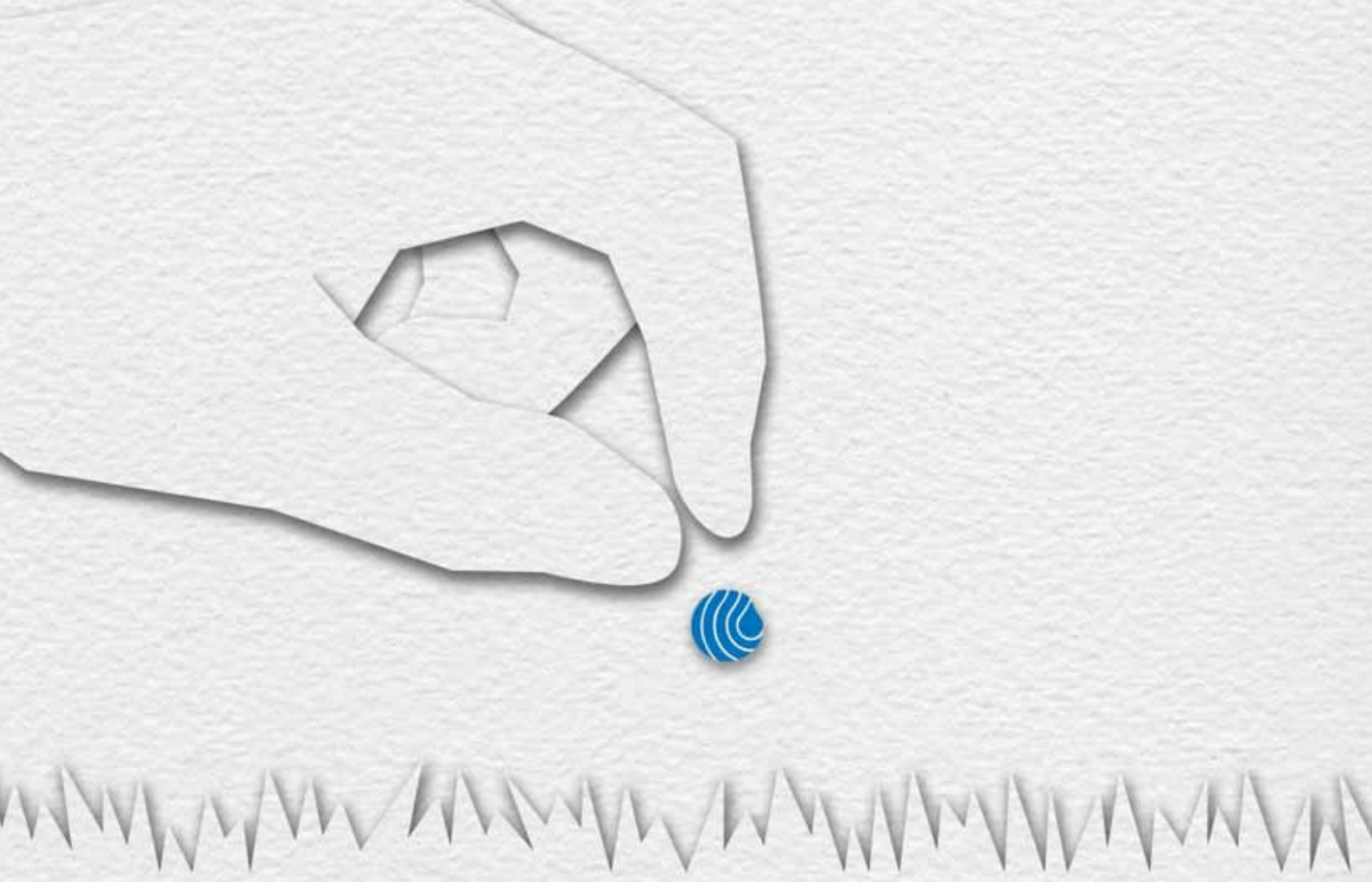


The EU Eco design directive

EVERY DAY, WE SOW TECHNOLOGY FOR LIFE

LOWARA
a xylem brand

2020.
We have a big target to reach

Eco design directive.

