Solar PV cost update

Department of Energy & Climate Change

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PARSONS BRINCKERHOFF

Solar PV cost update

Prepared for
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Prepared by
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PARSONS BRINCKERHOFF

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1 INTRODUCTION

The Department of Energy & Climate Change (DECC) appointed Parsons Brinckerhoff (PB) to update the costs of solar PV used in DECC's model for the UK Feed-In Tariff (FIT), following the recent consultation[1]. These costs had been provided previously by PB in January 2012. This report provides the updated cost data.

The project work and data gathering presented in this report took place between March 23rd and April 12th 2012.

2 METHODOLOGY

PB used a number of different sources to update the PV cost data. These were:

- market intelligence received from DECC (both formal consultation responses and data received through other channels)
- quotes for PV installations sourced from a number of different PV companies.
- consultation with experts from the PV industry, including installers, manufacturers, and industry analysts
- analysis of domestic and global trends in PV markets, both on the supply and the demand side making use where possible of existing expert analysis on the solar sector

The individual cost data used is provided in Appendix C of this report. In total, we gathered 120 cost data points from 26 companies (either directly or in data provided via the consultation). In addition, we obtained data from a further 6 individuals and organisations.

For each installation size band, we have derived central, low and high case cost values. The central case values represent the median of the data points for each band, while the low and high values represent the 1st and 3rd quartiles of the data (i.e. 25 and 75% of the range respectively) in order to provide a realistic range that is not skewed by outlying data points.

For the future cost projections, cost values for 2012 and 2013 have been developed based on an assessment of industry views and the numerous factors affecting both demand and supply. For 2014 onwards, we have applied reduction based on long-term learning rates linked to total installed capacity. Three scenarios for cost reduction – fast, medium and slow – have been developed and applied to the range of current cost data to provide a range of possible future cost values.

It should be noted that the data used in this update has been gathered while the PV industry remains in a state of considerable uncertainty. Our current and future cost data is therefore also subject to uncertainty and this report should be read with this in mind.

[1] Comprehensive Review Phase 2A: Consultation on Solar PV Cost Control, http://www.decc.gov.uk/en/content/cms/consultations/fits_rev_ph2a/fits_rev_ph2a.aspx

3 CURRENT COSTS

3.1.1 Current total capex

Appendix B of this report provides our updated capex data for PV installations in Great Britain, with individual data points provided in Appendix C. A summary of current total installed cost estimates for solar PV installations is provided in the table below.

	Capex (£/kw) – March 2012 basis[2]		
Band	Low	Central	High
<4kW [3]	2247	2564	3043
4-10kW	2139	2269	2332
10-50kW	1856	2011	2268
50-150kW	1801	1885	1926
150-250kW	1600	1705	1929
250-5000kW	1218	1300	1450
Stand alone	1218	1300	1450
Aggregators (<4kW)	1978	2249	2304
Aggregators (>4kW)	1781	1946	2151

As in our January 2012 data, there were no significant differences observed between retro-fit and new build costs. Retro-fit continues to represent the vast majority of UK installations.

The capex data is based on a sample size of approximately 100 data points covering the range of system sizes. These individual data points are provided in Appendix C. The majority of data points are from the period between the end of February to the beginning of April 2012. Data for the larger systems dates back to January 2012 owing to a lack of new systems of this size being installed. We consider the data to provide a reasonable representation of current costs, with the central case values (the median of the data set for each band) being the typical values that would be expected in the current market.

The high and low capex values represent the upper and lower quartiles of the range of data gathered. As such, they include the different sources of variability inherent in the source data - which will include different component prices available to different installers, site-to-site variability, varying installer margins etc.

The widest range of cost values is for <4kW individual installations. This reflects the range in the data gathered and we believe this is likely to be due to a wider range of site-specific factors such as roof shape, size etc. compared to larger installations where sites are more likely to be similar in nature. The ranges for larger installations are smaller, reflecting the narrower range of data received. This is likely to be a result of a smaller impact from site-specific variations in system design.

[2] Data include installer profit margins, and also include VAT for domestic installations.
[3] As in our previous reports, 2.6kW has been used as a representative system size within the <4kW band to provide a £/kW value. Note that in the detailed cost data in Appendix B we have divided costs for the <4kW bands into a fixed £/installation element and a marginal £/kW element. See Appendix B for details.

The data available for <4kW individual installations showed no statistically significant correlation between £/kW capex and system size. We have therefore used the median of the entire data set (28 data points) to derive the central capex value for this band. The use of this approach compared to potential alternative approaches is discussed in Appendix D.

There was limited data available on aggregator projects being commissioned in 2012 to date (i.e. projects which will have up-to-date costs). Recent data available for <4kW aggregators was limited to commercial systems. Data on aggregators at the >4kW scale was difficult to obtain. The data that we were able to source were generally from local authorities and represent costs from the second half of 2011. The indications from these sources were that there has been little activity in this size band to date in 2012. To derive an estimate of current costs for this size band, we calculated the cost reduction experienced for individual 4-10kW and 10-50kW installations since the second half of 2011 and applied the same rate reduction to the >4kW aggregator data. More details are provided in Appendix C.

The capex ranges for the aggregator bands are relatively narrow. This is in part a reflection of the sources available for each band, but may also reflect a degree of averaging that has already occurred in the data provided to us, i.e. the data already represents a typical value for an aggregator's portfolio, which will tend to reduce the overall range.

The costs data includes a limited number of data points for systems that are ground-mounted (rather than roof-mounted), but still associated with supply to occupied buildings on site. These are included within the data set for each band. The exception is the 250-5000kW band where stand-alone system data was available. This indicated that costs for this kind of installation are in-line with costs for "non stand-alone" systems of the same size.

In general, the data corresponds to systems using reasonable quality manufacturers for the key components (modules and inverters). There was no evidence that the costs link directly to component quality i.e. the lower cost data does not necessarily represent systems using less established/lower quality components.

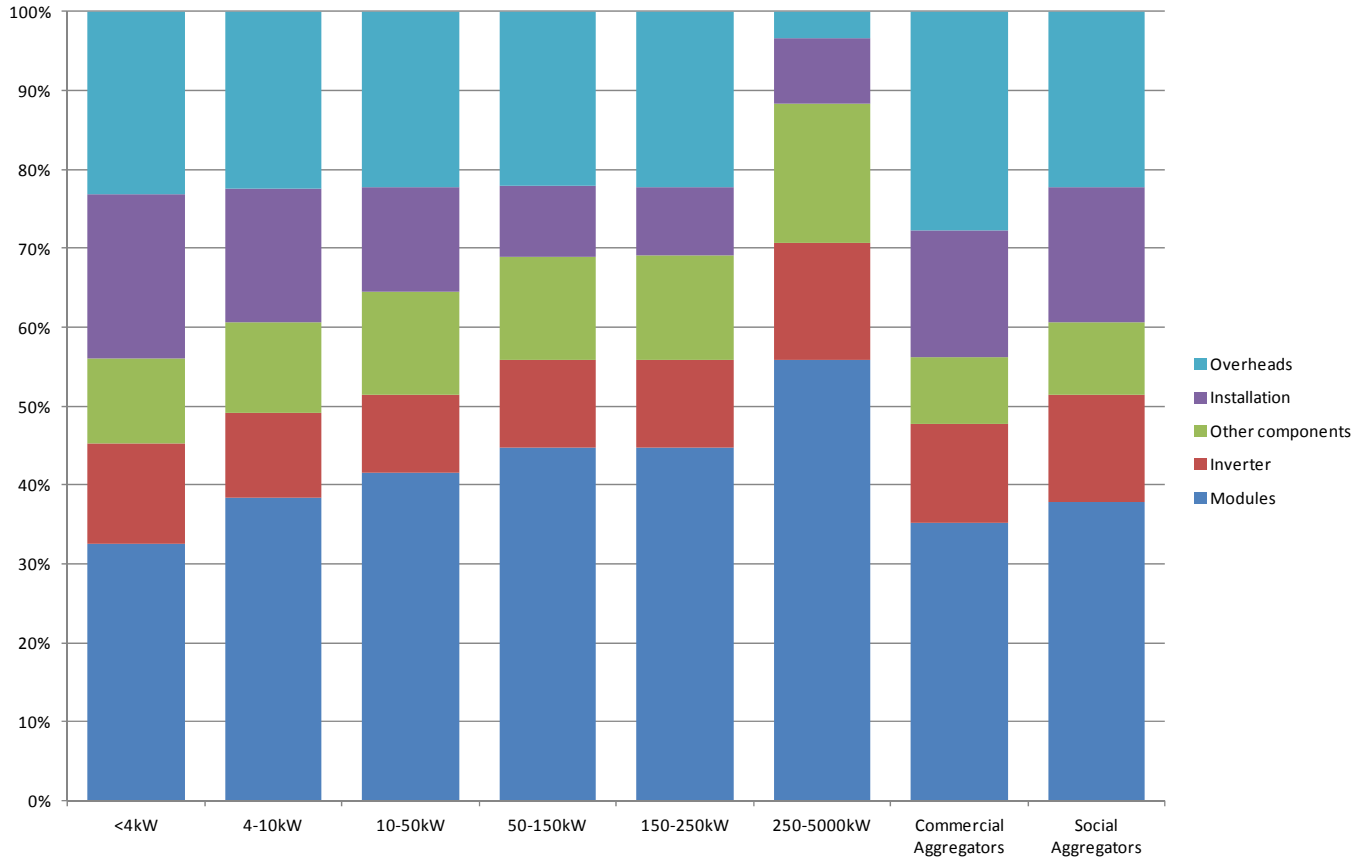
3.1.2 Capex breakdown

The chart below shows the proportion of capex made up by the different cost elements for each size band, derived from data sourced for this study including consultation responses, component costs data and discussions with industry. We have included data for both commercial aggregators (i.e. multiple installations on sites rented from the property owners) and social housing aggregators (multiple installations on sites under the control of a single local authority or housing association) as we received data indicating.

Note that this chart shows the percentage breakdown for the cost in each band, but should not be used to directly compare costs across bands. For example, the chart indicates that modules represent a slightly higher percentage of the total cost for commercial aggregators compared to individual <4kW systems, but this does not mean that the actual module cost per kW is higher for aggregators.

While we consider this breakdown to be reasonably representative of the cost breakdown for the different installation sizes, there is likely to be variation between different installations as a result of factors such as the ease or difficulty of installation,

the prices of components available to different installers at different times, the allocation of overheads etc.



As the chart shows, with increasing system size the proportion of cost represented by modules increases and the proportion due to installation decreases. This would be expected as installation time (and therefore cost) per kW will be likely to decrease as system size increases.

The data shows a step change between the 150-250kW and 250-5000kW bands. This is a result of the developers in the larger bands focussing on significantly larger projects (>1MW) where overheads are spread over a much higher total cost (and are therefore a lower percentage of the total) and other equipment costs such as substation equipment are more significant.

From the data gathered, cost breakdowns are similar for roof-mounted and ground-mounted systems within each band, and for stand-alone systems in the 250-5,000kW band.

Compared to individual installations, commercial aggregators have a higher percentage of costs associated with overheads such as conveyancing. A number of these overheads do not apply to social aggregators, resulting in a smaller overhead proportion.

We have not included profit in the breakdown above as we understand that profit levels vary significantly depending on the business strategy of (and the competitive

pressures on) the installer/developer in question, e.g. a new entrant may be willing to operate at lower profit initially to establish a market presence.

