

LOW-TEMPERATURE DISTRICT HEATING AND LOW-ENERGY HOUSES

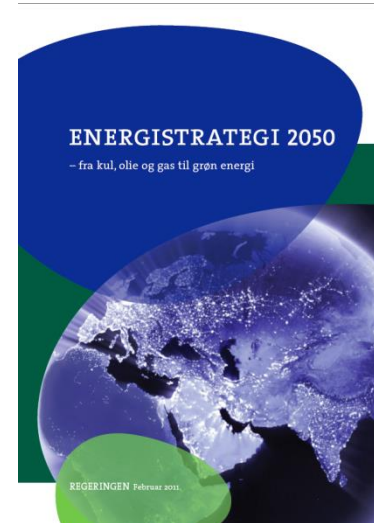
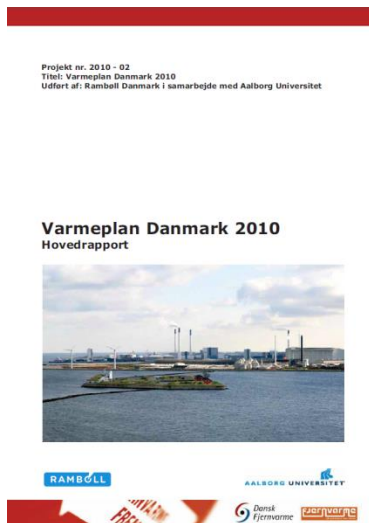
KASPER VARN QVIST
LARS GRUNDAHL



AALBORG UNIVERSITY
DENMARK

Purpose

Investigate if there is a basis for supplying low-energy buildings with district heating and if so, should the district heating be low-temperature



Analytical challenges

Energy consumption in new buildings

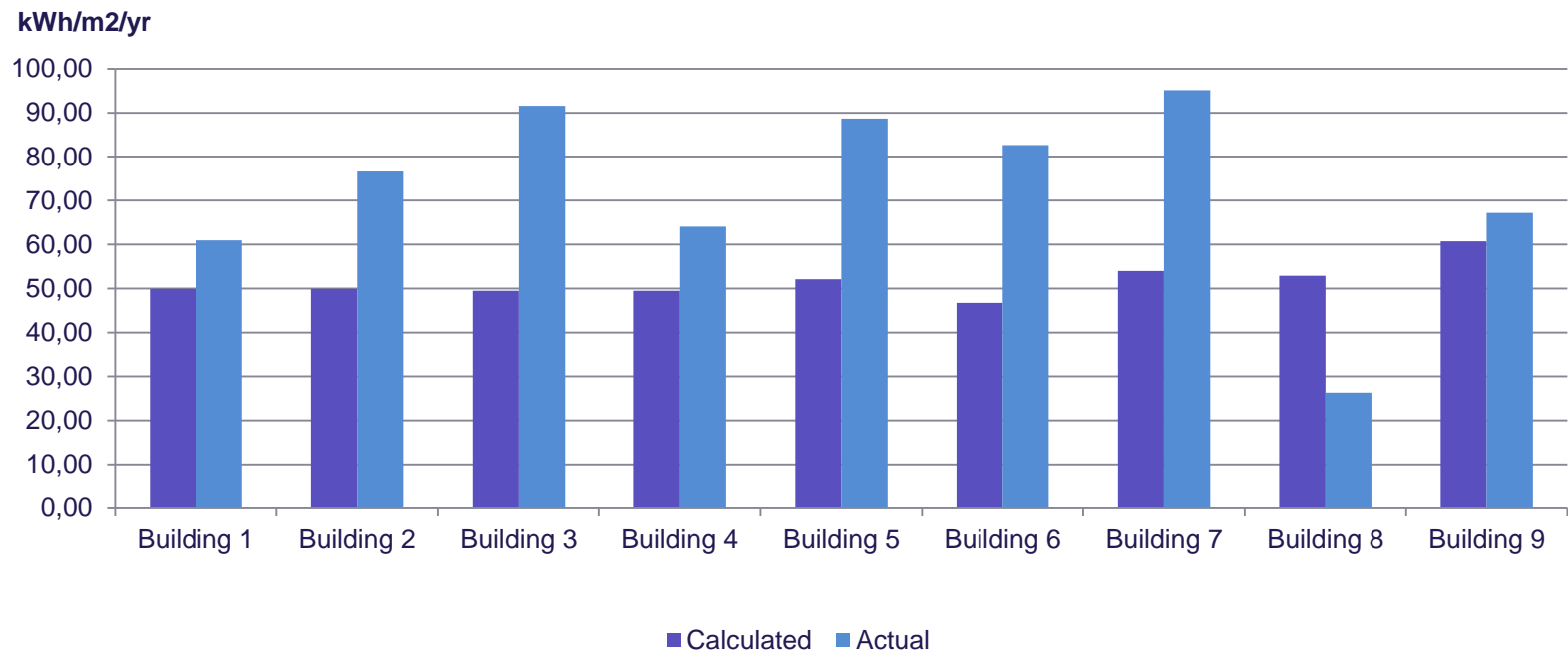
Capacity of heat supply in individual houses

