

# Canada's EnerGuide for Industry Website for Energy-Efficient Industrial Products

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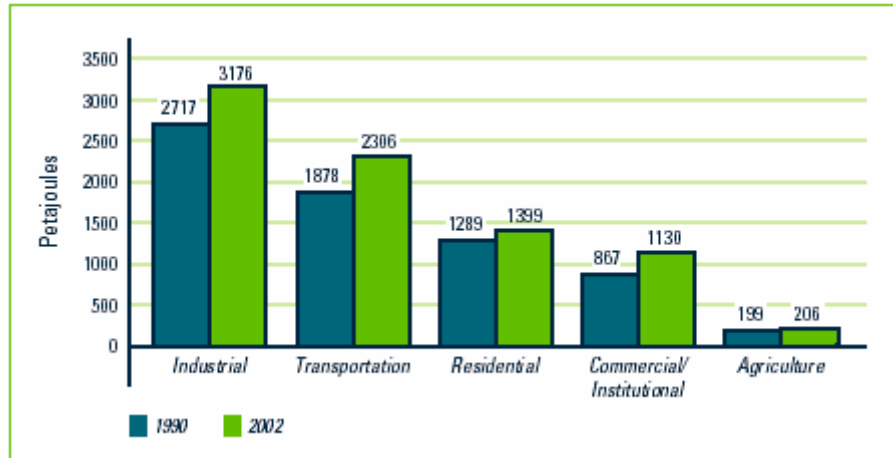
## ABSTRACT

In order to give Canadian companies a starting point for information on energy-efficient industrial equipment, Natural Resources Canada's Office of Energy Efficiency has developed a web-based initiative called EnerGuide for Industry. The objective is to provide information and tools to help energy-wise industries make better-educated, more energy-efficient selections when purchasing "off-the-shelf" industrial equipment. This paper discusses EnerGuide for Industry's Website approach, its contents, how it is marketed, and the performance measures that will be used to determine the effectiveness of the initiative.

## Introduction

Industry is by far the bigger user of energy in Canada, consuming 39% of the energy (Natural Resources Canada. 2004), as illustrated in Figure 1.

**Figure 1. Canadian Energy Use by Sector, 1990 and 2002**



Source: Natural Resources Canada. 2004.

Many of the large industrial companies in Canada recognise the economic benefits of energy efficiency, and have implemented programs to reduce energy usage in their plant. However, many medium and small companies have not. How can we reach these companies, and once we have convinced them that energy efficiency is a smart investment, where do they start?

Natural Resources Canada's Office of Energy Efficiency has developed the Web-based EnerGuide for Industry initiative (<http://egi.gc.ca>), to provide information about energy-efficient "off-the-shelf" industrial products. (See Figure 2.)

**Figure 2. EnerGuide for Industry Home Page**



Source: EnerGuide for Industry Website – egi.gc.ca

EnerGuide for Industry is an initiative that uses the familiar EnerGuide name and symbol – both well recognized by Canadians – to provide information and tools to help energy-wise companies make better educated, more energy-efficient selections when purchasing "off-the-shelf" equipment for their specific applications.

The purpose of the initiative is to help increase the competitiveness of Canadian industry by reducing its energy bills, while reducing greenhouse gas emissions that contribute to climate change. EnerGuide for Industry is one of a number of Natural Resources Canada's energy-efficiency programs targeted at Canadian industry.

## How EnerGuide for Industry Got Started

A 2002 EnerGuide for Industry business plan (Marbek Resource Consultants 2002) was developed for Natural Resources Canada. This business plan states:

As part of its ongoing efforts to promote continued improvements in the energy performance of Canada's stock of energy-using equipment and appliances, Natural Resources Canada, in consultation with industry representatives identified the need for an energy rating system for industrial equipment purchases. The proposed energy ratings system, which would support the purchase of more

efficient industrial equipment, was one of the measures that emerged from the earlier Industry Issues Table that was conducted as part of the development of Canada's Climate Change Action Plan. The underlying assumption was that if industry procurement personnel had easy access to reliable equipment energy performance data, they would increase their purchase of more energy efficient models, thus reducing both energy consumption and emissions of greenhouse gases.

