solarcombi+

WP4 – Task3
Most Promising Markets

Solar Combi+ Project meeting
Gleisdorf 17th - 18th December 2009

Identification of most promising markets and promotion of standardised system configurations for the market entry of small scale combined solar heating & cooling applications
EIE/07/158/SI2.466793 09/2007 – 02/2010

Intelligent Energy Europe

Task 3 – Most promising applications

The analysis of the virtual case studies will at the same time reveal the **most promising markets** for early market access

These are in particular **climatic regions** and **applications**, where Solar Combi+ systems have particular high economical efficiency, due to

- High workload of each component, leading to low specific costs
- Favourable economic circumstances (high fuel/electricity cost, subsidy schemes, etc.)

Task 3 – Most promising applications

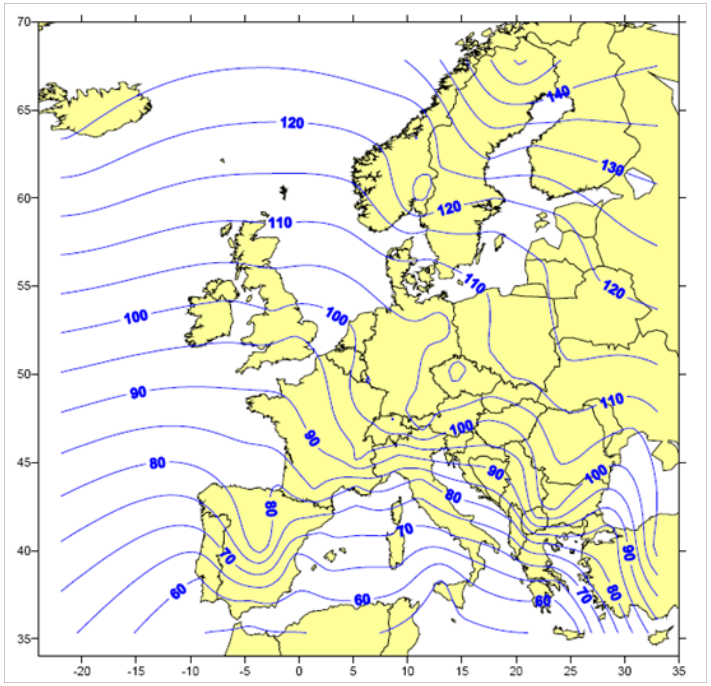
GIS – Geographical Information System

→Analysis and correlation of information with different geographical distribution

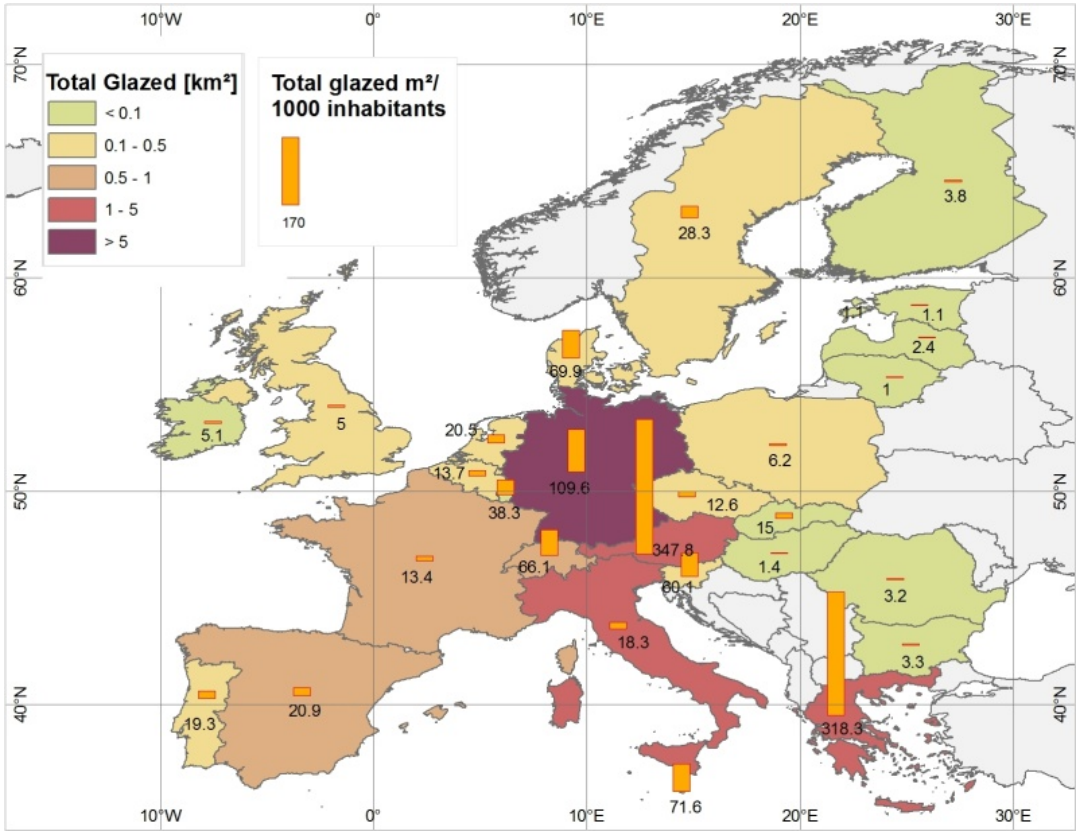
- climatic information
- economic information on country or regional level

