Solar Heat Europe
ESTIF

Solar Heat Markets in Europe

Trends and Market Statistics 2017
Summary (November 2018)

Data Highlights of 2017

Total installed capacity in operation:
35.2 GW_{th}

Total installed capacity in 2017:
1.4 GW_{th}

Annual energy generation (estimated):
25 TWh_{th}

(Estimated) sector turnover
1.7 EUR billion

Numbers of jobs (estimated):
17 400

Estimated
6.65 Mt CO_2
emission savings

Market size in terms of Solar Thermal Capacity (KW_{th}) and in terms of Collector Area (m^2)

	Market (=Newly Installed)							In Operation[2]		
	2015	2016	2017				Annual Evolution of the Market	2017		Annual Evolution of the Total Installed Capacity
	Total Glazed	Total Glazed	Flat Plate	Vacuum Collectors	Total Glazed		Total Glazed	Total Glazed		Total Glazed
	m^2	m^2	m^2	m^2	m^2	kW_{th}[1]	%	m^2	kW_{th}	%
Austria	136 580	111 040	99 770	1 060	100 830	70 581	-9.2%	4 047 511	2 833 258	-2.0%
Belgium	45 000	46 500	30 200	5 200	35 400	24 780	-23.9%	617 333	432 133	5.8%
Bulgaria *	5 600	5 600	4 600	450	5 050	3 535	-	140 050	98 035	-
Croatia *	19 269	20 688	19 300	1 400	20 700	14 490	-	210 516	147 361	-
Cyprus	36 891	37 824	37 000	1 400	38 400	26 880	1.5%	724 359	507 051	1.2%
Czechia	31 000	31 000	16 500	7 500	24 000	16 800	-22.6%	581 103	406 772	3.4%
Denmark	260 161	478 297	31 500	0	31 500	22 050	-93.4%	1 620 067	1 134 047	0.5%
Estonia *	2 000	2 000	900	600	1 500	1 050	-	16 020	11 214	-
Finland *	4 000	4 000	2 700	900	3 600	2 520	-	53 723	37 606	-
France[3]	101 376	61 300	45 740	2 260	48 000	33 600	-21.7%	2 625 876	1 838 113	1.9%
Germany	806 000	744 000	573 100	56 900	630 000	441 000	-15.3%	19 075 000	13 352 500	1.6%
Greece	271 600	272 000	315 400	600	316 000	221 200	16.2%	4 594 600	3 216 220	2.7%
Hungary+	15 650	16 570	12 000	5 000	17 000	11 900	2.6%	303 034	212 124	5.9%
Ireland	22 650	19 750	11 250	9 050	20 300	14 210	2.8%	384 282	268 997	5.5%
Italy	229 330	208 690	171 600	23 400	195 000	136 500	-6.6%	4 530 729	3 171 510	3.8%
Latvia *	1 910	1 800	1 350	250	1 600	1 120	-	13 882	9 717	-
Lithuania *	2 200	2 200	750	1 250	2 000	1 400	-	16 750	11 725	-
Luxembourg+	5 450	4 459	3 600	0	3 600	2 520	-19.3%	62 645	43 852	4.9%
Malta+	931	800	577	133	710	497	-11.3%	54 780	38 346	0.8%
Netherlands	21 519	25 316	21 150	6 162	27 312	19 118	7.9%	580 872	406 610	0.5%
Poland	277 000	115 400	107 200	3 900	111 100	77 770	-3.7%	2 249 090	1 574 363	5.2%
Portugal*	46 134	46 100	45 250	850	46 100	32 270	0.0%	1 057 235	740 065	3.9%
Romania *	17 800	17 800	7 200	9 600	16 800	11 760	-	189 150	132 405	-
Slovakia+	5 300	9 600	8 000	1 600	9 600	6 720	0.0%	165 700	115 990	3.5%
Slovenia	2 800	2 700	1 300	250	1 550	1 085	-42.6%	138 350	96 845	-5.%
Spain	237 259	208 869	190 666	7 187	197 853	138 497	-5.3%	3 663 339	2 564 337	5.3%
Sweden	6 571	3 099	2 867	341	3 208	2 245	3.5%	318 103	222 672	-2.9%
Switzerland	91 760	61 045	57 774	6 626	64 400	45 080	5.5%	1 488 701	1 042 091	2.6%
United Kingdom	24 289	13 910	9 938	0	9 938	6 957	-28.6%	799 719	559 803	0.2%
EU28 + Switzerland	2 728 030	2 572 357	-	-	1 983 051	1 388 136	-22.9%	50 322 520	35 225 764	2.1%

