Energy Efficient End-use Equipment
International Energy Agency

ENERGY EFFICIENCY POLICY BRIEF

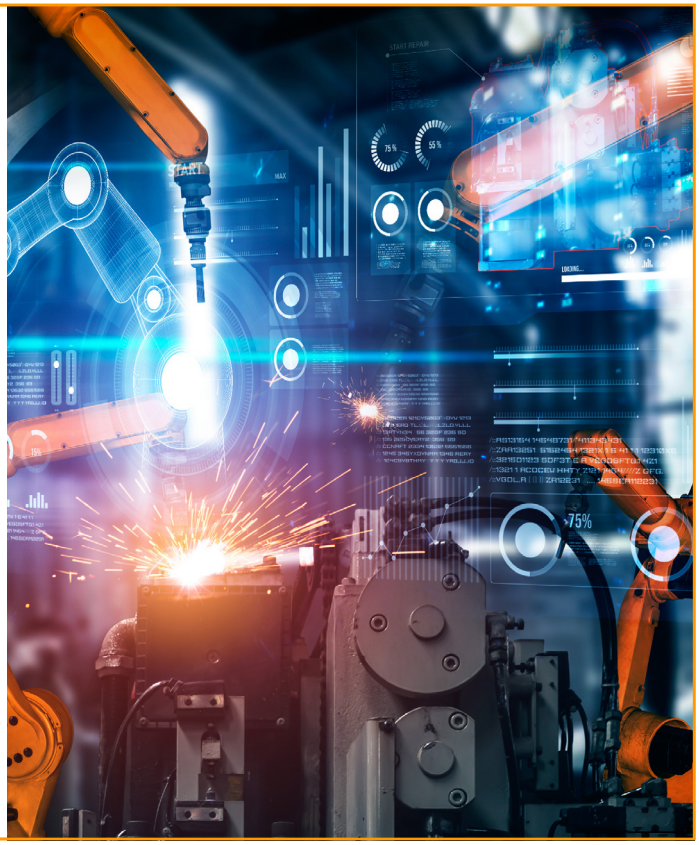
Digital technologies for motor systems

EMSA4

Statement of Annex Objectives

The 4E Electric Motor Systems Annex (EMSA) promotes the opportunities for energy efficiency in motor systems by disseminating best practice information worldwide. It supports the development of internationally aligned test standards and policies to improve the energy performance of new and existing motor systems with the aim of achieving 20% to 30% energy savings.

This Policy Brief gives an overview of the content of the EMSA report on *Classification of digitalisation technologies for electric motor driven systems*. The report identifies 13 digital technologies with the potential to influence energy consumption in electric motor driven systems and contains definitions, descriptions and examples in this area.



Observations for Policy Makers

- All major digital technologies, which have been identified and analysed, are already used in the field of electric motor systems.
- Digital technologies are mainly used for reasons other than energy efficiency, such as higher production efficiency, a more flexible system, better control and predictive maintenance.
- All identified and reported digital technologies can be used to increase the energy efficiency in electric motor systems and save energy.
- As it is the interrelation of different digital technologies that often leads to energy savings, it is difficult to attribute concrete savings to specific single technologies.
- While digital technologies can help identify opportunities, energy savings will only be realised once this information is acted upon.
- Examples of specific applications with concrete evidence of energy savings are rare.
- Limited data is available on the energy consumption of digital communication and data analysis applications used for energy optimisation, since this is often not possible to be distinguished from energy used for other process and quality-related analysis.

