

# Drive Power Initiative

*Market Progress Evaluation Report, No. 5*

*Executive Summary*

*prepared by*

**Currents Consulting**

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# DRIVE POWER INITIATIVE

## MARKET PROGRESS EVALUATION REPORT #5

### *Final Report*

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# Executive Summary

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## A. Introduction

The Northwest Energy Efficiency Alliance (the Alliance) is a non-profit group of electric utilities, state governments, public interest groups, and industry representatives committed to bringing affordable, energy-efficient products and services to the marketplace. The *Drive Power Initiative* (the Initiative) is a market transformation effort funded by the Alliance and administered by the Electric League of the Pacific Northwest (the League). The League began work on the Initiative in January 1999. Funding was approved at the October 2003 Alliance Board meeting for continuation of the contract through December 31, 2004. Pacific Energy Associates, Inc. (PEA) was the evaluation contractor for the Initiative through April 2001. The contract was then transferred to Currents Consulting, under the management of Jennifer Stout in May 2001.

This report comprises the fifth *Market Progress Evaluation Report* (MPER) on the Initiative and covers the period from June 2002 through June 2003. The following provides an overview of Initiative activities, market effects, and recommendations. These items are also summarized in a more compact form in Table 9 in the main report.

## B. Drive Power Initiative Objectives and Services

The *Drive Power Initiative* has three core areas of service: *Electric Motor Management* (EMM), motor systems efficiency, and marketing and administration of the *Compressed Air Challenge* (CAC) training and the *Pumping System Assessment Tool* (PSAT) workshops.

### Initiative Objectives

The Initiative's primary objectives are to:

1. Increase the region's overall fleet and systems efficiency.
2. Influence end-users' repair/replace decision-making for motors so they plan ahead and use operating or life-cycle costs.
3. Help motor service centers improve their repair practices and expand their motor management services.

4. Market and deliver the regional training for *Compressed Air Challenge (CAC)* and the *Pumping System Assessment Tool (PSAT)*.

### Initiative Methods

To meet the program objectives, the Initiative uses the following methods:

- Implementing a broad motor end-user education program, including seminars, a newsletter, a toolkit of printed information, motor database software (*EM2*), and a web site.
- Deploying four field consultants to work one-on-one with end-users throughout the region and develop success stories.
- Leveraging program success stories and information through dissemination in various media.
- Executing a pilot demonstration of motor system optimization.
- Working with motor service centers on improving repair methods, integrating motor operating costs into repair/replace decisions, and expanding motor management services.
- Coordinating promotion of motor management efforts with trade associations, utilities, and organizations and agencies such as the Consortium for Energy Efficiency (CEE).
- Marketing and implementing CAC and PSAT training.

### C. Summary of Initiative Activities and Achievements

Below is a brief recap of the Initiative's progress through May 2002, described in the last MPER, followed by a description of additional activities carried out through June 2003. Market effects are discussed in the following section.

### One-on-One End-User Work and Success Stories

- Through May 2002, the field consultants had met with 151 motor end-users. Through June 2003, they had met with another 43, bringing the total to 194.
- Data on numbers of motors were available for 162 of 194 motor end-users. About 56% have over 250 motors or more than 20 motors larger than 50 horsepower, the target size for the Initiative.
- Through May 2002, thirteen formal stories documenting motor management successes had been prepared; these vary in level of reported savings and marketability. These stories have not been updated and no new formal success stories have been prepared. However, there are eight prospects for new stories, and three additional “mini” success stories have been prepared.
- Based on assessments by the field consultants, in addition to the existing success stories, 27 more contacted motor users have excellent potential to make concrete improvements to their practices and about 57 have fair-to-good potential.
- Since the beginning of the Initiative, fifteen articles on EMM have appeared in various publications, including *US Industry Today* and *Forbes*. The *CEE Motor Decisions Matter* web site<sup>1</sup> uses six of the EMM success stories.

