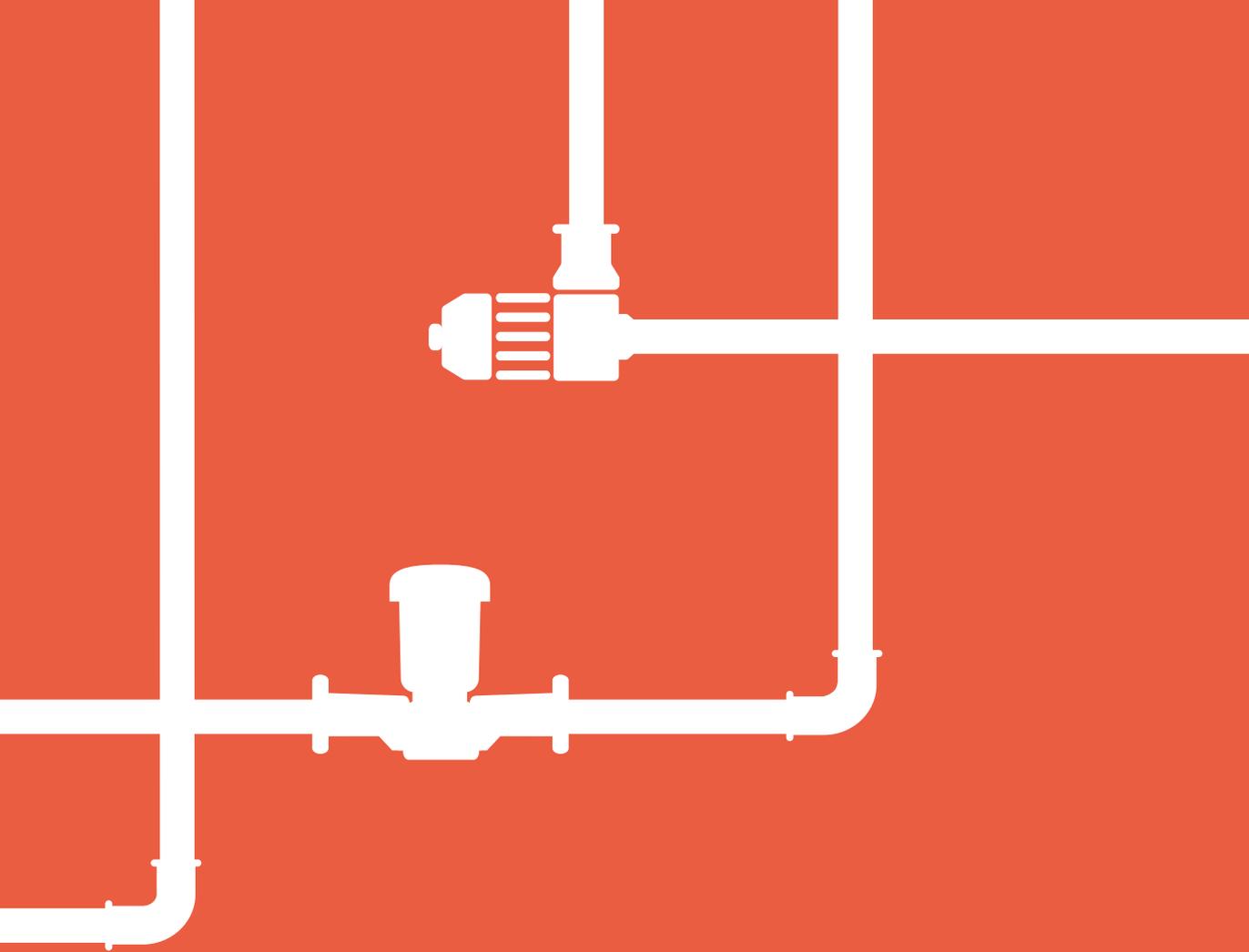


EUROPEAN PUMP INDUSTRY

ENERGY COMMITMENT





Europump, the European Association of Pump Manufacturers, was established in 1960. It represents 17 National Associations in 14 European Union member states, Turkey, Russia & Switzerland. Europump members represent more than 450 companies with a collective production worth more than €10 billion and employing 100,000 people in Europe. The ever improving performance of liquid pumps increases the productivity of end user sectors and contributes to competitiveness and growth.

