



energy



Derbyshire Dales District Council

Consultancy support.

Report on proposals for a solar farm programme on Council owned land.

Report V2.

This report was completed on 12 April 2022



APSE (Association for Public Service Excellence) is a not for profit local government body working with over 300 councils throughout the UK. Promoting excellence in public services, APSE is the foremost specialist in local authority front line services, hosting a network for front line service providers in areas such as waste and refuse collection, parks and environmental services, leisure, school meals, cleaning, housing and building maintenance.

APSE Energy is APSE's local authority energy collaboration. The vision for the collaboration is to form an effective collaboration of a large number of local authorities to enable and facilitate the local municipalisation of energy services. By this we mean the public and community, as well as private, ownership and managerial control of local energy generation, distribution networks and delivery of energy efficiency works. Local authorities working together in this way would have great influence and would be able to deliver economies of scale in green energy to promote economic growth and combat fuel poverty.

Association for Public Service Excellence
3rd floor Trafford House
Chester Road, Old Trafford
Manchester M32 0RS
Telephone: 0161 772 1810
Fax: 0161 772 1811
Email: enquiries@apse.org.uk
Web: www.apse.org.uk

DERBYSHIRE DALES DISTRICT COUNCIL

REPORT ON PROPOSALS FOR A SOLAR FARM PROGRAMME ON COUNCIL OWNED LAND

REPORT BY APSE ENERGY

Executive Summary

The Council has commissioned APSE Energy to prepare a report on the viability of it developing one or more solar farms on land within its ownership.

The work was undertaken in the Spring of 2022 and concluded that it would be possible for the Council to develop two of the five sites put forward and to do so would be in tune with action by other local authorities across the wider UK. However, there are issues with both sites that will need to be resolved. One site is more appropriate for development than the other.

There are many advantages, both financial and non-financial, from undertaking a solar farm development. The Council has made clear that it would have to make a suitable financial return as a pre-requisite to embarking on any programme.

The timing of the development will depend on a number of factors that are discussed in the main body of the report in some detail. It is suggested that the Council should start with best project at Watery Lane and seek to complete this as a first scheme within a two year time frame, whereby it would be completed and energised towards the end of 2024.

Whilst there are different ways of undertaking such a development, the maximum gains come from the Council finding or borrowing the money and funding the development itself. Risk can be properly managed during this process and necessary expertise bought in.

The purpose of this report is to get the Council to the position whereby Members can consider a formal report and resolve to press ahead with a solar farm project. To do so will require a budget to be identified and responsibilities allocated in terms of officer leads and external assistance.

This report recommends that the Council proceed with the programme on this basis. Full details are provided in the body of the report.

1. INTRODUCTION

APSE Energy has been commissioned by Derbyshire Dales District Council to assist it to consider the potential for a solar farm project within its area. The Council has recently calculated its carbon footprint and will need to include some offsetting to reach a position of net zero.

It has undertaken a high level review of land within its ownership and identified five small sites for APSE Energy to consider. It hopes to be in a position to recommend to Members that the Council move towards a delivery strategy, if the results of this preliminary work were favourable. Fortunately, it has been confirmed that the Council does have one or more appropriate sites for development and so this report completes this preliminary work.

The Council had identified five areas as capable of hosting such a development. These sites were all briefly inspected and meetings have been held with a wide range of officers to discuss the Council's position.

The purpose of this commission is for the Council to be in a position to report to Members, indicating that the chosen area can be developed as a solar farm and to recommend that the project proceed, with a budget being allocated for this work. The time frame being adopted for the project is for it to be developed, without Government subsidy, within the next two years.

This report sets out why local authorities across the country are going down the green route, what action the Council needs to take to bring the project to fruition and the likely timescales that will apply. It also looks in detail at the business case for this development.

2. THE CURRENT POSITION ON CLIMATE CHANGE

The United Kingdom had passed the Climate Change Act in 2008. Its target, to reduce greenhouse gas emissions in the UK by 80% by 2050, against a 1990 baseline, was well known. However, in 2020 the government amended the 2008 Act to increase the targets to 100% reduction in greenhouse gases by 2050.

These changes were in response to the ongoing work by the international community to track global warming and to advise on climate change. In particular, the United Nations Intergovernmental Panel on Climate Change (IPCC) had continued to produce reports on the levels of greenhouse gases in the atmosphere and the changes that these were causing.

The need to reduce the impact that human activity is having on the environment is not a new concept. The impact greenhouse gas emissions are having on our climate and the risks this present have been well documented for over thirty years. So the starting position is that climate change is happening and is *anthropological* in nature i.e. caused by human activity.

Under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC), international conferences are held periodically to review the position and seek intergovernmental agreement on the way forwards. At COP 21 in Paris on 12 December 2015, the so-called Paris Accord was signed. Under this, the international community reached a landmark consensus to accelerate and intensify the actions and investments needed for a sustainable low carbon future. However, progress was not moving fast enough.

The IPCC continued to produce reports on the worsening position but a watershed was reached in October 2018 when it published the most hard hitting report yet. According to this report, the target that the international community had hitherto been working to – namely that global warming must be restricted to no more than 2 degrees Celsius above pre industrial levels – was no longer sufficient and that a new target of 1.5 degrees C should be adopted. In short, the report indicated that the world had just 12 years to improve the situation or irreparable damage would be done to the ecosystems of the planet.

This report touched a nerve with the public and climate change had suddenly moved to the front of the public conscience. Urgent action was required and support was growing for its adoption at both central and local levels.

Many local authorities declared climate emergencies whilst also adopting exacting new standards to reach net zero carbon status, either for their own activities or their areas as a whole. This movement has grown in intensity and now most of the local authorities in the country have agreed to take action in one form or another.

In developing action plans to reach a net zero carbon target, local authorities are considering all sorts of action. Primarily, the aim is to reduce emissions by changing work practices and how services are delivered. This is particularly in relation to buildings, transport and heating.

Derbyshire Dales District Council declared a climate emergency on 30 May 2019, demonstrating the authority's understanding and commitment to playing its role in tackling the global challenge of sustainable development. As discussed below, it has put in place plans to achieve this.

However, in seeking to become carbon neutral, there will be a level below which emissions cannot be reduced. Here, the notion of offsetting comes into play, i.e. netting off the carbon benefits calculated from conversion factors in relation to renewable energy installations a Council owns and operates and thereby reaching net zero carbon overall.

So renewable energy is entering a new phase in local government, whereby its value has appreciated over and above the traditional areas covered by a climate change or sustainability strategy. Renewable energy has been under consideration by local authorities for the past ten years, but for a variety of different factors, has never reached the same levels as seen in the private sector. So the climate emergencies are offering a useful fillip for this type of activity.

A number of other wider points in relation to energy are now under discussion in local government, in particular on how the energy market in the UK is changing. APSE Energy has summarised this to the four D's: decentralisation, decarbonisation, digitalisation and democratisation. These will result in a very different landscape for energy in the UK over the next decade.

When considering the players in this market, the so called 'big six' energy companies who have been seen as dominant in this field for many years are starting to be dwarfed by the entry in to the market of the former oil and gas majors, such as Shell and BP, who are patiently buying up companies involved in the more innovative areas of decentralised renewable energy. They see prospects for a movement into 'energy as a service.' However, even they seem small against the technology giants of the United States, such as Apple, Google and Microsoft. These companies also want to enter the UK energy market, attracted by the potential to digitalise energy in this country.

It is also predicted that energy costs will continue to rise as the different elements in the cost stacks are identifiable and projected. This is a concern to every Council that is a large energy user.

The prospect of further ways to generate income from renewables are constantly being considered and it is clear that the key to this is to own and operate renewable energy assets. Only those in that space will be able to consider the newer forms of electricity trading, aggregation and demand side response. This project would put the Council in a good position not just to reduce its energy costs and make a good financial return, but also to start to engage in the more innovative elements of market development.

3. THE COUNCIL'S POLICY FRAMEWORK

As mentioned above, Derbyshire Dales District Council declared a climate emergency in May 2019, demonstrating the authority's understanding and commitment to playing its role in tackling the global challenge of sustainable development.

The Minute of the Council meeting reads:

"Climate change is an existential threat. Extreme weather events have caused damage and destruction in this country and have led to deaths and displacement of thousands of people worldwide. Natural habitats, wildlife and biodiversity are in peril, not only from climate change, but they are being adversely affected by human intervention, which in turn is enhancing the effects of climate change.

Scientists are warning that we have a little over a decade to implement urgent action to reduce greenhouse gas emissions before we reach a global tipping point.

Action is required at international, national, local and individual level to achieve the carbon reduction levels needed.

This Council pledges to:

- Declare a Climate Emergency*
- Make Derbyshire Dales District Council carbon neutral by 2030*
- Call on the UK Government to provide the powers and resources to make the 2030 target possible*
- Work with partners across the county and region to deliver this new goal through all relevant strategies*
- Report back to Council within six months with the actions the Council will take to address this emergency."*

The motion was passed by the Council and the 2030 target adopted. At this stage the subtlety of whether Scopes 1,2 and 3 had all been included had not been addressed. It has since been clarified that the target relates to Scope 1 and 2 emissions and the Council will address the Scope 3 issues at a later date.

Following the adoption of the climate emergency declaration external consultants (ClearLead) were appointed to calculate the Council's carbon footprint and also provide advice to reduce, avoid, mitigate and offset emissions over the next decade in order to reach the target.

ClearLead were also commissioned to prepare on behalf of the Council a Climate Change Strategy and Action Plan (2020 – 2030) which was subsequently published on 16 September 2020.

In setting a new goal to strive towards carbon neutrality for its direct activities, the Council recognises that there are a number of different ways in which this can be achieved. These include the reduction of energy consumption as far as possible across the corporate estate, the improvement of energy efficiency in the Council's buildings and the generation of renewable energy that can be used to run Council services.

