

Document Version Control

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Battery storage for solar power: guidance for sellers/installers

Batteries designed to capture surplus electricity generated by a solar PV system can allow consumers to store solar electricity for use later in the day. Until recently, they were prohibitively expensive for the domestic market but, as prices fall and the technology improves, RECC members are increasingly offering these systems to residential consumers.

These systems vary in their size, operation and cost and they are not right for everyone. So it is very important that RECC members provide consumers with sufficient information for them to make an informed choice.

What's in this guidance

This guidance sets out:

1. Pre-sales information

- a) The information you must provide about the system when proposing a battery system to a consumer.
- b) A Grid for presenting that information

2. Guidance on presenting the financial benefits of battery systems

3. Suggested wording for proposals

Other guidance available

You may also find the following useful:

- RECC guidance on batteries and solar power for domestic consumers, produced jointly with BRE's National Solar Centre, here:
http://www.bre.co.uk/filelibrary/nsc/Documents%20Library/NSC%20Publications/88166-BRE_Solar-Consumer-Guide-A4-12pp-JAN16.pdf
- Technical guidance in BRE National Solar Centre's "Batteries and Solar Power: A Technical Guide" and the forthcoming publications from IET on battery storage systems.

1. Pre-Sale information on battery systems for consumers

Batteries designed to capture surplus electricity generated by a solar PV system can allow consumers to store solar electricity for use later in the day.

These systems vary in their size, operation and cost and they are not right for everyone. So it is very important that RECC members provide consumers with sufficient information for them to make an informed choice. This guidance provides you with a list of items you must include [in blue below] and a grid for presenting that information.

In selling these systems, members must comply with consumer protection legislation. In particular:

- consumers have a right for goods to be ‘as described’ by the trader – they must be what the customer expects from your description;¹
- anything you or any persons working on your behalf say or write about your company or its services are binding if that information influences the customer’s decision to sign up. So if you get it wrong eg you give an inaccurate savings estimate, customers may now be able to claim a breach of contract;²
- You must not claim that a product has been approved, endorsed or authorised by a public or private body when the product has not e.g. by displaying a logo that suggests such approval.³ This means that, as long as battery systems are not MCS certified (none are at the time of writing), they must not be shown or quoted for on website pages or documents that carry the MCS logo, nor must you suggest that your MCS certification covers your installation of a non-MCS product.

and

- You must not mislead consumers by over-stating the benefits of ANY products or services you sell, whether these are MCS-certified or not.⁴

General information

For general information about battery storage for solar power, you should refer any prospective consumer to the RECC/BRE guidance:

http://www.bre.co.uk/filelibrary/nsc/Documents%20Library/NSC%20Publications/88166-BRE_Solar-Consumer-Guide-A4-12pp-JAN16.pdf

Pre-sale information

In addition, you should provide consumers with all the information listed in blue and bullets BEFORE making a sale. So if you are selling these products ‘off premises’, that is consumers are signing contracts to buy them in their home with a company representative or a sales rep present, then they must have been provided with all the following information – and given time to absorb it – before they sign anything.

We have provided a suggested grid in which you can present this information overleaf.

¹ Consumer Rights Act 2015

² Consumer Rights Act 2015

³ Consumer Protection from Unfair Trading Regulations 2008

⁴ Consumer Protection from Unfair Trading Regulations 2008

1 The technology the system uses and features

- Type (typically lithium-ion or lead-acid)
- Weight
- Size
- Where it can be safely sited
- (For systems fitted to an existing solar PV system), if it works with existing solar inverter.

2 The USEABLE storage capacity in kilo-watt hours (kWh)

The useable storage capacity is not the same as nominal capacity because most types of battery should not be 100% discharged as this shortens their life.

You should give:

- The useable storage capacity (ie capacity at allowable depth of discharge) in kWh.
- Where the figure is quoted as Amp-hours (Ah), the Ah converted to kWh ($Ah \times Voltage = kWh$).

3 What that capacity will run

E.g. a 3kWh battery operated with an allowable depth of discharge of 80% outputs 2.4kWh (80% of 3kWh) – enough to supply 200W of lighting for approximately 12hrs.

You should give:

- What appliances a consumer could run from the battery and for how long, given its useable capacity
- If the consumer can add more batteries later to increase capacity.