Solar Heat Europe/ESTIF would like to thank the solar thermal associations and other national sources for providing the data for these statistics, in particular:

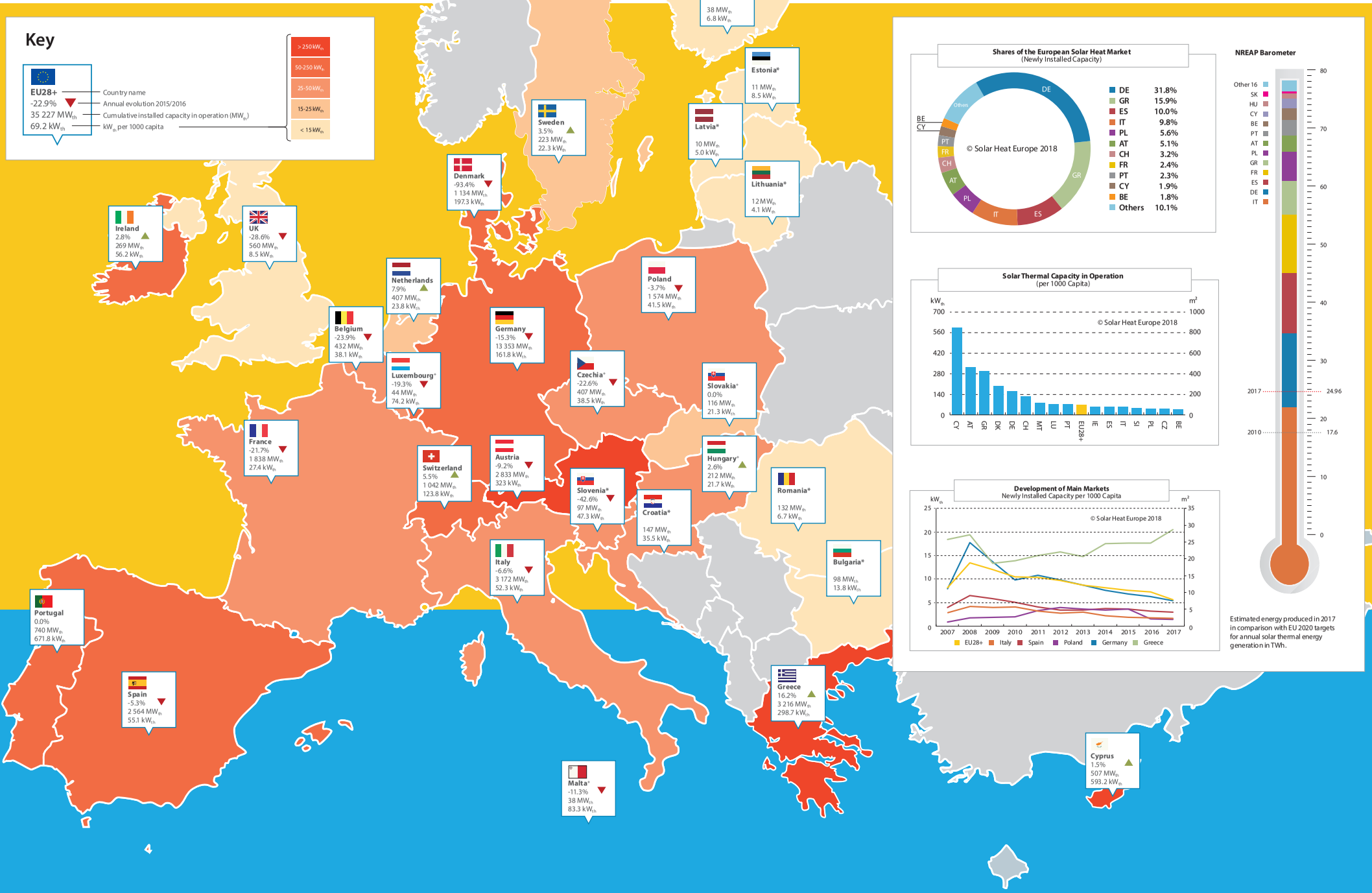
AEE Intec; Association pour Techniques Thermiques de Belgique (ATTB/Belsolar); Solar Key; Syndicat des professionnels de l'énergie solaire (ENERPLAN); Bundesverband Solarwirtschaft (BSW-Solar); Greek Solar Industry Association (EBHE); Sustainable Energy Authority of Ireland (SEIA); Assotermica; Holland Solar; Polish Association of Manufacturers and Importers of Heating Appliances (SPiUG); Associação Portuguesa da Indústria Solar (APISOLAR); University of Ljubljana; Asociación Solar de la Industria Térmica (ASIT); Svensk solenergi/Chalmers University of Technology; Swissolar; Solar Trade Association (STA).