However, it was also recognised that if the Council continued to provide services to the public it would never reach a position of pure zero emissions (i.e. there would still be a level of residual emissions) and would instead have to rely on a position of net zero, with carbon offsetting being necessary to reach its targets. The consultants calculated that 2 MW of renewable energy capacity would be needed to do this.

The Council also has in place a carbon reporting mechanism which runs from 1 April to 31 March each year. The last reported period is 1 April 2020 to 31 March 2021. The baseline year is 2019.

The reporting shows that the Council's own carbon footprint is not high at 807 tonnes CO₂(e) and this is commensurate with a small district council. Of that, a considerable amount is from use of buildings and also transport. However, this excludes Scope 3 emissions which are double this amount. In due course, the Council will need to focus on its outsourced activities and take active steps to reduce the Scope 3 emissions.

Looking at the wider Council area, the largest proportion of emissions comes from the industrial and commercial sector, followed by transport and then domestic emissions. As part of its wider Climate Change Strategy, the Council will also have to consider how it can support the private and community sectors in decarbonising their activities.

We are informed that the Council is very committed to the climate change agenda, both at Member and senior management team levels.

4. RENEWABLE ENERGY

As indicated above, local authorities across the country have been considering the development of renewable energy facilities on their land. Whilst this is more difficult in urban settings, for rural Councils the issue is normally not so much the availability of land, but the ability to secure a grid connection and achieve a planning consent. As it happens, Derbyshire Dales District Council does not own much land and what it has is already earmarked for different uses, particularly affordable housing.

When considering renewable energy, most local authorities have decided that it is normally best to undertake solar PV projects first. This is, quite simply, because they are the easiest and the quickest to complete. There is no reason why a solar PV project cannot be devised, planned, funded and constructed in 12 – 18 months if all things are in line (depending on size and capacity).

The benefit of having a project up and running cannot be underestimated on any front. It helps the Members in justifying the investment and also causes further support for other projects to emerge. It develops further confidence in the officers on the delivery side and this is usually helpful to encourage bigger and more complex projects that might come later. But it also helps with the public and wider support for the Council's overall renewable energy programme.

The Council has, of course, implemented some solar PV projects to date, but these have mainly been roof based systems, usually at small scale. The Town Hall has already had a small PV installation fitted and also one of the leisure centres. The Council has bid for and succeeded in securing monies under the Public Sector Decarbonisation Scheme and also the Green Homes Grant.

Solar PV is now mainstream in the UK. By Spring 2020 there were over 15 GW (i.e. 15,000 MW) of solar capacity in operation in the UK.

Prior to 2019, Government incentives were available to assist with the costs of solar farm development. These were predominantly the Feed in Tariff and the Renewables Obligation. Following their closure, the Contracts for Difference regime was introduced by the Government to assume the position of financial incentive. However, the Government decided to exclude solar PV from this process following the first CFD auction. This position has now changed when in early 2020 the Government indicated its intention to re-admit solar PV and onshore wind to the CFD scheme. Solar and onshore wind will both be able to compete in the next CFD auction which will take place in 2022.

The breakdown of solar PV installations is mainly between residential schemes, where there are now over a million houses with solar panels, and large farm scale developments on open land. These latter developments have gained traction in the last five years and are now the largest element. The roof based commercial solar PV market is less well developed but is now gaining traction.

On the local authority front, the first solar farm in the UK built, owned and operated by a local authority was in Cornwall, where Cornwall Council's farm near Newquay airport is an excellent example. This was built on Council owned land and provides a number of important functions, including income

generation, economic benefit generally and the use of renewable energy as a tool for economic regeneration. This is being followed by a host of other authorities across the country, that are in different stages of development. Telford and Wrekin Council completed its solar farm in 2014 and Wrexham in North Wales also completed its own facility in 2015. There are now around 20 local authority owned and operated solar farms across the country.

There is much that could be said about the technical basis of solar power, but that is beyond the realm of this strategic report. Suffice to say that PV cells are made of semi conductors (usually silicon), which become excited when exposed to light and release electrons. These electrons are collected by wires, attached to the semi conductors, and carried away as electricity (in its direct current form or DC). In order to convert the electricity to AC (on which the electricity system in the UK works) the power needs to pass through an inverter. It is of some comfort that this technology has been around for decades now and is one of the mature renewable energy technologies.

For land based installations, a well planned solar farm should obtain planning consent without a problem and there are various ways in which strong public support can be garnered. Key amongst these are the local authority choosing the right sites, consulting very early with the local inhabitants, preserving biodiversity and agricultural uses and providing a community benefit fund. Support is available from the National Farmers Union, the British Beekeepers Association and a variety of other environmental charities for solar farms in the right locations. It is very much about how the Council goes about it.

5. BENEFITS OF SOLAR PV INSTALLATIONS

There are many benefits of procuring a solar PV installation for a local authority. These include the following financial and non financial benefits:

- *Community Leadership*

Local authorities are encouraged to 'lead from the front' and to provide an example to their local areas. The Council has demonstrated this via its various carbon management work but this takes it to another level of delivery.

- *Energy Security*

The Government has already hinted that there may be power cuts over the next decade, as the electricity system adjusts to new ways of operation and any area that might be affected by such cuts will be in a stronger position if it has its own renewable energy sources.

- *Carbon Benefits*

The Government is legislating to place ever more stringent targets in relation to greenhouse gases. The Climate Change Act 2008 (as amended) provides the current targets, which will be very challenging of themselves and part of the burden of delivering them will fall on to local government.

The potential for offsetting renewable energy generation is mentioned above and is a new and powerful factor in this space.

- *Effectiveness and Efficiency*

Local authorities are always under the microscope over expenditure and whether it offers maximum value for money. The solar PV option gives it the chance to save money, by using the energy that is generated from its solar arrays, thereby meaning that external energy costs do not have to be incurred.

- *Income Generation*

Renewable energy offers local authorities an important way to generate further funds on the finance side, without legal question or Government disapproval. Such funds can be recycled back into other green agenda activities, or simply used to supplement the General Fund and enhance public services.

- *Economic Benefits*

The green agenda offers the best potential for growth in a difficult financial climate. It is possible to generate significant levels of income from renewable energy projects under the green agenda, but the benefits go wider than that, an example being new and sustainable jobs and a local supply chain boost.

Other local authorities that have gone down the solar PV route have a clear appreciation of the significant benefits that can be secured.

6. TYPES OF SOLAR PROJECTS

There are three types of solar PV projects, namely: ground mounted, buildings based and housing. The Council has opted to go for a ground mounted solar PV installation on this occasion, commonly known as a solar farm.

A land based solar PV project usually involves solar panels being ground mounted on either low-grade agricultural land or brownfield sites that have previously been developed or used for an industrial purpose.

The panels are fitted in long rows, with wiring connecting them together and then leading to the inverter cabinets, before being connected to the national grid via transformers and a substation.

The advantage of land based projects is that they can be larger in size and gain the benefits of economies of scale. However, smaller infill sites are also useful for this purpose, particularly if there is a use for the power nearby.

In order to undertake a commercial sized park, which would be at least 5 MW capacity, around 20 - 25 acres of land would be necessary. However, the 5 MW limit came from the Feed in Tariff regulation and now that Government incentive scheme has gone, local authorities are rightly considering larger capacity facilities where possible and appropriate. These would require more land and more finance to construct, but the rewards would be proportionately greater.

However, solar farms can be scaled in either direction and so there is no reason why small sites cannot succeed. Lancaster City Council (another district authority) had just completed a 1 MW solar farm in its area. This will be more relevant to the type of sites the Council has put forward.

7. THE COUNCIL'S SITES

Appendix 1 below reproduces a short Sites Report, prepared by APSE Energy following its inspection on 18 March 2022 of the five sites that had been forwarded by officers.

The site inspections were to determine whether it would be possible to fit a solar PV installation on any of the sites, whether this would be appropriate and, if so, what size of installation would be possible.

As the Sites Report reveals, some of the sites were not really appropriate or might be difficult or expensive to develop. However, there were two sites that could be developed, subject to grid and planning. These were Watery Lane and Stoney Middleton.

The Watery Lane site would be particularly useful if a grid connection could be secured and also a deal could be struck with Severn Trent Water to sell electricity to power the neighbouring sewage works. This would give an excellent financial return and provide local benefits.

The Stoney Middleton site was also suitable but more problematic in terms of a grid connection. This would need further work before a decision could be taken on this site. Despite this, there is a section below on whether the Council should consider direct community involvement in its renewable energy sites or not. If the Stoney Middleton site were to proceed, this issue would need to be addressed.

A number of issues are outlined in the Sites Report, including legal and ownership issues, topography, planning issues and the potential for offtakers to buy the generated electricity.

8. THE BUSINESS AND FINANCIAL CASES

The business case for solar PV is an important document and is comprised of:

- The costs to build it;
- Maintenance costs;
- Any financial incentive payments which might be relevant – sadly none are relevant here;
- The export value of the electricity to the grid;
- And / or the use of the electricity on site or its sale to a third party under a Power Purchase Agreement (PPA);
- The addition of battery storage (where relevant).

The best returns will be from a suitably sized land based installation. This is because the cost of fitting the panels has been reducing steadily over time and due to economies of scale.

As indicated above, from a preliminary inspection the Council has land at Watery Lane that appears to be suitable for at least 1 MW of solar PV capacity and provided that the business case works for the Council, it is suggested that this solar farm should be the one progressed.

Delivered to the Council prior to the delivery of this report are the industry standard business cases for the two sites indicated in the sites report by APSE Energy as being suitable for development. These have been provided by Peter Walker of the APSE Energy team.

However, in order to support reading of the full business case for that estate, the following is a note on the assumptions that have been used.

Financial Model for the Land at Watery Lane

This site has three business cases based on building out the installation by the end of the 2024.

The first model assumes that there is no Government subsidy at all at this time and that 100% of the power generated on the sites is exported via the notional grid connection.

