assistance.

U.S. Department of Energy (DOE). The Office of Coal and Power Import and Export acts as a facilitator for other governments and U.S. industry by supporting information exchange and dissemination, trade and reverse trade missions, technology

Agency/Organization	Types of Assistance						
	Export Finance			Export Assistance			
	Loans	Loan Guarantee	Insurance	Trade Missions	Export Information	Technology Demonstration	Feasibility Studies
Agency for Int'l. Development					X	X	X
Department of Energy				X	X	X	
Export-Import Bank	X	X	X				
International Trade Administration				X	X		
Overseas Private Investment Corp.	X	X	X	X	X		
Small Business Administration	X	X		X	X		
Trade and Development Agency					X		X

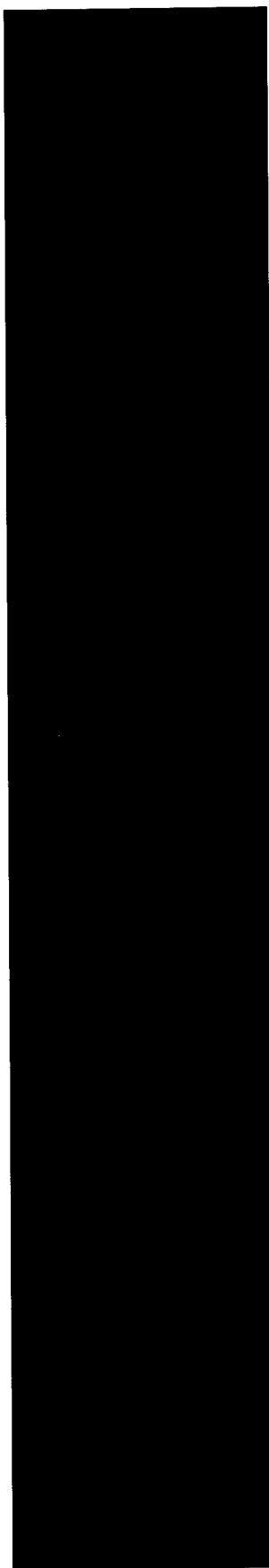
cooperation and expertise, joint forums, and international agreements. The office specifically focuses on CCTs. In addition, DOE helps to identify business opportunities, eliminate discriminatory trade barriers, locate possible financing alternatives, and assists in coordination with other U.S. Government agencies.

International Trade Administration (ITA). The International Trade Administration offers assistance and information to help U.S. exporters. The ITA, as a part of the U.S. Department of Commerce, assists in gathering information about trends and barriers to trade and provides a range of services to potential exporters traveling abroad, such as assisting with appointments with key buyers and government officials. ITA also develops marketing packages for individual companies, individually tailored to a firm's specific products and services.

Overseas Private Investment Corporation (OPIC). The Overseas Private Investment Corporation provides access to general export information and trade missions.

Small Business Administration (SBA). The Small Business Administration provides general export assistance, primarily export information, to U.S. small businesses. A listing of Small Business Administration district offices throughout the U.S. is located in Appendix C.

Trade and Development Agency (TDA). The Trade and Development Agency has industry specialists that work to identify trade opportunities and obstacles by product or service, industry sector and market. Primary activities of the TDA include funding feasibility studies, trade missions, conferences and technical symposia, orientation visits, trade-related training, technical assistance cooperation, and designing engineering and financial packaging.



CLEAN COAL TECHNOLOGY INFORMATION REQUEST

— FAXBACK FORM —

Name: _____

Title: _____

Organization: _____

Address: _____

Country: _____

Phone: _____ Fax: _____ e-mail: _____

Please send me information on (check all that apply):

Type of Technology	Type of Application	Small Business Assistance
<input type="checkbox"/> Pre-combustion	<input type="checkbox"/> New Power Plant	<input type="checkbox"/> Federal Export Programs
<input type="checkbox"/> Combustion	<input type="checkbox"/> Retrofit	<input type="checkbox"/> Export Financing
<input type="checkbox"/> Post-combustion	<input type="checkbox"/> Repowering	<input type="checkbox"/> Other (please specify):
<input type="checkbox"/> Conversion	<input type="checkbox"/> Industrial Application	
<input type="checkbox"/> Other (please specify):	<input type="checkbox"/> Other (please specify):	

Comments: _____

Fax to:

Attention: Barbara McKee
U.S. Department of Energy
Office of Coal & Power Import and Export
Office of Fossil Energy
1000 Independence Avenue
Washington, DC 20585 • USA

FAX NUMBER: 1-301-903-1591

APPENDIX A

PARTICIPANTS IN THE U.S. DOE CLEAN COAL DEMONSTRATION PROGRAM

Project	Participants / Team Members
ADVANCED ELECTRIC POWER GENERATION	
Fluidized-Bed Combustion	
PCFB Demonstration Project	DMEC-1 Limited Partnership - Ahlstrom Pyropower - MidAmerican Energy - Dairyland Power - Pyropower Corporation - Black and Veatch
Four Rivers Energy Modernization Project	Four Rivers Energy Partners, L.P. - Four Rivers Energy Partners - Air Products and Chemicals - Foster Wheeler Corporation - Westinghouse Electric Corporation - LLB Lurgi Lentjes Babcock Energietechnik GmbH
Tidd PFBC Demonstration Project	The Ohio Power Company - American Electric Power Service Corp. - The Babcock & Wilcox Company - Ohio Coal Development Office
ACFB Demonstration Project	Pennsylvania Electric Company - Foster Wheeler Energy Corporation
Nucla CFB Demonstration Project	Tri-State Generation and Transmission Assoc., Inc. - Pyropower Corporation - Technical Advisory Group - Electric Power Research Institute