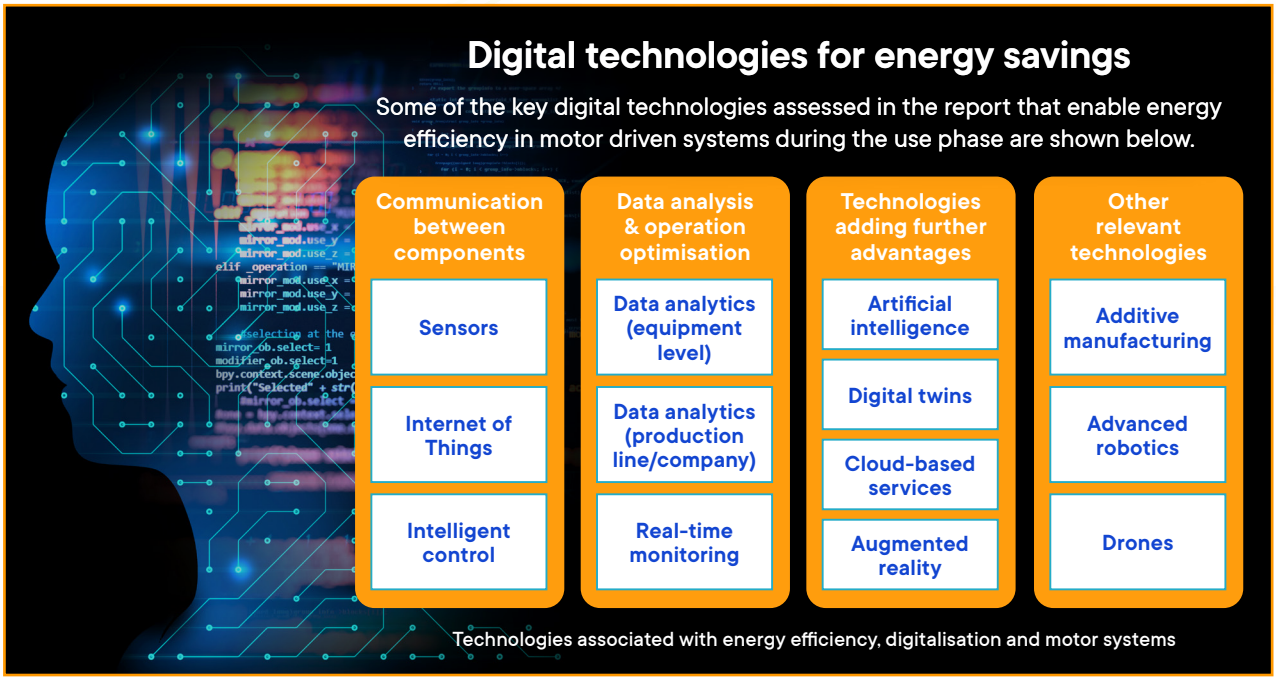
MORE INFORMATION

Published August 2022

The EMSA report *Classification of digitalisation technologies for electric motor driven systems* is available for download **here**.

Further information is available on **www.iea-4e.org/emsa** and by contacting the main author of the report: **konstantin.kulterer@energyagency.at**.

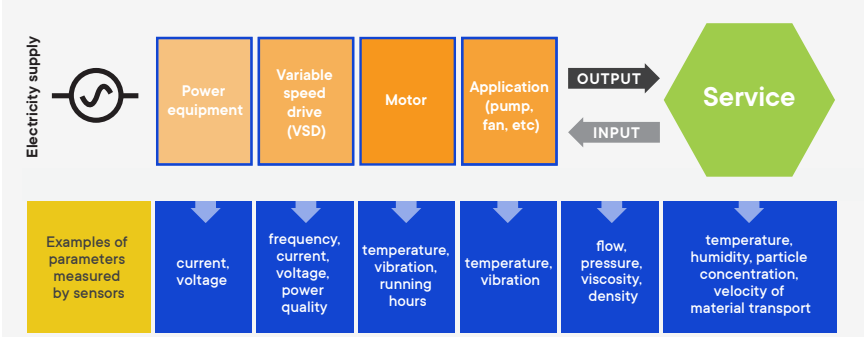
Key Findings



The role of sensors

Sensors can be used in connection with motor driven systems to monitor the:

- Power supply
- Machine
- Delivered output
- Supplied process



Potential areas of measurements and of application of sensors in motor driven systems.
Source: Austrian Energy Agency

In Europe sensors and data-analytics for optimising motor driven systems can bring an additional 50-100 TWh electricity savings per year by 2030, together with additional benefits such as lower maintenance and production costs. These savings equal 5-10% of the total electricity use by motors in EU.

Energy effect analysis remains a challenge

There is little data available to attribute energy savings, and energy costs, to a single digitalisation technology for the following reasons:

- Several technologies interact with each other and cannot easily be assessed independently.
- Digital technologies are seldom used for the purpose of saving energy, but more due to other (multiple) benefits.

Once data has been collected through these technologies, there needs to be an action taken to increase energy efficiency. It often happens that data is collected without being followed by an energy saving activity, leading to no saving being made.

Further research

EMSA is currently undertaking further research to provide more information and clarity especially on concrete examples of specific applications as well as on the energy consumption of digital communication and data analysis applications used for energy optimisation.