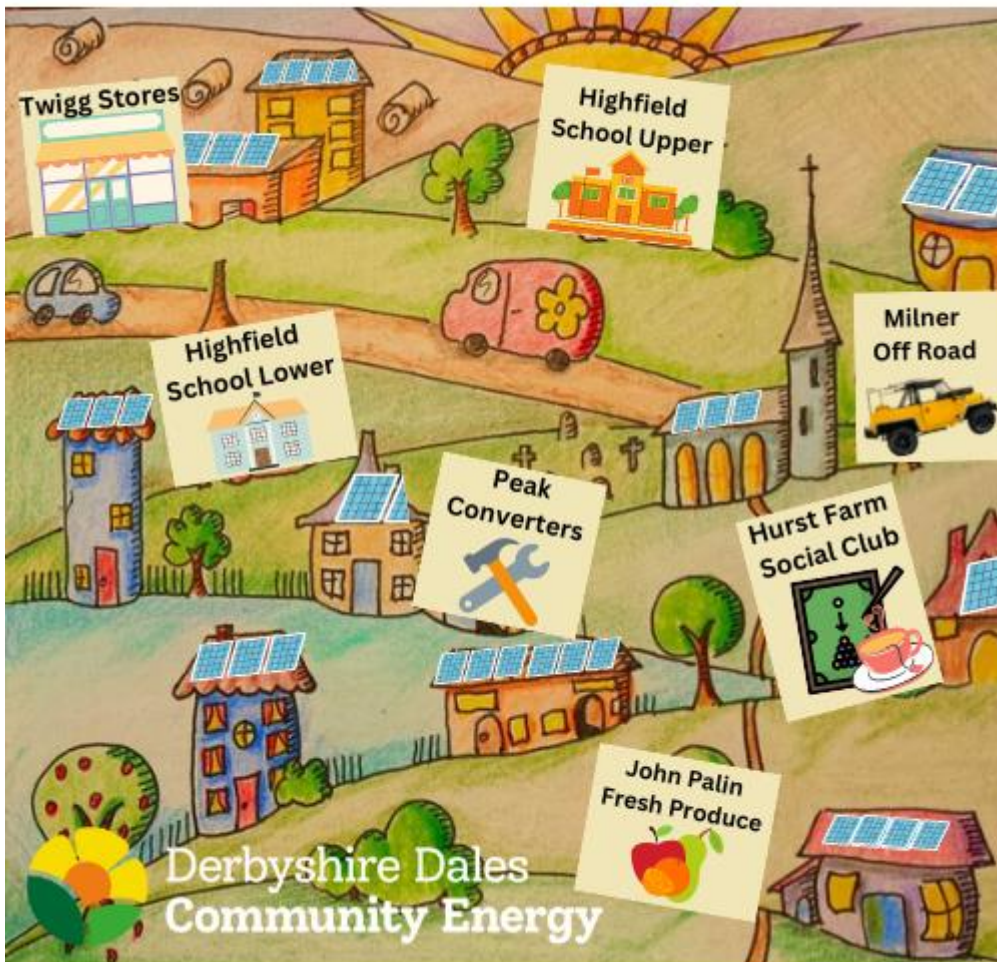


Derbyshire Dales Community Solar



A Report on behalf of
Derbyshire Dales Community Energy
Funded by Rural Community Energy Fund (RCEF) Stage 2

Richard Lane, Shareenergy
Version 1, March 2023



Derbyshire Dales
Community Energy

Contents

1.	Executive Summary.....	2
2.	Introduction	2
2.1.	Business Model and Approach.....	3
3.	Site Modelling and Assessment	4
3.1.	Sites Progressing to Installation.....	4
3.2.	Sites Still Under Negotiation	6
3.3.	Sites Not Progressing	7
4.	Delivery	8
5.	Community Engagement	10
6.	Financial Projections	11
6.1.	The Tendering Process.....	12
7.	Community Benefits.....	13
8.	Planning & Permitting.....	14
8.1.	Planning Consent.....	14
8.2.	Grid Connection.....	14
9.	Conclusion	15
10.	Appendices	16
10.1.	Appendix A: Sites Identified by Feasibility Study	16
10.2.	Appendix B: All Sites Considered for this Study.....	17
10.3.	Appendix C: Detailed Description of Final Sites	19
10.4.	Appendix D: Publicity and engagement materials.....	23
10.5.	Appendix E: Press Coverage.....	25
11.	Document control.....	26

1. Executive Summary

Derbyshire Dales Community Energy, a Community Benefit Society based in Matlock, has worked with support from Matlock Town Council, Derbyshire Dales District Council and Derbyshire County Council to assemble a portfolio of sites that may host community owned rooftop photovoltaic arrays. 47 sites have been considered in the process, with a final portfolio of seven sites being brought forward. Four of these are confirmed and proceeding toward installation, with a further three sites still under negotiation.

Structural surveys and planning approvals were successfully completed out on all four sites, and a tendering process for an installer was also carried out. Grid connection applications have been submitted for two of the sites with one successfully approved by project close.

Due to considerations of capacity in the local group and concerns about the risk and viability of the small size of the portfolio of confirmed sites, Derbyshire Dales Community Energy took the decision to develop the sites through the Big Solar Co-op. The Big Solar Co-op is a nationwide carbon-first non-profit working to install and operate PV arrays on sites across the UK.

This had several implications for the project as initially defined: whilst there would still be local raising of share capital, these shares would be in the national co-operative. Installation and procurement would be done through the Big Solar Co-op's pipeline, although pledges were secured to use local contractors and to develop sites for local community benefit that might not be viable if considered in isolation.

As a result of this project, at least two community owned PV arrays will be installed in Derbyshire Dales this calendar year, with more to follow. A community energy network has been established across Derbyshire and the county and community are rapidly expanding its ambitions.

2. Introduction

Matlock Town Council (MTC) officially recognized the Climate and Ecological Emergency in June 2019. As part of their response MTC would support the establishment of community owned renewable energy, owned and operated for community benefit. A feasibility study was undertaken for Matlock Town Council by Leapfrog in 2021-22, funded by a Rural Community Energy Fund (RCEF) Stage 1 grant. This study examined eight potential sites with the aim of identifying the two sites most viable for further development into a community energy project.

Derbyshire Dales Community Energy (DDCE) was established in 2020 with the support of MTC and incorporated in January 2022. One of its objectives is the development and operation of community owned renewable energy projects for the benefit of the Derbyshire Dales area for the mitigation of climate change.