Other information to be included could be

- solar thermal market figures
- chiller market figures
- ...

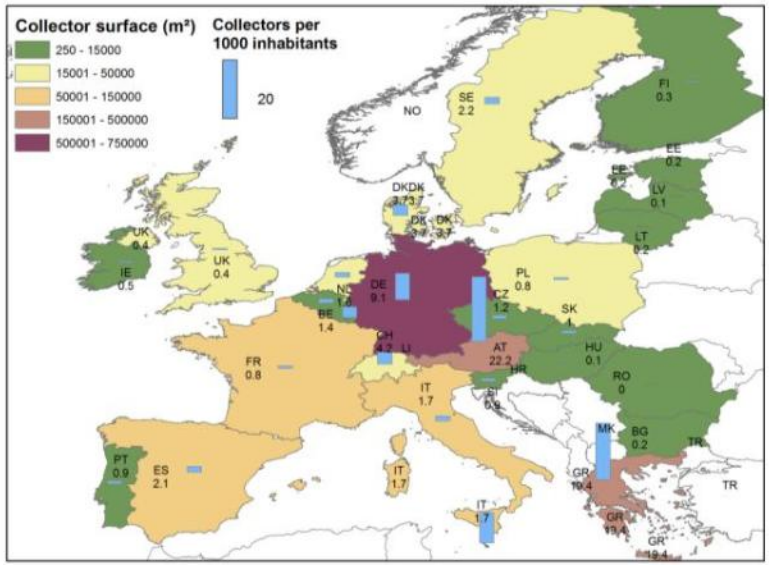


Most Promising Markets

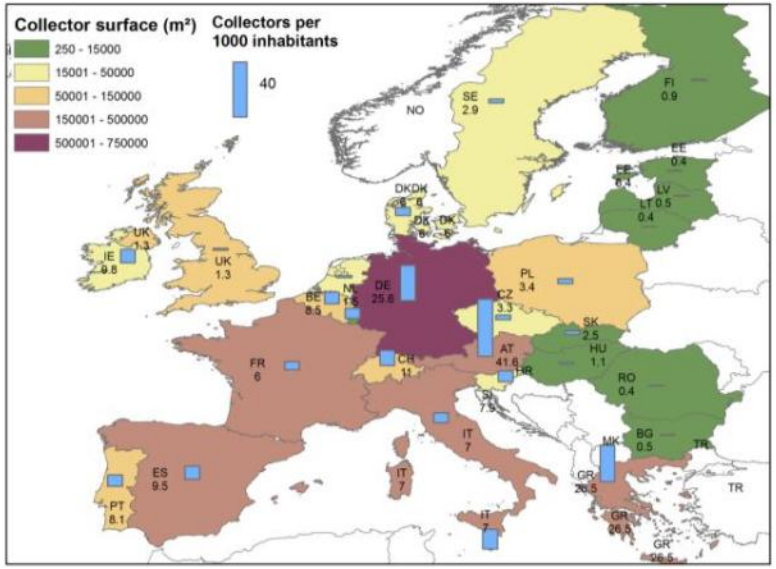


Most Promising Markets

2004



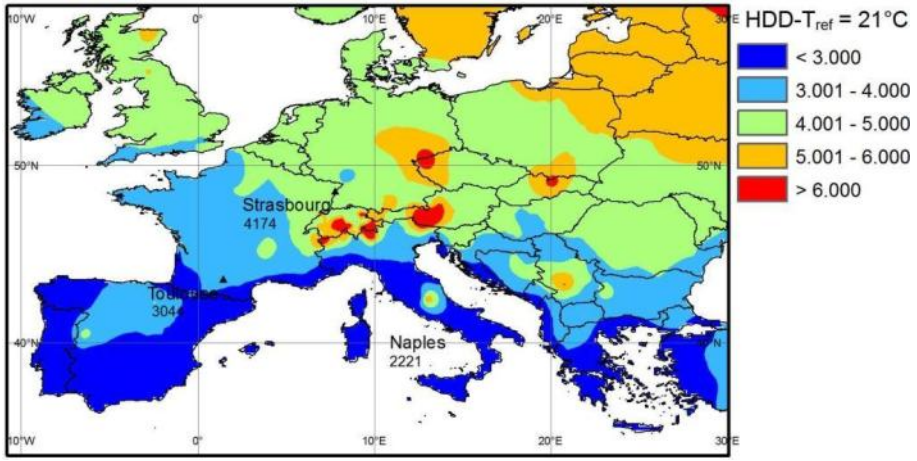
2008



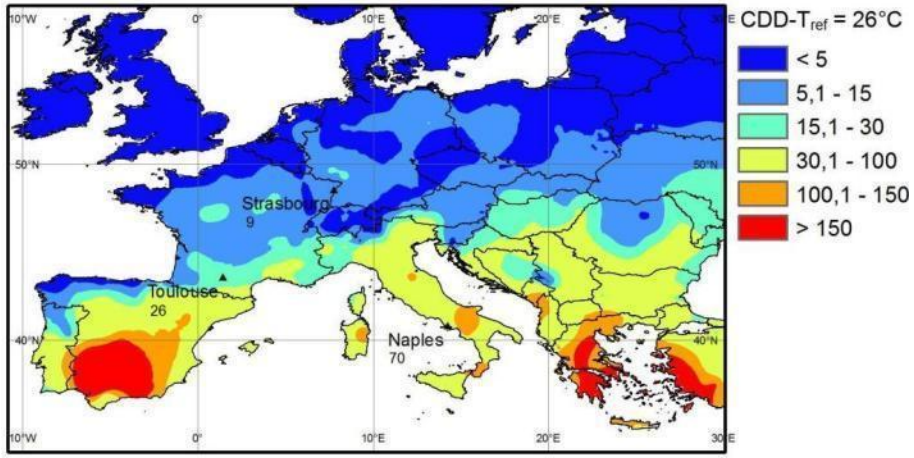
Slovenia, Portugal, and again France, Spain and Italy show surprising rises of their solar thermal markets: +789%, +760%, +646%, +382% and +260%. The three greatest markets (Germany, Austria and Greece) grow at slower rates, although still +34% is observed in Greece, +90% in Austria and +180% in Germany.