Project	Participants / Team Members
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Integrated Gasification Combined Cycle	
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Clean Energy Demonstration Project	
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Piñon Pine IGCC Power Project	
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Tampa Electric IGCC Project	
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Wabash River Coal Gasification Repowering Project	
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Advanced Combustion/Heat Engines	
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Healy Clean Coal Project	
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Coal Diesel Project	
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Externally Fired Combined-Cycle Demonstration Project	
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Clean Energy Partners Limited Partnership	
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<ul style="list-style-type: none"> - Clean Energy Genco, Inc. - Makowski Clean Energy Investors, Inc. - British Gas Americas, Inc. - Duke Engineering & Services, Inc. - General Electric Company - Fuel Cell Engineering Corporation - Electric Power Research Institute - National Rural Electric Cooperative Assoc. - Deutsche Aerospace AG 	
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Sierra Pacific Power Company	
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<ul style="list-style-type: none"> - Foster Wheeler USA Corporation - The M.W. Kellogg Company 	
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Tampa Electric Company	
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<ul style="list-style-type: none"> - Texaco Development Corporation - General Electric Company - GE Environmental Systems, Inc. - TECO Power Services Corporation - Bechtel Power Corporation 	
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Destec Energy, Inc. and PSI Energy, Inc. (Jointly)	
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Alaska Industrial Development and Export Authority	
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<ul style="list-style-type: none"> - Golden Valley Electric Association - Stone and Webster Engineering Corp. - TRW, Inc. - Joy Technologies, Inc. 	
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Arthur D. Little, Inc.	
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<ul style="list-style-type: none"> - University of Alaska at Fairbanks - Cooper Energy Services - CQ Inc. - PSI - AMBAC International - Usibelli Coal Company 	
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Pennsylvania Electric Company	
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<ul style="list-style-type: none"> - Hague International - Black & Veatch 	
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Project	Participants / Team Members
ENVIRONMENTAL CONTROL DEVICES	
NO_x Control Technologies	
Demonstration of Coal Returning for Cyclone Boiler NO _x Control	<p>The Babcock & Wilcox Company</p> <ul style="list-style-type: none"> - Wisconsin Power & Light Company - Sargent and Lundy - Electric Power Research Institute - State of Illinois, Dept. Energy/Nat. Res. - 14 Utility Companies (cofunders)
Full-Scale Demonstration of Low-NO _x Cell Burner Retrofit	<p>The Babcock & Wilcox Company</p> <ul style="list-style-type: none"> - The Dayton Power & Light Company - Electric Power Research Institute - Ohio Coal Development Office - Tennessee Valley Authority - New England Power Company - Duke Power Company - Allegheny Power System - Centerior Energy Corporation
Evaluation of Gas Returning and Low-NO _x Burners on a Wall-Fired Boiler	<p>Energy and Environmental Research Corporation</p> <ul style="list-style-type: none"> - Public Service Company of Colorado - Gas Research Institute - Colorado Interstate Gas Company - Electric Power Research Institute
Micronized Coal Reburning Demonstration for NO _x Control	<p>New York State Electric & Gas Corporation</p> <ul style="list-style-type: none"> - Eastman Kodak Company - Consol - D.B. Riley - Fuller Company - Energy and Environmental Research Corp.
Demonstration of Advanced Combustion Techniques for a Wall-Fired Boiler	<p>Southern Company Services, Inc.</p> <ul style="list-style-type: none"> - Electric Power Research Institute - Foster Wheeler Energy Corporation - Georgia Power Company
Demonstration of Selective Catalytic Reduction Technology for the Control of NO _x Emissions from High-Sulfur-Coal-Fired Boilers	<p>Southern Company Services, Inc.</p> <ul style="list-style-type: none"> - Electric Power Research Institute - Ontario Hydro - Gulf Power Company
180-MWe Demonstration of Advanced Tangentially Fired Combustion Techniques for the Reduction of NO _x Emissions from Coal-Fired Boilers	<p>Southern Company Services, Inc.</p> <ul style="list-style-type: none"> - Gulf Power Company - Electric Power Research Institute - ABB Combustion Engineering, Inc.

Project	Participants / Team Members
SO₂ Control Technologies	
10-MWe Demonstration of Gas Suspension Absorption	AirPol, Inc.
- FLS miljo a/s	
- Tennessee Valley Authority	
Confined Zone Dispersion Flue Gas Desulfurization Demonstration	Bechtel Corporation
- Pennsylvania Electric Company - PA Energy Development Authority - New York State Electric & Gas Corp. - Rockwell Lime Company	
LIFAC Sorbent Injection Desulfurization Demonstration Project	LIFAC-North America
- Tampella Power Corporation - ICF Kaiser Engineers, Inc. - Tampella, Ltd. - Richmond Power & Light - Electric Power Research Institute - Black Beauty Coal Company - State of Indiana	
Advanced Flue Gas Desulfurization Demonstration Project	Pure Air on the Lake, L.P.
- Air Products and Chemicals, Inc. - Mitsubishi Heavy Industries America, Inc. - Northern Indiana Public Service Company - United Engineers and Constructors	
Demonstration of Innovative Applications of Technology for the CT-121 FGD Process	Southern Company Services, Inc.
- Georgia Power Company - Electric Power Research Institute - Radian Corporation - Ershigs, Inc. - Composite Construction and Equipment - Acentech - Ardaman - Univ. of Georgia Research Foundation	
Combined SO₂/NO_x Control Technologies	
SNOX™ Flue Gas Cleaning Demonstration Project	ABB Environmental Systems
- Ohio Coal Development Office - Ohio Edison Company - Haldor Topsoe a/s - Snamprogetti, U.S.A.	

Project	Participants / Team Members
LIMB Demonstration Project Extension and Coolside Demonstration	<p>The Babcock & Wilcox Company</p> <ul style="list-style-type: none"> - Ohio Coal Development Office - Consolidation Coal Company - Ohio Edison Company
SO _x -NO _x -Rox Box™ Flue Gas Cleanup Demonstration Project	<p>The Babcock & Wilcox Company</p> <ul style="list-style-type: none"> - Ohio Edison Company - Ohio Coal Development Office - Electric Power Research Institute - Norton Company - 3M Company - Owens Corning Fiberglass Corporation
Enhancing the Use of Coals by Gas Returning and Sorbent Injection	<p>Energy and Environmental Research Corporation</p> <ul style="list-style-type: none"> - Gas Research Institute - State of Illinois, Dept. of Energy/Nat. Res. - Illinois Power Company - City Water, Light and Power
Milliken Clean Coal Technology Demonstration Project	<p>New York State Electric & Gas Corporation</p> <ul style="list-style-type: none"> - NYSERDA - Empire State Elec. Energy Research Corp. - Consolidation Coal Company - Saarberg-Hölter-Umwelttechnik, GmbH - The Stebbins Eng. and Manufacturing Co. - Nalco Fuel Tech - ABB Air Preheater, Inc. - DHR Technologies, Inc.
Commercial Demonstration of the NOXSO SO ₂ /NO _x Removal Flue Gas Cleanup System	<p>NOXSO Corporation</p> <ul style="list-style-type: none"> - Alcoa Generating Company - Olin Corporation - State of Indiana - Warrick County - Southern Indiana Gas and Electric Co. - Gas Research Institute - Electric Power Research Institute - W.R. Grace and Company
Integrated Dry NO _x /SO ₂ Emissions Control System	<p>Public Service Company of Colorado</p> <ul style="list-style-type: none"> - Electric Power Research Institute - Stone and Webster Engineering Corp. - The Babcock & Wilcox Company - Fossil Energy Research Corporation - Western Research Institute - Colorado School of Mines - Noell, Inc.

