



Lots of Energy to Save in Ukraine

Case Story - Kiev, Ukraine

Reconstruction of district heating system in Ukrainian cities will result in huge energy savings.

A huge amount of district heating systems in Ukrainian cities need to be reconstructed. Therefore much work lies ahead for the capital of Kiev since only 6-7% of the systems have been modernized by now.

The blocks of flats along Romena Rollana Street in Kiev have recently had their district heating and hot water system reconstructed. Several outdated heating stations and an ineffective hot water system were until lately supplying the 220 flats, but after the reconstruction one single high-efficient substation is enough to supply all of them.

Viktor Vasilievich, a resident in the blocks for 37 years, is very satisfied because both the heating and hot water supply has become much more stable and reliable than ever before. We meet him in front of his building, where he is having a chat with other

elderly people from the surrounding buildings.

- Until this project finished we often had to let the hot water tap run for almost half an hour before the water turned warm. Sometimes it didn't become warm at all. Now I just open the tap and the hot water is instantly warm - and even warmer than before, Viktor Vasilievich says.

This is due to the fact that the new substation is taking care of recirculation of the domestic hot water inside the building. Before the reconstruction, it was sent to the customers directly from the power plant several kilometers away. According to Vadym Aldoshyn, manager of District Heating & Water of Danfoss Ukraine, this meant a huge loss of heat in the hot water pipes, so that the water arrived to the flats being only 40 degrees Celsius warm. Today the water is sent to the flats at a constant temperature of 55 degrees.

Saving money

Moreover, the flats are warmer than prior to the reconstruction because

the heating system is much more stable. The improvements will also result in lower heating bills. - Before customers paid for heating all year around, whereas now they don't pay in the 5 (summer) months when the district heating system is switched off, Vadym Aldoshyn explains.

Viktor Vasilievich adds: - I think KievEnergO (the energy company) has raised the price for hot water delivery after the reconstruction. Concerning heating prices we don't know yet. His comment shows, according to Vadim Aldoshyn, what the Ukrainian gas conflict with Russia means in reality. The more Ukraine has to pay for Russian gas the more KievEnergO has to raise the prices. This hurts because many people don't have much money. The financial crisis has hit Ukraine very hard. However, the customers are now paying according to hot water meters and heat meters at the substation, so the bills must become lower than before as far as he is informed.

- Unfortunately there are still no meters in each flat, but anyhow this pro-



- We live on the 8th floor where hot water supply was very unstable. Now we just open the tap and have hot water instantly. Of course it improves our living conditions, 28-year-old Alona says - with her daughter Amina sitting next to her.

ject is a huge step forward, Vadym Aldoshyn says.

Close cooperation

The private construction company Teploenergomontazh has done the reconstruction project in co-operation with Danfoss. Vasiliy Bondarenko, a technical director from Teploenergomontazh, takes us down into the cellar of one of the buildings to see the newly installed substation. He explains that the substation saves the blocks of flats 30-40% of their energy consumption compared to previous years, so the project is a huge success.

The substation receives the hot water at around 90 degrees from the local power plant and transforms it to 55 degrees before it is distributed as domestic hot water to the flats. The temperature of the district heating water to the flats is transformed to 60-65 degrees, whereas the return temperature to the power plant has an upper limit - set by KievEnergo - of 40 degrees.

The substation is almost entirely produced at the Danfoss factory in Poland and transported in pieces to

to Kiev, where it was assembled on location.

- Teploenergomontazh made the calculations for the need of hot water and heat. Danfoss then designed the substation for installation specifically here on Romena Rollana Street. We worked in close co-operation and this is an important element of our work in general, Vadym Aldoshyn says. Only a heat meter and a pump were added to the substation in Kiev.

Much work ahead

The city-owned energy company KievEnergo is the owner of power generation facilities, the pipeline network and is distributing the heat and hot water to customers as well. No unbundling has taken place. As contractor KievEnergo has hired Teploenergomontazh and Danfoss to implement the reconstruction project. The company has chosen to start out with the buildings which have the biggest need for a modernization of the DH system. The systems in general are in serious need of renovation all over Kiev, and since only 6-7 % are done till now, a lot of work is waiting ahead.

All over the city

In the administration building of Teploenergomontazh we meet the leading technical Director Aleksei Aleksiovich. He explains that at first 3 or 4 reconstruction projects included delivery of different Danfoss components like heat meters, flow regulators, pressure controllers and weather compensators. But they found out that the total substation solution offered by Danfoss is the best solution for the future.

- KievEnergo was satisfied and decided to implement the total solution in all the buildings which supply district heating and hot water in the city in the coming years. That is quite many, Aleksei Aleksiovich says with a smile.

The goal of KievEnergo is to bring the heating and hot water supply systems up to European standards. Next to the work inside the buildings it also demands modernization of big parts of the district heating pipeline network in Kiev, which in general dates back to the 1950s and -60s.

- It wasn't maintained during the time we were part of the Soviet Union and not in independent Ukraine either, so



Director Volodomir Evgeniovich(left), Technical Director Aleksei Aleksiovich(center) from the construction company Teploenergomontazh and Vadym Aldoshyn, manager of District Heating & Water of Danfoss Ukraine are discussing future district heating projects in Kiev



The residents were not happy when the construction company started digging up the street in front of the buildings to place new pipelines. But I can tell you, those who complained don't anymore, the caretaker of the buildings Arkady Stotland explains



The new substation from Danfoss is squeezed into a 3 times 3 square meter room in the cellar in one of the buildings, but is anyway supplying 220 flats

it is in a bad condition. In the old non-reconstructed systems 4 pipes are supplying each building: Two for the heating system and two for domestic hot water. The reconstructed buildings only have a two-pipe system, because preparation of hot water takes place in the substation inside the building. Therefore we exchange several kilometers of pipeline every year. We install pre-insulated pipes which save a lot of energy compared to the old ones, Director of Teploenergomontazh Volodomir Evgeniovich explains.

Good for the climate

Ukraine is in a difficult financial situation, but one very good thing for the

former Soviet republic is that it has kept a big part of its district heating systems using surplus heat from the local gas-fuelled power plants. In Kiev 90 % of the population is supplied by district heating and there are only few individual boilers.

- It is good for the climate, but we also have cities like Ivano Frankivsk in Western Ukraine where only 25% is centralized. In the 1990s, when Ukraine had a lot of economical and structural problems, some DH networks went out of operation. The heating systems were not maintained and therefore some regional administrations allowed people to install private boilers. In times of climate

changes that is not the right way, Vadym Aldoshyn says.

However, most DH systems will be reconstructed and works like the one on Romena Rollana Street will continue for years to come in cities all over the country.

- I hope the next step will be to install thermostats and balancing valves in all flats connected to the DH network. Buildings in Kiev have either one- or two-pipe systems inside the buildings and the Danfoss thermostats can be added to both. It is a huge job and according to a statement from the government it will happen step by step, Vadim Aldoshyn says.

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