3.1.3 Aggregator installations

Aggregation of solar PV installations is a complex area, with a number of different business models being used. A detailed investigation of these different models was beyond the scope of this report, however discussions with participants in the aggregator sector has led to a number of observations:

- In comparison with individual systems, aggregator systems appear to have reduced equipment cost due to the economies of scale associated with bulk buying solar panels and inverters.
- It is understood that reductions in cost due to increased buying power are negated to an extent by other costs, such as the legal costs required for conveyancing, and the long running administration costs needed to initialise and maintain projects.
- There are significant differences between the business models and overheads for commercial and social aggregators. Commercial aggregators need to spend proportionally more effort on, for example, sales and marketing.
- Within commercial aggregation, there may be further differences in business models that result in differences in how capital cost is allocated. For example, a commercial aggregator may sell on a portfolio of systems (and all its future revenues) once installed, or it may maintain a degree of long term ownership. In the latter case, the capex "charged" to the portfolio may be lower as the aggregator would expect part of their return to come from on-going ownership.
- Note that the data for aggregators do not include as a cost the foregone revenue from savings on electricity bills that residents of aggregator properties receive (although as noted below some aggregators are starting to charge fees to gain some of this benefit). As noted above, the available data for <4kW aggregated systems was limited to commercial aggregators.
- Properties for aggregator systems are usually in the same area. This is because of the strategic canvassing of areas carried out by commercial aggregator businesses, and the local authorities targeting estates for their developments. Therefore, there is a slight reduction in the installation cost compared with an individual installation as there is less distance between each property. This reduction is likely to be smaller for commercial aggregators whose portfolios are likely to be more spread out than those of social landlords.
- Extra costs for social aggregator systems may also be incurred due to the need to have equipment that allows local authorities to 'switch off' the ability to use the generated electricity when properties are vacant.
- According to two local authorities, there may also an increase in the installation cost due to the upgrading of the distribution network within the area. This can have a detrimental affect on the scale of projects since larger

projects require an increased number of improvements to the grid. This can price out some installations as they become unviable.

- The data gathered indicated that commercial aggregators appear to be concentrating solely on the <4kW size band. Local authorities, however, are making use of their portfolio of properties and installing (or proposing to install) systems in the <4kW, 4-10kW and 10-50kW bands. PB did, however, receive one comment from a commercial aggregator that they were considering switching to >4kW systems due to insufficient returns for <4kW installations.

- Local authority social housing schemes provide free electricity to tenants, and any excess is sold. The revenue generated from the sale of electricity is then fed back into the local authority. In contrast, commercial aggregator systems vary. For the larger scale systems, we received a single comment of a commercial aggregator selling any generated electricity back to the building owner at a reduced price (5-7p/kwh). This price is fixed, and guaranteed throughout the life span of the system.

- One local authority that has mainly installed systems on schools indicated that they charge schools a fee for the electricity that the systems provide. They also stated that they are looking into charging their social housing residents a small fee for the electricity.

- In order to ensure completion ahead of FiT changes, local authorities have included delay penalties in their installation contracts. One local authority stated that as a result higher installation costs had been quoted as contractors built in a level of risk premium into their prices.

- For aggregators in the >4kW band, the data received indicates that the number of installations typically involved is relatively small (i.e. less than 100 installations). This appears to reflect the nature of local authority property portfolios, with a smaller number of buildings suitable for the larger installations.

- Overall, the data suggest that aggregator capital costs are around 90% of the cost for a similar individual system, although there is a degree of variation within a range of 85-95%. This is in line with anecdotal comments received from industry sources during this project.

3.2 Opex

The opex costs are generally in line with those provided in our January 2012 report. More detailed information has resulted in a slight upward adjustment to the central case values for the larger size bands. The data provided indicates that, once systems are big enough to justify a genuine maintenance regime (as opposed to domestic installations which tend to have little planned maintenance), the costs per kW are similar across the size bands.

For installations <4kW, aggregator opex remains higher than for individual installations as a result of the costs of monitoring and maintaining a portfolio of assets, compared to the minimal planned maintenance for individual installations.

4 FUTURE COSTS

4.1 Capex

4.1.1 Cost drivers

There are numerous different factors which will impact on the future pricing of solar PV systems including the level of the FiT, the price of raw materials and resultant equipment costs through the supply chain, the developing market in the UK to deliver solar PV projects at all scales and the ongoing developments in global supply and demand.

In developing the future cost projections shown in Appendix B, PB has gathered data from DECC (including consultation responses), a range of UK suppliers and installers, private and public bodies and supplemented this with industry reports and market intelligence on developments in the wider solar industry.

Note that our assessment of future costs has not included quantitative analysis of demand for PV in the UK or elsewhere, supply chain capacity or future technology development. We have, however, used insights drawn from our evidence gathering on possible trends in these factors to develop the future cost values.

- Module prices appear unlikely to continue to reduce at the same rate as in 2010 and 2011. This is supported by news of some module manufacturers being unable to operate at the lowest cost levels and filing for bankruptcy[4]. Reductions in capacity as a result of plant closures would tend to stabilise prices, although it appears likely that overall global module capacity will remain sufficient to maintain downward pressure on prices.

- As a result of the significant reductions over the past two years, module price is no longer the only key price driver for total installed costs. Therefore, further reductions in module price are likely to have a less significant impact on the total installed cost than has been witnessed previously. Other costs (inverters, fixings and other components, labour, scaffolding, transport and other overheads etc.) are less volatile than module costs, and form an increasing proportion of total cost.

- There is potential for cost reduction on inverters as an increasing supply of lower cost inverters enters the market from countries such as Malaysia and China.

- Other costs (balance of system components, installation etc.) appear likely to see gradual reductions over time as the market and installation techniques develop, however these may be mitigated to some extent by increases in labour or raw material costs.

- Short term price volatility may continue given current market uncertainties (e.g. as a result of increased installation rates ahead of tariff level changes).

- Although there has been some recent volatility, global silicon prices appear to have stabilised. With anticipated supply being greater than demand,

[4] http://uk.reuters.com/article/2012/04/02/qcellsse-insolvency-idUKL6E8F261R20120402 http://af.reuters.com/article/commoditiesNews/idAFL5E8EG0O820120316 http://www.rechargenews.com/business_area/finance/article310008.ece accessed 03/04/2012

however, the price of silicon is expected to fall in future, albeit at a gradual pace. This would tend to keep downward pressure on module prices (or at least allow more capacity to be kept on-stream at current prices).

- Changes to support regimes may reduce demand in Europe, however this may be balanced by increasing demand elsewhere – for example in countries introducing new FiT schemes, or with high levels of solar resource (where recent costs reductions mean PV is increasingly competitive with other forms of generation). The introduction of a FiT scheme in China in 2011 has increased demand there and may reduce the availability of lower cost modules for export.

- There is potential for a reduction in supply chain capacity in the UK as firms are unable to secure previous margins and so leave the market. This would tend to stabilise prices.

Overall, our view of the impact of the above factors is that a degree of downward pressure on PV system prices is likely to remain, albeit less than has been the case over the past 2 years, and that this will lead to more gradual price reductions in future. This is on the basis that the capacity of the supply chain overall will remain sufficient to meet demand and this will continue to drive competition and ongoing price reduction.

Although our expectation is that prices will fall in 2012, as indicated in our "medium reduction" scenario below, there is a possibility that prices may remain level during this period (as shown in our "slow reduction" scenario below) if short term demand is strong, before resuming a downward path in 2013.

4.1.2 Future cost projections

For costs in 2012 and 2013, we have developed our projections based on an assessment of market views and the supply and demand factors described above.

A learning rate formula has been applied in the longer term (from the beginning of 2014 until 2030).

Learning rates are determined by plotting historical data of installed capacity against cost. The learning rate is defined as the percentage cost reduction witnessed with every doubling of capacity and represents cost reductions due to technology development, improved manufacturing techniques, supply chain capability and so on. The learning rate can then be used to predict what future cost reductions may occur with future increases in installed capacity.

Historically, the learning rate associated with crystalline silicon modules has generally been in the region of 20%[5]. Learning rates on a PV system level, however are typically considered to be lower than for modules this owing to the reduced learning rate associated with other elements of the cost. The IEA[6][7] uses a learning rate for PV systems of 17-18%, this rate is based upon cumulative PV sales and cost data from

[5] "The learning potential of photovoltaics: implications for energy policy" 2004 van der Zwaan et al (data from the period 1976-1996)
[6] "Experience Curves for Energy Technology Policy" IEA 2000 page 11 "Technology Roadmap Solar Photovoltaic Energy" IEA 2010 page 18
[7] World Energy Outlook 2011, IEA, 2011, http://www.worldenergyoutlook.org/investments.asp

1976-1992. Other recent research[8] suggests a learning rate of 14% using data from 2001-2010 based on installed capacity rather than sales. A learning rate of 14% (i.e. a cost reduction of 14% with every doubling of installed capacity) has been adopted in this update, based on this more recent research which includes more up-to-date data which is more representative of the current solar PV market globally and can be directly applied to available installed capacity forecasts. A high, medium and low forecast[9] of installed global capacity has been applied to the UK to determine potential installed capacity to 2030 and hence potential learning-based cost reductions to 2030. For the fixed costs associated with <4kW systems we have used a DECC forecast for UK capacity, as these costs will be related more to UK factors than to global learning.

Learning rates as discussed above are typically used to predict future costs of components rather than installed systems. Within the scope and timescale of this report, it was not possible to source detailed data for learning rates on the installation element of total PV system costs. We consider that the 14% rate is suitable for use for installed PV systems as a whole on the basis that (a) the majority of the cost for larger systems is related to components (see Section 3.1.2 above) and (b) from discussions during the data gathering for this study, there is significant potential for learning and cost reduction in the installation of smaller systems. Should learning on installation not take place, the reduction in costs would be slower, i.e. would be likely to be closer to our slow cost reduction scenario than to the medium reduction scenario.

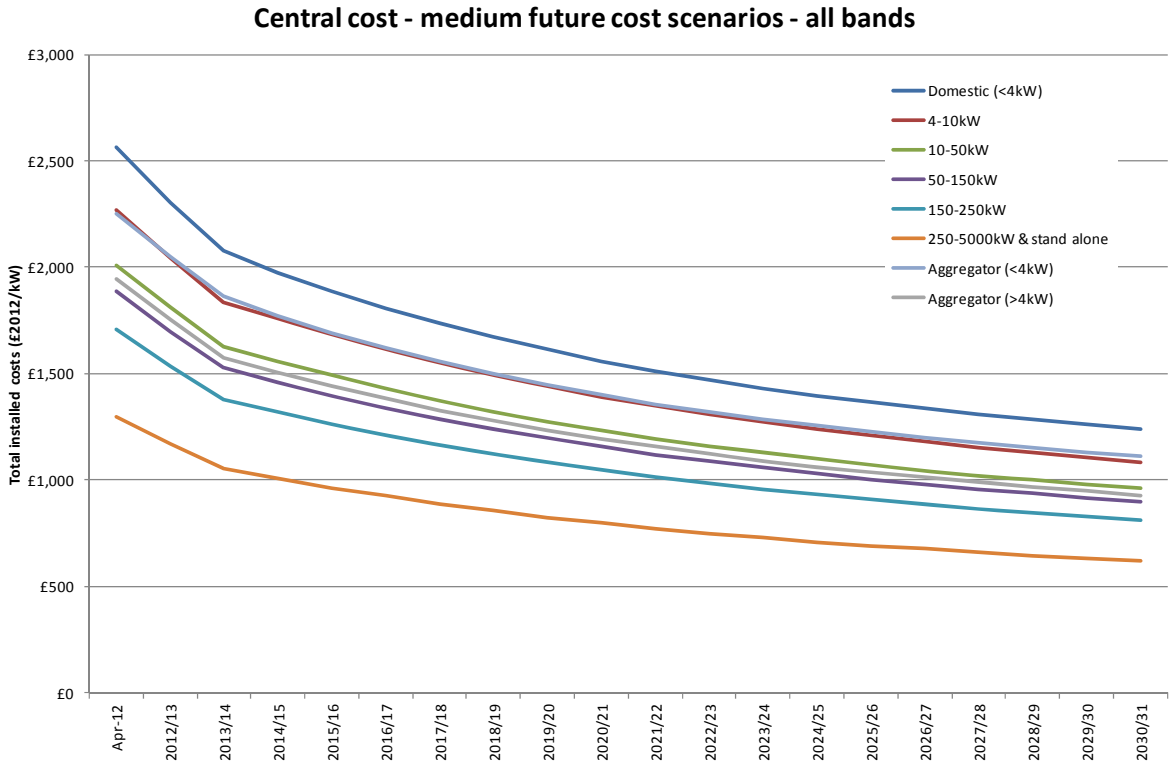
Note that the learning rates are based on real costs and so the future cost data provided is in real terms (i.e. in £ of 2012).

