COTSWOLD DISTRICT COUNCIL

Council name	**COTSWOLD DISTRICT COUNCIL**
Name and date of Committee	**CABINET 17 JULY 2023**
SubjectF	**Cotswold residents' group-buying scheme for solar panels**
Wards affected	All
Accountable member	Cllr Mike McKeown, Cabinet Member for Climate Change and Sustainability Email: Mike.McKeown@cotswold.gov.uk
Accountable officer	Claire Locke, Assistant Director Email: claire.locke@cotswold.gov.uk
Report author	Christopher Crookall-Fallon, Head of Climate Action Email: chris.crookall-fallon@cotswold.gov.uk
Summary/Purpose	To obtain Cabinet approval for the Council to enter an arrangement with a company, Switchd Ltd trading as MakeMyHouseGreen, to co-brand and promote a district-wide domestic rooftop solar group purchasing scheme. The scheme's aim is to increase the uptake of solar PV in the district by building on the trust that residents have in the Council as a statutory body, and reducing risk, increasing confidence and ensuring cost-effectiveness for homeowners considering the purchasing rooftop solar PV and battery systems.
Annexes	**Exempt** Annex A – Customer acquisition fee **Exempt** Annex B - MMHG partnership presentation slides
Recommendation(s)	*That Cabinet resolves to:* 1. *Approve the Council's engagement with Switchd Ltd to run a district-wide householder support programme for purchasing solar panels.* 2. *Delegate authority to the Head of Climate Action, in consultation with Cllr Mike McKeown, CDC's Heritage and Design Manager,*

	Publica's Business Manager for Communications and Marketing and Publica's Head of Legal Services to enter into a contract with Switchd Ltd and run a programme of Council communications to support the scheme.
Corporate priorities	• Deliver the highest standard of service • Respond to the climate crisis
Key Decision	No
Exempt	Marked annexes only
Consultees/ Consultation	Cllr Mike McKeown, Cabinet Member for Climate Change and Sustainability Climate lead officers within the Publica Group Assistant Director, Property and Regeneration, Publica Group Business Manager, Marketing and Communications, Publica Group

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1. EXECUTIVE SUMMARY

1.1 This report proposes that the Council should enter a partnership with MakeMyHouseGreen (MMHG), a specialist provider of a proven web platform that supports customers through the specification, purchase and operation of domestic solar PV and batteries.

1.2 Residential solar PV can reduce household carbon emissions and energy cost, and can make a small contribution to the Council's target of a net zero carbon district by 2045.

1.3 Cotswold lags neighbouring districts in the extent of installed domestic solar PV. Potential customers can find purchasing solar PV daunting, and have natural concerns about bad faith actors. The proposed scheme builds on the trust that residents have in the Council to give greater confidence in purchasing solar PV, which may contribute to an increased rate of installation in the district.

1.4 The website operated by MMHG on behalf of the Cotswold-promoted scheme will be co-branded between the Council and MMHG. There is no charge from MMHG for partnering on a co-branded scheme, but a small allocation (£2k) has been made for optional direct marketing costs. Non-direct costs will be incurred in staff time to develop and execute a communication campaign to support the scheme.

1.5 MMHG fulfils the requirements of a partner for delivery of this scheme to residents, and due diligence has been carried out to ensure the company and its product is sound.

1.6 The suggested initial duration of the scheme, which may be regarded as a pilot, is two years. This period can readily be shortened or extended if necessary. Commencement of the scheme will be as soon as possible following Cabinet approval.

1.7 Key risks for the Council include potential reputational damage in the event of poor customer experience (mitigated by due diligence in partner selection and continuous oversight of installations and customer satisfaction), and unforeseen time pressure on officers or councillors in the event of any queries or complaints being directed at the Council (mitigated by clear communication to residents on the correct channels for customer queries, and adequate customer service capacity in MMHG).

