



Efficient Electric Motors and Motor Systems: Challenges and Solutions for Effective Regulation

SEAD Policy Exchange Forum Overview
2 April 2019, 12:00–14:00 UTC

Motors are ubiquitous powering different products from computers, to appliances to industry processes. According to the International Energy Agency (IEA), globally about 53 percent of electrical energy is used to power motors and motor systems, emitting about 6,800 MT of CO₂ emissions.

United for Efficiency (U4E) estimates that transitioning to more efficient motors can reduce their global electricity demand by up to 30 percent in 2030 – equivalent to 300 TWh of electricity savings and 200 MT of CO₂ emissions reduction. Minimum energy performance standards (MEPS) for motors are essential to the success of market transformation, and the supporting policies have already been implemented by many major economies globally. Mandatory energy efficiency policies cover over 25 percent of global electric motor energy use, while a third of motor energy is consumed by unregulated motors either in countries without MEPS or the motors fall outside the policy coverage. In 2014, the International Electrotechnical Commission (IEC) released new testing and efficiency classification standards requirements for motors, which cover a wider range of motor sizes, however no countries have enacted MEPS that cover this expanded range. In addition to adopting and enforcing the MEPS for motors, harmonization with international standards is essential to eliminate barriers to competition, including trade. Regulating and improving efficiency in motor-driven systems, including pumps, fans, and compressors presents an additional opportunity for efficiency gains. Only a few countries have started to regulate motor-driven systems.

National MEPS are usually based on IEC standards, which cover motor efficiency classification and efficiency testing methods. However, the certification and conformity compliance requirements including test method, process, labeling, and laboratory accreditation can vary among countries. Because electric motors are manufactured and shipped across many countries, the differences in national regulations can create technical barriers to trade and require large investments in compliance regimes to ensure that products sold on the markets are compliant. Thus, the sharing of test results or accepting test reports from third party or other countries' laboratories can help reduce costs to manufacturers while also allowing countries to allocate their limited resources to cost-effective compliance efforts rather than investing in new national motor testing laboratories. The IEC Energy Efficiency (IECEE) [Global Motor Energy Efficiency Programme](#) (GMEE) attempts to address these challenges and trade barriers. The GMEE programme aims to promote harmonization of national standards with the IEC International Standards. Harmonization would reduce testing and enforcement costs to the regulators, as well as trade barriers and the burden on manufacturers to meet different requirements in the markets they wish to sell their products.



This SEAD Policy Exchange Forum will explore the different challenges and requirements to build an effective program to promote energy efficient electric motors. Participants will learn about electric motors technology, approaches and challenges to electric motor regulation, the challenges and requirements for electric motor efficiency testing, and more about the GMEE programme and how it can help solve the challenges of motors regulation.

Co-host of this forum, the 4E Electric Motor Systems Annex (EMSA), will provide an overview of motors technology, international standards and current national regulations, and benefits and challenges of regulating motors. Following this, three case studies presentations will highlight regional and global experiences and approaches to motor regulation. The first case study, presented by the European Commission, will share lessons learned and challenges to developing energy efficiency policies and setting MEPS levels for electric motors. The Laboratory for Electrical Machines and Drive Systems at Bern University of Applied Sciences will then provide an overview of the infrastructure requirements and methodology of efficiency measurements of electrical machines. The third case study, from the National Electrical Manufacturer's Association, will present an overview of the GMEE programme and discuss its opportunities and benefits.

Presenters will address questions such as:

- What are the major barriers and challenges to regulate motors energy efficiency?
- How can countries use policy tools and incentive programs to promote the adoption of high-efficiency motors, motor driven units (MDUs), and motor systems?
- Where are the biggest opportunities for potential emissions reductions within motor driven systems? What could help to achieve these opportunities?
- Who are the agents of change (e.g. national governments, international and professional organizations, manufacturers)?
- What are the lessons learned from your country or region's experience?

Webinar participants will have the opportunity to ask questions, share their perspectives and lessons learned, and engage in discussions with policymakers and experts from around the globe.

Relevant resources for this Policy Exchange Forum include:

- The IEA 4E EMSA [website](#) and their publications, such as the [Energy efficiency roadmap for electric motors and motor systems \(2015\)](#) and the Policy Guidelines for Motor Driven Units - [Part 1 \(2016\)](#) and [Part 2 \(2018\)](#)
- U4E's motors guidance, [Accelerating the Global Adoption of Energy-Efficient Electric Motors and Motor Systems \(2017\)](#)
- IEA's [Energy Efficiency 2018: Analysis and outlooks to 2040 - Market Report Series](#)
- SEAD's [Evaluation of International Comparable Compliance, Certification, and Enforcement Requirements for Electric Motor \(2015\)](#)