It is also assumed that the project would be financed with 100% debt over a 20 year term at an interest rate of 3.63%. There is a discussion below about funding solar projects and it may well be that the Council does not need to borrow to build out this scheme. If this is the case, then the model can be amended to remove the borrowing costs.

The Base Case

In the first model, income is derived from the sale of electricity generated to a Licenced Electricity Supplier under a Power Purchase Agreement at a revenue calculation of 5 pence per kWh for a term of 25 years.

The model assumes a construction cost of £650 per kW peak of installed capacity, meaning that a 1 MW site would come to around £750,000 to develop (but only at this stage including a notional cost for the grid connection).

This gives a project return of just 2.3% and would require considerable early working capital to assist cashflow. This would counteract a total net profit of just over £450,000, tax free.

The Battery Storage Option

The second business case is included for the site on the basis of using battery storage to store the power generated during the day, so that it can then be sold on for premium rates, using one of the mechanisms to do this.

The assumptions here are that there is no Government subsidy in play and that 100% of the electricity generated is stored each day in the battery system before being discharged into the grid via the grid connection at the appropriate point.

Again, the model assumes a construction cost of £650 per kW peak of installed capacity, but this time there is an additional capital cost for the supply and fitting of a 1MW battery. This has been included at £500 per kW installed. Based on the 1MW capacity, the solar PV would come to £750,000 and the battery storage £500,000. Total costs would therefore be £1,550,000, including relatively substantial figure for grid connection costs of £387,000.

Extracting trading value from the solar + battery solutions revolves around capturing the arbitrage value of power prices in the various markets and will require an optimisation contract to achieve this. This trading value can be combined with participation in Frequency Response contracts with National Grid (although there is some cannibalisation between these two activities).

It can be seen from this that the inclusion of battery storage produces a different result, which is an internal rate of return of 6.78% and a profit over 25 years of just over £2.3m, tax free. As battery costs continue to fall, these returns are likely to increase.

A Private Wire Option

Finally, a private wire option needs to be considered. For the Watery Lane site, this would be sales of electricity to the Severn Trent sewage works next door, although it would be necessary to ascertain the energy requirements of the site before proceeding, to ensure that a large percentage of the energy generated could be sold to the plant.

Here, the cost of the solar PV is the same as above. A notional charge for the private wire connection has been added. There is no battery storage on this option, but the grid connection has been included (in case the Severn Trent facility does not use all of the power generated).

This change in circumstance means that for the Watery Lane site the highest return of 10.4% is possible, and a projected profit of over £3.5m from the Council's modest investment. This is why this site forms the main recommendation of this report.

Financial Model for the Land at Stoney Middleton

This site also has three business cases based on building out the installation by the end of the 2024.

The first model assumes that there is no Government subsidy at all at this time and that 100% of the power generated on the sites is exported via the grid connection.

It is also assumed that the project would be financed with 100% debt over a 20 year term at an interest rate of 3.63%. There is a discussion below about funding solar projects and it may well be that the Council does not need to borrow to build out this scheme. If this is the case, then the model can be amended to remove the borrowing costs.

The Base Case

In the first model, income is derived from the sale of electricity generated to a Licenced Electricity Supplier under a Power Purchase Agreement at a revenue calculation of 5 pence per kWh for a term of 25 years.

The model assumes a construction cost of £650 per kW peak of installed capacity, meaning that a 2 MW site would come to around £2.3m to develop (but only at this stage including a budget cost for the grid connection).

This gives a project return of only 1.43% and would require considerable early working capital to assist cashflow. As such, this project would not work on this basis.

The Battery Storage Option

The second business case is included for the site on the basis of using battery storage to store the power generated during the day, so that it can then be sold on for premium rates, using one of the mechanisms to do this.

The assumptions here are that there is no Government subsidy in play and that 100% of the electricity generated is stored each day in the battery system before being discharged into the grid via the grid connection at the appropriate point.

Again, the model assumes a construction cost of £650 per kW peak of installed capacity, but this time there is an additional capital cost for the supply and fitting of a 2MW battery. This has been included at £500 per kW installed. Based on the 2MW capacity, the solar PV would come to £2.3m and the battery storage £1m. Total costs would therefore be £3.3m, including a budget figure for grid connection costs.

Extracting trading value from the solar + battery solutions revolves around capturing the arbitrage value of power prices in the various markets and will require an optimisation contract to achieve this. This trading value can be combined with participation in Frequency Response contracts with National Grid (although there is some cannibalisation between these two activities).

It can be seen from this that the inclusion of battery storage produces a different result again, which is an internal rate of return of 4.74%, which although delivering a profit over 25 years of nearly £4m, tax free, requires early working capital to assist cash flow. As such, this business case does not work any better than the first.

A Private Wire Option

Finally, a private wire option needs to be considered. For the Watery Lane site, this worked really well, as we were able to assume that the Severn Trent sewage works next door would consume all of the energy generated. However, for the Stoney Middleton site, it would just be sales to the small industrial park on adjoining land and these units would not consume all of the power generated. As such, an assumption on maximum power required has had to be made at 50% of generated volume.

Here, the cost of the solar PV is the same as above. A charge for the private wire connection has been added. There is no battery storage on this option.

This change in circumstance means that for the Stoney Middleton site a return of 6.13% is possible, and a projected profit of over £4m from the Council's investment. However, the negative cashflow is likely to make this site unviable at this stage.

If the position in relation to this site were to change over time, then it might be reconsidered, but for now it is not viable for the Council to proceed with it.

9. KEY CONSIDERATIONS FOR SOLAR PV PROJECTS

There are five main steps to completing a solar farm development. In simple terms, these are five “boxes” that need to be ticked to be ready to develop. These are:

- Identifying sites and sorting out any issues that appertain in relation to them (such as any form of tenancy agreements);
- Obtaining planning consent;
- Obtaining a grid connection agreement from the DNO;
- Undertaking a procurement exercise, allowing a contractor to be appointed to do the construction and commissioning work;
- Completing a business case that gives an appropriate financial return for the Council.

There can be no doubt that the two biggest risks for any project are the granting of planning permission and the gaining of a grid connection from the Distribution Network Operator, but the other steps are also important. These and other areas are considered below.

The Sites

As noted above, three of the sites were unsuitable but Watery Lane and Stoney Middleton were capable of development as a solar farm.

The best site put forward by officers is the Watery Lane site, where a small solar farm could be sited on the upper field (above the allotments) and the electricity sold to Severn Trent who occupy neighbouring land where they operate a sewage works.

As the Sites Report reproduced in **Appendix 1** indicates, there are some access issues with this site (which the County Council might need to be involved with) and an existing grazing licence of some form. There will need to be an investigation of the title and in particular the position about the restrictive covenant with Nestle will need to be examined. It will also be necessary to verify the electricity use on the site by Severn Trent to ensure that a large percentage of any electricity generated can be sold to Severn Trent.

These will be the main urgent actions if the Council wishes to proceed. Generally, however, apart from ensuring that both the allotment holders and cemetery visitors are assuaged about impact on their sites, this site is ideal for development.

The issues mentioned above will also affect the timing of the project, as these can take considerable time to be resolved. The obvious advice should the Council wish to proceed is to look at the private wire and restrictive covenant issues as the early part of the first phase of the work.

The Stoney Middleton site is not viable at this stage for two principal reasons. Firstly, the grid connection costs are huge and also uncertain. This would destroy the business case. The Distribution Network Operator (Western Power Distribution) responded to a budget costs request and gave detailed information about how a grid connection could be accessed. This detail can be provided if necessary.

The second reason is to do with the sale of power, assuming that a grid connection could be achieved. If the industrial estate on the neighbouring site were larger and had a bigger electricity demand then a private wire option would have improved the business case. Without that such a small site would not achieve a level of financial return acceptable to the Council.

The Planning Process

It is fortunate that the planning process is considerably easier for solar PV than it is for other renewable energy technologies, such as wind energy, biomass or anaerobic digestion. Whereas an Environmental Impact Assessment will almost always be required for a wind project of any decent size, this is very unusual for a solar farm.

Fortunately, the Council is the planning authority for the Watery Lane site and so it will be in a good position to understand the local policies. The planning officer is comfortable with the issues raised by solar farms and appreciates that they are a legitimate use of land in any area.

For the Stoney Middleton site the Council is not the Planning Authority, a function which rests with the Peak District National Park. This is an added complication for this site, as whilst the position in the National Parks is that the planning process is the same, the policy framework under which they operate can, by its very nature, be restrictive of development. However, there is nothing further to be said on this issue at this stage as the site is not viable and does not feature in the recommendations below.

The main decision where the Council is the planning authority, is whether to prepare the planning application in house or to commission the services of an external planning consultant. It is, of course, necessary to counter any allegations of conflicts of interest or favouritism. Normally, there is some form of Chinese wall between those on the applicant side and the planning officer who is representative of the regulatory function.

It is preferable to have a planning officer on the applicant team too, so that the proposals can be tailored to meet the Council's policies as effectively as possible. However, in the Council current staff resources prohibit this. As such, the preferred route might be for the planning work to be undertaken externally.

Looking at the planning application, the argument that the Council as applicant will need to adopt will be that it has set exacting standards for net zero carbon (as discussed above) and is striving to reach the target of being net zero carbon by 2030. It will only do this by a combination of reductions in emissions from buildings and vehicles, together with an increase in the amount of renewable energy generation in the area.

Any Council resolution on development will therefore be in compliance with national legislation under the Climate Change Act 2008 (as amended) and significant weight should be given to these factors.

There are also links from the planning process to the communications process, mentioned below. This is the means by which the Council announces its intentions and engages with the public upon them. In other words, it is over and above the planning laws, which require a certain amount of consultation in relation to the development site itself.

One issue covering both planning and communications where there is sometimes a problem would be where the Council has previously determined other applications for solar farm developments in past years. Whilst not a legal issue, it is problematic if the Council's planning officer has turned down many other applications for solar farms and then the Council's own development plans are presented.