2. BACKGROUND

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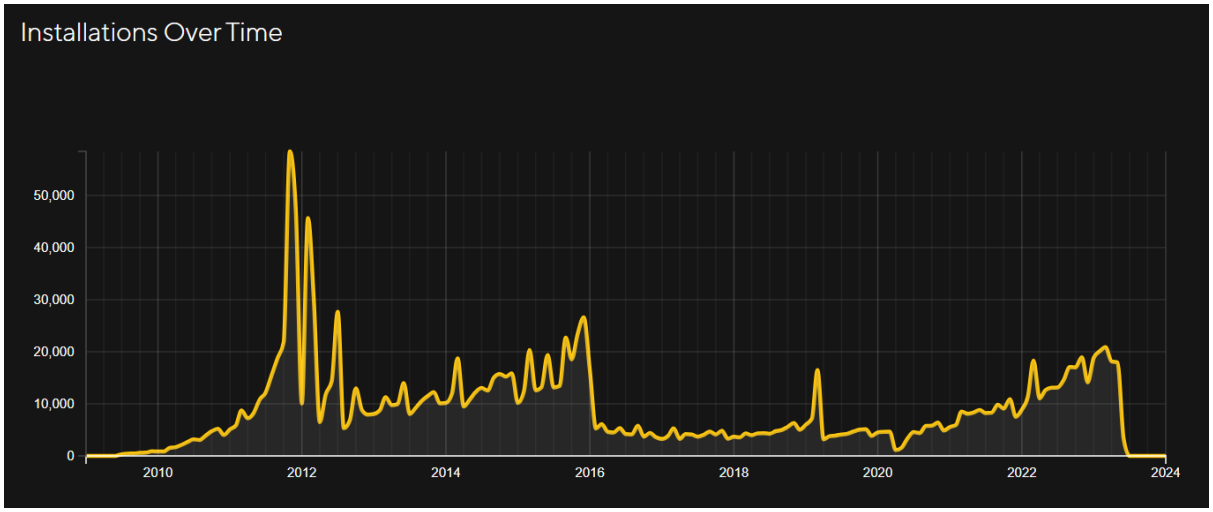
2.1 Residential rooftop solar photovoltaic (PV) panels have the potential to reduce household electricity cost and carbon emissions, and to make a modest contribution to the Council's goal of a net zero carbon district by 2045.

2.2 It is important to note that the dominant source of household carbon emissions is from heating, not electricity. So whilst solar PV makes a contribution to carbon reduction, and is generally cost effective, it is not a single or simple answer to decarbonising home energy.

2.3 Whilst a typical rooftop solar array in a favourable location will generate about as much electricity as a household consumes in a year, the timing match of generation-consumption is relatively weak, with generation concentrated in the summer daytime but consumption higher in the winter and in the evenings. Note however that the use of a battery to store electricity (which is included in this proposed scheme) overcomes some of this mis-match and for this reason has become a very popular add-on to new PV systems.

2.4 Notwithstanding the relatively modest carbon benefit, consumer demand for rooftop PV has grown strongly recently, even without a feed-in tariff to award generation. The graph below[1] shows installations per month from 2009 – driven by generous feed-in tariff subsidies until 2016, then a less generous tariff rate until 2019 (the spike in 2019 was the final month of the feed-in-tariff scheme), and then showing growing demand in response to the increase in and instability of the cost of electricity to households.



2.5 Take-up of solar PV to date by Cotswold district residents (5.33% of households)[2] is by coincidence equal to the average of all UK council areas (average 5.33%, median 4.88%), but

[1] Data from MCS https://datadashboard.mcscertified.com/InstallationInsights
[2] Data from MCS https://datadashboard.mcscertified.com/InstallationInsights

is lower than a selection of neighbouring and near-neighbour council areas (see table below):

	MCS Certified PV Installations Total	% of Households with PV installation	Gross disposable household income as % of UK average
Cotswold	1930	5.33%	105.6%
South Gloucestershire	6674	5.94%	105.9%
Wiltshire	14946	7.11%	105.5%
Stroud	4069	7.92%	105.6%
West Oxfordshire	3602	8.15%	117.4%
Tewkesbury	3324	9.13%	105.6%
Forest of Dean	3358	9.41%	105.6%

2.6 The BEIS (now DESNZ) 2021 report 'UK Rooftop Solar Behavioural Research'[3] concluded: *"**The potential to drive greater adoption of solar PV to help meet net zero commitments is encouraging** given: a) the cost of solar panel installation has declined by 60% since 2010; b) there have been very positive experiences of household Adopters in this study, with expectations met or exceeded in terms of efficiency savings, ease of purchase, maintenance and reliability, and environmental benefits; c) solar offers less disruption and greater familiarity relative to other low carbon measures such as wall and floor insulation and heat pumps; d) the technology is effective at offsetting carbon.*

2.7 The same report drew conclusions that support the principle of a Council-led and endorsed district-wide support scheme, eg: *"There is no stand-out incentive that would encourage the installation of solar panels, but … **Risk mitigation is the strongest single incentive**. … Capability of accessing information was … low, with the perceived difficulty of the buying, installation, and maintenance process also a strong motivational barrier. Central government and **local authorities have a potential role to play in… facilitating an approved list of suppliers – both being strong motivators for Considerers… Providing clear and trusted information about the process is a further way to address these barriers…**"*

3 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001896/uk-rooftop-solar-panel-behavioural-research.pdf

2.8 Whilst there are good reliable sources of information and guidance for homeowners[4], it is nonetheless understandable that homeowners who would like to install solar panels can be hesitant to commit, and may fear mis-selling and cowboy installers, given the unfamiliarity of solar technology and the information asymmetry between customer and the solar industry. There are some well publicised examples of mis-selling[5] despite surveys showing generally high customer satisfaction[6]. An internet search of solar installers returns hundreds of options, and a search on mis-selling returns many advertisements for legal firms offering no-win-no-fee deals to pursue compensation – strengthening the impression of an industry full of bad faith actors.

