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**STUDY OF THE FEASIBILITY OF
PUBLISHING A DIRECTORY OF
U.S.-MANUFACTURED ENERGY-
EFFICIENT EQUIPMENT FOR DIS-
TRIBUTION IN DEVELOPING COUNTRIES**

Final Report

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BACKGROUND

In the course of its work in developing countries, Hagler, Bailly & Company has participated in a number of energy audits of industrial firms and commercial buildings. As a result of these audits, energy-efficient equipment needs were generally identified. In many cases, the industrial firms asked Hagler, Bailly to provide the names of American manufacturers of the specified equipment. Despite a search of local information sources, however, Hagler, Bailly was unable to help companies locate appropriate U.S. suppliers.

In light of this lack of information, Hagler, Bailly & Company initiated a feasibility study on behalf of the Department of Energy (Office of Industrial Programs) and the Agency for International Development (Office of Energy). The study sought to determine the feasibility of producing a directory of U.S. suppliers of energy-efficient equipment for distribution in developing countries.

The feasibility study focused on several issues:

1. Is there a need for information about American-made energy-efficient equipment in developing countries?
2. Will American energy-efficient equipment manufacturers contribute sufficient revenue to the directory to support its production?
3. Given the anticipated costs and the projected revenue, is the publication of a directory a viable private-sector venture?
4. What are the alternatives for marketing, producing, and distributing the directory?

STUDY METHODOLOGY

The objective of the feasibility study was to answer these questions and thus provide a basis for deciding whether to publish and distribute a directory of U.S. manufacturers of energy-efficient equipment. To conduct the feasibility analysis, it was necessary to identify the scope. A major problem was the size of the universe: the large number of developing countries, the many types of energy-efficient equipment, and the large number of equipment manufacturers.

Hagler, Bailly gathered information from central data sources in Washington, D.C., from cable correspondence with commercial officers in U.S. embassies in several countries, and from interviews with representatives of the private and public sectors in selected countries. On the basis of this information, Hagler, Bailly decided to limit the feasibility study to one type of widely-used equipment: instrumentation and controls. In the course of interviews with equipment manufacturers, other types of equipment were also discussed, but not as fully.

Information was obtained from manufacturers of instruments and controls in several ways:

- Telephone contact with manufacturers selected through prior knowledge of their leadership in the field and their interest in international sales; see Appendix A for a list of manufacturers and Appendix B for the material they were sent
- Personal interviews with manufacturers who exhibited at the March 1984 Energy Technology Conference in Washington, D.C.; see Appendix C for the companies interviewed and Appendix D for the interview guide
- A test market mailing to over 1,000 manufacturers with descriptive material on the directory (see Appendix E) and a postage-paid response card requesting expressions of interest; follow-up telephone calls were also made to some companies on this list (see Appendix F).

For the financial analysis, Hagler, Bailly had to develop revenues and costs. Revenue estimates were prepared based on discussions with manufacturers and their

willingness to pay for a listing in the directory. Cost estimates were developed for each step in the publication process. To develop directory production and distribution costs, several scenarios were constructed. These scenarios were based on information derived from the examination of U.S. and international directories, from discussions with the staff of companies that produce directories, and from quotes from printers and shippers. Ranges of likely costs were studied and various production methods were considered before final costs were selected for the financial analysis.

RESULTS

The results of this feasibility study derive from the response we received from the various manufacturing representatives we contacted and an examination of potential costs and revenue. The initial telephone survey generally brought a mixed response, though also a willingness to learn more about the directory concept. Manufacturer representatives interviewed at the Energy Technology Conference responded favorably to participating in an energy efficiency equipment directory, but none responded to the mailing of the marketing brochure. The test marketing brought positive response from a limited number of companies interested in contributing to the directory. A subsequent telephone survey brought more positive responses.

The examination of production costs indicates that publication of one volume of an energy-efficient equipment directory dealing with instrumentation and controls would cost approximately \$200,000.

Another result of this look at the equipment marketing in developing countries is the disadvantage the U.S. manufacturers confront in competition with those from other countries. European and Japanese manufacturers see the developing countries as an important and growing market for their products and services; they are devoting significant resources (including assistance from their governments) to establishing a market position in these countries.

CONCLUSIONS AND RECOMMENDATIONS

Several general conclusions were reached as a result of the analysis. They are:

- Users of energy-efficient equipment believe that the information available to them on American-made products is inadequate and that there is a need for more information.
- Instrumentation and controls manufacturers have mixed opinions on the need for a directory: some think that adequate information is available and that exposure in the international market is satisfactory; others think that the market does not warrant major attention, given the lack of information on market size and the perceived difficulties (including cost) of conducting business in developing countries.
- Revenues are not likely to exceed the costs of marketing, publishing, and distributing the directory, particularly in the start-up phase. If a series of directories is published, the revenue outlook might improve.
- Based on need, possible revenues, projected costs, and business risks, it appears unlikely that the directory project could be initiated and carried out as a fully private-sector initiative; a subsidy from the government or some other source would be needed to avoid initial, unacceptable losses.

Based on our general conclusions, we offer the following recommendations:

- Efforts should be intensified to better define the character and magnitude of the market for energy-efficient equipment in developing countries and to communicate more vigorously through publications and workshops the potential that exists to market American-made equipment
- USAID and DOE/OIP should consider additional efforts to promote the participation of more manufacturers or various industry associations that could underwrite/subsidize the effort and consider the possibility of publishing the

first volume of the directory as a cost-shared demonstration with private-sector supporters

- USAID and DOE/OIP should consider jointly forming a public-sector organization to publish the directory with the idea of turning it over to a private-sector vendor when its commercial viability is demonstrated.

ORGANIZATION OF REPORT

The report consists of five sections and several appendices. The first section examines the need for a directory of energy-efficient equipment, from the point of view of the users and suppliers. The topics covered in this section include the need for export promotion, the users' need for information, and the need for better energy-efficient equipment in developing countries. Also discussed is the perception of need on the part of both users and suppliers.

The second section describes the components of a directory, from the type of technology to be included to the way in which the products would be described. The section also discusses indexes, advertising, company information, and suggestions on quality control.

Section three is concerned with how and to whom the directory would be distributed. Also discussed are levels of circulation and languages that could be used.

The fourth section discusses the various production options, together with recommendations for each element in the production process.

The fifth and last section examines the cost of producing a directory and what this would entail in terms of revenue to break even on the project. Included in this section is a risk analysis to assist decision-making.

This chapter first discusses the demand for energy-efficient equipment in developing countries, the lack of information on American-made energy-efficient equipment, and the potential benefits of this equipment in terms of energy savings, technology transfer, and balance of payments.

Then, the chapter examines the need for a directory in terms of both potential directory users and potential directory participants.

DEMAND FOR ENERGY-EFFICIENT EQUIPMENT

Projected Expenditures For Energy Conservation

In a recent report that will be published by the World Bank, Hagler, Bailly & Company estimated that developing countries will spend between \$50 and \$125 billion during the 1984-1995 period on energy conservation and fuel switching for industry. If buildings and transportation are also included, the figures climb to between \$70 and \$150 billion. Of this, equipment imports from industrialized countries will amount to roughly \$40 to \$80 billion, a major portion of which the United States could capture.

Differences Among Countries and Regions

The demand for energy-efficient equipment differs widely from country to country and region to region. Within each region, the differences stem in part from the energy resources that are available and the level of industrialization. Among the major regions in the Third World, Southeast Asia appears to be the strongest market at present. The peak demand years for energy conservation equipment are estimated by Hagler, Bailly to be 1979-1985. Although the market there will remain strong for many years after 1985, the improvement in energy efficiency that can be achieved by installing new equipment will drop below 15 percent.

In Latin America, the peak demand years are estimated to be 1984-1990, and the improvement in energy efficiency achievable is presently about 25 percent. In Africa, the potential for efficiency improvement is about 30 percent, but the peak years for equipment demand will not occur until the 1990s or beyond.

Influence of Energy Audits on Demand

Some of the demand for equipment results from energy audit programs that are being financed by international lending institutions and other donors. Such programs have recently been carried out in Peru, Korea, Thailand, the Philippines, and Tunisia; programs are currently under way in Turkey, Bangladesh, Kenya, and Sri Lanka.

An industrial energy audit program comprises a series of steps that ultimately culminate in the purchase order for equipment. First is the audit itself, followed by identification of energy conservation opportunities. Then a feasibility study is conducted to determine -- among other things -- the general equipment specifications (Terms of References). At this point, the company needs detailed information on available equipment. Companies wishing to implement the recommendations of the audit program must identify the suppliers of equipment that meets the specifications and request bids from them.

LACK OF INFORMATION ON U.S. EQUIPMENT

The experience of Hagler, Bailly staff working in developing countries around the world indicates a serious shortage of information about U.S.-manufactured energy-efficient equipment and products. Many companies in developing countries have requested information on where they can purchase the equipment that they require. Hagler, Bailly staff found that no literature was readily available that could provide such information in an effective manner for the U.S. export market. Staff members did find, however, that other countries, such as the United Kingdom, distribute energy equipment directories for their own export markets.

