

US Department of Energy's Motor Challenge: Developed with Industry for Industry

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Synopsis

The U.S. Department of Energy's Motor Challenge Program is an industry/government partnership that works with existing market structures to promote industrial energy efficiency through the use of energy-efficient electric motor systems. This program model is constantly evolving to more effectively respond to industry needs.

Abstract

Motor-driven equipment accounts for more than 70% of all electricity consumption by U.S. industries. The U.S. Department of Energy's (USDOE) Motor Challenge Program was launched in 1993, with the twin aims of increasing the energy-efficiency of electric motor-driven systems in domestic industry and enhancing environmental quality. The program is an industry/government partnership that promotes industrial energy efficiency through the use of energy-efficient electric motors, drives and driven equipment, and effective motor-driven system integration and optimization. Through these efforts, USDOE's Motor Challenge seeks to save 5 billion kWh of electricity per year and 1.2 million metric tons of carbon equivalent (MMTCE) by the year 2000.

Program offerings include: the Information Clearinghouse, which provides up-to-date information about the practicality and profitability of electric motor system strategies; design decision tools, such as MotorMaster+ software; Showcase Demonstration projects; training; workshops, and conferences. While these offerings offer solid technical information on the benefits of energy efficient motor-driven systems, the methods devised for 1) getting information to industrial end-users and 2) adding new information and services to the program portfolio clearly illustrate the program's theme- "developed with industry for industry."

The Motor Challenge Program recognizes the benefits of working with the existing marketplace of companies and organizations that routinely provide products and services to industrial users of electric motor-driven systems. This market-driven approach requires a delicate balance between conveying the program message of energy efficiency and the commercial interests of companies delivering (and in some cases, developing) the message. To deliver the program message, Motor Challenge recruits suppliers, distributors, utilities, state agencies, consulting engineers, and others as Allied Partners. The Allied Partner effort has been highly successful in recruiting companies interested in working with Motor Challenge as a way to provide an added benefit to their customers. This paper will include examples of how Allied Partners use Motor Challenge publications and decision tools in communicating with industrial end users in the course of their daily business or in conjunction with customer education meetings or workshops. In addition, an emerging initiative under Motor Challenge, the Excellence Partner program, will be described. This initiative is designed for companies that commit to undertake efforts aimed at continuous improvement of their motor systems management practices.

The current portfolio of educational materials, workshops, and software tools available through Motor Challenge focus primarily on energy-efficient motors and drives. To broaden the scope of program offerings to include motor-driven equipment such as air compressors, pumps, and fans and blowers, Motor Challenge is forming Industry Partnerships. These partnerships can include: industrial trade associations, energy providers, efficiency experts, and industrial end-users and are formed for the purpose of developing new educational products, materials, and services. Examples of successful collaboration will be provided along with an analysis of key elements and lessons learned.

Issues concerning use of the Motor Challenge program model in other countries will also be discussed.

Background

US industry spends over \$30 billion (US) annually on electricity dedicated to motor-driven systems; a large portion of this cost is associated with pumps, fan and blowers, and air compressor systems. To date, most public and private-sector efforts to improve motor system energy efficiency have focused on the motor, rather than other individual motor-driven system components or, more importantly, on the system as a whole. With the implementation of the Energy Policy Act of 1992 (EPACT), general purpose, polyphase, single speed, squirrel-cage induction motors manufactured for sale in the US and rated from 1-200 hp must meet minimum efficiency standards as of October 1997. At least 50% of all 1-200 hp polyphase motors sold will be affected by this regulation. Although improvements in motor efficiency beyond these efficiency standards, as described in National Manufacturers Association (NEMA) standard 12-10, are clearly possible, economic returns on further increases in motor efficiency appear to be diminishing. However, very attractive savings opportunities exist from efficiency improvements to motor-driven systems.

Twenty percent of all US electricity is used to operate industrial motor-driven systems. The potential savings in system improvement opportunities are very large - over 100 billion kwh/year energy savings and \$3 billion (US) annual energy cost savings opportunity with existing and new technology by 2010 (or 10% of the total energy cost of industrial motor-driven systems). System improvement opportunities may include: improved sizing and proper matching to load, use of more efficient drive trains, improved system layout, updated and well-maintained controls, improved operation and maintenance, and use of adjustable speed drives (ASDs).