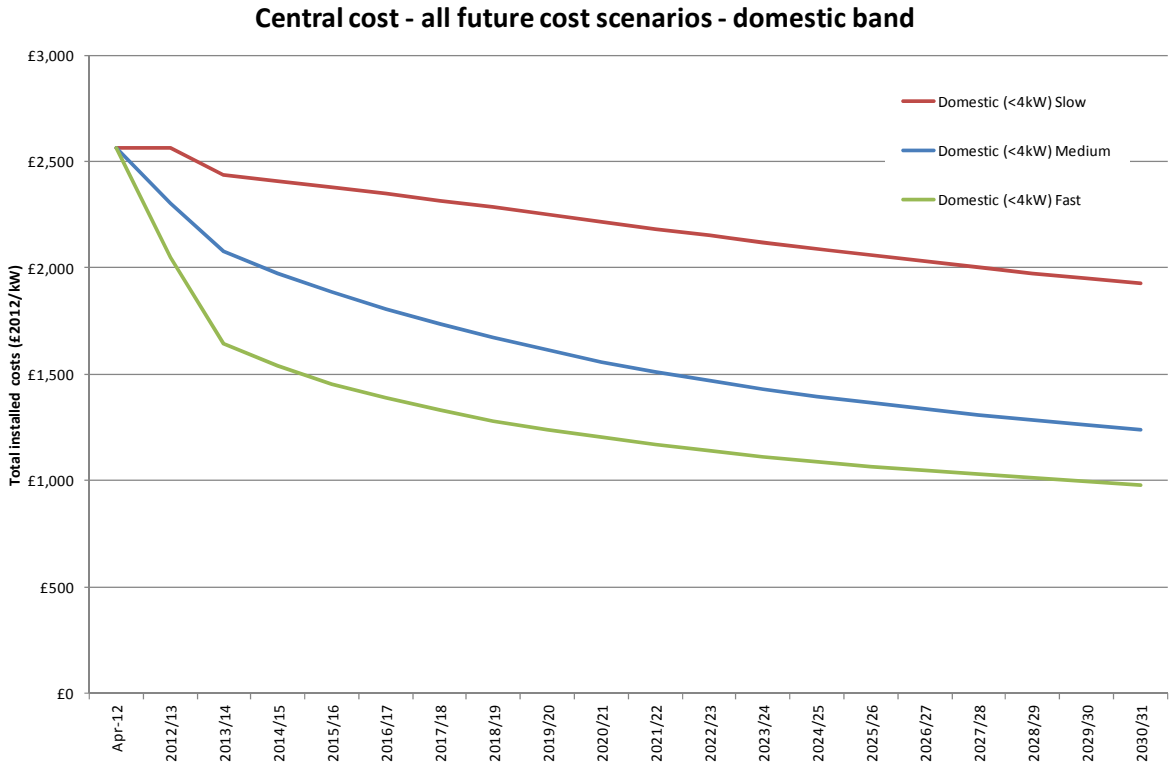
Three scenarios have been developed considering the potential for cost reductions in the future (slow, medium and fast cost reductions). These represent different capacity forecasts (i.e. with a slower rate of capacity installation, learning is slower and costs reduce more slowly). The three scenarios of cost reduction have been applied to the range of current costs to provide what we consider to be a reasonable range of possible future costs.

The resulting potential future cost data from this methodology is shown in the tables in Appendix B. The range of potential reductions is 0 – 20% between April 2012 and March 2013, with a medium case of 10%. Further falls of 5 – 20% in the year to March 2014 are projected, again with a medium case of 10%, with smaller ongoing reductions thereafter.

The first graph below shows how costs are projected to change under the medium cost reduction scenario, starting from the current central case for each band. The second graph shows the range of possible future costs for the <4kW domestic band under the slow, medium and fast future scenarios, again starting from the central current cost.

[8] "PV Learning Curves: Past and future drivers of cost reduction" Kersten *et al.* 2011
[9] Derived from global PV capacity forecasts in "Solar Generation 6: Solar photovoltaic electricity empowering the world", EPIA/Greenpeace 2011; and "Global Market Outlook – 7th Market Workshop", EPIA, March 2012


Central cost - medium future cost scenarios - all bands
Total installed costs (£2012/kW)
£3,000
£2,500
£2,000
£1,500
£1,000
£500
£0
Apr-12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18
2018/19
2019/20
2020/21
2021/22
2022/23
2023/24
2024/25
2025/26
2026/27
2027/28
2028/29
2029/30
2030/31
Domestic (<4kW)
4-10kW
10-50kW
50-150kW
150-250kW
250-5000kW & stand alone
Aggregator (<4kW)
Aggregator (>4kW)


Central cost - all future cost scenarios - domestic band
Total installed costs (£2012/kW)
£3,000
£2,500
£2,000
£1,500
£1,000
£500
£0
Apr-12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18
2018/19
2019/20
2020/21
2021/22
2022/23
2023/24
2024/25
2025/26
2026/27
2027/28
2028/29
2029/30
2030/31
Domestic (<4kW) Slow
Domestic (<4kW) Medium
Domestic (<4kW) Fast

4.2 Opex

Future estimates of opex changes remain unchanged from PB's January update report. These include inverter replacement as a major element of operating cost, and take account of future inverter costs.

These opex projections have been applied to the current low, central and high opex costs in the same way as for the capex costs as described above.

5 COMMENTS

5.1 Changes since January 2012 report

This section provides comments on how data and methodology have changed in this update compared to our January 2012 report.

The table below shows the central case capex values from this report compared to the equivalent values from January.

Size band	Central capex value (£/kW)		% change
	January 2012	April 2012	
<4kW	3167	2564	-19
4-10kW	2464	2269	-8
10-50kW	2260	2011	-11
50-150kW	1648	1885	14
150-250kW	1300	1705	31
250-5000kW	1200	1300	8
Stand alone	1200	1300	8
Aggregators <4kW	2060	2249	9
Aggregators >4kW	1650	1946	18

For smaller installations, costs are lower than our January report for installations below 50kW. We believe this to be a result of a combination of a larger data set being available for this update and of actual cost reductions that have taken place in this part of the market since January. For installations larger than 50kW, costs are higher than in our January report. This is as a result of the more detailed data available for this update and is in line with anecdotal industry comments on our January 2012 data. More detailed information on aggregators has resulted in an increase in the cost data for this type of installation, with costs now closer to those for individual installations of the same scale. Again, this is in line with consultation comments and anecdotal evidence from industry.

Opex costs are slightly higher than in our January 2012 update for the larger bands, based on more detailed data being available.

Short term future capex costs (up to March 2014) estimated in PB's January report have been altered in this update following consideration of information provided as described in Section 4 above. It is anticipated that capex will continue to decrease in the future but at a slower rate than previously forecast, with the possibility of flat costs

during 2012 in our slow cost reduction scenario. This is in line with general industry comments and DECC's consultation responses.

A long term learning rate based approach has been applied to the forecast of total installed costs from the April 2014 onwards. Cost reductions have been applied to the current cost estimate ranges to give three future cost ranges. This differs from our January 2012 update report (where fast reductions were applied to low current costs and slow reductions to high current costs, resulting in a single, wide range of future costs).

5.2 Uncertainty in current and future costs

While we consider that we have gathered a reasonable data set on current costs, it should be noted that this has taken place at a time when the PV market is in an unstable state, with changes in both demand and supply factors making it difficult to establish clear and consistent market prices. This is likely to have added a degree of uncertainty to the data.

Given the uncertainties relating to each of the cost drivers described in Section 4.1.1, any prediction of future costs must be approached with caution. We have used a learning rate approach for the longer term future trend, however there is no guarantee that the past trends on which this rate is based will apply in the future, or whether major technology breakthroughs will cause a step-change in the learning rate curve. Indeed, we chose not to use learning rates for the short term future costs due to the current unstable state of the PV market, and there is no certainty on when stability will in fact return. In addition, the inherent uncertainty of any prediction increases the further into the future one attempts to predict. For these reasons, the future costs in this report should be used with caution.

Appendix A – Data sources

- DECC – responses to consultation "Comprehensive Review Phase 2A: Consultation on Solar PV Cost Control" February 2012
- Other market data and intelligence provided by DECC
- Recent PB experience of large scale PV projects
- Discussions with PV installation companies and developers
- Discussions with PV supply chain participants
- Discussions with PV aggregator companies
- Discussions with housing associations and local authorities involved in PV projects
- News articles on the NPD Solarbuzz Marketbuzz report: (http://www.pv-magazine.com/news/details/beitrag/module-prices-to-drop-29-percent-in-2012_100006178/#axzz1qJNI1Tr4) http://www.pv-magazine.com/news/details/beitrag/a-strong-early-pv-demand-in-2012_100006337/#axzz1runuDW1x
- Discussions with Ray Noble (Renewable Energy Association)
- Discussions with British Photovoltaic Association (BPVA)
- "PV Learning Curves: Past and future drivers of cost reduction" Kersten et al. 2011
- "Solar Generation 6: Solar photovoltaic electricity empowering the world", EPIA/Greenpeace 2011
- "Global Market Outlook – 7th Market Workshop", EPIA, March 2012
- "The learning potential of photovoltaics: implications for energy policy" 2004, van der Zwaan et al
- "Experience Curves for Energy Technology Policy" IEA 2000
- "Technology Roadmap Solar Photovoltaic Energy" IEA 2010
- World Energy Outlook 2011, IEA, 2011, http://www.worldenergyoutlook.org/investments.asp
- News articles on module manufacturers: http://uk.reuters.com/article/2012/04/02/qcellsse-insolvency-idUKL6E8F261R20120402 http://af.reuters.com/article/commoditiesNews/idAFL5E8EG0O820120316 http://www.rechargenews.com/business_area/finance/article310008.ece

Appendix B – Updated cost tables

Notes on all tables:

- Costs are in £ of 2012
- Units for fixed costs are £ per installation, units for marginal costs are £ per kW installed capacity.
- Years are financial years beginning 1 April/ending 31 March. Data in column 'Apr-12' is as of 1 April 2012.

Capex

Note that for the <4kW size bands (both individual and aggregated), we have divided costs between a fixed cost per installation and a marginal cost related to the capacity, on the basis that for systems of this size there will be some costs that are independent of scale. On the basis of cost breakdown data received, we have assumed these fixed costs to be 20% of the total installed cost and used this to derive the fixed and marginal elements. For individual <4kW installations, this results in a central case fixed cost of £1,333 per system.
For larger size bands, costs will be more directly related to system size and it was not considered necessary to split costs into fixed and marginal components.

