SDH solar district heating

SDHplus

Solar District Heating in Europe

WP2 – SDH enabling buildings with high energy performance
Task 2.1 – Survey and horizontal review of the existing models

D2.2 – Information sheet on building legislation and district heating

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1. *How DH is accounted for in the calculation of energy performance of buildings according to national laws, with specific attention to SDH.*

Determining specific energy use of a building is based on the Energy Performance of the Building Directive and is defined in "BBR" (Swedish Building Regulation). According to "BBR" energy performance of a building/ building´s energy use is defined as energy delivered to the building for heating, comfort cooling, domestic hot water, service installations and other electrical energy for building services. The electricity used for the activities/operations carried out in the building and for domestic purposes are not included.

For existing buildings the calculations are based on measured values which are corrected to normal year. For new buildings a theoretical calculation of building´s energy use is done. In order to verify if the requirements stated in the "BBR" are fulfilled it is required to report the measured values within 24 months after the final commissioning.

According to "BBR" specific energy use of a building (bought energy) can be reduced by installing solar collectors or solar cells on the building or on the land connected to the building, in the extent the building can utilize this energy. A number of property owners have therefore installed solar collectors and solar cells on the roof to improve energy performance of their buildings. Installation of solar collectors can for example be considered as an alternative for adding additional insulation on the building envelope, as this is often considered to be costly measure to improve energy performance of a building.

2. *Practical example of calculation.*

Calculated specific energy use of the building: 100 kWh/m^2
Calculated annual net solar heat gain: 15 kWh/m^2 (from solar collectors on the roof).
Calculated specific energy use of the building with solar heat: 85 kWh/m^2
Measured specific energy use of the building with solar heat: 85 kWh/m^2

3. *Building energy performance and district heat*

District heating is counted as bought energy and charged 100 % on the building´s energy use even if the energy comes from renewable sources, for example from solar thermal energy. Specific energy use, e.g. 100 kWh/m^2 as in the example above, for a building where heat is supplied via a local or district heating system is not affected by whether district heating is produced by oil- or biofuel fired heating plant, nor if there is a solar thermal system connected to the heating plant.

As mentioned before solar heat can be generated with collectors installed on the building or on the land connected to the building in order to improve building's energy performance and there is a certain interest from the housing companies side, who are connected to the district heating grid, to use solar thermal energy. When the property owner installs solar collector system for domestic hot water (on the secondary side) they will minimize simply the amount of bought energy from district heating network and improve the specific energy performance of the building. There is also a possibility to install solar thermal system connected in the primary district heating system via a substation in the building. This means that a contract between the district heating supplier and property owners is be made that regulates how property owner can utilize the solar energy similar way as shown with the example before.

4. Summary

Solar heat is treated differently if it is supplied in a building or via district heating system. BBR requirements encourage the use of solar heat in buildings connected to district heating, but they do not stimulate the use of solar thermal energy in district heating systems.

5. Possible improvements for the methodology and for the current legislation.

The current regulations must be reviewed and amended to promote renewable energy in district heating systems. How bought energy is produced should be relevant when evaluating building's energy performance. The use of weighting factors (as mentioned in the EPBD directive) for different energy sources in the assessment of building's energy performance can be a one solution.