The decision to pursue further development of the energy rating system for industry is supported by the documented success of similar energy consumption labelling and promotional efforts, such as Natural Resources Canada's current EnerGuide Program. The decision to pursue development of this initiative was further supported by the results of initial consultations conducted with a variety of industry associations and industrial companies.

The initial products on the EnerGuide for Industry web site were ones for which energy-using information was readily available (motors, dry-type transformers, lighting products, and large, unitary air conditioners). Natural Resources Canada recognized the need, however, to provide energy-saving information on additional energy-efficient industrial equipment, even if there was no database for energy-ratings, and so the web site was extended to include other products. The initiative also recognized that to guide industry to greater energy efficiency, it was not enough to simply provide equipment energy-use information: in an industrial setting, the specific application of the equipment, as well as the way in which it is operated and maintained, greatly influences its energy usage.

## Objectives

The objective of the initiative is to be the first stop for industrial buyers who want to get a broad understanding of energy efficiency as it pertains to industrial equipment. EnerGuide for Industry provides enough depth of information for buyers to understand the basics of the equipment they are looking at purchasing, so that they know what key areas to focus on, and can sit knowledgeable with a supplier.

EnerGuide for Industry's mandate is not to produce in-depth publications, as those often already exist elsewhere. There are a number of excellent web sites that do that for specific products, such as

- US Department of Energy's Best Practices web site (<http://www.oit.doe.gov/bestpractices>), which covers compressed air, motors, steam and process heating.
- Compressed Air Challenge (<http://www.compressedairchallenge.org>), which covers compressed air.
- Council of Industrial Boiler Operators (<http://www.cibo.org>), which covers boilers.

However, there is currently no Web single source that covers a wide range of industrial products. EnerGuide for Industry fills that niche. Also, information is often available only in English. Because of Canada's bilingual nature, one of the initiative's mandates is to make all information available in both English and French.

## Products Covered

Products on the initiative's website since its start-up in June 2003 include:

- motors
- dry-type transformers
- electronic ballasts for high-intensity discharge lighting
- large unitary air conditioners

In the near future, additional products will be added including:

- arc welding
- industrial battery chargers
- blowers and fans
- boilers and steam
- chillers
- compressed air
- direct-contact water heaters
- elevators and escalators
- infra-red heating
- lighting (high bay and pulse-start)
- liquid-filled transformers
- pumps
- variable speed drives
- commercial, walk-in refrigeration
- uninterruptible power supplies

## Website Contents

For each product, information is provided in the following areas:

- **Introduction:** The Introduction provides an overview of the product, including its industrial energy-use context, and whether the product is regulated under Canada's *Energy Efficiency Regulations*. (See Figure 3 for an example.)
- **How Much Will I Save:** A simple example is provided of the potential savings by purchasing the energy-efficient version of the product, taking into account only the initial price and the cost of energy used over the expected lifetime of the equipment. The potential savings in maintenance costs and in reduced production down-time are not factored into this calculation.
- **Purchasing Tips:** This section provides advice for purchasing energy-efficient models. Are there energy-saving technologies or features that should be looked at? The user is pointed to any databases that can aid in purchasing that energy-efficient product. (See Figure 4 for an example.)

**Figure 3. EGI Web Page for Introduction (for Motors)**

The screenshot shows the EGI website interface. At the top, there are logos for Natural Resources Canada and Canada. A navigation menu includes links for Français, Contact Us, Help, Search, and Canada Site. Below this is a banner for the Office of Energy Efficiency and Industrial Facilities. The main content area is titled 'Introduction' and includes links for 'How Much Will I Save?', 'Purchasing Tips', 'Operation and Maintenance Tips', 'Tools', 'Links', and 'Back to Products'. A 'Products' section is highlighted, with a sub-section for 'Electric Motors'. The text explains that motors account for 10 to 20% of total electricity consumed in Canada and that energy improvements can provide substantial savings. A table is provided to compare the minimum nominal efficiency required by Energy Efficiency Regulations against the NEMA Premium efficiency for various motor power ratings.