### Motor Service Centers (MSCs)

- Through June 2003, field consultants had met with 41 motor service centers representing about 60% of the region’s repair market.
- Through June 2003, about 27% of shops region-wide (30 of 112) have attended one of the *Electric Motor Management* seminars, representing about 40% of the region’s total repair market.

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<sup>1</sup> [www.motorsmatter.org](http://www.motorsmatter.org).

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- In May 2002, *MotorTracker* was initiated on a pilot basis with ten MSCs (and one additional shop has essentially moved forward on their own). *MotorTracker* is a marketing package designed to help MSCs expand their service offerings. The eleven *MotorTracker* shops represent about 25% of the region's repair market.

### Electric Motor Management (EMM) Seminars

- The EMM seminar has been offered a total of 53 times through June 2003.
- Attendance lists were available for 44 of the 53 seminars. They show 896 individuals attending, representing 446 organizations, of which 76% were facilities that use motors. Among the attending motor users, 57% (254) were industrial.
- Based on analysis of exit surveys, attending motor users represented about 135,000 motors, or 28% of the Northwest fleet total (based on number of motors, not horsepower).

### Work with EASA

EMM staff also continue to work actively and effectively with the Electrical Apparatus Service Association (EASA), both regionally (in the Mountain and Oregon Chapters) and nationally. Below are highlights.

Dennis Bowns, the field consultant for Idaho and Montana, is a voting member of both the EASA Mountain Empire and Pacific Northwest Chapters, and is editor of the *EASA Mountain Empire Newsletter*. He recently established a web site for both EASA chapters<sup>2</sup>. His involvement is very important to the growing collaboration between EASA and EMM.

### Attendance at Other Events

Since January 2003, Initiative staff have attended the *Northwest Food Processors Association Annual Conference* (program exhibit with EM2

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<sup>2</sup> [www.easamountainempire.org](http://www.easamountainempire.org).

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demonstration) and the *Northwest Plant Engineering & Maintenance Show and Conference* (presentation and booth).

In the fall of 2003, Initiative staff attended the *Washington Plant Engineering & Maintenance Show and Conference* in Seattle (with a presentation and booth) and held a technical workshop for the Oregon Cement & Aggregate Producers Association and the Washington Aggregate & Concrete Association.

### Motor Management Toolkit

The toolkit has been significantly improved over time: the kit has been streamlined, the marketing brochure has been upgraded, copies of the success stories are included, and the *EM2* software was created and a second upgrade has been completed.

Two new and useful elements were added to the toolkit:

- A quick reference table of motor operating costs for various motor sizes and efficiencies.
- For motor repair shops, posters of *Good Motor Repair DOs and DON'Ts* were developed and have been distributed.

### EM2 Motor Management Database Software

Through June 2003, a total of 618 copies of the *EM2* motor management database software had been distributed to 571 individuals who represent 401 companies and organizations. Among those 401, 281 are facilities that use motors, 38 are repair shops, 34 are consulting/engineering firms, 11 are motor manufacturer/distributors, and 24 are utilities; the remaining 13 are uncategorized users.

In June 2003, the *EM2* software had been upgraded to *Version 3.0* by Dennis Bowns, the creator of the original software. The upgrade includes a new tutorial and a written user's manual.

### Motor Systems Pilot

One of the goals of the *Drive Power Initiative* has been to complete several pilot motor systems projects. Despite diligent efforts by Initiative

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staff, work with the first pilot customer was substantially delayed and ultimately suspended because of decision-making issues with the customer. Work is now proceeding with a different company. The following is a brief summary.

### ***Fan Replacement Project***

After several months, SP Newsprint's corporate management approved replacement of a boiler induced draft fan. It will save an estimated \$237,000 per year in electrical energy costs (about 0.54 aMW based on \$0.05/kWh), has a six-month payback, and is anticipated to have important reliability benefits.

