The Value of Solar Property

The financial benefits of a solar-powered future

Appendix two: case studies

Contents

Summary

This Appendix accompanies the Solar Energy UK report, The Value of Solar Property. In addition to the four case studies included in the report, it provides detail on the costs and savings which installing a solar system would provide in a further eight scenarios.

The case studies provide reference information relating to a range of different property types, in different parts of the country, with different financing arrangements. The intention is to provide a snapshot of the variety in financial performance which can be expected from a residential solar project.

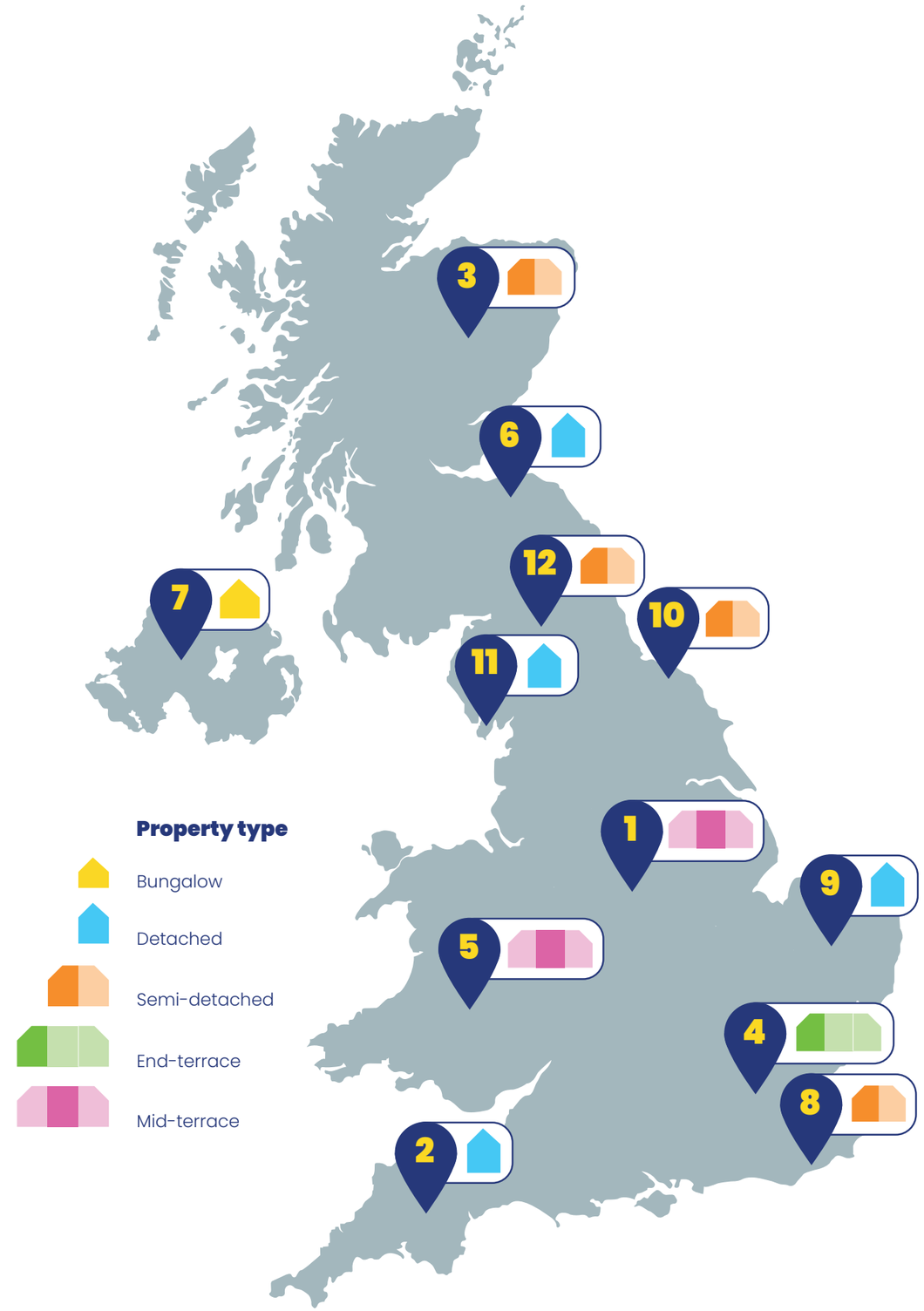
Each scenario is presented in the same format, including key parameters relating to the type of home, location, solar system, and financing for that scenario. Each case study then provides a summary of the financial outputs which it could be expected that a solar system would generate based on the scenario specified.