A “systems approach” seeks to increase the efficiency of electric motor systems by shifting the focus from individual components and functions to total system performance (see Figure 1). New market transformation initiatives that encourage behavioral change and infrastructure development play an important role in achieving this shift. Motor Challenge is an industry/government initiative that uses market forces to promote a systems approach to the design, purchase, installation, and management of electric motor-driven systems. Program objectives, in addition to improving industrial energy efficiency, include enhancing manufacturing productivity, and reducing energy-related greenhouse gas emissions.

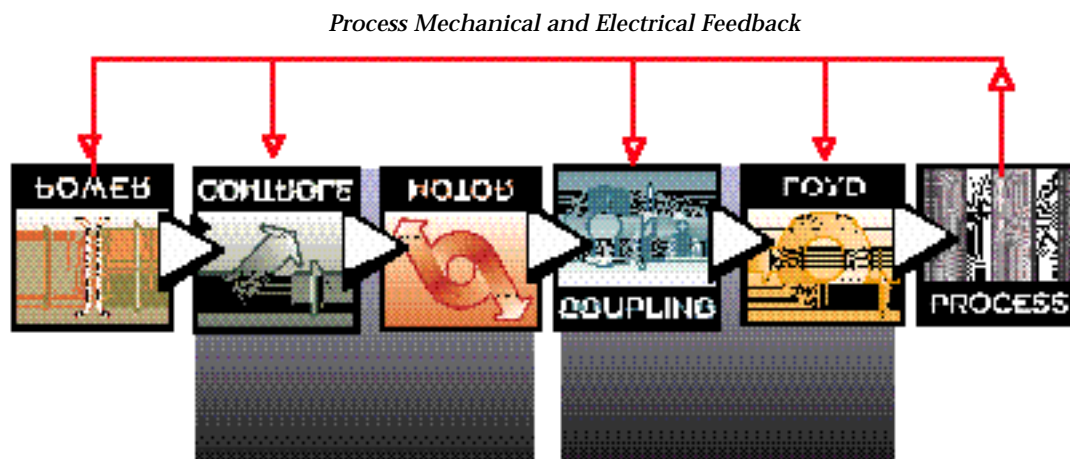


Figure 1: Motor system diagram

Developing a Federal Program Response

Beginning in 1992, US DOE Office of Industrial Technologies (OIT) sought to design a program that promoted increased energy efficiency of motor systems and was responsive to industry needs. The Motor Challenge pro-

gram evolved from a series of events that presented industrial end-users and the companies that serve them with a unique opportunity to share in and help shape the program. The result is a program “designed with industry for industry” that relies extensively on existing market forces to bring program messages to the industrial end-user¹.

Pivotal events in creating the Motor Challenge program included the following:

- National Energy Efficient Electric Motor System Conference, cosponsored by USDOE and the Electric Power Research Institute (1993)
- Roundtable on Efficient Electric Motor Systems for Industry (1993)²
- Roundtable on Market Transformation Strategies for Industrial Electric Motor Systems (April 1995)³
- Two-hour national telecast “Efficient Motor Systems: Strategies for Success” (May 1995)
- National Conference “Motor Challenge ‘95: Gaining the Competitive Edge” (Sept 1995)
- Publication of “National Market Transformation Strategies for Industrial Electric Motor Systems⁴”
- Focus groups in late 1995 with industrial end-users and the companies that serve them

Participants in these events included representatives from: large users of industrial motor-driven systems; manufacturers and distributors of motors, drives, pumps, air compressors, fans and blowers, controls, and related equipment; industrial trade associations; utility companies; consulting engineers; and state and federal government.

Three overarching Motor Challenge program objectives resulted from this industry interaction: to develop market pull for energy efficient motor systems; to maximize the best-practice technology through system/performance optimization; and to implement and improve motor system management systems.