Most Promising Markets

CDD



HDD



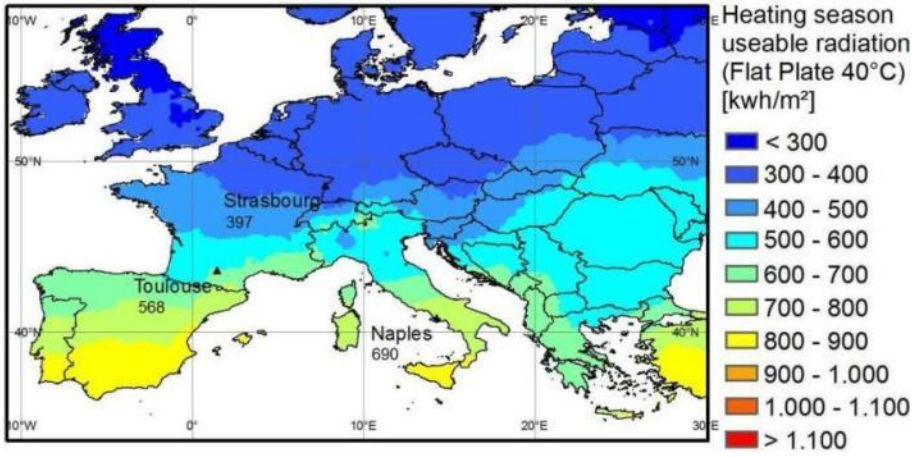
$$HDD = \sum_{h=1}^{8760} \frac{(21 - T_{amb,h})}{24} \approx \sum_{d=1}^{365} (21 - T_{amb,d})$$

$$CDD = \sum_{h=1}^{8760} \frac{(T_{amb,h} - 26)}{24} \approx \sum_{d=1}^{365} (T_{amb,d} - 26)$$

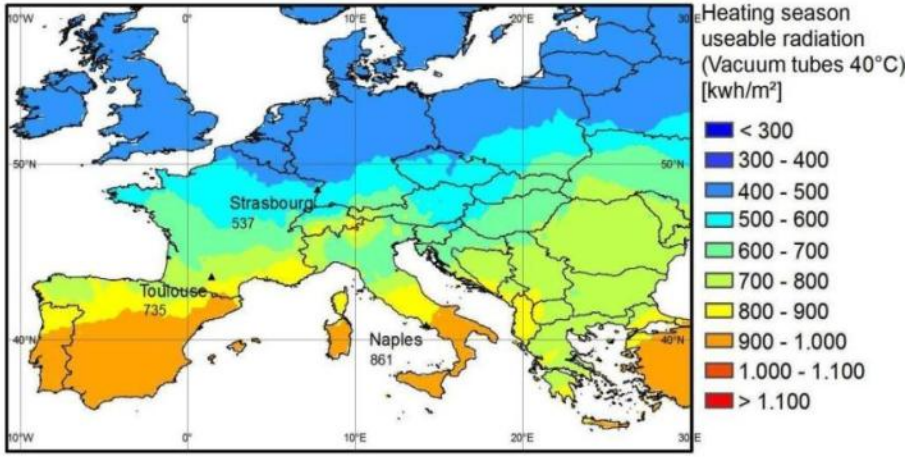
	HDD (21°C)	CDD (26°C)
Strasbourg	4174	9
Toulouse	3044	26
Naples	2221	70

Most Promising Markets

Flat plate collectors



Evacuated tubes collectors

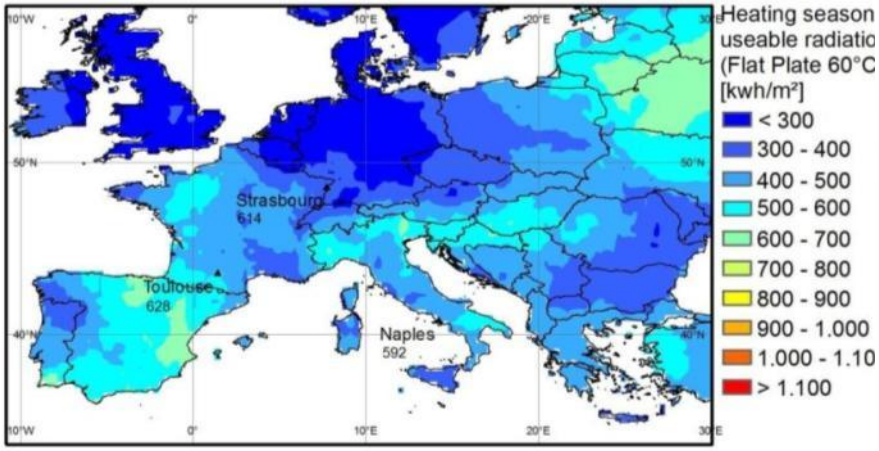


Useful radiation @ 40°C working temperature

	FP-Heating Season	ET-Heating Season	Relation FP /ET
Strasbourg	397	537	73.92%
Toulouse	568	735	77.28%
Naples	690	861	80.13%

