Title of the measure:	EU 1 Motor Challenge Programme

General description

Improving the efficiency with which energy is consumed by end-users is a central theme of energy policy within the European Community. Moreover there is a close link between the development of renewable energy sources and the efficiency use of energy and electricity to maximize the benefit of renewable energy sources. Therefore, many EU energy efficiency policies and programmes have been designed, implemented and monitored. One of these programmes is the Motor Challenge Programme:

The Motor Challenge Programme is a European Commission voluntary programme (launched in February 2003) through which industrial companies are aided in improving the energy efficiency of their Motor Driven Systems. The core of the Programme is an Action Plan by which a Challenge Partner commits to undertaking specific measures to reduce energy consumption. At the launch event, thirteen European countries were represented. Among the participants were the National Contact Points and representatives from the European Commission (DG Environment, DG TREN, DG JRC), but also numerous companies.
Any enterprise or organisation planning to contribute to the Motor Challenge Programme objectives can participate. The Challenge focuses on:

- compressed air systems
- fan systems
- pump systems
- drives -electric motors and speed controllers- used in other machinery

for which it has been demonstrated that there exists a large technical and economic potential for energy savings.

Companies that use Motor Driven Systems can request "Partner" status.
Through the Motor Challenge Programme the Partner can receive:

- aid in defining and carrying out an Action Plan, to reduce energy related operating expenses, while maintaining or improving reliability and quality of service;
- public recognition for their contribution to achieving the objectives of the European Union's energy and environmental policies: minimizing environmental impact and particular reducing CO2 emissions; improving competitivity of European industry; reducing dependence on imported energy sources

There are 93 companies listed as Partners during 2003-2009 as mentioned in the evaluation report of 2010. In order to maintain the credibility of the Partnership, some eligibility criteria have been developed. Though not entailing legally binding obligations, Partner status requires strong commitment and a substantial contribution to the objectives of the Motor Challenge Programme. Partners can withdraw from programme at any time without penalty.

Companies that supply Motor Driven Systems can request "Endorser" status.
Through the Motor Challenge Programme, the Endorsers get public acknowledgment for their efforts to support the Programme. They may participate in promoting the Programme by assisting Partners in defining and carrying out their Action Plan.
Currently, there are over 70 companies listed as Endorsers (see: http://re.jrc.ec.europa.eu/energyefficiency/index.htm).

The Motor Challenge Programme is totally voluntary: companies are free to decide whether they want to join or not and they may withdraw from the Programme at any time without any prejudice.

The core of the programme is an Action plan by which a partner commits to take particular measures to reduce energy consumption. The Partner company itself determines which production facilities and type of systems are covered by the commitment. The scope of the commitment is flexible and can be limited to a single fabrication shop or may include all of company's European production sites. Motor challenge Partners will receive financial aid, advise and technical assistance to execute their Action plans.

Impact evaluation (methods and results)

An ex ante evaluation done in the framework of SAVE supported by the EU (DG TREN) shows relatively large savings potentials. In the following, an extract from the Executive Summary on the Report on Energy Efficient Motor Driven Systems (see End-use Energy efficiency: http://re.jrc.ec.europa.eu/energyefficiency/index.htm) depicts the potential impacts:

Switching to energy efficient motor driven systems can save Europe up to 202 billion kWh in electricity consumption, equivalent to a reduction of €10 billion per year in operating costs for industry. It would also create the following additional benefits:

- a saving of €5-10 billion per year in operating costs for European industry through reduced maintenance and improved operations (EU-25).
- a saving of €6 billion per year for Europe in reduced environmental costs (EU-25, calculated using the EU-15 fuel mix).
- a reduction of 79 million tonne of CO_2 emissions (EU-15), or approximately a quarter of the EU's Kyoto target. This is the annual amount of CO_2 that a forest the size of Finland transforms into oxygen. If industry is allowed to trade these emission reductions based on energy saved, this would generate a revenue stream of €2 billion per year. For EU-25, the reduction potential is 100 million tonne.
- a 45 GW reduction in the need for new power plant capacity over the next 20 years (EU-25).
- a 6% reduction in Europe's energy imports (EU-25).

To achieve this a four-year package of measures is suggested, investing €400 million in the motor systems market. The Motor Challenge Programme should continue to be the forum for developing common tools and fast learning, and ensure that the national programmes are implemented and achieve their goals.

The package of measures should include:

- introduction of audits of energy systems in industrial installations
- financial support for training and certification of energy auditors
- fiscal and financial incentives for investments in energy saving projects
- a framework for claiming emissions credits for investments in electricity saving (eg the 'White Certificates' in Italy)
- an information campaign based on the Motor Challenge Programme.

In total, the savings potential of energy and CO2 emissions, estimated in this report, are depicted in table 1 for the industry in the EU. The potential is specified of using high efficiency motors, installing of variable speed drivers and optimising the application part of the drive system.

Table 1: Energy and CO2 emissions savings potential:
(source: Report on Energy Efficient Motor Driven Systems**)**

	Savings potential (billion kWh/year)					
	EU-15	EU-25	France	Germany	Italy	UK
High efficiency motors	24	27	4	6	4	3
Variable speed drives	45	50	8	10	7	6
Application part of the motor systems (pumps, fans, compressors)	112	125	19	26	17	15
Total electricity savings potential	181	202	31	42	28	24

	EU-15	EU-25	France	Germany	Italy	UK
Reduction potential for greenhouse gas emissions (Million tonne CO_2eq per year)	79	100	3	27	14	12
% of Kyoto gap	24%	-	6%	175%	26%	n/a

A further ex ante evaluation was provided by the European Climate Change programme EPPC (2010: European Climate Change Programme, http://europa.eu.int/comm./environment/climate/eccp.htm). It estimated savings of CO2 emissions in the range of 34Mt CO2 and 84 TWh in industry for 2015.