Power (hp)	Energy Efficiency Regulations' Minimum Nominal Efficiency	NEMA Premium™ Efficiency
1	82.5%	85.5%
10	89.5%	91.7%
25	91.7%	93.6%
50	93.0%	94.5%
100	94.1%	95.4%
200	95.0%	95.8%

Source: EnerGuide for Industry Website – egi.gc.ca

- Operation and Maintenance Tips:** This section provides information on how to operate and maintain the product in order to maximize the energy savings. (See Figure 5 for an example.) With industrial equipment, poor operating conditions and improper or insufficient maintenance can negate much of the gain generated by the purchase of a more efficient model. In some cases, greater employee awareness and better operator training may be necessary to ensure equipment is operated at its highest possible efficiency. Sometimes it is not the energy-using equipment itself that is the issue, but operating conditions. For example, fixing leaks in an air or steam distribution system will greatly improve the efficiency of a system regardless of the compressor or boiler used.

**Figure 4. Example of Purchasing Tips (for Motors)**

**Motors**

**Purchasing Tips**

**Selecting an efficient motor**

To select the most appropriate motor for an application, you must know the motor type (size, speed and enclosure) and motor load (constant or variable).

[CanMOST](#) – the Canadian Motor Selection Tool – is a useful software tool for selecting energy-efficient motors.

**Motor size:** Motors should be sized to operate with a load factor between 75 and 100 percent. ...

**Watch the motor speed.** Some energy-efficient motors will run slightly faster than the motor being replaced, and this speed increase can negate the energy efficiency of the new motor. ...

**Watch the power factor.** A motor that is oversized and lightly loaded has a lower power factor. A facility with many induction motors and a low power factor can address this issue by replacing these motors with properly sized premium-efficiency ones. Power factor can also be improved by adding power-factor correction capacitors to the in-plant distribution system. ...

Source: EnerGuide for Industry Website – egi.gc.ca

- **Tools:** The user is directed to any software tools or databases that will help in selecting the most energy-efficient product for that application. For example, for motors the user can download the CanMOST (Canadian Motor Selection Tool) software (see below) for choosing an energy-efficient motor.
- **Case Studies:** Case studies are given for Canadian companies that either have purchased the energy-efficiency product or have taken action to improve the product's energy-efficiency in the plant. The case study includes what was done and how much was saved, both in energy and in dollars.
- **Links:** The Links section lists other useful web sites having useful sources of information, such as other government publications, industry association, etc. (See Figure 6 for an example.) For each link, a description of the web site's contents is given.

**Figure 5. Example of Operation & Maintenance Tips (for Compressors)**  
(Note: Only the Headings Are Shown Below for the Tips)

**Compressed Air**

**Operation & Maintenance Tips**

- Do a compressed air audit
- Find and fix the leaks
- Change the mode of compressor operation
- Determine your real requirements
- Eliminate wasteful uses of compressed air
- Lower the operating pressure
- Keep the heat
- Examine the air dryer
- Slow the flow
- Repair or replace condensate drains
- Upgrade piping and connectors
- Replace or upgrade filters
- Turn the compressors off
- Smaller is better
- Set up an ongoing inspection and maintenance schedule

Source: EnerGuide for Industry Website – egi.gc.ca

**Figure 6. Example of Links (for Variable Speed Drives)**

**Useful Links**

[\*Application Guide for AC Adjustable Speed Drive Systems\*](#) by the National Electrical Manufacturers Association (NEMA) is a 73-page publication that provides a wealth of information on selecting, installing and using VFDs.

