



Energy savings by an annual average of up to 50%

District heating modernization project in Odessa, Ukraine

A thorough makeover – including boilers, pipes, heat exchangers and substations – of the district heating system within a residential area in the Ukrainian city of Odessa turned out to be somewhat of a model case. A modern 3-circuit solution with a primary side comprising the distribution network produced considerable energy savings – and thereby a very encouraging example.

Good relations and reliable technology

The system replaced was of traditional design, tormented by the “classical” problems of high water flows, excessive hot water tapping and inflexible heat supply. The system put into place is a modern 3-circuit solution, where the circuits for production, distribution and end-user consumptions are separated. The primary side comprises the distribution network all the way to the consumer substation.

The project included transition from three central district heating substations to 36 individual substations, equipped with 40 heat and hot water heat exchangers produced by Alfa Laval. In this project, Alfa Laval assumed the role of advisor, coordination of installations and main equipment supplier.

The customer for this comprehensive project was a municipal development company **Odessateploenergo**, that has been an Alfa Laval customer for more than three years. The chairman of the company, mr *Valery N. Pyatov* explains why Alfa Laval was a natural choice:



Fast facts:

The customer: The municipal Ukrainian company Odessateploenergo

The task: Renovation and reconstruction of the DH network in a residential area.

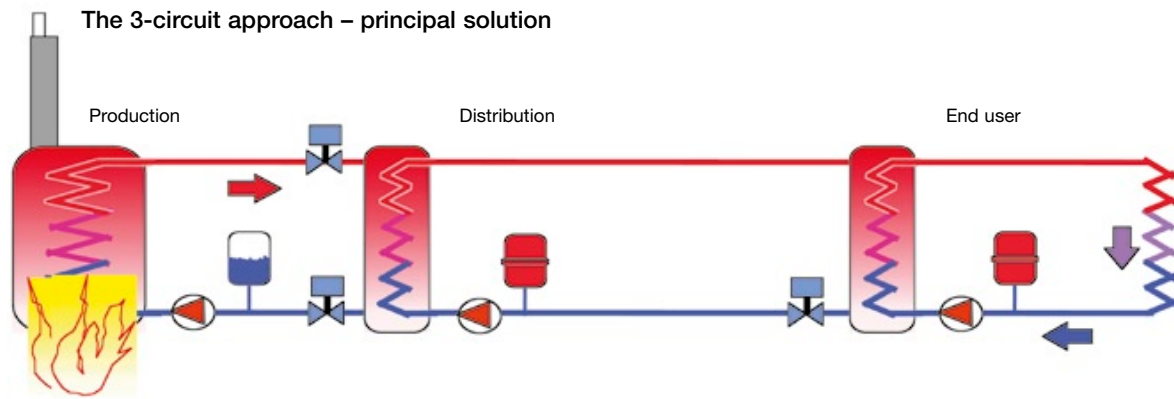
The scene: The Yuzhnyy district in the city of Odessa, Ukraine

The challenge: Reduction of energy consumption and assessment of long-term reliability

The result: Energy savings by an annual average of up to 50%

– Well, first of all we have a very solid relationship with them. We have worked with them for a couple of years by now. For this project, they offered attractive technological solutions that have been tested in Sweden and in other parts of the world with excellent result. We put real emphasis on the reliability of the technology, and we are very satisfied.

During the project, the Alfa Laval team devised efficient routines for close interaction with the companies Logstor (pipe provider) and Petrokraft (renovation and replacement of burners including controls). In fact, this enterprise was more than a renovation project. It was in fact replacement of obsolete equipment with a completely new system, although built upon well-proven solutions for the various functions.



A primary distribution circuit

The production unit of the 3-circuit system consists of hot water along with heat exchangers, condensers, circulation pumps, water treatment equipment and instruments for supervision and control. Hot water (130°C) is used as a medium to carry the energy.

The distribution circuit between the production unit and the consumer substation is on the primary side, a fact implying a fair set of advantages. The temperature and pressure level can be kept relatively low. Since the temperature difference is larger, a high effect can be obtained with relatively modest flows. Consequently, pipe dimensions can be reduced. In turn, this means reduced energy consumption by pumps. This type of distribution network can be supported from different production units and is easily linked to looped networks in order to add capacity or ensure a stable heat supply.

On the secondary (consumer) side, substations ensure the supply of heat and eliminate some of the problems stemming from excessive tapping. Hot tap water is produced locally in every substation and the total energy consumption can be measured at one point. Water transmission due to tapping will be restricted to the consumer circuit.

The Alfa Laval equipment

40 complete DH substations Maxi with PHE – capacities ranging between 260-2 700 kW



Heat exchangers used: T5M, M6-FG, M10-BFG and MX25-BFG (to separate production and distribution circuits)

Short payback horizon and considerable energy savings

From previous experience, the payback interval for this kind of project can be expected to be fairly short – i.e. due to the considerable energy savings achieved by the application of state-of-the-art (still well documented) equipment. In fact, the energy consumption in this case was no less than 35% as an annual average. The consumption of water from the district heating network was reduced 30 times (from 34 277 m³ down to 1 225 m³).

Energy savings – the Shkolnyj Project

- Reduced annual direct cost with EUR 231 000 (from EUR 608 000 to EUR 377 000)
- Reduced annual energy consumption of 70 TJ – 19,4 MWh (equals > 800 Swedish one-family houses)
- Reduced annual emissions with 3,800 ton CO₂ (carbon financing available within a range of EUR 19 000 to EUR 26 000 annually)
- Consumed gas, from 6 251 652 m³ down to 4 313 169 m³ (31%)
- Consumed electricity, from 1 481 434 kWh down to 884 005 kWh (40%)
- Consumed water, from 34 277 m³ down to 1 225 m³ (30 times)
- Wages and overhead cost, reduced by 52%

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