The U.S. domestic market, on the other hand, has a plethora of directories. Some are exclusively devoted to energy-efficient equipment, while others include

energy-efficient equipment as a component. The Thomas Register is perhaps the best known. For a company located in a developing country and interested in specific types of energy equipment, however, the Thomas Register is unwieldy to use and lacks the detail necessary to pinpoint the appropriate U.S. equipment producers and make contact with them.

The limitations of other existing equipment directories are related to their range of equipment, the number of companies covered, the type and amount of information provided, and mix of U.S. and foreign companies. An energy equipment directory that is currently being prepared with U.S. government assistance will be organized by company rather than by type of equipment and will have no details about the equipment listed. Such a directory would complement one that emphasizes the equipment but would not replace it.

POTENTIAL BENEFITS OF DIRECTORY

Energy Savings

Most developing countries lack the technology and equipment required to improve efficiency in energy consumption. In their efforts to industrialize, they continue to waste expensive fuels. The potential for energy conservation can be seen by comparing their industrial energy consumption patterns with those of developed countries. The importance of increased conservation efforts is apparent when the ranges of the specific energy consumption (SEC) of selected energy-intensive industries are compared with the best international values (see Exhibit 1.a).

An analysis of conservation measures that could be implemented in the commercial and industrial sectors of various developing countries has revealed that the savings potential is substantial. The conservation measures considered most appropriate can be organized into two groups:

- Short-term measures requiring small investments and consisting mostly of combustion efficiency improvements, insulation, steam system efficiency improvements, and other housekeeping measures, including better management, measurement, and control of energy

Exhibit 1.a

Specific Energy Consumption of Three
Energy-Intensive Industries: 1982
(koe/ton)¹

<u>Industry</u>	<u>LDCs</u>	<u>Best international value</u>
Steel	.200 - 1.400	.145
Cement	.130 - .210	.103
Pulp & paper	.150 - 2.200 ²	.100

1. Total commercial primary energy (fuel and electricity) in kg of oil equivalent (1 koe = 10 mcal).
2. Depends on the level of black liquor recovery. The upper bound refers to some mills in India and Bangladesh.

SOURCE: Hagler, Bailly & Company.

- Medium-term measures requiring larger investments in retrofits of existing plants and buildings and additions to facilities, including waste heat recovery, combined heat and power generation, increased use of waste fuels, simple process controls, some process modifications, and replacement of inefficient equipment.

It is estimated that, as a group, the non-industrialized countries can save approximately 35 to 70 million tons of oil equivalent (mtoe) per year through short-term measures and an additional 70 to 125 mtoe per year through medium-term measures. The full realization of the energy savings potential associated with the above measures depends, however, on many factors, including appropriate information and suitable equipment.

Technology Transfer

One of the major objectives of the United States' development assistance program is technology transfer. It is generally accepted that improved technology is an important component of the development process. According to the World Bank:

"Technology is knowledge of how to do all those things associated with economic activity. Thus, the acquisition of technology is as important to the development process and as essential an aspect of the process of investment as the accumulation of financial resources. Moreover, because technology is continuously changing, with new products and processes being developed year by year, the need to acquire technology is also a continuous one, and one that expands with expansion in economic activity."*

A directory would facilitate technology transfer by providing information on proven energy technologies to developing countries. As local energy specialists in

*Source: World Bank. International Technology Transfer: Issues and Policy Options, Staff Working Paper No. 344, July 1979, p. 1.

developing countries became acquainted with U.S. technology, they would be able to advance to the development of technologies more appropriate to local conditions.

Some U.S. manufacturers may find it more attractive to license their technologies in developing countries than to sell the products directly. Such licensing would result in both the transfer of knowledge and the transfer of proprietary rights. A directory would include guidance to those interested in obtaining licenses.

Many developing countries are already producing energy-efficient equipment in the form of solar thermal collectors and other equipment that uses relatively simple technology. Some of the more advanced developing countries have the ability to develop and produce more complex technology. For some types of equipment, a local manufacturer will assemble the final product and may make some of the components but will look to industrialized countries for components that require more advanced technology.

IMPACT OF ENERGY CONSERVATION ON ECONOMY

The high cost of oil and other fossil fuels has had an adverse effect on the economies of many developing countries. Several countries that are net importers of oil are struggling to avoid bankruptcy. Commercial banks have been covering defaults of a number of governments with new debt obligations. The situation will continue to deteriorate as long as the demand for oil consumes financial resources earmarked for investment to further the development process.

One way of helping countries survive the financial crises that they now face is to reduce the demand for oil. Energy conservation represents such a way. By using more efficient energy equipment, a country can continue its development while minimizing the energy costs that are incurred.

Not every country burdened with debt is prepared to invest in energy-efficient equipment. For some countries, the lack of foreign exchange is so great that no investment in energy-efficient equipment is possible. For other countries, foreign exchange is carefully rationed, and the government may or may not see the benefits in investment in this field. The investment

policy may be geared more to development of exports than to ways of reducing imports. Some governments may not adequately understand the benefits of energy conservation and the technologies that are available. International lending institutions and bilateral donor agencies have been working with many governments to improve such understanding.

Many of the oil-exporting countries that only a few years ago were considered free from further economic stress are now finding themselves heavily in debt as weak demand for oil has reduced prices enough to upset their development programs. They, too, have become sensitive to the need for energy conservation at home.

PERCEIVED USER NEED FOR DIRECTORY

The assessment of user need is based on the results of energy audits and other work that Hagler, Bailly has done in a number of developing countries. For the feasibility study, Hagler, Bailly staff, while on assignment in a number of developing countries, interviewed local businessmen, government officials, American businessmen based in these countries, and U.S. embassy officials. A list of organizations interviewed is provided in Appendix G. The interviews confirmed the lack of information about American-made energy-efficient equipment. In addition, most of those interviewed believed that a directory was needed.

There were some differences of opinion about whether a directory should be sold at a nominal price or distributed without charge. For example, in Malaysia, those interviewed believed that a nominal price would not be a barrier, as those who would want to use the directory would have the resources to buy it. Several of the interviewees said that a directory would be viewed as more valuable if it had a price attached to it.

In Indonesia, the general belief was that if a directory was to be of value, it had to reach a large number of engineers and other technical people. The interviewees considered it unlikely that a sufficient number of people would be willing to pay for a directory. One person suggested that a directory bear a price but be distributed free of charge, which would add value to it in the eyes of users.

In the Philippines, the President of the Philippine Chamber of Commerce and Industry (PCCI) said that his organization would be glad to distribute a directory free of charge to its members. The benefit to PCCI would be the opportunity to provide a useful service to its members. The numerous local CCIs in the country do not have many functions, and a directory distribution would help to boost the value of the organization. However, the Philippines has many professional associations that are more directly connected to the energy field. The one with the most direct interest in a directory is the Energy Managers Association of the Philippines (ENMAP).

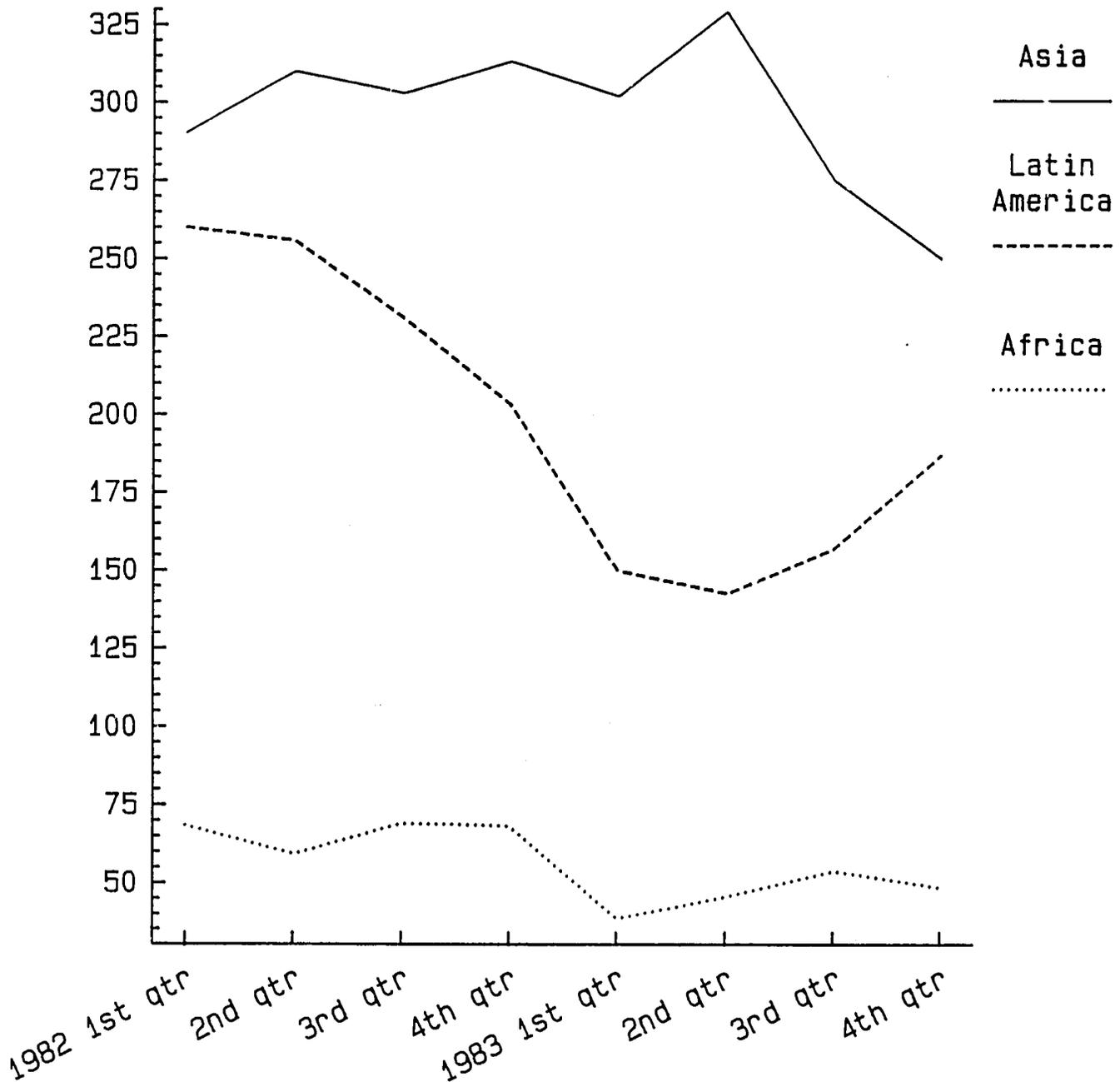
In Southeast Asia, work is under way to develop a Center for Technology Exchange that will have representatives in six countries. The Center will be financially supported by AID and by contributions from U.S. private companies. The individuals involved in setting up the Center see a directory as an important resource for Center activities. One role of the Center will be to act as a clearing house for requests for information about American products. A directory was considered an important means of providing such information in an efficient and effective manner.