Heat prices, e.g.:

- Variation between different areas
- Tax and subsidy changes
- Etc.

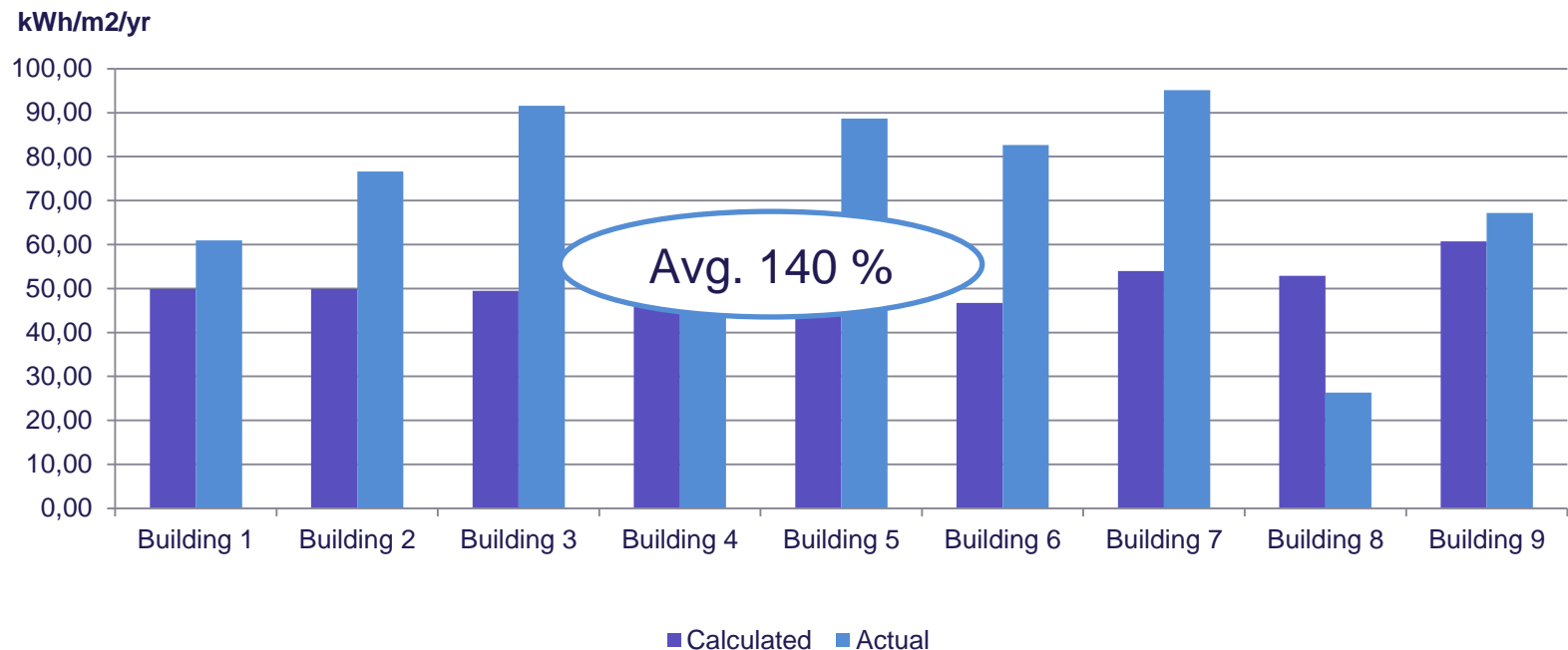
Energy consumption in low-energy houses

Calculated consumption \neq Actual consumption!



Energy consumption in low-energy houses

Calculated consumption \neq Actual consumption!



