Aarhus (Tilst), Denmark

In Tilst, a suburb of Aarhus, a street with eight houses has been retrofitted with low-temperature district heating. The focus of this project is on how existing houses can be prepared for low-temperature district heating. For this reason, the existing pipes in this street were replaced with new ones, and the temperature was reduced through the use of a mixing shunt at the connection to the main network.

Table 1. Key data for the Tilst case study from year 2013.

Parameter	Value
Year of construction	2013
New development/renovation	Renovation
Type of houses	Detached houses, built in the 1970s
Number of houses	8
Total heated area	1,049 m²
Supply temperature (design/measured)	55 / 61-66 °C
SH design temperatures (supply/return)	60 / 30 °C
Trench length	237 m

Supply-side technologies/System solution

- The system is connected to the main district heating system through a mixing shunt.

Distribution technologies

- New network: twin pipes, Isoplus for main pipes (insulation class / series 2) and Logstor Alupex for all house-connection pipes (insulation class / series 3).

Demand-side technologies

- Radiators. According to inspections the radiator system is undersized in several of the houses. Some of the houses use a wood stove to ensure enough heating during cold days. Original DHW heaters were kept in some houses since the district heating company was not able to convince all of the house owners to replace them. Because of this, the supply temperature could not be lowered below 61 °C.

Lessons learned

Some lessons learned are:

- The potential reduction of the distribution losses with just lowering the temperature from 85 to 60 °C was stated
- Some of the houses are dependent on wood stoves in order to compensate for the undersized radiator system, which is not optimal for a district heating area. By installing extra radiator capacity and/or improving the building envelope (for example replacing / upgrading some windows and doors), the houses can shift to only district heating as heating source. This would make the houses better qualified for low-temperature district heating. However, it

was difficult for the heating company to motivate the building owners to make improvements to the building envelope and heating installations, despite subsidy offers.

- The district heating company has realized that it is a long-term project to reduce the supply and return temperatures of the network in an existing area. The house owners need to be willing to make energy efficiency measures on their homes and to replace existing equipment.