Case study summaries

The table below provides summary information on the different solar financing scenarios discussed in this document. To receive a detailed breakdown of inputs and outputs for each scenario, please contact Solar Energy UK.

Page no.	Scenario no.	Location	Property type	Finance	Heating fuel
6	1	Midlands	Mid-terrace	Loan	Gas
7	2	SW England	Detached	Cash	Electricity
8	3	NE Scotland	Semi-detached	Mortgage	Gas
9	4	London	End-terrace	Housing association	Gas
10	5	Wales	Mid-terrace	Loan	Gas
11	6	E Scotland	Detached	Cash	Heat pump
12	7	Northern Ireland	Bungalow	Mortgage	Gas
13	8	SE England	Semi-detached	Loan	Gas
14	9	East Anglia	Detached	Cash	Gas
15	10	NE England	Semi-detached	Mortgage	Gas
16	11	NW England	Detached	Cash	Electricity
17	12	West Pennines	Semi-detached	Loan	Heat pump

Note that all figures are indicative and based on the methodology outlined in the document which accompanies the report and this Annex.



Case study 1 – Midlands (typical case)

This scenario represents a likely 'typical' scenario for a home in the UK, based on current UK energy prices and residential electricity consumption profiles.

Property and system details		1a	1b
Property characteristics	Indicative sale price (£)	£163,975*	£163,975*
	Location	Midlands	Midlands
	Property type	Mid-terraced	Mid-terraced
	Heating fuel	Gas	Gas
	Occupancy	In half day	In half day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	3.06	3.06
	Estimated generation (kWh / year)	2,512	2,512
	Battery capacity (kW)	N/A	≥2.1 <3.1
	Generation used on site (%)	25%	54%
System costs	Total installation cost (£)	£3,874	£6,026
	Annual running cost (£)	£125	£383
	Electricity price (p/kWh)	20	20
System financing	Type	Loan	Loan
	Interest rate (%)	6%	6%
	Loan term (years)	5	5
	SEG price (p/kWh)	8	8
Financial benefits (running cost)	Annual revenue (year one)	£152	£-19
	Annual revenue (year five)	£236	£169
	Annual revenue (year ten)	£328	£375
	Net present value (lifespan)	£9,860	£9,376
	Payback period (years)	16.1	21
	Internal rate of return (%)	4.1%	-2.9%
	Return on investment (%)	254.5%	155.6%
	Effective annual saving (lifespan)	£329	£313
Financial benefit (equity value)	Indicative sale price increase	£1,891 - £2,722	N/A
Overall payback period**	Effective payback period (years)	10.2	N/A

*Based on UK House Price Index data from March 2021
** This figure will vary depending on if and how the increased equity value of a home with solar installed is realised, and will differ according to the specific characteristics of each home.

Case study 2 – SW England (best case)

This scenario represents a likely best-case scenario for a home in the UK, based on current UK energy prices and residential electricity consumption profiles.

Property and system details		2a	2b
Property characteristics	Indicative sale price (£)	£448,039*	£448,039*
	Location	SW England	SW England
	Property type	Detached	Detached
	Heating fuel	Direct electric	Direct electric
	Occupancy	Home all day	Home all day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	4.08	4.08
	Estimated generation (kWh / year)	3,984	3,984
	Battery capacity (kW)	N/A	≥11.1 <12.1
	Generation used on site (%)	41%	88%
System costs	Total installation cost (£)	£5,165	£13,773
	Annual running cost (£)	£143	£1,176
	Electricity price (p/kWh)	20	20
System financing	Type	Cash	Cash
	Interest rate (%)	N/A	N/A
	Loan term (years)	N/A	N/A
	SEG price (p/kWh)	11	11
Financial benefits (running cost)	Annual revenue (year one)	£442	£-422
	Annual revenue (year five)	£607	£148
	Annual revenue (year ten)	£797	£704
	Net present value (lifespan)	£28,902	£18,501
	Payback period (years)	9	21.9
	Internal rate of return (%)	11.9%	-5%
	Return on investment (%)	559.5%	134.3%
	Effective annual saving (lifespan)	£963	£617
Financial benefit (equity value)	Indicative sale price increase	£866 - £2,516	N/A
Overall payback period**	Effective payback period (years)	7.8	N/A

