



Solar thermal UK

World renewables 2013

A multi client study

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1 MARKET SIZE, STRUCTURE AND SEGMENTATION

1.1 MARKET VOLUME AND VALUE

Table 1 Total market volume and value, 2011

Type of collectors	Volume m ²	Value € million (at MSP)
Flat plate collectors	86,690	19.1
Vacuum tubes	18,690	6.7
Total	105,380	25.8

Source: BSRIA

Notes MSP = manufacturer selling price of collector

Table 2 Total market volume and value, 2012e

Type of collectors	Volume m ²	Value € million (at MSP)
Flat plate collectors	50,850	10.2
Vacuum tubes	12,100	3.7
Total	62,950	13.9

Source: BSRIA

Notes MSP = manufacturer selling price of collector

In 2012 the overall UK solar thermal market was estimated at approximately 63,000 m², down by around 40% from the previous year.

Sales of flat plate collectors account for the vast majority of the market due to their lower price compared to vacuum tubes and their better aesthetics, which makes them particularly popular in new buildings where they are usually roof-integrated.

Sales to new as well as refurbished buildings declined in 2012 as a result of reduced investment in both new construction and refurbishment works but also because of competition coming from alternative renewable technologies with shorter payback periods. In particular, as in 2011, growth in the solar thermal market was kered by the high Feed-in-Tariff (FiT) granted to photovoltaic installations (several thousands of pounds sterling) compared to which the only financial incentive to residential solar thermal installations was practically non-existent (a £300 voucher - RHHP; 5.3.2).

The non-domestic RHI incentive scheme, on the other hand, (5.3.1) had a positive impact on the biomass boiler market but a negligible effect on sales of large solar thermal systems.

The majority of solar thermal systems sold in the UK are fitted in residential buildings (63%). This percentage remained stable from 2011 even though 2012 saw a relatively increase in installations in new single and multi-dwellings while the share of systems fitted in existing buildings decreased as end users preferred to wait until the introduction of the domestic RHI scheme or install PV systems.

Sales to non-residential buildings dropped sharply on account of an almost 10% drop in investment in commercial building construction.

In value terms, the market posted a 46% fall as the declining trend for collector's prices at first point of distribution continued. Demand contraction brought prices for vacuum tubes down by approximately 10% while reductions in the flat plate segment remained in the range of 2 and 4% thanks partly to the shift towards aluminium absorbers.

BSRIA confirms its previous forecasts of a positive outlook for the UK solar thermal market up to 2016, even though in view of last year's collapse and the weakness of the macroeconomic indicators on which our forecasts are based, the absolute volume size of the market is anticipated to remain under 2008 volumes until the end of 2014.

Legislation for new buildings and incentives in the existing segment will be the key factors behind this positive outlook.

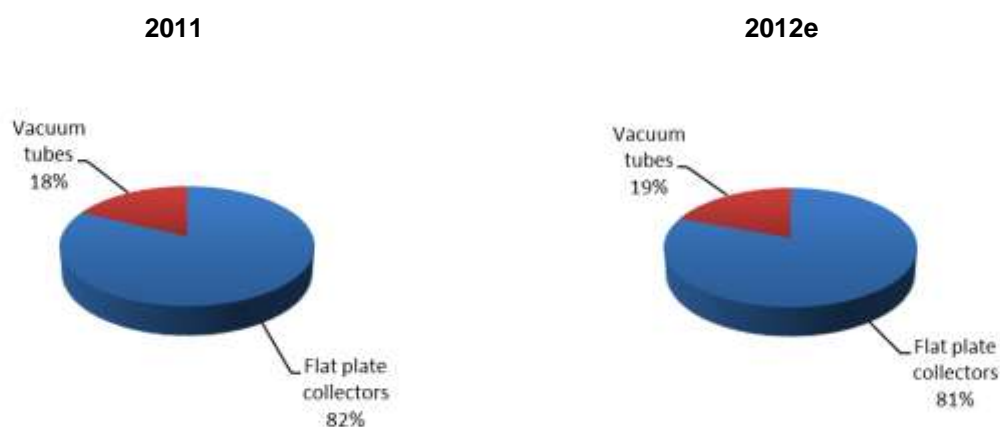
Limited growth at the end of 2013 is anticipated provided that the domestic RHI is launched by summer 2013 and its mechanism is clear, financially appealing and easy to access for all subjects involved. A failure in this sense will most certainly result in a third negative year for the solar thermal industry.

In 2015 and 2016 higher growth rates are based on the recovery of the new construction sector as well as increasing penetration of solar systems in new buildings resulting from tighter Building Regulations which will make alternative solutions insufficient to comply with the law.