DDCE successfully bid for RCEF Stage 2 funding to build on this feasibility study, bringing sites to the point of share issue. Shareenergy was chosen to perform this project development work.

The aims of this work were initially defined as:

- to secure the two sites identified in the RCEF Stage 1 feasibility study, including all required legal work, assessment and permissioning;
- the development of a full business plan, financial projection and investment model;
- the selection of an appropriate installation partner for the work;
- engagement with the community; and
- the management of the project to the point of installation.

The eight sites identified in the Stage 1 study are listed in Appendix A, which also includes the results of any subsequent investigation taken into the sites.

2.1. Business Model and Approach

The business model assessed in both Stage 1 and in this project are both based around behind-the-meter connection of rooftop solar photovoltaic (PV) arrays. In this model, the community energy group installs and manages an asset installed on leased roof area at a host site. Electricity is sold onsite to the host via a Power Purchase Agreement (PPA) at a rate representing a significant saving on their grid supply price. Excess electricity not consumed onsite is sold (usually at a much lower rate) through the grid via a separate PPA. Capital is raised by community investment, and the sales of electricity fund the interest and repayment of this capital, with surpluses being used for community benefit. For this model to work a host site needs a significantly sized and suitable roof and a high level of electricity demand during daylight hours.

A key consideration added to this in Stage 2 is that of risk: with the small portfolio of two sites proposed by the Stage 1 assessment, the project is extremely exposed to the risk of either site ceasing to buy the solar energy for any reason. A host may move site, cease trading, or experience electrical or structural problems necessitating the disconnection of the array. In order to mitigate this risk a key element of the work to be done during this project is to widen the portfolio. To this end, many more sites were considered and modelled for inclusion in the eventual portfolio.

3. Site Modelling and Assessment

In all, 47 sites were considered, with 24 undergoing some degree of modelling. The figure below shows how sites filtered down from those initially considered to those contacted, those that responded, those that were modelled and those that agreed to proceed. The full list of sites modelled is provided at Appendix B and an overview of the reasons for sites not proceeding is given below in section 3.3.

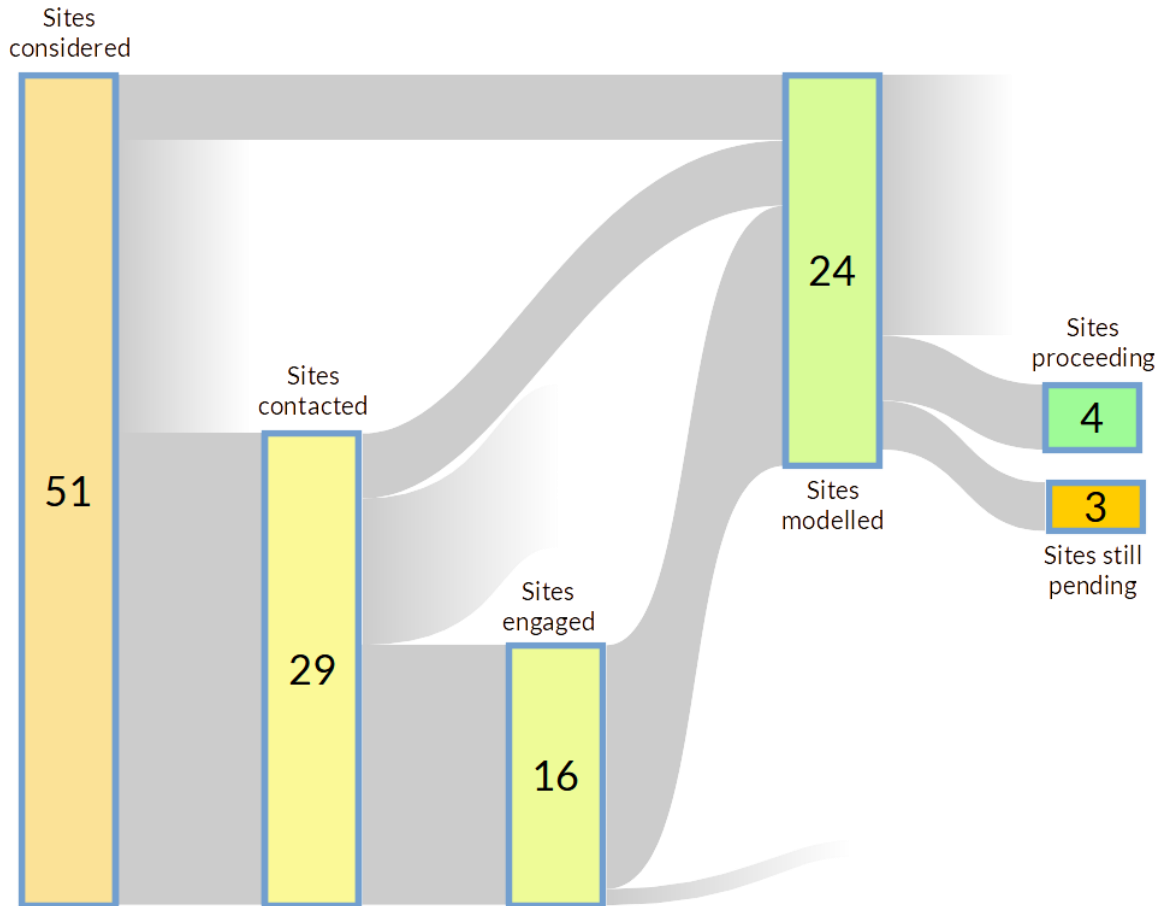


Figure 1- Site journeys from initial consideration

3.1. Sites Progressing to Installation

By the close of this project four sites are proceeding toward installation. These are:

Twigg Stores (Bakewell Road, Matlock, DE4 3AU, [///sour.valued.track*](https://sour.valued.track))

A site identified in the Stage 1 study, this building comprises a hardware retail unit, warehouse storage and the offices for the William Twigg (Matlock) Ltd company.

Twigg is a high profile local company, founded in 1905 and well known for steel fabrication and engineering as well as retail. The company is very community-minded and has been supportive of the project throughout. Their (larger and more energy

* These three-word-sequences prefixed with three forward slashes are What3Words references, which define a location worldwide to a within a three metre square based on English words. The locations can be seen on a map by going to <https://what3words.com/>.

intensive) steel fabrication plant was also identified as a primary site in Phase 1 but not progressed in this work due to its roof, which is almost entirely asbestos.

John Palin Wholesale (Old Coach Rd, Tansley, DE4 5ND, [///client.skin.organs](http://client.skin.organs))

John Palin Wholesale is also a long-established company with deep community links, supplying fresh food to schools and other local institutions, and can trace its history back to the 1840s. Their warehouse includes extensive refrigeration and therefore has a high energy demand which matches well with the higher PV generation in summer.