Findings emerging from these industry interactions that strongly influenced program strategies included:

- many industrial end-user companies expressed a preference for USDOE as an unbiased source of information on energy efficiency;
- to be attractive to industrial firms, any message on energy efficiency must be linked with productivity and competitiveness;
- both industrial end-users and the companies that serve them encouraged use of existing market actors (utilities, distributors, consulting engineers) to carry the message on energy efficient motor systems
- many companies, particularly manufacturers of motor-driven equipment, had very limited experience with interactions with the Federal government, but perceived such interactions as potentially beneficial to their business
- companies felt that the program had to quickly reveal its value and substance for industry; companies indicated a strong preference for reliance on case studies and products (decisionmaking tools, training, printed materials); and
- the message must be tailored to a variety of decisionmaking levels: plant engineers, consulting engineers, chief executive officers (CEOs) and chief financial officers (CFOs), and maintenance staff all have a role in the design, purchase, operation and maintenance of industrial motor systems⁵.

Program design

Strategies

The most significant feature of the Motor Challenge Program is that its design is incremental and constantly evolving to more effectively meet industry needs. While the essential goals and purpose of the program have been established, the methods of achieving those goals (through program offerings and partnerships) are fluid and more strongly allied with changing needs of industry than with any bureaucratic archetype. The program began in 1993-94 with three initial offerings: showcase demonstrations, MotorMaster software, and the Information Clearinghouse. As additional program offerings were developed and the ongoing dialogue with industry matured, a program structure emerged to deliver the program message within existing market mechanisms. This structure includes: Motor Challenge Partners, Allied Partners, Excellence Partners, and additional industry part-

nerships (See Table 1). Both the program structure and offerings will continue to evolve as participation grows and content expands. The long-range goal of the program is to develop an industry focus on energy-efficient motor systems that is so multi-dimensional and embedded in daily business practices that it possesses a life and vitality of its own. It is only then that true market transformation will have been achieved.

The program's market-driven approach requires a delicate balance between the need to change existing behavior and the desire to work within existing, and potentially resistant, market structures. A clear recognition that all parties bring their own agenda to the table is an essential first step to identifying points of common interest and opportunity. The inherent tension between conveying the program message of energy efficiency and the commercial interests of companies delivering (and in some cases, developing) the message must be recognized, discussed, and resolved through program guidelines and oversight. Working within the market can be rewarding and cost effective, but the need to recognize differing interests is essential to avoid seriously compromising the program message.

Building partnerships also enables the program to develop a very broad reach with a modest level of support from USDOE. For example, Allied Partners are not paid to use program offerings or to promote more energy efficient motor-driven systems; they choose to participate for sound business reasons. Similarly, trade associations involved in cooperative product development contribute substantial amounts of members' time, expertise, and other resources in exchange for positive exposure for the organization and the industry that they represent.

Program Offerings

The *Information Clearinghouse* is the central point for accessing the wide array of products and services available through the Motor Challenge program. Clearinghouse staff include experts in motor system specification, design, and maintenance who are available by toll-free telephone to provide information and advice. Electronic resources include: the Motor Challenge WorldWide Web site [<http://www.motor.doe.gov>], databases of motor system components, bulletin boards, and chat services. Publications, the Motor Challenge Sourcebook, partnership applications, newsletters, technical bulletins, listings of education/training opportunities, and updates on program activities are all available through the Clearinghouse.

Motor Challenge offers *design-decision tools*. Current offerings are MotorMaster and MotorMaster+ software, which catalog over 12,000 three-phase electric-induction motors available in the US, allowing motor users and others to select the best motor for a specific application. MotorMaster+ also allows motor users or service providers to keep an inventory of all motors in use or in storage in any manufacturing plant, and to track maintenance, operation, and replacement details. MotorMaster+ was developed by Washington State Energy Office (now part of Washington State University) with USDOE funding and costs approximately \$50K (US) annually for WSU to maintain, including an annual survey of motor manufacturers. New program offerings include: ORMEL, a motor efficiency and load estimator developed by Oak Ridge National Laboratory, and ASDMaster, a design and specification tool for adjustable speed drives developed by the Electric Power Research Institute and the Bonneville Power Administration.