*Based on UK House Price Index data from March 2021
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Case study 3 – NE Scotland (non-optimal case)

This scenario represents a non-optimum scenario for a home in the UK, based on current UK energy prices and residential electricity consumption profiles.

Property and system details		3a	3b
Property characteristics	Indicative sale price (£)	£263,814*	£263,814*
	Location	NE Scotland	NE Scotland
	Property type	Semi-detached	Semi-detached
	Heating fuel	Gas	Gas
	Occupancy	Out all day	Out all day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	3.4	3.4
	Estimated generation (kWh / year)	2,579	2,579
	Battery capacity (kW)	N/A	≥3.1 <4.1
	Generation used on site (%)	21%	59%
System costs	Total installation cost (£)	£4,304	£7,174
	Annual running cost (£)	£125	£469
	Electricity price (p/kWh)	18	18
System financing	Type	Mortgage	Mortgage
	Interest rate (%)	3%	3%
	Loan term (years)	3	3
	SEG price (p/kWh)	5.5	5.5
Financial benefits (running cost)	Annual revenue (year one)	£85	£-137
	Annual revenue (year five)	£154	£79
	Annual revenue (year ten)	£226	£297
	Net present value (lifespan)	£5,638	£6,083
	Payback period (years)	20.3	24.1
	Internal rate of return (%)	-2.5%	-9.2%
	Return on investment (%)	131%	84.8%
	Effective annual saving (lifespan)	£188	£203
Financial benefit (equity value)	Indicative sale price increase	£1,815 - £2,765	N/A
Overall payback period**	Effective payback period (years)	14.6	N/A

*Based on UK House Price Index data from March 2021
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Case study 4 – London (social case)

This scenario represents the social landlord case for a home in the UK, based on current energy prices and residential electricity consumption profiles. It includes the respective costs and benefits for the tenant and landlord, as well as the investment figures for the system as a whole.

Property and system details		4a	4b
Property characteristics	Indicative sale price (£)	£543,515*	£543,515*
	Location	London	London
	Property type	End-terrace	End-terrace
	Heating fuel	Gas	Gas
	Occupancy	Home all day	Home all day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	2.38	2.38
	Estimated generation (kWh / year)	2,016	2,016
	Battery capacity (kW)	N/A	≥3.1 <4.1
	Generation used on site (%)	39%	81%
System costs	Total installation cost (£)	£3,013	£5,882
	Annual running cost (£)	£106	£450
	Electricity price (p/kWh)	20	20
System financing	Type	Housing association	Housing association
	Interest rate (%)	1.5%	1.5%
	Loan term (years)	3	3
	SEG price (p/kWh)	11	11
Financial benefits (running cost) – tenant	Annual reduction in electricity bills (£)	£338	£656
Financial benefits (running cost only) – Housing Association	Net present value (£)	£2,554	-£9,517
	Effective annual SEG payments	£186	£-121
	Effective annual saving	£85	£-317
Financial benefit (equity value)	Indicative sale price increase	£1,050 - £3,053	N/A
Returns (whole system)	Payback period (years)	11.4	20.2
	Internal rate of return (%)	10.7%	-1.8%
	Return on investment (%)	418.2%	169.6%
Overall payback period (whole system)**	Effective payback period (years)	8.3	N/A

*Based on UK House Price Index data from March 2021
** This figure will vary depending on if and how the increased equity value of a home with solar installed is realised, and will differ according to the specific characteristics of each home.