Milner Off Road (Old Road, Darley Dale, DE4 2ER, [///drizzly.crust.expanded](http://drizzly.crust.expanded))

A retailer and repair shop for off-road vehicles. As with Twigg the site comprises retail, warehousing and offices, with a workshop on a separate incoming mains supply. The electricity consumption of the site is only moderately high for the building size, with electric warehousing vehicles (pallet truck and high-level forklift) being charged mainly out of hours.

The Farmer's View (Hazel Grove, Matlock DE4 3ED, [///ruler.towns.driven](http://ruler.towns.driven))

Run by The Hurst Farm Social Club CiC (its former name), this site is a recently-refurbished community centre which hosts a foodbank/community pantry, bar and venue, "community living room" warm hub, café and small (fully-electric) commercial kitchen in which catering courses are run and food is prepared for a meals-on-wheels service. It is a valuable asset making a significant contribution to the regeneration of the neighbourhood: a 1950s council estate now struggling with high levels of fuel poverty and deprivation. The Farmer's View is a new venture, having been established for less than one year at the time of writing, with many activities and facilities only coming onstream over the summer. For this reason it has not been possible to get an estimation of its annual energy use.

Detailed descriptions of each site and the array layouts proposed are shown in Appendix C. The characteristics of the sites and arrays are summarised in Table 1:

	Twigg	John Palin	Milner	Farmer's View
Annual electricity use	62.0MWh	561MWh	58.6MWh	Unavailable ^[1]
Roof construction	Standing seam metal	Standing seam metal	Plastic cladding	Flat (5°) warm roof with EPDM surface
Array capacity	59.3kWp	75.5kWp	61.9kWp	26.3kWp
Annual PV yield	47.6MWh	56.4MWh	53.6MWh	22.0MWh
Onsite self-consumption	64% ^[2]	95% ^[3]	51% ^[4]	Unknown ^[1]
Import avoided	49%	9.6%	47%	Unknown ^[1]

Table 1 - Potential arrays at engaged sites

Notes:

1. See text above regarding the unavailability of energy data for The Farmer's View. For the financial modelling an onsite energy consumption of 60% was used; this is

regarded as pessimistic in the context of the full range of activities that the site is intended for.

2. *Based on five meter readings interpolated using known patterns of activity*
3. *Based on supplied half-hourly energy data*
4. *Based on energy consumption profiles constructed from monthly bills incorporating the known pattern of activity.*

3.2. Sites Still Under Negotiation

A further three sites have signalled their interest but have not progressed to the point where an offer could be made for installation, for different reasons in each case. The three sites are:

Arc Leisure Centre (Bakewell Rd, Matlock DE4 3AZ, [///petted.amicably.bunny](http://petted.amicably.bunny))

A 'secondary' site identified by the Stage 1 study, this is a relatively new leisure centre comprising gymnasium facilities with sports halls and a large swimming pool. It has an extensive modern roof and very high energy consumption. The imported electricity is, however, much lower due to the presence of a gas CHP system which generates electricity whilst heating the space and water for the site during the daytime. This means that the majority of its current electricity demand (around 292MWh per year) is already generated onsite and therefore cannot be supplied by a PV array.

As part of a commitment to decarbonisation, the future of the CHP system is under review, which would mean that the site would stand to benefit greatly from PV energy. An analysis of supplied half-hourly data put as estimate of the consumption in the absence of the CHP system at 640MWh. However, during the timescale of this project the site became part of a Public Sector Decarbonisation Scheme programme by Derbyshire Dales District Council (DDDC) – this includes plans to install a PV array. PV arrays are only fundable through this scheme as a secondary measure to supporting the decarbonisation of heat onsite – this means that it is possible that the funded array may leave a significant shortfall. There may therefore in future be the possibility of co-locating a community array alongside a Council-installed one, provided that the CHP system is indeed removed. This will become clearer when the PSDS project is developed, planned for the financial year 2023-24.

Nenplas (Blenheim Rd, Ashbourne DE6 1HA, [///sushi.obstinate.steroids](http://sushi.obstinate.steroids))

Nenplas is an extensive plastics extrusion factory on the Ashbourne Airfield Industrial Estate. It has a huge annual electricity demand of 6.0GWh, with the plant operating on shifts 24 hours a day for five days a week. This means that although the roof could potentially support an array of 602kWp, the yield of 495MWh/yr would only displace around 7% of their energy needs.

Meetings have taken place with Nenplas senior management, a site visit has taken place, and a proposal for a potential PV array has been submitted. This site is therefore reasonably likely to proceed, but no commitment has yet been received from the management.

Peak Converters (Water Lane, Wirksworth DE4 4AA, [///newsprint.left.timer](http://newsprint.left.timer))

Peak Converters Ltd is another long established local business, reportedly the largest employer in Wirksworth in the 1990s. The site, which makes foam for upholstery and clothing, has been expanded since the 1970s, with additional buildings being constructed around a large central warehouse. The factory operates a two-shift pattern 8am-1am Monday to Friday and consumes around 800MWh per year. The company is supportive and enthusiastic about the prospect of community partnership and onsite renewables, but unfortunately the large central warehouse has an asbestos roof. Whilst it may be possible to install an array of reasonable size split between the more modern roofs there are issues with shading and access that are difficult to resolve. It may be possible to progress this site either after detailed negotiations and a visit from an installer, or at the point where the roof is replaced.

3.3. Sites Not Progressing

The remaining 27 sites did not progress for a variety of reasons, as shown in summary in Figure 2.