Showcase Demonstrations case studies provide examples of how companies have undertaken improvements in their electric motor systems and have benefited from verified energy savings and related improvements in waste reduction and productivity. DOE has sought Motor Challenge Partners who are willing to participate as Showcase Demonstrations. In exchange for technical assistance and the opportunity to try out new technologies, Showcase participants must be willing to undertake detailed monitoring and analysis that will help all other Partners understand how to make their operations run better. To date, there are 29 Showcases that will in aggregate invest \$10 million (US). Nine projects have already been completed and have achieved collectively an annual energy savings of \$1.2 million (US). Early indications are that there is a large demand for well-documented case studies to be published by trade magazines.

Workshops, training sessions, and conferences provide flexible learning options, allowing participants to: attend a regularly scheduled class or workshop; work with one of the Motor Challenge's Allied Partners, who can offer training using prepared training modules; purchase training modules to deliver them as part of an ongoing

meeting or training activities; or make the training modules available to individual staff members to learn on their own. These professionally developed modules include slides, trainer notes, and handout materials. The target audience for this training includes industrial plant engineers and operations staff. A number of training modules are available: Introduction to Motor System Management, Motor Basics, Repair/Replace Decision-Making Policy, Using MotorMaster Software . On-line training is also available for MotorMaster+ software.

In addition, Motor Challenge has been offering a series of workshops on Performance Optimization for Pump Systems directed toward the municipal pumping industry. By December 1996, more than 1000 people had attended these workshops.

Table 1: Program Structure

Type of Partnership	Partner	Allied Partner	Excellence Partner	Industry Partner
Participant	Motor system users Consulting engineers Utilities Suppliers/distributors State governments Efficiency experts	Suppliers/ distributors Consulting engineers Utilities State governments	Large industrial users of motor-driven systems	Industrial trade associations Utilities & Utility consortia Efficiency experts Industrial end-use associations
What do they do?	Promote energy-efficient motor-driven systems within their company/agency	Promote energy-efficient motor-driven systems with their customers	Commit to continual improvement of their motor-driven system managemt practices; develop & implement a plan to achieve measurable results	Cooperatively develop new program offerings; forge new alliances to further develop existing offerings
Participant benefit	Access to Clearinghouse, newsletter, publications	Improved customer relationships through identification w/ program; access to: Clearinghouse, MC account manager, quantities of MC offerings at little or no cost	Accelerated corporate & plant energy cost savings; access to motor system managemt resources: MC account manager, technical support; recognized as "good corporate citizen" through highly visible identification w/ program;	Increased and positive marketplace visibility for associations/consortia and their members; ability to leverage development of educational materials through collaboration
Program benefit	Broader program awareness; potential Allied Partners; improved motor system practices	Primary method for educating and encouraging changed behavior in industrial users of motor-driven systems; documented energy savings	Highly visible industry leaders to serve as examples to others; substantial and well-documented energy and productivity savings; practical applications of emerging technologies	Access to specialized technical knowledge; ability to leverage development of educational materials through collaboration; broader program support

Program Structure

Motor Challenge Partners

Joining as a *Motor Challenge Partner* is the entry point into the Motor Challenge program. Motor Challenge Partners are organizations that are collaborating with USDOE to encourage increased market penetration of energy efficient motor systems. An organization that signs on as a Partner of the Motor Challenge sends a message to its employees that energy efficiency is an important consideration when developing electric motor system management strategies and decisions. Partners also play a key role in helping guide the program to ensure that it continues to meet the needs of US industry. Primary avenues for program feedback include the Clearinghouse (key comments are circulated to program staff weekly) and the program newsletter.

Partners and any of their employees may register for and receive a copy of MotorMaster+ software, have access to the Information Clearinghouse, and receive the bimonthly "Turning Point" newsletter as well as a variety of free publications, among many of the Program's offerings.

To become a Partner, an organization needs to complete a simple application, an agreement between USDOE and its Partner organizations that signifies each party's commitment to the goals of Motor Challenge. By December 1996, nearly 1800 organizations had joined the program as Motor Challenge Partners, including: industrial users of motor systems, utilities, equipment suppliers and distributors, consulting engineers, and state government agencies.