Table B1: Central cost estimate, medium cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (<4kW)	Fixed	£1,333	£1,266	£1,203	£1,122	£1,062	£1,014	£973	£938	£907	£878	£855	£835	£819	£805	£793	£781	£771	£762	£754	£746
Retrofit domestic (<4kW)	Fixed	£1,333	£1,266	£1,203	£1,122	£1,062	£1,014	£973	£938	£907	£878	£855	£835	£819	£805	£793	£781	£771	£762	£754	£746
Aggregators<4kW	Fixed	£1,169	£1,111	£1,055	£984	£932	£889	£854	£823	£795	£770	£750	£733	£719	£706	£695	£686	£677	£669	£662	£655
New build domestic (<4kW)	Marginal	£2,051	£1,819	£1,614	£1,543	£1,477	£1,416	£1,360	£1,310	£1,264	£1,222	£1,184	£1,149	£1,117	£1,088	£1,061	£1,036	£1,012	£990	£970	£951
Retrofit domestic (<4kW)	Marginal	£2,051	£1,819	£1,614	£1,543	£1,477	£1,416	£1,360	£1,310	£1,264	£1,222	£1,184	£1,149	£1,117	£1,088	£1,061	£1,036	£1,012	£990	£970	£951
New build 4–10kW	Marginal	£2,269	£2,042	£1,838	£1,758	£1,683	£1,613	£1,550	£1,492	£1,440	£1,392	£1,349	£1,309	£1,273	£1,239	£1,208	£1,180	£1,153	£1,128	£1,105	£1,083
Retrofit 4–10kW	Marginal	£2,269	£2,042	£1,838	£1,758	£1,683	£1,613	£1,550	£1,492	£1,440	£1,392	£1,349	£1,309	£1,273	£1,239	£1,208	£1,180	£1,153	£1,128	£1,105	£1,083
New build 10–50kW	Marginal	£2,011	£1,810	£1,629	£1,558	£1,491	£1,430	£1,373	£1,322	£1,276	£1,234	£1,195	£1,160	£1,128	£1,098	£1,071	£1,045	£1,022	£1,000	£979	£960
Retrofit 10–50kW	Marginal	£2,011	£1,810	£1,629	£1,558	£1,491	£1,430	£1,373	£1,322	£1,276	£1,234	£1,195	£1,160	£1,128	£1,098	£1,071	£1,045	£1,022	£1,000	£979	£960
New build 50–150kW	Marginal	£1,885	£1,697	£1,527	£1,460	£1,398	£1,340	£1,287	£1,239	£1,196	£1,156	£1,120	£1,088	£1,057	£1,029	£1,004	£980	£958	£937	£918	£900
Retrofit 50–150kW	Marginal	£1,885	£1,697	£1,527	£1,460	£1,398	£1,340	£1,287	£1,239	£1,196	£1,156	£1,120	£1,088	£1,057	£1,029	£1,004	£980	£958	£937	£918	£900
New build 150–250kW	Marginal	£1,705	£1,535	£1,381	£1,321	£1,264	£1,212	£1,164	£1,121	£1,082	£1,046	£1,013	£984	£956	£931	£908	£886	£866	£848	£830	£814
Retrofit 150–250kW	Marginal	£1,705	£1,535	£1,381	£1,321	£1,264	£1,212	£1,164	£1,121	£1,082	£1,046	£1,013	£984	£956	£931	£908	£886	£866	£848	£830	£814
New build 250–5000kW	Marginal	£1,300	£1,170	£1,053	£1,007	£964	£924	£888	£855	£825	£798	£773	£750	£729	£710	£692	£676	£661	£646	£633	£620
Retrofit 250–5000kW	Marginal	£1,300	£1,170	£1,053	£1,007	£964	£924	£888	£855	£825	£798	£773	£750	£729	£710	£692	£676	£661	£646	£633	£620
Stand alone system	Marginal	£1,300	£1,170	£1,053	£1,007	£964	£924	£888	£855	£825	£798	£773	£750	£729	£710	£692	£676	£661	£646	£633	£620
Aggregators<4kW	Marginal	£1,799	£1,619	£1,457	£1,394	£1,334	£1,279	£1,229	£1,183	£1,142	£1,104	£1,069	£1,038	£1,009	£983	£958	£935	£914	£894	£876	£859
Aggregators>4kW	Marginal	£1,946	£1,751	£1,576	£1,508	£1,443	£1,383	£1,329	£1,280	£1,235	£1,194	£1,157	£1,123	£1,092	£1,063	£1,036	£1,012	£989	£967	£947	£929

* Note that for aggregators <4 kW, there is both a marginal cost element and a fixed cost element. For a 2.6 kW aggregated system, current total installed cost would therefore = £1169 + (2.6 x £1799) = £5,847. This is equivalent to £2,249/kW and it is this value that should be compared against the £1,946 cost for >4kW aggregated systems.

Table B2: Central cost estimate, slow cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (<4kW)	Fixed	£1,333	£1,333	£1,300	£1,298	£1,297	£1,297	£1,297	£1,296	£1,296	£1,292	£1,289	£1,286	£1,282	£1,279	£1,276	£1,273	£1,270	£1,267	£1,264	£1,261
Retrofit domestic (<4kW)	Fixed	£1,333	£1,333	£1,300	£1,298	£1,297	£1,297	£1,297	£1,296	£1,296	£1,292	£1,289	£1,286	£1,282	£1,279	£1,276	£1,273	£1,270	£1,267	£1,264	£1,261
Aggregators<4kW	Fixed	£1,169	£1,169	£1,140	£1,139	£1,138	£1,138	£1,138	£1,137	£1,137	£1,134	£1,131	£1,128	£1,125	£1,122	£1,119	£1,117	£1,114	£1,111	£1,109	£1,106
New build domestic (<4kW)	Marginal	£2,051	£2,051	£1,936	£1,910	£1,881	£1,851	£1,818	£1,786	£1,753	£1,720	£1,688	£1,657	£1,626	£1,597	£1,568	£1,541	£1,514	£1,489	£1,465	£1,442
Retrofit domestic (<4kW)	Marginal	£2,051	£2,051	£1,936	£1,910	£1,881	£1,851	£1,818	£1,786	£1,753	£1,720	£1,688	£1,657	£1,626	£1,597	£1,568	£1,541	£1,514	£1,489	£1,465	£1,442
New build 4–10kW	Marginal	£2,269	£2,269	£2,156	£2,127	£2,095	£2,060	£2,025	£1,988	£1,952	£1,915	£1,880	£1,845	£1,811	£1,778	£1,746	£1,716	£1,686	£1,658	£1,631	£1,605
Retrofit 4–10kW	Marginal	£2,269	£2,269	£2,156	£2,127	£2,095	£2,060	£2,025	£1,988	£1,952	£1,915	£1,880	£1,845	£1,811	£1,778	£1,746	£1,716	£1,686	£1,658	£1,631	£1,605
New build 10–50kW	Marginal	£2,011	£2,011	£1,910	£1,885	£1,857	£1,826	£1,795	£1,762	£1,730	£1,698	£1,666	£1,635	£1,605	£1,576	£1,548	£1,521	£1,495	£1,470	£1,446	£1,423
Retrofit 10–50kW	Marginal	£2,011	£2,011	£1,910	£1,885	£1,857	£1,826	£1,795	£1,762	£1,730	£1,698	£1,666	£1,635	£1,605	£1,576	£1,548	£1,521	£1,495	£1,470	£1,446	£1,423
New build 50–150kW	Marginal	£1,885	£1,885	£1,791	£1,767	£1,740	£1,712	£1,682	£1,652	£1,621	£1,591	£1,561	£1,532	£1,504	£1,477	£1,451	£1,425	£1,401	£1,377	£1,355	£1,333
Retrofit 50–150kW	Marginal	£1,885	£1,885	£1,791	£1,767	£1,740	£1,712	£1,682	£1,652	£1,621	£1,591	£1,561	£1,532	£1,504	£1,477	£1,451	£1,425	£1,401	£1,377	£1,355	£1,333
New build 150–250kW	Marginal	£1,705	£1,705	£1,620	£1,598	£1,574	£1,548	£1,521	£1,494	£1,467	£1,439	£1,412	£1,386	£1,361	£1,336	£1,312	£1,289	£1,267	£1,246	£1,226	£1,206
Retrofit 150–250kW	Marginal	£1,705	£1,705	£1,620	£1,598	£1,574	£1,548	£1,521	£1,494	£1,467	£1,439	£1,412	£1,386	£1,361	£1,336	£1,312	£1,289	£1,267	£1,246	£1,226	£1,206
New build 250–5000kW	Marginal	£1,300	£1,300	£1,235	£1,219	£1,200	£1,181	£1,160	£1,139	£1,118	£1,097	£1,077	£1,057	£1,037	£1,019	£1,000	£983	£966	£950	£934	£920
Retrofit 250–5000kW	Marginal	£1,300	£1,300	£1,235	£1,219	£1,200	£1,181	£1,160	£1,139	£1,118	£1,097	£1,077	£1,057	£1,037	£1,019	£1,000	£983	£966	£950	£934	£920
Stand alone system	Marginal	£1,300	£1,300	£1,235	£1,219	£1,200	£1,181	£1,160	£1,139	£1,118	£1,097	£1,077	£1,057	£1,037	£1,019	£1,000	£983	£966	£950	£934	£920
Aggregators<4kW	Marginal	£1,799	£1,799	£1,709	£1,686	£1,661	£1,634	£1,606	£1,577	£1,548	£1,519	£1,490	£1,463	£1,436	£1,410	£1,385	£1,360	£1,337	£1,315	£1,293	£1,273
Aggregators>4kW	Marginal	£1,946	£1,946	£1,849	£1,824	£1,797	£1,767	£1,736	£1,705	£1,674	£1,643	£1,612	£1,582	£1,553	£1,525	£1,498	£1,471	£1,446	£1,422	£1,399	£1,377

Table B3: Central cost estimate, fast cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (<4kW)	Fixed	£1,333	£1,200	£1,080	£997	£939	£893	£855	£823	£794	£768	£747	£730	£716	£703	£692	£683	£674	£666	£658	£652
Retrofit domestic (<4kW)	Fixed	£1,333	£1,200	£1,080	£997	£939	£893	£855	£823	£794	£768	£747	£730	£716	£703	£692	£683	£674	£666	£658	£652
Aggregators<4kW	Fixed	£1,169	£1,053	£947	£875	£824	£784	£750	£722	£696	£674	£656	£641	£628	£617	£607	£599	£591	£584	£578	£572
New build domestic (<4kW)	Marginal	£2,051	£1,589	£1,232	£1,154	£1,093	£1,044	£1,002	£966	£935	£907	£882	£859	£838	£819	£801	£785	£770	£756	£742	£730
Retrofit domestic (<4kW)	Marginal	£2,051	£1,589	£1,232	£1,154	£1,093	£1,044	£1,002	£966	£935	£907	£882	£859	£838	£819	£801	£785	£770	£756	£742	£730
New build 4–10kW	Marginal	£2,269	£1,815	£1,452	£1,360	£1,289	£1,230	£1,181	£1,139	£1,102	£1,069	£1,039	£1,013	£988	£966	£945	£926	£908	£891	£875	£860
Retrofit 4–10kW	Marginal	£2,269	£1,815	£1,452	£1,360	£1,289	£1,230	£1,181	£1,139	£1,102	£1,069	£1,039	£1,013	£988	£966	£945	£926	£908	£891	£875	£860
New build 10–50kW	Marginal	£2,011	£1,609	£1,287	£1,206	£1,142	£1,090	£1,047	£1,009	£977	£947	£921	£897	£876	£856	£837	£820	£804	£790	£776	£763
Retrofit 10–50kW	Marginal	£2,011	£1,609	£1,287	£1,206	£1,142	£1,090	£1,047	£1,009	£977	£947	£921	£897	£876	£856	£837	£820	£804	£790	£776	£763
New build 50–150kW	Marginal	£1,885	£1,508	£1,206	£1,130	£1,071	£1,022	£981	£946	£915	£888	£863	£841	£821	£802	£785	£769	£754	£740	£727	£715
Retrofit 50–150kW	Marginal	£1,885	£1,508	£1,206	£1,130	£1,071	£1,022	£981	£946	£915	£888	£863	£841	£821	£802	£785	£769	£754	£740	£727	£715
New build 150–250kW	Marginal	£1,705	£1,364	£1,091	£1,022	£968	£925	£888	£856	£828	£803	£781	£761	£742	£726	£710	£696	£682	£669	£658	£647
Retrofit 150–250kW	Marginal	£1,705	£1,364	£1,091	£1,022	£968	£925	£888	£856	£828	£803	£781	£761	£742	£726	£710	£696	£682	£669	£658	£647
New build 250–5000kW	Marginal	£1,300	£1,040	£832	£779	£738	£705	£677	£653	£631	£612	£595	£580	£566	£553	£541	£530	£520	£510	£501	£493
Retrofit 250–5000kW	Marginal	£1,300	£1,040	£832	£779	£738	£705	£677	£653	£631	£612	£595	£580	£566	£553	£541	£530	£520	£510	£501	£493
Stand alone system	Marginal	£1,300	£1,040	£832	£779	£738	£705	£677	£653	£631	£612	£595	£580	£566	£553	£541	£530	£520	£510	£501	£493
Aggregators<4kW	Marginal	£1,799	£1,439	£1,151	£1,079	£1,022	£976	£937	£903	£874	£848	£824	£803	£784	£766	£749	£734	£720	£706	£694	£682
Aggregators>4kW	Marginal	£1,946	£1,557	£1,245	£1,167	£1,105	£1,055	£1,013	£977	£945	£917	£891	£868	£847	£828	£810	£794	£778	£764	£751	£738