PERCEIVED SUPPLIER NEED FOR A DIRECTORY

The United States is a major supplier of energy equipment to both industrialized and developing countries. During conversations with representatives from various industries, it was determined that current export markets are largest in instrumentation and controls, energy transformation, and heat recovery. Statistics on U.S. exports of selected energy equipment in the latter two categories to Asia, Africa, and Latin America can be found in Exhibits 1.b, 1.c, and 1.d. Currently, there are no export statistics available for energy-efficient equipment as opposed to energy equipment in general. The major competitors of American manufacturers of energy-efficient equipment are Japanese firms and some European companies. The Japanese have been marketing their equipment very aggressively, particularly in Southeast Asia, and the Europeans have been making a concerted effort to gain more exposure for their products.

U.S. Export Sales of Pumps, Compressors and Furnaces 1982-1983

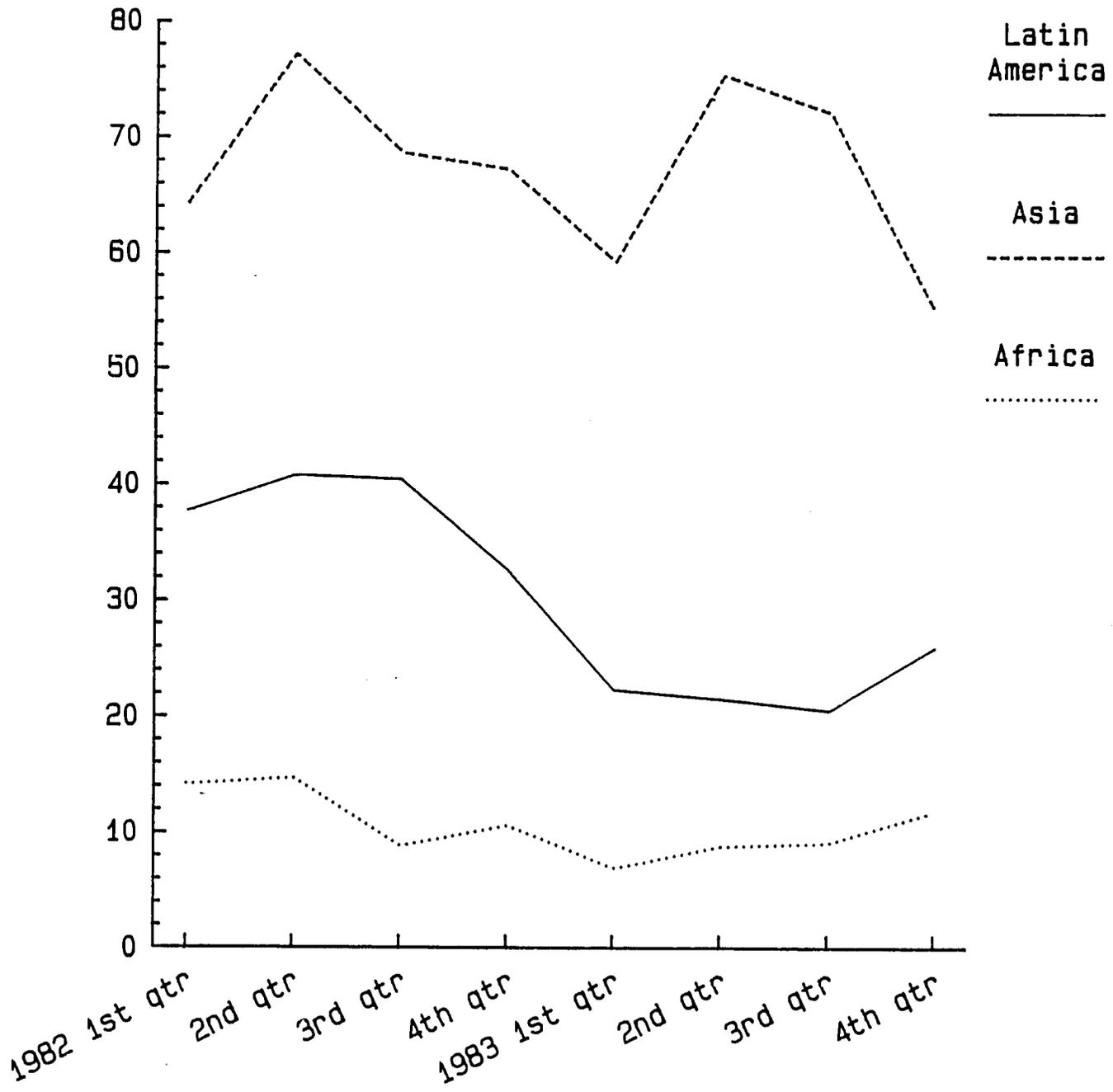
Sales (million U.S. dollars)



Source: U.S. Department of Commerce, Guide to Foreign Trade Statistics.

U.S. Export Sales of Industrial and Commercial Heating/Cooling Equipment 1982-1983

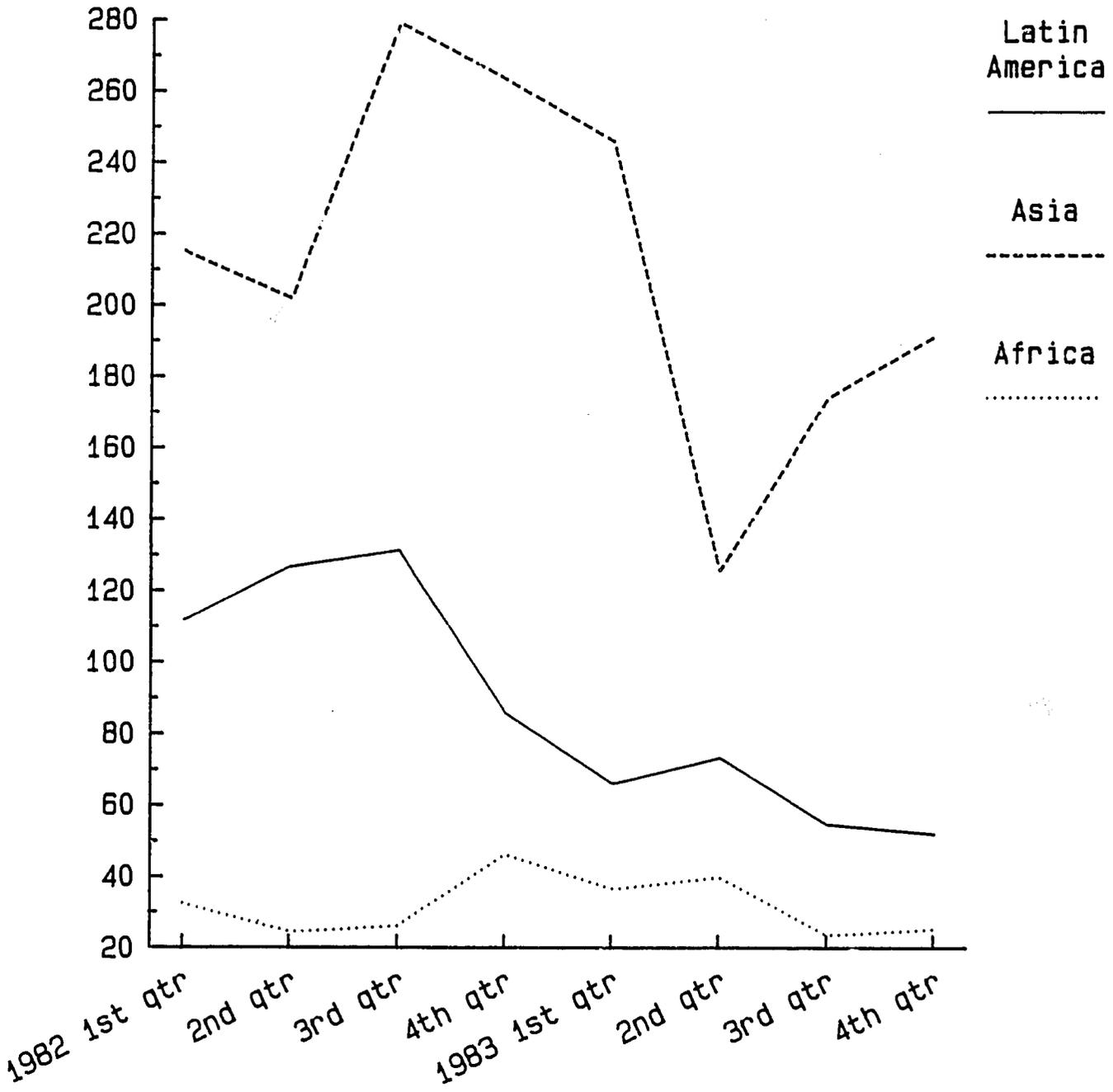
Sales (million U.S. dollars)



Source: U.S. Department of Commerce, Guide to Foreign Trade Statistics.

