

Type: Renewable energy

Category: Energy efficiency and mitigation

Measures for using renewable energy sources, in the urban environment



Description

Renewable energy sources in the urban environment concern two main sections: generation of heating or cooling (solar, geothermal, biomass) and generation of electricity (solar, wind, biomass/biogas, hydro). Within the Adaptation Compass the focus is on renewable energy measures that are combined with the water system (e.g. cold-heat storage) and which are influenced by the urban spatial structure.

Spatial scale

Building; Urban quarter/street; City

Problems addressed

- Heat/ Extreme cold

Combination with other types of measures

- Increase energy efficiency
- Urban setting, urban texture: e.g. configuration for using solar energy

Implementation – functionality issues

The natural conditions of the site are crucial: e.g. the groundwater level and underground structure for use of geothermal energy or the solar radiation for use of solar energy. Need and provision must fit, e.g. good insulated buildings are precondition for sole use of geothermal energy for heating. Spatial preconditions are also necessary, e.g. the orientation of the buildings for solar energy use.

Further benefits

- Responding to the envisaged higher demand for cooling buildings during summer and to prevent from use of air conditioning systems based on fossil energy
- Greenhouse gas emission is reduced
- Reduces the dependency on fossil or nuclear energy sources like gas, oil, coal or uranium
- Combination with solving problems of the groundwater (high levels, pollution) can be especially beneficial (e.g. using cold-heat storage)

Economic issues

Cost-effectiveness has to take into account specific investments and maintenance costs. Compare to costs for fossil/nuclear energy (from generation to waste disposal). The industrialisation of renewable technologies makes the use of renewable energies more and more affordable. Several funding possibilities (e.g. for solar panels, for retrofitting existing buildings).

Acceptance

- Social acceptance for renewable energy is high
- Social acceptance can be improved by creating synergies (e.g. solving problems in the water system and providing opportunities for new developments)
- Solutions on building level are more accepted than collective solutions
- Information campaign and stakeholder involvement is beneficial to improve acceptance

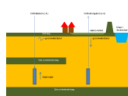
Possible obstacles

- Green walls and green roofs: installation of solar panels might be contradictory
- Interference with the underground function and setting might arise (use of geothermal energy)
- New techniques and involvement of many stakeholders: development is subject to a complex process
- Lack of know-how of building and maintaining services

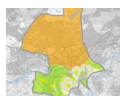
Find examples in Structural Fact Sheets



Renewable energy
Rouen, FR



Cold-heat storage
Tiel, NL



Cold-heat storage
Arnhem, NL



Energy map and -strategy
Arnhem, NL



Strategy underground
Nijmegen, NL



Water vision
Nijmegen, NL



Sustainable energy system, Wvi, leper, BE



Ambition note
Wvi, leper, BE



Urban planning
Wvi, leper, BE