Project	Participants / Team Members
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COAL PROCESSING FOR CLEAN FUELS

Coal Preparation Technologies

Development of the Coal Quality Expert

Self-Scrubbing Coal™: An Integrated Approach to Clean Air

Advanced Coal Conversion Process Demonstration

Mild Gasification

ENCOAL Mild Coal Gasification Project

Indirect Liquefaction

Commercial-Scale Demonstration of the Liquid-Phase Methanol (LPMEOH™) Process

ABB Combustion Engineering, Inc., and CQ Inc.

- Black and Veatch
- Electric Power Research Institute
- The Babcock & Wilcox Company
- Electric Power Technologies, Inc.
- Univ. of N.D., Energy/Env. Res. Center
- Alabama Power Company
- Mississippi Power Company
- New England Power Company
- Northern States Power Company
- Public Service Company of Oklahoma

Custom Coals International

- Pennsylvania Power & Light Company
- Richmond Power & Light
- Centerior Service Company

Rosebud SynCoal Partnership

ENCOAL Corporation

- SMC Mining Company
- TEK-KOL
- SGI International
- Triton Coal Company
- The M.W. Kellogg Company

Air Products Liquid Phase Conversion Co., L.P.

- Air Products and Chemicals, Inc.
- Eastman Chemical Company
- Acurex Environmental Corporation
- Electric Power Research Institute

Project	Participants / Team Members
INDUSTRIAL APPLICATIONS	
Blast Furnace Granulated-Coal Injection System Demonstration Project	<p>Bethlehem Steel Corporation</p> <ul style="list-style-type: none"> - British Steel Consult. Overseas Services - Simon-Macawber, Ltd. - Flour Daniel, Inc. - ATSI, Inc.
Advanced Cyclone Combustor with Internal Sulfur, Nitrogen, and Ash Control	<p>Coal Tech Corporation</p> <ul style="list-style-type: none"> - PA Energy Development Authority - Pennsylvania Power and Light Company - Tampella Power Corporation
Clean Power from Integrated Coal/Ore Reduction (COREX®)	<p>CIPICOR™ Management Company, L.L.C.</p> <ul style="list-style-type: none"> - Geneva Steel Company - Centerior Energy Corporation - Air Products and Chemicals, Inc. - Deutsche Voest-Alpine Industrieanlagenbau, GmbH
Cement Kiln Flue Gas Recovery Scrubber	<p>Passamaquoddy Tribe</p> <ul style="list-style-type: none"> - Dragon Products Company - HPD, Inc. and Cianbro Corporation

APPENDIX B

FEDERAL AGENCY EXPORT PROGRAMS AND CONTACT INFORMATION BY AGENCY

U.S. DEPARTMENT OF ENERGY

<http://www.fe.doe.gov/int>

Office of Coal and Power Import and Export
Phone: (301) 903-3820
Fax: (301) 903-1591

The Office works to advance the clean and efficient use of coal and electric power worldwide through technology cooperation, international partnerships, information exchange, and trade promotion.

Technology Cooperation. The Office is committed to the dissemination of coal and power technology and supports U.S. businesses by offering effective liaison and cost-sharing with industry; established relations with foreign governments; a strong technical knowledge base; relevant products; and cutting-edge technology demonstrations.

International Partnerships. The Office is organized into seven regional focus areas with specialists assigned to each area. Their goal is to assist nations to strive for: energy stability and diversification; market-driven energy solutions; sustainable development; restructuring and privatization; and expanded energy trade programs. The Office also sustains close relationships with a number of international organizations relating to coal and energy worldwide.

Information Exchange. The Office supports the distribution and exchange of information through country-specific studies of electric power systems; acting as a liaison between U.S. technology companies and potential international customers; sponsorship of international conferences and workshops covering policy, technology, and sustainable development; and the facilitation of

international management exchange programs to transfer hands-on know how.

Trade Promotion. The Office is committed to promoting international trade in coal and electric power generation systems. Specific activities include: technology and trade missions; information exchange and dissemination; and international agreements.

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

<http://www.info.usaid.gov>

Business Development Services
Phone: (202) 663-2680
Fax: (202) 663-2670

Supports industry-specific business development services in developing countries and emerging democracies. Also assists small businesses through joint- and co-ventures.

Center for Trade and Investment Services
Phone: (800) 872-4348
Fax: (202) 663-2660
e-mail: ctis@usaid.gov

Offers a clearinghouse/contact for U.S. and developing country entrepreneurs for information concerning USAID programs, business intelligence, and other opportunities. Also provides technical assistance and project financing.

Environmental Technology Network for Asia**Phone: (202) 663-2695****Fax: (202) 663-2760**

USAID-USEPA partnership gathers information on trade leads in 9 Asian countries, then matches U.S. environmental companies registered with the network.

International Executive Service Corps**Phone: (202) 663-2384****Fax: (202) 663-2149**

Retired U.S. corporate executives provide technical assistance to businesses and organizations in emerging markets.

Office of Small and Disadvantaged Business Utilization**Phone: (703) 875-1551****Fax: (703) 875-1862**

Provides information and assistance to small and minority-owned firms on U.S.-AID programs.