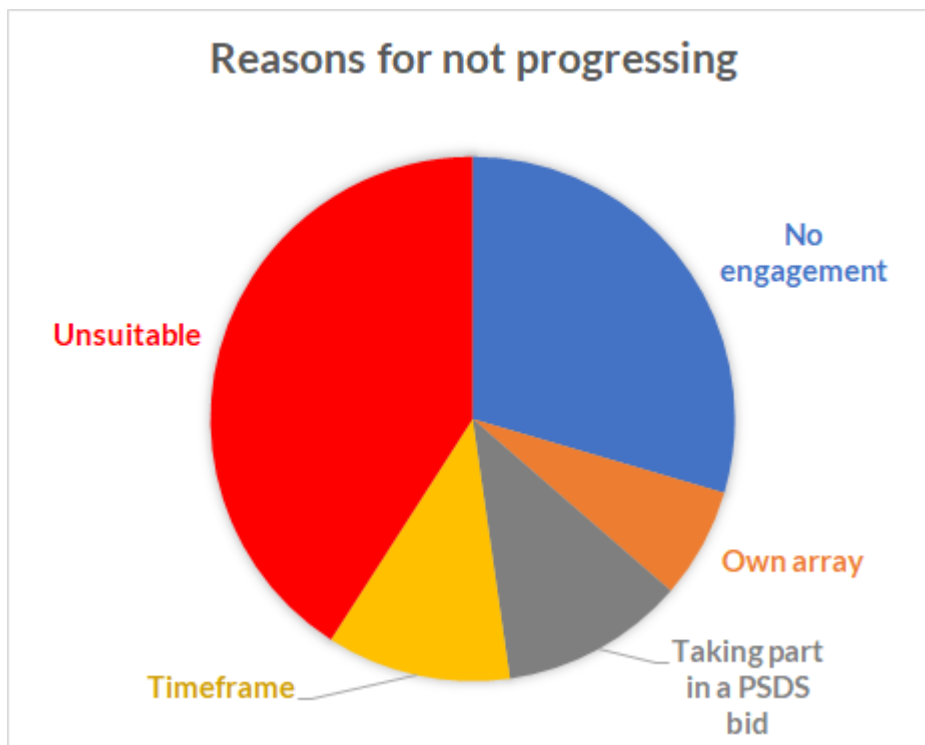


Figure 2 Reasons for sites not progressing.

Sites were unsuitable due to roofs being small, shaded or in poor condition, or due to a low likelihood of significant electricity consumption onsite. Three sites had plans either in train or already completed for their own PV arrays. Five were taking part in a Public Sector Decarbonisation Scheme programme, either via DDDC or the East Midlands Educational Trust (EMET), owners of the two Highfields School sites identified in the Stage 1 study, and therefore would be likely to also install their own PV arrays in due course.

Five sites did not progress purely due to time constraints – either caused by their situation or the need to progress the DDCE project. These sites could plausibly be the subject of further investigation in future.

4. Delivery

The most appropriate delivery mechanism for PV arrays at these sites is a key consideration. Although DDCE’s aims were initially to develop and operate community energy assets in the area for the benefit of the local community, it was important to consider how such a project would be managed and administered over the 25-year typical duration of community solar contracts. With a small portfolio and no other areas of activity, community energy projects typically rely on large pools of volunteer labour, which represents a significant commitment as well as the need for succession planning.

Based on a clear-sighted view of their capacity, DDCE concluded that they could not in good faith make a proposal to local businesses based on a 20-year-plus commitment, and that a better model for the delivery and management of the sites identified was to put them in the hands of a professional delivery partner. To this end the DDCE Board decided to work with the Big Solar Co-op.

The Big Solar Co-op is a nationwide carbon-first non-profit composed of volunteer and investor members, with a core of professional staff working to install and operate PV arrays on as many viable sites as possible across the UK. It was founded to respond to this problem within the sector of community energy groups struggling to maintain capacity to manage existing schemes, which in many cases became a blocker on the development of additional PV, and to bring scale to the problem of narrow margins and high risk on potential PV sites. During the course of this project it ran its first share issue, raising over £840,000, which will fund the installation of PV on at least three sites.

DDCE will continue to be the lead point of contact with sites in the area, and work toward identifying further sites for future development.

The below table lists the four sites progressing toward installation and the milestones passed during the project period:

Site	Agreement in principle	Structural survey completed	Legal searches complete	Planning approval obtained	Proposal and financial offer made	Proposal accepted	Grid connection applied for	Grid connection approved
Twigg Stores	✓	✓	[1]	✓	✓	✓	✓	
John Palin Wholesale	✓	✓	✓	✓	✓	✓	✓	✓
The Farmer’s View	✓	✓	✓	N/A ^[2]				
Milner Off-Road	✓	[3]	✓	✓	✓			

Table 2 - Milestones passed for sites progressing

Notes:

1. *No title deed has been registered with the Land Registry for the Twigg Stores site – reflecting the fact that the site has not been sold since registration became compulsory. However, the title deed has been shared with the solicitors supporting this project and searches are being carried out.*
2. *No Prior Approval application is required for The Farmer's View as the array is under 50kWp in capacity. See section 8 for more details.*
3. *Whilst a structural survey has not been completed for Milner Off Road the roof is in excellent condition, the building very new, and we have confirmed its suitability for installation with the roofing manufacturer. Nonetheless a structural survey will take place before installation.*

Structural surveys were also conducted on the two Highfields School sites, before it became clear that EMET would not be allowing these to proceed. The surveys identified only one significant problem with any of the sites remaining in the pipeline – the strength of the roof at The Farmer's View. This roof, a timber-supported warm roof, does not have the strength to support the sort of ballasting that would usually be used to overcome wind loading for an array on a flat roof. This has implications for the cost of installation at this site, and therefore the viability.

Title deed searches were carried out by our legal partners, Spencer West Partners LLP on 10 sites, and revealed no restrictive covenants or other obstacles to establishing and registered a roof lease.

5. Community Engagement

DDCE has had a good level of support and engagement from the local council and community throughout their RCEF journey and has received good coverage in the press. As part of this project a communication strategy and full branding was created for DDCE, including a logo and website (available at derbyshiredalesenergy.org.uk). DDCE was supported to create a full media toolkit, including:

- Biographies & photographs of DDCE personnel
- Key messages and media for dissemination
- Key partnerships
- Case studies and useful supporting information factsheets

DDCE also established a presence on social media, assisted by a Community Energy Apprentice from Octopus Energy. Examples of media coverage of the project are included at Appendix E.

DDCE and Shareenergy presented to key members of Derbyshire Dales District Council in July 2022, which resulted in more site leads and an ongoing relationship that has already yielded benefits for community energy in Derbyshire.

A successful bid to the County Council from DDCE has led to the funding of a Derbyshire Community Energy Co-ordinator role who will support the 13 groups working in this space across the county. This co-ordinator is integrated into the Big Solar Co-op development pipeline, offering the possibility of making this delivery model available to groups across the county after this project concludes.

At the point that the agreement was gained to transfer the portfolio delivery to the Big Solar Co-op the opportunity for specific local promotion of the share issue was raised. The reopening of the Big Solar share offer in February 2023 provides an opportunity for renewed community engagement around this. To this end, a short promotional film featuring DDCE and their partner sites has been commissioned, and publicity materials created. Filming is due to take place on March 21st, and examples of the publicity materials are shown in Appendix D.