In 2005, the European Union approved the new 2005/32/EC Directive with requirements on the environmental design of energy-using products.
This has been known as the EuP (Energy using products) or Ecodesign Directive.
On 20 November 2009, it was replaced by the new 2009/125/EC Directive. The most significant modification is that the scope of "Energy-using Products" was expanded to include "Energy-related Products" and is now shortened to the "ErP Directive".
The scope of the Ecodesign Directive is to reduce energy consumption and other negative environmental impacts. The target by 2020 is a 12% reduction of the 2007 years consumption meaning a totally saving of 341TWh (terra watt hours).
The Lowara products affected by the Ecodesign Directive are

- Electrical motors used in surface pumps
- Circulators
- Pumps for Clean Water

Motors: new levels of efficiency.

The EU MEPS (European Minimum Energy Performance Standard) scheme sets mandatory minimum efficiency levels for electric motors introduced into the European market. The European Community (EC) directive n. 640/2009 was set up in July 2009 as part of the EU's eco-design project. The EU legislation is basically based on the standard IEC 60034-30: 2008 and uses the classes and testing methods defined within.
The legislation is valid for single speed, squirrel cage induction motors, with 2, 4 or 6 poles, rated voltage up to 1000V, 3-Phase motors from 0.75 kW to 375 kW (rating based on continuous duty). (The important dates*)

From 1 January, 2013
Circulators** must be A-classed. The EEI-index for A-class will change from 0,4 to 0,27.
Clean water pumps *** must have a MEI higher than 0,1.

From 1 January, 2015
Motors* with a rated output of 7.5 – 375 kW must meet either IE3 efficiency level or IE2 level if fitted with a variable speed drive.
Clean water pumps*** must have a MEI higher than 0,4.

From 1 August, 2015**
For stand-alone and new installed integrated circulators the MEI must be ≤ 0,23.

From 1 January, 2017*
The regulation now covers also the smaller sizes and now motors with a rated output of 0.75 – 375 kW must meet either IE3 efficiency level or IE2 level if fitted with a variable speed drive

From 1 January, 2020**
For replacement circulators integrated in products the EEI must be ≤ 0,23.

Circulators.

The eco-design directive also calls for more efficient wet rotor circulators used in heating systems. They are already today energy efficiency labelled, but the so called EEI index (the index that determines the energy class) will change and demand more efficient circulators. The index is calculated based on the overall efficiency of the circulator and a duty simulating the variance in a heating system; the lower index, the more efficient pump. Today, the EEI index has to be below 0,4 for an A-classed circulator. The European Community (EC) directive n. 641/2009, set up in July 2009 describes the new index levels and from 2013, it will only be allowed to sell A-classed circulators. Also the formula to calculate the index will change, so it's not possible to compare old and new EEI index. (The important dates**)

Clean water pumps.

The EU MEPS scheme sets mandatory minimum hydraulic efficiency levels for certain types of clean water pumps (end suction, in-line, vertical multistage and borehole pumps). The European Commission (EC) directive no. 547/2012 was set up on the 25th June 2012 as part of EU's eco-design project.
The purpose of the Directive is to cut off the pumps with the lowest hydraulic efficiency, whose percentage in the market is indicated by the MEI (Minimum Efficiency Index); this means that the MEI index corresponds to a bottom cut-off of those pumps that are under performing and its value defines, for each pump design and for each size, the minimum value of efficiency.
The European Commission has benchmarked all the pumps on the market affected by the Directive and established a formula to calculate the minimum hydraulic efficiency value related to each specific MEI index. The cut will be made in two steps; the first in January 2013 is cutting off the lowest 10% of the pumps in the market. The second step in January 2015 will cut off 40% of today's pumps. These cuts are referred to as MEI 0,1 and MEI 0,4 and it means that a pump must have a higher MEI than 0,1 (2013) and 0,4 (2015) to be sold in the European Union. (The important dates ***)

Our way there

Technical solutions.

The efficiency of an induction motor depends on how well losses are kept low in the motor. The main types of losses are electrical, mechanical and magnetically losses. Mechanical losses are mainly due to bearings or sealing systems in the motor. Electrical losses are due to resistance in the windings. Magnetically losses are due to hysteresis and eddy current losses.
Since there are a number of different types of losses, the ways of reaching higher efficiencies will vary with the type of motor you start with. In general actions like adding more copper to motor, using higher grade materials in the stator and rotor or equipping the motor with low friction bearings are common ways to reach a more efficient motor. Unfortunately all these ways usually also increase the motor cost.
Another way to increase the motor efficiency is to change the technology to electronically commutated (EC) motors with permanent magnet rotors.