Pump manufacturing is a growing and SME-driven sector. With almost half of all world exports and 40% of major patent applications, the Western European pump industry is the economic, commercial and technological leader.

Europump is an associate member of Orgalime, the European engineering industry association representing the mechanical, electrical, electronic and metal working articles industries as a whole. Orgalime has many activities and some translates into position papers.



EUROPUMP GENERAL

EUROPUMP REPRESENTS

17 national associations, over 450 companies employing some 100,000 people in Europe, and has a collective annual production worth over 10 billion euros.

MISSION

It is Europump's mission to:

- Develop appropriate programmes and tools to support the European pump industry in understanding and maintaining knowledge of fluid system technologies and the related market requirements
- Promote energy savings and environmental integrity where these are beneficial to our sector and pump users
- Maintain an open and constructive dialogue with all stakeholders determining or influencing the progress of our industry
- Look after the best interests of all pump manufacturers, both large and small, against the backdrop and challenges of political and environmental programmes.

MARKET CONTEXT

Pumps, being key enabling technologies, are used everywhere: buildings, water cycle, industry, power generation, chemicals, oil processing.... All these user sectors are facing increasing demand for energy savings and far-reaching environmental challenges to combat climate change.

Since 2004, European pump manufacturers have been providing solutions to these new energy savings and environmental challenges under the Europump flagship project called "**Ecopump**".

The Ecopump initiative was designed to be the cornerstone of the European pump sector's energy

and environmental policy. Ecopump is built around three key pillars: 'Product', 'Extended Product' and 'Systems', the concept being to ensure that:

1. The liquid end of our products meets minimum efficiency levels
2. Product savings are optimised via the Extended Product Approach through the control of our products
3. The installed base is investigated to make sure that efficient products are installed into efficient systems.



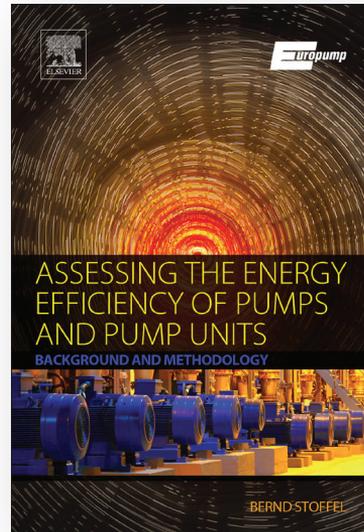
Today there are minimum energy efficiency requirements in place, which have been enforced by EU legislation for clean water pumps and circulators and which are supported and enhanced by Europump. Other types of water and waste water pumps have also been investigated for new requirements.

During the last few years, studies and research have been undertaken to extend energy efficiency requirements at extended product level with the electric motor, and at system level.

HANDBOOK ON ENERGY EFFICIENCY

In 2015, Europump published under the **Ecopump** initiative a handbook assessing the energy efficiency of pumps and pump units (for sale at Elsevier). This book consolidates and reaffirms the outcomes of a series of studies that Europump has conducted in recent years in collaboration with Darmstadt University of Technology.

Energy and environmental challenges can provide industry with a good basis for innovation in pump applications, and European pump manufacturers are playing a leading role in this field. For example, Europump is the only mechanical industry group engaged in tracking, with the consultants to the European Commission, the product environmental footprint initiative. This is despite the fact that it is acknowledged that pump energy consumption is predominantly concentrated in the use phase, further confirming our commitment to environmental integrity.



OUR ENVIRONMENTAL PRINCIPLES

- Environmentally targeted and reliable pumps (correctly sized, installed and maintained)
- Efficiently optimised pumps and systems
- Environmentally friendly pump installations taking into account system demand requirements in the pump design.