*Figures for countries marked with an * are Solar Heat Europe/ESTIF estimations and, therefore, these are not sufficiently accurate to be used for percent change calculations in these markets. For some of the cases, the total sales or distribution between collector type combines historical data and information received regarding the market evolution. In the case of countries marked with an +, the 2017 figures are based on the EurObserv'ER "Solar thermal and CSP barometers" (2018).*

1) The relation between collector area and capacity is $1m^2 = 0.7kW_{th}$ (kilowatt-thermal) ;
2) Capacity "in operation" refers to the solar thermal capacity built in the past and deemed to be still in use. Solar Heat Europe/ESTIF assumes a 20 year product life for all systems installed since 1990. Most products today would last considerably longer, but they often cease to be used earlier, e.g. because the building was demolished, or there has been a change of building use.
3) The figures shown here relate to Metropolitan France (mainland). As a reference, in 2010 the overseas departments amounted to 49 MW_{th} (70,000 m^2).

Solar Thermal Markets in Europe

Data for 2017



Solar Heating and Cooling capacity in Europe exceeds 35 MW_{th}

In 2017, the European solar heat market has surpassed the threshold of 35 MW_{th} of total installed capacity, which corresponds to an area over 50 million m^2 of solar thermal collectors in Europe. This threshold was reached after an increase of 2.1% on the total installed capacity for solar thermal, with an additional 1.4 MW_{th} of solar collectors installed. Such total capacity corresponds to an estimated energy generation capacity of 25 TWh. This record level of energy generation is nevertheless still distant from the indicative targets set by Member States for solar heat in 2020, an estimated 78 TWh. This only confirms that the potential of solar thermal in Europe remains clearly untapped, as referred by IRENA in their analysis of the RES potential in the European Union, where it was identified that solar thermal could provide 3% of the heat demand in Europe by 2030.

Solar heating and cooling market behaviour in 2017

2017 will remain in the history books of the solar heating and cooling sector as the year in which an important milestone was reached: 35 MWth (50 million m^2) of total installed solar thermal capacity in Europe. This installed capacity allowed for the generation of 25 TWh of heat in Europe. Such a level of energy generation is a record for solar thermal. This is the equivalent to 90 PJ or 2.1 Mtoe and is 1.2 times the gross final energy consumption of Cyprus as well as 3.5 times that of Malta1. It also means that there are over 10 million households in Europe benefitting from a solar thermal system. This also represents over 10 million households which benefit already from solar thermal storage systems to manage the variability of the solar resource.