Case study 5 – Wales

Property and system details		5a	5b
Property characteristics	Indicative sale price (£)	£145,896*	£145,896*
	Location	Wales	Wales
	Property type	Mid-terrace	Mid-terrace
	Heating fuel	Gas	Gas
	Occupancy	In half day	In half day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	2.04	2.04
	Estimated generation (kWh / year)	1,737	1,737
	Battery capacity (kW)	N/A	≥2.1 <3.1
	Generation used on site (%)	33%	70%
System costs	Total installation cost (£)	£2,583	£4,735
	Annual running cost (£)	£106	£364
	Electricity price (p/kWh)	20	20
System financing	Type	Loan	Loan
	Interest rate (%)	6%	6%
	Loan term (years)	5	5
	SEG price (p/kWh)	8	8
Financial benefits (running cost)	Annual revenue (year one)	£102	£-80
	Annual revenue (year five)	£163	£85
	Annual revenue (year ten)	£230	£261
	Net present value (lifespan)	£7,223	£6,187
	Payback period (years)	15.6	22.4
	Internal rate of return (%)	4.9%	-5.5%
	Return on investment (%)	279.7%	130.7%
	Effective annual saving (lifespan)	£241	£206
Financial benefit (equity value)	Indicative sale price increase	£1,682 - £2,422	N/A
Overall payback period**	Effective payback period (years)	7.6	N/A

*Based on UK House Price Index data from March 2021
** This figure will vary depending on if and how the increased equity value of a home with solar installed is realised, and will differ according to the specific characteristics of each home.

Case study 6 – E Scotland

Property and system details		6a	6b
Property characteristics	Indicative sale price (£)	£251,921*	£251,921*
	Location	East Scotland	East Scotland
	Property type	Detached	Detached
	Heating fuel	Heat pump	Heat pump
	Occupancy	Home all day	Home all day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	4.08	4.08
	Estimated generation (kWh / year)	3,376	3,376
	Battery capacity (kW)	N/A	≥6.1 <7.1
	Generation used on site (%)	45%	88%
System costs	Total installation cost (£)	£5,165	£10,184
	Annual running cost (£)	£143	£746
	Electricity price (p/kWh)	20	20
System financing	Type	Cash	Cash
	Interest rate (%)	N/A	N/A
	Loan term (years)	N/A	N/A
	SEG price (p/kWh)	8	8
Financial benefits (running cost)	Annual revenue (year one)	£309	£-119
	Annual revenue (year five)	£444	£254
	Annual revenue (year ten)	£594	£658
	Net present value (lifespan)	£20,475	£18,509
	Payback period (years)	11.4	19.4
	Internal rate of return (%)	8.0%	-1.4%
	Return on investment (%)	396.4%	181.7%
	Effective annual saving (lifespan)	£682	£617
Financial benefit (equity value)	Indicative sale price increase	£1,733 - £2,640	N/A
Overall payback period**	Effective payback period (years)	8.4	N/A

*Based on UK House Price Index data from March 2021
** This figure will vary depending on if and how the increased equity value of a home with solar installed is realised, and will differ according to the specific characteristics of each home.

Case study 7 – Northern Ireland

Property and system details		7a	7b
Property characteristics	Indicative sale price (£)	£113,700*	£113,700*
	Location	Northern Ireland	Northern Ireland
	Property type	Bungalow	Bungalow
	Heating fuel	Gas	Gas
	Occupancy	Out all day	Out all day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	2.04	2.04
	Estimated generation (kWh / year)	1,657	1,657
	Battery capacity (kW)	N/A	≥3.1 <4.1
	Generation used on site (%)	28%	75%
System costs	Total installation cost (£)	£2,583	£5,452
	Annual running cost (£)	£106	£450
	Electricity price (p/kWh)	20	20
System financing	Type	Mortgage	Mortgage
	Interest rate (%)	3%	3%
	Loan term (years)	3	3
	SEG price (p/kWh)	8	8
Financial benefits (running cost)	Annual revenue (year one)	£82	£-169
	Annual revenue (year five)	£138	£30
	Annual revenue (year ten)	£199	£226
	Net present value (lifespan)	£6,287	£4,977
	Payback period (years)	16	24.2
	Internal rate of return (%)	3.5%	-9.2%
	Return on investment (%)	243.4%	91.3%
	Effective annual saving (lifespan)	£210	£166
Financial benefit (equity value)	Indicative sale price increase	£1,754 - £3,242	N/A
Overall payback period**	Effective payback period (years)	7.4	N/A

*Based on UK House Price Index data from March 2021
** This figure will vary depending on if and how the increased equity value of a home with solar installed is realised, and will differ according to the specific characteristics of each home.