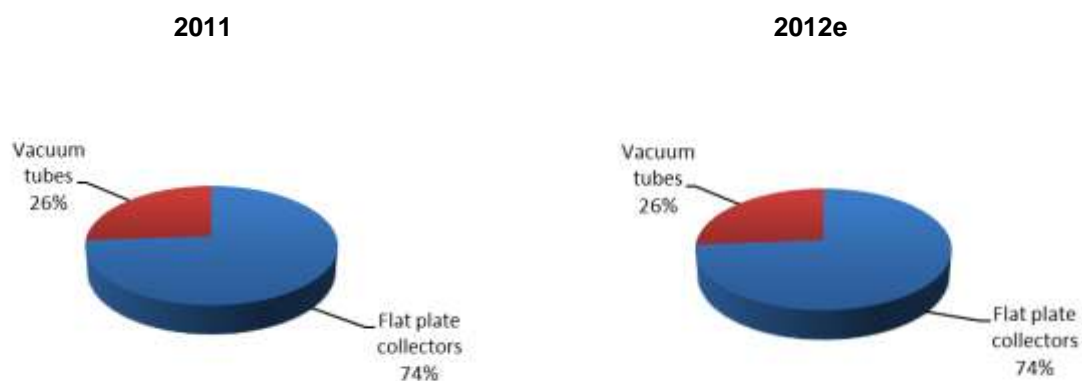
Positive developments from 2015 onwards are also likely to come from the implementation of the ErP Lot 2 legislation (5.2.6), which favours more efficient water heaters such as solar or heat pump water heaters at the expenses of traditional electric or gas products; and compliance with EU Energy Performance of Building Directive (2010/31/EU) regarding "nearly zero-energy" (5.2.1).

Drivers and challenges for the UK solar thermal market (including the potential impact of the Green Deal) as well as its potential to become a main source of domestic hot water are analysed in details in Sections 5 and 7 of this publication.

Figure 1 Solar thermal market volume %, 2011 and 2012e



Source: BSRIA

Figure 2 Solar thermal market value %, 2011 and 2012e

Source: BSRIA

1.2 PRODUCT SEGMENTATION

1.2.1 Flat plate collectors

Flat plate collectors, with over 80% of total sales, account for the bulk of the UK solar thermal market. Their lower price compared to vacuum tubes and their better aesthetics are the main reasons behind this large share. In fact, flat plates are especially preferred for installations in new buildings where they are usually roof-integrated.

Sales of flat plates shrank by an estimated 40% in 2012 with installations in both new and refurbished buildings losing to alternative technologies or solutions.

In new buildings the low penetration of solar thermal can be explained by the fact that the current national Building Regulations only set as a percentage reduction in carbon emissions (compared to 2006 standards) as a requirement. At the moment this percentage is set at 25% (or Level 3 of the Code for Sustainable Homes – 5.2.2). Designers have several options to reach this percentage and usually choose the cheaper solution. Heat pumps or boilers with either heat recovery ventilation (HRV) or mechanical extract ventilation (MEV) and increased wall cavity insulation have been reported to be frequently preferred to solar thermal systems.

In the existing segment, on the other hand, demand contraction was the result of yet another year of considerably higher financial incentives for PV systems compared to solar thermal as well as a further delay in the launch of the domestic RHI (5.3.3; 5.3.4).

In terms of absorber material, 2012 saw the disappearance of stainless steel and the share of aluminium increase to almost half of the market.

The remaining half of the market is still accounted for by copper absorbers since the main market players sell these. However, the share of copper dropped significantly in 2012 as more and more manufacturers over the last twelve months have started to switch to aluminium in an effort to reduce production costs.

The downward trend for copper absorbers in favour of aluminium is therefore expected to continue, if not accelerate, in light of the increasing price pressure faced by the industry. In fact, cheaper materials such as plastics could also appear in the future.

1.2.2 Vacuum tubes

Sales of vacuum tubes in 2012 dropped by around 35% over the previous year and their share of the total market remains of approximately 20%.

This segment, after recording a small 2% increase in 2011, contracted strongly in 2012. This was primarily the consequence of another delay in the launch of the domestic RHI which players expected to boost sales in existing dwellings – where vacuum tubes tend to be more common - at least in the second half of the year. The existing incentive schemes, namely the commercial RHI and the RHHP (5.3.1; 5.3.4), had a negligible impact on sales as end users preferred to install PV systems which were granted remarkably higher financial support.