2.9 Purchasing solar panels (and possibly an associated battery to store electricity) is a significant financial commitment for a homeowner – reported to be between around £6,769[7] and £9,020[8] for a typical 3.5kWp installation (excluding batteries) at 2023 prices.

2.10 In principle, 'solar street' type area-based group buying or bulk buying schemes offer the opportunity for cost effectiveness and quality assurance for participants, but care must be taken to ensure that due diligence on scheme partners is thoroughly carried out, and cost saving is not the only, or even the main, objective of such schemes.

2.11 A report to Cabinet in February 2022 proposed joining a solar PV scheme which operates on a different model to that proposed here, that had been (and continues to be) used by many Local Authorities. Concerns raised about customer experience, subsequent to that Cabinet decision, led to the Council deciding not to proceed. It is important to note that council-endorsed group buying schemes are not an automatic guarantee of customer

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[4] Good examples are Energy Saving Trust (https://energysavingtrust.org.uk/advice/solar-panels/); Which? (https://www.which.co.uk/reviews/solar-panels/article/solar-panels/is-solar-pv-a-good-investment-aIzWf7E3P0dO); The trade association Solar Energy UK (https://solarenergyuk.org/resource/everything-under-the-sun-the-facts-about-solar-energy/); Money Saving Expert (https://www.moneysavingexpert.com/utilities/free-solar-panels/)

[5] Eg the BBC Inside Out episode of 2019 reporting gross mis-selling https://www.bbc.co.uk/news/uk-england-49566130

[6] A 2018 Which? survey found that 93% of solar PV system owners were satisfied with it and solar power is the UK's most popular energy generation technology, consistently scoring over 80% in BEIS public attitude tracker polls.

[7] Specific cost of PV installation, 2023 year to date average value, £1,934/kWp reported by MCS https://datadashboard.mcscertified.com/InstallationInsights

[8] Specific cost of PV installation, 2023 year to date median value, £2,578/kWp, reported by DESNZ monthly solar PV cost tracker, https://www.gov.uk/government/statistics/solar-pv-cost-data

satisfaction[9], and such concerns have been central to the subsequent search for a partner that should be able to provide more confidence to residents and Cabinet members.

3. PROPOSAL

3.1 It is proposed that the Council should enter a collaboration arrangement with Switchd Ltd (https://www.switchd.co.uk/) trading as MakeMyHouseGreen (MMHG) (https://makemyhousegreen.com/), to offer to Cotswold district residents a reliable and trustworthy way to explore, specify and buy solar PV (and batteries if appropriate), for a provisional period of two years. No charge is made by MMHG for the co-branded service, since MMHG revenues depend on sales volume, not on charging for co-branding.

3.2 The purpose of the scheme will be to leverage the trust that residents have in the Council to provide extra reassurance in the solar PV buying process, thereby reducing perceived risk and helping to overcome residents' hesitation, leading to an increased uptake of solar PV in the district.

3.3 The scheme would entail residents being guided through a mainly online and social media-based promotion campaign to a Council-branded 'landing' web page. The page would explain the scheme, provide high level objective advice (such as recommending that residents seek at least one quotation in addition to the MMHG one), provide links to other reliable sources of information, reiterate existing Council guidance (such as the Net Zero Toolkit, and the importance of taking a whole-house view when planning low carbon retrofit interventions) and invite residents to follow through to the website of the Council's scheme partner, MMHG.

3.4 The MMHG website supporting the scheme will be co-branded between Cotswold District Council and MMHG, reinforcing the reassurance to residents that comes from the Council's endorsement and co-design of the scheme. The co-branding will continue through the resident's 'customer journey' up to the point where the resident books a phone consultation with the company, at which point the branding will be MMHG only.

3.5 The key messages to residents will focus on the transparency of the process, the lack of pressure selling, the Council's selection / endorsement of the partner and their business process, the Council's ongoing oversight of installation rate and customer satisfaction, the

[9] https://www.theguardian.com/money/2023/mar/13/solar-panel-firm-leaves-londoners-in-the-dark-about-installations

partner's track record, and householders' ongoing ability to track system performance after installation (refer to exempt Annex B for further detail). The focus of the messages will not be on cost saving, since least cost is not necessarily a desirable objective (in isolation). Nonetheless it should be noted that MMHG reports typical installation costs per kWp lower than the averages reported by government and MCS. Note however that there is no guarantee that MMHG installation costs will be consistently lower than competitors, on a comparable basis.