U.S. DEPARTMENT OF COMMERCE
<http://www.doc.gov>

Advocacy Center**Phone: (202) 482-3896****Fax: (202) 482-3508**

Main point of contact for U.S. firms bidding on projects overseas seeking U.S. government assistance. Supports U.S. businesses bidding on projects where there is a foreign government or government-controlled entity which has decision-making influence over the project. Coordinates aggressive, targeted strategies to combat the strong lobbying efforts of foreign competitors.

American Business Centers in Newly**Independent States (NIS)****Business Information Services for the NIS (BISNIS)****Phone: (202) 482-4655****Fax: (202) 482-2293**

One-stop-shop for U.S. firms interested in doing business in the NIS. Information includes commercial opportunities, sources of financing, trade contacts, US government programs. Publishes a monthly bulletin with trade promotion events, US regional programs, and practical advice on doing business in the NIS.

Asia Business Center**Phone: (202) 482-2522****Fax: (202) 482-4453**

Offers information and assistance that U.S. companies need to increase the U.S. market share in Asia and the Pacific.

Bureau of Export Administration**Phone: (202) 482-4811**

Controls exports. Operates Export Licensing Voice Information System (ELVIS) which offers licensing and emergency handling services information and the Export License Application and Information Network (ELAIN) which accepts export licensing applications.

Central and Eastern Europe Business Information Center (CEEBIC)**Phone: (202) 482-3462****Fax: (202) 482-4473**

Offers a wide array of services, business counseling, and information products designed to help U.S. companies expand into Central and Eastern European markets. Publishes a monthly newsletter. Recently opened a new small business support facility providing additional hands-on assistance to small firms providing step-by-step support through the exporting process.

**Consortia of American Businesses in the NIS
(CABNIS)****Phone: (202) 482-5004**

A grant program designed to stimulate U.S. business in the NIS and assist the move toward privatization.

Economic Bulletin Board**Phone: (202) 482-1986****Fax: (202) 482-2164**

Use fax machine to receive trade leads, procurement opportunities, and the latest trade and economic information from the federal government. \$29.95/quarter or \$100/yr for unlimited access.

**Office of Export Promotion Coordination
(OEPC)****Phone: (202) 482-4501**

The management and information dissemination arm for cross-sectoral programs that deal directly with the private sector. Coordinates the export promotion program by analyzing comparative export potential for U.S. goods and services in overseas markets, and planning customer and product-driven overseas export promotion and information activities.

Office of Export Trading Company Affairs**Phone: (202) 482-5131****Fax: (202) 482-1790**

Promotes the formation and use of U.S. export service providers; offers information and counseling to businesses and trade associations; and administers the Export Trade Certificate of Review program which provides exporters with an antitrust “insurance policy” intended to foster joint export activities where economies of scale and risk diversification are achieved.

Japan Export Information Center**Phone: (202) 482-2425****Fax: (202) 482-0469**

Assists U.S. companies interested in developing export business to Japan by providing them with business counseling services; current information on exporting to Japan; business customs and practices; market entry alternatives; etc. The JEIC also informs U.S. companies of the types of assistance available through the Japanese government's import promotion programs and works with the Japanese government to better adapt these programs to the needs of U.S. exporters.

Japanese Untied Aid Program**Phone: (202) 482-4002****Fax: (202) 482-5702**

Provides information on how to access Japan's foreign aid program to finance U.S. export sales.

Office of Latin America and the Caribbean**Phone: (202) 482-2437****Fax: (202) 482-4726**

Promotes and facilitates private sector business development in Latin America and the Caribbean. Offers publications, LA/C Business Bulletin (monthly), the Andean Trade Preference Act Guidebook, and seminars, sector studies, trade and investment missions, and individual business counseling.

Market Development Cooperator Program**Phone: (202) 482-3197**

Provides funding through cooperative agreements to help minimize risks inherent in implementing creative private sector market development projects. Applicants must supply 2/3 of the total project costs.

Matchmaker Trade Delegations**Phone: (202) 482-0692****Fax: (202) 482-0178**

Designed to introduce new-to-export or new-to-market businesses to prospective representatives and distributors overseas.

Office of the Middle East and North Africa**Phone: (202) 482-1860****Fax: (202) 482-0878**

Assists U.S. companies interested in developing export business to the region by providing them with business counseling services; current market information on exporting to the region; business customs and practices; etc.

Multilateral Development Bank Operations (MDOB)**Phone: (202) 482-3399****Fax: (202) 273-0927****World Bank/International Bank of Reconstruction and Development (WB/IBRD)****Phone: (202) 458-0120****Fax: (202) 477-2967****InterAmerican Development Bank (IADB)****Phone: (202) 623-3821****Fax: (202) 623-2039****African Development Bank (AfDB)****Phone: (225) 21-46-16****Fax: (225) 22-24-37****Asian Development Bank (ADB)****Phone: (632) 890-9364****Fax: (632) 890-9713****European Bank for Reconstruction and Development (EBRD)****Phone: (44) 171-338-6569****Fax: (44) 171-338-6487**

Counsels U.S. firms, ensures project information is available on a timely basis, and organizes and develops outreach programs throughout the U.S. The development banks assist in financing social and economic infrastructure and privatization projects in developing countries.

National Institute of Standards and Technology (NIST)**Phone: (301) 975-4040****Fax: (301) 975-2128**

Provides information on foreign standards and certification requirements.

Office of Trade and Economic Analysis**Phone: (800) USA-TRADE**

Conducts a comprehensive program of data development, dissemination, and research and analysis on international and domestic trade and investment issues to support trade promotion and trade policy responsibilities of ITA, DOC, and other U.S government organizations.

Trade Development Industry Officers**Phone: (800) USA-TRADE**

Industry specialists that work with manufacturing and service industry associations and firms to identify trade opportunities and obstacles by product or service, industry sector, and market. They also help develop export marketing plans and programs. They conduct executive trade missions, trade fairs, marketing seminars, and business counseling.

Trade Information Center (TIC)**Phone: (800) USA-TRADE****Fax: (202) 482-4473**

Provides information on financing sources and promotion, federal export promotion programs, and international trade shows and events.

Trade Opportunities Program (TOP)**Phone: (800) USA-TRADE**

Provides companies with current sales leads from international firms seeking to buy or represent their products or services.