Table B4: Low cost estimate, medium cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (<4kW)	Fixed	£1,168	£1,110	£1,054	£984	£931	£888	£853	£822	£795	£769	£749	£732	£718	£706	£695	£685	£676	£668	£661	£654
Retrofit domestic (<4kW)	Fixed	£1,168	£1,110	£1,054	£984	£931	£888	£853	£822	£795	£769	£749	£732	£718	£706	£695	£685	£676	£668	£661	£654
Aggregators<4kW	Fixed	£1,028	£977	£928	£866	£819	£782	£751	£724	£699	£677	£659	£644	£632	£621	£611	£603	£595	£588	£582	£576
New build domestic (<4kW)	Marginal	£1,797	£1,594	£1,414	£1,353	£1,295	£1,241	£1,192	£1,148	£1,108	£1,071	£1,038	£1,007	£979	£953	£930	£908	£887	£868	£850	£833
Retrofit domestic (<4kW)	Marginal	£1,797	£1,594	£1,414	£1,353	£1,295	£1,241	£1,192	£1,148	£1,108	£1,071	£1,038	£1,007	£979	£953	£930	£908	£887	£868	£850	£833
New build 4–10kW	Marginal	£2,139	£1,925	£1,732	£1,657	£1,586	£1,520	£1,461	£1,406	£1,357	£1,312	£1,271	£1,234	£1,200	£1,168	£1,139	£1,112	£1,087	£1,063	£1,041	£1,021
Retrofit 4–10kW	Marginal	£2,139	£1,925	£1,732	£1,657	£1,586	£1,520	£1,461	£1,406	£1,357	£1,312	£1,271	£1,234	£1,200	£1,168	£1,139	£1,112	£1,087	£1,063	£1,041	£1,021
New build 10–50kW	Marginal	£1,856	£1,670	£1,503	£1,438	£1,376	£1,319	£1,267	£1,220	£1,177	£1,138	£1,103	£1,071	£1,041	£1,013	£988	£965	£943	£922	£903	£885
Retrofit 10–50kW	Marginal	£1,856	£1,670	£1,503	£1,438	£1,376	£1,319	£1,267	£1,220	£1,177	£1,138	£1,103	£1,071	£1,041	£1,013	£988	£965	£943	£922	£903	£885
New build 50–150kW	Marginal	£1,801	£1,621	£1,459	£1,395	£1,335	£1,280	£1,230	£1,184	£1,143	£1,105	£1,070	£1,039	£1,010	£983	£959	£936	£915	£895	£877	£859
Retrofit 50–150kW	Marginal	£1,801	£1,621	£1,459	£1,395	£1,335	£1,280	£1,230	£1,184	£1,143	£1,105	£1,070	£1,039	£1,010	£983	£959	£936	£915	£895	£877	£859
New build 150–250kW	Marginal	£1,600	£1,440	£1,296	£1,240	£1,186	£1,137	£1,093	£1,052	£1,015	£982	£951	£923	£897	£874	£852	£832	£813	£795	£779	£764
Retrofit 150–250kW	Marginal	£1,600	£1,440	£1,296	£1,240	£1,186	£1,137	£1,093	£1,052	£1,015	£982	£951	£923	£897	£874	£852	£832	£813	£795	£779	£764
New build 250–5000kW	Marginal	£1,218	£1,096	£987	£944	£903	£866	£832	£801	£773	£747	£724	£703	£683	£665	£649	£633	£619	£605	£593	£581
Retrofit 250–5000kW	Marginal	£1,218	£1,096	£987	£944	£903	£866	£832	£801	£773	£747	£724	£703	£683	£665	£649	£633	£619	£605	£593	£581
Stand alone system	Marginal	£1,218	£1,096	£987	£944	£903	£866	£832	£801	£773	£747	£724	£703	£683	£665	£649	£633	£619	£605	£593	£581
Aggregators<4kW	Marginal	£1,582	£1,424	£1,281	£1,226	£1,173	£1,125	£1,080	£1,040	£1,004	£971	£940	£913	£887	£864	£842	£822	£804	£786	£770	£755
Aggregators>4kW	Marginal	£1,781	£1,602	£1,442	£1,380	£1,320	£1,266	£1,216	£1,171	£1,130	£1,092	£1,058	£1,027	£999	£972	£948	£926	£905	£885	£867	£850

Table B5: Low cost estimate, slow cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (<4kW)	Fixed	£1,168	£1,139	£1,111	£1,109	£1,109	£1,108	£1,108	£1,108	£1,107	£1,104	£1,102	£1,099	£1,096	£1,093	£1,090	£1,088	£1,085	£1,083	£1,080	£1,078
Retrofit domestic (<4kW)	Fixed	£1,168	£1,139	£1,111	£1,109	£1,109	£1,108	£1,108	£1,108	£1,107	£1,104	£1,102	£1,099	£1,096	£1,093	£1,090	£1,088	£1,085	£1,083	£1,080	£1,078
Aggregators<4kW	Fixed	£1,028	£1,003	£978	£976	£976	£975	£975	£975	£975	£972	£969	£967	£965	£962	£960	£957	£955	£953	£951	£949
New build domestic (<4kW)	Marginal	£1,797	£1,697	£1,602	£1,580	£1,557	£1,531	£1,505	£1,477	£1,450	£1,423	£1,397	£1,371	£1,345	£1,321	£1,298	£1,275	£1,253	£1,232	£1,212	£1,193
Retrofit domestic (<4kW)	Marginal	£1,797	£1,697	£1,602	£1,580	£1,557	£1,531	£1,505	£1,477	£1,450	£1,423	£1,397	£1,371	£1,345	£1,321	£1,298	£1,275	£1,253	£1,232	£1,212	£1,193
New build 4–10kW	Marginal	£2,139	£2,032	£1,930	£1,904	£1,876	£1,845	£1,813	£1,780	£1,748	£1,715	£1,683	£1,652	£1,621	£1,592	£1,564	£1,536	£1,510	£1,485	£1,461	£1,437
Retrofit 4–10kW	Marginal	£2,139	£2,032	£1,930	£1,904	£1,876	£1,845	£1,813	£1,780	£1,748	£1,715	£1,683	£1,652	£1,621	£1,592	£1,564	£1,536	£1,510	£1,485	£1,461	£1,437
New build 10–50kW	Marginal	£1,856	£1,763	£1,675	£1,652	£1,627	£1,601	£1,573	£1,545	£1,516	£1,488	£1,460	£1,433	£1,407	£1,381	£1,357	£1,333	£1,310	£1,288	£1,267	£1,247
Retrofit 10–50kW	Marginal	£1,856	£1,763	£1,675	£1,652	£1,627	£1,601	£1,573	£1,545	£1,516	£1,488	£1,460	£1,433	£1,407	£1,381	£1,357	£1,333	£1,310	£1,288	£1,267	£1,247
New build 50–150kW	Marginal	£1,801	£1,711	£1,625	£1,603	£1,579	£1,553	£1,527	£1,499	£1,471	£1,444	£1,417	£1,391	£1,365	£1,340	£1,317	£1,293	£1,271	£1,250	£1,230	£1,210
Retrofit 50–150kW	Marginal	£1,801	£1,711	£1,625	£1,603	£1,579	£1,553	£1,527	£1,499	£1,471	£1,444	£1,417	£1,391	£1,365	£1,340	£1,317	£1,293	£1,271	£1,250	£1,230	£1,210
New build 150–250kW	Marginal	£1,600	£1,520	£1,444	£1,425	£1,403	£1,380	£1,356	£1,332	£1,307	£1,283	£1,259	£1,236	£1,213	£1,191	£1,170	£1,149	£1,130	£1,111	£1,093	£1,075
Retrofit 150–250kW	Marginal	£1,600	£1,520	£1,444	£1,425	£1,403	£1,380	£1,356	£1,332	£1,307	£1,283	£1,259	£1,236	£1,213	£1,191	£1,170	£1,149	£1,130	£1,111	£1,093	£1,075
New build 250–5000kW	Marginal	£1,218	£1,157	£1,099	£1,085	£1,068	£1,051	£1,033	£1,014	£995	£977	£958	£941	£923	£907	£890	£875	£860	£846	£832	£819
Retrofit 250–5000kW	Marginal	£1,218	£1,157	£1,099	£1,085	£1,068	£1,051	£1,033	£1,014	£995	£977	£958	£941	£923	£907	£890	£875	£860	£846	£832	£819
Stand alone system	Marginal	£1,218	£1,157	£1,099	£1,085	£1,068	£1,051	£1,033	£1,014	£995	£977	£958	£941	£923	£907	£890	£875	£860	£846	£832	£819
Aggregators<4kW	Marginal	£1,582	£1,503	£1,428	£1,409	£1,387	£1,365	£1,341	£1,317	£1,293	£1,269	£1,245	£1,222	£1,199	£1,178	£1,157	£1,136	£1,117	£1,098	£1,080	£1,063
Aggregators>4kW	Marginal	£1,781	£1,691	£1,607	£1,585	£1,562	£1,536	£1,509	£1,482	£1,455	£1,428	£1,401	£1,375	£1,350	£1,325	£1,302	£1,279	£1,257	£1,236	£1,216	£1,197

Table B6: Low cost estimate, fast cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (<4kW)	Fixed	£1,168	£1,051	£946	£874	£823	£783	£750	£721	£696	£673	£655	£640	£627	£616	£607	£598	£591	£584	£577	£571
Retrofit domestic (<4kW)	Fixed	£1,168	£1,051	£946	£874	£823	£783	£750	£721	£696	£673	£655	£640	£627	£616	£607	£598	£591	£584	£577	£571
Aggregators<4kW	Fixed	£1,028	£925	£833	£769	£724	£689	£660	£634	£612	£592	£576	£563	£552	£543	£534	£527	£520	£514	£508	£503
New build domestic (<4kW)	Marginal	£1,797	£1,393	£1,080	£1,011	£958	£915	£878	£847	£819	£795	£773	£753	£735	£718	£702	£688	£675	£662	£651	£640
Retrofit domestic (<4kW)	Marginal	£1,797	£1,393	£1,080	£1,011	£958	£915	£878	£847	£819	£795	£773	£753	£735	£718	£702	£688	£675	£662	£651	£640
New build 4–10kW	Marginal	£2,139	£1,711	£1,369	£1,282	£1,215	£1,160	£1,113	£1,074	£1,039	£1,008	£980	£954	£931	£910	£891	£873	£856	£840	£825	£811
Retrofit 4–10kW	Marginal	£2,139	£1,711	£1,369	£1,282	£1,215	£1,160	£1,113	£1,074	£1,039	£1,008	£980	£954	£931	£910	£891	£873	£856	£840	£825	£811
New build 10–50kW	Marginal	£1,856	£1,484	£1,188	£1,112	£1,054	£1,006	£966	£931	£901	£874	£850	£828	£808	£790	£773	£757	£742	£729	£716	£704
Retrofit 10–50kW	Marginal	£1,856	£1,484	£1,188	£1,112	£1,054	£1,006	£966	£931	£901	£874	£850	£828	£808	£790	£773	£757	£742	£729	£716	£704
New build 50–150kW	Marginal	£1,801	£1,441	£1,152	£1,080	£1,023	£976	£937	£904	£874	£848	£825	£804	£784	£766	£750	£735	£720	£707	£695	£683
Retrofit 50–150kW	Marginal	£1,801	£1,441	£1,152	£1,080	£1,023	£976	£937	£904	£874	£848	£825	£804	£784	£766	£750	£735	£720	£707	£695	£683
New build 150–250kW	Marginal	£1,600	£1,280	£1,024	£959	£909	£868	£833	£803	£777	£754	£733	£714	£697	£681	£666	£653	£640	£628	£617	£607
Retrofit 150–250kW	Marginal	£1,600	£1,280	£1,024	£959	£909	£868	£833	£803	£777	£754	£733	£714	£697	£681	£666	£653	£640	£628	£617	£607
New build 250–5000kW	Marginal	£1,218	£974	£780	£730	£692	£660	£634	£611	£591	£574	£558	£544	£530	£518	£507	£497	£487	£478	£470	£462
Retrofit 250–5000kW	Marginal	£1,218	£974	£780	£730	£692	£660	£634	£611	£591	£574	£558	£544	£530	£518	£507	£497	£487	£478	£470	£462
Stand alone system	Marginal	£1,218	£974	£780	£730	£692	£660	£634	£611	£591	£574	£558	£544	£530	£518	£507	£497	£487	£478	£470	£462
Aggregators<4kW	Marginal	£1,582	£1,266	£1,012	£948	£899	£858	£824	£794	£768	£745	£725	£706	£689	£673	£659	£645	£633	£621	£610	£600
Aggregators>4kW	Marginal	£1,781	£1,424	£1,140	£1,067	£1,011	£965	£927	£894	£865	£839	£816	£795	£775	£758	£741	£726	£712	£699	£687	£675