### ***Pump Replacement Project***

SP Newsprint indicated that because they already had committed capital to the fan venture, they would not be able to complete a recommended pump project. The project is estimated to save \$150,000 per year (about 0.34 aMW based on \$0.05/kWh), with an estimated payback of between 18 and 24 months. It also would solve a number of maintenance problems.

### **Compressed Air Challenge and Pumping System Assessment Tool Training**

In the summer of 2002, the Initiative team assumed responsibility for marketing and implementing training for *Compressed Air Challenge* (CAC) and workshops for the *Pumping System Assessment Tool* (PSAT) software. Between October 2002 and June 2003, the Initiative team held five *Level 1* CAC workshops and one *Level 2* CAC workshop. The *Level 1* workshops had a total of 102 attendees, who represented 54 different companies and organizations. The *Level 2* workshop had 24 attendees.

The *Pumping System Assessment Tool* (PSAT) is a software program for assessing energy savings opportunities in pumping systems. The Initiative team implemented three PSAT workshops in January 2003, attended by 143 individuals who represented 73 companies.

### Collaboration Between MDM and EMM

The *Electric Motor Management Program* (EMM) and the *Motor Decisions Matter Campaign* (MDM) being implemented by the Consortium for Energy Efficiency (CEE) have benefited from active collaboration. MDM is using six of the EMM success stories on their web site. EMM staff attended the MDM meeting in Chicago in March 2003 and the CEE meeting in Portland, Oregon, in July 2003. EMM and MDM had adjoining booths at the EASA national convention in June 2003.

The *Drive Power* evaluation team has assessed awareness of MDM among industrial end-users. These results are reported below.

### D. Market Transformation Effects

The following section focuses on changes in motor management practices among motor end-users who have attended the seminars and/or worked with the field consultants. The Initiative is clearly playing a role in motivating end-users to improve their motor management practices.

The market transformation effects described below are positive indicators that changes *are occurring* in the market, both among end-users and among motor service centers. While market effects are clearly related to market transformation, it not possible yet to draw conclusions about whether market transformation *has occurred*. This will involve a longer-term assessment of market penetration, spillover to other end-users and market actors, and sustainability of market change.

### One-on-One End-User Work

#### **Success Stories**

*Table ES-1*, below, summarizes the potential of motor users to make substantial and lasting changes to their motor management practice. These assessments were done by the field consultants for 177 of the 194 motor users with whom they have worked directly. The assessments are based on the field consultants' overall sense of these end-users' level of interest in and ability to make motor management changes.

**Table ES-1: Potential for Motor Management Practice Changes**

| N = 177                       | NONE        | WEAK        | FAIR TO GOOD | EXCEL- LENT | FORMAL SUCCESS STORY  |
|-------------------------------|-------------|-------------|--------------|-------------|---|
| POTENTIAL FOR PRACTICE CHANGE | 31<br>(18%) | 49<br>(28%) | 57<br>(32%)  | 27<br>(15%) | 13 (7%)<br>(9 finalized; 2 more finalized but have since closed; 1 on hold; 1 in draft) |

The success stories vary in level of reported savings and marketability with only five reporting substantial savings. Eight of the success stories are available on the Initiative's web site<sup>3</sup>. The stories have not been updated with current information and no new formal success stories have been prepared since May 2002. However, there are eight story prospects, and three additional "mini" success stories have been prepared.

### ***Participants and Nonparticipants Compared***

Internet surveys were conducted of 34 participants and 39 non-participants. Participants were motor users working with field consultants. Nonparticipants were motor users who had not worked with the field consultants (although about 10% said they had attended a seminar).

The four most important electric motor management practices promoted by the Initiative are:

- Using operating costs for motor management,
- Specification of premium efficiency motors,
- Using a written guideline for motor repair/replace decisions, and
- Implementing a computerized motor database.

For all of these practices, participants are more than twice as likely as nonparticipants to have adopted the approach, and attribution to the

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<sup>3</sup> [www.drivesandmotors.com](http://www.drivesandmotors.com).