Several separate studies are conducted on fans, compressed air systems, pumps, drives. They all show that savings in energy and CO2 emissions are possible, but since this initiative as an voluntary agreement, the actual savings will be much lower than the calculated potential. Therefore the impact is considered as low.

According to an evaluation report of 2010 from the European Commission, by the end of 2009 all the Motor Challenger Programme measures resulted in an estimated annual energy savings of 185,104.5 MWh and CO2 savings of 88109.74 tons per year which corresponds to an estimated 0.02% reduction of total electricity consumption in EU 27's industry. Energy savings in MWh/year according to the area of measures in the Motor Challenger Programme Action plans are as follows;

Area of measures	**Energy savings (MWh/a)**	**% of Total Savings**
Drives	88133.13	47.61
Pumps	52770.66	28.51
Compressed Air	26160.03	14.13
Refrigeration and Cooling	6512.56	3.52
Fans and Ventilation	4881.75	2.64
Heat recovery and others	4510.75	2.43
Electrical distribution	1795.58	0.97
Management policies	340	0.18

From the evaluation report, estimated savings in percent of total per area are shown;

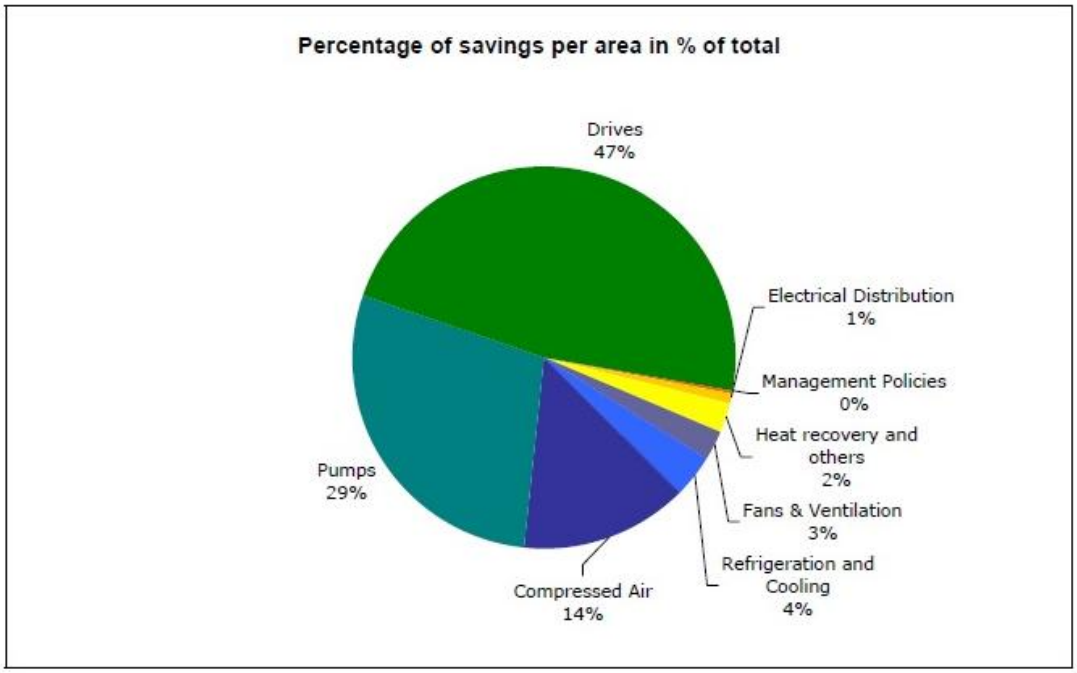

Figure 10: Estimated savings in percent of total per area

Historical data

The Renewable Energy Unit of Institute for Environment & Sustainability of the European Commission Joint Research Centre (JRC) provides technical and scientific advise to the Commission services (DG TREN, DG ENV) for the design, implementation and monitoring of EU energy efficiency policies and programmes. Moreover a number of EU programmes are directly managed by JRC on behalf of DG TREN. These programmes are:

- Lightening:
  - The GreenLight Programme: EC Voluntary pollution prevention initiative to reduce lighting energy use in the commercial sector;

  - Residential Lighting: Technology & initiatives to improve efficiency;
- Electric motors:
  - Eurodeem: Software for the selection of energy-efficient electric motors;
  - The Motor Challenge Programme: EC voluntary programme through which companies commit to energy efficiency measures in Motor Driven Systems;
- Stand-by loads:
  - The European Actions to Improve the Energy: Efficiency of Electrical Equipment while either OFF or in Stand-by;
  - Community Voluntary Energy Labelling: Programme for Office Equipment
- Buildings:
  - The GreenBuilding Programme: EC voluntary programme through which companies commit to energy efficiency measures in non-residential buildings;
  - Electricity end-use efficiency in buildings in Member States and Candidate Countries: The aim of the project is to develop a bottom-up end use electricity consumption model for the building sector in the above countries.
- Energy Service Companies: The European Commission DG JRC analysis and research the activities and development of ESCO as part of Scientific & Technical Reference System on Renewable Energy and Energy End-use Efficiency in order to provide accurate information to policy makers, experts and other interested parties.

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