U.S. ENVIRONMENTAL PROTECTION AGENCY
<http://www.epa.gov>

International Technology Cooperation
Phone: (202) 260-0424
Fax: (202) 260-4470

Promotes the adoption and sale of U.S. environmental technologies and services abroad. Also helps to create environmental protection regimes, and to provide technical assistance to solve environmental problems.

**EXPORT-IMPORT BANK OF THE
UNITED STATES**
<http://www.exim.gov>

Bank Letter of Credit Policy
Phone: (202) 565-3900
Fax: (202) 565-3931

Insures commercial banks against loss on irrevocable letters of credit issued by foreign banks for U.S. exporters.

City-State Program
Phone: (202) 565-3781
Fax: (202) 565-3932

Working with state and local government agencies to offer export counseling and financial assistance to the businesses in their jurisdictions.

Credit Services
Phone: (202) 565-3960
Fax: (202) 565-3962

Uses its repayment records to provide credit information for U.S. exporting firms and the commercial banking community. ExIm can provide information useful in the financing of export sales to a specific country or an individual company abroad.

Engineering Multiplier Program

Phone: (202) 565-3900

Fax: (202) 565-3931

Stimulates exports of U.S. architectural, industrial design, and engineering services. ExIm will extend loans or guarantees for up to 85 percent of the U.S. export value of services involving projects with the potential of generating U.S. export orders of \$10 million or double the original export contract, whichever is greater. It also will guarantee commercial financing for approved project-related costs in the host country of up to 15 percent of the U.S. export value.

Export Credit Insurance

Phone: (202) 565-3900

Fax: (202) 565-3931

ExIm offers insurance which covers political and commercial risks on export receivables.

Export Financing Hotline

Phone: (800) 424-5201

Provides information on its export credit insurance, pre-export financing through working capital guarantee loans, and medium- and long-term loans and guarantees to overseas buyers.

Financial Institution Buyer Credit Policy

Phone: (212) 306-5000

Reduces the risk for financial institutions that extend direct buyer credit loans.

Guarantee Program

Phone: (202) 566-4490

Fax: (202) 566-7524

Provides repayment guarantees to creditworthy buyers of U.S. exports for private-sector loans. ExIm pays principal and most of the interest on the loan in the event of a default.

Lease Guarantees**Phone: (202) 565-3900****Fax: (202) 565-3931**

For large finance leases to foreign entities covering U.S. manufactured goods. Transactions of less than \$10 million are best served by the Insurance Program.

Lease Insurance Policies**Phone: (212) 306-5000**

Offers comprehensive insurance for overseas leasing.

Loan Program**Phone: (202) 565-3900****Fax: (202) 565-3931**

Provides competitive, fixed interest rate financing for U.S. export sales of U.S. capital equipment and related services. ExIm extends direct loans to foreign buyers of U.S. exports. Coverage is available for loans up to 85 percent of the U.S. export value.

Medium-Term Single-Buyer Policy**Phone: (212) 306-5000**

Offers feasibility study analysis as a precursor to issuing medium-term risk insurance policies.

Multi-Buyer Policy**Phone: (212) 306-5000**

Offers comprehensive credit risk protection on the sale of short and medium-term goods to buyers.

New-to-Export Policy**Phone: (212) 306-5000**

Provides insurance against risks of nonpayment by a foreign buyer for exporting novices.

Operations and Maintenance Contracts Program**Phone: (202) 565-3946**

Offers support for operations and maintenance contracts and needed financing for U.S. markets overseas.

Regional Offices**NY – Phone: (212) 466-2950****Fax: (212) 466-2959****FL – Phone: (305) 526-7425****Fax: (305) 526-7484****IL – Phone: (312) 353-8081****Fax: (312) 353-8098****TX – Phone: (713) 589-8182****Fax: (713) 589-8184**

Provide full service to businesses interested in ExIm Bank programs. ExIm is also represented at each of the U.S. Export Assistance Centers.

Short-Term Single-Buyer Credit Policy**Phone: (212) 306-5000**

Provides coverage for short-term export sales to single-buyers.

Umbrella Policy**Phone: (212) 306-5000**

One year blanket policies insuring short-term export credit sales.

Working Capital Guarantee Program**Phone: (202) 565-3900****Fax: (202) 565-3931**

Helps small and medium-size businesses obtain critical pre-export financing from commercial lenders. ExIm will guarantee 90 percent of the principal and interest on loans or revolving lines of credit which are extended to eligible exports. The funds may be used for such pre-export activities as buying raw materials or foreign marketing.

**OVERSEAS PRIVATE INVESTMENT
CORPORATION**
<http://www.opic.gov>

Automated Information Line

Phone: (202) 336-8799

Fax: (202) 408-5155

Responds to preliminary inquiries or initial requests for information regarding OPIC programs and services. Information is available on OPIC programs, project finance, and political risk insurance.

Finance Programs

Phone: (202) 336-8799

Fax: (202) 408-5155

Medium- to long-term financing for sound overseas investment projects is made available through loan guarantees and direct loans. OPIC's financing commitment may range from 50 percent of total project costs for new ventures to 75 percent for expansion of existing successful operations.

Investment Insurance

Phone: (202) 336-8799

Fax: (202) 408-5155

A number of programs to insure U.S. investments in emerging markets and developing countries against the risks of (1) currency inconvertibility, (2) expropriation, and (3) political violence. Coverage is available for new investments and for investments to expand or modernize existing operations. Equity, debt, loan guarantees, leases, and most other forms of long-term investment can be insured.

U.S. SMALL BUSINESS ADMINISTRATION
<http://www.sbaonline.sba.gov>

Export Legal Assistance Network

Phone: (202) 778-3080

Fax: (202) 778-3063

A group of attorneys with international trade experience who provide free initial consultations to businesses on export-related matters.

Export Working Capital Program

Phone: (800) 827-5722

A short-term guarantee loan program for businesses needing working capital to finance the production or acquisition cost of export goods or services, or to finance existing receivables resulting from export transactions.

Office of International Trade

Phone: (202) 205-6720

Fax: (202) 205-7272

Encourages small business exports and assists exporters by directing and coordinating SBA export initiatives. Also promotes SBA's loan guarantee programs.