Furthermore, last year sales of vacuum tubes were adversely affected by the decline in investment in new commercial buildings where vacuum tubes are preferred for their higher efficiency.

In the past, some sales of poor quality tubes had caused scepticism towards them. This previous reluctance has now disappeared, and vacuum tubes are now considered of high quality and work very efficiently in the UK. Because of their high quality, they are more expensive than flat plates.

In terms of types of collectors, heat pipe tubes account for the majority of sales in the UK and their share has increased in 2012. The share of U-shape tubes, on the other hand, has decreased due to the lower number of suppliers of this type of tube as well as the small sales volume achieved by the companies offering them.

2 STRUCTURE OF SUPPLY

2.1 END USER SECTOR

Sales to residential buildings represent the majority of solar thermal UK market. The percentage of sales to houses in 2012 remained stable compared to the previous year, even though, the mix have changed with installations to existing buildings suffering more as end users preferred to install PV systems or, in the best case, wait until the introduction of the domestic RHI scheme.

In new houses, penetration remains low, as designers are more likely to specify other technologies to comply with building regulations. This low penetration is also partly due to the fact that the majority of suppliers target the refurbishment market. Kingspan and Viridian are the main two players targeting new buildings. In new houses, in roof mounted flat plates are usually preferred for their almost nil visual impact as well as their contribution to cost reduction since flat plate collectors can replace roof tiles.

Vacuum tubes, on the other hand, are preferred for retrofits where they are easier to install. This is not expected to change in the short term even though vacuum tubes are more efficient in cold weather and their score is higher on SAP calculations for new buildings.

Since the UK solar thermal market is relatively young, the number of replacements is still low and mostly owing to cases of bad installations carried out by unqualified installers rather than systems reaching the end of their life cycle.

The percentage of sales to buildings undergoing major renovations dropped again in 2012 as a result of end users postponing non-essential repairs and maintenance works or choosing micro generation technologies with shorter payback periods.

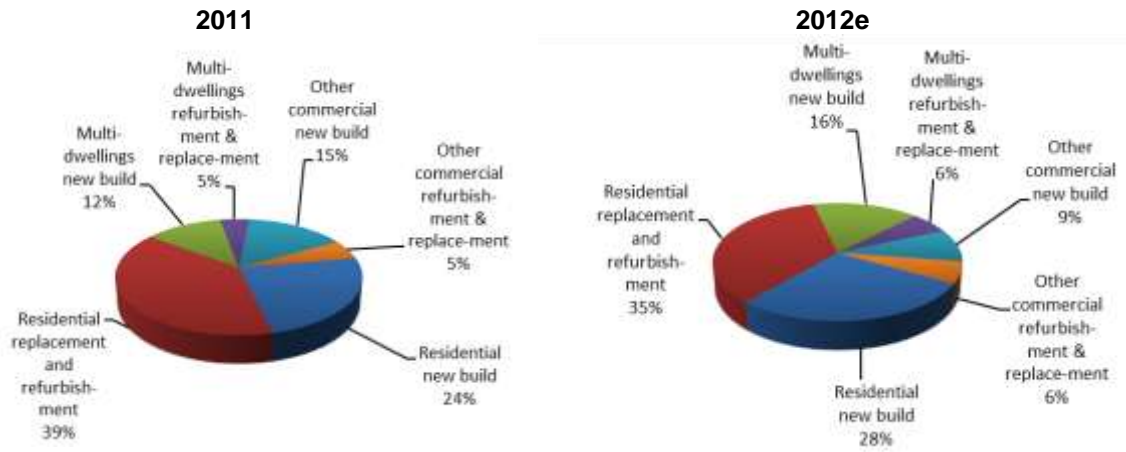
The share of sales to the non-residential segment fell significantly from over 20% in 2011 to 15% due to an almost 10% drop in investment in new commercial buildings.

Table 3 Solar thermal market by end user sector, 2011 and 2012e

End user sector	2011		2012e	
	Volume m ²	%	Volume m ²	%
Residential segment (1+2 family dwellings)	66,495	63.1%	39,659	63.0%
Residential new build	25,291	24.0%	17,626	28.0%
Residential refurbishment & replacement	41,204	39.1%	22,033	35.0%
Commercial segment	38,885	36.9%	23,292	37.0%
Multi-dwellings new build	12,435	11.8%	10,072	16.0%
Multi-dwellings refurbishment & replacement	4,742	4.5%	3,777	6.0%
Other commercial new build	16,018	15.2%	5,666	9.0%
Other commercial refurbishment & replacement	5,691	5.4%	3,777	6.0%
Total	105,380	100.0%	62,950	100.0%

