

Digital Production Technologies in Electric Motor Driven Systems – short overview

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Introduction

Digitalization brings ‘smart’ applications to all kinds of industrial energy systems, of which electric motor driven systems take the largest part of the industrial electricity use. Electric motor driven systems (EMDS) are responsible for some 53% of global electricity consumption (IEA 2017), and approximately 70% of the industrial electricity use.

An optimal motor system includes optimal aligned system components (motor control, motor, mechanical equipment and driven application like a pump, fan, compressor or machine) engineered and operated for the right process demands in a specific timeframe. The application of digital technologies to electric motor driven systems can enlarge the scope and accessibility of optimization measures, leading to increased efficiencies in energy use, operations (operational cost, increased flexibility and options for procurement, smaller footprint), materials (circular economic aspects) and emissions.

Goal

The IEA Technology Collaboration Programme 4E EMSA (Electric Motor Systems Annex) works on the assessment of specific developments in the field of industrial digitalisation. The target is to identify the relevant technology fields (areas), its potential impact on energy use and efficiency and the potential need for policy measures. EMSA will categorise the key technologies in this field, describe the potential effects on energy use and efficiency, and other non-energy benefits (NEBs), and will report on some key examples for application in motor driven systems.

Organisation

Work under this Task is a collaborative effort by Austria, The Netherlands and Sweden.

The following sub-tasks were defined:

- Analysis, definition and categorisation of digital production technologies in the field of motor driven systems
- Identification of stakeholders and collection of national programmes in the areas mentioned
- Quantification of the effects of individual categories on energy consumption
- Survey on enablers, advantages, barriers, and disadvantages of digital production technologies, suggestions for policy intervention and examples of applications of digital technologies in motor driven systems
- Identification of the development, necessity and possibility for policy intervention
- Research and description of use cases of Industry 4.0 technologies in the field of energy-efficient motor driven systems.

In the next phase, the focus will be on relevant policies, further use cases and final evaluation of the effect of the technologies on energy consumption.

	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Technology Structure					
Technology Energy Effect					
Actors in Industry 4.0					
Survey					
Policy Recommendations					
Use Cases					

Survey

The survey in form of an online questionnaire seeks to collect further insights to provide guidance to decision makers in industry and governments on what digitalisation can mean in energy efficiency of motor systems and energy transition in a broader perspective. The survey includes questions on enablers, advantages, barriers, and added costs of these technologies for specific projects, and on drivers and barriers for digitalisation in general. The survey will be online during the summer of 2020. The results will be reported in a general summary report on this task.

Survey link: www.surveygizmo.eu/s3/90243585/EMSA-Task-3



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