Capacity of heat supply

Danish Energy Agency

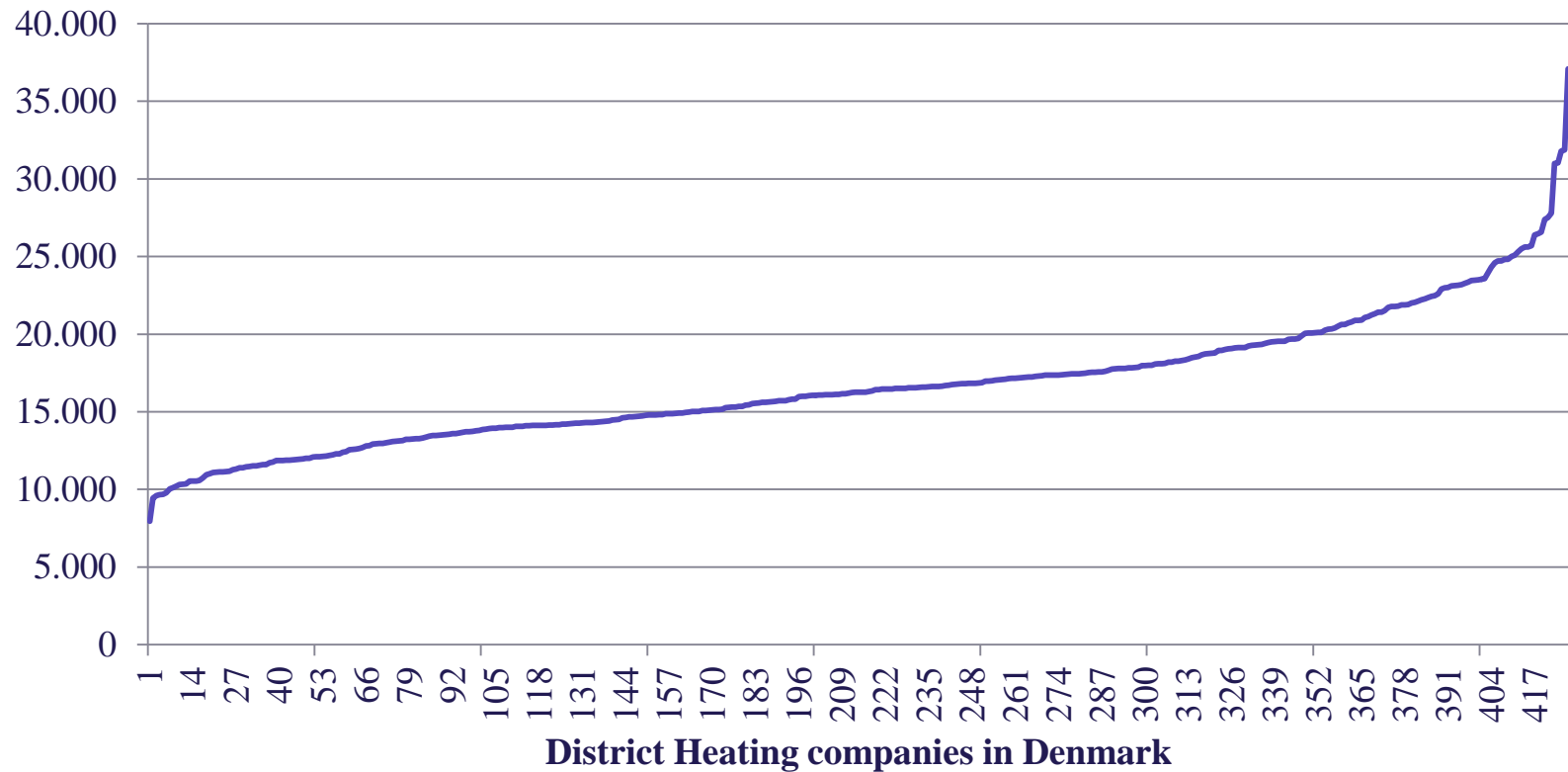
- 3-5 kW

Verdo Varme A/S

