



Intelligent thermal network at TU Delft campus

Experimenting with Intelligent Networks

Aim

To optimise the heat supply in the existing campus with an intelligent thermal network.

Vraagstukken

- How do we convert an existing high temperature thermal network to a lower temperature thermal network?
- How do we harmonise the operation of the heat supplies in different buildings?
- How do we integrate energy which has been generated on a decentralised basis with an existing gas-fired heat and power generator?

Running time

3 to 5 years from 2012

Project partners

- Imtech Nederland - This technical service provider is the project leader and will carry out the system integration activities.
- Deerns - This climate systems consultancy is providing the system design, control equipment and dynamic system design simulations using the HENK model.
- Deltares - This knowledge institute is providing a hydraulic pipe network design, dynamic systems design simulations with the WANDA model and a link to the HENK model.
- Priva - This manufacturer of climate systems and building management systems for greenhouse horticulture and commercial construction is supplying building measurement and control systems, building automation and energy management solutions.
- TU Delft - The owner of the thermal network and the connected buildings is facilitating the project.

TU Delft (Delft University of Technology) will be making its entire campus sustainable over the coming years. The thermal network is part of this transformation into a green campus. Imtech Nederland, Deerns, Deltares and Priva will be converting it to an intelligent thermal network with a variety of (renewable) sources of thermal energy. The aim is to show that a smart thermal supply network like this can give a substantial energy saving and improved sustainability.

Unique opportunity for an integrated solution

“The renovation offers us a unique opportunity to use TU Delft as a trial for an integrated thermal network solution,” says Wiebe Embroek of Imtech Nederland. “A renovation usually only involves a single building, and therefore just one part of the thermal network, whilst it is better to update the thermal network in its entirety. Hence we can, for example, find out how buildings can best make use of one another’s residual heat. The large scale renovation in Delft means that for the first time we can investigate how we can optimise the supply of thermal energy in its entirety.”

Harmonisation between buildings using smart network

“The problem that we want to solve is the harmonisation between the various buildings and the systems for thermal energy storage. A lot of such systems do not work well with the building to which they belong, let alone the next building along. As a result they do not offer an energy saving, but actually consume more energy. In the new thermal network in Delft we are trying to get everything to communicate well together via a smart network, so that supply of and demand for heat are effectively matched.”

From high to low temperature

Another challenge is the conversion of the high temperature network to an energy-saving low temperature network.

Emsbroek says: “Older thermal energy systems use heat at a high temperature, e.g. generated using gas. Newer, sustainable systems use heat at a much lower temperature. These systems will have to run alongside one another for a while at TU Delft. We must examine carefully how we can still achieve an optimum heat supply with this. If we manage to do that and the new, intelligent thermal network works well, then that will offer a lot of possibilities for use in other building complexes such as other universities or hospitals.”

More information

If you would like to know more about the approach to the thermal network at TU Delft or the latest developments on the project, please contact Wiebe Emsbroek, project leader at Imtech Nederland, via wiebe.emsbroek@imtech.nl or call +31 (0)6 29 40 97 93.

Intelligent Network Trials

Innovating with energy

The aim of the Intelligent Networks innovation programme (IPIN) is to accelerate the introduction of intelligent networks in the Netherlands. In twelve trials we are gaining experience with new technologies, partnerships and forms of collaboration. The results of the trials are helping to resolve important issues relating to intelligent networks, such as the needs of consumers, new business cases and new laws and regulations. We are thus working cost-efficiently towards the large scale application of these networks.

For more information see:
www.agentschapnl.nl/intelligentenetten

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