U.S. Export Sales of Power Generating Equipment 1982-1983

Sales (million U.S. dollars)



Source: U.S. Department of Commerce, Guide to Foreign Trade Statistics.

Overall Interest in Participating

As part of the feasibility study, interviews were conducted with exhibitors at the 11th annual Energy Technology Conference and exposition in Washington, D.C. A total of 42 exhibitors were contacted, and 30 of these had American-made, exportable products. The companies contacted are listed in Appendix C. The questionnaire used in the interviews is reproduced in Appendix D. Of the 30 companies interviewed, 60 percent said they were interested in participating in a directory. Only 23 percent responded negatively, and the remainder were unsure.

The OEM and End-User Market

About two-thirds of the companies interviewed sell to end users. The remaining companies sell to original equipment manufacturers (OEMs). Some companies sell the same product and/or different products to both end users and OEMs. While there was more interest in the export market among those that sell to end users, only three of the companies selling to OEMs were not exporting their products.

Percent of Companies Exporting

Sixty percent of the companies interviewed were already exporting their products. Some companies (the larger ones) had a worldwide network, but many were exporting only to Europe and the Middle East. Countries such as Singapore and Argentina (semi-industrialized) were mentioned in a number of cases. Only three companies reported that they export directly without the benefit of a local network. In most cases, the companies have established agents or dealers handling a country or region for them. Many of those interviewed said it was important to have people in the field who could provide service or other support to the buyers. The field people are often trained in the United States.

Below, the results of interviews with large, medium-sized, and small companies are presented.

Large U.S. Manufacturers

The larger U.S. companies have an established presence in many of the more advanced developing countries, and the largest ones, such as General Electric and Westinghouse, have an extensive marketing network that includes most developing countries. Interviews with representatives of some of the large U.S. companies indicate that they do not expect any loss of position in the world market. They generally believe that they are adequately reaching potential buyers in their major market areas and thus see little benefit in a directory. However, many of those interviewed noted that because of the low price suggested for participation in a directory, they would probably be interested in participating just to have their companies listed.

Medium-Sized U.S. Companies

Medium-sized equipment manufacturers have little or no experience in developing countries. Some of them have developed limited sales networks in Europe and in selected developing countries such as Korea and Singapore. However, most of these efforts appear to be the result of inadvertent domestic marketing; little investment has been made in export marketing activities. Those medium-sized companies interviewed in this study generally expressed interest in the export market but were not ready to spend a lot of money to pursue it.

Relatively many medium-sized U.S. manufacturers have established themselves in the domestic market with quality instrumentation and control products and service. There appears to be a ready market for many of these products in developing countries, but the companies have little knowledge about this market, and many have so far refrained from pursuing it. Many of the companies interviewed expressed an interest in a directory that would offer a means of exposure in developing countries at low cost.

Small U.S. Companies

Small companies showed little interest in a directory because they do not have the capability of responding to requests. Several of these companies are hard pressed to meet local demand, and although they see the export market as an attractive option for the future,

they prefer to concentrate on the domestic market at present. Their ability to handle the export market depends to some extent on the product and the need to provide installation and/or servicing or training. Some products need to be modified to meet foreign voltage/current requirements. Because of the many variations in these requirements, the companies saw them as a critical obstacle to the export market at this time. Small companies that have products that can be sent anywhere without modification or service were generally positive about participation in a directory.

TEST MARKETING

To further test the response of equipment suppliers to participation in an equipment directory, a one-page brochure was sent to 1,000 U.S. manufacturers. Various directories and energy publications were used to identify companies that manufacture energy-efficient equipment, particularly instruments and controls. The brochure (see Appendix E) briefly outlines the features, costs, and distribution plan of the directory. A return card was included with the brochure. A total of 12 cards were returned expressing interest in Volume I (instrumentation and controls) or future volumes. The interested companies are listed in Exhibit 1.e. Some of the 1,000 companies to which the brochure was mailed were telephoned to elicit additional responses. Of 85 calls, 43 people were actually contacted. Of those, five expressed interest in the directory. These companies are listed in Exhibit 1.f. Thirty-eight companies were not interested in the directory for various reasons:

- No budgeted funds for such a venture
- No interest in international sales and in some cases, no interest in LDCs
- No longer manufactured energy conservation equipment.

The conclusion from the feasibility study is that, while there is a need for a directory and some suppliers have expressed an interest in its usefulness, it is unlikely to be a viable commercial venture. Some subsidy or underwriting would be required to complete the necessary marketing and to publish a first edition. However, the merit of a directory and its potential for

Exhibit 1.e

Companies That Expressed Interest in the
Equipment Directory as a Result of the Test Mailing

1. Advanced Automation Concepts, Inc.
2. Atlantic Energy Technologies
3. Cogenic Energy Systems, Inc.
4. Dynatron, Inc.
5. Franklin Research Company
6. General Instrument Corporation, Energy Management Division
7. Kent Process Control, Inc.
8. Lutron Electronics Company, Inc.
9. Neotonics, NA
10. NSI Control Products
11. Parametrics
12. Sybron Corporation, Analytical Products Division

Exhibit 1.f

Companies That Expressed Interest in the Equipment
Directory as a Result of the Telephone Sample

1. Atlantic Solar Power, Inc.
2. Barber Coleman Company
3. Devar, Inc.
4. General Electric Company
5. Industotherm Industries

success suggest that subsequent editions would be able to pay for themselves.

SELECTION OF TECHNOLOGY

The rubric of "energy-efficient equipment" covers a wide range of technology. To limit this range, it was necessary to establish criteria for selection. Because a directory such as that being considered is intended for export promotion, the first criterion was the existence of an export market. This criterion eliminated large boilers and furnaces, which are usually manufactured locally. It also eliminated products, such as insulation, that are rarely exported. Another criterion was the existence of adequate demand. This criterion eliminated space heating equipment, as the target market is non-industrialized countries, most of which have tropical climates.

Even after the selection criteria were applied, a large number of products remained. To facilitate ease of dissemination and use, and still cover all relevant types of equipment, a multi-volume format was deemed appropriate.

The first volume of a directory should focus on the type of equipment that elicited the greatest interest on the part of both U.S. manufacturers and developing countries. From the experience of Hagler, Bailly personnel in some of the target countries, it was evident that instrumentation and controls were of major interest, while at the same time there were numerous U.S. manufacturers of this equipment. Thus, the study team concluded that the first volume of an energy-efficient equipment supplier directory should address instrumentation and controls.

The remaining types of equipment were grouped into seven volumes, which were then reorganized and consolidated into three volumes. The interest of manufacturers in these volumes is unclear. Some of the interviews with manufacturers at which instrumentation and controls were discussed also covered other types of equipment, and the response of those interviewed was mixed. It was thus not possible for the study team to determine priorities with respect to the three volumes.

DESCRIPTION OF PRODUCTS

An important objective of the directory was to provide guidance to the user on the important features and applications of the different product categories. This guidance would require a generic description for each category, to be followed by a description of each of the products in that category. The generic description (see Exhibit 2.a) should explain the range of applications; the range of product sizes and capacities; other information that indicates common features of the products; important information about installation, maintenance, and warranties; and a range of prices.

To obtain information on each product in a category, the study team concluded that a questionnaire should be completed by the manufacturer. Such a questionnaire would ensure that the product description covered the major characteristics needed for a directory. A manufacturer could submit its regular product literature to supplement the information in the questionnaire. However, the questionnaire would be necessary to obtain information of value to the prospective purchaser in a developing country. Among this information is:

- User programming requirements
- Voltage and current requirements
- Service needs/warranties
- Maintenance requirements
- Installation requirements
- FOB and/or installed cost
- Storage/backup capability
- Year product introduced
- Energy savings.

Exhibit 2.b contains product descriptions for two hypothetical energy management systems.

It would also be helpful for a directory to summarize the most important information about products in a matrix. Each matrix could be devoted to a product category and include all the products in that category. Such a matrix would enable users to compare the features of one product with another, to determine which best suits their needs and finances.