ENERGY EFFICIENCY OF PUMPS

THE EUROPUMP APPROACH

Europump promotes the improvement of the energy performance of all pump types by adequate measures at the different pump system levels: namely the product, extended product and system levels. Europump aims to provide policy-makers with technological know-how to facilitate effective new legislation.

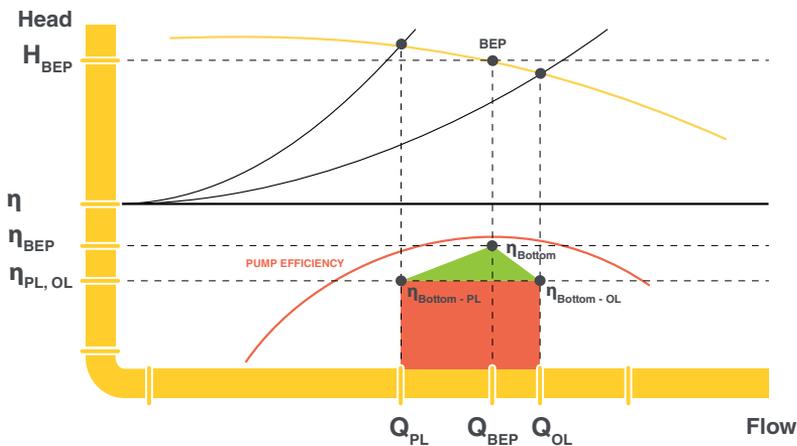
A major example and case in point is the European Commission's review of Commission Regulation (EU) 547/2012 (lot 11 – water pumps), Ecodesign lots 28 (wastewater pumps), and 29 (other clean water pumps), taking place in 2016. For this Europump recommends adopting the 'Extended Product Approach'.

WHAT IS THE PRODUCT APPROACH

Originating from a preparatory study for the Energy Using Products (EuP) Directive (2005/32/EC), the 'House of Efficiency' is a pass or fail scheme that takes into account design and application

requirements as well as pump minimum efficiency dependent on flow capacity and geometric design parameters. It sets out formulas to calculate energy efficiency of water pumps.

Figure 1. The House of Efficiency



The requirements in place today are set out in Regulation EU/547/2012.

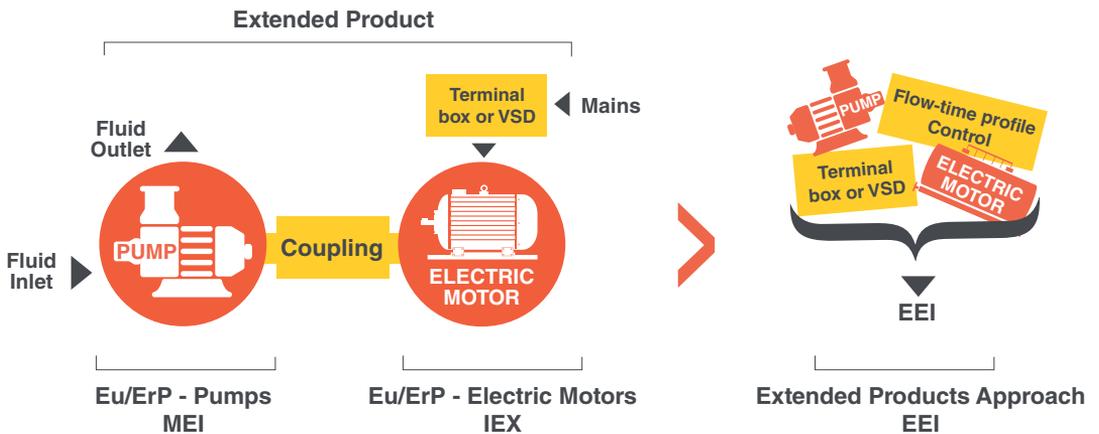


WHAT IS THE EXTENDED PRODUCT APPROACH?

The Extended Product Approach is a methodology designed by Europump to focus on the different operation points inside an installation. This is a major advantage in installations with a high variable load i.e. heating and air conditioning installations. It calculates the energy efficiency index (EEI) of an Extended Product (EP), which incorporates flow-time profiles and control method.