However, the Council's planning officer has indicated that around 10 other solar farms have been consented by Derbyshire Dales DC and only one other application for a solar farm development has been refused by the Planning Committee.

So far as the substance of any planning application is concerned, the starting point would be to seek a screening opinion from the planning officer to confirm whether an Environmental Impact Assessment is required or not. We would expect that this would not be necessary.

It might also be necessary to submit an ecological or habitats assessment of the site at the same time as the screening application to seek to demonstrate that the scheme would be unlikely to have any significant environmental effects. The planning officer will give guidance on what he or she believes is required.

The application itself would be relatively straightforward, with submission of plans and drawings, a planning statement and a design and access statement. Bearing in mind that one of the main issues will be landscape and visual impact, a separate assessment of that will probably need to be submitted. A flood risk assessment may also be required. Finally, other documents will cover areas such as maintenance, connection and decommissioning.

The fact that there is no Green Belt land or Areas of Outstanding Natural Beauty within the district is of considerable assistance in planning terms.

Grid Connections

The other major risk is securing a grid connection for the site, at an affordable price. Here, Western Power Distribution is the Distribution Network Operator and it will be necessary to make a formal application to it to arrange a grid connection for the Watery Lane site.

When considering whether to proceed with a certain site, it is normal practice to apply for a budget price, as opposed to submitting a full application. Budget costs are free of charge and will give an indication of whether a grid connection will be possible or not.

A budget estimate is not binding on the DNO and is only a preliminary estimate given by an engineer. The available grid capacity can only be secured once a formal application has been made by the Council to the DNO and it has issued a formal offer, which the Council has formally accepted. This is because the DNO undertakes a proper survey prior to issuing a formal grid offer. As such, the offer is binding on the DNO, subject to unforeseen circumstances arising. If the Council accepts the grid offer, the payment of a deposit is required at the same time, but this effectively reserves that grid space to the Council for up to five years.

The Council may be aware that grid offers are made up of 'contestable' and 'non-contestable' works. The DNO has to undertake the non-contestable works itself, but any applicant is able to invite tenders for the contestable works to see if a lower quote can be obtained. This might cover aspects of the project such as laying cables to the nearest substation.

On this basis, Northumberland County Council reduced a £1.5m estimated cost from Northern Powergrid for its site in Ashington a few years ago to a figure of about £800,000. So even where reasonable connection figures might have been suggested by the DNO, it is very likely that these can be reduced further. We have therefore found it prudent to reduce the DNO's estimate by around 10%, although a bigger saving might also be available when further detail has been obtained.

It is therefore essential that if the budget costs are favourable and the Council decides to proceed, it should make the grid application as soon as possible, as it is otherwise vulnerable to applications being made by others that will take that available capacity.

In fact there is no financial risk with making a formal grid offer as under the rules, deposits paid to Distribution Network Operators are refundable if the scheme does not go ahead, subject to any costs that the DNO has already incurred in dealing with the application. This means that the Council should not delay in submitting the application, as it is not at financial risk if the scheme did not proceed.

There is one final matter on grid that is rarely relevant to local authorities but might come into play here. In simple terms a grid connection is not necessary where there is an offtaker who is willing to buy all of the generating asset's output. As such, even large private sector solar farms have been built without grid connections. The point with such a strategy, however, is that if the offtaker's business closes or relocates for any reason, the generator will have a 'stranded asset' i.e. a solar farm which cannot get its electricity to any buyers.

For this reason, it is almost universal practice where public money is involved to go for a grid connection, even if it is considered unnecessary at the start. Then, if the situation changes, the Council would always have the option to switch to sales on the wholesale market via the grid.

But if Severn Trent was prepared to enter into a 20 or 25 year Power Purchase Agreement to buy the power from the Watery Lane site, the Council could legitimately take the decision not to proceed with the grid connection application. If the Council decides to proceed, then this issue will need to be addressed.

The Procurement Exercise

A Government procurement regime currently applies to any contract for consideration that involves works, supplies or services, where the local authority is the client and the contract value is over the relevant threshold. This was formerly the EU Public Procurement Regime, but that has lapsed now that the UK has left the European Union. The Government has taken the easiest route, in adopting the same regime at national level for now, with the potential to amend it in future. In simple terms, this means that the Council will need to have a tendering exercise to appoint a contractor to design, build and maintain its solar farm.

Normally, this procurement work would be undertaken in house, but there are options for external assistance and also framework arrangements.

Using a Framework Arrangement

One of the exceptions to the rule that a separate tendering exercise will always be required is where a framework arrangement has already been set up that is available to the Council. A framework is a select list of contractors which has been tendered at the start, but which can then work for up to four years thereafter. The framework is tendered as a contract and then each time a draw down is anticipated from the framework, the organisation that is a member runs a mini competition exercise to refresh prices.

There are a number of different potential frameworks that the Council could take advantage of but three will be mentioned here: Nottingham City Council, Public Power Solutions (owned by Swindon Borough Council) or Local Partnerships (owned by HM Treasury and the Local Government Association). However, only basic details are given here. Should the Council wish to proceed, then further details can be obtained.

Taking Nottingham City Council's framework as an example, this has been set up with every local authority in the UK in mind. Prices have been obtained and a suite of contract documentation prepared. There is no doubt that this would work for the Council in undertaking its procurement.

So if a framework is utilised by the Council, it can undertake a simple mini competition when the time is right to proceed with the development.

However, the problem is cost. On larger schemes, costs of frameworks can be prohibitive. As an example, the Nottingham framework costs 1% of the procurement value to use. If the Council was developing a

5 MW solar farm, with battery storage, at a cost of approximately £5m, then the cost to use the framework would be in excess of £50,000. This is unlikely to be acceptable to the Council.

However, Lancaster City Council used the PPS framework and negotiated a fixed fee of £12,000 for its use, which it considered acceptable.

If a framework is not favoured, the Council has time to undertake a tailored and specific procurement exercise, with external help if required, as part of its development cycle. Discussions with Caroline Leatherday, on behalf of the procurement team, suggested that this would be satisfactorily undertaken in house. The Council's procurement needs are partly met by a shared service arrangement with the County Council and, subject to agreement from the development team, this would be undertaken as part of those arrangements.

Undertaking a Separate Procurement Exercise

This section considers the Council undertaking its own procurement. Fortunately, this is not a complex procurement, simply a design, build and operate exercise, based on an output specification.

The reason that it is done in this manner is to make the process quicker and to fully utilise the experience and expertise of the solar development companies. They know best how to design a site to gain maximum output and how to build for minimum subsequent operational maintenance. This experience and expertise is harnessed in the exercise.

Looking at land based solar farms, the specification for the scheme should be output in nature, i.e. focus on what is achieved at the end rather than in the inputs that are needed to bring that about. This minimises cost and avoids the contractor blaming the Council for specifying something that was not workable.

Two contracts will be entered after the procurement exercise, namely one for the design and construction of the site and the other for the operation and maintenance work to the site, as discussed below.

The Council needs to undertake preliminary work prior to the contract for the construction work being entered. This includes an application for planning permission and a grid connection offer. All of the preliminary work needs to be undertaken before the procurement exercise is started.

As mentioned above, the procurement exercise is relatively straightforward. It is using the restricted procedure, which is a two stage process of expressing an interest and then only a limited number of companies being invited to bid. Crucially, it does not involve either negotiation or competitive dialogue with the companies. There are only a few timescales set down by law and the rest of the process is up to the Council.

The usual advice is to use the restricted procedure without a Prior Information Notice. This means that there is a two stage process, with applicants expressing an interest as the first stage and the Council inviting only a selected number to tender for the work.

The Council will need to prepare a suite of documentation for the process, including the following:

- A Contract Notice;
- A Pre Qualification Questionnaire;
- An invitation to tender;
- A contract.

Just as important as the documents above, will be the selection criteria and the evaluation criteria / model used. These will also need to be prepared.

Experience demonstrates that procurement officers need time to think about the implications of a renewable energy project, which means that an early start on the documentation is essential, as this all has to be completed before the initial Contract Notice is published in the new Government 'Find a Tender' system (which is the successor of the old European Union OJEU system).

Business Case

The business cases have already been prepared and are considered in **Section 7** above. The Watery Lane site is the recommended project to proceed with, where the business case for a private wire connection is high at over 13%.

Communications and Public Consultation

There are some other areas worthy of mention at this stage and communications is a key one.

The Council needs to prepare a communications plan, which will detail all of the activity that it intends to take to make people aware of these proposals. The main mantra here is to ensure that the public hear the proposals and every important aspect of them from the Council, and do not find out by reading it in the local paper or from local gossip. This is colloquially referred to as being on the 'front foot' rather than the 'back foot.'

The sort of issues that can be included here are briefing members, briefing senior officers, press releases, reports on the proposals, public meetings and so on. Again, the Council will be used to this type of activity.

The need to consult widely and genuinely as landowner, in advance of a development, is to be distinguished from the statutory requirements of the Town and Country Planning regime. Here, the

Council will want to show considerable community support for its proposals and will do this via an exemplar consultation process. This should take place before the statutory process under the planning legislation.

There are a variety of hooks that could be used to launch the communications strategy, such as the Council's climate emergency or the declaration of a climate emergency by the UK Government (i.e. emissions issues), energy policy generally under the Conservative Government, the hosting of COP 26 in Glasgow in the Autumn of 2021, this APSE Commission, the Council reviewing its land holdings, the need for further cuts in expenditure and so on.

The Legal Contracts

The other outstanding issue is the fact that the procurement exercise leads to two or three contracts being entered.

The first is the design and build contract, which is one of the most essential parts of the whole process, as if the solar farm does not work, the Council has put a large sum of money at risk. This contract is a complex document that needs to be put together by an expert on renewable energy contracts. In particular, the warranties element will be vital and any provisions dealing with economic loss, if the farm goes offline during the summer months. Moreover, as the contract documents have to be prepared in advance, it will be needed when the contract notice or advertisement is published (as indicated above in the procurement section above).