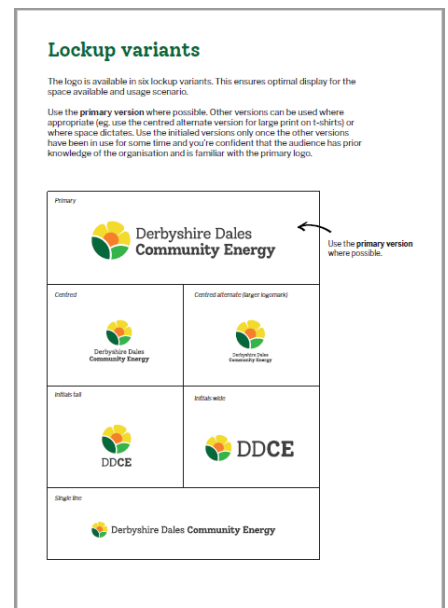


Figure 3 Example page from the DDCE Branding Guidelines

6. Financial Projections

A detailed financial model was created for the four-site portfolio given in section 3.1 as a standalone venture. The key characteristics of this portfolio are shown in Table 3:

Total capacity	194kWp
Capital costs (share raise)	£208,700
Annual OM&A costs yr1	£9,400
Time to share repay	15 years
Shareholder IRR	4.28%
Total surplus generated by year 25	£302,800
Saving to sites yr 1	£15,400
Cumulative savings to yr 20	£254,710

Table 3 - financial projections as standalone portfolio

These projections assume that the repayment of capital is set as a top priority of the financial model, with the goal of putting five-sixths of surplus (excluding depreciation), as well as cash balances above an end-of-year target of £10k, toward capital repayment. Although this has the effect of minimising possible community benefit disbursements until the capital is repaid, it has the virtue of working to de-risk the project as fast as possible. Small portfolios are very vulnerable to the loss of any single site, so there is a significant risk of becoming bankrupt whilst still owing money to investors. It is imperative to minimise this risk.

Capital costs here include estimated install costs based on MCS reported figures as well as quotes received by Shareenergy in the recent past (including those received as part of the tendering process described in section 6.1 below), as well as the residual project development costs. The Operation, Maintenance and Administration (OM&A) costs assume that management is provided free of charge by DDCE volunteers.

Energy prices have been estimated from market trends; all sites that were prepared to share their energy costs were on fixed tariffs that would expire before any likely installation date. The energy price profile used in the model incorporates a descent from the current spike back to approximately 25% above their pre-spike levels. RPI is similarly treated as descending back to a long-term value of 2.5%.

It is important to acknowledge that this portfolio of four sites, whilst theoretically viable, demonstrates marginal benefit. There is no community benefit for 15 years, and the Internal Rate of Return (IRR – a measure of the benefit of the scheme to shareholders) is low, at less than half a percentage point above the Bank of England base rate at the time of writing. Although the discount offered to the sites represents a discount of approximately 40% against estimated typical electricity prices at the point of installation, the benefit of this reduces significantly as prices return from recent historic highs.

Earlier versions of the portfolio containing the Highfield sites were far more attractive, and similarly the character is transformed by the inclusion of either Peak Converters or Nenplas, which brings the minimum time to share repay down to 13 and 9 years respectively.

The high levels of risk for marginal benefit further supports the use of a delivery partner that can act at scale – the portfolio is significantly de-risked by being merged into the larger nationwide portfolio of the Big Solar Co-op. In some cases where data on energy consumption is this permits larger installations.

The Big Solar Co-op was able to make proposals to four sites as follows:

	Twigg	John Palin	Milner	Nenplas
Array capacity	57.0kWp	75.8kWp	61.9kWp	602kWp
Annual PV yield	47.2MWh	57.7MWh	53.6MWh	496MWh
Onsite unit price yr 1	16.8p/kWh	15.0p/kWh	18.0p/kWh	16.8p/kWh
Estimated savings over 20 yrs	£75,500	£154,000	£47,900	£956,000

Table 4 - Big Solar Co-op proposals

In addition, a pledge was made by the Big Solar Co-op to install panels at The Farmer's View, but in the absence of any energy data no proposal could be drawn up at this stage. Negotiations are ongoing.

All figures in the offer are provisional, subject to detailed modelling which would take place after acceptance, and in the case of Nenplas and Milner also subject to the results of structural surveys. The price set for onsite sale of generated electricity would rise with RPI inflation over the course of the contract.

6.1. The Tendering Process

Before the decision was made to adopt the Big Solar Co-op as a delivery partner, an Invitation to Tender for the installations on seven sites was composed and circulated to nine installers across the Midlands and South Yorkshire. The tender period coincided with a period of extreme supply chain difficulty for solar PV, as interest spiked following the unprecedented rise in electricity costs at the same time as global shipping struggled with post-pandemic demand, with shipping prices spiking to six times their pre-pandemic levels. Responses to the tender were only received from two of the nine installers contacted, and the prices per kWp installed in the responses were among the highest that Shareenergy has ever seen. One of these respondents was a local installer with established relationships both with DDCE and various of the sites considered for arrays.

As part of its business model, the Big Solar Co-op bulk-buys panels that meet its high ethical standards, and so necessarily takes a more active role in the design and specification of installations. The local installer has indicated that they would be prepared to accept this and would revise their installation costs accordingly. At the time of writing, the Big Solar Co-op is expecting to contract this local installer for some, if not all, of the sites to be developed.

7. Community Benefits

As a standalone portfolio the financial model shows a closing cash balance of £294,381 in year 25. If sites wish to have their PV array removed at this point this would be paid from this cash balance, but normally panels are still generating and therefore worth retaining on a roof, either in community ownership or gifted to the site host. The remaining cash balance in the model at this point represents the amount that could be disbursed for community benefit in years 15-25, assuming no disruption to onsite electricity sales.

The Big Solar Co-op's carbon-first philosophy means that surpluses are reinvested into expanding its portfolio of sites and driving further decarbonisation, rather than providing funding for other community groups and activities local to the installations. This does not however mean that no community benefit will be delivered by the project.