Europump encourages the continuous improvement of the Extended Product Approach, allowing for greater savings and the development of necessary corresponding standards. This reduces the administrative burden for manufacturers and market surveillance authorities.

Figure 2. The Extended Product Approach





PUMP SYSTEMS

For many years the system approach has been recognised as one of the most difficult strategies to implement on equipment across Europe. This approach involves individual components which, in themselves, can be efficient, interacting within a system which can be inefficient. By investigating the total system need (demand) and then looking at the actual operating conditions, a comparison of how efficient the actual system can be assessed.

Pumping systems are generally oversized for a variety of reasons. An oversized system will require either an orifice plate or control valve to be fitted to bring the system back to its operating point, which wastes energy.

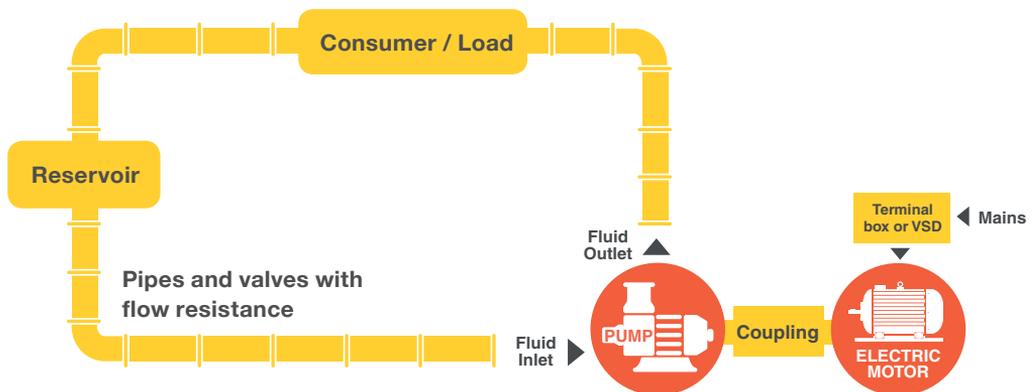
Once the total system demand is realised, individual components can be investigated to see if they are actually operating efficiently or can

be improved. The system approach potentially offers not only the most energy savings within motor driven systems, but also the greatest improvements in equipment reliability and reduced maintenance.

Acceptance of a system approach requires the user (operator) to be made aware of the potential energy savings within motor driven systems.

The Energy Efficiency Directive (2012/27/EU) has been introduced across Europe. This Directive mandates energy audits in Industrial Processes, Buildings and Transportation. The first audit is required by 5 December 2015 and then again at least every four years from the previous audit. The Directive subsequently instructed the responsible European Standardisation Body (CEN) to prepare appropriate generic standards to assist those carrying out energy audits.

SYSTEM APPROACH





EU DIRECTIVES AND CEN STANDARDS

The pump industry recognised that carrying out an energy audit on a pumping system would require specific technical information, so it subsequently introduced its own international

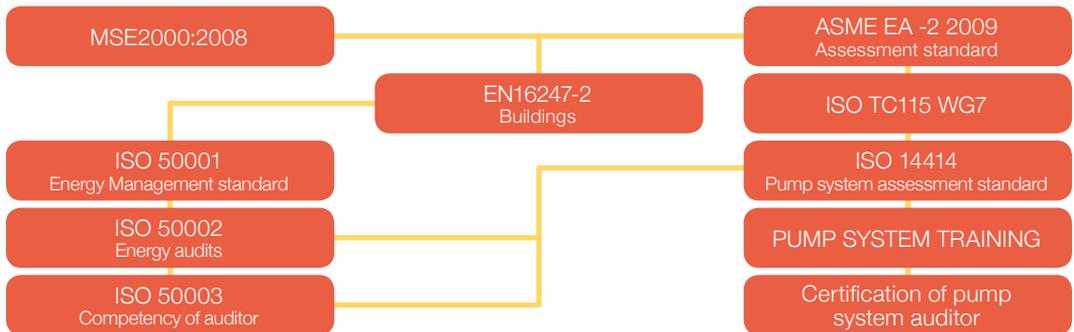
standard ISO 14414 "pump system assessment". A new series of energy management and generic audit standards were also introduced on an international voluntary basis.



