

## **Alfa Laval takes on a global challenge:**

### **Addressing the environmental aspect of cooling**

The need for efficient cooling is expanding rapidly all over the world. In emerging industrial economies - like China and India – economic growth and an explosive development of vast consumer markets generate needs for new solutions at a frantic pace. In the Middle East, Dubai has the fastest market growth in the world. In the Western hemisphere, a rising tide of environmental concerns call for fresh approaches - often under the pressure of increasingly strict legislation. At a summit meeting with European leaders in 2007, a 20 percent reduction of greenhouse gas emissions was defined as an aiming point for 2020. This reduction is expected to be achieved parallel to an increased energy consumption. The International Energy Authority (IEA) predicts a 50 percent increase of the global energy consumption up to 2030. Obviously, only innovative technology can harmonize these apparently contradictory estimates.

As a world leader within district cooling technology, Alfa Laval is an instrumental force in the development of solutions meeting the severe demand specifications from the global market. The environmental aspects generate a tremendous pressure on equipment manufacturers, and Alfa Laval has taken on this challenge successfully. Plate heat exchangers play a vital role in the process.

*ID Image: 009834*

*Alfa Laval plate heat exchangers play a vital role in cooling systems.*

### **Focus set on plate heat exchangers**

The benefits offered by district cooling are multiple and obvious. Consequently, community and business leaders all over the world are increasingly attracted by this technology. To enhance and multiply its benefits, Alfa Laval conducts research & development projects at many levels. In this article, we will describe the vital role of plate heat exchangers in cooling systems. For quite a number of years, Alfa Laval has set out to exploit the full potential of this function in order to reduce energy consumption and environmental impact.

*Mikael Hellborg* is a Business Unit Manager within Comfort Cooling at Alfa Laval. He labels the systematic development of plate heat exchangers at Alfa Laval “a natural priority”.

- As a major global player within cooling technology, we have an obligation to direct our research and development resources into areas where they can generate the most added value for our customers and for society as a whole. The environmental aspects are crucial, and the potential of plate heat exchangers is quite fascinating.

*ID Image: 009850*

*Mikael Hellborg, Business Unit Manager within Comfort Cooling at Alfa Laval*

### **Indirect and direct benefits**

Mikael Hellborg defines some of the environmental specific benefits offered by plate heat exchangers as “indirect” – i.e. that they can be defined mainly in the long run. However, quite

a number of benefits are “direct”. They can be calculated, and thus quantified immediately. Mikael Hellborg explains the distinction by examples.

- Our optimisation software offers calculation of the most efficient combination of plate heat exchangers. I consider this an indirect benefit, since you are not likely to calculate the cost - often generated by unfavourably high energy consumption - of a mismatch. All kinds of prevention represent the indirect category, because the true value of prevention can only be evaluated fully in a long-term perspective. One example: Plate heat exchangers can be used to separate cooling circuits in multi-story building, thus protecting chiller condensers and air conditioners from high pressure and thereby reduce future costs for repair and maintenance.

The direct benefits are obvious and their exact value can often be foreseen with some degree of accuracy. In the case of plate heat exchangers, they are multiple and can often be determined in terms of energy saving. Mikael Hellborg speaks with obvious pride.

- In many cooling applications, our plate heat exchangers make it possible to use free cooling media during the winter or when temperature shifts with the season. Most free cooling sources however – water from rivers and lakes, seawater, ice and snow – provide quite aggressive media. Separation of circuits and plates made of resistant material will eliminate this problem - and will sometimes cut electricity costs up to 75 percent during part of the year.

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*In many cooling applications, our plate heat exchangers make it possible to use free cooling media during the winter or when temperature shifts with the season, says Mikael Hellborg.*

### **A whole set of direct benefits**

Mikael Hellborg then a whole set of additional examples where plate heat exchangers from Alfa Laval add environmental benefits – strikingly often also parallel to cost reduction and improved functionality. He mentions the use of dry liquid coolers as an energy-saving cooling source in small-scale cooling systems, the reduction of chemicals for water treatment in cooling towers and plate heat exchangers saving electricity when installed in chiller bypass systems. He also describes the wide span of energy-saving options offered by integrated heating/cooling applications.

- In integrated system, plate heat exchangers make it possible to re-utilize waste heat as well as waste cold. In a system where there is a demand for hot water and cooling simultaneously, a plate heat exchanger can be installed between the condenser and the cooling tower to retrieve some of the energy otherwise wasted. This energy can be used for preheating of tap water. This is done indirectly via the district heating net. In some applications like this, our plate heat exchangers make it possible to recover up to 95 percent of the energy.

### **A global perspective**

Global warming is an undisputable phenomenon. So is the accelerating need for cooling capacity and the need minimize the environmental impact of the cooling systems built all over the world. For Alfa Laval this means that they must offer a combination of

standardization and flexibility – and that the environmental aspects must be given high priority. Mikael Hellborg concludes:

- Demand specifications may be challenging indeed, but the fact that we have experience from a great number of countries all over the world helps a lot. We have delivered cooling technology adapted to the most varying surrounding conditions – in terms of climate, infrastructure and legal framework. The cooling technology for the future has to be developed from a global perspective. The experience from one installation must be documented and held available whenever applicable on another project. Oddly enough, it often takes a global perspective to optimize solutions at a local level.

*Image ID: 009852*

*The cooling technology for the future has to be developed from a global perspective, says Mikael Hellborg.*