In place of a financial community benefit fund, the following benefits are still expected from this project:

- **Support for the community support work at The Farmer's View**
Hurst Farm Social Club CiC, a non-profit social enterprise delivering a range of community benefits and facilities, will be supported by this project. Due to the small size of the roof and unknown energy consumption, an array at The Farmer's View would not normally be considered as an eligible project for the Big Solar Co-op, but the Big Solar Co-op has agreed to develop this as part of the portfolio of sites being brought to it by DDCE. This brings them the prospect of reduced energy bills in future. A self-funded installation on the site will be difficult to fund due to the relatively weak roof structure (see Section 4 above).
- **Local share investment opportunity**
Local investors can invest in the Big Solar's share offer in exactly the same way as they could in a dedicated share offer for the Derbyshire Dales sites. The reopening of the Big Solar Co-op share offer in February 2023 supports these sites, and the share issue is being marketed to the local community.
- **Decarbonisation**
The same reduction in the carbon footprint of the sites (and therefore of Derbyshire Dales) is delivered irrespective of the organisation owning and maintaining the arrays. Indeed, the scale of the Big Solar Co-op's operation is such that they are able to specify higher quality European-made panels which have a far lower level of embodied carbon (both associated with shipping and the use of coal power in Chinese manufacturing), meaning that a greater carbon benefit is possible. This also supports the development of European supply chains for PV, with prices for European PV expected to fall in coming years.
- **Increased capacity for future development**
The long-term goal of DDCE is to continue to work within the Derbyshire community to promote the uptake of renewable energy systems. An on-going relationship with the Big Solar Co-op enables DDCE to focus on their advocacy and outreach work, and to identify other local businesses and organisations that would benefit from roof-mounted PV.

Finally, it is worth reiterating that the high levels of risk associated with such a small portfolio, alongside the minimal community benefit, mitigate against carrying out a share offer at all until such time as more sites could be secured. The need to decarbonise is urgent, and the Big Solar Co-op offers a robust and viable way forward.

8. Planning & Permitting

8.1. Planning Consent

Rooftop solar of a capacity up to 1MWp on nondomestic property is considered as Permitted Development (Class J) under the Town and Country Planning (General Permitted Development) (England) Order 2015. However arrays with a capacity over 50kWp are required to apply to the local planning authority for prior approval as to the design and external appearance of the development. Consequently, Prior Approval applications were submitted for three sites:

Twigg Stores – application reference 22/01134/PDL

Decision: Prior Approval not required (dated 28th November 2022)

John Palin Wholesale -application reference 22/01218/PDL

Decision: Prior Approval not required (dated 19th December 2022)

Milner Off Road – application reference 22/01392/PDL

Decision: Prior Approval not required (dated 7th February 2022)

8.2. Grid Connection

An early conversation was held with Western Power Distribution (subsequently rebranded to National Grid Electricity Distribution) in which they were asked to confirm any export restrictions that might be present in sites under consideration at that time. The results were as follows:

Site	Max array size (kWp DC)	WPD LV Assessment Maximum allowable Export
Arc Leisure	319	230kW
Twigg Stores	70.1	45kW
Highfields School (Upper Site)	257	250kW
Highfields School (Lower Site)	118	80kW
Hurst Farm Social Club	33.8	33.8kW
John Palin Fresh Produce	108	108kW
Peak Converters	224	180kW
Milner Off-Road	38.6	38.6kW

Table 5 - Connection assessments by WPD

The export limitation on Twigg Stores was found to block less than 1% of the generated solar energy – and since the unit price anticipated from sales to grid are around 10% of the onsite costs the effect on income is negligible.

No export limit was placed on any of the other sites currently under investigation.

Subsequently, full G99 applications were been lodged for Twigg Stores and John Palin Wholesale. Notification was received on March 3th that the application for John Palin was approved, although with a 62kWp export limit. As the site is expected to use around 95% of the generation onsite, this does not affect the viability of the array, but it a noteworthy indicator of the tightening of grid connection availability in the area. DNOs are required to respond to G99 applications within 65 working days, so the Twigg application may not be resolved until May 2023.

9. Conclusion

Whilst a theoretically viable portfolio of sites has been identified and modelled in this study, it has illustrated again the difficulty presented to the creation of viable community energy projects in smaller urban and rural districts following the removal of the guaranteed income provided by the Feed in Tariff. With the need for onsite usage paramount the small portfolio is unacceptably exposed to the risk of sites becoming vacated or otherwise depowered temporarily or permanently.

The decision to partner with the Big Solar Co-op will lead to the installation of PV on at least two sites within the next six months, and a relationship has been established which is likely to lead to the development of further sites.

10. Appendices

10.1. Appendix A: Sites Identified by Feasibility Study

The Stage 1 feasibility study identified eight sites in total: the two preferred sites, being the most viable for taking forward to stage 2; a further two 'primary' sites and four 'secondary' sites. These are shown in the table below, along with the results of any subsequent investigation into these sites.

Site	Option(s) presented	Subsequent outcomes
<i>Preferred sites</i>		
Twigg Stores	55kWp array	Progressing to installation
Highfields School Upper Site	180kWp array	Not progressing: School absorbed into East Midlands Educational Trust and brought into PSDS bid (see 3.3 above)
<i>Other primary sites</i>		
Twigg Steelyard	Arrays from 15 - 77kWp modelled	Not considered due to asbestos roof; cost of replacement would be prohibitive.
Highfields School Lower Site	Arrays from 55 to 155kWp modelled	Not progressing: School absorbed into East Midlands Educational Trust and brought into PSDS bid (see 3.3 above)
<i>Secondary sites</i>		
Arc Leisure	Array yielding 88MWh/yr Not recommended due to lack of engagement.	Not progressing, investigated but currently the subject of a PSDS bid by DDDC.
Gateway Court	Array yielding 108MWh/yr Not recommended due to lack of engagement.	Not feasible for community ownership model as roof is shared between 58 dwellings.
Victoria Court	Array yielding 83MWh/yr Not recommended due to lack of engagement.	Not feasible for community ownership model as roof is shared between 64 dwellings.
Denefields Court	Array yielding 116MWh/yr Not recommended due to lack of engagement.	Not feasible for community ownership model as roof is shared between 50 dwellings.