Table B7: High cost estimate, medium cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (<4kW)	Fixed	£1,582	£1,503	£1,428	£1,332	£1,261	£1,203	£1,155	£1,114	£1,076	£1,042	£1,014	£992	£972	£956	£941	£928	£916	£905	£895	£886
Retrofit domestic (<4kW)	Fixed	£1,582	£1,503	£1,428	£1,332	£1,261	£1,203	£1,155	£1,114	£1,076	£1,042	£1,014	£992	£972	£956	£941	£928	£916	£905	£895	£886
Aggregators<4kW	Fixed	£1,198	£1,138	£1,081	£1,008	£954	£911	£875	£843	£815	£789	£768	£751	£736	£723	£712	£702	£693	£685	£678	£671
New build domestic (<4kW)	Marginal	£2,435	£2,159	£1,915	£1,832	£1,754	£1,681	£1,615	£1,555	£1,500	£1,451	£1,406	£1,364	£1,326	£1,292	£1,259	£1,229	£1,202	£1,176	£1,151	£1,128
Retrofit domestic (<4kW)	Marginal	£2,435	£2,159	£1,915	£1,832	£1,754	£1,681	£1,615	£1,555	£1,500	£1,451	£1,406	£1,364	£1,326	£1,292	£1,259	£1,229	£1,202	£1,176	£1,151	£1,128
New build 4–10kW	Marginal	£2,332	£2,098	£1,889	£1,806	£1,729	£1,657	£1,592	£1,533	£1,479	£1,430	£1,386	£1,345	£1,308	£1,273	£1,242	£1,212	£1,185	£1,159	£1,135	£1,113
Retrofit 4–10kW	Marginal	£2,332	£2,098	£1,889	£1,806	£1,729	£1,657	£1,592	£1,533	£1,479	£1,430	£1,386	£1,345	£1,308	£1,273	£1,242	£1,212	£1,185	£1,159	£1,135	£1,113
New build 10–50kW	Marginal	£2,268	£2,041	£1,837	£1,757	£1,682	£1,612	£1,549	£1,491	£1,439	£1,391	£1,348	£1,309	£1,272	£1,239	£1,208	£1,179	£1,152	£1,127	£1,104	£1,082
Retrofit 10–50kW	Marginal	£2,268	£2,041	£1,837	£1,757	£1,682	£1,612	£1,549	£1,491	£1,439	£1,391	£1,348	£1,309	£1,272	£1,239	£1,208	£1,179	£1,152	£1,127	£1,104	£1,082
New build 50–150kW	Marginal	£1,926	£1,733	£1,560	£1,492	£1,428	£1,369	£1,315	£1,266	£1,222	£1,181	£1,145	£1,111	£1,080	£1,052	£1,025	£1,001	£978	£957	£938	£919
Retrofit 50–150kW	Marginal	£1,926	£1,733	£1,560	£1,492	£1,428	£1,369	£1,315	£1,266	£1,222	£1,181	£1,145	£1,111	£1,080	£1,052	£1,025	£1,001	£978	£957	£938	£919
New build 150–250kW	Marginal	£1,929	£1,736	£1,563	£1,495	£1,431	£1,371	£1,318	£1,269	£1,224	£1,184	£1,147	£1,113	£1,082	£1,054	£1,027	£1,003	£980	£959	£939	£921
Retrofit 150–250kW	Marginal	£1,929	£1,736	£1,563	£1,495	£1,431	£1,371	£1,318	£1,269	£1,224	£1,184	£1,147	£1,113	£1,082	£1,054	£1,027	£1,003	£980	£959	£939	£921
New build 250–5000kW	Marginal	£1,450	£1,305	£1,175	£1,123	£1,075	£1,031	£990	£953	£920	£890	£862	£837	£813	£792	£772	£754	£737	£721	£706	£692
Retrofit 250–5000kW	Marginal	£1,450	£1,305	£1,175	£1,123	£1,075	£1,031	£990	£953	£920	£890	£862	£837	£813	£792	£772	£754	£737	£721	£706	£692
Stand alone system	Marginal	£1,450	£1,305	£1,175	£1,123	£1,075	£1,031	£990	£953	£920	£890	£862	£837	£813	£792	£772	£754	£737	£721	£706	£692
Aggregators<4kW	Marginal	£1,843	£1,659	£1,493	£1,428	£1,367	£1,310	£1,259	£1,212	£1,169	£1,131	£1,096	£1,063	£1,034	£1,007	£981	£958	£936	£916	£897	£879
Aggregators>4kW	Marginal	£2,151	£1,936	£1,742	£1,667	£1,595	£1,529	£1,469	£1,414	£1,365	£1,320	£1,279	£1,241	£1,207	£1,175	£1,145	£1,118	£1,093	£1,069	£1,047	£1,026

Table B8: High cost estimate, slow cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (<4kW)	Fixed	£1,582	£1,582	£1,543	£1,541	£1,540	£1,540	£1,539	£1,539	£1,538	£1,534	£1,530	£1,526	£1,522	£1,519	£1,515	£1,511	£1,508	£1,504	£1,501	£1,497
Retrofit domestic (<4kW)	Fixed	£1,582	£1,582	£1,543	£1,541	£1,540	£1,540	£1,539	£1,539	£1,538	£1,534	£1,530	£1,526	£1,522	£1,519	£1,515	£1,511	£1,508	£1,504	£1,501	£1,497
Aggregators<4kW	Fixed	£1,198	£1,198	£1,168	£1,167	£1,166	£1,166	£1,165	£1,165	£1,165	£1,161	£1,158	£1,155	£1,152	£1,150	£1,147	£1,144	£1,141	£1,139	£1,136	£1,133
New build domestic (<4kW)	Marginal	£2,435	£2,435	£2,298	£2,268	£2,233	£2,197	£2,159	£2,120	£2,081	£2,042	£2,004	£1,967	£1,931	£1,896	£1,862	£1,829	£1,798	£1,768	£1,739	£1,711
Retrofit domestic (<4kW)	Marginal	£2,435	£2,435	£2,298	£2,268	£2,233	£2,197	£2,159	£2,120	£2,081	£2,042	£2,004	£1,967	£1,931	£1,896	£1,862	£1,829	£1,798	£1,768	£1,739	£1,711
New build 4–10kW	Marginal	£2,332	£2,332	£2,215	£2,185	£2,152	£2,117	£2,080	£2,043	£2,005	£1,968	£1,931	£1,895	£1,861	£1,827	£1,794	£1,763	£1,733	£1,704	£1,676	£1,649
Retrofit 4–10kW	Marginal	£2,332	£2,332	£2,215	£2,185	£2,152	£2,117	£2,080	£2,043	£2,005	£1,968	£1,931	£1,895	£1,861	£1,827	£1,794	£1,763	£1,733	£1,704	£1,676	£1,649
New build 10–50kW	Marginal	£2,268	£2,268	£2,155	£2,126	£2,094	£2,060	£2,024	£1,987	£1,951	£1,914	£1,879	£1,844	£1,810	£1,777	£1,745	£1,715	£1,686	£1,657	£1,630	£1,604
Retrofit 10–50kW	Marginal	£2,268	£2,268	£2,155	£2,126	£2,094	£2,060	£2,024	£1,987	£1,951	£1,914	£1,879	£1,844	£1,810	£1,777	£1,745	£1,715	£1,686	£1,657	£1,630	£1,604
New build 50–150kW	Marginal	£1,926	£1,926	£1,829	£1,805	£1,778	£1,749	£1,718	£1,687	£1,656	£1,626	£1,595	£1,566	£1,537	£1,509	£1,482	£1,456	£1,431	£1,407	£1,384	£1,362
Retrofit 50–150kW	Marginal	£1,926	£1,926	£1,829	£1,805	£1,778	£1,749	£1,718	£1,687	£1,656	£1,626	£1,595	£1,566	£1,537	£1,509	£1,482	£1,456	£1,431	£1,407	£1,384	£1,362
New build 150–250kW	Marginal	£1,929	£1,929	£1,833	£1,808	£1,781	£1,752	£1,722	£1,691	£1,659	£1,628	£1,598	£1,568	£1,540	£1,512	£1,485	£1,459	£1,434	£1,410	£1,387	£1,365
Retrofit 150–250kW	Marginal	£1,929	£1,929	£1,833	£1,808	£1,781	£1,752	£1,722	£1,691	£1,659	£1,628	£1,598	£1,568	£1,540	£1,512	£1,485	£1,459	£1,434	£1,410	£1,387	£1,365
New build 250–5000kW	Marginal	£1,450	£1,450	£1,378	£1,359	£1,339	£1,317	£1,294	£1,271	£1,247	£1,224	£1,201	£1,179	£1,157	£1,136	£1,116	£1,096	£1,078	£1,060	£1,042	£1,026
Retrofit 250–5000kW	Marginal	£1,450	£1,450	£1,378	£1,359	£1,339	£1,317	£1,294	£1,271	£1,247	£1,224	£1,201	£1,179	£1,157	£1,136	£1,116	£1,096	£1,078	£1,060	£1,042	£1,026
Stand alone system	Marginal	£1,450	£1,450	£1,378	£1,359	£1,339	£1,317	£1,294	£1,271	£1,247	£1,224	£1,201	£1,179	£1,157	£1,136	£1,116	£1,096	£1,078	£1,060	£1,042	£1,026
Aggregators<4kW	Marginal	£1,843	£1,843	£1,751	£1,727	£1,701	£1,674	£1,645	£1,615	£1,585	£1,556	£1,527	£1,498	£1,471	£1,444	£1,418	£1,394	£1,370	£1,347	£1,325	£1,304
Aggregators>4kW	Marginal	£2,151	£2,151	£2,043	£2,016	£1,986	£1,953	£1,919	£1,885	£1,850	£1,816	£1,782	£1,749	£1,717	£1,685	£1,655	£1,626	£1,599	£1,572	£1,546	£1,522