The evolution of the installed capacity was not homogeneous across countries or market segments. The most positive development was observed in Greece, where the market grew 16%. This growth mainly came from the thermosiphon market and the increased competition among this type of system, which has brought down prices in the market, hence making it even more attractive to consumers. It is also reported in other markets, such as Italy, that thermosiphon systems are performing better than forced circulation. In the case of Italy, the thermosiphon market might have increased between 15 to 20%.

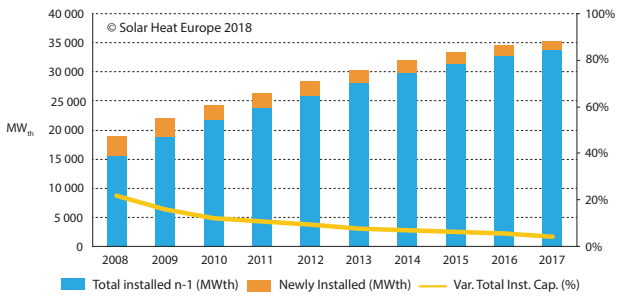
Still concerning the residential sector, it can be observed that markets where combi-systems have a large share, mostly in central European countries (Germany, Austria), have been facing steeper decreases in sales, in comparison with southern countries, where the domestic hot water systems are the large majority of those markets. Another country that faced a dramatic decrease in sales was Poland, which is feeling the effect of stop-go support measures. The market benefits from large tenders from municipalities, addressing public buildings and also residential systems. Though such tenders did not compensate the overall decrease caused by the end of support schemes for residential installations.

In sharp contrast, with regard to solar district heating, the main player, Denmark, went from installing a record 335 MWth (478 mio m^2) in 2016 to installing only 22 MWth (31.5 mio m^2) in 2017. This was mainly due to a freeze in the framework supporting the investments in renewables and energy efficiency, while the Government was reassessing its policy. With a new framework in place, this market started to recover in 2018, hence leading us to consider 2017 as an anomaly on the dynamic of the solar district heating market in Denmark. Solar district heating is also finding its place in the European market, with smaller installations in countries such as Austria, Germany, France or Italy. In this regard the main reference for new systems is the flagship project 'Big Solar Graz', a solar district heating system of 200 MWth, that continued to gain shape in 2017, in spite of some delays in the process.

Overall, the annual sales totalled 1.4 GWth (approximately 2 million m^2). The total capacity in operation increased to 35.2 GWth (50.3 mio m^2), adding 0.74 GWth (+ 2.1%) to the total installed capacity by the end of 2016. The total installed capacity in operation generates an estimated 24.96 TWhth of solar thermal energy while contributing to saving an equivalent of 2.1 Mtoe and avoiding 6.7 Mt CO2 emissions. In terms of economic significance, the solar heating and cooling sector reached a combined turnover of 1.7 billion euros in 2017, employing approximately 17 300 people.

[1] According to Eurostat (SHARES), the gross final consumption of energy (GFCoE) in 2016 was 2.15 Mtoe for Cyprus 0.6 Mtoe and for Malta

Solar Thermal Market in EU28 and Switzerland
Total and Newly Installed Capacity (glazed collectors)



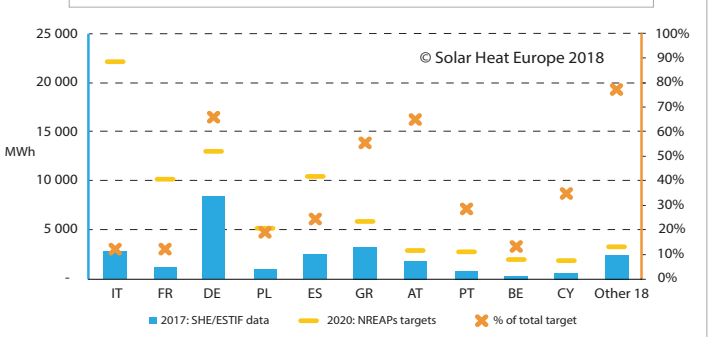
Solar thermal is a low-hanging fruit in view of the 2020 targets