10.2. Appendix B: All Sites Considered for this Study

Site	Contacted?	Engaged?	Modelled?	Discounted?
Agricultural Business Centre, Bakewell	No	No	Yes	No
All Saints CE Junior School	No	No	No	No
Arc Leisure, Matlock	Yes	Yes	Yes	No
Ashbourne Leisure Centre	No	No	No	No
Belper Leisure Centre	No	No	No	No
Belper School & Sixth Form College	No	No	No	No
Buxton Architectural Stone	Yes	No	No	No
Chatsworth Garden Centre	No	No	No	Yes
Darley Dale Primary School	No	No	No	No
DCC Chatsworth Hall	Yes	No	No	No
DCC County Hall	Yes	No	No	No
DCC Shand House	Yes	Yes	Yes	No
Denefields Court	No	No	No	Yes
DFS Darley Dale	Yes	No	No	No
DSF Refractories and Minerals	Yes	No	Yes	No
Forest Garden Centre	No	No	Yes	Yes
Forticrete Masoncrete	Yes	Yes	Yes	No
Gateway Court	No	No	No	Yes
H.J. Enthoven and Sons	Yes	No	Yes	Yes
Heights of Abraham	No	No	No	Yes
Henry Fanshawe School, Dronfield	No	No	Yes	No
Highfields Lower School	Yes	Yes	Yes	No
Highfields Upper School	Yes	Yes	Yes	No
Hoben International Limited	Yes	No	No	No
Hurst Farm Social Club	Yes	Yes	Yes	No
IKO Grangemill	Yes	No	Yes	No
Ivonbrook Care Home	No	No	No	Yes
John Palin Fresh Produce	Yes	Yes	Yes	No
John Smedley Mill	Yes	Yes	Yes	No
Lady Manners School	Yes	No	No	No
Lumsdale Mill	No	No	No	Yes
Matlock Farm Park	Yes	No	Yes	No
Matlock Ford Accident Repair Centre	No	No	No	Yes
Matlock Meadows Ice Cream	Yes	No	Yes	Yes
Milner Off Road	Yes	Yes	Yes	No
Moy Park	No	No	No	No
Nenplas	Yes	Yes	Yes	No
New Mills School	No	No	No	No
Northwood Depot, Matlock	Yes	Yes	Yes	No
Other sites at Brookfield Park	No	No	No	Yes
Peak Converters, Wirksworth	Yes	Yes	Yes	No
Sharley Park Primary School	No	No	Yes	No
Sibelco Toll Processing	Yes	No	No	No
Tansley Barn Garden Centre	No	No	No	Yes
TDP	Yes	Yes	Yes	Yes

Tibshelf School	No	No	No	No
Trouw Nutrition UK, Ashbourne	Yes	No	No	No
Twigg Steelyard, Matlock	Yes	Yes	No	Yes
Twigg Stores	Yes	Yes	Yes	No
Victoria Court	No	No	No	Yes
Wirksworth Leisure Centre	Yes	Yes	Yes	No

Any site not discounted has the potential to be included for future development.

10.3. Appendix C: Detailed Description of Final Sites

Twigg Stores

Bakewell Road, Matlock, DE4 3AU [///sour.valued.track](http://sour.valued.track)

The roof of the Twigg Stores building consists of a double-pitched raised seam metal roof with a slope of approximately 10 degrees down from a central ridge, and a total area of approximately 833m². The building is built into the slope of the bank with its north-eastern end flanked by mature trees. The south-eastern gable end of the roof, facing onto Bakewell Road, is concealed by a parapet wall – this, combined with the shallow pitch of the roof and surrounding trees, means that the roof is largely obscured from the surrounding highways and public spaces.

The roof is easily accessible from a footpath that passes along the hillside above the site. Arrays were modelled that covered just the south-facing pitch but given the shallow slope it was found to be more viable to cover the entire roof.



Figure 4 - Twigg Stores roof from the footpath



Figure 5 - Proposed rooftop array at Twigg Stores

John Palin Wholesale

Old Coach Rd, Tansley, DE4 5ND, [///client.skin.organs](http://client.skin.organs)

The John Palin Wholesale site consists of a large industrial warehouse of trapezoidal steel construction. The main warehouse is two storeys high with an internal footprint of approximately 985m², with a single storey side extension adding a further 185m² of floorspace. The roof of the main area is triple pitched with ridges running NNE-SSW and an awning on the east side. All roof pitches are at approximately 11°. The main role of the warehouse is in the storage, packing and despatch of fresh fruit and vegetables, with related office facilities.

The site is built into the hillside descending from Riber Hill toward Tansley Pool, and the southern end of the site is heavily shaded by trees in the bank that forms the southern edge of the site.

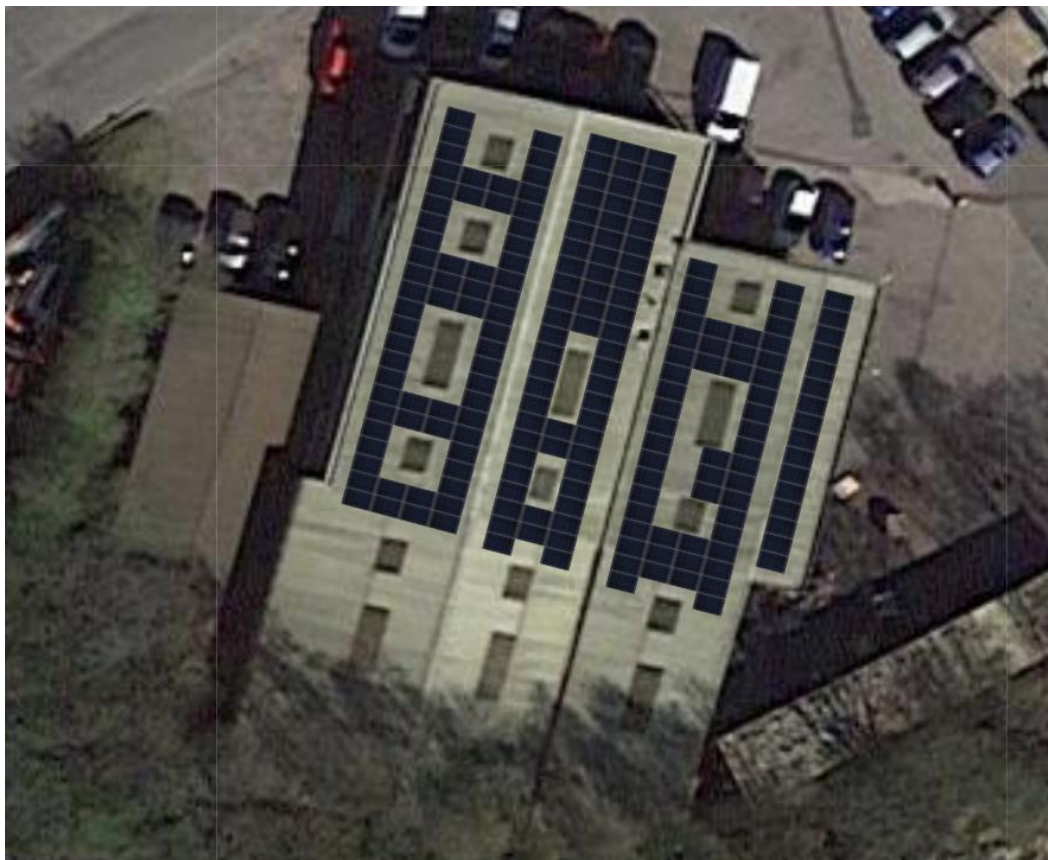


Figure 6 - Proposed array at John Palin Wholesale

Milner Off Road

Old Road, Darley Dale, DE4 2ER, [///drizzly.crust.expanded](http://drizzly.crust.expanded)

The Milner Off Road site consists of two large industrial warehouses and a separate workshop. The two adjoining warehouse buildings on which the proposed array is to be sited are made of brick and steel construction, faced with box profile plastic cladding. The southern warehouse, which houses the trade counter and offices, has a footprint of approximately 678m² and a roof pitch of 5°, whilst the northern warehouse, used for storage only, is 896m², with a roof pitch of approximately 7°. Both roofs have east-west ridges and are clad in grey plastisol sheeting.



