

ECOINNOVATION

Topics Online „Eco-Innovation“ presents cutting-edge and fascinating best practices for increased resource productivity. In the tradition of „Factor Four“ they show what is possible, present obstacles and how green lead markets can emerge.

Best Practice

»» Energy Plus Pumps

Energy Efficient Circulating Pumps for Heating Systems

Circulating pumps in European heating systems induce annually an electricity consumption of more than 50 TWh and cause CO₂ emissions of more than 30 million tons per year. The energy used by circulator pumps is equal to about 2 % of the overall electricity consumption of the EU-27.

With energy efficient technologies, the energy consumption and the annual electricity costs can be reduced significantly: Improved circulating pumps now on the market consume up to 80 % less electricity than conventional models. By combining electronically optimised motors with an improved impeller design the efficiency can be enhanced from at best 24 % (conventional circulator pumps) to 40 %. A frequency converter enables a pump regulation adapted to different capacities and applications, which leads to further energy savings.

The new pump technology with electronically commutating (EC) motors has been developed and introduced by Biral in 2000. Since the year 2005, it is available as series product from all major pump firms. The producer association **Europump** has created an EU-Label (efficiency class A – G) to support the new pump technology. The new pumps meet the energy efficiency class A.



Sustainability-effects

ECOLOGY	<p>A new pump consumes up to 80% less energy compared with conventional models. Implementing this new energy saving pump technology as European standard for circulators would save more than 60% of the circulator annual electricity use, that is more than 30 TWh. These savings amount to CO₂-reductions of more than 15 million tons per year.</p> <p>Provided a correct hydraulic balance, in most cases a smaller pump can be installed, leading to energy and material savings.</p>	<ul style="list-style-type: none"> ✓ Energy consumption ✓ Emissions ✓ Material consumption
ECONOMY	<p>Currently, high initial costs of around 300 Euros amortize within only two years in a single family dwelling through energy savings. During an average life-span of a circulator, savings of up to 500 Euros can be achieved compared to a conventional model.</p> <p>Innovative circulating pumps have good prospects in the export market and provide competitive advantages for the European pump industry. The dependence on foreign energy sources and the effects of price fluctuations in international energy markets decline.</p>	<ul style="list-style-type: none"> ✓ Markets ✓ Competitiveness ✓ Costs
SOCIAL	<p>Energy savings lower the cost of housing and leave tenants with more spending money in the purse. Optimised pumps are less noisy due to the frequency converter.</p>	<ul style="list-style-type: none"> ✓ Financial benefit ✓ Quality of life

Obstacles and drawbacks

Manufacturing costs are currently higher than those of conventional models, due to low production numbers, but prices may be expected to decrease with mass production. Customer interest is low, as usually not the final customer but installation contractors or boiler manufacturers choose the pump, referring to the lower product price only. Furthermore, the new pumps do not fit into existing wall-mounted heaters and cannot be installed afterwards.

Engineers and installers need qualifications or training that enables them to promote the new pumps and to decide where to install which product. Another important factor are partners in related branches of industry, e.g. boiler manufacturers who integrate the pump into their boilers and bring it to a broad base of costumers.

Potential

In the EU-27, there are more than 100 million circulators. Approx. 2 million small circulating pumps in single and two-family dwellings in Germany annually require maintenance and replacement. Pumps with medium and high output make up a separate share of the market, consisting mainly of institutional buyers. They specify the pumps themselves and are used to economic calculations and are hence easier to convince than the single homeowner.

In most cases, old boilers can be replaced by smaller ones, as installation contractors tend to install a big pump so as to receive no complaints from their customers (about three times over-dimensioned in most dwelling). Furthermore, many dwellings have undergone extensive thermal insulation measures in recent years. Smaller pumps save energy and material.

The [EU-project „Energy+Pumps“](#) brings together the key market actors in order to transform the market so that the new technology will become the standard technology, at prices close to those of conventional pumps. Since April 1st, 2009, the German KfW Bankengruppe supports the anticipated replacement of old non-regulated heating pumps with high efficiency pumps (energy efficiency class A).

Policy recommendations

The obstacles listed above show where environmental, energy and economic policy and the related authorities can support the launch of innovative circulating pumps. The focus lies on the methods of technology procurement that have been successfully tested for other products. The overall idea of this process is to raise confidence between the participating partners (housing industry, building service suppliers, installers, heating systems industry, pump industry, multipliers) in order to create a sufficient market and reduce the product price through mass production. It also makes sense to adopt the requirements in building regulations for private homes.

Links and contacts

Further information:

[Energy + Pumps](#)

[KfW Förderbank](#)

Manufacturers and suppliers (examples):

Biral GmbH Präzisionspumpen www.biral.de

Grundfos GmbH www.grundfos.com

WILO GmbH www.wilo.com

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Photos: Biral GmbH, Grundfos GmbH, WILO GmbH
Date of publication: 02/2010

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