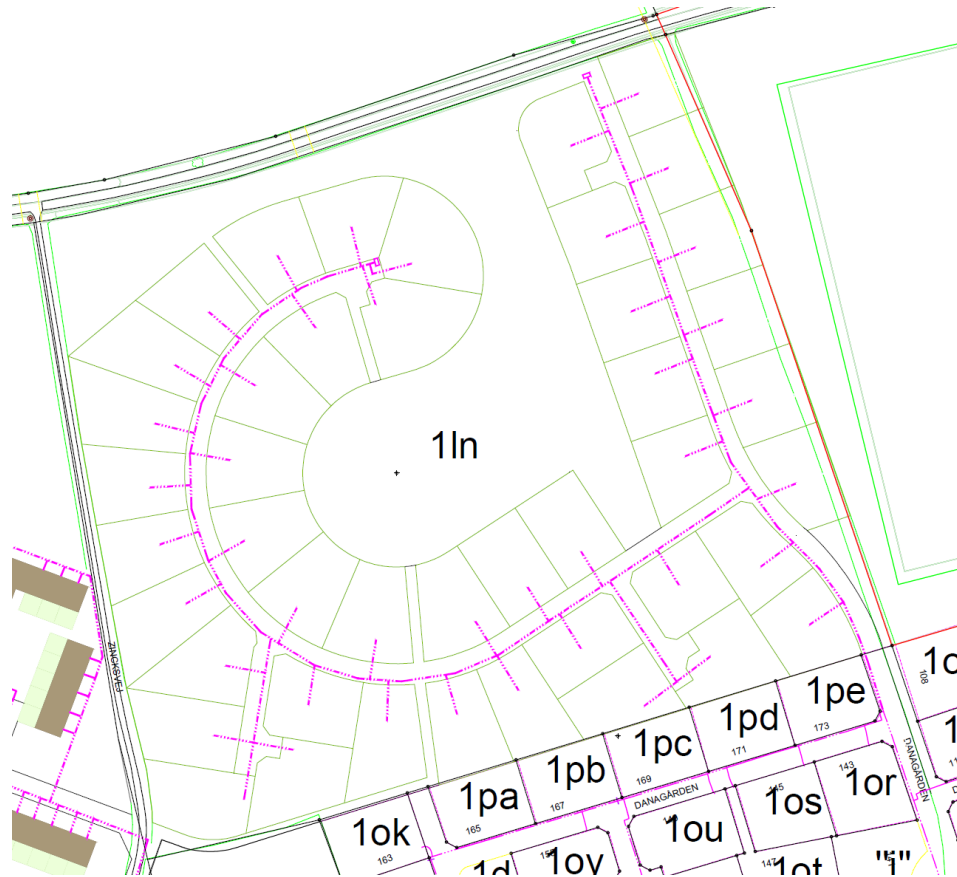
- 10 kW with hot-water tank
- 25 kW without

Price variation in Denmark

[DKK/year]



Case study (Aalborg)