Source: BSRIA

Figure 3 Solar collectors by end-user sector, volume %, 2011 and 2012e



Source: BSRIA

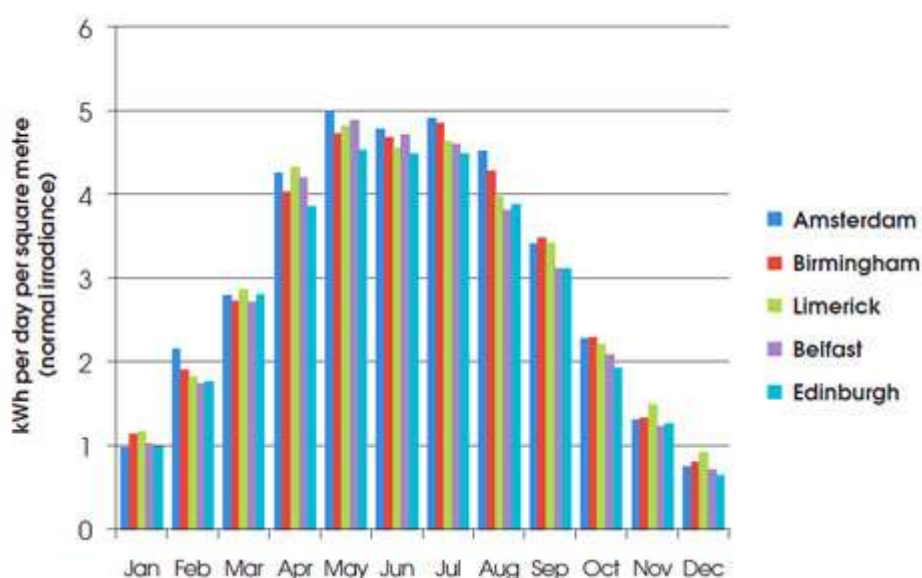
3 FUTURE MARKET STRATEGY

3.1 POTENTIAL UPTAKE AS MAIN SOURCE OF SANITARY HOT WATER

In an ESTIF report published in 2011¹, the take up of solar thermal per capita in the UK was one third that of countries of similar climates, such as Ireland and the Netherlands. As shown by the data in Figure 14, there is little variance in the solar irradiance between locations at approximately the same latitude such as Amsterdam, Birmingham and Limerick, or even for more northerly like Belfast and Edinburgh.

There is, therefore, good potential for solar thermal systems to become a supportive source of sanitary hot water. It is unlikely, however, that solar thermal becomes the main source of sanitary hot water, even though this will be increasingly based on renewable energy, for instance heat pumps.

Figure 4 Average daily total normal irradiance in Amsterdam, Holland; Birmingham, UK; Limerick, Ireland; Belfast, Northern Ireland; and Edinburgh, Scotland



Source: Cibse Journal², ESTIF

Installations in new buildings will continue to be supported by legislation, in particular the Merton Rule which requires new developments to generate at least 10% of their energy needs from on-site renewable energy equipment. (5.2.4). Increasing use of solar thermal in this segment is expected as building regulations are likely to be tightened every 3 or 4 years.

Solar domestic hot water heating in new buildings is also anticipated to benefit from the implementation of the Energy Performance of Building Directive (2002/91/EC - recast 2010/31/EU) requiring that all new public buildings are nearly zero-energy buildings from 31st December 2018 and that all new buildings are nearly zero-energy from 31st December 2020.

As the number of housing completion is forecast to remain under 140,000 units a year until 2016, real potential for growth lies in the **refurbishment sector**. It is estimated that at least 70% of the UK's housing stock likely to exist in 2050 has already been built. Three-quarters of these existing dwellings were built before 1975 with 25% built before 1919.

In this regard, solar thermal systems have the advantage of being – together with PV systems – among the most convenient ways to reduce energy consumptions and bills in existing buildings.

¹ Solar Thermal Markets in Europe Trends and Market Statistics 2010 – European Solar Thermal Industry Federation

² <http://www.cibsejournal.com/cpd/2012-05/>

The positive life time economics of solar thermal water heating, though, are currently dependent on the provision of subsidies. Otherwise the investment payback period is still perceived as too long by end users compared to fossil fuelled hot water heating systems.

The success of incentive mechanisms such as the Green Deal and the domestic RHI will be crucial to achieve the growth potential of the existing segment. A boost to sales in this segment could come from the implementation of EU Directive 2009/125/EC (recasting Directive 2005/32/EC) on the Ecodesign for Energy-related Products. Lot 2 of the Directive covers water heaters (gas, oil, electric, solar and dedicated heat pumps).