The other contract is the operation and maintenance contract. This can last for any time up to 20 years and will detail the routine maintenance of the site. It is important that this is also prepared by an expert, so that all the risk of non-performance rests wholly with the contractor. That party will then do any routine maintenance, as well as fault fixing and repairs. The Council will then have a counterparty to sue if this work is not properly completed and this leads to financial losses.

The main decision for the authority here is whether to commission the services of a commercial firm of lawyers or to undertake the work inhouse. Our recommendation is to obtain external assistance for the contractual work, bearing in mind its importance to the overall project and an increase in the legal risks with having a counterparty to sue if there is a subsequent problem. That said, there have only been a handful of Court cases in all of the 15,000 MW of solar installation in the UK and so this risk is manageable.

It is clear that the in house Legal Services team is well versed in land and tenancy issues and can therefore should be able to undertake the remaining legal work, which will principally be land based issues, but may include legal powers to act and other elements of local government law.

10. FUNDING RENEWABLES

If the Council is to go down the design, build and operate route to develop its solar farm, then it needs to identify where the money is coming from. This will need active involvement of finance colleagues.

Fortunately, the Council has a healthy financial position. This increases the flexibility available to it to fund the project.

There are various ways the money can be found for this scheme:

- Reserves. Very helpful if there are any and there is political will to use them. Discussions with the Finance Department have confirmed that it does have some reserves that might be relevant in this context;
- Savings on the capital programme or capital receipts from sales of assets. Other projects that are not going forwards now might provide some temporary assistance or, alternatively, capital receipts from the sale of land or property can be used for this purpose;
- Borrowing from the Public Works Loans Board. This is low cost public sector borrowing at a very good rate and without many conditions;
- Commercial borrowing. Unlikely to be of relevance if PWLB money is available to the Council, as that is usually less expensive;
- Joint ventures. Selling a stake in the development to someone else is another option;
- Crowd funding / public funding / community involvement. This is the one that is coming forwards strongly;
- Finally, the Municipal Bonds Agency has now issued its first bond, allegedly offering rates lower than the PWLB.

Of the above, the decision normally comes down to the question of whether the Council is acting alone or in joint venture with someone else? There may be a potential for acting in concert with other authorities that are on the same path or with the private sector over the longer term, and the Council should consider whether this is attractive.

However, this is a small site and so for now, it is considered that the Council will have its own programme of development. This means that it has to raise the money for the development and the decision is normally to go for reserves, capital receipts or PWLB loans to fund it. Most of the authorities that have built solar farms to date have gone down the developer route and decided to simply build and operate the facilities themselves.

The main exception to this has been Warrington Borough Council which has followed an investment route. The Council has indicated that it is interested in considering the investment route itself, including bonds and other financial instruments, in the future. This is not covered in this commission, but APSE Energy can assist with this as a separate matter at the conclusion of this work, should the Council wish to explore that avenue. As mentioned above, 99% of local authorities have followed the developer rather than the investor route.

The Council has confirmed that it is very familiar with the Public Works Loans Board approach and so nothing further needs to be said about that. It has also been confirmed that the Council is comfortable with borrowing money where a project is supported by a robust business case.

It is perhaps worth saying something about crowd funding, as this may be of interest to the Council. This has been successfully trialled by Swindon Borough Council and the public offering in relation to its solar farm was oversubscribed.

The basic proposition here is to fund a commercial project to develop a renewable energy installation by selling a stake in the project to members of the public. There is a fundamental difference between this and a community project trying to raise money to build something that will be run on a 'not for profit' basis. By contrast, the local authority proposition here is to develop a commercial scheme and to pass on some of the commercial gains from that project to those that provide the finance (here, members of the public).

This perhaps raises a question as to why a local authority would want to do this? The simple reason is often an authority does not want to have to find all of the money to make its solar PV programme a reality. However, there is another very strong reason for going down the crowd funding line: *engagement*. The publication of a prospectus offering shares in a civic solar farm, for example, will engage with the public far better than any normal consultation process.

So the crowd funding route gives the authority a good chance to explain its overriding strategy, what the underlying drivers are for the project and how it proposes to deliver them. This will inspire confidence and it is very likely that members of the public will offer to invest.

The best known crowd funding company in relation to renewable energy is Abundance (see abundanceinvestment.com). It has raised millions of pounds in relation to solar and wind schemes and is run similarly to an online bank account. To be able to do this, it had to register with the Financial Services Authority and be licenced. In view of the lack of experience in crowd funding, it would probably be better for a local authority to partner with another organisation experienced in this area if it was to go down this route.

The recommendation from APSE Energy for now is that the Council focuses on the Watery Lane project itself and funds the project via available funds or borrowing from the Public Works Loans Board.

11. EXTERNAL HELP ON THE PROGRAMME AND RESOURCES

The Council will need to consider whether other external help is needed to deliver these projects.

The following are the key areas where external help might be useful:

- Strategic advice;
- Communications;
- Planning;
- Business cases;
- Legal services;
- Grid consultancy.

Looking at communications, which is discussed above, some authorities undertake this in house and others put it out to an experienced agency, although this tends to be expensive. It is suggested that the in-house team undertake this work directly if they have the capacity to do so. As noted above, the messages will need to be carefully crafted, as public support cannot be taken for granted in relation to any renewable energy project.

Planning is also considered above and the Council has confirmed that it is likely to recruit an external planning specialist to undertake the planning work on this project. This needs to be a consultant experienced in renewable energy projects.

The strategic help and business cases to date have been organised by APSE Energy. However, should the Council wish to proceed to the development stage it is likely it will need to evaluate what further strategic support and business case development it will need under the next phase of the work.

Turning to legal services, the main contractual work under the procurement will need careful consideration. As indicated above, the preparation of the engineer, procure, construct (EPC) contract and operation and maintenance contracts is complex work and our recommendation is to commission an outside commercial firm of lawyers to assist with this. Aside from that, all other aspects of the legal work can normally be undertaken in house, in particular the land / title work, general advice and so on, although capacity for this has not yet been confirmed by the Legal Services department.

Finally, there is grid consultancy. Most solar farm developers will appoint a separate grid consultant to submit applications on its behalf. This is because these are complex technical documents. However, APSE Energy can assist with this process. The first stage is to submit a formal application to the DNO in relation to a grid connection offer for the chosen site. Thereafter, there will be issues with contestable works and other matters. As grid issues are inextricably linked to the overall strategy work, APSE Energy normally arranges grid consultancy assistance on behalf of its local authority members.

Having said that there are external parties available to assist with this process, the Council will still wish to consider its *internal* resource levels. If it is to build out a solar park, it will need to project manage the process and run the client side of the operation. This is something that APSE Energy can support the Council with externally, but the projects will have to enjoy sufficient priority internally to ensure that the client side work is undertaken.

In the experience of APSE Energy it is best to create a Project Team and to split the work evenly between the officers on that team. This would include key skills such as legal, finance, procurement, planning, assets, communications and so on. Whilst each person would have personal responsibility for one aspect of the scheme, the Project Team would have collective responsibility for its outcome.

This internal client side team would be supported by external expertise which can be bought in as appropriate. This system has worked well in other authorities; however, allocation of duties has to be sensible. It cannot be wise to allocate heavy extra workloads to staff who already have a full schedule of duties.

12. REVIEW OF THE OPTIONS FOR ENERGY SALES

The Council is anticipating developing a solar farm on Council owned land. To develop such a project will mean that the Council has a supply of electricity to use or sell in the market in future.

There are various ways that the Council can use or sell the power created from such a solar park. In many ways, these depend on the Council's wider plans for its renewable energy operations, for example the extent to which it hopes to realise social consequences from its work.

Each solution will also have a different impact on the business case that the Council develops. If the Council can sell the electricity through the retail market, it will reap a significantly higher price. Moreover, it can only really have a lasting social impact if it is in control of the retail supply of power to customers and residents of its area. In this regard, the Council has signed up to APSE Energy, which has as its vision the municipalisation of energy at local level and an involvement in supply of heat and power to local people and businesses.

Options for the Sale or Use of Power

The following are the main options available to the Council:

- *Sell the power wholesale, in a single block, via a power purchase agreement (PPA);*

This is the base level option and is very straightforward. A power purchase agreement is effectively just a contract to sell the electricity to a third party.

This could be for any term, from a short term of 1-3 years, right through to a longer term of 15 - 20 years. However, the price will be dependent on the length of the arrangement. Generally, the best prices will be available in relation to short-term deals and longer ones will offer a lower price, as there is less risk.

Generally, finance directors in local government have expressed a preference for longer term deals, offering price stability over a longer period and accepting a median price as a result. However, this does obviate the need to be selling power on a regular basis.

This will offer a stable return, with the modelling currently averaging around 4.5 pence per kWh, which is still at the lower end of the scale of what is possible. Wholesale prices are currently higher than this, but these higher prices will not in all likelihood be sustained over a long period.

- *The Council uses the power itself;*

Unless the solar facility is right next to another facility that will use this amount (in which case, see private wire below) the electricity will need to be put into the grid. However, there is still the possibility that the Council can supply itself. This will involve putting the electricity into the grid where it is

generated and then taking it out where it needs to be used, such as in the Council offices. This is often referred to as 'sleeving'.

The Council has indicated that it has current procurement arrangements in place and the price it is paying for its electricity averages 15-20 pence per kWh. By definition, if the Council could sleeve some of its own power to its own sites, this could possibly reduce its electricity bill.

Sleeving utilises the electricity grid and so the Council would be responsible for paying 'use of network charges.' Effectively, this means that the Council pays the supply company for transmitting its power to where it needs it. A number of authorities have looked into this and believed that the joint cost of use of network charges, together with the net cost of producing the power, should be substantially less than the retail cost of buying power, which is currently around 15 pence per kWh on a commercial level. However, it appears that it is not as simple as that.

Even where there are sleeving clauses in supply contracts, these have often not been used and it is difficult to find accurate advice on what the costs are. The 'Big 6' electricity companies are notoriously opaque about their pricing for energy.

