

Protecting the environment and reducing costs

Variable speed pumps

Since fossil fuels will be important for energy production for the foreseeable future, the emission of carbon dioxide CO₂ cannot be avoided in the short term. End-user energy efficiency is therefore a key part to reduce emissions. Sulzer Pumps supports strategy to save energy and reduce emissions by providing state of the art high efficiency industrial pumping systems. An overlooked opportunity?

Pump systems account for nearly one third of all industrial electric drive applications and account around 20% of the world's electrical energy demand. As the largest single application group pump systems have the highest potential for energy savings. The systems are widespread; they provide domestic services, commercial and agricultural services, water/waste-water services, industrial services for power generation, oil and gas, petrochemical, chemical, pulp and paper, and food processing. Initial purchase price is a small part of a pump's total life cycle cost (LCC). Energy and maintenance constitute the main cost over time. For example, in pulp and paper, one of

the core business segments of Sulzer Pumps, the share of energy costs may easily be up to 90 %.

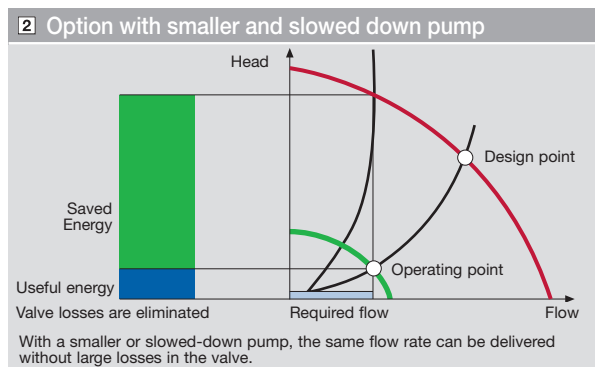
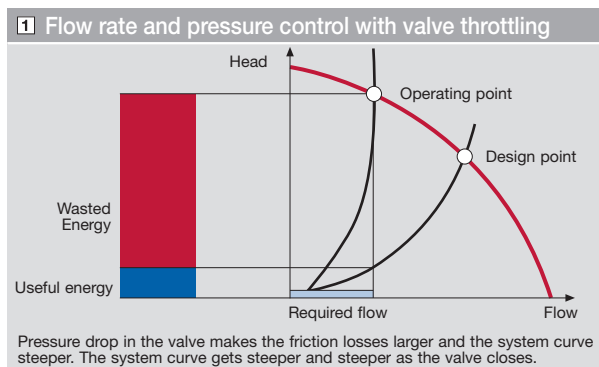
There are different methods of controlling process flow rate. Typically these are achieved through by-passing or valve throttling [1]. Both options destroy the energy by generating friction losses. A more efficient option is adjusting pump speed by using a Variable Speed Drive (VSD) [2].

The most common type of VSD is an electronic frequency converter used in conjunction with a standard induction motor. The benefits of using VSDs are energy savings, improved process control, extended pump life, simplified pipe systems and soft start/stop etc. Potential

drawbacks include structural resonances (voided by appropriate design) and maintenance and installation costs of the VSD system. Sulzer Pumps provides market adapted, economically attractive solutions that maximize the benefits of a VSD package.

Retrofitting existing equipment

There are approximately 20 times more pumps in service in existing installations than are supplied new each year. The SulzerGreen™ concept is designed to optimize the energy efficiency of existing pumping systems; it is targeted at industrial processes and is used as a tool in energy audits. The aim of a Sulzer Green™ audit is optimized energy use,



increased efficiency and a more reliable process with flow capacity that matches operational requirements. Benefits of the SulzerGreen™ concept to the user:

- energy savings
- optimized pumping
- more reliable process
- verified/updated adjustment methods available
- pumps with capacity restrictions can be identified and upgraded
- updated knowledge of pumping technology and new savings opportunities

The SulzerGreen™ concept is best suited to customers whose:

- energy consumption in pumping is significant
- process has undergone capacity changes or where changes are planned
- pumps require modernization
- pumps operate with poor efficiency

Applying the SulzerGreen™ concept, Sulzer Pumps has performed energy audits in several pulp and paper mills. Chart 3 illustrates the results achieved in an analysis made for a modern, large paper mill. First, the pumps were classified in a study by utilizing both the information received from the customer and our own comprehensive reference data-



Process pumps are central to pulp and paper production.

base. This step is important in order to identify the pumps to be studied in more detail. By analysing the operating conditions and process requirements, 27 pumps were identified as most promising for modification. Proposed actions included installation of variable speed drives, trimming impellers, and in certain cases, pump replacements. The calculated payback time for the improvements was less than two years.

Outlook

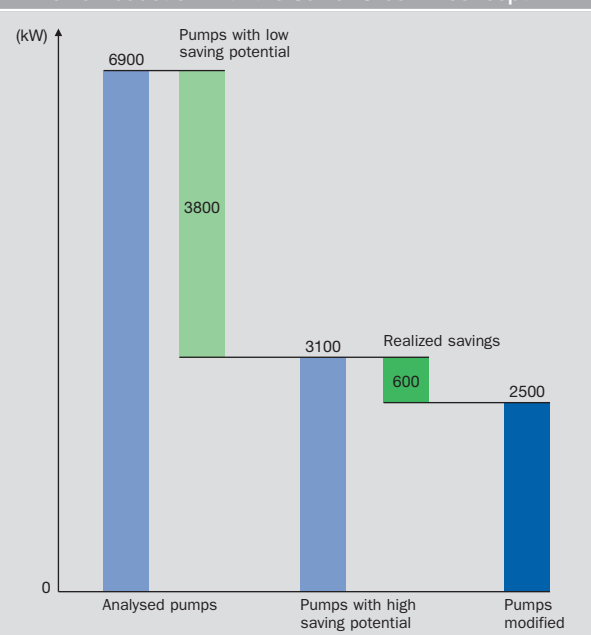
Energy saving is of increasing interest for operators of both new and existing pump systems. Environmental legislation support progressive companies with com-

petitive advantages. In the industries served by Sulzer Process Pumps, the number of VSD controlled pumps is continuously increasing, currently representing approximately 30% of new installations. Sulzer Pumps is applying this technology to enable its customers to save both energy, money and reduce the production of CO₂.

Marc Heggemann
 Sulzer Innotec
 Sulzer Markets and Technology Ltd.
 Sulzer-Allee 25
 8404 Winterthur
 Switzerland
 Phone +41 52 262 82 36
 marc.heggemann@sulzer.com

Ralf Gerdes
 Sulzer Pumps Ltd.
 Zürcherstrasse 12
 8401 Winterthur
 Switzerland
 Phone +41 52 262 85 45
 ralf.gerdes@sulzer.com

3 Power reduction with the Sulzer Green™ concept



A typical modern pulp and paper mill.