Most Promising Markets

Flat plate collectors



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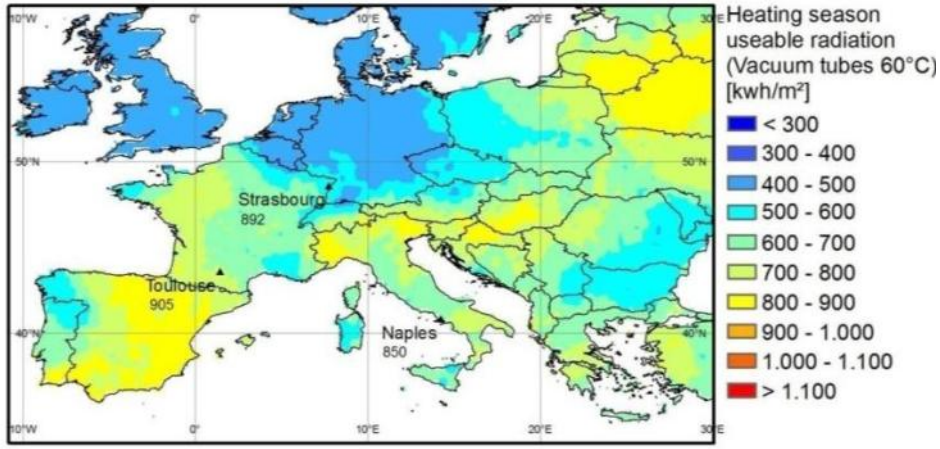
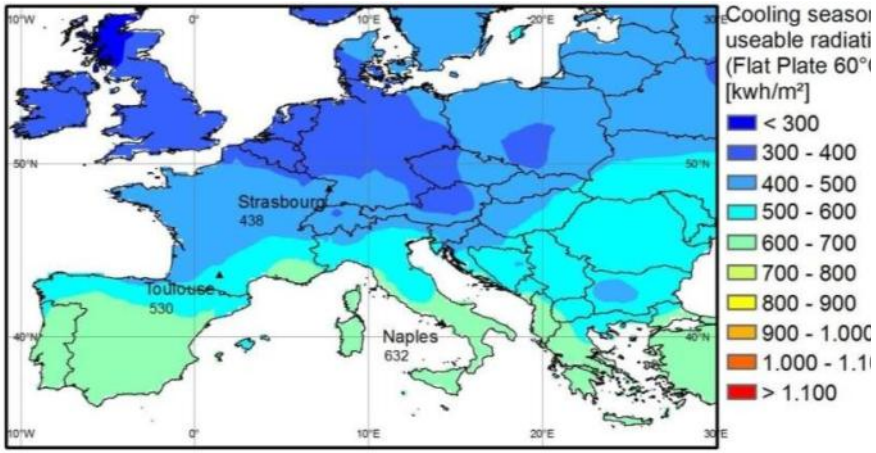