3.6 MMHG's business model yields a notional discount / commission / customer acquisition fee per customer (refer to exempt Annex A). This sum is available for distribution between stakeholders as determined by the scheme promoter (the Council). The recommendation here is that the bulk of this modest discount is passed through to residents (identifying that the discount comes about through the Council's creation / endorsement of the scheme), with a minor part retained by the Council to offset costs. The logic here is that a) the direct cost to the Council of promoting the scheme is modest, therefore there is no need for the Council to recoup a significant financial outlay, and b) the customer discount may have a positive effect in encouraging scheme uptake among residents.

3.7 In order to visualise the process, the following two screenshots show the initial landing page and linked co-branded MMHG page used by the DIY and building materials business Wickes, which very recently launched its partnership with MMHG on a very similar basis to the Council partnership proposed here:

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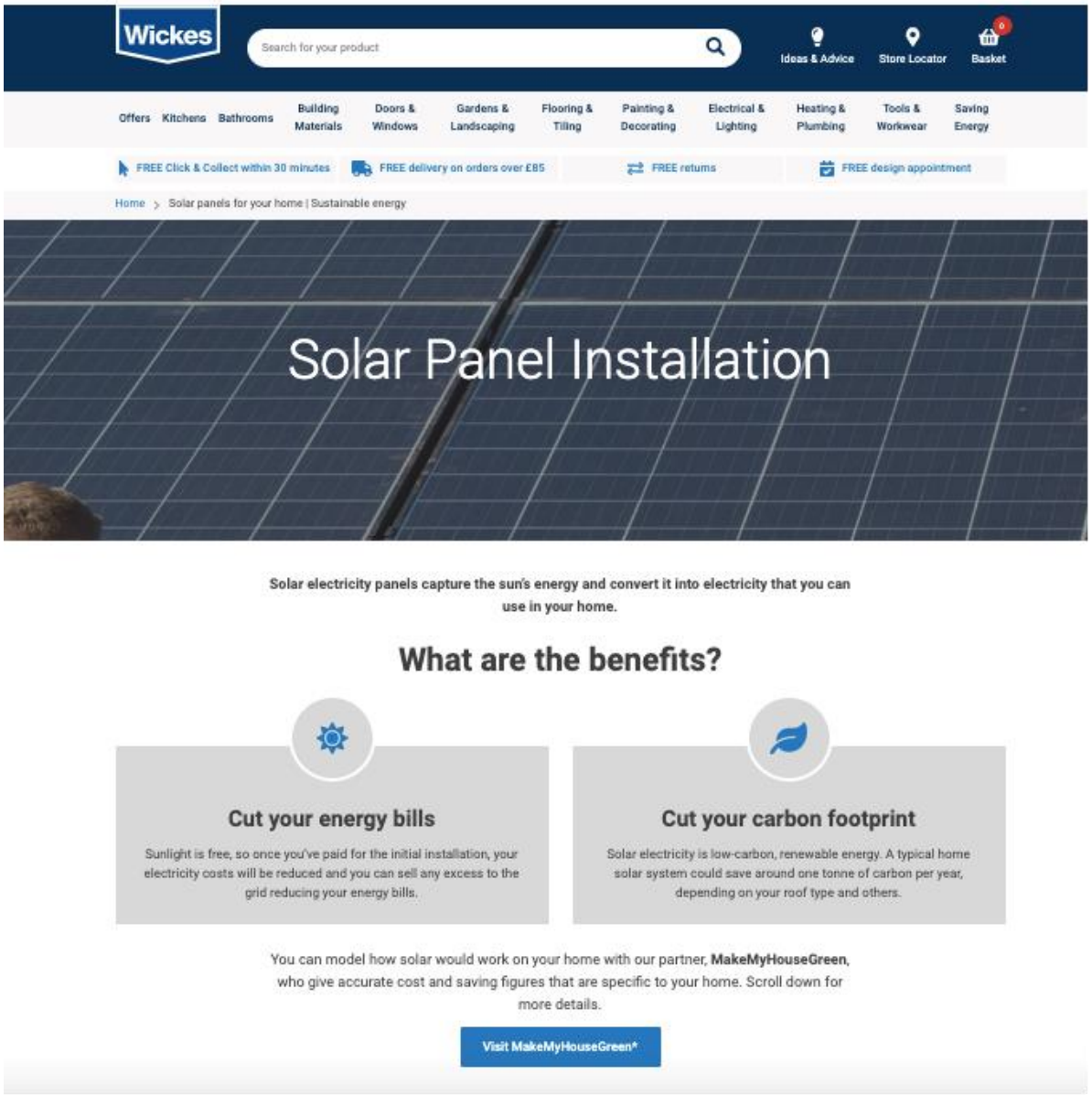
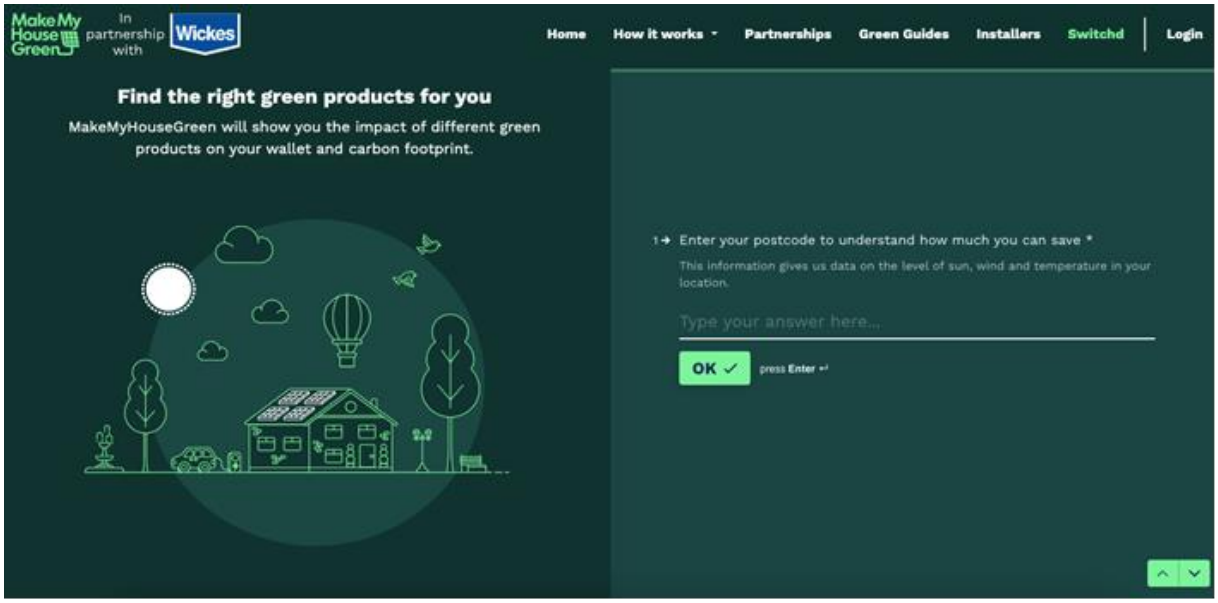