Case study 8 – SE England

In this scenario a longer than standard battery life is assumed, although the battery has a higher degradation rate.

Property and system details		8a	8b
Property characteristics	Indicative sale price (£)	£375,266*	£375,266*
	Location	SE England	SE England
	Property type	Semi-detached	Semi-detached
	Heating fuel	Gas	Gas
	Occupancy	In half day	In half day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	2.72	2.72
	Estimated generation (kWh / year)	2,241	2,241
	Battery capacity (kW)	N/A	≥3.1 <4.1
	Generation used on site (%)	33%	74%
System costs	Total installation cost (£)	£3,444	£6,313
	Annual running cost (£)	£115	£288
	Electricity price (p/kWh)	20	20
System financing	Type	Loan	Loan
	Interest rate (%)	5%	5%
	Loan term (years)	5	5
	SEG price (p/kWh)	8	8
Financial benefits (running cost)	Annual revenue (year one)	£153	£91
	Annual revenue (year five)	£232	£211
	Annual revenue (year ten)	£319	£297
	Net present value (lifespan)	£10,078	£7,845
	Payback period (years)	14.9	22.2
	Internal rate of return (%)	6.0%	-4.4%
	Return on investment (%)	292.7%	124.3%
	Effective annual saving (lifespan)	£336	£262
Financial benefit (equity value)	Indicative sale price increase	£725 - £2,108	N/A
Overall payback period**	Effective payback period (years)	12.7	N/A

*Based on UK House Price Index data from March 2021
** This figure will vary depending on if and how the increased equity value of a home with solar installed is realised, and will differ according to the specific characteristics of each home.

Case study 9 – East Anglia

In this scenario a longer than standard battery life is assumed, although the battery has a higher degradation rate.

Property and system details		9a	9b
Property characteristics	Indicative sale price (£)	£478,474*	£478,474*
	Location	East Anglia	East Anglia
	Property type	Detached	Detached
	Heating fuel	Gas	Gas
	Occupancy	Home all day	Home all day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	5.1	5.1
	Estimated generation (kWh / year)	4,555	4,555
	Battery capacity (kW)	N/A	≥4.1 <5.1
	Generation used on site (%)	30%	60%
System costs	Total installation cost (£)	£6,457	£9,684
	Annual running cost (£)	£162	£355
	Electricity price (p/kWh)	20	20
System financing	Type	Cash	Cash
	Interest rate (%)	N/A	N/A
	Loan term (years)	N/A	N/A
	SEG price (p/kWh)	8	8
Financial benefits (running cost)	Annual revenue (year one)	£367	£337
	Annual revenue (year five)	£525	£522
	Annual revenue (year ten)	£702	£670
	Net present value (lifespan)	£23,771	£22,032
	Payback period (years)	11.9	16.3
	Internal rate of return (%)	7.3%	2.2%
	Return on investment (%)	368.2%	227.5%
	Effective annual saving (lifespan)	£792	£734
Financial benefit (equity value)	Indicative sale price increase	£924 - £2,687	N/A
Overall payback period**	Effective payback period (years)	10.6	N/A

*Based on UK House Price Index data from March 2021
** This figure will vary depending on if and how the increased equity value of a home with solar installed is realised, and will differ according to the specific characteristics of each home.

Case study 10 – NE England

In this scenario a longer than standard battery life is assumed, although the battery has a higher degradation rate.