Allied Partners

The *Allied Partner* initiative is designed to facilitate the distribution of information about efficient motor-driven system technology and applications. Allied Partners consist of companies and organizations that routinely provide products and services to industry. They make a greater level of commitment to the program than Motor Challenge Partners because they agree to promote increased energy-efficiency of motor systems among their customers as well as within their own company through the use of Motor Challenge program offerings. Each Allied Partner must complete an Action Plan that outlines activities they agree to undertake, along with identifying the specific program offerings that the Allied Partner plans to distribute. They also agree to provide data concerning their use of program offerings, and on their experiences in working with customers using those materials. Motor Challenge collects data that range from the number of material copies distributed to the number of kilowatt hours of electricity and dollars saved through specific motor system modifications. In exchange, most Motor Challenge program materials, publications, and software tools are available to Allied Partners in quantity and at minimal cost. Allied Partners can use these Motor Challenge publications and decision tools directly with their industrial end users in the course of their daily business or in conjunction with customer education meetings or workshops.

Allied Partners are reporting that the materials are well received by customers because they recognize that the information is from an independent, credible source. They note that the materials and software tools provide them with an excellent basis on which to discuss or highlight motor system opportunities in customer plant operations. Allied Partners are using the program materials both "at the sales counter" and in conjunction with customer visits "at the plant."

Motor Challenge Motor System Management training modules are being used by Allied Partners in a similar fashion. The modules allow the Allied Partner to select the appropriate information for the audience, whether it is a management or technical group, and to tailor it to the time available. Modules are used to provide training on electric motors and motor system applications for customers in traditional classroom settings as well as impromptu settings in customer plants.

MotorMaster+ (MM+) is the program product now used most frequently by Allied Partners, often in very creative ways. The most straightforward approach is simple distribution to customers with an accompanying demonstration and training on its use. However, most Allied Partners are being more strategic in their use of this tool. Some are offering motor survey services using MM+. Others are using the software to provide "free" inventory services of customer motor system applications so that the Allied Partner will have this valuable customer information at

their fingertips. MM+ is providing these Partners with a simple, easy to use tool for analyzing and tracking their customer system applications.

Other Allied Partner activities range from sponsoring Motor Challenge training workshops to working with the Program to carry out cooperative advertising. Since March 1996, more than 100 companies throughout the nation have signed up to participate in the Allied Partner initiative.

Excellence Partners

Excellence Partners are end user companies that are willing to commit to continual quality improvement in electric motor system management practices. In return for this commitment, Excellence Partners may receive assistance in bench marking and developing motor system management plans and special program recognition.

Companies for candidacy as Excellence Partners must meet the following qualifications:

- Identify a motor systems energy management project and assign a manager
- Benchmark current energy status of the project
- Use benchmarking to establish project energy management goals and a timetable
- Develop a project implementation plan

The “project” can be selected from various levels such as: a particular application or group of applications; a single process, department, plant, or an entire company. The selection level is at the discretion of the Excellence Partner Candidate, subject to acceptance by the Motor Challenge Program.

The primary objectives of the Excellence Partner initiative are to: develop, improve, measure, benchmark, report, and recognize motor-driven system management practices (current and best) at specific manufacturing facilities or business units. This initiative seeks to transform the practices of a company and its plants to a *complete motor systems management strategy* starting with motor management and progressing to a system optimization tactic (- pumps, fans, etc.) and then to an overall process optimization approach.

Industry Partners

The current portfolio of materials, workshops, and software tools available through Motor Challenge focus primarily on energy-efficient motors and drives. To broaden the scope of program offerings to include motor-driven equipment such as air compressors, pumps, and fans and blowers, Motor Challenge is forming *Industry Partnerships*. These partnerships can include: industrial trade associations, industrial end user associations, utilities and utility consortia, efficiency experts, and state government and are formed for the purpose of cooperatively developing new educational products, materials, and services.

This is a highly leveraged activity that draws on the technical strengths of trade associations representing manufacturers of motor-driven equipment (also referred to as original equipment manufacturers or OEMs). Industry partnerships seek to build and strengthen networks of relationships among OEM trade associations, industrial end-users, and energy providers to create new types of information, tools, and technical materials.