The Cotswold District Council logo would appear on the MMHG website in a similar way to the Wickes logo above.

4. SCHEME PARTNER SELECTION AND DUE DILIGENCE

4.1 Since deciding not to proceed with a previous solar group-buying scheme, officers have explored a number of alternatives that could achieve the same or similar outcome. No service providers have been found that directly replicate the business model of the previous scheme, and smaller-scale, locally-based schemes tied to an individual installer have shown weaknesses.

4.2 The following criteria were applied, and met, as part of the due diligence on the proposed service provider, MMHG:

a) High willingness to co-develop the service to suit the Council's and district's needs;

b) transparency on numbers of residents (anonymised) moving through each phase of the customer journey;

c) transparency on any complaints or negative feedback that arises, and responses to those by MMHG;

d) stated minimum response time by MMHG to any customer concern / complaint;

e) ability to run the scheme at any scale from town to district or larger;

f) responsibility staying with the Council for promoting the scheme, and Council control over messaging;

g) Council control of the initial landing page to guide residents;

h) transparency of the partner's business process, including installer vetting / selection and management;

i) good record of reviews on customer satisfaction reporting sites;

j) good warranties provided for equipment and installation;

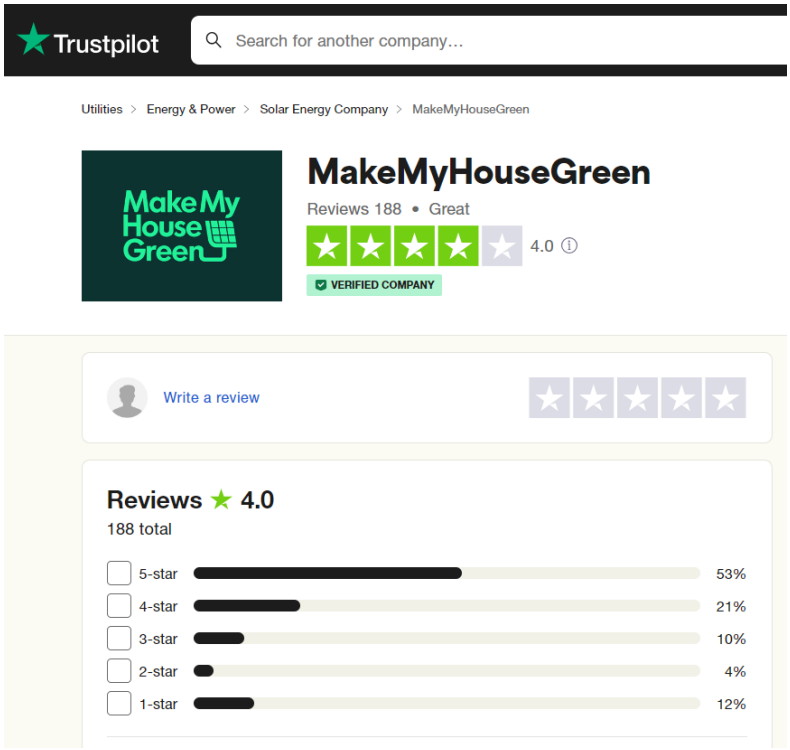
k) vetting of solar panel suppliers to minimise the risk of forced labour in the panel supply chain;

l) maintaining tight central control of equipment procurement, scheduling, installation process and post-installation performance, rather than simply sub-contracting the entire process to third parties;

m) flexibility to choose a depth of engagement, branding and control by the Council;

n) ability of the Council to oversee rate of installation and degree of customer satisfaction through regular and frequent reporting.

4.3 MMHG's current Trustpilot scores are shown below. All customers are encouraged to submit a review to Trustpilot. The 188 reviews reported are in the context of around 450 completed installations, but some reviews are from customers who did not continue through to an installation. MMHG has provided a credible narrative to explain some of the negative feedback, and how business processes have been improved during a phase of rapid business growth.



4.4 In respect of business maturity, investment and partners, note that:

a) Switchd Ltd was established five years ago, the MMHG brand about two years ago.

b) Nationwide Building Society invested in Switchd Ltd some years ago, in order to grow the MMHG offer and run a solar PV pilot programme for Nationwide members (branded throughout as Nationwide, rather than the co-branded approach proposed here). Nationwide BS has an extremely low tolerance to reputational risk.

c) The Dunn and Bradstreet (D&B) report for Switchd Ltd is satisfactory.

d) Two recent businesses choosing to work with MMHG are Wickes and Santander, each rolling out the offer to their own customer base. Switchd Ltd reports that other high street names are in negotiation.

4.5 In terms of precedent, note that this will be the first collaboration between MMHG and a Local Authority. If successful, MMHG would like to see this replicated in local government. Note that the other Publica councils have been party to discussions with MMHG and at least one is likely to replicate this scheme if the Cotswold-led pilot is successful.

4.6 Regarding support for local economic development and added value to the district economy, note that at present MMHG reports sufficient installer capacity close to the district that additional demand created by the scheme can be met in the short term. In the event of demand rising more quickly than expected, MMHG is willing and keen to recruit further installer(s) within or close to the district. This is one of the advantages of the MMHG model, in contrast to other wide-area Local Authority schemes that have contracted with national providers.

5. ALTERNATIVE OPTIONS

5.1 Option 1: Do not proceed, and do not provide any assistance to Cotswold residents that are interested in but hesitant to purchase rooftop solar PV.

5.2 Option 2: Do not proceed with the MMHG partnership, but create web pages within the Council's website to signpost residents to sources of reliable and objective guidance, to increase their knowledge and confidence in respect of solar PV and battery purchases, and reduce the risk of poor outcomes.

5.3 Option 3: Do not proceed with the co-branded MMHG partnership, but instead work closely with MMHG to build a fully Cotswold District Council branded and controlled version through MMHG's 'white label' proposition, similar to the approach taken by Nationwide. This option would entail a cost (see Financial Implications section and exempt Annex B) but would enable the Council to present to residents a fully featured PV purchasing platform under Council-only branding throughout the customer journey, and (in principle) complete Council control over all aspects of the scheme, including equipment and installer selection.

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6. CONCLUSIONS

6.1 A co-branded MMHG collaboration demonstrates a pro-active approach by the Council to minimising PV purchase risk to residents, improving resident confidence and, in principle, increasing the speed of uptake of solar PV in the district.

6.2 Domestic PV usefully reduces purchased electricity cost and carbon emissions for homeowners and makes a very modest contribution to the district-wide carbon emissions objective.

6.3 We recommend that a Council-MMHG co-branded approach is cost effective for the Council and strikes the right balance between visibility of the Council's commitment and engagement with residents, the effectiveness of the scheme, and the degree of Council control, cost and complexity.