Property and system details		10a	10b
Property characteristics	Indicative sale price (£)	£146,425*	£146,425*
	Location	NE England	NE England
	Property type	Semi-detached	Semi-detached
	Heating fuel	Gas	Gas
	Occupancy	Out all day	Out all day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	3.06	3.06
	Estimated generation (kWh / year)	2,649	2,649
	Battery capacity (kW)	N/A	≥3.1 <4.1
	Generation used on site (%)	21%	59%
System costs	Total installation cost (£)	£3,874	£6,743
	Annual running cost (£)	£125	£297
	Electricity price (p/kWh)	20	20
System financing	Type	Mortgage	Mortgage
	Interest rate (%)	3%	3%
	Loan term (years)	3	3
	SEG price (p/kWh)	8	8
Financial benefits (running cost)	Annual revenue (year one)	£154	£103
	Annual revenue (year five)	£238	£234
	Annual revenue (year ten)	£331	£333
	Net present value (lifespan)	£10,483	£9,465
	Payback period (years)	14.9	21.1
	Internal rate of return (%)	5%	-2.6%
	Return on investment (%)	270.6%	140.4%
	Effective annual saving (lifespan)	£349	£316
Financial benefit (equity value)	Indicative sale price increase	£1,688 - £2,431	N/A
Overall payback period**	Effective payback period (years)	10	N/A

*Based on UK House Price Index data from March 2021
** This figure will vary depending on if and how the increased equity value of a home with solar installed is realised, and will differ according to the specific characteristics of each home.

Case study 11 – NW England

In this scenario a longer than standard battery life is assumed, although the battery has a higher degradation rate.

Property and system details		11a	11b
Property characteristics	Indicative sale price (£)	£325,348*	£325,348*
	Location	NW England	NW England
	Property type	Detached	Detached
	Heating fuel	Direct electric	Electricity
	Occupancy	Home all day	Home all day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	3.74	3.74
	Estimated generation (kWh / year)	3,029	3,029
	Battery capacity (kW)	N/A	≥11.1 <12.1
	Generation used on site (%)	47%	93%
System costs	Total installation cost (£)	£4,735	£13,342
	Annual running cost (£)	£134	£650
	Electricity price (p/kWh)	20	20
System financing	Type	Cash	Cash
	Interest rate (%)	N/A	N/A
	Loan term (years)	N/A	N/A
	SEG price (p/kWh)	8	8
Financial benefits (running cost)	Annual revenue (year one)	£279	£-70
	Annual revenue (year five)	£401	£208
	Annual revenue (year ten)	£537	£390
	Net present value (lifespan)	£18,488	£8,248
	Payback period (years)	11.5	25.2
	Internal rate of return (%)	7.8%	-11.9%
	Return on investment (%)	390.5%	61.8%
	Effective annual saving (lifespan)	£616	£275
Financial benefit (equity value)	Indicative sale price increase	£629 - £1,827	N/A
Overall payback period**	Effective payback period (years)	10.4	N/A

*Based on UK House Price Index data from March 2021
** This figure will vary depending on if and how the increased equity value of a home with solar installed is realised, and will differ according to the specific characteristics of each home.

Case study 12 – West Pennines

In this scenario a longer than standard battery life is assumed, although the battery has a higher degradation rate.

Property and system details		12a	12b
Property characteristics	Indicative sale price (£)	£184,668*	£184,668*
	Location	West Pennines	West Pennines
	Property type	Semi-detached	Semi-detached
	Heating fuel	Heat pump	Heat pump
	Occupancy	In half day	In half day
System characteristics	Type	PV	PV + battery
	PV array (kWp)	4.76	4.76
	Estimated generation (kWh / year)	4,058	4,058
	Battery capacity (kW)	N/A	≥5.1 <6.1
	Generation used on site (%)	29%	70%
System costs	Total installation cost (£)	£6,026	£10,543
	Annual running cost (£)	£152	£424
	Electricity price (p/kWh)	20	20
System financing	Type	Loan	Loan
	Interest rate (%)	5%	5%
	Loan term (years)	5	5
	SEG price (p/kWh)	8	8
Financial benefits (running cost)	Annual revenue (year one)	£313	£242
	Annual revenue (year five)	£453	£445
	Annual revenue (year ten)	£609	£597
	Net present value (lifespan)	£19,352	£16,915
	Payback period (years)	13.9	20.6
	Internal rate of return (%)	7.5%	-1.3%
	Return on investment (%)	321.1%	160.4%
	Effective annual saving (lifespan)	£645	£564
Financial benefit (equity value)	Indicative sale price increase	£2,129 - £3,065	N/A
Overall payback period**	Effective payback period (years)	10.2	N/A

*Based on UK House Price Index data from March 2021
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