4 Charge-discharge efficiency

All batteries lose some energy in the charge-discharge cycle.

5 Power-cut operation

Some systems, such as those integrated or connected to a solar inverter, will not operate during a power-cut.

You should indicate:

- whether the proposed system will work in a power-cut.
- If the customer has to do anything to ensure it does work in a power-cut.
- any limitations on what it can run and for how long in a power-cut.

6 Guarantees

- The length of the guarantee on the battery itself.
- If different, the length of the guarantee on any other parts of the system.

7 The predicted lifetime of the batteries

- Battery expected life in years and in charge-discharge cycles.
- Advice to the customer that the batteries are likely to need replacing at least once in the lifetime of the solar panels.
- How the battery indicates it is nearing the end of its lifetime.

8 The cost of replacement/additional batteries

- How much it will cost, at current prices, to replace the battery at the end of its lifetime.

9 Any restrictions on replacing batteries

- where the customer can source replacements or if they have to buy from the original manufacturer.

10 Arrangements for safe disposal of batteries at the end of their life

- If the manufacturer operates a swap/replacement scheme so they're responsible for safe disposal or recycling/refurbishment
- If not, what the customer must do.

11 Any mains electricity costs

- If the system tops up from the mains, eg in 'winter mode', indicate how much electricity it is likely to use.
- An estimate of the likely annual cost of this electricity
- Where applicable, if the system can be programmed to charge from cheaper off-peak electricity.

12 Impact on (potential) Feed-In tariff income

There will be an impact on potential FiT income (or for retrofit, an actual reduction in FiT) if the battery is 'DC-coupled' (this arrangement is most likely if you are installing solar PV and storage together).⁵

- Where this is applicable, you must provide either an estimate of Year 1 income with and without the battery (for new solar PV-plus-storage installs) or an estimate of the reduction in FiT once the battery is installed (for battery systems installed alongside existing solar PV systems).

13 Management and maintenance

- Any necessary battery management.
- Any other maintenance requirements.

14 Required notifications of the install and who is responsible for notifying

In normal circumstances it is your responsibility to make such notifications, with the exception of notifying the home insurer, where the consumer should notify.

- The DNO.
- If applicable, Ofgem and the local council.
- Home insurer.

⁵ The generation FiT is paid for every kWh generated by the solar PV system, as measured by the solar generation meter.

Where a battery is installed on the solar PV side of the generation meter (i.e. DC-coupled), the solar electricity that goes to charge the batteries is not registered by the generation meter at the time, but only when it is subsequently discharged by the batteries or when the batteries are full.

Since all batteries lose energy in the charge-discharge cycle, some of the original solar PV output will be lost in the process. Those losses occur before the generation has been registered by the meter ie the meter records lower generation, and hence a lower FiT income is payable, with the battery.

Battery storage for your Solar PV		
	Standard information	Additional information if applicable
Battery technology	E.g. Lithium-ion, Lead-acid	
Battery weight and dimensions	XX Kg H x W x D	
Battery location		Safety considerations/instructions: ...
Useable storage capacity [nominal capacity, depth of discharge]	XX kWh [YY kWh, ZZ%]	XX Amp-hours x XX V (Voltage) = XX kWh Extra batteries can be added
How long this will run 200W of lighting	[useable kWh/0.2kW] hours	
Charge-discharge efficiency	XX% energy lost	
Power-cut operation	YES/NO	If YES: If the battery is fully-charged at the start of the outage (e.g. early evening), it should run 'background' lower-powered items such as lights, TV, computers, fridge-freezer for XX hours.
Guarantee	XX Years	
Predicted life expectancy	XX years OR YY cycles	
Cost of replacement battery	£XXXX at current prices	Getting a replacement battery: ...
Mains electricity required?	YES/NO	If YES: Estimated annual use of electricity XX kWh Estimated annual cost of electricity [XX kWh x tariff] = £YYY
Impact on FiT income	YES/NO	If YES: (For new install solar PV-plus-storage) Year 1 FiT without battery (from separate solar PV projections) £XX Year 1 FiT with battery £XX (For retrofit storage) Current annual FiT without battery £XX Estimated annual FiT with battery £XX
Management and maintenance of the battery system	The battery system requires ...	
Notifications required	DNO Other regulatory bodies Home insurer	We will notify ... You must notify...

