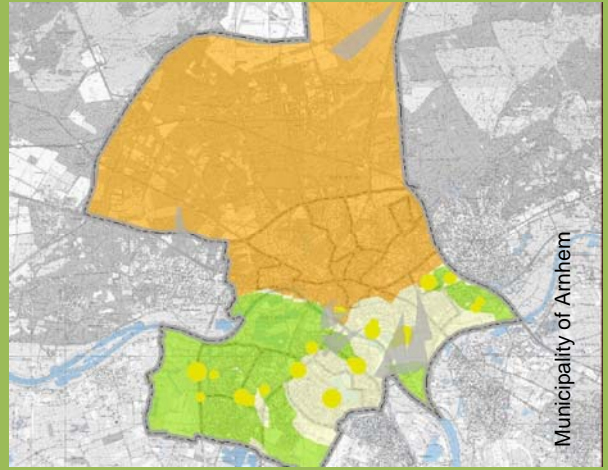


## Cold-heat storage suitability map

Status	Study completed in December 2009
Location	The Netherlands, Gelderland, Arnhem
Spatial info	Town
Measure type(s)	Water drainage; Renewable energy;
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### Description and Aim

Preliminary assessment of the suitability of the soil for cold-heat storage.

The Arnhem soil contains three aquifers. All three aquifers are rated in suitability for cold-heat storage, of which three maps are made.

The first aquifer is rather thin, and has little potency for (large) cold-heat storage systems. The second aquifer has quite large potency, but contains a lot of iron in some parts of the city, which might obstruct the storage systems. The third aquifer is considered as the best aquifer for cold-heat storage, and is already used for this purpose by about 40 different systems. Based on the three maps, also three 'floor space index maps' were made, indicating how many m<sup>2</sup> floor space can be provided with the potency of cold-heat in the aquifers.

### Adaptation to climate change

Cold-heat storages are used instead of fossil energy to warm and cool buildings. Therefore they contribute to reduction of CO<sub>2</sub> emissions. Furthermore, the inside temperatures in houses can be kept at a comfortable level by using cold-heat storage, which is an adaptation measure, e.g. during heat waves. The costs of the storage systems on the long term are lower than using fossil energy.

#### Problems addressed:

Weather parameters: indirect.

Via mitigation: Heat wave, heavy precipitation / flooding, drought, storm

#### Receptor(s):

Built environment, economy, natural resources, population

The aim is to define opportunities and possibilities for cold-heat storage systems in the city.

### Experiences

#### Functionality:

By having an overview of suitability of the soil and aquifers for cold-heat storage, the city of Arnhem wants to facilitate and persuade area developers and other parties to install cold-heat storage systems for their buildings.

The results of the study prove to be very useful and they facilitate all kinds of stakeholders in designing and balancing the costs and benefits of cold-heat systems. Based on the cold-heat suitability maps, a master plan for cold-heat storage is made for the city centre of Arnhem, taking into account the energy demand of the planned future buildings.

#### Further synergies/benefits:

Mitigation: cold-heat storages contribute to reduction of CO<sub>2</sub> emissions.

#### Costs:

20.000€ for the assessment study

#### Funding:

International and local. ERDF and municipality budget.

#### Stakeholder involvement:

City soil experts, city water experts, province, city planners

#### Acceptance:

Not necessary, the study contains facts and figures.