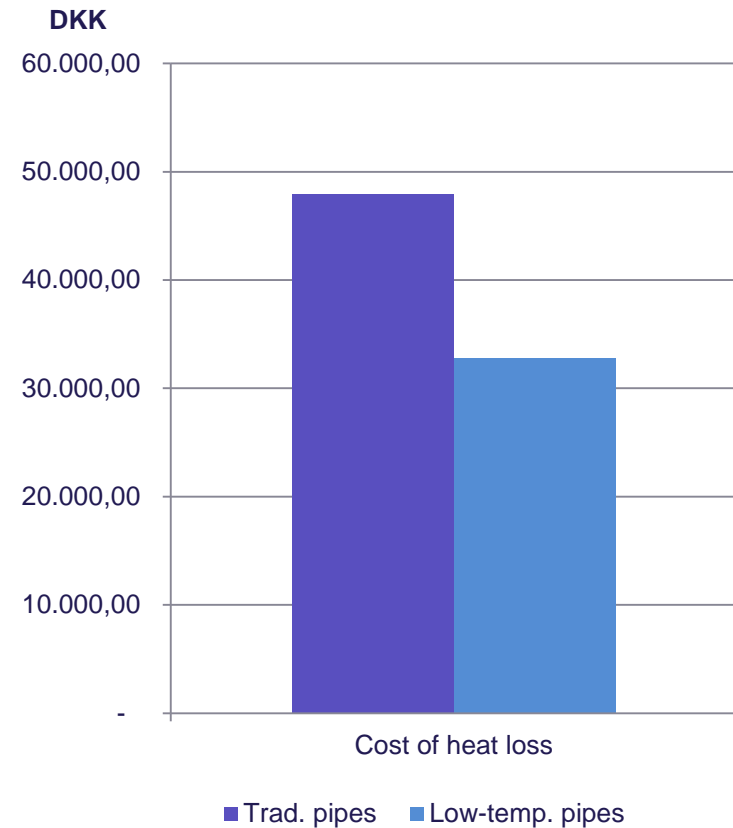
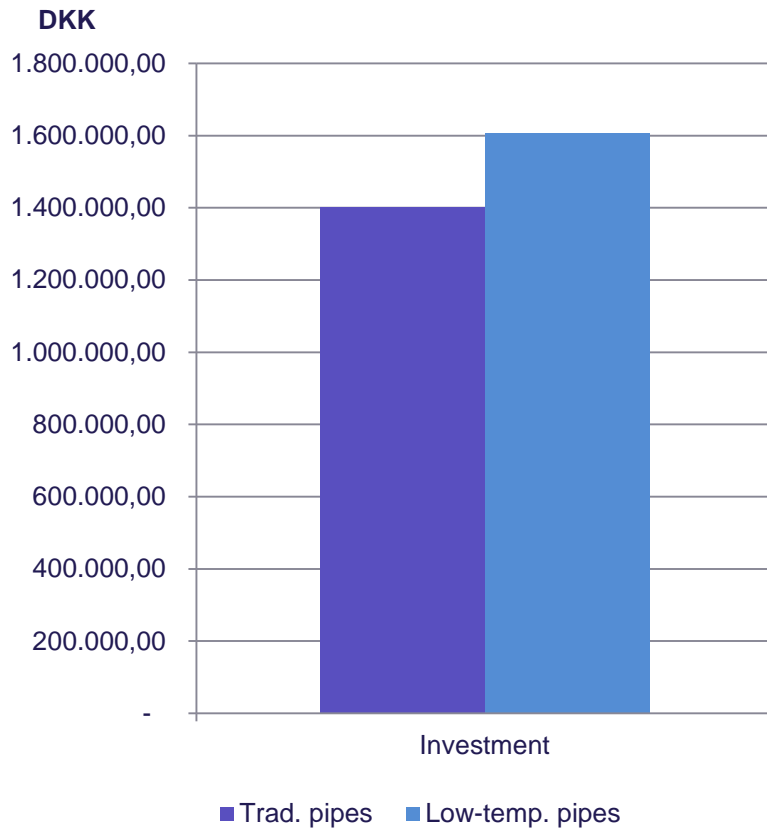
Life time of investment