7. FINANCIAL IMPLICATIONS

7.1 There is no direct cost in entering the arrangement with MMHG in which the first phases of the customer journey are co-branded between the Council and MMHG. MMHG's profit is underpinned by the volume of sales, not charging for the co-branding.

7.2 There is a staff time cost in designing and running a promotion / information campaign to drive traffic to the Council's scheme landing page, and staff time in creating the landing page and further managing the scheme.

7.3 The direct cost of targeted social media advertising for the scheme is likely to be no more than £1,000 per year. It is proposed that a £2,000 budget for scheme direct costs should be earmarked from the climate studies fund.

7.4 If a decision was taken to pursue alternative option 3 and develop a fully Council-branded ('white label') offer for residents, a separate negotiation would be needed with MMHG, and the cost (estimate) is explained in exempt Annex B.

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8. LEGAL IMPLICATIONS

8.1 Procurement has confirmed that the Council may enter a contract with MMHG, after no equivalent commercial offer has been found.

8.2 The contract for installation of panels will be between the homeowner and provider and any poor performance could be addressed by the homeowner enforcing their usual consumer rights. There is a theoretical possibility that homeowners might attempt to hold the Council liable in negligence law for poor service when that service has been endorsed by the Council, but as long as we have taken all reasonable steps to ensure the provider is reputable and reliable we could be able to resist claims against us. In any case there is a general rule that claims for financial loss or property damage could not be made in negligence law and would have to be addressed as a breach of contract.

9. RISK ASSESSMENT

9.1 The principal risks in relation to proceeding with the preferred option are:

a) **Risk**: Reputational damage in the event of poor customer experience. **Mitigation**: i) published customer satisfaction scores show a generally high level of satisfaction; ii) discussion with the contractor demonstrating that steps have been taken to address the causes (principally customer communication) of some earlier poor scores; iii) contractor transparency over capacity in their customer-facing team (six FTEs); iv) transparency over statistics on the customer journey and any complaints that arise; v) transparency over MMHG's selection / vetting process for sub-contracted installers; vi) the Council's ability to track residents' progress (anonymously) through the the customer journey, and degree of customer satisfaction, through frequent reports from MMHG's platform.

b) **Risk**: Unforeseen time and resource pressure on either members or officers in the event that complaints or queries are submitted direct to the Council instead of MMHG (such events have been seen in other Local Authorities not linked to MMHG). **Mitigation**: i) clarity provided to users on channels for complaints or queries; ii) minimising risk of adverse outcomes as per point a) above.

c) **Risk**: Overall programme fails to reach, help or persuade sufficient residents to purchase PV. **Mitigation**: i) No target has been set for the number of households that express interest or go through to installation, given that there is no associated revenue

target to meet; ii) any early evidence of a lack of engagement can be used to refine the promotion campaign.

d) **Risk**: Programme takes longer to launch than anticipated. **Mitigation**: i) It will be necessary to work within the capacity limitations of the comms team, but whilst we should launch as soon as possible there is presently no hard deadline for launching the scheme. It will benefit the scheme if we do it 'right' rather than do it 'quick'.

e) **Risk**: Criticism directed at the Council for supporting technology that is only available to relatively well-off homeowners with capital to spare. **Mitigation**: i) Communicating that the Council advice is aimed at all householders, including those with less capital to spare that may be at risk of mis-selling of PV, particularly mis-selling of financing packages; ii) using the scheme to give links to Council partners (such as Severn Wye Energy Agency's Warm and Well scheme) and other sources of objective advice showing which least cost interventions give the greatest energy cost savings.

f) **Risk**: Criticism directed at the Council for promoting solar PV over lower cost or higher priority carbon saving measures as set out in the 'whole house' and 'fabric first' retrofit principles described in the Council's own Net Zero Carbon Toolkit[10]. **Mitigation**: i) Communicating clearly (eg through the scheme landing page) that we encourage residents to follow fabric-first principles and to do all they can to decarbonise their homes following a logical 'hierarchy'; ii) using interest in the PV scheme to reinforce such 'hierarchy' messages, accepting that this may lead some residents (if motivated by climate more than cost) to abandon or postpone a PV investment; iii) communicating that, notwithstanding fabric-first principles, there is evident consumer interest in solar PV and therefore the Council's objective is to help ensure that those residents that want to invest do so with least risk.

9.2 The principal risks in relation to alternative option 1 (not proceeding with the scheme) are missing the opportunity to support residents and accelerate uptake of a technology that can make a modest contribution to the district-wide goal of emissions reduction.

9.3 The principal risk in relation to alternative option 2 (not running a scheme but providing signposting advice) is the likely smaller 'reach' of such advice, and the lower value-add in terms of evidencing the Council's commitment to the climate objective.