In the final stretch towards 2020, it is evident that most countries will fall short of reaching their indicative targets for solar heating and cooling. This technology provides competitive solutions for rather different applications in diverse locations, ranging, for instance, from a small, low-cost thermosiphon system (2.8 kWth) with diurnal thermal storage (12.7 kWhth) that provides domestic hot water in a Mediterranean country for less than 2 €-cents per kWh, to a large solar district heating system (35 MWth) with seasonal thermal storage (142 MWhth) in Denmark and generation costs of a remarkable 3.5 €-cents per kWh. Conversely, when considering the full product lifecycle of solar thermal installations, from manufacturing to decommissions and recycling, the technology is well proven to be among the most environmentally friendly in terms of its contribution to the reduction of CO2 emissions.

Naturally it is faced with several challenges, most of which are common to other renewable heating and cooling solutions in the market, such as the upfront investment. In the case of solar thermal, this effect is even stronger as the operating costs are extremely low. As such most of the investment is done at purchase, it is comparable to having a consumer paying their energy bill in advance. The combined effect of uncertain economic context and low fossil-fuel prices contribute to making the upfront investment a harsher hurdle when planning to invest in a new heating system. And this leads to another important barrier: urgent replacement of the space and/or water heating devices. Most system changes are unplanned, meaning that they are done when a consumer faces a problem with their heating system, either breakdown or malfunction. When the issue is severe and a replacement is required, the fastest option is to opt for a similar solution, making it harder to integrate new efficient and renewable systems.

Promoting a level playing field for renewable heating and cooling solutions, assisting consumers in facing the upfront investment and facilitating a planned replacement of the space and water heating systems are low-hanging fruits at the reach of any Members State, especially for those at risk of failing their 2020 targets for renewable energy.

Solar Heat Generation in Europe
Current capacity vs. 2020 targets



Solar heating can provide more than 3% of the heat demand in Europe by 2030

The report "Renewable Energy Prospects for the European Union", published by IRENA (International Renewable Energy Agency) in 2018 identified solar thermal in buildings as one of main solutions to be explored in Europe until 2030.

IRENA prepared this report in cooperation with the European Commission looking into cost-effective renewable energy options in the EU that can contribute to accelerate the deployment of renewables towards 2030.

One of the main findings of this report is the potential to increase the share of Renewable Energy Sources in the energy mix to 34% by 2030, surpassing even the current target defined at the EU level of 32%. Hence, they have identified the main renewable energy options in terms of their contribution to the additional potential (beyond the 24% renewables resulting from the reference scenario).

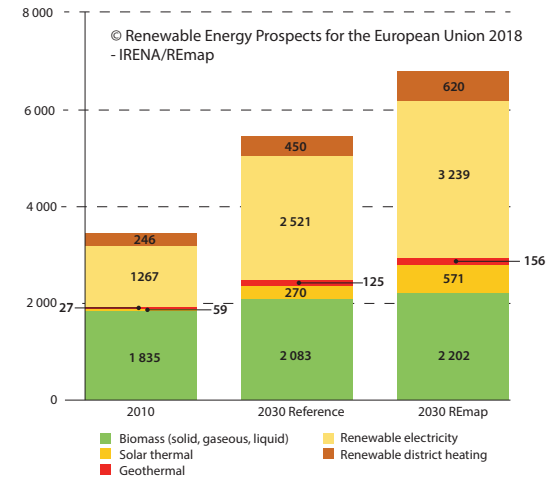
Wind power, biofuels for transport, solar thermal in industry and buildings, biomass in industry and buildings, and solar PV (photovoltaics) are the solutions providing the best results, in terms of additional renewable energy generation, while being cost-effective.