District heating pipes: 30 years+

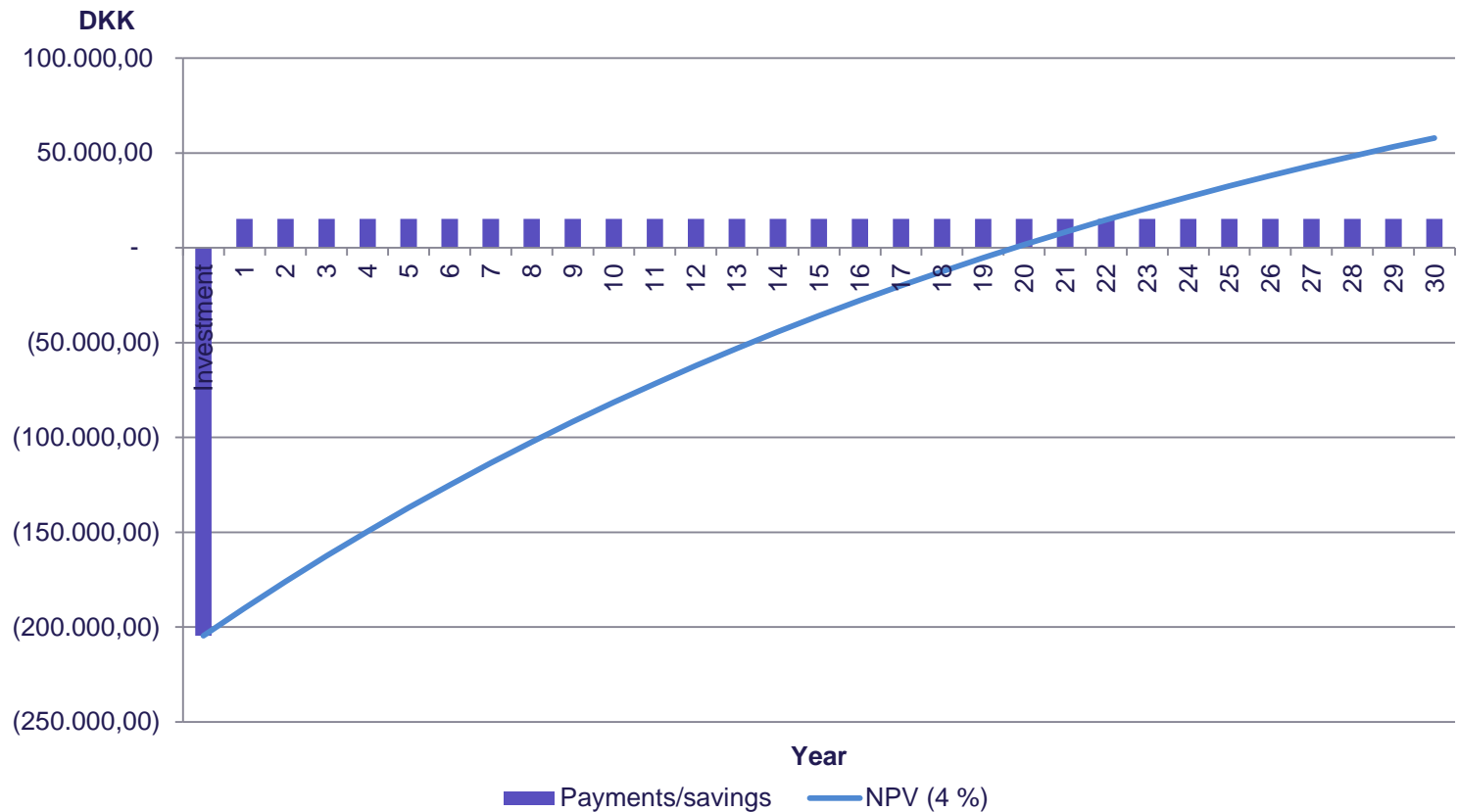
Low-temperature district heating:

- Higher investment
- Lower heat losses

Life time of investment



Life time of investment



Conclusion

Impossible to draw general conclusions on feasibility of district heating in new residential areas

Low-temperature district heating is already feasible in areas where district heating is feasible

Areas with higher heat costs have greater benefits of low-temperature district heating but have more difficulties in the competition with individual heating.

Plan for the future!



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