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Initiative by participants is also high – ranging from 40% to 60%, depending upon the practice.

Some additional highlights include:

- In terms of decision-making drivers for repair/replace decisions, operating costs are “always” or “usually” a factor 60% of the time for participants versus 41% of the time for nonparticipants, a substantial difference.
- Fifty-four percent of participants said they were using the *EM2* software.
- Nine percent of participants and 3% of nonparticipants have made recent changes to their practices that have achieved energy savings.
- Nonparticipants ranked seminars and field consultants as a source of guidance for motor management at 8% and 0% respectively, while participants ranked the same at 26% and 29%.
- More than half (54%) of participants rated the influence of the *Electric Motor Management* field consultant and the seminar as “influential” or “very influential” for the improvements that the end-user has made (or is currently making).

It was also noted that even though fewer nonparticipants than participants have over 100 motors, there were no meaningful differences between the responses of those nonparticipants with more than 100 motors and the responses of those nonparticipants with less than 100 motors.

### Motor Management Practice Change from the Seminars

The *Electric Motor Management* seminars are also having a substantial impact on the motor management practices of end-users. Research conducted for the two previous MPEs indicated that between 79% and 88% of attendees had made at least one practice change as a result of the seminar. For individual tools or practices, between 15% and 38% of users said they have “changed or increased” their use of or “started” using specific tools or practices. The highest percentage, at 38%, was for operating costs, a key seminar concept. A substantial number of

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respondents also said they were “going to start” using the tools and practices.

### Motor Service Centers

From January to April 2003, nine in-person and seven phone interviews were conducted with motor service centers. These included eleven participants in the *MotorTracker* program and five nonparticipants. All had received at least one field consultant visit.

A key finding was that MSCs participating in *MotorTracker* are using the practices being promoted by the *Drive Power Initiative* much more than non-participating shops and a substantial number of participants have attributed this to the Initiative. These practices are: use of motor operating costs, recommendation of premium efficiency motors, and offering motor database services. These results are shown below in *Table ES-2*. (Note that by definition each of the *MotorTracker* shops is offering database services in some fashion.)

**Table ES-2: Initiative Attribution of Promoted Practices**

| HOW OFTEN  | MOTOR OPERATING COSTS | RECOMMEND PREMIUM MOTORS | OFFERING MOTORS DATABASE |
|--|-----------------------|--------------------------|--------------------------|
| MOTORTRACKER PARTICIPANTS USING PRACTICE                         | 82%                   | 91%                      | 100%                     |
| MOTORTRACKER PARTICIPANTS ATTRIBUTING PRACTICE USE TO INITIATIVE | 55%                   | 18%                      | 45%                      |
| NONPARTICIPANTS USING PRACTICE                                   | 20%                   | 80%                      | 10%                      |

Another key finding was that when results from MSC interviews conducted in 2001 are compared with those performed in 2003; the average percentage of repairs that involve rewinds has decreased by about half (from 46% to 25%). We believe that this indicates an overall trend to replace failed motors in poor condition instead of repairing them, and is likely also the result of higher thresholds for motor replacement.

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Each of the MSCs participating in *MotorTracker* is offering motor database services as they see fit – from awareness only and being able to respond if customers specifically ask (but not actively seeking customers for new services) to full-tilt promotion of *MotorTracker* to every customer.

Two of the *MotorTracker* shops are developing motor databases for customers and retaining the databases in the shop; five shops are simply handing out the *EM2* software to their customers; and another three are going to maintain the database at both the shop and customer's facility. The remaining shop does not appear to have a specific approach in mind.

There are indications that the Initiative was directly or indirectly influential in the decisions of several motor repair shops to buy a core loss tester, a critical tool for assessing a motor that is undergoing repair. In 2001, a survey of shops indicated that only two out of three had a core loss tester. Since that time, at least two additional shops have acquired the tool and another three are making decisions to buy one before the end of 2003.

