Ranagård with New 4GDH Technology

A New Reality — eceee Summer study June 7-11, 2021

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Heat Road Map Europe 2021

- There is enough excess heat for heating all housing and premises throughout Europe according to Mathiesen et al (2019)
- The European district heating level of today's 12% should be increased up to 50% in 2050
- The EU has set aside 100 Mill. € for district heating projects

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Heat Road Map Europe 2021

- Using already existing heat instead of generating new heat with expensive technical solutions is rational
- If all new buildings are constructed as nZEB buildings with low heat demand, district heating with low temperature would be enough to heat twice as many buildings
- nZEB buildings and district heating with low temperature seems to be a perfect match

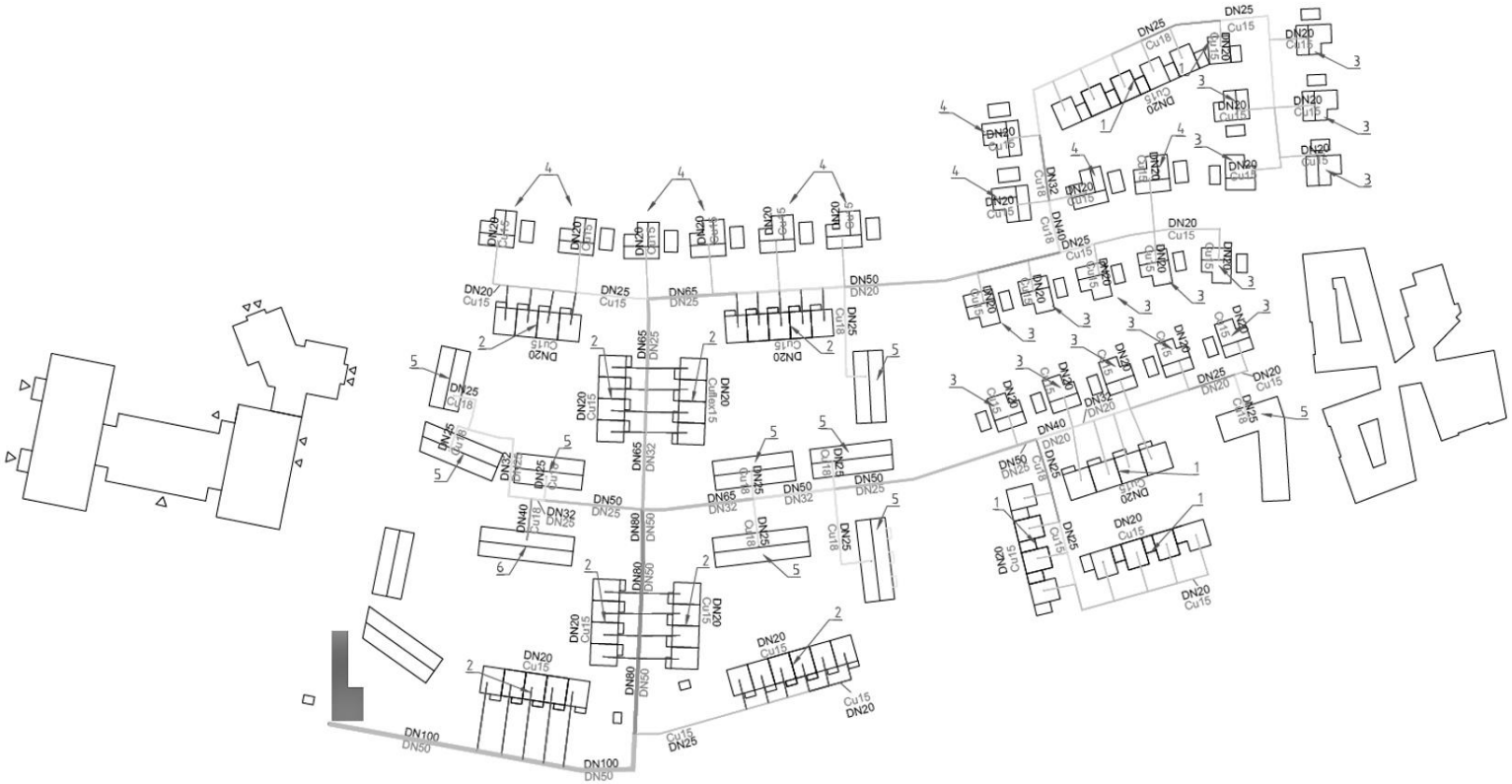
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Ranagård with New 4GDH Technology

- The local company HEM is expanding their district heating system for 550 new flats in Ranagård
- HEM is testing a new 4GDH technology developed at Halmstad University
- The university follows the technical work in one part of the project for quality assurance
- Our university together with Malmö University is also making a study on the acceptance of new technique