Table B9: High cost estimate, fast cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (<4kW)	Fixed	£1,582	£1,424	£1,282	£1,184	£1,115	£1,060	£1,015	£976	£942	£911	£887	£867	£850	£835	£822	£810	£800	£790	£782	£774
Retrofit domestic (<4kW)	Fixed	£1,582	£1,424	£1,282	£1,184	£1,115	£1,060	£1,015	£976	£942	£911	£887	£867	£850	£835	£822	£810	£800	£790	£782	£774
Aggregators<4kW	Fixed	£1,198	£1,078	£970	£896	£844	£803	£769	£739	£713	£690	£672	£656	£643	£632	£622	£613	£606	£598	£592	£586
New build domestic (<4kW)	Marginal	£2,435	£1,887	£1,462	£1,370	£1,298	£1,239	£1,189	£1,147	£1,109	£1,076	£1,047	£1,020	£995	£972	£951	£932	£914	£897	£881	£866
Retrofit domestic (<4kW)	Marginal	£2,435	£1,887	£1,462	£1,370	£1,298	£1,239	£1,189	£1,147	£1,109	£1,076	£1,047	£1,020	£995	£972	£951	£932	£914	£897	£881	£866
New build 4–10kW	Marginal	£2,332	£1,865	£1,492	£1,398	£1,324	£1,264	£1,214	£1,170	£1,132	£1,098	£1,068	£1,040	£1,015	£992	£971	£951	£933	£915	£899	£884
Retrofit 4–10kW	Marginal	£2,332	£1,865	£1,492	£1,398	£1,324	£1,264	£1,214	£1,170	£1,132	£1,098	£1,068	£1,040	£1,015	£992	£971	£951	£933	£915	£899	£884
New build 10–50kW	Marginal	£2,268	£1,814	£1,452	£1,360	£1,288	£1,230	£1,181	£1,138	£1,101	£1,068	£1,039	£1,012	£988	£965	£944	£925	£907	£891	£875	£860
Retrofit 10–50kW	Marginal	£2,268	£1,814	£1,452	£1,360	£1,288	£1,230	£1,181	£1,138	£1,101	£1,068	£1,039	£1,012	£988	£965	£944	£925	£907	£891	£875	£860
New build 50–150kW	Marginal	£1,926	£1,541	£1,232	£1,154	£1,094	£1,044	£1,003	£967	£935	£907	£882	£859	£839	£820	£802	£786	£770	£756	£743	£730
Retrofit 50–150kW	Marginal	£1,926	£1,541	£1,232	£1,154	£1,094	£1,044	£1,003	£967	£935	£907	£882	£859	£839	£820	£802	£786	£770	£756	£743	£730
New build 150–250kW	Marginal	£1,929	£1,543	£1,235	£1,157	£1,096	£1,046	£1,004	£968	£937	£909	£884	£861	£840	£821	£803	£787	£772	£758	£744	£732
Retrofit 150–250kW	Marginal	£1,929	£1,543	£1,235	£1,157	£1,096	£1,046	£1,004	£968	£937	£909	£884	£861	£840	£821	£803	£787	£772	£758	£744	£732
New build 250–5000kW	Marginal	£1,450	£1,160	£928	£869	£824	£786	£755	£728	£704	£683	£664	£647	£631	£617	£604	£592	£580	£569	£559	£550
Retrofit 250–5000kW	Marginal	£1,450	£1,160	£928	£869	£824	£786	£755	£728	£704	£683	£664	£647	£631	£617	£604	£592	£580	£569	£559	£550
Stand alone system	Marginal	£1,450	£1,160	£928	£869	£824	£786	£755	£728	£704	£683	£664	£647	£631	£617	£604	£592	£580	£569	£559	£550
Aggregators<4kW	Marginal	£1,843	£1,474	£1,180	£1,105	£1,047	£999	£959	£925	£895	£868	£844	£822	£803	£784	£767	£752	£737	£724	£711	£699
Aggregators>4kW	Marginal	£2,151	£1,721	£1,377	£1,290	£1,222	£1,166	£1,120	£1,080	£1,045	£1,013	£985	£960	£937	£915	£896	£878	£861	£845	£830	£816

Opex

Table B10: Central cost estimate, medium cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (2kW)	Fixed	£65	£63	£63	£62	£61	£61	£61	£61	£61	£61	£61	£61	£61	£60	£60	£60	£60	£60	£60	£60
Retrofit domestic (2kW)	Fixed	£65	£63	£63	£62	£61	£61	£61	£61	£61	£61	£61	£61	£61	£60	£60	£60	£60	£60	£60	£60
Aggregators<4kW	Fixed	£90	£88	£87	£86	£85	£85	£85	£85	£84	£84	£84	£84	£84	£84	£83	£83	£83	£83	£83	£83
New build domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Retrofit domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
New build 4–10kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
Retrofit 4–10kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
New build 10–50kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
Retrofit 10–50kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
New build 50–150kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
Retrofit 50–150kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
New build 150–250kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
Retrofit 150–250kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
New build 250–5000kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
Retrofit 250–5000kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
Stand alone system	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19
Aggregators<4kW	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Aggregators>4kW	Marginal	£23	£22	£22	£22	£22	£21	£21	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£20	£19	£19

Table B11: Central cost estimate, slow cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (2kW)	Fixed	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65
Retrofit domestic (2kW)	Fixed	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65	£65
Aggregators<4kW	Fixed	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90	£90
New build domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Retrofit domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
New build 4–10kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
Retrofit 4–10kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
New build 10–50kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
Retrofit 10–50kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
New build 50–150kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
Retrofit 50–150kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
New build 150–250kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
Retrofit 150–250kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
New build 250–5000kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
Retrofit 250–5000kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
Stand alone system	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23
Aggregators<4kW	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Aggregators>4kW	Marginal	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23	£23

Table B12: Central cost estimate, fast cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (2kW)	Fixed	£65	£62	£61	£60	£59	£58	£58	£58	£58	£57	£57	£57	£56	£56	£56	£56	£55	£55	£55	£54
Retrofit domestic (2kW)	Fixed	£65	£62	£61	£60	£59	£58	£58	£58	£58	£57	£57	£57	£56	£56	£56	£56	£55	£55	£55	£54
Aggregators<4kW	Fixed	£90	£86	£85	£83	£81	£81	£81	£80	£80	£79	£79	£79	£78	£78	£77	£77	£77	£76	£76	£75
New build domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Retrofit domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
New build 4–10kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
Retrofit 4–10kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
New build 10–50kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
Retrofit 10–50kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
New build 50–150kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
Retrofit 50–150kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
New build 150–250kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
Retrofit 150–250kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
New build 250–5000kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
Retrofit 250–5000kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
Stand alone system	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18
Aggregators<4kW	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Aggregators>4kW	Marginal	£23	£22	£22	£21	£21	£21	£21	£21	£20	£20	£20	£20	£20	£19	£19	£19	£19	£19	£18	£18

Table B13: Low cost estimate, medium cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (2kW)	Fixed	£45	£44	£43	£43	£43	£42	£42	£42	£42	£42	£42	£42	£42	£42	£42	£42	£42	£41	£41	£41
Retrofit domestic (2kW)	Fixed	£45	£44	£43	£43	£43	£42	£42	£42	£42	£42	£42	£42	£42	£42	£42	£42	£42	£41	£41	£41
Aggregators<4kW	Fixed	£40	£39	£39	£38	£38	£38	£38	£38	£38	£37	£37	£37	£37	£37	£37	£37	£37	£37	£37	£37
New build domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Retrofit domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
New build 4–10kW	Marginal	£17	£17	£17	£16	£16	£16	£16	£16	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15
Retrofit 4–10kW	Marginal	£17	£17	£17	£16	£16	£16	£16	£16	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15
New build 10–50kW	Marginal	£17	£17	£17	£16	£16	£16	£16	£16	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15
Retrofit 10–50kW	Marginal	£17	£17	£17	£16	£16	£16	£16	£16	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15
New build 50–150kW	Marginal	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£14
Retrofit 50–150kW	Marginal	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£14
New build 150–250kW	Marginal	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£14
Retrofit 150–250kW	Marginal	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£14
New build 250–5000kW	Marginal	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£14
Retrofit 250–5000kW	Marginal	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£14
Stand alone system	Marginal	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£14
Aggregators<4kW	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Aggregators>4kW	Marginal	£16	£16	£16	£15	£15	£15	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£14

Table B14: Low cost estimate, slow cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (2kW)	Fixed	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45
Retrofit domestic (2kW)	Fixed	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45	£45
Aggregators<4kW	Fixed	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40	£40
New build domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Retrofit domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
New build 4–10kW	Marginal	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17
Retrofit 4–10kW	Marginal	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17
New build 10–50kW	Marginal	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17
Retrofit 10–50kW	Marginal	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17	£17
New build 50–150kW	Marginal	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16
Retrofit 50–150kW	Marginal	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16
New build 150–250kW	Marginal	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16
Retrofit 150–250kW	Marginal	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16
New build 250–5000kW	Marginal	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16
Retrofit 250–5000kW	Marginal	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16
Stand alone system	Marginal	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16
Aggregators<4kW	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Aggregators>4kW	Marginal	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16	£16

Table B15: Low cost estimate, fast cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (2kW)	Fixed	£45	£43	£42	£41	£41	£40	£40	£40	£40	£40	£39	£39	£39	£39	£39	£38	£38	£38	£38	£38
Retrofit domestic (2kW)	Fixed	£45	£43	£42	£41	£41	£40	£40	£40	£40	£40	£39	£39	£39	£39	£39	£38	£38	£38	£38	£38
Aggregators<4kW	Fixed	£40	£38	£38	£37	£36	£36	£36	£36	£35	£35	£35	£35	£35	£35	£34	£34	£34	£34	£34	£34
New build domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Retrofit domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
New build 4–10kW	Marginal	£17	£17	£16	£16	£16	£16	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14
Retrofit 4–10kW	Marginal	£17	£17	£16	£16	£16	£16	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14
New build 10–50kW	Marginal	£17	£17	£16	£16	£16	£16	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14
Retrofit 10–50kW	Marginal	£17	£17	£16	£16	£16	£16	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14
New build 50–150kW	Marginal	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£13	£13	£13	£13	£13
Retrofit 50–150kW	Marginal	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£13	£13	£13	£13	£13
New build 150–250kW	Marginal	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£13	£13	£13	£13	£13
Retrofit 150–250kW	Marginal	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£13	£13	£13	£13	£13
New build 250–5000kW	Marginal	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£13	£13	£13	£13	£13
Retrofit 250–5000kW	Marginal	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£13	£13	£13	£13	£13
Stand alone system	Marginal	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£13	£13	£13	£13	£13
Aggregators<4kW	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Aggregators>4kW	Marginal	£16	£16	£15	£15	£15	£15	£15	£15	£14	£14	£14	£14	£14	£14	£14	£13	£13	£13	£13	£13

Table B16: High cost estimate, medium cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (2kW)	Fixed	£110	£107	£106	£105	£104	£104	£104	£103	£103	£103	£103	£103	£102	£102	£102	£102	£102	£101	£101	£101
Retrofit domestic (2kW)	Fixed	£110	£107	£106	£105	£104	£104	£104	£103	£103	£103	£103	£103	£102	£102	£102	£102	£102	£101	£101	£101
Aggregators<4kW	Fixed	£140	£137	£135	£134	£132	£132	£132	£132	£131	£131	£131	£131	£130	£130	£130	£130	£129	£129	£129	£129
New build domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Retrofit domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
New build 4–10kW	Marginal	£33	£33	£32	£32	£32	£31	£31	£31	£31	£31	£30	£30	£30	£30	£29	£29	£29	£29	£29	£28
Retrofit 4–10kW	Marginal	£33	£33	£32	£32	£32	£31	£31	£31	£31	£31	£30	£30	£30	£30	£29	£29	£29	£29	£29	£28
New build 10–50kW	Marginal	£32	£32	£31	£31	£31	£31	£30	£30	£30	£30	£29	£29	£29	£29	£29	£28	£28	£28	£28	£27
Retrofit 10–50kW	Marginal	£32	£32	£31	£31	£31	£31	£30	£30	£30	£30	£29	£29	£29	£29	£29	£28	£28	£28	£28	£27
New build 50–150kW	Marginal	£28	£28	£27	£27	£27	£27	£26	£26	£26	£26	£26	£26	£25	£25	£25	£25	£25	£24	£24	£24
Retrofit 50–150kW	Marginal	£28	£28	£27	£27	£27	£27	£26	£26	£26	£26	£26	£26	£25	£25	£25	£25	£25	£24	£24	£24
New build 150–250kW	Marginal	£28	£28	£27	£27	£27	£27	£26	£26	£26	£26	£26	£26	£25	£25	£25	£25	£25	£24	£24	£24
Retrofit 150–250kW	Marginal	£28	£28	£27	£27	£27	£27	£26	£26	£26	£26	£26	£26	£25	£25	£25	£25	£25	£24	£24	£24
New build 250–5000kW	Marginal	£28	£28	£27	£27	£27	£27	£26	£26	£26	£26	£26	£26	£25	£25	£25	£25	£25	£24	£24	£24
Retrofit 250–5000kW	Marginal	£28	£28	£27	£27	£27	£27	£26	£26	£26	£26	£26	£26	£25	£25	£25	£25	£25	£24	£24	£24
Stand alone system	Marginal	£28	£28	£27	£27	£27	£27	£26	£26	£26	£26	£26	£26	£25	£25	£25	£25	£25	£24	£24	£24
Aggregators<4kW	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Aggregators>4kW	Marginal	£28	£28	£27	£27	£27	£27	£26	£26	£26	£26	£26	£26	£25	£25	£25	£25	£25	£24	£24	£24