Accordingly, when some authorities that APSE Energy has worked for have looked into this, they found out that the use of network charges were significantly more than they had anticipated and this made the potential cost of the power more than they could buy power for under normal purchasing arrangements. In general, the advice of APSE Energy on sleeving is that the financial benefit is neutral, i.e. there no mark up to be achieved from this avenue. If a Council did enter into a contract on that basis, then it would still be able to say that it is using its own power that it has generated from its own solar farm. However, the vast majority of local authorities have decided that it is not really worth the effort.

If the Council did want to consider this option, it would be worth entering into a dialogue with the Council's supply companies.

- *A private wire solution;*

This involves simply laying a cable between the generating station and a nearby user (often referred to as an 'offtaker'), whereby the user uses the power and pays the generator directly for it. This is particularly relevant to economic development, where nearby commercial users can be identified. The example given from APSE Energy's experience was Barnsley MBC, which intends to develop a 12 MW solar farm on a former spoil tip next to a large glass factory. The power generated by the solar farm could all be sold to the neighbouring user. For Derbyshire Dales, the prospect is the sewage works operated by Severn Trent Water which are on neighbouring land.

Where a private wire is in place, due to the fact that the power does not go through the network, no 'use of network charges' are payable and the normal regulatory system does not apply either. This means that the prices for the power can be freely negotiated and allows the Council to realise electricity prices nearer to the retail level.

- *Sell the power to retail customers;*

This is the 'holy grail', as retail electricity prices are substantially higher than wholesale prices. Whilst wholesale prices might be around 5 pence per kWh, retail prices are now at least 20 pence. In simple terms, there is another strand of profit to be realised here, if that proves possible.

The main disadvantage of this option is that to sell electricity to retail customers, a supplier normally needs to be regulated under the Electricity Act 1989 and this is a burdensome process only generally undertaken by professional and full time energy suppliers, as the regulatory codes are complex.

Two or three local authorities have gone down this route, the best known being Nottingham City Council (Robin Hood Energy) and Bristol City Council (Bristol Energy) but both of these companies have now been sold and the respective Councils have left the electricity supply market.

So whilst the option of establishing an energy services company (ESCO) needs to be on the menu, most authorities are not likely to go for this. If this is deemed relevant by the Council, specialist advice would need to be sought on this nearer the time.

However, it is important to emphasise that there is no right or wrong solution here. What is appropriate for the Council depends on what its aims are, what capacity it has to pursue different solutions and its attitude to risk.

13. A BATTERY STORAGE SOLUTION

When considering sales of power above, it was mentioned that there are various ways that income from a solar farm can be improved. One is to find an outlet for the electricity such as an adjoining factory that can be joined via private wire, another is to sleeve the electricity to the Council itself and finally the establishment of an Energy Services Company.

However, there is another way that the Council's return from its solar developments can be increased and that is by introducing battery storage in tandem with the development of a solar farm.

Storage has now become a mainstream solution, although still in its formative years. However, it is already clear that storage will play a big part in the energy mix in years to come and will be particularly important to intermittent forms of renewable energy such as wind and solar PV.

The principle behind storage is very simple: the energy generated is diverted into a storage device (for this example assume a battery) instead of being put directly into the grid. The electricity is then discharged from that storage device when it is needed, generally a few hours later. In simple terms, solar panels on a house generate power during daylight hours in the summer; the electricity is stored in a battery during the day and then discharged in the evening, thereby allowing the solar power to completely fuel the house without recourse to the grid. However, storage works on every level, from the utility level, through commercial and industrial uses down to the domestic level. This means that it will work with solar farms at a commercial level.

Advice published by the Renewable Energy Association explains all of the different types of electricity storage that are possible. However, for the purposes of this document, battery storage, particularly lithium ion (which is being driven down in cost rapidly by the motor industry for their electric vehicles), is the only solution that is likely to be relevant for the next few years and so this advice focuses on this area alone.

On a large scale solar farm, container sized batteries will be fitted and will sit on the site with the inverter cabinets and other equipment. These will collect power during daylight hours and then discharge it later in the day or evening. One significant advantage to battery storage is that batteries can be retrofitted to existing solar PV installations without difficulty. This means that storage does not need to be part of the solution at the time the facility is built. However, if the business case is improved, there would be every reason to do so.

The batteries gaining most attention are lithium ion in nature. Prices of lithium ion batteries fell by approximately a factor of ten from 1991 to 2005. These are the batteries that are used in laptops and phones and, latterly, electric vehicles such as the Nissan Leaf and Tesla models. Research has shown that the price of lithium ion batteries falls 15% per doubling of volume and the projected cost curve of such batteries bears a remarkable resemblance to the cost curve of solar cells themselves over the past fifteen years. In other words, batteries are projected to reduce in price in much the same way as solar panels, where huge decreases have accompanied greater volumes of deployment.

The key point in relation to battery storage is that the prices paid by commercial customers vary according to the time of day that the power is required. Prices during the day are relatively inexpensive, whilst prices at peak times are significantly higher.

This means that if a renewable energy facility operated by a local authority can store energy from the daytime in batteries and then discharge it at peak time, its business case can be greatly improved.

There are a number of ways that this can be done, but few local authorities have yet gone down this path. Warrington Borough Council has taken possession of a very large solar farm in East Riding that will do this. The best way that a local authority could enhance returns in this way is by bidding the solar plus storage asset into the Government's Capacity Market. Other opportunities for revenue are from National Grid contracts, such as Short Term Operating Reserve or some form of Frequency Response contract.

So if a deal can be done to discharge power at peak times, then a much greater value can be attached to that power, thereby improving the business case. However, it will not become clear until nearer the time of completion of the solar farm exactly what form this might take.

This means that battery storage should always be considered with solar PV. It will be a simple case of determining how much the relevant batteries cost and how much extra income can be generated from their use. These figures can then be factored into the business case, as has been done in the business cases prepared by APSE Energy and outlined in **Section 8 above**.

In respect of size, 1-2 MW of lithium ion batteries will generally fit into a 40 foot shipping container. However, the precise number of such units will depend on both the battery capacity and other switchgear and equipment needed on the site in question. It should be noted that this infrastructure will also need to be factored into the planning application.

Finally, this form of electricity trading will only be possible if the site can secure a sufficiently high export element to the grid connection it has secured. Here, a preferable option would be to sell the power via private wire.

The main recommendation of this report is to develop the Watery Lane site. Bearing in mind that a private wire connection may be on offer here, there would be little benefit in pursuing battery storage for such a small installation.

14. RISK

Any commercial contract involves risk and the Council will be familiar with this. However, how risk is quantified and managed is key to the delivery of any such project.

Here, there are a number of different types of risk that will occur during a solar PV project. The Council can protect itself against many of these by employing experts in the planning and construction of solar facilities.

The three most fundamental risks to a large scale solar PV project are:

- Getting a planning consent;
- Arranging a grid connection;
- Construction of the site.

Planning consent is considered above and is closely linked to public perception and the communications strategy (both internal and external). Pre-planning enquiries will assist in indicating if planning is likely to be a problem and getting consent will always be more difficult in the Green Belt.

Grid connections are to be explored further with the local Distribution Network Operator, Western Power Distribution, in due course. Once a surgery has been held, the Council will receive an indication of available capacity and its cost, in advance of a formal offer. As no grid connection offer has been made and accepted yet, this is the largest risk to the programme at this stage.

Procurement and construction risk is offset by the Council undertaking a well run procurement exercise, supported by external expertise and requiring appropriate experience and capability from applicants, or from a collaborative exercise, which is the case here.

There are a multiplicity of other risks, as is the case with any construction / engineering project. These include:

- Raising finance;
- Income risk / technical performance;
- Supply chain issues;
- Site based issues – flooding, access, topography etc.
- Contractor failure / insolvency etc;
- Weather damage / storms etc;
- Warranties.

All of these risks can be managed as part of the process. A good programme of preliminary work and a sound procurement exercise will assist in managing most of these risks.

There are also other risks relevant to local authorities, such as:

- Change in political control;
- Change in Government policy;
- Loss of key personnel internally;
- Leakage of corporate support, political or managerial.

These might be more sensitive but can be managed. If Members are properly briefed, they should retain support, even if the Council's membership changes in subsequent local elections. We are aware that there are Council elections in May 2023 and so it is important to try and secure cross party support for the solar PV programme to ensure that it is not at risk from change of political control. We are assured that all parties on the Council are fully in support of the climate change plans and so this appears very unlikely.

National policy risk has been mentioned above, with changes to both FITs and ROCs in the past. However, Government policy on the green agenda is strengthening, particularly following the COP 26 intergovernmental conference which was hosted by the UK in late 2021.

It would be normal practice for the Council to undertake a full risk analysis as part of its later work on this project. However, it would seem sensible to undertake much more preliminary work on the project before such detailed work is undertaken.

Once the Council has completed its preliminary work, launched its procurement process and given thought to the source of the funds, it would be worth having a specific and detailed session on risk. The way that this would normally work would be for the preparation of a report detailing all of the risks, set into categories. Each risk can then be explained and a discussion held upon it. Then a decision is made as to what ranking that risk should have and the risk is put in the Council's risk register.

15. RECOMMENDED TIMESCALES

It is always good practice for a single project to be identified which offers the easiest route to implementation, based on size, capacity, availability of land and cost. Here, the Watery Lane site has been identified as the best project.

Between one and two years is likely to be required for development here, bearing in mind the capacity of the facility and the level of preparatory work necessary.

This would suggest the earliest date for completion and energisation of the solar farm would be the end of 2023. This is entirely dependent, however, on key outstanding issues: the obtaining of planning consent, the acceptance by the Council of a satisfactory grid connection offer, agreement with Severn Trent over a private wire and possession of the land.