This technology is more costly, mainly because of the permanent magnets and that it requires electronic control of the motor to work. It's also more difficult to service an EC motor as the magnets are very strong. Service will require an environment free from metal particles and only non magnetic tools can be used. This technology is mainly used for wet rotor circulators where a failed motor is replaced instead of being repaired.

Lowara solution and offer.

Standard electrical motors
Since 16 June 2011, Lowara is compliant with the legislation and deliver IE2/IE3 motors. (For more information about IE3 motor implementation see our technical catalogues).

Wet rotor circulators
Lowara use a special designed EC motor with a spherical rotor. This design adds the advantage of the EC technology with a mechanical design without shaft and bush bearings to reduce the losses in the motor. Our Ecocirc models are ErP 2015 ready.

ErP ready 2015 — Tomorrow's high efficiency ready now: the new Lowara Ecocirc® are compliant with the ErP-Directive for 2015

Lowara products included in MEI:

FH cast iron end suction pumps

SH stainless steel end suction pumps

FC in-line pumps

e-SV vertical multistage pumps

GS 4" borehole pumps

Z6 6" borehole pumps

All Lowara products have a MEI higher than 0,1 and are "ready" for the 2013 cut off.

But green life is more than motors

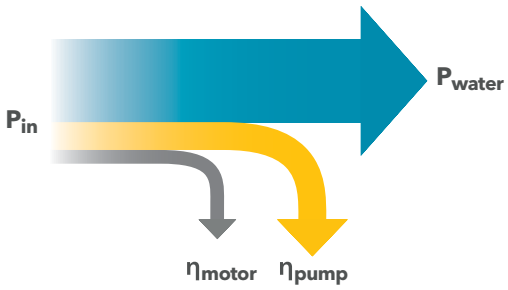
Holistic approach.

Motors are important, but to be true green it's important to have a holistic approach. In a pump system, the motor is one of the components contributing to the total efficiency of the system and the possibilities to save energy are much greater when looking at the whole picture. The base line is set by the pump system design (pipe diameter, components, pipe layout etc). The energy required is determined by the formula

$$P = Q \times H \times g \times \rho$$

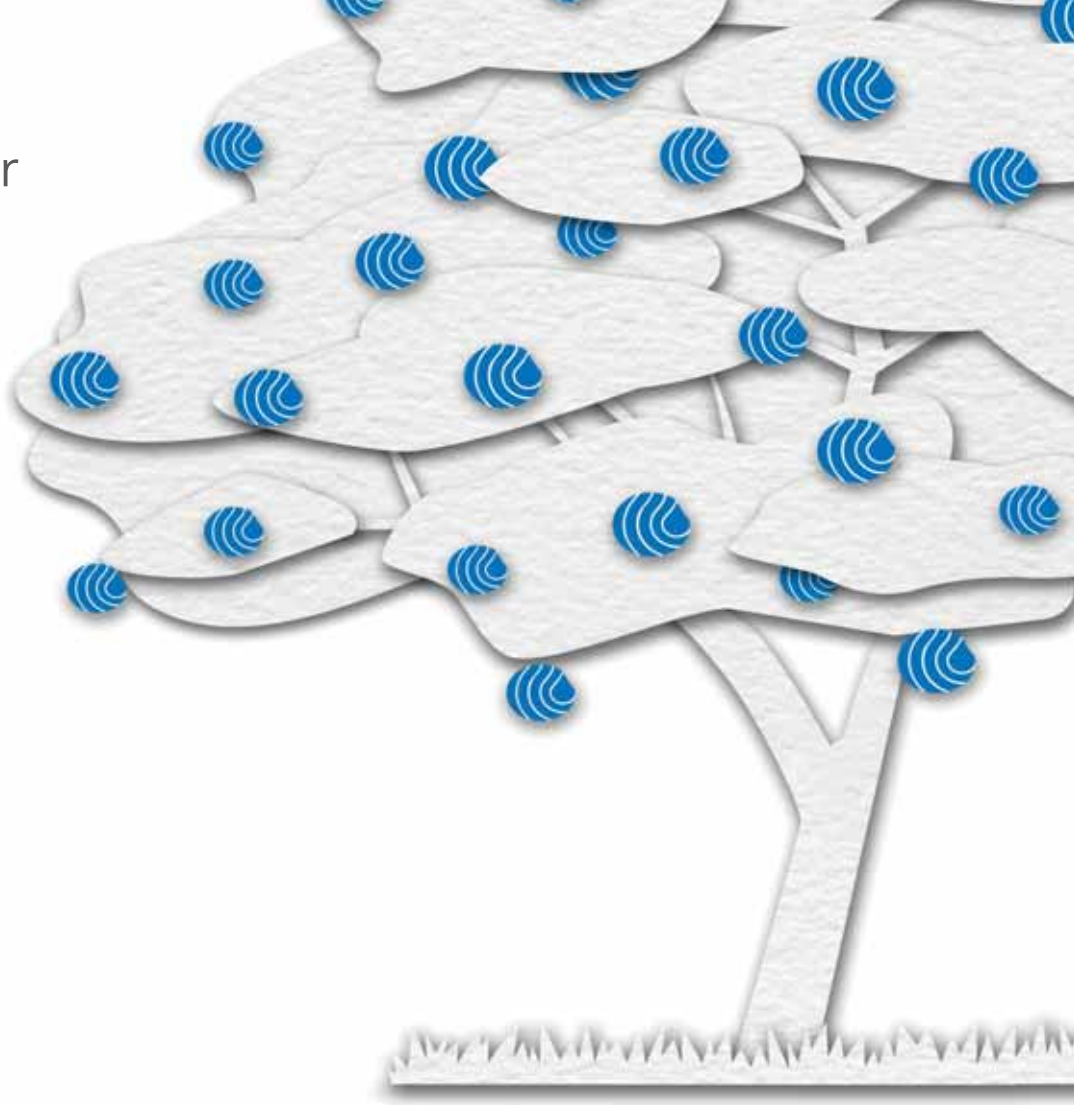
P= Power - Q= Flow - H= Head - g= gravity - ρ= density