Exhibit 2.a

Sample Generic Description: Energy Management Systems

An energy management system is a microprocessor-, microcomputer-, minicomputer-, or computer-based system whose primary function is to optimize energy use in a building or process through the control of energy-using equipment. Energy management systems can be divided into three main categories: (1) microprocessor-based, controlling up to 60 points; (2) microcomputer-based, controlling up to 250 points; and (3) computer-based (central processing units), controlling from 200 to 3,000 or more points.

Exhibit 2.b

Preliminary Product Descriptions

<u>Product/model</u>	<u>Company/division</u>	<u>Product description</u>	<u>Cost/payback</u>	<u>Installation/warranty</u>
All purpose energy manager	Energy Corporation, Conservation Division	8-point system includes microprocessor, input/output card, battery backup, 24-key pad, RS 232 communications port, software relays. Expandable to 16 points. Time-of-day scheduling; duty cycling; demand control; optimum start; 48 holidays; controls air handling units, fans, motors, pumps, boilers, chillers, hot water heaters, interior and exterior lighting, single and multi-zone control; English programming with prompting; 4 analog inputs, 1 analog output, 8 to 16 digital outputs. System introduced in 1979.	\$800/installed point. Payback in 6 to 8 months.	Installation through manufacturer, user, or third-party contractor. 1 year parts and labor warranty. Maintenance contracts available.
Saver-system	AK Company, Systems Division	8-load system includes processor, software, relays, 2 temperature sensors. The four systems to choose from are: time-of-day scheduling only; TOD, duty cycling; TOD, duty cycling and demand limiting; or TOD, duty cycling, demand limiting, and optimum start/stop. All systems operate over existing power lines (power-line carriers). Can provide on/off control for boilers and chillers; security control optional. 10 binary output relays, 1 binary alarm output, 1 binary alarm input and 2 analog temperature inputs. Use English language promptings; expandable to 40 channels. Introduced in 1983.	Installed cost ranges from \$4,000 to \$8,500. Payback in 2 years.	Installation by contractor. 1-year warranty on parts and software. Service by installing contractor.

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INFORMATION ON COMPANIES

The study team concluded that all companies participating in a directory should be described in a special section. The information should include the size of the company, the scope of company operations, how long the company has been in business, where the company's products are manufactured, and other relevant information such as the company structure (if a parent company or divisions are to be identified) and major markets. For an additional charge, the participants could list their contact points, and whether -- for instance -- they are branch offices, sales representatives, or service facilities.

INDEXES

A directory should contain indexes that enable users to easily identify all of the products of a manufacturer or to search for products by type of application.

ADVERTISEMENTS

Participating manufacturers should be able to show their products in a directory by purchasing advertising space. The advertising space should be sold at market rates (see Exhibit 2.c for price list) and could be an important source of revenue for a directory. The price structure was developed from a survey of publications similar to the directory.

FINANCING GUIDE

An important element in a guide designed to promote exports is information about how a potential buyer can obtain financing for a purchase. A directory should include information about sources of financing for U.S.-made products.

LICENSING

There are many products that are not suitable for export or may have restricted entry in a number of countries. In these cases, the manufacturer may be interested in licensing local companies to produce the

Exhibit 2.c

Equipment Directory Advertising Price List

<u>Size</u>	<u>Black/white</u>	<u>Color</u>
Full page	\$2,500.00	\$3,000.00
2/3 page	1,900.00	2,250.00
1/2 page	1,700.00	1,950.00
1/3 page	1,250.00	1,400.00
1/4 page	900.00	1,100.00

product. The directory could note those products that are available for licensing.

QUALITY CONTROL

In developing a prototype volume of U.S. energy-efficient equipment for distribution primarily to developing countries, a key question is whether there should be quality control. The intent is to make the guide as comprehensive and reliable as possible. A listing in the publication should not be construed as an endorsement for the products described or advertised. The staff will review and/or write the description for completeness, clarity and accuracy, but they (or the publisher) cannot be liable for misinformation supplied. Large companies, with a known name and worldwide reputation, will tend to produce credible products. Nonetheless, even these products, if relatively new, may require servicing or may be defective. However, larger companies will be able either to repair the product on-site or replace it.

On the other hand, small- to medium-sized firms often have no service people "in country" or cannot quickly replace faulty equipment, or both.

Below, three options are discussed in connection with the problem of product reliability:

1. Use panels to review the products.
2. Do no screening of products or manufacturer.
3. Request references from the manufacturer or service provider.

Use Panels to Review the Products

This option would be expensive and time-consuming. The selection of panel participants with sufficient knowledge and no conflict of interest would be a difficult task, and the rejection of a product could lead to controversy.

Do No Screening of Products or Manufacturer

This option would not involve any personnel time or expense. An endorsement and liability disclaimer could be printed in the directory. However, it is possible that products with no proven track record would be included, purchased, and fail to deliver the service promised, thus causing a bad name for the directory.

Request References From the Manufacturer or Service Provider

In submitting a description of the product, the manufacturer could be requested to provide the names of two or three users of the equipment. The references would not be published, nor would they be checked. Thus, this option would require no more resources than the second option. If a manufacturer had no customer references, its product might be excluded. As manufacturers would list only satisfied customers, a disclaimer similar to that in the second option would be necessary. This type of quality control was used by the Consulting Engineer Council when it published a directory in 1983 containing major software sources and descriptions. Its directory contained product listings and advertising. During the feasibility study, when large and small manufacturers were asked about quality control and this option, none raised any objections.

The study team thus concluded that the third option, requesting references, would provide an adequate degree of quality control.

**PROFESSIONS OF INDIVIDUALS
TARGETED AS DIRECTORY RECIPIENTS**

The individuals targeted as potential directory recipients would be those that play important roles in decisions on what equipment to order and from what company. Among these individuals are engineers, architects, contractors, consultants, plant and building owners and managers, sales agents, and dealers. The experience of Hagler, Bailly, together with interviews with business leaders in a number of developing countries, indicates that engineers generally play the most important role in selecting the source of equipment. Agents and dealers would be interested in finding manufacturers to represent, manufacturers would appreciate help in soliciting inquiries, and architects would include energy systems in their building designs. The other groups might act as advisors for equipment purchasing or be part of the review process.

INSTITUTIONAL CHANNELS

The professional organizations representing prospective directory recipients could be used for directory distribution. In almost every developing country, there is at least a national chamber of commerce and industry that could act as the distributor. In the more advanced developing countries, there is generally a large number of professional associations. In some countries, all the engineers may be grouped in one association, while in other countries there may be associations for specific categories of engineers such as energy engineers. Other possible associations are those of plant managers, importers, and architects.

The U.S. Department of Commerce has surveyed its commercial officers in 40 developing countries to identify three or four local organizations that would be interested in distributing a directory. The findings from this survey suggest that in most of the countries, there are many associations that could provide assistance in distributing the directory. Commercial

officers in 25 countries have responded to the query and indicate that potentially as many as 141 professional and trade organizations based in these countries would be likely candidates to help with distribution.

From interviews conducted with local business leaders in several developing countries, it appears that some local organizations would be interested in distributing a directory as a service to their members and would undertake this task at their own expense. Alternatively, a directory could be distributed to these local organizations by U.S. government agencies or by American business associations in the developing countries.

The Deputy Director of International Programs for the American Chambers of Commerce said that he would expect field staff in a number of countries to agree to work on distribution of a directory, while in some countries staff might not be interested. There are AID energy specialists in a number of countries, and these people would be expected to help with distribution. AID has a full mission presence in 48 countries and has representatives in an additional 12 countries. There are also AID officers in five other countries (all in Africa). The Department of Commerce has a commercial officer in each of 40 developing countries, and many of them could be expected to provide assistance.

An operations officer at Commerce described the work that the commercial officers could do. They could identify the organizations for local distribution and arrange the necessary logistics and controls. They could coordinate their work with other U.S. agencies that might be helping with this effort. However, they could not be expected to do the actual clearing of directories through the port and through customs, nor would they physically handle directories.

MEANS OF SHIPMENT

Commercial Channels

If directories are sent out through commercial channels, they would have to be cleared through customs upon arrival. In some countries, customs clearance is a very laborious and time-consuming operation. There are numerous cases where shipments of books have taken many months to be cleared. For some countries, commercial

channels would be the only means of delivering directories. In these situations, directories should be addressed to someone in USAID, USIA, or the embassy. The embassy would have the task of processing the directories through the port and through customs.

Pouch

For some of the smaller, less developed countries, particularly in Africa, the number of directories would be so small that they could be sent through the diplomatic pouch. The Department of Commerce has said that it would handle them by pouch if the number was a dozen or less. In countries where there is no commercial officer, an AID or USIA official could be the addressee.

APO

Of the countries with an AID presence, 31 have APOs. The bulk rate for APO mail would be very low compared with sea freight through commercial channels. In a discussion with a representative of the State Department postal service, it was learned that the APO would handle even larger shipments (e.g., 2,000 copies to the Philippines). APO shipments do not need to be cleared through customs, so there would be none of the difficulties associated with the commercial shipments. Thus, APO should be used whenever possible.

COUNTRY-SPECIFIC PROCEDURE

The mailing and distribution strategy would vary by country. For commercial shipments, if no official U.S. agency is willing and able to do the necessary clearance work, it might be necessary to pay a local company to clear and deliver directories to one or more local organizations.

