

European emission targets for efficient pumping

Energy is the heart of our society. Life depends on safe, secure, and sustainable energy. Pumps, in particular, account for 10% of the total energy consumption in the world. Standart Pompa's Energy Efficiency Consultant, Metehan Karaca, investigates how energy policies are shaping the future of the pump industry.

By Metehan Karaca, Energy Efficiency Consultant, Standart Pompa

Our energy demand has been increasing each and every day as a result of global population growth and industrialization. Energy has the largest share of global greenhouse gas emissions by 69%. Carbon dioxide (CO₂) has the largest share of greenhouse gas emission by 90% in the world.

According to a meeting of European Union (EU) leaders in December 2014, an agreement to update targets for reducing greenhouse gas emissions by 2050 was formed. EU committees are working to meet the goals of an energy efficient, low carbon economy.

Energy 2020 is a strategy for competitive, sustainable, and secure energy. The EU has committed to energy savings of 20% in regards to the 1990 levels by 2020. Europe 2020 objectives:

- Reduce greenhouse gas emissions by 20%
- Increase the share of renewable energy in Europe up to 20%
- Decrease energy consumption by 20% with energy efficiency

80% of the greenhouse gas emissions in Europe are based on energy. Therefore, using energy efficiently is a key factor for sustainability. In this respect, the EU 2020 package, the 2030 framework, and the 2050 roadmap play an important role in energy policies.

Efficient pumping for zero emission targets

Pumps lead to 10% of the total energy consumption in the world. Globally, 20% of the electric motor energy consumption is from pumps. In regards to pumps under these energy strategies, the Ecodesign Directive (2009/125/EC) is establishing requirements for energy-related products. The Ecodesign Directive

targets energy savings of 40 terawatt-hours (TWh) for water pumps and 24 TWh for circulators in Europe by 2020 according to the European Commission, Directorate-General for Energy, from 2010. The Directive defines the minimum energy efficiency class of products. Right now, there are three active regulations and two regulations that are under development.

Carbon Footprint : Tips for Energy Efficiency

Carbon footprint is the measure of greenhouse gas emissions caused by an organization, product, or person. The Kyoto Protocol lists the following types of greenhouse gases:

Symbol	Name	CO ₂ Value
CO ₂	Carbon dioxide	1
CH ₄	Methane	21
N ₂ O	Nitrous oxide	310
HFCs	Hydrofluorocarbons	140~11700
PFCs	Perfluorocarbons	6500~9200
SF ₆	Sulphur hexafluoride	23900

The basic greenhouse gases listed in Kyoto Protocol.

Factors that affect the amount of the greenhouse gases throughout a product's life cycle could specified as follows:

- Raw Material
- Land Use
- Use/Operation
- Energy Consumption
- Transportation
- Disposal
- Product/Service
- Storage

Individuals and companies should calculate their carbon footprint and trace it because carbon footprints will soon be inspected as stated by the Kyoto Protocol. With the new international policies and legal regulations, it will be mandatory for every company to calculate their carbon footprint. Here are the international standards for calculating carbon footprint:

- GHG Protocol
- PAS 2060
- ISO 14064



Active regulations and their coverage on pumps are as follows:

a) Water Pumps - EU 547 / 2012 Regulation

For water pumps, the following efficiency index requirement applies:

MEI (minimum efficiency index):
 a high value = high efficiency
 From 1 January 2013: MEI ≥ 0.10
 From 1 January 2015: MEI ≥ 0.40

b) Circulators - EU 622 / 2012 (former EU 641 / 2009) Regulation

For circulators, the following efficiency index requirement applies:

EEl (energy efficiency index):
 a low value = high efficiency
 From 1 January 2013: EEl ≥ 0.27
 From 1 January 2015: EEl ≥ 0.23

The regulations under development are as follows:

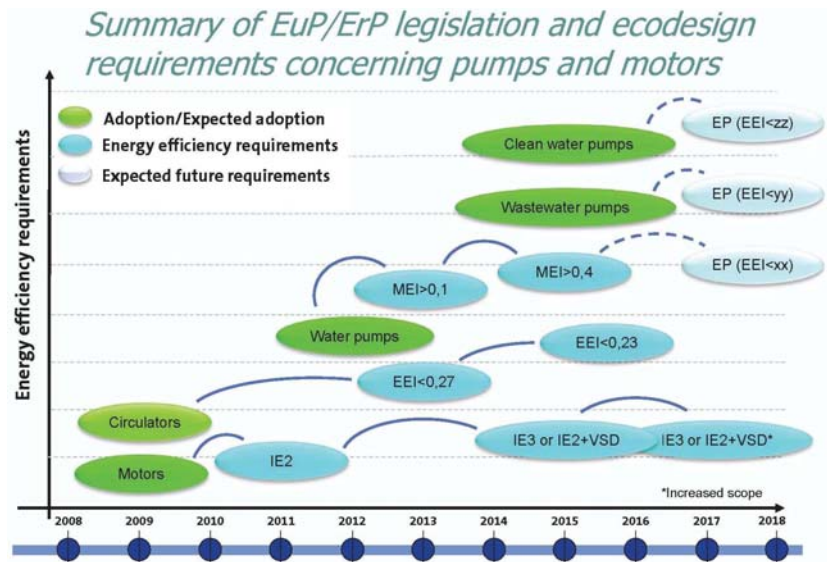


Figure 2: Eco-design regulations for pumps.

- Waste Water Pumps - ENER Lot28
- Large Water Pumps - ENER Lot29

From a broader perspective, concepts like carbon footprint, sustainability, renewable energy, energy savings, and efficiency

are for creating a brighter future and a cleaner world. They also have financial importance. New regulations, country wise policies, and legislations seek to use energy efficiently for individuals, products, and companies.

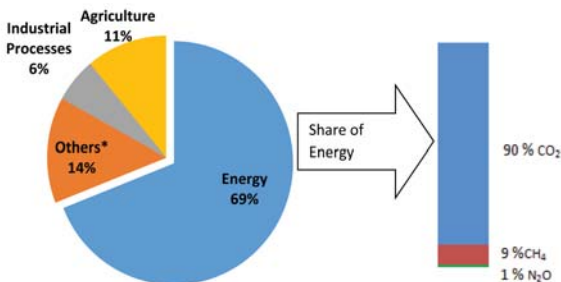


Figure 1: Share of Global GHG emission (IEA)

ABOUT THE AUTHOR: Metehan Karaca

Metehan Karaca is an Energy Efficiency Consultant at Standart Pompa, a Turkish pump and pump systems manufacturer. Karaca is responsible for energy audits, energy management, energy efficiency improvement projects, and pumping system consulting. He previously worked as a Design Engineer at Standart Pompa in the R&D Department. Karaca holds B.Sc. degree in Mechanical Engineering from Yıldız Technical University and a M.Sc. degree in Energy Science and Technology from Istanbul Technical University. He is certified by the Turkish Ministry of Energy as an Energy Manager, is a member of the Association of Energy Engineers (AEE), and the Turkish Chamber of Mechanical Engineers. His current research interests include efficiency improvement projects, energy management, monitoring systems, and pumping system design.



Metehan Karaca, Standart Pompa

