COOLREGION

Criteria for benchmarking system - Slovenia

Aproach

Cooling capacity and cooling energy consumption in Slovenia is presented in Table 4, based on the pole done within the Cooling and refrigeration society of Slovenia in 2003. About 70% of data were collected based on the actual information from the building sites; another 30 % of data are estimated (extrapolated to the entire building stock).

	Cooling capacity [MW]	Operation [h/year]	Cooling ratio COP	Energy consumption [MWh/year]
all	**236**	**0**	**0**	**60.415**
Residential buildings	**59**	**250**	**2,5**	**5.877**
Non residential buildings	**177**	**0**	**0**	**54.538**
Retail	**0**	**650**	**1**	**-**
Trade	**33**	**900**	**2,8**	**10.652**
Offices	**69**	**700**	**2,8**	**17.250**
Health	**16**	**1050**	**2,8**	**6.000**
Factories and garages	**10**	**400**	**1**	**4.000**
Hotels	**20**	**1050**	**2,8**	**7.500**
Events, theatres, cinemas etc.	**15**	**1050**	**3**	**5.250**
Sports culture	**2**	**450**	**2,8**	**321**
Indoor swimming pool	**0**	**650**	**1**	**-**
Education	**4**	**500**	**2,8**	**714**
Agricultural used buildings	**0**	**500**	**1**	**-**
Others non-residential buildings	**10**	**650**	**1**	**6.500**

It’s very hard to find data about cooling consumption by building type and to give average values because of the very large differences on building envelope insulation, specific climate condition and specific use of buildings in each sector.

Unfortunately, apart from residential building sector, there are no data available about the total floor area of buildings in each sub sector. Statistically, only the new built gross area per year (including external areas) of buildings and other structures is collected. The total floor area of non-residential buildings in Slovenia is not available (in national statistics). The provisional estimation of conditioned floor areas was estimated, based on recent yearly construction rate, but it was found to be too vague to be used to create cooling benchmark.

Right now the inventory of real-estate floor areas in Slovenia is being carried out by National Office of Statistics and will be finished until July 2007 (data collection prolonged until September 2007; www.popis-nepremicnin.si). Slovenian project team proposes to use these figures for building sub-sectors as soon as they are available in national statistics and to create the average benchmark of cooling energy consumption in combination with the data from Tab.1.

EPBD implementation

Slovenian EPBD regulation (expected 9/2007) will introduce also calculations of energy use for cooling. The minimum requirements will be imposed on the level of final energy consumption with specific technical requirements for summer conditions, mainly focused on obligatory effective solar protection. For residential buildings the calculations of maximum indoor temperature is considered, but not yet accepted, as well as the requirement that the building design must ensure summer thermal comfort without cooling devices (relevant for residential buildings and feasible in most parts of Slovenia). Consideration of energy demand for cooling will influence cooling demand on national level, although at this stage there are no direct requirements for cooling energy consumption considered.

Conclusion

In the absence of systematically collected data on energy consumption for cooling and based on the selected sample buildings investigated the following benchmarks are proposed:

Easy accessible (building in use):

- Annual electricity consumption (kWh/m2a)
- Annual costs for electricity (EUR/m2a)

Accessible after some effort and analysis of building / energy manager:

- Annual electricity consumption for cooling (kWh/m2a)
- Annual costs for electricity for cooling (EUR/m2a)
- Cooling power (kW) and operating hours (nr of h)

Accessible at design stage (for new buildings after 2007)

- Cooling demand per volume in [kWh/m^{3}a]