2. Presentation of benefits

PV-plus-storage installs: separate assessments

Consumers must be able to readily compare quotes for the MCS-certified elements of a deal, whether they are being sold alone or in a package with storage.

This means that members selling packages must not bundle the benefits together but must present them in such a way that a consumer can readily compare the MCS element of a quote from a company that only provides the MCS system with a quote from a member that includes other products alongside the MCS system.

In practice, members must show:

- the performance (and if they are showing them, the benefits, payback etc.) of any MCS/RECC-covered system within any quote and over however many years the Member is estimating them

CLEARLY AND SEPARATELY FROM

- any predicted performance, income, savings, impact on payback period etc which the member is seeking to attribute to the non-MCS products

General claims about benefits

Any general claims (e.g. about performance and/or financial benefits) wherever they are made must be realistic:

- claims that battery systems will increase on-site consumption 'up to x%' are only permissible if there is sound objective recent evidence that a reasonable proportion (at least 10%) of consumers could achieve the top-end.⁶
- *Unsubstantiated* manufacturers' claims are unlikely to be regarded as sufficient evidence to support a claim.
- members should indicate the circumstances in which the top-end of claimed benefits could be achieved e.g. location, battery size, household lifestyle.

⁶ The Advertising Standards Authority has indicated in relation to similar claims in other sectors: 'A savings claim should not exaggerate the availability or extent of benefits likely to be attained by consumers. It should be qualified, if necessary, to refer to the conditions that affect it, for example: the product or service against which the comparison is being made; the fuel or combination of fuels that must be bought for the claim to be valid; the usage pattern of the consumer for the claim to be valid, for example low, average or high (ASA Help Note, Price claims in utilities marketing, Revised: February 2011). On similar claims in telecoms it has stated: 'Marketers should distinguish between absolute claims, referring to all consumers or products, and conditional claims, referring to some consumers or products. Claims stating "up to" or "from" are likely to be regarded as absolute claims referring to a range of savings unless qualified otherwise. They should not exaggerate the availability of benefits likely to be obtained by consumers; for example, 10% availability of the maximum benefit attributed to an "up to" or "from" price claim is likely to be considered a reasonable proportion that avoids exaggeration.' (ASA Help Note, Price claims in telecommunications marketing, Updated November 2010)

Benefits for individual consumers

Where the benefits are likely to vary considerably from consumer to consumer, members should wherever possible provide calculations based on the individual consumer's circumstances.

Any estimates of the financial benefits of a battery system, if provided:

- should be based on an assessment of the consumer's circumstances, system size, lifestyle etc. and, where solar PV is already installed, on current on-site use;
- should not be based on standard assumptions e.g. where manufacturers claim a system can increase self-consumption 'up to 80%', members should not use 80% in all quotations UNLESS the member is confident that the consumer can realistically achieve close to that;
- must be based on the yearly average 'surplus' available i.e. must reflect the reduced solar PV output and hence 'surplus' available to charge the battery in the UK's winter months vs summer months;
- must take into account the cost of any mains electricity the battery will use;
- must take into account the impact, if any, on the Feed-In tariff income;
- must make allowance for the need to replace the battery if projections are being made for beyond the likely lifetime of the battery;
- should alert consumers to the potential impact of smart meters on their export income.⁷

Estimating the potential financial benefits of a battery system

To estimate of the likely benefit of a battery system, you need to make a reasonable comparison of the on-site use (or 'self-consumption' as it is sometimes called) with a PV system alone to the on-site use with a battery system. In the case of retrofit battery installations, you should use the existing on-site for comparison purposes; with new solar PV-plus-storage installations ['new'], you should have an estimate of on-site use with solar PV alone in your separate solar PV estimate. The calculation is then as follows:⁸

A. Estimated on-site use with battery

Estimated on-site use of solar PV output with battery system p. a., in kWh

[sense-check: vs. useable capacity; vs. current output of solar PV system [retrofit] or estimated output of solar PV system in separate PV estimate [new]]

Typically this is expressed in % terms. If you wish to give this, it should be calculated as:
on-site total in kWh/total current output in kWh x 100

⁷ The meters can measure actual export. When the Government consulted on changes to subsidies for renewables in 2015, it said it intended to 'end 'deemed' exports for all FITs installations and see the entire scheme moved to export tariff payments based on actual meter reads on the completion of the smart meter roll-out'. At the time of writing it has said that it is not proposing to make any change to the export tariff for now but will consult on it 'in future'.