[\*DrivesMag\*](#), an online trade magazine serving the variable speed motor drive industry, is an excellent reference on VFDs and includes a library of articles on drives. Most North American manufacturers, their products and specifications are listed.

Power quality and harmonic mitigation filter manufacturers are listed by [\*DrivesMag\*](#). This index also has many other useful resources for AC drives and includes examples of VFD applications.

Ontario Hydro's [\*Adjustable Speed Drive Reference Guide\*](#) is a 103-page guide containing a wealth of information on adjustable speed drives (ASDs), including principles of operation, a comparison of ASDs, advantages, application considerations, economics, harmonic distortion, and a list of ASD suppliers in Ontario.

The [\*Canadian Energy Efficiency Centre\*](#) lists VFD distributors and manufacturers. Click on the link for "New product information: Variable Speed Drives."

**List of Manufacturers**

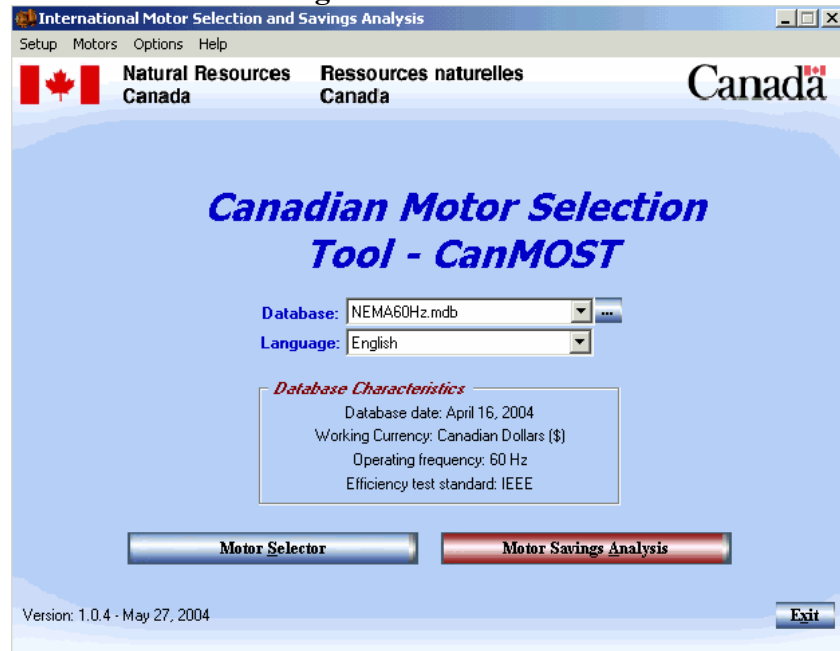
...

Source: EnerGuide for Industry Website – egi.gc.ca

## CanMOST

CanMOST (Canadian Motor Selection Tool, see Figure 7) is a software tool that users can download from the EnerGuide for Industry website to help them select energy-efficient motors and calculate the energy savings and greenhouse gas emissions reductions. CanMOST is the Canadian name for the IMSSA (International Motor Selection and Savings Analysis) software, which in turn was developed from the Washington State University's MotorMaster+ software.

Figure 7. CanMOST



Source: EnerGuide for Industry Website – egi.gc.ca

The IMSSA software is the product of a multinational consortium:

- the International Copper Association,
- the European community, including the Joint Research Center,
- the United Kingdom's Action Energy (Carbon Trust),
- Corporacion del Cobre de Chile (Codelco), and
- Natural Resources Canada.

IMSSA includes many of the capabilities and features of MotorMaster+, but adds the European EuroDEEM database of motors. IMSSA allows the user to conduct analyses in different currencies, calculate efficiency benefits for utility rate schedules with demand charges, edit and modify motor rewind efficiency loss defaults, and determine "best available" motors. The IMSSA version added Spanish as a language option. Canadian requirements added to IMSSA include:

- a French language version,
- the ability to handle Canadian utility rate structures and rebate schemes,



- prices in Canadian dollars,
- the calculation of greenhouse gas emissions, and
- the addition of some 575 volt motors available only in Canada.

