

1. Design and operation of integrated cooling and heating systems in regions and buildings

2. What is integrated with DSM

- | | |
|-------------------------|-------------------------------------|
| DG | <input type="checkbox"/> |
| Energy storage | <input checked="" type="checkbox"/> |
| Smart grid technologies | <input type="checkbox"/> |

3. What is the level of commercialization

- | | |
|-------------------|-------------------------------------|
| Research project | <input checked="" type="checkbox"/> |
| Demonstration | <input type="checkbox"/> |
| Field test | <input type="checkbox"/> |
| Existing practice | <input type="checkbox"/> |

4. Where to find more information?

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- http://akseli.tekes.fi/opencms/opencms/OhjelmaPortaali/ohjelmat/DENSY/en/Closing_Seminar_2007.html → Final Report

5. Objectives of the case

The objectives of the project was to study and develop integrated cooling and heating systems in regions and buildings with the focus in energy efficiency and economy and in overall optimization of the cooling systems. The transport and storage technologies applicable in district cooling were studied in this frame together with the suitability of different media for cooling effect distribution.

6. Business rationale/model

7. Technologies used

8. Short description of the case

In urban areas district cooling (DC) has increased in recent years, replacing separate cooling machines in each room or building with central cooling generation plants and cold media distribution networks. Coldwater is distributed to the customers in similar pipelines as hot water in the district heating (DH) networks. By combining a central cooling plant with cold media storages the daily variations in the cooling demand can be handled with smaller machine capacities. Integration of heating and cooling in regions and buildings can further improve the energy efficiency and economy of the future systems.

9. Achieved/expected results (operational savings, CO₂, efficiency enhancement)
Daily variations in the cooling demand can be handled with smaller machine capacity.
10. Lessons learnt
Project gave valuable guidelines of how to future cooling systems should be designed.