As the grid connection situation changes regularly and capacity can be short, this is one of the early priorities for action. Firstly, the Council has to decide if it does want to apply for a grid connection. Assuming it does, then as soon as the Council gets an indication from the DNO that a grid connection is possible and affordable, it needs to submit a formal application. As soon as it gets the grid offer for the site it should accept that offer formally. It will pay a small deposit in relation to that offer but the capacity is then reserved for it.

Planning consent is the next priority, as this can often take some time to complete. The Council has intimated that it will get external assistance with this, which should ensure that internal resource issues are avoided. Planning may well take some time to work through in this instance, particularly as there are reports required such as ecology and habitats. In the meantime, preliminary work such as a pre planning meeting should be undertaken as soon as possible.

The private wire issue is also of considerable importance here, as this provides the best business case and use of the power locally. Severn Trent will need to be approached and the Council will need to prepare in advance its offer in relation to the sale of electricity. This will need careful preparation in advance, including determining the price at which the power will be offered. Before proceeding, the Council needs confirmation from Severn Trent that it will purchase the majority (if not all) of the power generated. This is also likely to take time, but can be done in tandem with the planning and grid work.

There is a multiplicity of other work to be undertaken by the Council's officers in the meantime, such as the proposals will need to comply with the Council's Commercial Strategy and decisions taken on funding. As soon as the Council has taken the decision to proceed, a full work plan can be drawn up. However, the first part of the process would normally be taken up by planning and grid (if applicable). Once these have been completed, the scheme will be much closer to implementation.

It is the advice of APSE Energy that this work must be done in the correct order, to ensure that the Council does not expend any more money than is necessary whilst 'deal breaker' issues remain unresolved.

16. THE NEXT PHASE OF WORK

The purpose of this report is to get the Council to the point whereby it can report to Members on the prospects for a large solar farm on this site. It aims to give sufficient detail to evidence the basis on which this proposition is made. However, there is still much work to do if the Council does decide to proceed.

Assuming that the Members determine that they do want to proceed, the Council will need to establish a budget for the next phase of work. This will need to include the following elements:

- Grid connection offers – the Council may decide to make a formal application to the DNO which attracts a fee;
- Once a grid offer is accepted a deposit will need to be paid to the DNO in relation to that grid offer. It is not clear what their position will be on this yet as deposits vary but can be up to 10% of the grid cost;
- Planning fees. Generally, a fee will still be levied by the Council, even if the Council is the applicant to itself. External planning consultants preparing the application will charge fees for their work. In addition, some supporting reports will also be necessary such as an ecological assessment of the site and bird surveys which are likely to be undertaken externally;
- Further strategic level consultancy from external consultants.

The Council will need to determine what budget would be sensible for the work involved and include this as part of the resolution to proceed to delivery stage.

This report is a high level first stage report, allowing the Council to take an informed decision on whether to proceed to the development stage. If this is in the affirmative, then it is normally followed by a second phase of consultancy work, which will press ahead with many of the issues raised in this report.

The Phase 2 consultancy work would include steps such as:

- Making and then overseeing a grid application. This work will require a formal technical application and there are likely to be other complications, such as points of connection and contestable works for cabling;
- Developing a planning brief to appoint external advisers;
- Procuring a scheme layout drawing to support the planning process;
- Reviewing the position regarding private wire and possible offtaker organisations;
- Developing tactics to deal with the agricultural tenants or licensees and to ensure that they cannot frustrate the process;
- Developing the communications strategy and taking steps to put it into effect;
- Holding briefings for the Members and senior management of the Council;
- Undertaking a more detailed risk analysis, including a full risk meeting;
- Consideration of sleeving arrangements, if relevant;
- Continuing to advise on a strategic basis as the work progresses;
- Reporting back to the Project Team;

If the Council is disappointed with the fact that it can only develop one of the five sites put forwards (and then at only 1 MW of capacity) then there are other options that it can consider. These are not part of this commission but are referred to in passing for the sake of completeness:

- Purchase of land – the Council has legal powers to purchase land for appropriate purposes. The most obvious way to do this would be to contact estate agents and land agents and see what is for sale in the area. Prices will range from £7,000 - £12,000 per acre for agricultural land;
- Approach specific parties, such as the County Council to see if it has land in the district that it might be prepared to sell. Severn Trent Water or other utilities are also large land owners and may have suitable land that they are prepared to sell;
- The Council may also be aware of land that would be suitable for such development. One site mentioned was contaminated land in Darley Bridge, near Northwood. Due to the lead contamination, no other development is possible on such land, but it may be suitable for solar PV. As the Council knows the ownership of the land, enquiries could be made;
- Another alternative is to look for solar PV proposals that have not gone forward. The planning officer referred to an application at Doveridge Farm, where planning was granted but the proposal did not go forwards. It might be possible to negotiate a sale of land which is known to be suitable for a solar farm;
- Think more innovatively about where solar could be situated – a good example is car parks. Where there is a nearby use for the power, car park business cases work well;
- Finally, there is the Council's building stock. There are offices, depots and leisure centres that might be used to host solar PV or host more solar PV where they already have installations.

These are merely suggestions that demonstrate that there is always somewhere else to look for a suitable site in an area. All of these avenues if pursued would help develop more solar PV capacity suitable in size for a district council.

17. COMMUNITY PROPOSALS ON THE STONEY MIDDLETON SITE

As it turns out, the Stoney Middleton site is not viable due to the excessive costs of the grid connection. However, there is another issue to raise in this context and that is the potential for community involvement in solar PV in the District.

We are informed that the Council was approached by a local community group about the potential for a community solar farm on the Stoney Middleton site. The Council consented to an application being submitted to the Rural Community Energy Fund for feasibility report costs on the suitability of this site.

This report is just about to be published; however, it is apparent that the conclusion will be that the site is not viable for a solar farm due to the high grid connection costs.

This is mentioned as the principle is relevant to the Council's plans under its Climate Change Strategy. It appears that similar approaches have been made to the Council elsewhere, such as in relation to the Town Hall roof. The question for the Council is whether it wants to go down this route.

There is a difference between *civic energy*, where a local authority develops a solar farm and effectively runs it commercially, but on behalf of the community in its area, and a *community* facility, which is more than likely run on a not for profit and very local basis.

The arguments for community involvement are various but include community involvement, local benefit and the development of sites not of interest to commercial developers. In APSE Energy's view, all of these benefits can be given to the community via a civic energy project, which the Council controls.

As such it is difficult to see why the Council would hand over a viable commercial site to a community group, when it has insufficient land to meet its own targets under its Climate Change Strategy.

This would have given the Council a predicament if the Stoney Middleton site had been viable for a solar farm after all. By agreeing to the Rural Community Energy Fund application an expectation would have been created that the Council would provide the land for a community project, which in our view, it would have been difficult to resile from.

In the circumstances, it might be worth the Council considering the potential for community involvement – in principle – without any sites under active consideration.

If the community does develop an asset then the offer might be for the community to sell the power to the Council under a PPA for a discounted rate. However, the Council will still need to purchase the energy generated from its own site, when it could have generated that electricity itself at a lower cost. This is one reason why most Councils have prioritised their own renewable energy generation rather than focussing on community schemes.

18. CONCLUSIONS AND RECOMMENDATIONS

It is clear from this report that the Council has identified a site on which to build a small solar farm within its area. Whilst the best return will be obtainable from a private wire connection (and this has not yet been verified with Severn Trent) this should be achievable. At this stage it is not clear whether a grid connection will also be available, should the Council need a back up plan.

However, the finding that the site is suitable at this stage is only a preliminary finding, although one based on relevant evidence. Nonetheless, more work will be necessary once the Council has decided to proceed.

The following recommendations are therefore made by APSE Energy for further action by the Council:

1. *Consider the contents of this report and determine at the appropriate level that the opportunity to develop the Watery Lane site is worth the Council pursuing;*
2. *Take a report to Council as soon as possible, to seek a decision to move into the delivery phase on a programme of works;*
3. *Allocate a budget for the preliminary work that will need to be undertaken to progress this programme. Also allocate internal resource as necessary to ensure delivery;*
4. *Appoint external advisers as necessary. APSE Energy is appointed to assist with the strategic work and decisions will need to be taken on the planning work, communications, legal and other advisers;*
5. *As soon as budget figures for a grid connection have been received from the DNO make the formal grid application as soon as possible;*
6. *Move forwards to submit the planning application as soon as possible, following appointment of planning consultants;*
7. *Work with Legal Services to clarify the land issues relating to this site and confirmation that these will not be a problem;*
8. *Negotiate with the current grazing licensee for surrender of the field in question and agree a timetable for this which is mutually acceptable;*
9. *Prepare a plan for delivery of the project, setting down each task that is required to be delivered;*
10. *Agree a timetable for the work. This should be on the basis of a one to two year programme, culminating in energisation of the completed solar farm in 2023/4;*
11. *The Council should also arrange both Member and officer briefings and organise a visit to a completed and operational solar farm somewhere in the region.*

It is our view that the development of the Watery Lane would be a good start for the Council. For district councils with limited capacity, a small development will help develop confidence in the process and should lead to an appetite for more renewable energy. It is also the case that should the Council develop a solar farm, even one of modest capacity, then this would propel the Council into a select group of local authorities who own and operate such assets.

APPENDIX 1

DERBYSHIRE DALES DISTRICT COUNCIL - SOLAR FARM PROGRAMME

SITES REPORT

The Council has commissioned APSE Energy to advise it on the potential for one or more solar farms being developed within its area. Five sites had been proposed and these were inspected on Friday 18 March 2022 by Stephen Cirell, accompanied by Joanna Hill and Mike Galsworthy of the Council.

This report considers the factors relating to each of the sites inspected. The more general advice on developing solar farms will appear in the APSE Energy main report to follow.

The sites are considered below in the order in which they were visited, which is roughly South to North of the Council's area.

Land adjacent to allotments at Watery Lane, Ashbourne

This land is approximately 1.9 hectares and is the upper part of the field which hosts the allotments site on its lower part. It is in a rural part of Ashbourne, by the church and cemetery and next to a Severn Trent water treatment works.