**International Trade Loan Guarantee
Program**

Phone: (800) 827-5722

A loan guarantee program for businesses either involved in exporting and trying to expand this activity or adversely impacted by import competition.

**SBA Automated Trade Locator Assistance
Service**

Phone: (202) 205-6720

Fax: (202) 205-7272

Offers market research including free reports (product or country specific) ranking the top 35 import and export markets for particular goods and services. Country report identifies top 20 products most frequently traded in the target market.

7(a) Business Loan Guarantee Program**Phone: (800) 827-5722**

Assists qualified small businesses in obtaining financial assistance from banks by providing the lender with a guarantee that if the borrower cannot repay the loan, the federal government will, up to the percentage of the SBA guarantee.

Small Business Development Centers**Phone: (202) 205-6766****Fax: (202) 205-7064**

Provides export assistance to small businesses, especially those new to exporting. Includes: counseling, training, managerial, and trade finance assistance.

Small Business Investment Companies**Phone: (202) 205-3644****Fax: (202) 202-6959**

Provides equity capital or extended unsecured loans and loans not fully collateralized to an exporting company requiring extra capital.

U.S. DEPARTMENT OF STATE
<http://www.state.gov>

Bureau of Economic and Business Affairs**(202) 736-4167****Fax: (202) 647-5957**

Formulates and implements policies concerning foreign economic matters, international trade promotion, and business services.

Coordinator of Business Affairs**Phone: (202) 736-4167****Fax: (202) 647-5957**

Ensures that DOS and its overseas missions provide consistent and effective support for U.S. businesses.

Regional Bureaus**Africa-Phone: (202) 647-3502****E. Asia/Pacific-Phone: (202) 647-6594****Europe/Canada-Phone: (202) 647-2469****Russia/NIS-Phone: (202) 647-6747****Inter-American-Phone: (202) 647-6754****Near East-Phone: (202) 647-4589****South Asia-Phone: (202) 736-4331**

Maintain regular contact with overseas diplomatic missions and provide country specific economic and political analysis for U.S. companies

U.S. TRADE AND DEVELOPMENT AGENCY
<http://www.tda.gov>

Definitional Missions**Phone: (703) 875-4357****Fax: (703) 875-4009**

Hiring technically qualified U.S. consultants to visit a country and discuss the plan with project sponsors. The consultants work with the sponsors to define the work program for the feasibility study and recommends whether the project should be funded.

Feasibility Studies**Phone: (703) 875-4357****Fax: (703) 875-4009**

Grant funding of feasibility studies, consultancies, and other project planning services for major projects in developing countries.

Grants to Multilateral Development Banks**Phone: (703) 875-4357****Fax: (703) 875-4009**

Provides funds for MBDs to hire consultants to investigate projects considered by MDBs.

International Finance Corporation**Phone: (202) 473-0661**

Lends directly to the private sector in developing countries. Companies must arrange a meeting with a project officer or submit a proposal to IFC.

Reverse Trade Missions**Phone: (703) 875-4357****Fax: (703) 875-4009**

Provides funds for visits to the U.S. by high-level foreign government officials to meet with U.S. industry and government representatives. These foreign officials represent procurement authorities of specific projects interested in purchasing U.S. equipment and services. The missions are usually cofunded by U.S. industry.

Technical Assistance Grants**Phone: (703) 875-4357****Fax: (703) 875-4009**

Funds activities designed to bring U.S. technical assistance to bear on a variety of projects.

Technical Assistance Trust Funds for U.S. Consultants**African Development Bank (AfDB)****Phone: (202) 429-5160****InterAmerican Development Bank (IADB)****Phone: (202) 623-1810****World Bank/International Bank for Reconstruction and Development (WB/IBRD)****Phone: (202) 473-1795****International Finance Corporation (IFC)****Phone: (202) 473-0642**

Funds available to finance consultancies and feasibility studies.

Technical Symposia and Business Briefs**Phone: (703) 875-4357****Fax: (703) 875-4009**

Sponsors symposia designed to familiarize foreign governments and industry with U.S. products and services.

Training Grants**Phone: (703) 875-4357****Fax: (703) 875-4009**

Grants in support of short-listed companies on a transaction-specific basis. These most frequently take the form of grants to cover the cost of training local personnel by the U.S. company on the installation, operation, and maintenance of equipment specific to the bid proposal.

U.S. TRADE REPRESENTATIVE**<http://www.ustr.gov>****Office of the General Counsel****Phone: (202) 395-3432****Fax: (202) 395-3639**

Responsible for administering trade cases that provide relief from unfair trade practices.

Office of the U.S. Trade Representative**Industry****Phone: (202) 395-5656****Investment and Technology****Phone: (202) 395-3606****Services****Phone: (202) 395-7271**

Provides publications to exporters confronted with foreign barriers to trade and unfair trade practices.

APPENDIX C

SMALL BUSINESS ADMINISTRATION DISTRICT OFFICES

HEADQUARTERS

Small Business Administration
Office of International Trade
409 Third St., S.W.
Washington, DC 20416
(800) 827-5722

ALABAMA

2121 Eighth Ave. N., Suite 200
Birmingham, AL 35203-2398
(205) 731-1338

ALASKA

222 West Eighth Ave., Rm. 67
Anchorage, AK 99513-7559
(907) 271-4838

ARIZONA

2828 North Central Ave., Suite
800
Phoenix, AZ 85004-1025
(602) 261-3737

ARKANSAS

2120 Riverfront Dr., Suite 100
Little Rock, AR 72202
(501) 324-5871

CALIFORNIA

2719 North Air Fresno Dr.
Fresno, CA 93727-1547
(209) 487-5605

330 North Brand Blvd., Suite
1200
Glendale, CA 91203-2304
(213) 894-7900

660 J St., Suite 215
Sacramento, CA 95814-2413
(916) 551-1440

901 W. Civic Center Dr., Suite 160
Santa Ana, CA 92703-2352
(714) 836-2494

Federal Bldg., Suite 4-S-29
880 Front St.
San Diego, CA 92188-0270
(619) 557-7269