Figure 7- Proposed array design at Milner Off Road

The Farmer's View

Hazel Grove, Matlock DE4 3ED, [///ruler.towns.driven](http://ruler.towns.driven)

The Farmer's View (formerly the Hurst Farm Social Club) is a recently-refurbished two storey building built into the slope of the hill so that its main floor is at ground level to the northeast with a basement level accessible only from the southwest. Its roof is surfaced with EDPM and consists of two sections of flat roof, the main one in fact has a shallow pitch of approximately 2.5° running down from a central ridge, with a smaller flat section protruding to the southeast. The main section is approximately 316m^2 , with the lower flat roof adding a further 41m^2 surrounded by a low parapet wall.

The proposed array would consist of panels arranged in landscape orientation on racks at a tilt of approximately 13 degrees. The result will be to cover approximately 133m^2 , or around 37% of the roof area. As the roof is not structurally strong enough to support ballasting the EPDM surface of the roof would need to be carefully penetrated by fixings that could be sealed to preserve the waterproofing of the membrane.



Figure 8 - The Farmer's View, showing the new roof



Figure 9 - Proposed array at The Farmer's View (note that satellite image is of the site before re-roofing)

10.4. Appendix D: Publicity and engagement materials

An A4 poster and A5 two-sided leaflet were produced and are being distributed locally to promote the Big Solar share offer and DDCE. A short video has also been commissioned.

Invest in clean energy for the Derbyshire Dales





**For as little as £100 you can own a part
of the co-operative that's rolling out
solar onto rooftops in Derbyshire.**

The Big Solar Co-op is working with Derbyshire Dales Community Energy to reduce the carbon emissions and energy costs of local businesses and community facilities.

We are both not-for-profit, carbon-first and volunteer-led. Join us for serious action on carbon and a projected 5% return on your investment.

Sign up at bigsolar.coop/invest

The Big Solar Co-op is a Co-operative Society registered with the Financial Conduct Authority no. 4877. Derbyshire Dales Community Energy is a Community Benefit Society registered with the FCA no. 8792. Maximum investment £100,000. Your capital is at risk.



BIG SOLAR CO-OP



Derbyshire Dales Community Energy

Figure 10 - A4 poster for local share offer promotion.



For as little as £100 you can own a part of the co-operative that's rolling out solar onto rooftops in Derbyshire.

The Big Solar Co-op is working with Derbyshire Dales Community Energy to reduce the carbon emissions and energy costs of local businesses and community facilities.

We are both not-for-profit, carbon-first and volunteer-led. Join us for serious action on carbon and a projected 5% return on your investment.

Sign up at bigsolar.coop/invest



Derbyshire Dales Community Energy (DDCE) is a local, volunteer-run social enterprise formed as part of our region's response to the climate emergency. We look beyond a straight swap of fossil fuels for renewables and champion the benefits of energy democracy.

derbyshiredalesenergy.org.uk

Derbyshire Dales Community Energy (DDCE) is a local, volunteer-run social enterprise formed as part of our region's response to the climate emergency. We champion energy democracy, looking beyond a straight swap of fossil fuels for renewables.

The Big Solar Co-op is a new approach to subsidy-free community solar power. We are a nationwide co-operative that brings economies of scale, reducing risk for investors and raising ethical standards.

We are working together toward our shared goal of getting more solar on roofs and generating clean energy for communities.



Read the full share offer document and sign up to invest at: bigsolar.coop/invest

The Big Solar Co-op is a Co-operative Society registered with the Financial Conduct Authority no. 4877. Derbyshire Dales Community Energy is a Community Benefit Society registered with the FCA no. 8792. Maximum investment £100,000. Your capital is at risk.



Figure 11 - A5 two-sided leaflet produced to promote the share offer

10.5. Appendix E: Press Coverage

As part of this project, Shareenergy worked with DDCE to compile a Media Toolkit to help them boost their profile in local media. As well as maintaining a steady social media presence, local media covered DDCE's work several times during the project period:

- ***“New investment partner supercharges plans for Dales community energy scheme”***
 Derbyshire Times, June 9th 2022
 Coverage of the appointment of Shareenergy as project consultants
<https://www.derbyshiretimes.co.uk/business/new-investment-partner-supercharges-plans-for-dales-community-energy-scheme-3725289>
- ***“Derbyshire Dales group gets £50K council grant for renewable energy projects”***
 Derbyshire Times September 16th 2022
 Coverage of the grant received to create a funded position to support
<https://www.derbyshiretimes.co.uk/business/derbyshire-dales-group-gets-ps50k-council-grant-for-renewable-energy-projects-3845332>
- ***“Council committed to climate change action in challenging times”*** Peak Advertiser, November 15th 2022
 Coverage of various Council-supported decarbonisation projects alongside COP27.
<https://www.peak-advertiser.co.uk/post/council-committed-to-climate-change-action-in-challenging-times>
- ***“Derbyshire green energy co-op lands major shareholder investment despite change of plan”*** Derbyshire Times, December 8th 2022
 Coverage of the project change from locally-owned arrays to a partnership with Big Solar Co-op.
<https://www.derbyshiretimes.co.uk/business/derbyshire-green-energy-co-op-lands-major-shareholder-investment-despite-change-of-plan-3947010>
- ***“Derbyshire community energy project plans networking event as more potential solar sites revealed”*** Derbyshire Times March 10th 2023
 Coverage of the Derbyshire-wide conference taking place March 21st, and the list of sites named in this report.
<https://www.derbyshiretimes.co.uk/news/environment/derbyshire-community-energy-project-plans-networking-event-as-more-potential-solar-sites-revealed-4057442>

11. Document control

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