To reach the program goal to increase the energy efficiency of motor driven systems used in industrial applications, Motor Challenge must make information on energy efficient motor-driven systems readily available to both industrial end-users and the network of suppliers and technical professionals that serve them. For each type of motor-driven equipment and end-use industry, the market structure for supply and services is slightly different. Working with industry partners and Allied Partners, Motor Challenge seeks to find the most effective methods of presenting and delivering information on energy-efficient motor systems.

A few examples of industry partnerships include:

Compressed Air & Gas Institute (CAGI) is a trade organization of 35 manufacturers of compressed air system equipment: compressors, compressed air dryers, filters, and pneumatic tools. CAGI has formed an Energy Awareness Committee specifically to work on energy-related issues for compressed air systems and has recently decided

to become a Motor Challenge Allied Partner. The following projects have been identified and are being developed to meet the goal of more efficient compressed air systems:

- Developing a common means of certifying and reporting performance of compressors, compressed air dryers, and filters. Standardized data sheets are being developed to allow purchasers to more easily compare products. The first standardized data sheets will include the following topics: air-cooled rotary screw compressors, refrigerated compressed air dryers, and regenerative desiccant compressed air dryers;
- Preparing a consumer fact sheet that will explain the methods of testing a compressor and the importance of the standard performance reporting using the standard data sheets;
- Compiling a database of information found on the standard data sheets, made accessible through a CAGI home page;
- Developing an educational video or series of videos to address proper selection, installation, and maintenance of compressed air systems and components. The video will stress items such as leak detection and repair, proper piping, controls, and other related topics;
- Co-sponsoring a certification and training program for plant compressed air system auditors. This project is in the planning stage and is anticipated to include a number of additional project partners.

Electrical Apparatus Service Association (EASA) is an international trade organization with over 2,500 member companies that sell and/or service industrial electric motors, generators, transformers, controls, variable frequency drives, DC adjustable speed drives, and related equipment. EASA publishes standards for the repair of electrical apparatus, has published a booklet entitled "Understanding A-C Motor Efficiency", and has developed a motor repair quality management system called "EASA-Q". EASA has the distinction of being the Motor Challenge's first Allied Partner. Joint projects include

- Publishing a motor repair/rewind guidebook;
- Developing follow-on video materials that address motor replacement and repair issues.

Hydraulic Institute (HI) is a trade organization of approximately 70 pump manufacturers. HI has thirteen different ANSI-approved standards on pumps, including standards on test procedures and efficiency prediction guidelines. Seven new additional standards are under development. HI is a charter Motor Challenge partner, and has worked with Motor Challenge on the following projects:

- Co-authored an article on efficient pumping systems that appeared in the August 1996 issue of *Chemical Processing* magazine;
- Co-sponsored with Motor Challenge a series of five "Performance Optimization" seminars for the municipal pumping industry;
- Produced a video training product, "Energy Reduction in Pumps and Pumping Systems", in cooperation with Motor Challenge. The training program consists of a 60 minute video and workbooks for instructors and students.

Other Motor Challenge industry partnerships include:

- Air Movement and Control Association International, an international trade organization dedicated to the certification of performance ratings on fans, louvers, dampers, and other air handling equipment.
- National Electrical Manufacturers Association, a trade organization representing nearly 600 manufacturers of electric motors and other electrical equipment throughout the US;
- Power Transmission Distributors Association, an international trade association comprised of 300 power transmission/motion control distributor firms and 200 manufacturers of transmission/motion control products.;
- Institute of Electrical and Electronics Engineers, Inc., an international technical organization. Motor Challenge is working with the Industry Applications Society, Pulp & Paper Industry Committee, is comprised of plant electrical engineers, consultants, and other industry personnel;
- Technical Association of the Pulp and Paper Industry, an international technical association with over 33,000 members.
- Utility organizations working with Motor Challenge include: the Consortium for Energy Efficiency (information on applications for premium efficiency motors), the Bonneville Power Administration (AirMaster - a new air compressor design-decision tool in development), and the Electric Power Research Institute (ASDMaster).