NUMBER OF COPIES BY COUNTRY AND WORLDWIDE

The major constraint in deciding on the number of copies to distribute would be the cost of printing and shipping. The number of copies would have to be high enough to reach an agreed minimum number of potential buyers and high enough to merit a reasonable price for product description space and advertising space. To

ensure the participation of U.S. manufacturers, a review of price/circulation data on domestic directories indicates that a minimum of 20,000 copies should be printed.

The number of countries that should receive a directory is indicated in part by the response received from the Department of Commerce's cable and in part by the level of participation that AID and other official agencies can provide; 20,000 copies would allow a distribution of 500 copies for 40 countries. Some countries, such as the Philippines and Brazil, might be able to absorb 1,000 to 2,000 copies, while some of the smaller, less developed countries of Africa might only be able to use 10 copies. Letters of inquiry could be sent to the local organizations identified in the Commerce cables requesting information about the number of potential users. If the letters indicate that more copies are needed, and if revenue shows that more copies can be printed and shipped, then the circulation could be increased. If the cable replies indicate that 20,000 would be too many, then the remainder could be sold in European and other industrialized countries.

LANGUAGES

To reduce costs, a directory should be printed only in English, which would represent some minor problems to users in Latin America and French-speaking Africa. However, in interviews with American manufacturers and from observation in the field, the study team learned that most literature on U.S. equipment is usually in English, which does not represent a major obstacle to sales. The literature would have considerable technical language, and many engineers and others involved in technical decisions on equipment have learned to use English. A directory should have some general guidelines in Spanish and perhaps in French, but these could be supplements inserted before shipment.

Another reason for an English-language directory is the fact that many of the participating companies do not have a capability to market in any other language. If inquiries come in another language, they might be able to have them translated, but many of these companies are not prepared to do an extensive level of work in other than English.

SOLICITATION OF INFORMATION FROM COMPANIES

If a decision is made to proceed with the project, additional marketing activities would be conducted and questionnaires sent to all interested companies. The questionnaires would be used to request technical information about each company's products and information about the company itself.

DATA ENTRY

When the completed questionnaires are received, the information should be keyed into a computer. A data base program should be developed for managing the data. The amount of custom programming needed would depend on the ways in which the data is to be put into the directory and on how the data would be used in the future.

TECHNICAL DESCRIPTIONS

When all information has been obtained, generic descriptions can be written for the product types, with a discussion of similarities and differences within a product category. Also included can be the applications for these products and other information that would guide a potential buyer.

EDITING/TYPESSETTING

The text should be edited on the computer and then transmitted to the typesetting machine. The system should be automated to the maximum extent possible. It might be possible to use the typesetting facilities of a local company that rents the equipment for its own directories. The cost of using this equipment would be considerably less than the cost of a commercial typesetting house.

PRINTING

Three printing options would be available: local, out-of-town, and off-shore printing. Local printers generally do not handle the large number of copies that would be needed (20,000); their equipment is mostly geared to high-quality printing for small to medium-sized orders. A quote from a selected local printer for only 1,000 copies was double the quote of an out-of-town printer for 20,000 copies. Although the quality of a local printer may be higher, the out-of-town printer would use bulk printing techniques that lower costs. It might be even less expensive to use an off-shore printer (no quotes were obtained), but shipping would be complicated and shipping costs higher. The best option would appear to be the out-of-town printer.

COST

Printing costs are estimated at \$35,000. The typesetting cost estimate of \$35/page is based on quotes from a commercial typesetting house. Although a directory would be unlikely to exceed 200 pages, production costs are based on 300 pages for contingency purposes.

The data entry and technical description tasks should be grouped together, as the text would be written directly on the computer/word processor at an estimated rate of \$30 per hour; the actual cost may well be less. The time allotted these tasks -- 2 hours per page -- also builds in a margin of safety.

The project would require additional marketing to that done during the feasibility study, and the costs would vary depending on the response rate. The major costs would be the time spent on telephone marketing and using the telephone to fill information gaps for data entry.

Editing/typing is estimated at one hour per page, although the actual figure may prove to be less, especially if the technical descriptions are written on the computer/word processor. The estimated cost per hour -- \$20 -- is also high.

Production should be supervised by a manager who may have other responsibilities at the same time that he or she is managing the directory project. Management time was estimated at 3 months, with a fully burdened daily rate of \$600.

Shipping costs are based on an average of \$1.50 per a 1-pound directory. The average cost of shipping 500 books by boat using wooden crates and including shipment to the port and port costs for a sample of three countries (Indonesia, Peru, and Zaire) came to \$2.00 per book. However, 27 countries are covered by APO and many other smaller countries can be serviced by diplomatic pouch if only 10 or 12 copies are to be sent.

The average cost for APO is likely to be between \$0.25 and \$0.50 per pound.

The total cost for producing and distributing a directory at current prices (production would be expected to occur in 1984) would be \$191,504 (see Exhibit 5.a).

REVENUE

Revenue calculations were based on a breakeven rate to cover the cost described above. To reach this revenue level, a total of 77 companies would have to subscribe, paying an average of \$2,000 each for product descriptions. This average comes to approximately 5.7 products per company, assuming each description is 200 words. The 77 companies would also need to list 3.25 contact points, and 13 companies would need to buy a full page of advertising.

Some of the larger companies are expected to participate, but would probably not pay more than \$5,000 in total. If eight such companies participate, they would provide approximately 20 percent of the revenue.

Medium-sized companies are likely to play the major role in supporting a directory. Some would pay as much as \$5,000, but many would probably enter only one or two products and neither advertise nor list contact points aside from headquarters.

There are various ways in which the number of companies and the size of purchase could combine to reach the breakeven level (see Exhibit 5.b).

Exhibit 5.a

Cost Estimates for Directory
(20,000 copies, 300 pages)

Printing	\$35,087	
Typesetting	10,500	
Shipping	<u>30,000</u>	
Sub-total	\$85,587	\$85,587
Marketing	\$10,000	
Analysis	18,000	
Typing/Editing	6,000	
Management	<u>40,000</u>	
Sub-total	\$74,000	<u>\$74,000</u>
Total		\$159,587
Contingencies 20 percent		<u>31,917</u>
Total cost of directory		<u><u>\$191,504</u></u>

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Exhibit 5.b

8 large companies @ \$5,000 \$40,000

15 medium companies

Each company:

5 products @ \$350	=	\$1,750
2 products @ \$270	=	540
10 contact points @ \$20	=	200
1 full page ad b/w	=	<u>2,500</u>

Total \$4,990 x 15 = \$74,850

40 medium companies

Each company:

3 products @ \$275	=	\$825
4.5 contact points @ \$20	=	90
no ads	=	<u>0</u>

Total \$915 x 40 = \$36,600

80 medium and small companies

Each company:

2 products @ \$200	=	\$400
no contact points	=	0
no ads	=	<u>0</u>

Total \$400 x 80 = \$40,000

Overall total \$191,450

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Appendix A **LIST OF MANUFACTURERS INTERVIEWED** **A.1**

1. Ametek, Inc.
2. Andover Controls
3. Bailey Controls Corporation (McDermott Inc.)
4. Barber-Coleman Company
5. Beckman Instruments, Inc. (Smith Kline/Beckman Corporation)
6. Bionicontrol Corporation of America
7. Distributed Control Systems, Inc.
8. Eaton Corporation
9. Fisher Controls International, Inc. (Monsanto Company)
10. The Foxboro Company
11. General Electric Company
12. GTE Products Corporation
13. Hewlett-Packard Company
14. Honeywell, Inc.
15. Johnson Controls, Inc.
16. Leeds and Northrup Company (General Signal Corporation)
17. Measurex Corporation
18. Milton Roy Company
19. Robertshaw Controls Company
20. United Technologies Building Systems Company
21. Westinghouse Electric Corporation

Appendix B

MATERIAL SENT TO
MANUFACTURERS INTERVIEWED

B.1

Dear _____:

As I indicated in our recent conversation, Hagler, Bailly & Company has undertaken a study to determine the preliminary feasibility of establishing a private-sector initiative to create an energy equipment inventory guide for developing countries. The reasons for doing so are many, but some background on the need may be helpful.

In a soon-to-be published World Bank report, Hagler, Bailly & Company estimated that developing countries will spend approximately \$50-125 billion during the period 1984-1995 on energy conservation investments for the industrial sector. If the building and transportation sectors are included, the figures climb to \$70-150 billion. Of this amount, equipment imports from industrialized countries will reach \$40-80 billion, of which U.S. companies could potentially capture a major portion.

The demand for equipment results from comprehensive audit programs sponsored in part by the World Bank, Asian Development Bank, and others. From these audits, specifications have been developed and a need has arisen for detailed information on available equipment and services. It has become obvious that the type of information available to the potential purchaser will preferentially bias the purchase decision to the countries and companies who have provided the appropriate information to the purchaser in a timely manner. Indeed, countries such as the United Kingdom have provided energy equipment directories for these export markets. Regrettably, information on U.S. equipment is unavailable from selected manufacturers or unavailable in a form that can be readily used.

Thus, a need exists for such an equipment inventory guide, which can be made available to the right people, in the right place, at the right time, to ensure consideration of U.S. equipment purchases. However, there are many issues that must be considered prior to the preparation of this equipment directory, and a feasibility study is needed to analyze these issues prior to a commitment to proceed.