Useful radiation @ 60°C working temperature heating season

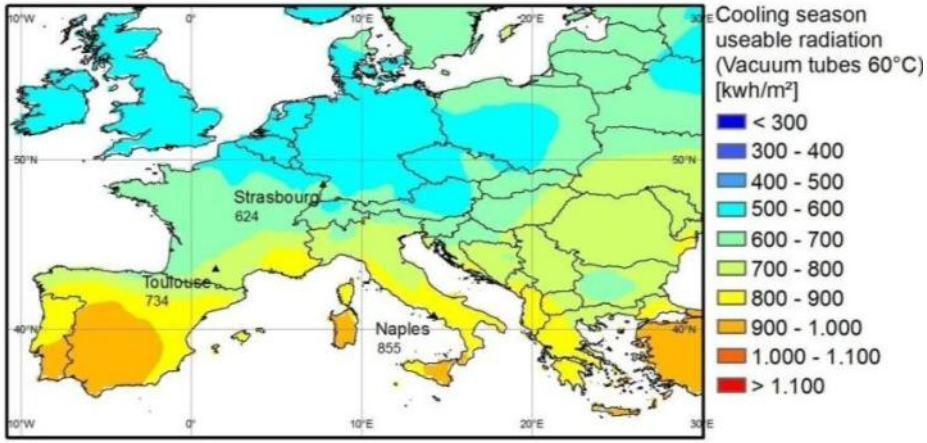
	FP-Cooling Season	ET-Cooling Season	FP-Heating Season	ET-Heating Season
Strasbourg	438	624	302	490
Toulouse	530	734	445	678
Naples	632	855	552	802

Most Promising Markets

Flat plate collectors



Evacuated tubes collectors

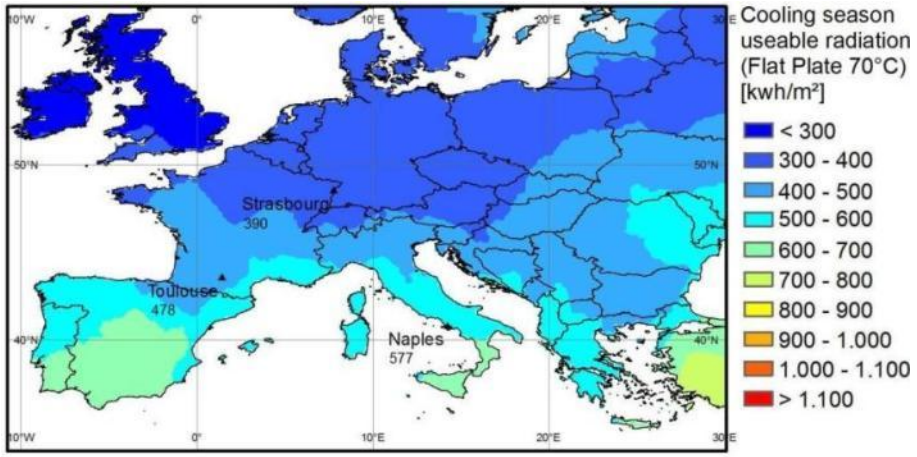


Useful radiation @ 60°C working temperature – cooling season

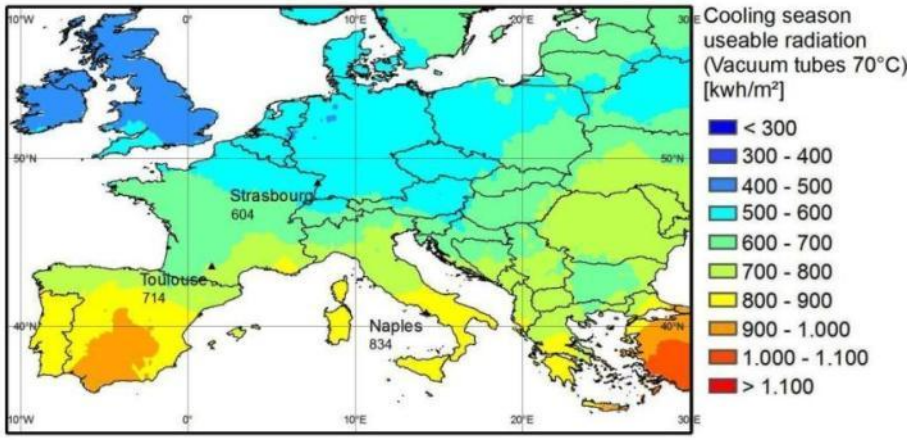
	Relation FP/ET Cooling Season	Relation FP/ET Heating season
Strasbourg	70.20%	61.63%
Toulouse	72.21%	65.63%
Naples	73.91%	68.82%