In addition to practice change of end-users and motor shops, there is also a Northwest utility that is in the initial phase of promoting the use of a motor inventory for their industrial customers.

### Compressed Air Challenge

A number of follow-up surveys of *Compressed Air Challenge* participants have been conducted using various methods. Some of the key findings are:

- There is a high rate of post-training activity. Seventy-five to 80% of end-users in three surveys (phone, mail, and Internet) say they have made or are making practice improvements. (Similar to the national CAC survey results.)
- In the Internet survey conducted in early 2002, 43% of respondents said they had saved compressed air energy and dollars as a result of the CAC training they attended. The national CAC study indicates that attendees save on average

149,000 kWh (0.017 aMW) per year, or roughly 7.5% of pre-project compressed air system energy.<sup>4</sup>

- Participants are changing the way they look at compressed air operating costs. Sixty-four percent of respondents to the 2002 Internet survey reported that they are either changing the way they look at operating costs or were planning to use operating costs for evaluations in the future.
- Half of respondents said they had achieved one or more non-energy benefits.

### **Pumping System Assessment Tool (PSAT)**

An Internet follow-up survey was conducted of PSAT workshop participants in the late spring of 2003, four months after attendance. There were a total of 44 respondents to the survey. Some of the key findings are:

- Sixty-seven percent of respondents have done at least one activity related to practice improvement since the workshop.
- Forty-four percent of respondents said they had installed the PSAT software. Twelve percent said they had used the software since the workshop and 31% said they were going to use it. Another 7% said they had been using the PSAT software (or a tool like it) for some time.
- None of the respondents volunteered a particular dollar or percent energy cost savings, but this may be because pump system projects can take some time to identify and complete.

### **Motor Decisions Matter**

The evaluation team for *Drive Power* is also assessing awareness of the *Motor Decisions Matter* (MDM) campaign in the Pacific Northwest.

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<sup>4</sup> This survey was conducted in early 2001 by Xenergy. The final report is not yet available. As a point of reference, compressed air system efficiency experts find that for the typical compressed air system, 30% of system energy savings can be saved through cost-effective measures.

- Forty-four percent of the sixteen motor service centers interviewed said they had heard of MDM; 6% said they actually knew something about it.
- Nine percent of the 35 *Drive Power* participants who responded to the Internet survey said they had heard of MDM; 3% said they actually knew something about it.
- Three percent of the 39 Initiative nonparticipants who responded to the Internet survey said they had heard about MDM.

### E. Drive Power Cost-Effectiveness Review Status

The evaluators reviewed the cost-effectiveness assumptions in 2001. The results of that review are included in the *Drive Power* MPER #3. A number of recommendations were made such as bringing the measures included in the Alliance's cost-effectiveness model more closely in line with the evolving activities, market changes, and approach of the Initiative.

In 2002-03, because the *Drive Power* customer database has been under development, Initiative tracking was suspended. Therefore, the evaluators have not conducted any further review of the Alliance's assumptions. It is anticipated that the database will be completed in 2004.

### F. Key Recommendations

#### Summary of Progress

The *Drive Power Initiative* has made substantial progress, and end-users are making concrete improvements to their motor management practices. Highlights of program accomplishment include:

- Field consultants have met with 194 motor users and distributed about 600 copies of the *EM2* motor management database software. Thirteen motor management success stories have been developed. Field consultants believe that another 27 (15%) of the end-users they have met with have excellent potential to make practice changes, and another 57 (32%) have fair-to-good potential.

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- Recent Internet surveys of participants and nonparticipants in the EMM program clearly show that the program is impacting participants' motor management practices.
- Based on follow-up surveys of seminar attendees, 15 to 28% of seminar attendees say they changed their use of, or started using various tools or practices discussed in the seminars. Another 30% to 38% say they are *going* to use the seminar tools or practices.
- Field consultants have met with 41 motor service centers. *MotorTracker* is being piloted with eleven shops.