211 Main St., 4th Floor
San Francisco, CA 94105-1988
(415) 744-6771

COLORADO

721 19th St., 4th Floor
Denver, CO 80202
(303) 844-3984

CONNECTICUT

330 Main St., 2nd Floor
Hartford, CT 06106
(203) 240-4642

DELAWARE

One Rodney Square, Suite 412
Wilmington, DE 19801
(302) 573-6295

DISTRICT OF COLUMBIA

1111 18th St., N.W., 6th Floor
P.O. Box 19993
Washington, DC 20036
(202) 634-6102

FLORIDA

7825 Baymeadows Way, Suite
100-B
Jacksonville, FL 32256-7504
(904) 443-1912

GEORGIA

1720 Peachtree Rd., N.W., 6th
Floor
Atlanta, GA 30309
(404) 347-2441

HAWAII

P.O. Box 50207
300 Ala Moana, Rm. 2213
Honolulu, HI 96850
(808) 541-2973

IDAHO

1020 Main St., Suite 290
Boise, ID 83702
(208) 334-1696

ILLINOIS

500 W. Madison, Suite 1250
Chicago, IL 60661
(312) 353-4578

Illinois Federal Center South
511 West Capitol St., 3rd Floor
Springfield, IL 62704
(217) 492-4232

INDIANA

Federal Building, Rm. 578
429 North Pennsylvania St.
Indianapolis, IN 46204-1873
(317) 226-7269

MARYLAND

Equitable Building, 3rd Floor
10 North Calvert St.
Baltimore, MD 21202
(410) 962-2235

620 South Glenstone, Suite 110
Springfield, MO 65802
(417) 864-7670

MONTANA

Federal Building, Drawer 10054
301 South Park, Rm. 528
Helena, MT 59626
(406) 449-5381

IOWA

373 Collins Rd., N.E., Rm. 100
Cedar Rapids, IA 52402-3147
(319) 393-2571

Federal Building, Suite 749
210 Walnut St.
Des Moines, IA 50309
(515) 284-4026

MASSACHUSETTS

Federal Building & Courthouse
Rm. 212
1550 Main St.
Springfield, MA 01103
(413) 785-0268

NEBRASKA

11145 Mill Valley Rd.
Omaha, NE 68154
(402) 221-3604

KANSAS

Main Place Building, 1st Floor
100 East English St.
Wichita, KS 67202
(316) 269-6273

MICHIGAN

477 Michigan Ave., Rm. 515
Detroit, MI 48226
(313) 226-6075

NEVADA

301 East Stewart St., Rm. 301
Las Vegas, NV 89125-2527
(702) 388-6611

KENTUCKY

Federal Office Building, Rm. 188
600 Martin Luther King, Jr. Place
Louisville, KY 40202
(502) 582-5971

MINNESOTA

Butler Square, Suite 610C
100 North 6th St.
Minneapolis, MN 55403
(612) 370-2319

NEW HAMPSHIRE

Stewart Nelson Plaza
143 North Main St., Suite 202
Concord, NH 03301-1257
(603) 225-1400

LOUISIANA

Ford-Fisk Building, Suite 2000
1661 Canal St.
New Orleans, LA 70112
(504) 589-2354

MISSISSIPPI

One Hancock Plaza, Suite 1001
Gulfport, MS 39501-7758
(601) 863-4449

NEW JERSEY

2600 Mt. Ephraim Ave.
Camden, NJ 08104
(609) 757-5183

MAINE

Federal Building, Rm. 512
40 Western Ave.
Augusta, ME 04330
(207) 622-6241

MISSOURI

Lucas Place
323 W. 8th St., Suite 501
Kansas City, MO 64105
(816) 374-5868

815 Olive St., Rm. 242
St. Louis, MO 63101
(314) 539-6600

NEW MEXICO

625 Silver Ave., S.W., 3rd Floor
Albuquerque, NM 87102
(505) 766-1879

NEW YORK

445 Broadway, Rm. 222
Albany, NY 12207
(518) 472-6300

111 West Huron St., Rm. 1311
Buffalo, NY 14202
(716) 846-5670

Elmira Savings Bank Building
4th Floor
333 E. Water St.
Elmira, NY 14901
(607) 734-3358

35 Pinelawn Rd., Rm. 102E
Melville, NY 11747
(516) 454-1753

26 Federal Plaza, Rm. 3100
New York, NY 10278
(212) 264-3439

100 State St., Rm. 410
Rochester, NY 14614
(716) 263-6700

Federal Building, Rm. 1071
100 South Clinton St.
Syracuse, NY 13260
(315) 423-5381

NORTH CAROLINA

200 North College St., Suite A-2015
Charlotte, NC 28202
(704) 344-6587

NORTH DAKOTA

Federal Building, Rm. 218
P.O. Box 3086
657 Second Ave., N.
Fargo, ND 58108
(701) 239-5131

OHIO

AJC Federal Building, Rm. 317
1240 East Ninth St.
Cleveland, OH 44199
(216) 522-4194

John Weld Peck Federal Building
525 Vine St., Suite 850
Cincinnati, OH 45202
(513) 684-2814

Two Nationwide Plaza, Suite 1400
Columbus, OH 43215-2542
(614) 469-5548

OKLAHOMA

Federal Building, Suite 670
200 N.W. 5th St.
Oklahoma City, OK 73102
(405) 231-4301

OREGON

222 S.W. Columbia St., Suite 500
Portland, OR 97201-6605
(503) 326-5202

PENNSYLVANIA

475 Allendale Rd., Suite 201
King of Prussia, PA 19406
(215) 962-3818

960 Penn Ave., 5th Floor
Pittsburgh, PA 15222
(412) 644-5441

100 Chestnut St., Rm. 309
Harrisburg, PA 17101
(717) 782-3846

Penn Place, Rm. 2327
20 N. Pennsylvania Ave.
Wilkes-Barre, PA 18702
(717) 826-6495

PUERTO RICO

Federal Building, Rm. 691
Carlos Chardon Ave.
Hato Rey, PR 00918
(809) 766-5519

RHODE ISLAND

380 Westminster Mall, 5th Floor
Providence, RI 02903
(401) 528-4583

SOUTH CAROLINA

P.O. Box 2786
1835 Assembly St., Rm. 358
Columbia, SC 29201
(803) 765-5298

SOUTH DAKOTA

Security Building, Suite 101
101 South Main St.
Sioux Falls, SD 57102-0527
(605) 330-4231