The ErP Lot 2 legislation, which is expected to enter into force in the second half of 2013, favours more efficient water heaters such as solar or heat pump water heaters at the expenses of traditional electric or gas products.

3.2 MARKET CHALLENGES

Weak macroeconomic indicators negative and competition coming from photovoltaic systems (even with the current lower Feed-in-tariffs) are the major challenges to the development of the UK solar thermal industry.

The third most significant holdback to the take up of solar thermal is represented by the delays and uncertainty surrounding the domestic RHI scheme. At the time of publication of this study, the final form and content of the domestic RHI has not been announced yet and a further delay of its introduction (now due in summer 2013) cannot be ruled out.

In new buildings penetration of solar thermal is currently low (less than 10%). This can be explained by the fact that the Merton Rule acts at local level while at national level there are no legal obligations to renewables. In fact, Building Regulations only require a minimum energy efficiency standards set as percentage reduction in carbon emissions (compared to 2006 Building Regulations). As a consequence, at the moment building requirements tend to be reached by means of alternative solutions with shorter payback such as heat pumps or by increasing the wall cavity insulation and installing a boiler with either heat recovery ventilation (HRV) or the even cheaper mechanical extract ventilation (MEV).

Higher solar thermal penetration rates in this segment is expected as building regulations are likely to be tightened every 3 or 4 years, thus making increased wall cavity insulation and MEV insufficient to reach the percentage reduction in carbon emissions.

In the **existing building segment**, the positive impact on the solar thermal market of the Green Deal is surrounded by scepticism. One of the concerns relates to the amount of finance received under the scheme which is capped, thus the Green Deal does not necessarily cover the full cost of the installation. In case it does not, the consumer will have to cover the remaining costs with its own capital or by taking up a loan. Consequently, it is likely that consumers will prefer cheaper energy-saving improvements such as loft or cavity wall insulation, draught-proofing or double glazing.

Other concerns relate to whether private-sector **Green Deal** loans will be attractive enough to consumers and to the possibility that the scheme may encourage doorstep selling. If sales people are on commission for getting new business, it is very difficult to ensure that correct and full information on energy savings and costs will be given to potential customers. In addition, other products or extra work (such as repointing or rewiring) may be sold, whether or not it is needed or reasonably priced. Despite advice about never buying under pressure, the risk remains that people who do not take the time and trouble to shop around, wrongly trust the accuracy and completeness of information given, or simply sign up inadvertently.

The domestic RHI also has the potential to give a strong boost to the market; however, its success depends not only on its final mechanism and financial value, but also on whether RHI and Green Deal will effectively work together since the two schemes have now been linked. The final form of the domestic RHI may require that all domestic RHI applicants need a Green Deal “Green Ticks” Assessment in order to access the RHI. ‘Green ticks’ on Green Deal assessments relate to the thermal efficiency of the house, with the exception of solid wall insulation. The ‘green ticks’ will be for improvements that are economically reasonable.

Further potential for growth in the refurbishment segment may come from Part L of Building Regulations 2013 provided that energy efficiency improvements are made compulsory when buildings under 1,000m² undergo renovation works.

Another challenge to the market’s uptake is that houses in the UK are smaller than in the mainland Europe. According to the latest Housing Survey, it is estimated that 93% of all the UK housing stock, or around 24 million dwellings, have a surface area of under 130 m². This represents a problem for solar thermal systems (as much as for other renewable technologies such as heat pumps) because they require space to fit large storage tanks.

Awareness among consumers and installers’ competence are both on the rise over the years thanks to the efforts of manufacturers and renewables associations such as the Solar Trade Association or the Energy Saving Trust. However, further improvements are still required especially on the consumer side, as false beliefs, unclear information about the solar thermal technology and confusion with photovoltaic are still common.

Despite the reduction of incentives to PV, competition from photovoltaic will continue even if it is likely to be less harsh than in the past.

Nonetheless photovoltaic systems are not the only substitute products to represent a threat for the solar thermal market. Started to appear on the UK market only at the end of 2010 a few years ago, combined **PV thermal systems** (PV-T) are another rival product to solar thermal. PV-T will soon start to compete for space on UK roofs, especially in existing buildings as the technology is too new to be installed in new buildings where panels integrated to the roof are also favoured.

PV-T systems are still very expensive and require a large roof area. However, as PV-T prices go down, this technology will undoubtedly represent a good investment in the near future especially in light of a trend towards systems’ integration and bivalent installations.

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APPENDIX: B WORLD SOLAR THERMAL ORDER FORM

Worldwide Market Intelligence



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