

How everybody wins.

The energy-related benefits of upgrading district-heating and community-heating networks are normally significant. Also, the environmental impact of burning less fossil fuel should not be underestimated. The advantages manifest themselves in many ways on several levels, with positive effects for residents, district-heating companies and municipalities alike.

The resident

The main benefit for residents is considerably lower heating costs – by controlling the heat (and energy) more closely. Thanks to local substations, households will be paying for the heat actually consumed, rather than simply a share of the heat produced.

Another welcome advantage is the increased heating comfort, as the indoor temperature automatically adjusts to fluctuations in the outdoor temperature. Also, by measuring the individual heat consumption, each household gets a strong incentive to save energy.

The district-heating company

With modern substations in every building building, heat is consumed in relation to heat actually needed. This means heat production becomes demand-driven, which benefits the district-heating company in more ways than one. Energy (and equivalent costs) can be saved at the central heat source – or be used to heat additional buildings or city sections.

The approach also increases the gap between the supply and return temperatures, which translates into lower flow rates throughout the network – allowing smaller pipe dimensions and lower pump capacity. Another energy saver.

The municipality

By successively upgrading, renovating and integrating its district-heating networks, a town or city can begin to realize significant benefits – economical as well as environmental. Network expansion can become more flexible – even in areas less densely populated. And when the time is right, such small community networks can easily be interconnected and

integrated, allowing central control and optimization of multiple heat sources.

Another opportunity is the flexible transition to alternative, non-fossil fuels. An investigation of alternative energy sources often reveals new advantageous options – including industrial excess heat, biogas, geothermal energy and waste combustion. Adding or switching to any of these alternative fuels causes little or no disruption in the overall network. But the result is always a reduction of CO₂ emissions, in some cases accompanied by energy savings.

Alfa Laval in brief

Alfa Laval is a leading global provider of specialized products and engineered solutions.

Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com



How to save energy in district heating.

Alfa Laval solutions lead the way.



Three energy-saving scenarios for district heating.

District heating and community heating are, in and of themselves, energy-efficient approaches to space heating (or cooling) and tap-water heating. Even so, there are several ways to increase the efficiency even further – with obvious positive effects on operating costs, CO₂ emissions and other environmental concerns.

Alfa Laval has been involved in hundreds of projects – upgrading district-heating networks in Sweden, Finland, Russia, Eastern Europe, China and elsewhere. We have seen first-hand how these upgrades have resulted in significant energy savings. And how district-heating companies, communities and residents have all benefited.

Three such scenarios are outlined below. The characteristics of each network and the circumstances surrounding its operation will help determine which scenario yields the largest energy savings.

New substations

The arguably simplest and least disruptive way of making a district-heating network more energy-efficient is to replace ageing substations with new ones.

Modern substations have two major advantages over those installed decades ago. Their control systems outperform their predecessors by far. Accurate sensors automatically adjust the indoor temperature in relation to fluctuations in the outdoor temperature. This means that only the heat actually needed by each building at any time is captured.

Also, the substations' built-in heat exchangers – where the transfer of heat from the external network to the building circuit takes place – are much more efficient today. Alfa Laval has invested heavily in developing new plate designs capable of optimizing the heat capture more closely.

Both aspects save energy at the central heat source or can be used to heat additional buildings or city sections.

Network renovation

Not only substations age. The entire network can often become considerably more efficient. For example, by installing substations in each building, rather than per



In Stockholm, Sweden, old district-heating substations in ten privately owned apartment buildings were replaced with new Alfa Laval Maxi units equipped with state-of-the-art control systems. The switch resulted in annual energy savings per building of 12-30 percent.

block or network section, the heat delivered will reflect the actual need – resulting in energy savings at the source.

Thanks to sophisticated control systems, modern substations increase the gap between the supply and return temperatures, which translates into lower flow rates throughout the network. This in turn means that smaller pipe dimensions and less pump capacity can be used – clearly reducing both investment and operating costs.



In a section of Irkutsk, Russia, 43 large apartment buildings were equipped with Alfa Laval Maxi substations. As a result, energy consumption dropped by 27 percent. (The savings are equivalent to the total energy consumed by 1,100 single-family homes under average Swedish climate conditions.)

Community heating

The expansion of existing district-heating networks can also be conducted in an energy-saving way – by focusing on a small section or community at a time. A community can be a limited number of buildings or even a single, large building complex.

Such small-scale “community-heating” networks (each with its own boiler plant and modern substations in all buildings) are easier to build, operate and optimize than larger ones.

Later, the community networks can be connected to the main city network – creating a system of integrated

loops with multiple, mutually supporting heat sources. The approach offers heat-source redundancy in case of a network failure. It also allows the district-heating company to jointly control all boilers and optimize the total output and energy consumption.



In a district-heating modernization project, a residential section of Odessa, Ukraine received new network piping, new or renovated boilers and 40 Alfa Laval Maxi substations. This resulted in an average annual drop in energy consumption of up to 50 percent. In addition, 98 percent less water was consumed. Overall operating costs dropped by 37 percent. (The energy saved is equivalent to the consumption of over 800 single-family homes in average Swedish climate conditions.)

District-heating solutions for every need.

Alfa Laval is a world leader in substations and system components for district heating. In every country where district heating is an established concept, Alfa Laval is a major provider of technology, products and application know-how.

Because all projects are different, with different requirements and preferences, it is important for Alfa Laval to offer a wide selection of solutions. Together, they cover every climate zone and every size of building.

Substations

Substations are available to suit virtually any need – from single-family homes to very large apartment complexes, as retrofit or new installation. They provide excellent heating comfort in radiator or floor systems, and instant hot tap water, thanks to patented technology. In many cases, they can be customized to individual requirements.

The Alfa Laval substations are all easy to install, operate and maintain. Thanks to clever design, top-quality materials and subcomponents, as well as per-unit pressure testing, their reliability is unparalleled. Thousands of them are proving themselves every day in networks throughout Western and Eastern Europe, Russia, China, etc.



Alfa Laval's Micro and Mini families



The Alfa Laval Midi family



The Alfa Laval Maxi substations

Heat exchangers

When district-heating companies prefer to tailor the substations to their own particular needs and circumstances, Alfa Laval can supply plate heat exchangers to match – in a multitude of sizes, materials and executions: gasketed, copper-

brazed or fusion-bonded in stainless steel.

They are all extremely energy-efficient, thanks to Alfa Laval's advanced plate technology. All Alfa Laval heat exchangers are thoroughly pressure- and leakage-tested and certified according to CE/PED and ASME. Their reliability is renowned all over the world.



Gasketed plate heat exchangers



Brazed plate heat exchangers



Fusion-bonded plate heat exchangers





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