⁸ This assumes export tariff income continues to be paid on the basis of 'deemed' export of 50% of total generation.

B. Estimated on-site use without battery

Either estimated current on-site use of solar PV output in kWh [retrofit] or estimated on-site use without battery from the solar-PV-only estimate [new].

Based on an assessment of consumer's lifestyle, use of timers etc.

C. Estimated increase in on-site consumption with battery in kWh [A – B]

D. Estimated savings on electricity costs

The increase in on-site consumption Year 1 = £ [C x current electricity tariff £0.XX per kWh]

E. Estimated cost of electricity used by battery Year 1

£ [from Grid: Estimated annual use of electricity Xx kWh x current electricity tariff £0.XX per kWh]

This may be zero.

F. Estimated impact on Feed-In tariff income from battery Year 1

£ [from Grid: Current annual FiT - Estimated annual FiT with battery]

This may be zero.

G. Net savings from battery Year 1

£[D – E – F]

3. SUGGESTED WORDING [text in red indicates where you need to insert information]

This quote is for a [insert technology] battery system.

The battery weighs [XX]kg and measures [h x w x d]

It will be installed at [insert location]

[Insert if applicable] For it to work, your existing solar inverter will need to be replaced. The cost of this is included in the quote.

Capacity

This [insert technology] battery system has a total capacity of [XX]kWh.

To ensure a good battery life, it is designed to discharge to no more than [XX]%

its USEABLE capacity is therefore [YY]kWh. This is enough to run 200W of lighting for [XX] hours.

[Delete if not applicable] You can add more batteries to increase capacity at a later date.

All batteries lose some energy in the charge-discharge cycle. We estimate that your system will lose [XX]% of the energy.

Power-cut operation

Your battery system will/will not [delete as applicable] operate in a mains power-cut.

[insert here if any special measures are required to enable this].

[Insert if applicable] If the battery is fully-charged when the power-cut occurs (e.g. early evening), then you can expect it to run lower-powered items - your lights, TV, computers and fridge-freezer - for [XX] hours.

Lifetime

The battery is guaranteed for [XX] years.

[insert any other relevant guarantees for system elements]

The life expectancy of the battery in this system is [XX] years or [XX,000] cycles, whichever is the sooner.

[Insert if battery indicates it is nearing end of life and how it does so]

[Insert information on safe disposal]

Replacement batteries

The cost of a replacement battery (at current prices) is [£XXXXX]

You can get replacement batteries from [insert sources or indicate any restrictions e.g. a special type that can only be bought from the original system manufacturer].

Electricity costs

The system does/does not [delete as applicable] use mains power for charging the battery.

[Insert if applicable] The estimated annual mains electricity use is [XX]kWh.

At your current electricity tariff this will cost £[tariff x kWh] a year.

[calculate with Economy 7 or other off-peak rate if the system can be programmed to charge during that rate's hours of operation]

Impact on Feed-in Tariff Income

Your potential Feed-in tariff income is/is not **[delete as applicable]** affected by the inclusion of a battery.

[If applicable] Your estimated Year 1 FiT without battery **£YYY**
Your estimated Year 1 FiT with battery **£XXX**

For retrofit:

Your current annual FiT **£XXX**
Your estimated FiT with battery **£YYY**

Management and maintenance

[Insert any requirements here]

Notifications

We will make the necessary notifications to **[insert any bodies who must be notified here]**

It is your responsibility to notify your insurer.

Estimated savings from battery system

We estimate that adding a battery storage system to your solar PV system will save you an additional **£XXX** per annum. **[insert G from calculation]**

This estimate is based on the following:

A. Estimated savings from increased on-site use = **£XXX**

[Estimated on-site use with battery kWh – estimated on-site use without battery kWh = increase in on-site use. Increase kWh x electricity tariff = £savings]

B. Minus estimated cost of electricity used by battery Year 1, **£XXX**

[Estimated annual use of electricity Xx kWh x current electricity tariff £0.XX per kWh]

C. Minus estimated impact on Feed-In tariff income from battery Year 1, **£XX**

[Current actual or estimated annual FiT without battery - Estimated annual FiT with battery]

Net savings from battery Year 1, **£XX**

£[A-B-C]