Most Promising Markets

Flat plate collectors



Evacuated tubes collectors

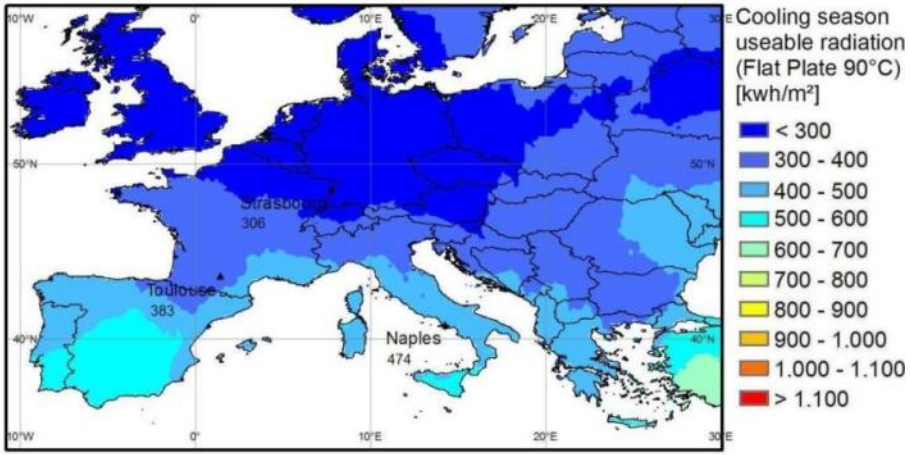


Useful radiation @ 70°C working temperature – cooling season

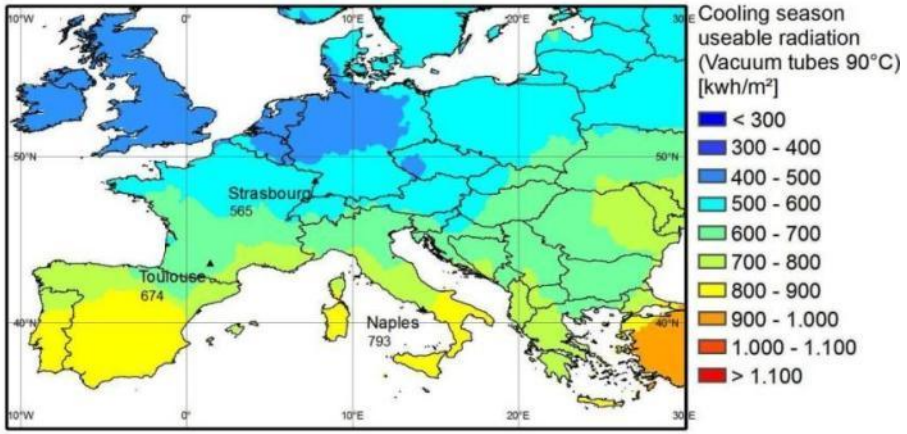
	FP-70°C	ET-70°C	Relation FP/ET 70°C
Strasbourg	390	604	64.57%
Toulouse	478	714	66.95%
Naples	577	834	69.18%

Most Promising Markets

Flat plate collectors



Evacuated tubes collectors



Useful radiation @ 90°C working temperature – cooling season

	FP-90°C	ET-90°C	Relation FP/ET 90°C
Strasbourg	306	565	54.16%
Toulouse	383	674	56.82%
Naples	474	793	59.77%

Most Promising Markets

- Between 30 and 40% less useful radiation is assessed in Strasbourg than in Naples.
- Southern countries are obviously more suitable for cooling applications due to the significantly higher radiation, which is available, while passive cooling could be a more adequate solution to cover northern countries requirements. However, cooling needs might result much higher too in southern regions, both during the days and the nights.
- The extra saving obtained with evacuated tube collectors should always be compared with the extra initial system costs. The seasonal demands are also important, i.e. cooling demands can be proportionally lower than the winter ones and the energy increase due to more expensive collectors not very significant.
- No economic parameters were reported