

**ENERSAVE Guideline / LCC** is the name of a project aimed at preparing a guide to energy saving and life cycle costing. Scheduled for publication this year, a printed brochure will soon be available to the international pump market. The following article is to introduce you to the topic and prepare you for questions likely to be asked by your customers.

## How to Save Energy and Analyse Life Cycle Costs

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### The project

A joint initiative by *EUROPUMP* and the *HYDRAULIC INSTITUTE*, the project was kicked off in 1997 by Kjell Alfredsson (ABS) and Lars Frenning (FLYGT). The contributing companies were: ABS PUMPS, BASE, GRUNDFOS, IDP, ITT-FLYGT, KARDO-PUMP, KSB, LEWA, MONO PUMPS, SARLIN, STERLING FLUID SYSTEMS, WILO and BROOK HANSEN (electric motors).

All applications considered, pumps account for an estimated consumption of one fifth of the electricity generated worldwide. As we all know, the shortcomings in plant engineering, the selection of pumps and modes of operation alone make for a vast energy-saving potential. For this reason, the project group has been working on a comprehensive "How to" brochure for the selection and improvement of pumps, plants and systems under energy-saving aspects, also considering availability and other parameters. A new model taking into account all cost elements is to provide a reliable basis for integrating life cycle cost analysis in general market considerations.

This guide will enable the user to assess the profitability of pumping systems. It includes all system elements and examines each of the factors which contribute to life cycle cost. The characteristics of differ-

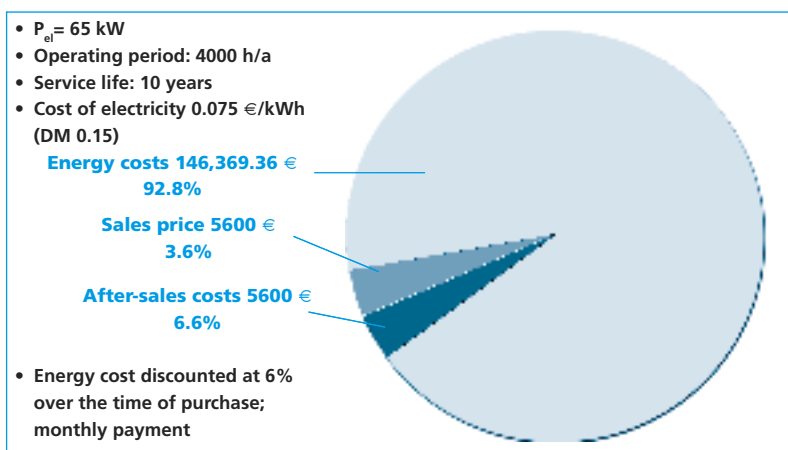


Fig. 1: Life cycle costs of a 10" submersible borehole pump

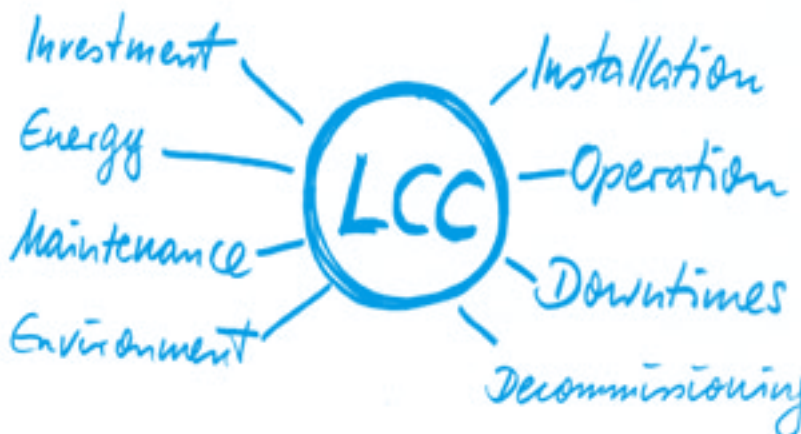
ent pumps and drives as well as the various system monitoring and control options are identified with regard to the particular customer benefit. Information is given on how to select pumps and drives for both nominal operation and varying operating conditions.

Finally, the guide describes how operating efficiency can be kept high and costs low through effective

maintenance. The guide's appendices focus on specific topics dealt with in depth, decision-making tools as well as 14 case studies indicating the expenses saved by taking life cycle cost elements into account.

### Life cycle cost elements

The life cycle cost elements are now described by the following definition throughout all branches of industry:



## Applications

**LCC is the sum of investment, installation, energy, operation, maintenance, downtimes, environment, decommissioning.**

Compared with ISO 15663 (Petroleum and Natural Gas Industries) defining 15 elements for the life cycle cost, the new model clearly simplifies matters and is a better tool for everyday use. A pragmatic approach must of course be found, and a basic understanding must be reached with the customers about the key elements. These may vary depending on the industry concerned. While energy costs are deemed to be less important than downtime costs (loss of production) in the chemical

industry, the aspects governing submersible motor pump applications (see Fig. 1) are completely different.

It is important to understand that life cycle costing according to the above definition should not be treated as an exact mathematical / economic equation which is better ignored if there is insufficient information on the individual elements. The aim is to estimate the relevant overall costs on the basis of conditions agreed upon between the customers and suppliers. Unlike the submersible borehole pump shown in Fig. 1, which is used as base load pump in continuous operation close to its best efficiency point,

some pump applications require that assumptions be made on the pumping period and changes in the flow rate. In these cases, a first approximation should be possible without great effort. Even leading electric motor suppliers follow a similar approach in their selection software for variable speed drives for pumps. The Divisions are working on tools to be used for this process which will be made available to you. Our competitors are also actively involved in this field. The guide including appendices will comprise approximately 200 pages. Please do not ask for copies of the present draft, we will inform you when the printed version is available for distribution.