Three issues are crucial to determine the viability of such a project as a private-sector initiative:

1. Is there a need for such a guide as perceived by both buyers and sellers? (Hagler, Bailly & Company is proceeding independently to evaluate the need for such a document from the buyer's perspective).
2. How will the equipment guide be financed? Given a need, how much would sellers be willing to pay to have their products represented in the guide, and what pricing techniques seem most reasonable (e.g., subscription, advertising, combination)?
3. What topics should be covered in the first guide and any future guides, and what are perceived to be the high priority items?

Other important issues include language, format, and detail of presentation, which will need to be analyzed. For the purposes of this study, we intend to use the instrumentation and control category as a prototype model to develop and explore the feasibility of the concept.

As a major supplier of energy conservation equipment to the international market, your views would be most helpful in answering the feasibility questions noted above. Any information that you can provide would be appreciated. Your input would not be attributed, unless you wish otherwise.

The enclosed preliminary discussion paper will provide some additional detail. The paper should be regarded as a straw man, which we hope you will critique.

We look forward to your participation in this study; I will contact you in the next week or two to obtain and discuss your comments.

Sincerely,

Howard Hagler

Enclosure

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(as of 2/7/84)

**PRELIMINARY DISCUSSION PAPER FOR A DIRECTORY OF
ENERGY EQUIPMENT FOR NON-INDUSTRIALIZED NATIONS**

1. Need

In the course of providing energy-related technical assistance to developing countries, Hagler, Bailly & Company has found a serious shortage of information about U.S.-manufactured energy equipment. There are no existing resources readily available to provide such information in an effective manner. However, other countries such as the United Kingdom and France distribute energy equipment directories for their own market development.

The U.S. domestic market has a plethora of directories. Some are exclusively devoted to energy equipment, while others include energy equipment as a component; the Thomas Register is perhaps the best known. For a company located in a developing country and interested in specific types of energy equipment, however, the Thomas Register is unwieldy to use and lacks the detail necessary to pinpoint the best equipment producers and facilitate contact with them. The limitations of other existing equipment directories are related to their range of equipment, the number of companies covered, the type and amount of information provided, and mix of U.S. and foreign companies.

Key Questions

1. Would the proposed directory fill a need to promote the use of U.S.-manufactured equipment?
2. If not, why not?

2. Format, Organization, and Content

The directory will be organized by type of equipment. Its structure will include a brief description of the equipment that will be supplemented by an index of companies. The index will include pertinent information about each company and a list of contact points. Information will also be provided on channels of communication that can be used to reduce the cost and effort of establishing contact with selected U.S. manufacturers.

The directory will be published as a series of volumes. The prototype volume, which will be devoted to instrumentation and controls, was chosen because of the strong demand for these products, the large number of U.S. products and producers, and the wide range of product

use. Future volumes will be defined during the feasibility stage, but are expected to include other equipment and components such as heat exchangers, electric motors, heat recovery systems, and cogeneration systems. The product listings in the directory will be organized in a format like that shown in Exhibit 1.

Key Questions

1. What is a minimum, and yet a reasonable, amount of space to describe the product?
2. Should price be included?
3. Should descriptions be in English or metric measures, or both?
4. Is the product listing format (Exhibit 1) reasonable for the instrumentation and control area?
5. Should service contacts be included?
6. What type of quality control, if any, should be exercised in selecting products for inclusion in the directory?
7. What additional topics, in order of priority, should be covered by subsequent directories?
8. What should be the revision period (e.g., 6 months, 1 year, longer)?

3. Distribution

Assuming revenues will be adequate to offset costs, the energy-efficient equipment directory will be produced and distributed free in developing countries. Recipients will be chambers of commerce, trade associations, and major companies such as A&E firms, industrial companies, and contractors. Distribution will be throughout Asia, Africa, and Latin America, with the exception of countries not trading with the United States. The directory may be available for sale in industrialized countries. Copies will be printed in English, with the probability of French and Spanish versions as well.

Key Questions

1. Should a private organization be completely responsible for distribution? Should the organization be profit or non-profit, or does it matter?

2. What language(s) would be desired, in order of preference?
3. Rank areas of greatest importance and specify countries of greatest interest: Caribbean, Latin America, Africa, Middle East, Asia.
4. What are benefits for distribution to industrialized nations?

4. Revenues

As a private-sector initiative, revenues must be adequate to cover costs. Revenues would be derived from manufacturers whose equipment was included in the directory, either through subscription for minimum coverage, specified price for line(s), advertising, or a combination of all.

Key Questions

1. What would you be willing to pay for the initial directory, for topics covered by your company, and for periodic updates?
2. What would be the preferred pricing technique?
3. Is there a upper dollar limit, and how was it determined (e.g., perceived benefits, competitive factors)?
4. If the private sector cannot provide all of the required funding, would government participation be acceptable? Should there be limitations on government participation?

Exhibit 1

1. Energy Management Systems

1.1 Buildings

1.2 Industrial Processes

2. Controls

2.1 Temperature

2.2 Electrical

2.3 Flow

2.4 Combustion

2.5 Lighting

2.6 Other

3. Instruments

3.1 Portable

3.1.1 Temperature

3.1.2 Electrical

3.1.3 Flow

3.1.4 Combustion Efficiency Measurement

3.1.5 Light Level

3.1.6 Energy Measurement

3.1.7 Other

3.2 Fixed (Integral)

3.2.1 Temperature

3.2.2 Electrical

3.2.3 Flow

3.2.4 Combustion Efficiency

3.2.5 Energy Measurement

3.2.6 Other

1. Alban Engine Company
2. American Auto Matrix
3. American Schack Company, Inc.
4. American Stabilis Inc.
5. Atlantic Energy Technologies
6. Atlantic Solar Power
7. Automatic Switch Company
8. Boland Trane
9. Clark Reliance Company
10. Cogenics Energy Systems
11. Controlatron Corporation
12. Corning Glass Works
13. Dranetz Technologies Inc.
14. E.I.L. Instruments
15. Flec Systems
16. Functional Devices Inc.
17. General Electric Company
18. Industrial Boiler Company
19. Inframetrics Inc.
20. Johnson Controls Inc.
21. Lear Siegler Inc.
22. Leviton Manufacturing
23. Lutron Electronics
24. Manville Products Corporation/Holophane Division
25. McDonnell Douglas Corporation
26. Novitas -- Light-O-Matic
27. Ogontz Controls
28. Ormat
29. Pacific Technology Inc.
30. Square D Company
31. TRW
32. TVA/Investment Recovery Project
33. Tech/S
34. Thermo Electron Corporation
35. Thermo Management Associates
36. Thermocycle International Inc.
37. Touch-Plate International
38. Tour & Andersson Inc.
39. Trimax Controls
40. Vestas North America Ltd.
41. Viatran Corporation
42. Zond

**DIRECTORY OF ENERGY-EFFICIENT EQUIPMENT
FOR NON-INDUSTRIALIZED COUNTRIES**

Hagler, Bailly & Company, an energy consulting firm in Washington, DC, is studying the feasibility of producing a directory of American-made energy-efficient equipment for export promotion.

There is currently a serious shortage of information available in the non-industrialized countries to inform potential buyers about U.S.-manufactured energy-efficient equipment. This market is estimated at roughly \$40 billion to \$80 billion. The U.S. domestic market has a plethora of directories, but they are not suited to the needs of export promotion.

While the need for a specialized directory is clear, there remain many questions about U.S. company interests, the means of participation, energy equipment priorities, and distribution.

The first volume has already been selected: instrumentation and controls. These products were chosen because of the strong demand for them and the large number of U.S. products and producers. Some subjects under consideration for future volumes are heat exchangers, electric motors, heat recovery systems, renewable energy equipment, and cogeneration systems.

The current evidence indicates a need for widespread distribution of a sufficient number of copies (20,000 to 50,000) to get them into the hands of the most likely buyers. This feasibility study is being conducted in the United States and also in non-industrialized countries of Asia, Latin America, and Africa. The information needed from U.S. manufacturers pertains to both marketing and technical matters.

Marketing

- General:
 - What percentage of your products are sold directly to end users?

- How long have you been exporting? To where?
- How is your export marketing operation organized:
 - a. at home?
 - b. abroad?
- Do you service your products outside the United States?
- Are you satisfied with your market penetration in non-industrialized countries?
- Among your products, what are your priorities for export promotion?
- For directory:
 - If a listing were priced at between \$100 and \$400 (a listing will consist of a paragraph describing the product, plus inclusion in summary tables), how many products would you list?
 - a. instrumentation and controls
 - b. other
 - Would you be interested in purchasing advertising space (at market rates)?

Technical

- Given a potential market in which the buyer (a technical person) is not familiar with your product, what characteristics would you highlight to demonstrate its:
 - a. technical capabilities?
 - b. advantages over similar products?
 - c. operating limitations?
- What are the 5-10 most important features of your product and of this product category in general?
- Is this information readily available in product literature, or will it require a special description?
- Can the product be installed by a technical person using accompanying instructions, or is special training required?

- Can the product be serviced:
 - a. on-site?
 - b. in-country at a service center?
 - c. only by the manufacturer?

- If applicable, do you have reliable information on the energy saved in kW, Btu, kcal, and the payback period?