A number of recommendations were made in MPER #4, published at the end of 2002. Below are two discussions. The first describes those recommendations from MPER #4 to which the Initiative team has responded. The second describes recommendations for the current MPER #5.

### **MPER #4 Recommendations Responded To by the Drive Power Team**

#### ***Recommendation: Create a Specific Work Plan***

As of the publication of this report, a work plan was being drafted for activities through 2004.

#### ***Recommendation: Improve Program Tracking***

The Initiative team is now nearing completion of a database for motor users that have met one-on-one with the field consultants. Additional program tracking recommendations are provided below.

#### ***Recommendation: Provide Funding After 2003***

A request to the Board is being prepared for funding through 2004.

### **Additional Recommendations for MPER #5**

The recommendations below are listed in approximate order of their importance according to the evaluators. Note that the recommendations in the body of the report contain considerably more detail, and there are five additional recommendations there that are not included in the *Executive Summary*.

#### ***Recommendation: Take the Most Motivated End-Users and MSCs to the Next Level***

It is recommended that the *Drive Power* team identify *specific motor users* they plan to continue to work with, and why, and create a brief plan for each. Motor service centers can also be taken to the next level to strengthen the market infrastructure.

#### ***Recommendation: Update Existing Success Stories and Develop New Ones***

The existing success stories need to be updated and additional ones prepared, including one focusing on a motor service center success in expanding their services and/or improving their repair practices.

#### ***Recommendation: Develop a Long-Term Plan for CAC, PSAT, and the EMM Seminars***

To maximize the effectiveness of training as a market transformation tool, the evaluation team recommends the following: conduct more targeted marketing based on analysis of market penetration to date; have a written plan for early personal marketing of EMM by field consultants, vendors, and utilities; have a specific plan for coordinating *Level 1* and *2* seminars as well as *AirMaster+*; arrange for the EMM seminar to qualify as continuing education for electricians and engineers; and consider developing an on-line version of the seminar.

#### ***Recommendation: Develop an Advanced Seminar***

The evaluators recommend that the *Drive Power* team develop an advanced half-day seminar for end-users and motor service centers that

covers the following topics: tips for mining a motor management database to maximize plant reliability and energy savings over time; the benefits of a motor database for systems applications; and an introduction to simple motor systems concepts. This seminar would still primarily target plant-level staff.

### ***Recommendation: Take a More Incremental Approach to Motor Systems Work Over the Coming Year***

One recommendation is an introduction to simple motor systems in a more advanced seminar as mentioned above. It is also recommended that PSAT attendees be “mined” to reveal where opportunities are for motor systems work, and that the Alliance focus on smaller projects and case studies involving relatively simple system changes.

### ***Recommendation: Expand the Database and Make Data Collection Consistent***

It is recommended that the *Drive Power Access* database of EMM participants be expanded to include attendees of the EMM seminars and CAC and PSAT training, *EM2* software users, and recipients of the *Windings* newsletter. In addition, the trip report form should be consistent with the data points in the database, and collection and entry of data on seminar participants and recipients of *EM2* need to be more systematic.

### ***Recommendation: Involve Field Consultants in Initiative Planning***

Because of their value to the Alliance’s market transformation efforts in motor management and motor systems, and their relationships with end-users and motor shops, it is recommended that the field consultants be involved more directly and frequently in Initiative planning. Involving the field consultants should include making sure that they have a clear vision of how their work in the field drives market transformation.

***Recommendation: Leverage EM2 Users' Motor Fleet Data***

Obtain copies of *EM2* users' motor databases to analyze and evaluate them for potential recommendations to the customer and reveal potential case studies for fan or pump systems improvements.

***Recommendation: Revise and Regularly Update the Electric Motor Management Web Site***

In particular, the calendar of events is often out of date for long periods of time. Other recommendations are detailed in a separate memorandum.



## ***Executive Summary***

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