

## Examples

1. For a single chiller with EER of 2.9 (known at full load only) then the input of SEER to SBEM is 2.9.
2. For a chiller with 100% and 50% EERs of 2.0 and 2.5 respectively in a building with unknown load profile the SEER would be 2.25.
3. For a chiller with unknown application load profile and part load EERs of

$$\begin{aligned} \text{EER}_{100} &= 4.89 \\ \text{EER}_{75} &= 4.42 \\ \text{EER}_{50} &= 3.93 \\ \text{EER}_{25} &= 2.59 \\ \text{SEER} &= 0.25 \times 2.59 + 0.25 \times 3.93 + 0.25 \times 4.42 + 0.25 \times 4.89 = 3.96 \end{aligned}$$

4. If the above chiller was to be used in an office and the typical UK weighting factors used then the SEER would be:

$$\text{SEER} = 0.2 \times 2.59 + 0.36 \times 3.93 + 0.32 \times 4.42 + 0.12 \times 4.89 = 3.93$$

## Multiple chiller systems

For systems with multiple chillers for use in office buildings, combined EER values may be calculated based on the sum of the energy consumptions of all the operating chillers. In this case care must be taken to include all of factors that can influence the combined performance of the multiple chiller installation. This will include:

- degree of oversizing of the total installed capacity
- sizing of individual chillers
- EERs of individual chillers
- control mode for the multiple chiller, e.g. parallel or sequential
- load profile of the proposed cooling load.

When these are known it may be possible to calculate a SEER which matches more closely the proposed installation than the simplifications described earlier.

## Systems with free cooling and/or heat recovery

Systems that have the ability to use free cooling and/or heat recovery can achieve greater SEERs than more conventional systems. In these cases the SEER must be derived for the specific application under consideration.

## Absorption chillers and district cooling

Absorption chillers may be used in conjunction with on-site CHP or from a Community or District Heating system. The CO<sub>2</sub> emissions will be calculated as for the use of CHP for heating. The control system shall ensure as far as possible that heat from boilers is not used to supply the absorption chiller.

Where a District Cooling scheme exists, connection to the system may result in lower CO<sub>2</sub> emissions if the cooling is produced centrally from CHP/absorption chillers, heat pumps or high efficiency vapour compression chillers. The District Cooling company will provide information on the CO<sub>2</sub> content of the cooling energy supplied, and this figure can then be used in calculating the CO<sub>2</sub> emissions for the building to demonstrate compliance.