So, the lower the friction losses are kept in the system, the less head the pump need to produce to give a certain flow and the less energy is needed to move the water in the pipe system. When the system is set, it's about choosing the most energy efficient solution to pump the water in system.



The figure shows the different losses in the pump system and the relation between them.

We can sow for life together.



The **first factor** is to choose a pump as close to it's best efficiency point as possible. Here it can easily differ 5-10% in efficiency in available alternatives (see ill. A).

The **second factor** is to determine if the pump system has big enough variations in the flow to justify a speed controller like Hydrovar.
This can make really big savings (up to 75%) in some systems. This is also acknowledged by the EU commission as an IE2 motor with VSD is allowed to sell also after 2015 (see ill. B).

The **third factor** is the motor efficiency. Here we talk about differences of 1-3% in efficiency.
It's not unimportant, but the big potential lies in he other factors. In systems with long running hours, it could make sense to use an IE 3 motor as the payback time becomes more reasonable.

A holistic perspective represents the best means to reduce energy bills while at the same time minimizing the overall ecologic impact. At Lowara, we fully realize the importance of those goals, from designing efficient pumps to help finding optimal solutions for every pump system.

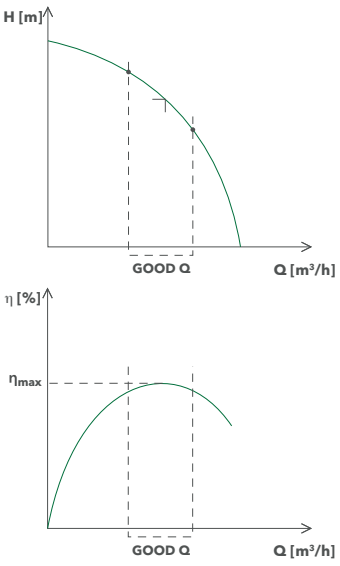


Fig. A

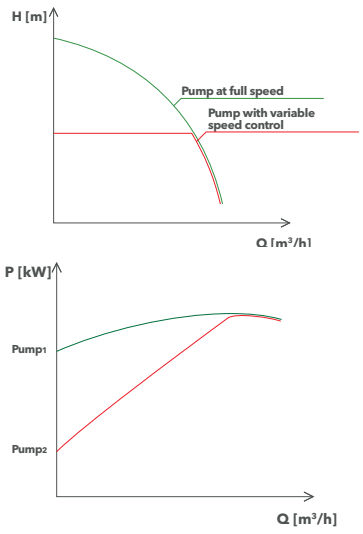


Fig. B

What can Xylem do for you?

Xylem |'zīləm|
1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.
We're 12,000 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to xyleminc.com.

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xylem
Let's Solve Water

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