Each of the international partners is allowed to re-brand IMSSA as they wish. In the US, IMSSA is called MotorMaster+ International. In Canada, IMSSA was renamed CanMOST (Canadian Motor Selection Tool), in order not to confuse it with products from a well-known Canadian chain of hardware stores. In Canada, the French version is called OSMCan (Outil de sélection des moteurs du Canada).

## **Promoting EnerGuide for Industry**

Launched in June of 2003, the initiative gained momentum in early 2004. Promotional efforts include a mix of mass marketing, to increase the awareness of the initiative within the target market, partnership work with utilities and industry associations, and presentations to small industry groups in various settings.

The overall communication goal for the EnerGuide for Industry initiative is to persuade key industry decision makers, influencers and buyers to consider energy efficiency when buying industrial equipment, and to turn to EnerGuide for Industry as their guide to selecting energy efficient industrial equipment.

The key elements of the overall message are similar to those currently being communicated by other Natural Resources Canada initiatives: save energy, save money, and help the environment by reducing greenhouse gas emissions that contribute to climate change. This message is adapted to a business/industrial context:

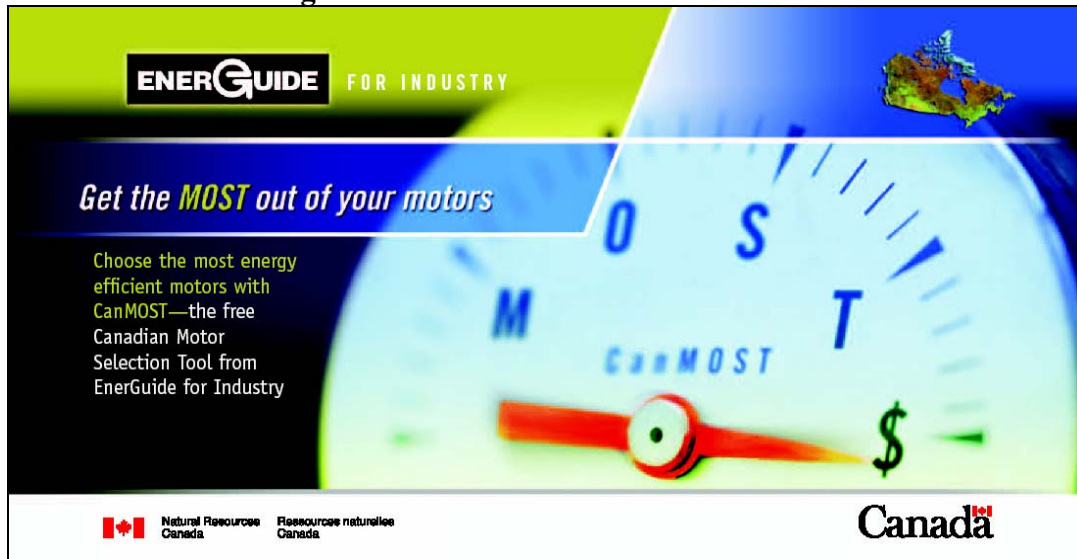
Choosing energy-efficient equipment and implementing proper operations and maintenance processes has many advantages:

- economic benefits of choosing energy efficient equipment versus conventional;
- positive impact on the bottom line and improvement in overall plant/process efficiency; and
- sense of corporate social responsibility and competitive value of corporate leadership for helping preserve our environment.

To reach our audience, approaches from the wide-reaching to the very targeted are used:

- Public relations are used to reach a large audience, increase awareness of the initiative, and encourage trial. Press releases, followed up with personal communications with the editors of key publications to ensure story pick up, and articles placed in wide-reaching trade press have the added benefit of a third party endorsement.
- Direct mail, using the postcard shown in Figure 8, is also used to reach a wide audience. Although the featured product is CanMOST, the underlying message is that it is a tool brought to you by EnerGuide for Industry, and that once on the site users will browse further than motors. CanMOST CDs are also being distributed to purchasers of the *Electric Motor Handbook* (The Electricity Forum, 2004).