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HEM is expanding their district heating grid for 550 flats

Area 1 showing the buildings and the 4GDH with three pipe district heating grid

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Heat demand for 550 new flats in Ranagård

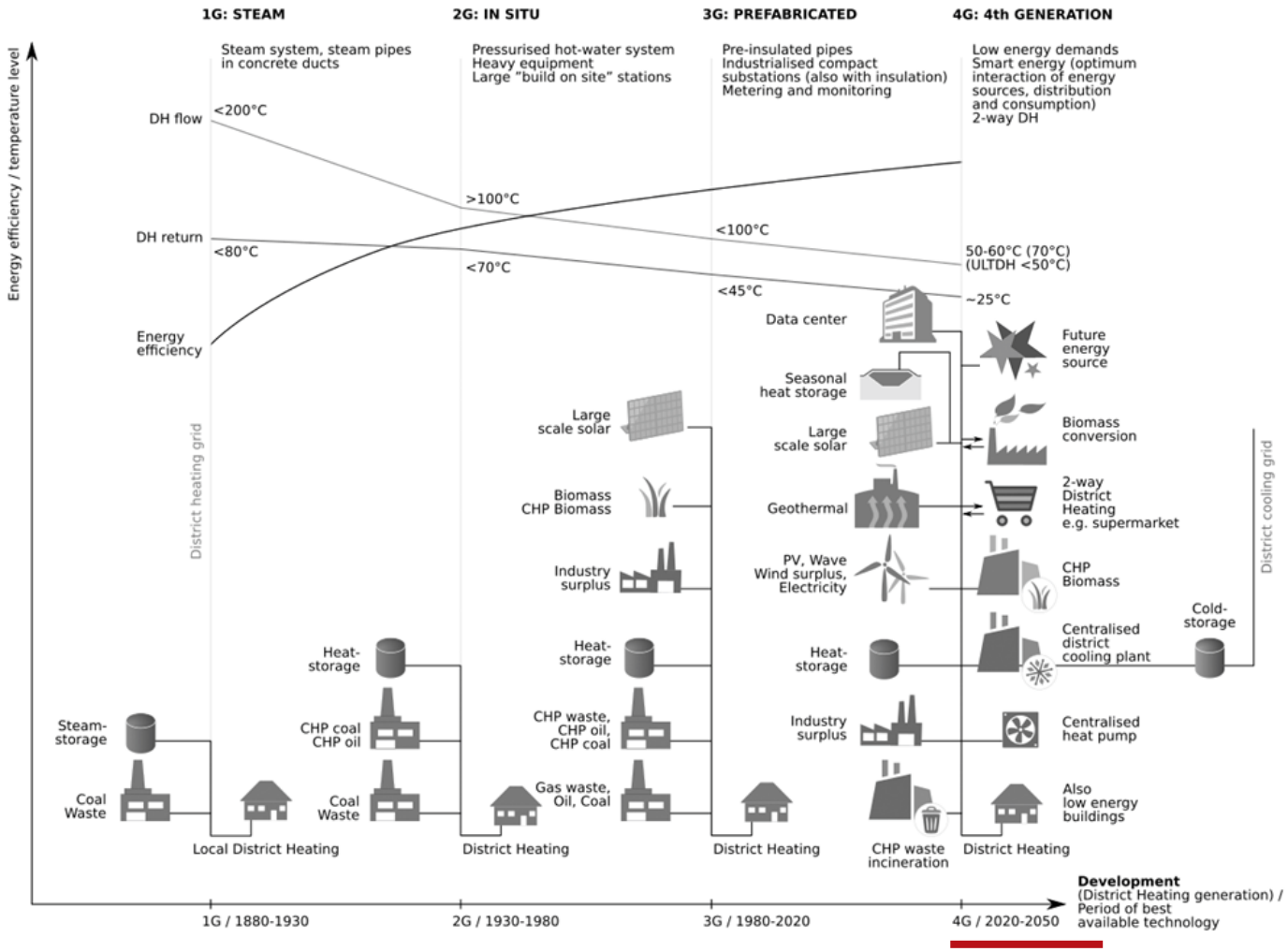
Heat demand	Heating, MWh	Hot tap water, MWh	Total, MWh	Specific heat demand, kWh/m²
Area 1	1417	547	1964	76,4
Area 2	1333	542	1875	77,5
Area 3	521	194	715	75,6

Heat demand in Ranagård with input from AFRY engineering

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The concept of 4GDH and previous generations. Illustration from Lund H. et al 2014 and 2018.



