



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



Co-funded by the Intelligent Energy Europe
Programme of the European Union

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Country

SLOVENIA

Date of last information update

June 2013

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

The conditions to achieve the building energy efficiency are listed in Energy efficiency building regulations (Official Gazette of RS, no. 52/2010). The articles that are associated to solar district heating systems are:

- Annual primary energy for system operation in residential building Q_p , calculated per unit of heated area of the building A_u , shall not exceed (Article 7, paragraph 4):

$$\frac{Q_p}{A_u} = 200 + 1,1(60f_0 - 4,4T_L) \left[\frac{kWh}{m^2 a} \right]$$

Factor f_0 is defined as ratio between the building envelope surface and heated building net volume, and T_L is the average annual ambient air temperature.

Advantage of solar district heating system is the use of non-renewable energy that is taken into account for heat transport and not solar energy which is converted into heat.

- Buildings energy efficiency is achieved if at least 25% of the total final energy consumption for the system operation in the building is ensured by the use of renewable energy (Article 16, paragraph 1).
- Building energy efficiency is also achieved if the building is at least 50 percent supplied by the energy-efficient district heating or cooling system (Article 16, paragraph 2).
- Energy-efficient district heating and cooling systems are systems, where the energy is produced from renewable sources or comes from a CHP plant with high efficiency in accordance to the regulations of electricity production by cogeneration of heat and electricity with high efficiency.
In the case of solar district heating system supply, the conditions of using renewable energy in buildings are achieved.
- The CO_2 emissions are not limited in regulations but have to be calculated and reported in the Statement of Buildings Energy Performance (EE study, article 17, paragraph 2).
The use of solar energy does not produce CO_2 emissions to the atmosphere, so the CO_2 emissions caused by the solar district heating system are very low.

2. *Practical example of calculation.*

A methodology for calculation of the building energy performance is provided in Technical Guideline TSG-1-004: 2010 in Chapter 9. In the case of providing heat from district heating system, the heat loss of heat substations must be taken into account.

If the building supply by energy-efficient district heating system (solar district heating system) or cooling is at least 50%, the conditions of using renewable energy sources are achieved.

The annual primary energy for the building operation shall be determined by multiplying the annual energy input and conversion factor. Conversion factor for district heating without cogeneration is 1.2 and for district heating with cogeneration 1.0. For renewable energy sources this factor is lower than 1 (0.1 for biomass). Factors for different types of energy are given in Chapter 11 (Table 3) in Technical guideline.

The CO_2 emissions are determined on the base of calculated energy consumption. The specific CO_2 emissions per unit of fuel or energy are given in chapter 11 in Technical guideline. When the fuel or energy emissions are not given by the supplier, factor 0.33 kg/kWh is used for district heating system.

3. *Standard methods and software tools usually used for such normative calculations.*
Standard calculation methods are given in Technical guideline TSG-1-004:2010. Software tools in which these methods are implemented are not prescribed by the legislation.
4. *Limits and opportunities for SDH according to the existing methodology.*
Opportunities for solar systems are showing in district heating systems which do not satisfy the conditions of renewable energy share and in which the use of primary energy is excessive. In that case the use of solar collector fields is reasonable.
The growth of solar district heating systems is limited by current legislation which supports the local systems for renewable energy sources without the broader view of energy use in urban areas and on the integration of energy systems.
5. *Possible improvements for the methodology and for the current legislation.*
Possible improvements of current legislation for solar district heating systems are mainly seen in the inclusion of a wider and integrated approach in the design of energy supplying urban areas.