Figure 8. CanMOST Direct Mail Piece



- Trade shows participation, ideally with strategic partners such as utilities, allow for brief but personal interaction with key target audience segments, such as plant design and maintenance people, or a specific industry sector. Demonstrations of CanMOST are done to again increase initiative awareness and encourage trial.
- Presentations at various forums (industry sector task forces, industrial energy efficiency information sessions and conferences, motor workshops, etc...) are a very effective way of demonstrating CanMOST. Although these reach a smaller audience, the quality of the more personal interaction and opportunity for in-depth presentation and question & answer sessions are a good way of not only reaching a receptive audience and ensuring adoption of our initiative, but also of getting feedback from our target and hopefully “grooming” reference accounts.

The next steps in the promotion of EnerGuide for Industry and CanMOST will focus on the creation of a steering committee formed of representatives from various levels of government, public utilities, equipment manufacturers and distributors, and major end-users. The initial work of the committee will be to review the results of an analysis of the barriers to adoption of premium efficiency motors by industry, and to recommend/implement specific initiatives to address those barriers across the country. The goal is to build on this collaborative effort of key stakeholders and eventually move the focus from motors and drives to include the driven equipment.

## Measuring Effectiveness

### Measurement to Date

The EnerGuide for Industry initiative is still relatively recent. Furthermore, circumstances beyond the control of initiative management have made it impossible to use advertising to widely promote the site to its target market. As EnerGuide is strictly Web-based, early evaluation of its performance is being measured primarily through Web measurement

methods: number of Web visits and software tools downloads. As is normally the case with promotional efforts, reach is measured by the number of industry presentations given and total number of attendees at these presentations, as well as by the circulation of trade publications in which articles are placed.

**Web hits:** The number of unique visitors and the average number of visits per visitor to the EnerGuide for Industry Website has increased between March 2004 and March 2005, as shown in Table 1. The overall number of visits has also climbed steadily, from 1,911 visits in March 2004 to 3,846 visits in March 2005, as shown in Figures 9(a) and 9(b).

**Table 1. Distinct Visitors to the Website**

	March 2004	March 2005
Visitors	917	1,668
Visitors Who Visited Once	738	1,396
Visitors Who Visited More Than Once	179	272
Average Visits per Visitor	2.16	2.31

**Figure 9(a). Web Visits 2004**



**Figure 9(b). Web Visits Jan-Apr 2005**



**CanMOST software downloads:** As of March 31, 2005, there were 427 unique downloads of the CanMOST tool, 369 of these originating from Canada, the initiative’s target market. At present, it is not known how many of these are actually in use.

**Future Measurement**

Two rounds of surveys are planned to add more solid information to the useful but imprecise Web hits and download measurements:

- In June 2005, qualitative public opinion research will be conducted in the form of an email survey to those Canadians who have downloaded CanMOST, to understand their level of satisfaction with the current functionality of the software and identify any barriers to use. In a second phase of this survey, a follow-up interview will be arranged with a subset of respondents who have actually used the software, to assess the desirability of proposed functionality enhancements.
- In the fall of 2005, a “pop-up” Web survey will be set up to collect data from visitors to the EnerGuide for Industry Website: who they are, why they have come to our site and whether the type and depth of information provided met their needs. The survey will be kept operational until a sufficient number of responses have been gathered for statistically significant quantitative analysis (to be determined by research firm retained).

## **Conclusions**

1. Natural Resources Canada has developed a bilingual (English and French) Website called EnerGuide for Industry, which provides information on the selection, operation, and maintenance of energy-efficient, “off-the-shelf” industrial equipment.
2. The Website currently contains information on four industrial products, and this will be expanded to 19 products in the near future.
3. The Website became on-line in June 2003, and currently is receiving about 4000 visits per month.

## **Acknowledgements**

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