When looking only at the cost effectiveness, IRENA identified that about three quarters of the REmap Options were cheaper than the conventional technology substituted, meaning that they have negative substitution costs. At the top of such group are solar PV and Solar Heat in Buildings.

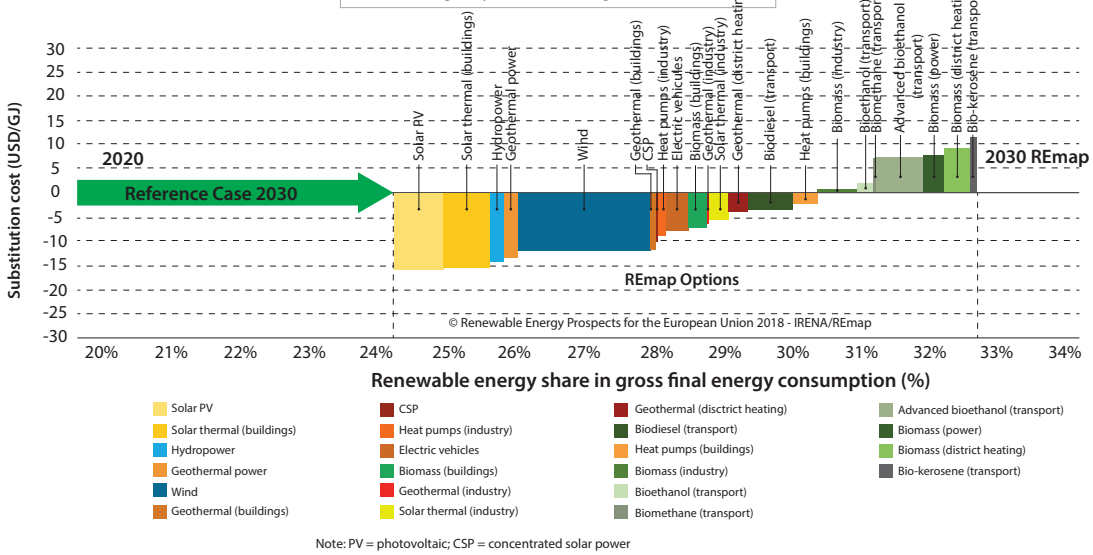
Besides ranking high in cost-effectiveness and potential contribution to the increase of the overall RES share, solar thermal can increase substantially, from a contribution of 3% of the heat demand in the reference case (24% renewables by 2030) to 6.2% in the REmap scenario (34% renewables by 2030).

Finally, IRENA projected that, by 2030, solar thermal in buildings and industry under the REmap scenario can reach 691 PJ (192 TWh) of energy generation which translates to 269 MW_{th} (384 mio m^2) of installed capacity. To this total, solar thermal in buildings can contribute 571 PJ (158 TWh) of energy generation which translates to 222 MW_{th} (371 mio m^2) of installed capacity.

Final renewable energy consomption by source
in the EU-28 buildings sector in 2010 and in 2030 under the Reference Case versus REmap (PJ)



Cost-supply curve of renewable energy options
to go beyond the 27% target for 2030



Note: PV = photovoltaic; CSP = concentrated solar power

1. Data released in January 2018 shows that the share of renewables in energy consumption in the EU reached 17% in 2016. (Eurostat, 2018)
2. Horizontal axis represents renewable energy deployment, with REmap Options organised by cost from left to right. Vertical axis represents 'substitution costs' i.e. differences between the Levelised Cost of Energy (LCOE) for the renewable and the conventional technology it suvstitutes. REmap Options with negative substitution costs are cheaper than conventional technologies.

Solar Heat Europe Members