The land is accessed off Watery Lane down a short lane, which is not made up but is made of some form of hardcore. Access issues will need to be considered regarding HGV vehicles if the site were to be developed. The turn into Watery Lane will be sharp in one direction, the track may need to be repaired and consideration given to other users of Watery Lane (principally Severn Trent Water). As Watery Lane is a highway, the County Council as Highway Authority will need to be involved.

However, there is a car park which could be used for unloading during construction work, although this would need to be agreed with the allotment holders (who would not then be able to use it).

Immediately turning into Watery Lane from Mayfield Road, the Council has earmarked the corner of the site for a vehicle parking area, where street sweeping and other vehicles were parked. This is fenced and surfaced and the Council is not proposing any change to this part of the land.

The allotments themselves are well established and there was steady visiting by allotment holders during the visit. As indicated in the main report, the Council will need to engage with the allotment holders to ensure that they are not in objection to the proposals. We are told that there is no proposal to extend the allotment land on to the proposed site, which might have caused a problem.

There is no other reason for their concern, save for inconvenience during construction, but this will only be a very short space of time (perhaps a month).

The proposed field is to the North of the allotments and is on a gently rising South facing slope. To its West is the sewage works and to its East is the cemetery. Any solar farm would not affect those visiting the cemetery (particularly as solar is silent) and so there should be no concern about objections from that direction.

The field is currently grassed and it is not clear whether it has an agricultural classification. This will be relevant and needs to be checked. There is currently some form of grazing agreement in place and this also needs to be verified as a licence or one of the other forms of agreement that can have higher levels of rights. If it is an annual licence, this should not be a problem.

At the top of the site there is a row of old trees, which are unlikely to be protected. However, this will also need to be checked. Some of these might need to be trimmed but as they are on the Northern boundary it should not be a bigger problem than this.

We are told that the area is not in the Green Belt or a Conservation Area and does not have any AONB or other similar designation. It was not possible to find out how the land has been zoned (if at all) in the Local Plan.

At the Southern end of the site there are some 11 kV cables just touching the SW corner of the site. This might provide a small shading issue but fortunately they only encroach slightly on to the field in question.

The Legal Services department will need to be canvassed about the title to the land. One particular matter that has arisen is the fact that the land was sold to the Council by Nestle when it left Ashbourne and apparently has a restrictive covenant of some form on it. It was not possible to find out what this says but it may be problematic if this is an overage clause of some form (i.e. the Council would have to pay Nestle if the site is developed). As this may be a 'deal breaker' this is an urgent matter, should the Council decide to proceed here.

We are also told that the land was originally taken on for expansion of the cemetery or the allotments. If this is an appropriation issue, this can be changed; of more concern would be if expectations were created with third parties that will need to be managed. It is also the case that the land has been discussed in the context of a potential travellers' site. Compared to the latter, some residents / citizens of the district may prefer a solar farm development, so this may help garner support for solar plans.

Generally, save for the sewage works and the cemetery, the land is not overlooked in any other direction. It is South facing and in a rural area and as such would be suitable for solar PV.

A grid connection might be an issue in this rural location, but there may be a possibility of a private wire connection to the sewage works, where a considerable amount of electricity will be used annually. There is a small solar PV installation at the sewage works already but this is less than 50 kW and will not provide all of the site's needs.

In order to see whether the private wire is viable, a dialogue will need to be opened with Severn Trent in the future. This would normally form part of the next phase of work. In the experience of APSE Energy, Severn Trent are well aware of the renewable energy position and it should be straightforward to discuss this with them.

The main disadvantage of this site (even assuming that it can get planning and a grid connection) is that it is small. It is only likely to host around [1 kW] of capacity which will not generate a large amount of power. That said, if what it does generate can be sold to Severn Trent under a PPA, this site would be worth developing.

Land Adjacent to Griggs Gardens, Wirksworth

This is a very small infill site in Wirksworth. It is approximately 0.2 hectares in size and is triangular in shape. It is on a gentle slope upwards from the houses on Griggs Gardens, whose back gardens look over the site.

The land is approached up a lane owned by the farm at the top of the land and over which the Council does not seem to have a right of way.

The land is currently grassed and has been let for grazing in the past. It was originally earmarked for housing but other parts were developed and this parcel of land left.

At the North Western elevation of the site are some trees that might provide shading.

There would be some planning issues, were the Council to seek to develop this site. However, a grid connection would be unlikely in its rural location and there is no prospect of a private wire.

Even if it was possible to private wire the power, the amount would not make this viable, due to the small size of the site.

This site is not suitable for this type of development and should be discounted.

Allen's Hill – Land off North Street, Cromford

This is another small site, measuring about 0.7 hectares. It derives its name from the topography of the land with a steep and high cliff on the Northern elevation and grassland leading up to that peak on the Southern elevation. The land is enclosed by housing and other development, with an access down North Street that would be problematic for larger vehicles.

The Council owns North Street and would be likely to have a right of way, although a bollard fitted by the hotel at the top of the road would need to be removed (this has not been authorised by the Council).

The most Northerly part of this site is at the bottom of the cliff and has a pub, toilets and other buildings situated on it. On the Southern part of the land there sits a recreation ground which it is not proposed to move (shaded darker on the plan). This leaves just the land in between, which rises steeply up to the cliff edge.

Part of this land is used as a well established smallholding, which the tenant may not wish to leave easily.

For a whole host of reasons, from topography, the site being overlooked, a number of competing interests and so on, this site is not suitable for this type of development and should be discounted.

Land Off Thorncliffe Avenue, Darley Dale

This parcel of land measures approximately 0.9 hectares and so is another relatively small site. It is on sloping land East to West in Northwood.

We are told that there are three competing uses for this site. One is the proposal for a solar farm, another is for affordable housing and finally there is also a proposal to use the land for some form of community gardens / biodiversity.

The land is not in the Green Belt or under designation and we are not aware if it has been classified agriculturally or how it is zoned in the Local Plan.

It is formed of three parts: a lower field which has goal posts fitted and is clearly used for football and other recreation; secondly on the southern elevation there is a made up children's play area; the most Westerly (and upper) field is therefore all that could be used for solar PV. This would leave only a very small area that would not really be viable.

There are other problems here too. The houses on Northwood Lane and the Avenue directly overlook the site and access down the Avenue (which the Council owns) would be difficult.

There would be planning issues due to the proximity of the houses, although the Southern and Eastern elevations have no problem in this regard.

A clear problem will also be the competing interests. In our experience, any land earmarked for housing is normally removed from consideration for solar PV and the potential for some form of community garden is an expectation that has already been raised.

For these reasons, it is the view of APSE Energy that this site is not worth considering further for this type of development and should be discounted.

Land at Stoney Middleton, Hope Valley

The final site visited is the most northerly of the five, having a Sheffield postmark. It is also the largest at 3 hectares and is situated in the Peak District National Park. The land is currently used for grazing horses.

The land is situated directly behind Meadow Close and there are 12 houses that directly overlook the fields in question. The land is currently grassed, although it has a watercourse running through it (this is marked on the plan) which is separately fenced off and cannot be built over. Water comes down from a quarry area on higher land and through pipes under the houses to enter into this channel for dispersal.

On the Eastern elevation is what looks like a small industrial estate with perhaps a dozen units. This will be relevant in planning terms but might also offer a private wire alternative. On the Western and Northern elevations there is an open aspect and nothing overlooks the site. The housing is on the Southern elevation. Bearing in mind that this is in the National Park, in planning terms the fact that the land already hosts houses and industry / commercial suggests that it would be difficult to argue a solar farm will encroach on to the National Park.

The land is flat and grassed and is currently used for grazing horses under some form of licence. This will need to be examined to check what potential there might be for possession. The current tenant is aware of the proposals, due to the community involvement discussed below.

The access to the land is via Meadow Close, a quiet crescent and a track leading between the houses on this street. Access for large vehicles might be an issue and this will need to be considered.

There are electrical cables on the Northern elevation but these appeared to be over the boundary on to the adjoining land. There are pylons for 11 kV electricity on the Western elevation too but as these are on the very edge of the site, this should not be a problem.

Solar farms are not normally built on land where there are adjoining houses but here there are only about a dozen properties and the impact would not be great. Whilst there is no screening currently in

place, most have sheds at the end of their gardens which would limit the view. It is interesting to note that if a community feasibility exercise has been undertaken (as discussed below) and if no objections have yet been made, this is a good sign.

As the Council is not the planning authority for the Peak District National Park, if it were to develop the site it would have to submit an application to the Park authority. A grid connection will also be necessary and there is evidence that this might be problematic in terms of cost. A private wire to the adjoining industrial estate would be possible, but this is only small. Nonetheless, a significant community benefit would appertain from such a connection.

We are told that there is community interest in this site as well. An application was submitted to the Government's Rural Communities Energy Fund to appoint consultants to advise on the feasibility of such a scheme. This was agreed by the Council and so an expectation of a community solar farm resulting has been created. At the time of writing this Sites Report we have not seen the conclusions of the community's consultants, but have been told that grid costs were prohibitive.

There is therefore an expectation that the Council would engage with the community group to allow it to develop the site if this were feasible. In the main APSE Energy report comments are made about the options here and how the Council might like to proceed should viability be proved.

It has been agreed that APSE Energy will review the consultant's report and provide the Council with a 'critical friend' view of the report. At this current time, a copy of this report is awaited.

From our standpoint, the land looks suitable for solar PV development, subject to planning and grid. However, despite the fact that it is the largest of the parcels of land considered, it is still a smallish site. We estimate that it would host [2 kW] of solar farm.

CONCLUSIONS

Of the five sites reviewed, three can be immediately discounted at this stage. Both Watery Lane and Stoney Middleton are potential development sites and are worthy of further consideration.

More information is provided on the Council's potential options for taking forward development in the APSE Energy main report.

**LOCAL SERVICES
LOCAL SOLUTIONS**