Appendix E

**BROCHURE: "ANNOUNCING A DIRECTORY
FOR ENERGY EFFICIENCY EQUIPMENT" E.1**

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INTERNATIONAL GUIDE AND DIRECTORY FOR U.S. ENERGY-EFFICIENT EQUIPMENT

The market for energy conservation equipment in developing countries is large and growing. However, detailed information on U.S.-made products is generally not available to the people responsible for deciding what equipment to buy. Thus, American manufacturers are at a disadvantage in many countries in Asia, Latin America, the Middle East, and Africa.

To help U.S. companies boost their share of a market estimated at \$40-\$80 billion over the next 10 years, Hagler, Bailly Company is publishing a directory of energy-efficient equipment for use by decision-makers in developing countries around the globe.

The directory will consist of several volumes each devoted to a particular type of equipment or system. The first volume focuses on instrumentation and controls. Each volume, organized by product type, will provide potential buyers with the basic information they need to initiate discussion with suppliers.

Among the features of the directory are:

• An introduction to each product category that describes the range of products available

• A paragraph of up to 300 words providing the technical specifications of each product, its potential energy savings, payback period, and service requirements

• A matrix to highlight the important technical features and major applications of each product

• A brief description of each company

• Advertisements

• A mailer that potential buyers can use to request additional information.

DISTRIBUTING THE DIRECTORY

How many copies?

A minimum of 20,000 copies of each volume will be distributed. The number of copies going to each country will depend on estimates of the size of the energy equipment market and the number of potential users.

Who will distribute the copies?

• Local professional and trade associations

• Chambers of commerce and industry

• Ministries of energy and industry and other public agencies

• In-country U.S. business and government trade representatives.

Who will receive copies?

The targeted recipients will be those individuals in industry and the building/construction services who make decisions on equipment purchases, and those who are involved in the marketing and local manufacturing of relevant equipment. Recipients will include engineers, architects, contractors, consultants, plant owners/managers, sales agents, dealers, and local government energy officials.

What will it cost users?

The directory will be distributed without charge in developing countries.

OBTAINING A DIRECTORY ENTRY

To participate in the directory, a company will be asked to provide a brief description of each product (or product series) and complete a questionnaire on the following types of information:

- User programming requirements
- Voltage and current requirements
- Service needs/warranties
- Maintenance requirements
- Installation requirements
- FOB and/or installed cost
- Storage/backup capability
- Year of product introduction
- Energy savings achieved.

In lieu of providing a description of the product(s) in up to 300 words, a company may submit the technical specifications, from which Hagler, Bailly will prepare the description. Subscribers can review their text for final approval.

Companies wishing to participate in the directory will be asked to supply the names of at least three users of the product(s) to be listed.

COST

Inclusion in the directory will consist of:

- A product description providing technical, cost, payback, and servicing information
- A matrix of product features
- A 50-word description of the company.

Each subscriber will receive five free copies of the volume. Additional copies may be purchased at a nominal cost.

The cost of participation will depend on the length of the description of each product, and the number of products listed.

For the first 100 words, the cost is \$200. For each additional 50 words, the cost is \$75. There is a 300 word limit for each product description. There is a quantity discount of 15 percent for orders over \$2,500, excluding advertising.

Companies that wish Hagler, Bailly to prepare the product description(s) should specify the desired length of the description(s).

The headquarters of each participating company will be listed without charge in the directory, but there will be a \$20.00 charge for listing foreign officers, agents, dealers, or other contacts.

The rates for advertising are given below:

<u>Size</u>	<u>Black/white</u>	<u>Color</u>
Full page	\$2,500.00	\$3,000.00
2/3 page	1,900.00	2,250.00
1/2 page	1,700.00	1,950.00
1/3 page	1,250.00	1,400.00
1/4 page	900.00	1,100.00

Prices subject to change without notice. The publication of each volume is dependent upon obtaining a viable number of subscribers.

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OUTLINE OF VOLUME ONE: INSTRUMENTATION AND CONTROLS

1. Instruments for Diagnosis and Measurement

- Temperature measurement (1.1)
 - Liquid-in-glass thermometer (1.11)
 - Dial thermometer (1.12)
 - Thermocouple (1.13)
 - Pyrometer (1.14)
- Electricity measurement (1.2)
 - Amperage meter (1.21)
 - Voltage meter (1.22)
 - Wattage meter (1.23)
 - Power factor meter (1.24)
- Flow measurement (1.3)
 - Pitot tube (manometer) (1.31)
 - Velometer (1.32)
 - Ultrasonic flow meter (1.33)
- Combustion efficiency measurement (1.4)
 - Chemical efficiency analysis (1.41)
 - Electromechanical (combustion computer) (1.42)
 - Smoke test (1.43)

- Light level measurement (1.5)
- Energy measurement (1.6)
- Pressure measurement (1.7)

2. Controls

- Temperature controllers (2.1)
- Electricity controllers (2.2)
- Flow controllers (2.3)
- Combustion controllers (2.4)
- Lighting controllers (2.5)

3. Energy Management Systems

FUTURE VOLUMES

Among the types of equipment to be addressed in future volumes are:

- Boilers and burners
- HVAC equipment
- Gasifiers
- Electric motors
- Pumps, compressors, turbines
- Engines, generators
- Cogeneration systems
- Heat exchanger.

COMPANIES IN THE TEST MARKET
MAILING THAT RECEIVED FOLLOW-UP
TELEPHONE CALLS

Appendix F

F.1

Academy Metal Products Company
Alban Engine Power Company
American Auto-Matrix, Inc.
American HV Test Systems, Inc.
American Stabilis, Inc.
Amprobe Instrument Company
Amsted Industries, Inc.
Anoted Industries, Inc.
Analog Devices, Inc.
Analogic Corporation
Analytical Products Company
Andover Controls Corporation
Anger Scientific Company, Inc.
Anter Laboratories, Inc.
Astro Metallurgical Corporation
Athena Controls, Inc.
Atlantic Research Corporation
Atlantic Solar Power, Inc.
Barber-Coleman Company
Bard Electronics, Inc.
Brooks Instrument Division
Butler Manufacturing Company
Carlisle Gas Burner Corporation
Clark Reliance Corporation
Combustion Engineering (formerly Bendix Corporation)
Combustion Service & Equipment Company
Computer Controls Corporation
Computer Sciences Corporation
Continental Resources, Inc.
Control Pak Corporation
Controlled Environment Systems, Inc.
Controlotron Corporation
Corning Process Systems
Data Precision Division
Davidson Pipe Supply Company, Inc.
Decker Reichert Steel Company
Devar, inc.
Distributed Control Systems, Inc.
Dranetz Engineering Laboratory, Inc.
Dunham-Bush, Inc.
Electronic Control Systems, Inc.
Enercon Data Corporation
Energy Management Corporation

**COMPANIES IN THE TEST MARKET MAILING
THAT RECEIVED FOLLOW-UP TELEPHONE CALLS**

F. 2

Farrand Controls
Foxboro Jordan
Functional Devices, Inc.
GSE, Inc.
General Electric Company, Inc.
General Metals Technologies
Heat Timer Corporation
Henry Pratt Company
Hewlett-Packard Company
High Voltage Engineering Company
Industotherm Industries, Inc.
Industrial Boiler Company, Inc.
Inframetrics
Intercole, Inc.
Ipac Group, Inc.
Iron, Inc.
Jewell Electrical Instruments, Inc.
Katy Industries, Inc.
LECO Corporation
Leeds and Northrup Company
Leviton Manufacturing Company, Inc.
Lewis Engineering Company
Litton Facilities Management Systems
Lutron Electronics Company, Inc.
MCC Marpac
Margaux Systems, Inc.
Marlin Manufacturing Corporation
Maxon Corporation
Mickle-Milnor Engineering Company of Virginia
Midland Pipe and Supply Company
North American Manufacturing Company
Radix II, Inc.
Rolock, Inc.
Solid State Systems, Inc.
Square D Company
TECHS
Tano Corporation
Thermo Electric Instruments Division
Tour and Andersson
Tritec, Inc.
Vending Components
Viatran Corporation
Viz Manufacturing Company

Bangkok, Thailand:

- Asian Institute of Technology
- ASEAN Energy Project
- Bangkok Weaving Mills Company
- Siam Cement Company
- Thailand Chamber of Commerce and Industry
- Bangkok Bank
- Commerce and Industry Division, Ministry of Foreign Affairs
- U.S. Embassy.

Kuala Lumpur, Malaysia:

- Malaysia Industrial Development Authority
- Ministry of Science, Technology and Environment
- American Business Council
- U.S. Embassy.

Singapore:

- U.S. Embassy
- Development and Building Control Division, Ministry of National Development
- Technonet Asia
- Asia Pacific Division, General Electric Company (USA)
- Faculty of Architecture and Building, National University of Singapore.

Manila, Philippines:

- Small and Medium Scale Industries, Ministry of Trade and Industry
- ASEAN-U.S. Business Council
- Philippine Chamber of Commerce and Industry
- Philippine Appliance Corporation
- National Science Technology Authority
- Philippine Federation of Food Processing Industries
- Republic Flour Mills.

Djakarta, Indonesia:

- U.S. Embassy
- LIPI Technical Institute
- Department of Industry
- P. T. Upjohn Indonesia
- American Business Council.

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