

Subject:	<b>Guarantee of annual</b> output of collector fields
Description:	Procedures for how to <b>give annual output guarantees</b> for large collector fields. Procedures for how to <b>check annual output guarantees</b> for large collector fields.
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### Intro

This method for giving and checking annual output of collector fields takes into account that the weather and operating temperatures may vary from year to year. The method works with monthly average operation temperatures and hourly average weather data and will work for systems having approx. constant operating temperatures on a monthly basis – like e.g. solar district heating systems. The basic idea of the method is described in brief below.

### Giving the guarantee

- Define/describe/estimate reference operating conditions for the collector field:
  - Location (find weather data for the actual location; Meteonorm may be used)
  - Forward and return temperatures in district heating network
- Calculate the reference collector field output,  $Q_{out,ref}$  for these reference weather data and operating temperatures using a validated calculation/simulation program.
- Calculate influence of weather using e.g. 10 years min and max values for radiation and temperature
- Calculate influence of operation conditions i.e. collector temperatures varying the temperature e.g. +/- 10 K.
- Give guarantee based on the calculated reference output and the sensitivities found above

### Checking the guarantee

Checking the guarantee is simply to compare the actual measured annual output of the collector field with the  $Q_{out,gar}$  calculated using the actual weather and operating temperatures for the actual year

### References

For more details, see “Guarantee of annual output”, IEA-SHC TECH SHEET 45.A.3.2, <http://task45.iea-shc.org/fact-sheets>