Policy Guidelines for Pumps, Fans and Compressors

Over 35% of global electricity is consumed by pumps, fans and compressors, equivalent to the combined annual electricity consumption of China, India and Japan. This is likely to double by 2040 according to the International Energy Agency.

This Policy Brief is based on studies by the IEA 4E Technology Collaboration Programme (4E TCP) into energy efficiency policy measures for pumps, fans and compressors, and the potential benefits from closer alignment of standards and regulations within the major markets.

Pumps, fans and compressors are considered to be motor driven units (MDUs), comprising a motor and its electrical controls, any gears or belts and the equipment used to move air, fluid or gas.

Observations for Policy Makers

- Minimum Energy Performance Standards (MEPS) for pumps, fans and compressors are either in force, currently under revision or consideration within China, the European Union and the United States.
- Substantial energy savings are available through the adoption of 'best practice' policies in these regions. In general, cost-effective savings will be maximised by:
  - Adopting metrics that include the energy performance of the pump, fan, or compressor MDU and which encourage energy savings from using controls and/or more efficient components;
  - Ensuring the regulation targets the most common products sold on the market;
  - Optimising the stringency of MEPS, for example on the basis of least life cycle cost within each market;
  - Enabling consumers to make purchasing decisions based on which products best match their needs;
  - Applying minimum requirements for the pump, fan, or compressor when it is included in another product.
- The International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO) can lead the way in developing technical standards that support better-aligned policies for these products, to reduce costs for manufacturers, end-users, regulators and market surveillance authorities.
- For the IEC and ISO technical standards to be used as the basis for energy efficiency policies, as widely occurs in the case of motors, the standards development process needs to incorporate regulatory objectives. This could be achieved through the participation of more government or independent members in the relevant standards committees.
- The key issues to be addressed by IEC and ISO standards for pumps, fans and compressors include establishing:
  - One method for testing efficiency for each product type that is sufficiently accurate and repeatable to support regional or national MEPS regulations;
  - A definition of energy efficiency at loads that reflect typical operating conditions and which accounts for both fixed and variable speed operation; to encourage end-users to select products fit for purpose and greater product differentiation within markets;
  - One common measurement metric of energy efficiency per product type that is appropriate to all technologies available, so that relative performance can be compared;
  - Tiered voluntary energy efficiency thresholds for pumps, fans and compressors as a guide for regulators, appropriate to national circumstances.
  - Requirements for manufacturers to disclose energy efficiency and performance information.
- A range of further recommendations specific to pumps, fans and compressors are included within the 4E TCP reports identified overleaf.

Published January 2019

ENERGY EFFICIENCY POLICY BRIEF

Key Findings

Potential for closer alignment

MEPS for pumps, fans and compressors are in force, under revision or development within the three regions (China, EU, USA), however there are significant differences in the approaches taken by each economy.

By learning from each other, there are major opportunities for improvement and closer alignment of MEPS as each economy goes through their cycle of developing and updating their regulations. For example, the table highlights the energy efficiency metrics for MEPS in 2017 that best cover the entire MDU, represent the product performance and address differences in constant and variable loads.

	PRODUCT TYPE	CHINA	EU	USA
PUMP	Clean Water	Pump only	Pump only	**MDU**
	MEPS Status	*In effect*	*In effect (under revision)*	***Published, in effect 2020***
FAN	Industrial fans	Fan only	**MDU**	MDU
	MEPS Status	*In effect*	***In effect (under revision)***	*Under development*
COMPRESSOR	Standard Air	**Compressor package**	Compressor package	Compressor package
	MEPS Status	***In effect***	*Under development*	*Pre-published*

- Currently enacted best practice policies

Note: *This information is based on the status of MEPS in 2017. The regulations for fans in the USA and compressors in the EU are in draft stage, therefore not highlighted in this table.*

Benefits of policy alignment

Using robust international IEC and ISO standards as the basis for regional and national energy efficiency policies will lead to closer alignment, resulting in:

- Greater energy savings by establishing metrics that capture the potential energy savings from using controls and/or more efficient components and ensuring the scope covers the most common products sold on the market;
- Lower compliance costs for manufacturers by avoiding multiple product performance testing to meet different national requirements. This leads to reduced costs for end-users;
- Quicker implementation of policies at lower cost by economies that are able to rely on international standards rather than replicate technical analysis for each country;
- Improved market surveillance through international collaboration, by mutually accepting and exchanging test results to reduce the surveillance burden on individual countries;
- Higher compliance levels through increased market transparency and product performance benchmarking.

The five largest manufacturers of motors, variable frequency drives, pumps, fans and compressors service between 27% and 53% of the global MDU market. This concentration, together with a shift towards more pumps, fans and compressors supplied as fully assembled products, means that the development of international technical standards as a basis for regulations will impact a large volume of sales and provide significant benefits in a global market.

More Information

The following publications can be downloaded from **www.iea-4e.org/publications**

Policy Guidelines for Motor Driven Units:

- *Part 1: Analysis of standards and regulations for pumps, fans and compressors, October 2016.*
- *Part 2: Recommendations for aligning standards and regulations for pumps, fans and compressors, February 2018.*