ISO STANDARDS AND TRAINING

As these are generic European and international standards, the goal has been to ensure that ISO 14414, Pumps and Motor Driven Systems are referenced appropriately within them. The mandated audits being introduced by the Energy Efficiency Directive across Europe should ensure that pump systems achieve the energy reducing

focus they deserve. However it is imperative that ISO 14414 is used when carrying out a pump system energy audit and that the Energy Auditor is suitably trained to carry out this task. Accreditation of a pump system auditor is generally carried out on a national basis.



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PRODUCT ENVIRONMENTAL FOOTPRINT

Whatever its application, a pump participates in the overall environmental impact of the system and a "green" pump is required for a "green" system. This is the motivation for the growing interest in environmental information for pumps, especially in the construction sector where we have seen a rising demand. As demonstrated by several studies conducted either by industry or by the European Commission, pumps are high consumers of electro-motive power, with

a major environmental impact corresponding to energy consumption during the use phase. This is therefore a priority for environmental communication and it is important that the figures are given in a comparable way for all pumps. Other environmental impacts, i.e. those due to manufacturing and end-of-life of pumps, should be taken into account in a straightforward and cost-efficient manner.

METHODOLOGY

Environmental communication should be primarily based on the Life Cycle Analysis (LCA) of the product, i.e. the analysis of all environmental impacts at all stages of its life cycle. In order to take into account the complexity of the product range and to ensure a harmonised methodology, "Product Category Rules" (PCR)

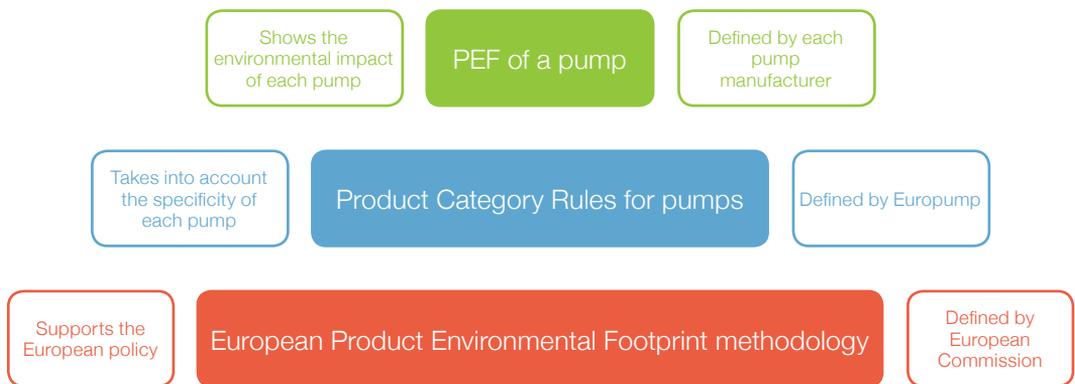
must be developed. Environmental declarations written according to such PCR will therefore be comparable. Such PCR will take into account the variety of applications as well as the specifics of the individual products. Europump is committed to preparing such rules.



EU POLICY IMPACT

The sheer variety of standards impacting on environmental footprint methodologies is continuously expanding. Combined with various end-user expectations, this presents an important threat to pump manufacturers who sell in different markets and countries. In this context, Europump welcomes the 2013 initiative of the European Commission to create a single market for green products and the willingness to place the foundations of a harmonised system across Europe. We believe that the Product

Environmental Footprint methodology developed by the Joint Research Centre is a starting point in harmonising an environmental footprint approach across Europe. However this harmonisation should not increase requirements to an unnecessary high level. It should take into account the specifics of sectors and feedback from new initiatives such as the European Commission's new pilot studies in this field for industrial and energy-consuming products.



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