TENNESSEE

50 Vantage Way, Suite 201
Nashville, TN 37228
(615) 736-7176

TEXAS

Wilson Tower
606 N. Carancahua, Suite 1200
Corpus Christi, TX 78476
(512) 888-3301

1100 Commerce St., Rm. 3C-36
Dallas, TX 75242
(214) 767-0495

10737 Gateway W., Suite 320
El Paso, TX 79935
(915) 541-7560

222 E. Van Buren
 Suite 500
 Harlingen, TX 78550
 (512) 427-8533

9301 Southwest Freeway, Suite
 550
 Houston, TX 77074
 (713) 773-6500

Regency Plaza
 1611 10th St.
 Suite 200
 Lubbock, TX 79401
 (806) 743-7562

7400 Blanco Rd.
 Suite 200
 San Antonio, TX 78216
 (512) 229-4551

UTAH

125 S. State St.
 Rm. 2237
 Salt Lake City, UT 84138-1195
 (801) 524-3215

VERMONT

87 State St.
 Rm. 205
 Montpelier, VT 05602
 (802) 828-4422

VIRGIN ISLANDS

420 United Shopping Plaza
 Suite 7
 Christiansted, St. Croix, VI
 00820-4487
 (809) 778-5380

Federal Office Building
 Veterans Dr., Rm. 210
 St. Thomas, VI 00802
 (809) 774-8530

VIRGINIA

Federal Building
 Rm. 3015
 P.O. Box 10126
 400 N. Eighth St.
 Richmond, VA 23240
 (804) 771-2765

WASHINGTON

Federal Building
 Rm. 1792
 915 Second Ave.
 Seattle, WA 98174-1088
 (206) 553-1420

Farm Credit Building
 10th Floor E.
 West 601 First Ave.
 Spokane, WA 99204-0317
 (509) 353-2806

WYOMING

100 East B St.
 Rm. 4001
 P.O. Box 2839
 Casper, WY 82602-2839
 (307) 261-5761

WEST VIRGINIA

550 Eagan St.
 Suite 309
 Charleston, WV 25301
 (304) 347-5220

168 W. Main St.
 5th Floor
 Clarksburg, WV 26301
 (304) 623-5631

WISCONSIN

212 E. Washington Ave.
 Rm. 213
 Madison, WI 53703
 (608) 264-5517

Henry S. Reuss Federal Plaza
 Suite 400
 310 W. Wisconsin Ave.
 Milwaukee, WI 53203
 (414) 297-1231

APPENDIX D

U.S. EXPORT ASSISTANCE CENTERS

One World Trade Center, Suite 1670
Long Beach, CA 90831
(310) 980-4550
Fax (310) 980-4561

1625 Broadway Avenue, Suite 680
Denver, CO 80202
(303) 844-6622
Fax (303) 844-5651

5600 NW 36th Street, Suite 617
P.O. Box 590570
Miami, FL 33159-0570
(305) 526-7425
Fax (305) 526-7434

285 Peachtree Center Avenue
Suite 213
Atlanta, GA 30303
(404) 657-1900
Fax (404) 657-1970

55 W. Monroe Street, Suite 2440
Chicago, IL 60603
(312) 353-8040
Fax (312) 353-8098

One Canal Place
365 Canal Street, Suite 2150
New Orleans, LA 70130
(504) 589-6546
Fax (504) 589-2337

401 E. Pratt Street, Suite 2432
Baltimore, MD 21202
(410) 962-4539
Fax (410) 962-4259

164 Northern Avenue, Suite 307
Boston, MA 02210
(617) 565-5517
Fax (617) 565-5598

477 Michigan Avenue, Rm. 515
Detroit, MI 48226
(313) 226-6075 ext. 224
Fax (313) 226-4769

8182 Maryland Avenue, Suite 303
St. Louis, MO 63105
(314) 425-3304 ext. 228
Fax (314) 425-3381

6 World Trade Center
6th Floor, Suite 635
New York, NY 10048
(212) 466-2958
Fax (212) 264-1356

600 Superior Avenue East, Suite 700
Cleveland, OH 44114-2650
(216) 522-4750
Fax (216) 522-2235

1 Independence Mall
615 Chestnut Street, Suite 1501
Philadelphia, PA 19106
(215) 597-6101
Fax (215) 597-6123

2050 N. Stemmon Freeway
Suite 170
P.O. Box 58130
Dallas, TX 75258
(214) 767-0543
Fax (214) 767-8240

2001 6th Avenue, Suite 650
Seattle, WA 98121
(206) 553-0051
Fax (206) 553-7253

APPENDIX E

ASSOCIATIONS SUPPORTING TRADE ACTIVITIES

AMERICAN ASSOCIATION OF EXPORTERS AND IMPORTERS

11 W. 42nd Street, 30th Floor
New York, NY 10036
Phone: (212) 944-2230
Fax: (212) 382-2606

INSTITUTE OF CLEAN AIR COMPANIES

1707 L Street, NW
Suite 570
Washington, DC 20036-5603
Phone: (202) 457-0911
Fax: (202) 331-1388

MINORITY INTERNATIONAL NETWORK FOR TRADE

c/o Assist International
60 Madison Avenue, 2nd Floor
New York, NY 10010
Phone: (212) 725-3311
Fax: (212) 725-3312

NATIONAL ASSOCIATION OF EXPORT COMPANIES

P.O. Box 1330
Murray Hill Station
New York, NY 10156
Phone: (212) 725-3311
(212) 725-3312

NATIONAL ASSOCIATION OF MINORITY CONTRACTORS

1333 F Street, NW
Suite 500
Washington, DC 20004
Phone: (202) 347-8259
Fax: (202) 628-1876

OVERSEAS SALES AND MARKETING ASSOCIATION OF AMERICA

P.O. Box 37
Lake Bluff, IL 60044
Phone: (708) 234-1760

SMALL BUSINESS EXPORTERS ASSOCIATION

4603 John Tyler Court, Suite 203
Annandale, VA 22003
Phone: (703) 642-2490
Fax: (703) 750-9655

UNITED STATES ENERGY ASSOCIATION

1620 I Street, NW Suite 1000
Washington, DC 20006
Phone: (202) 331-0415
Fax: (202) 331-0418

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