9.4 The principal risks in relation to alternative option 3 (building a fully Council-branded service under a 'white label' arrangement) would include a) that the expenditure, compared to the very low cost approach proposed in this report, may not result in a correspondingly higher

[10] https://www.cotswold.gov.uk/media/05couqdd/net-zero-carbon-toolkit.pdf

engagement and larger numbers of residents coming through the scheme, resulting in poorer cost effectiveness overall, and b) the potential for criticism of the Council committing limited funds to a scheme that, undeniably, benefits better-off households.

10. EQUALITIES IMPACT

10.1 No equalities impacts foreseen in relation to protected characteristics defined in equality legislation.

10.2 It should be noted that concerns have been raised within the PV industry in respect of the risk of forced labour in the PV supply chain (principally relating to the exploitation of the Uighur minority population in China in the manufacture of silicon, a key input to all solar panels). This risk has been flagged by the Council in its own direct procurement of solar PV, and has been flagged here with the scheme provider MMHG. The Council has been assured that the equipment wholesaler used by MMHG conducts regular due diligence and factory audits of its brands to ensure no use of forced labour. We should note here that 'no use of forced labour' is very hard to guarantee, given poor disclosure and the complexity of supply chains for Chinese manufactured panels.

11. CLIMATE AND ECOLOGICAL EMERGENCIES IMPLICATIONS

11.1 The principal beneficial climate impact of rooftop solar PV is the displacement of grid electricity, thereby saving the carbon emissions associated with national electricity generation. This carbon saving is achieved whether the PV electricity is wholly consumed within the house / building, or whether it is exported back into the grid.

11.2 It is worth noting that a typical domestic solar PV installation of about 3.5kWp will generate roughly as much electricity as a typical mid-size house consumes in a year. Therefore, ignoring the definitions of 'green tariffs' and ignoring the time-of-day and seasonal mis-match between solar generation and electricity demand, a standard PV installation can be considered to 'offset' or displace the entire annual carbon footprint of the home's electricity consumption.

11.3 It is important to note that household electricity consumption generally has a much smaller carbon footprint than home heating (usually gas or oil), so saving carbon through PV generation will normally be a relatively modest contribution to reducing overall household emissions. This balance is set to change in the future however, as more households move to electric space heating (heat pumps) and to electrification of private vehicles (which will increase electricity consumption).

11.4 For the district as a whole it is worth noting that domestic electricity emissions account for only about 7% of total estimated district-wide emissions[11]. This does not mean that tackling domestic electricity emissions is not important, but simply emphasises the scale of the challenge in other sectors.

11.5 Each average 3.5kWp installation will save about 580 kgCO2e per annum, based on the government's latest published estimate[12] of average annual carbon intensity of electricity. It is important to note that the carbon intensity (kgCO2e/kWh) of UK grid electricity has fallen steeply over the last decade, and is set to fall further, quickly. This is good news, but means that the lifetime carbon savings from solar PV installed now are harder to estimate, and will become less each year. This does not mean that the investment is not worthwhile from an emissions perspective.

11.6 In respect of energy and carbon payback period for PV systems, it should be noted that hard data is hard to come by. Environmental Product Declarations (EPDs) are less available for PV systems than for many other building materials. Energy and carbon payback time depends on where panels are made and the carbon intensity of the grid electricity they displace. Using carbon intensity values estimated by Etude[13] (one of the authors of the Council's Net Zero Carbon Toolkit) indicates a carbon payback time of around 3-4 years. Energy payback time[14] may be taken as roughly half the carbon payback time (around 1.5 years).

12. BACKGROUND PAPERS

12.1 The following documents have been identified by the author of the report in accordance with section 100D.5(a) of the Local Government Act 1972 and are listed in accordance with section 100 D.1(a) for inspection by members of the public:

- Cotswold District Council Climate Emergency Strategy, September 2020 https://www.cotswold.gov.uk/media/8d8eab9716634de/cdc-climate-emergency-strategy-adopted-2020_09_23.pdf
- Cotswold District Council Net Zero Carbon Toolkit, 2021 https://www.cotswold.gov.uk/media/05couqdd/net-zero-carbon-toolkit.pdf

[11] 2020 data from https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-national-statistics-2005-to-2020
[12] 2022 data from https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022
[13] https://etude.co.uk/how-we-work/low-embodied-carbon-of-pv/
[14] https://radar.brookes.ac.uk/radar/file/108c4e1c-f9e2-4973-86b6-bd0b7d992585/1/Solar%20cell%20energy%20payback%20times%20and%20environmental%20issues%20-%202020%20-%20Fthenakis%20Leccisi%20Raugei.pdf

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12.2 These documents will be available for inspection online at www.cotswold.gov.uk or by contacting democratic services democratic@cotswold.gov.uk for a period of up to 4 years from the date of the meeting.

(END)