Table B17: High cost estimate, slow cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (2kW)	Fixed	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110
Retrofit domestic (2kW)	Fixed	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110	£110
Aggregators<4kW	Fixed	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140	£140
New build domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Retrofit domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
New build 4–10kW	Marginal	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33
Retrofit 4–10kW	Marginal	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33	£33
New build 10–50kW	Marginal	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32
Retrofit 10–50kW	Marginal	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32	£32
New build 50–150kW	Marginal	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28
Retrofit 50–150kW	Marginal	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28
New build 150–250kW	Marginal	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28
Retrofit 150–250kW	Marginal	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28
New build 250–5000kW	Marginal	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28
Retrofit 250–5000kW	Marginal	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28
Stand alone system	Marginal	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28
Aggregators<4kW	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Aggregators>4kW	Marginal	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28	£28

Table B18: High cost estimate, fast cost reduction

Size		Apr-12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
New build domestic (2kW)	Fixed	£110	£106	£103	£101	£99	£99	£98	£98	£97	£97	£96	£96	£95	£95	£95	£94	£94	£93	£93	£92
Retrofit domestic (2kW)	Fixed	£110	£106	£103	£101	£99	£99	£98	£98	£97	£97	£96	£96	£95	£95	£95	£94	£94	£93	£93	£92
Aggregators<4kW	Fixed	£140	£134	£132	£129	£126	£126	£125	£125	£124	£123	£123	£122	£122	£121	£120	£120	£119	£119	£118	£117
New build domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Retrofit domestic (2kW)	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
New build 4–10kW	Marginal	£33	£32	£32	£31	£31	£31	£30	£30	£30	£30	£29	£29	£29	£28	£28	£28	£28	£27	£27	£27
Retrofit 4–10kW	Marginal	£33	£32	£32	£31	£31	£31	£30	£30	£30	£30	£29	£29	£29	£28	£28	£28	£28	£27	£27	£27
New build 10–50kW	Marginal	£32	£31	£31	£30	£30	£30	£30	£29	£29	£29	£28	£28	£28	£28	£27	£27	£27	£26	£26	£26
Retrofit 10–50kW	Marginal	£32	£31	£31	£30	£30	£30	£30	£29	£29	£29	£28	£28	£28	£28	£27	£27	£27	£26	£26	£26
New build 50–150kW	Marginal	£28	£27	£27	£27	£26	£26	£26	£26	£25	£25	£25	£25	£24	£24	£24	£24	£23	£23	£23	£23
Retrofit 50–150kW	Marginal	£28	£27	£27	£27	£26	£26	£26	£26	£25	£25	£25	£25	£24	£24	£24	£24	£23	£23	£23	£23
New build 150–250kW	Marginal	£28	£27	£27	£27	£26	£26	£26	£26	£25	£25	£25	£25	£24	£24	£24	£24	£23	£23	£23	£23
Retrofit 150–250kW	Marginal	£28	£27	£27	£27	£26	£26	£26	£26	£25	£25	£25	£25	£24	£24	£24	£24	£23	£23	£23	£23
New build 250–5000kW	Marginal	£28	£27	£27	£27	£26	£26	£26	£26	£25	£25	£25	£25	£24	£24	£24	£24	£23	£23	£23	£23
Retrofit 250–5000kW	Marginal	£28	£27	£27	£27	£26	£26	£26	£26	£25	£25	£25	£25	£24	£24	£24	£24	£23	£23	£23	£23
Stand alone system	Marginal	£28	£27	£27	£27	£26	£26	£26	£26	£25	£25	£25	£25	£24	£24	£24	£24	£23	£23	£23	£23
Aggregators<4kW	Marginal	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Aggregators>4kW	Marginal	£28	£27	£27	£27	£26	£26	£26	£26	£25	£25	£25	£25	£24	£24	£24	£24	£23	£23	£23	£23

Appendix C – Source cost data

Individual data points on capital cost data are shown in the tables below. Note that for <4kW systems, data is presented in on a £/kW basis.

Table C1: Source data for <4kW (£/kW)

Size									
1.6kw	2.4kw	2.5kw	2.88kw	3kw	3.3kw	3.5kw	3.68kw	3.8kw	4kw
3270	3003	2323	3470	3400	2432	3030	2174	3929	1575
	3003	2323	3200	2603		2524	2310	2271	2100
				1750				1993	2000
									2000
									2456
									2290
									2917
									3200
									3083
									2669
									2936

Data is from 11 different sources

Table C2: Source data for 4-10kW (£/kW)

Size				
6.58kw	7.05kw	8.88kw	9.88kw	10kw
2328	2185	1866	2200	2000
			2342	2300
				2000
				2323
				2238
				2343
				2460

Data is from 6 different sources

Table C3: Source data for 10-50kW (£/kW)

Size								
14.805kw	14.88kw	15.12kw	15.3kw	16.56kw	17.28kw	17.39kw	20kw	20.16kw
1990	2204	2380	1719	1675	2042	2011	2158	1994
							2066	
							2472	
							2288	

Size								
21.8kw	23.52kw	24kw	25kw	26.4kw	28.8kw	29.61kw	30.08kw	31kw
1885	1872	2162	1951	2733	1525	1981	1839	2258
	1939							

Size									
32.9kw	36.4kw	38kw	39.245kw	39.48kw	40kw	42.3kw	49.82kw	49.92kw	50kw
2144	1951	2400	2642	1824	1758	1450	2278	2362	1700
								1819	2210
									2407

Data is from 5 different sources

Table C4: Source data for 50-150kW (£/kW)

Size		
89.52kw	98.16kw	150kw
1803	1800	1700
		1900
		1800
		1900
		1600
		2169
		1916
		1870
		1929
		1838
		1994
		2384

Data is from 7 different sources

Table C5: Source data for 150-250kW (£/kW)

Size			
167kw	172kw	217kw	250kw
3061	1950	1770	1640
			1520
			1600
			1500
			1600
			1867
			2314

Data is from 6 different sources

Table C6: Source data for 250-5000kW (£/kW)

Size	
1.2MW	5MW
1100	1300
1200	1400
	1600
	1970
	1300
	1224

Data is from 5 different sources

Table C7: Source data for aggregators <4kW

Size	
3kw	4kw
2451	1898
2309	1900
2210	1898
	2288

Data is from 5 different sources

Table C8: Source data for aggregators >4kW

Date of cost data	Size (kW)					Cost adjusted to March 2012
	9.2	10.0	26.01	33.36	50.0	
Oct-11	3342					2234
Oct-11			3140			2099
Oct/ Nov-11				2100		1404
Dec-11		2887				2203
Dec-11					2550	1946
Nov-11					2600	1861
Mar-12					1700	1700

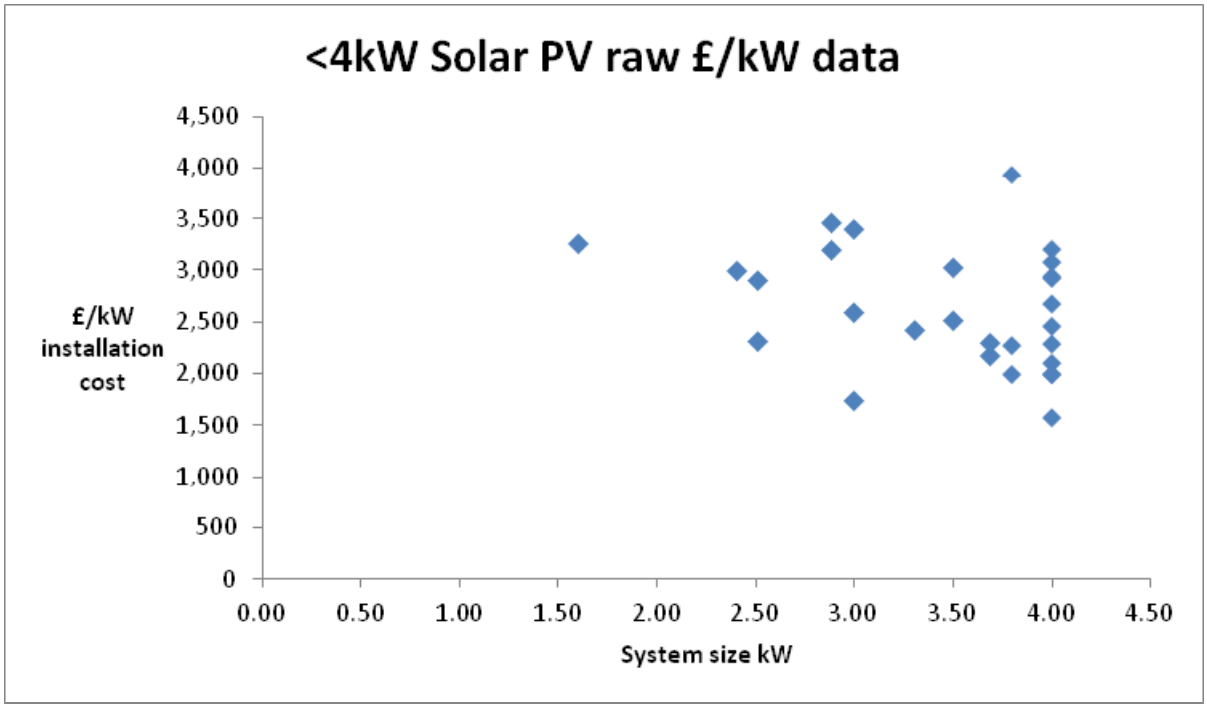
Data is from 6 different sources

Note on Table C8: costs were adjusted assuming a monthly cost reduction of 4.7%, based on the average reduction observed for the 4-10kW and 10-50kW individual bands between our October 2011 report and the data gathered for this update.

Appendix D – analysis of <4kW raw data

This Appendix D discusses how the raw data gathered for <4kW individual installations was translated into the final £/kW costs presented in the report, and the range of other potential methodologies.

The raw data gathered for individual <4KW installations is set out in Table C1 in Appendix C, and is shown graphically in the chart below.



From the 28 individual data points, the average system size is 3.46kW with a median £/kW of 2,564.

The DECC FITs model uses a reference installation size for each band, representative of a typical installation. For <4kW Solar PV, this is a 2.6kW installation. From the raw data, an average installation cost needs to be calculated for a 2.6kW system. This could be done in one of several ways:

A. Take the median £/kW figure across all installations and apply it to a 2.6kW system. This effectively assumes that £/kW costs are constant across installation size within the <4kW band.
B. Estimate £/kW figure for a 2.6kW system by regressing £/kW on system size.
C. Select a sub-sample of the data with an average system size closer to 2.6kW (with several choices on how to choose a sub-sample).

There are strengths and weaknesses with each of these of these methods, as described in the table below.

Method	Strengths	Weaknesses
A.	• Simple and transparent • Regression of £/kW on system size shows no statistically significant relationship • Makes use of all available data, increasing validity	• A greater sample size might show a significant relationship between £/kW and installation size.
B.	• Makes use of all available data	• Regression of £/kW on system size shows no statistically significant relationship
C.	• Gives a £/kW cost based on observed installation costs close to 2.6kW	• Ignores some data, decreasing validity of final result • Difficulty in choosing 'correct' sub-sample size

We used Method A to analyse the raw data for this report. It provides reasonable results which take account of all the data received and which are in line with comments received from industry during the study.