Evolving Industry Partnerships

Since its inception, Motor Challenge has been developing new program offerings by drawing on program resources to either entirely fund development costs or, more frequently, to partner with one or two other organizations. As the opportunities for development and the number of potential partnerships have increased, a new method for cooperative development has been sought to allow for a greater number of more highly leveraged new offerings. This new approach, called the "project team approach", is based on sharing development resources and materials among a larger number of interested participants. By brokering the creation of a multi-partner project team, Motor Challenge seeks to broaden the participation of market players to the development as well as the dissemination of new products, tools, and materials on energy-efficient motor-driven systems. Developing new information in this way can:

- increase access to the technical knowledge embedded within industries resulting in a greater variety of high-quality products;
- build commitment among multiple sponsors to encourage use of the products once developed;
- stretch participants' development dollars; and
- create new networks of industry partners that might not otherwise exist, thus creating an atmosphere congenial to continued collaboration.

This approach is currently being employed to develop a cooperative initiative for a compressed air system optimization training and certification program involving USDOE, an OEM trade association, several state-level research and development agencies, and several utility company consortia.

Evaluating program effectiveness

Motor Challenge is conducting a market assessment study which includes 300 plant surveys for the purpose of establishing a baseline of motor-driven system usage as well as industry profiles. This two and a half year effort with a budget of approximately \$1.4 million (US) is the largest single Motor Challenge program commitment. The effort is significant because existing market assessment information is incomplete and dates from the 1970s. While the study is entirely funded by USDOE, it is anticipated that industry partnerships will be formed to utilize the results of the completed study.

Motor Challenge program effectiveness is being measured through a series of annual performance metrics. Current performance targets for the end of FY 1997, include:

- 15 total Showcase Demonstrations completed for an aggregate annual energy savings of \$2 million (US);
- 150 Allied Partners participating; with documented annual energy savings of \$1 million (US);
- 10 Excellence Partners participating; target is 10 corporations and 25 plant sites for FY1997 with \$1 million (US) energy savings for the first year growing rapidly (\$25 million (US) estimate for FY1998) as additional corporations join the program and plan implementation is more fully realized.

Program achievements as of March 1997 include:

- 9 Showcase Demonstrations completed for an aggregate annual energy savings of \$1.2 million (US)
- 117 Allied Partners participating; energy savings to be documented by end of FY97;
- 1 Excellence Partner (3M Corp) participating; an intensive recruitment effort of 9 additional partners is underway .

International affiliates

The Motor Challenge Program has generated considerable interest in other countries. In response to this interest, a new program element was created, the International Affiliate. Affiliates have access to many Motor Challenge program offerings at a reasonable cost. A total of 23 new International Affiliates have been enlisted in the pro-

gram. Information has been shared with the governments of : Australia, Chile, Canada, China, Finland, Ghana, India, New Zealand, South Africa, and Vietnam. A new version of MM+ is nearly completed that will accommodate metric measures as well as additional voltages and frequencies. Arrangements are also being made to accommodate International Affiliates who are willing to collect and support integration of their regional or national motor data into MM+. An overall strategy for Motor Challenge to work with the Affiliates is currently under development; once this is completed, additional projects and technical assistance are anticipated.

Conclusion

The Motor Challenge Program represents an attempt to achieve industrial market transformation that engages industry in its own language and on its own terms. Although many of the program elements have been in place for less than a year, the program has enjoyed a very positive reception from its industry partners in all areas, from product development to program delivery. This is all the more remarkable given the much-repeated statement by many companies that energy-efficiency “isn’t even on the radar screen” in relative importance. The focus on tangible products and services rather than intangible “membership benefits” is a key element of this success and the direct result of the series of industry interactions during the program planning process. The continued refinement of the program message to more closely target each level of industry, from the maintenance staff to the executive suite, is essential to its continued growth and success.

The deep and lasting involvement in the program of industry and the companies that serve them is being actively sought. This involvement brings the program a degree of technical richness and a business-oriented attitude difficult to achieve through traditional program development methods. Industry participation in program planning has also led to a realization that the portfolio of program offerings can be substantially expanded through a cooperative development approach. However, this participation also carries with it industry’s expectation for a continued commitment to the partnership from its government sponsors. Long-term collaboration is required to effectively meet the program goal for market transformation: to develop an industry focus on energy-efficient motor systems that is so multi-dimensional and embedded in daily business practices that it possesses a life and vitality of its own.

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