HEM is testing the new technology developed by Halmstad University

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The project's technical parts are followed separately by Averfalk at our university

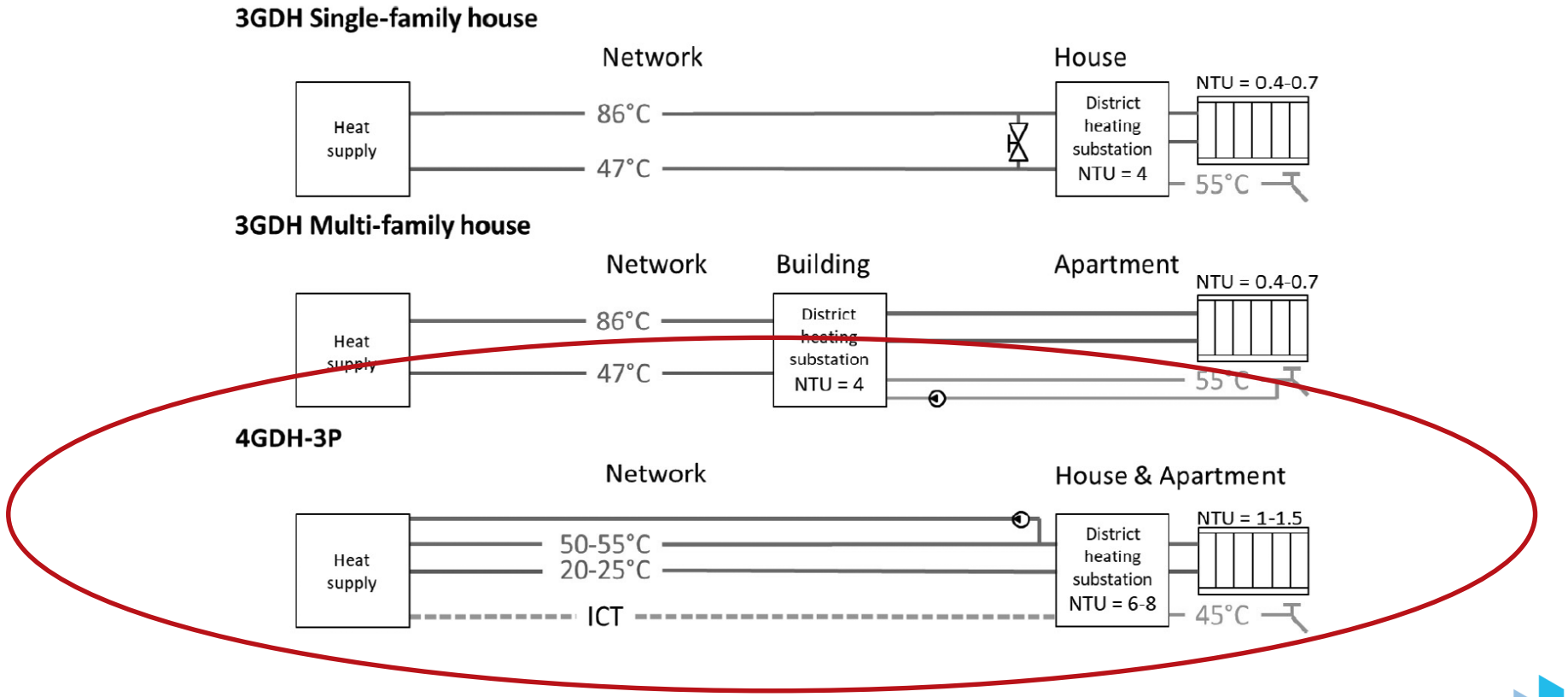


Illustration: Averfalk och Werner (2018)

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- In our part of the project our university and Malmö university is mapping acceptance and usefulness of new technology.
- Our focus is on district heating and other solutions, organizational issue and decision making for mirroring the actors' perspective

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- What opportunities and holdbacks lies in the development of new technologies, especially 4GDH with the three pipe solution?
- Are developers ready for new systems?
- What impacting decisions are taken and which ones are needed?

Are new methods and strategies needed for introduction of new technologies and solutions?

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Chosen groups for interviews are …

- Planners and property managers within construction
- Planners and companies within the energy sector
- Manufacturers / suppliers of system components

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- Economic perspectives
- Sustainability perspectives
- Technical perspectives
- Ethical perspectives
- Perspectives of corporate culture
- Other perspectives …

Which ones were most important?

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- Economic perspectives
- Sustainability perspectives
- Technical perspectives
- Ethical perspectives
- Perspectives of corporate culture
- Other perspectives …

These were most important ones!

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- The long term perspective impact for buildings as well as district heating, 80-100 years, make all decisions on investments exposed to long discussions
- Awareness of CO_2-free district heating as an important part of a fossil free future
- All companies have policies and/or action plans for this future and district heating is included in the plans

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- Are new methods and strategies needed for introduction of new technologies and solutions?

  That is the question we want to answer and the work continues

  For questions or contact send an e-mail to heidi.norrstrom@hh.se