Reach Community Solar Farm

Business Plan

Summary

Reach Community Solar Farm Ltd intends to build a community-owned solar farm on the edge of the village of Reach, Cambridgeshire. The project is expected to generate roughly half of the electricity used in the village.

Our aims are to contribute to reducing carbon emissions through the generation of clean, renewable electricity, to give returns to our members through an interest payment on shares held in the project, and to support wider environmental and social benefits through donations to a community benefit fund.

Our Vision

Reach Community Solar Farm Limited aims to generate low-carbon renewable electricity, provide benefits to the local community, and enable local residents to invest in clean energy and enjoy the financial benefits of the project.

The project

We aim to install 1056 solar panels on land at Spring Hall farm, opposite Swan Lake grain store on Little Fen Drove on the outskirts of Reach. The solar panels will feed electricity into the overhead power line that already crosses the land via inverters and a small substation located in one corner of the field.

The solar array will cover approximately 1.5 acres, and the frames will be approximately 2m high. The solar panels have a uniform dark blue appearance when viewed from a distance, and glare is reduced by using a textured glass over the solar cells. The combination of the dark neutral colour, low frame height and anti-reflection glass means that they are relatively unobtrusive relative to other agricultural structures such as greenhouses or polytunnels.

There are already hedgerows along Little Fen Drove and Barston Drove which screen most views of the site, and we intend to plant a new hedge which will give further screening. Our intention is to mount the panels in such a way that grazing of sheep will be possible around the solar array.

The solar farm has a projected life of 20 years. It is designed to be easily dismantled and have minimal lasting effect on the land.

A lease has been agreed with the land owners and will be signed before the issuing of shares in the scheme.

The scheme is smaller than originally intended owing to little capacity being available for connection of generation schemes at the local substation at Burwell. Work is planned in coming years to upgrade this substation, and we may look to expand the project at that point.

A number of documents are available at www.reachsolarfarm.co.uk/documents.html with further details about the scheme.

Environmental Benefits

One of the main motivations for the project is to reduce carbon emissions. Much of the electricity in the UK is still produced by coal and gas-fired power stations. By producing clean renewable electricity from the solar farm we will reduce our dependence on these plants.

Small, decentralised projects of this type located close to the point of usage of electricity also reduce transmission losses in the electricity network.

Social Benefits

We intend to create a community fund to support other local community initiatives, particularly those relating to energy efficiency and sustainable energy generation.

The community benefit fund will be financed from any surplus made by RCSF after achieving the target interest payments for members. Our financial model indicates that payments of between £300 and £800 per year can be made to the community fund whilst making interest payments at close to, or slightly above, RPI.

By encouraging local people to invest we also aim to give the village a sense of ownership of the project. We will also look to enable further community involvement in the project such as school visits.

Governance

Reach Community Solar Farm Ltd is a Industrial and Provident Community Benefit Society (CBS) formed in 2014. As a CBS, RCSF is democratically owned. Each member has one vote, regardless of the number of shares they hold, offering a fair and transparent way to operate a community-owned renewable energy business.

Unlike a limited company, which is designed to benefit shareholders, a CBS is designed to benefit the community whether they are members or not. A CBS also has the power to give priority to investment from the local area, ensuring that, as much as possible, local people enjoy the financial benefits of the renewable energy that is generated.

RCSF is bound by its Rules, and the powers of members and Directors are set out within those Rules. The Directors run RCSF in line with the Objects set out in the rules on behalf of the members. The members have the right to elect and remove Directors.

A copy of our rules is available for download via our website at http://reachsolarfarm.co.uk/documents.html.

Suppliers

The Directors have opted to use a local solar PV installer, Midsummer Energy, who have been instrumental in the development of the project, rather than put the installation out to tender. This decision was reviewed independently by the Co-operative Assistance Network, who considered whether value for money was being received and whether Midsummer Energy had the capability to carry out the work.

High voltage work (installation of the substation, transformer and 11kV cabling) is being tendered separately to a specialist contractor. A number of tenders have been received for this part of the installation. The directors will choose a company to work with based on value for money and competency to carry out the work.

Credit checks have been carried out on Midsummer Energy and the companies who have been asked to tender for the high voltage work.

The Board

The board of Reach Community Solar Farm limited is formed of volunteers from the village and surrounding area

Paul Robinson – Chair
Paul is a local organic farmer and runs a vegetable box scheme around Cambridge. He is an active member of Transition Cambridge, and has experience of leading community initiatives through the successful 'Cropshare' program at Waterlnd Organics.

Charlotte Cane
Charlotte has worked as a senior financial officer in a variety of organisations, and currently leads the Finance, HR and Operations department for the University of Cambridge Development and Alumni Office.

Nick Webb
Nick has considerable experience of Co-operative Societies, having been involved in Delta-T, a local Co-operatively run business, for a number of years. He has in the past served as a local Councillor.

Graham Lingley
Graham is a keen environmentalist and has been involved in a number of other community initiatives in the village.

Andrew Trump
Andrew brings valuable business and farming experience through his work for Organic Arable, a company that works with organic farmers to market their grain.

Company Secretary

Andy Rankin
Andy runs the solar PV installation company Midsummer Energy, who have provided support during the start-up phase and who will be installing the solar farm under contract.

Financial projections

Introduction

The community solar farm will require significant capital up front for the build, but should then benefit from a steady income each year from the feed-in tariff and the sale of electricity. We have used the expected build cost and projected income and annual costs to model the finances over time, and to give an indication of the level of interest we can pay on shares, and the amount we can donate to a community benefit fund.

As with any projections there are a number of uncertainties in the figures. Whilst we have estimates for the build cost for example, it is prudent to allow some contingency for unexpected costs. The amount of energy we generate will vary from year to year with weather conditions and as panels degrade, and although the generation feed-in tariff paid for each kWh of electricity generated is fixed, the price we will receive from the sale of electricity will depend on market conditions. We have to allow for possible equipment failure and future changes in tax or allowances such as business rates.

We have therefore created a spreadsheet model and run it three times with a 'pessimistic' set of numbers (costs higher than expected and income lower than expected); a 'realistic' set of numbers (a small amount is allowed for contingencies and unexpected costs, and energy generation is as predicted by models), and an 'optimistic' set of numbers (income is at the top of the expected range and we do not meet any unexpected costs).

From these three scenarios we can predict the surplus each year that can be used for interest payments on shares or donated to the community benefit fund.

There is of course a risk that the project will not return even as much as our 'pessimistic' scenario predicts. However, we have tried to model costs and income as accurately as we reasonably can, erring on the side of caution, and we believe it is likely that the returns will be within the range that we predict. We also know that similar projects that have been set up around the country have been able to achieve broadly similar rates of return.

Upfront cost

A substantial sum is required in order to get the project off the ground. The majority of the cost is the build itself – purchasing the panels, mounting frames and inverters, and the labour cost of the build. Midsummer Energy have provided a quotation for the installation of a 264kW solar array, priced at £241,000. This sum includes some money which has already been spent, such as planning application fees and legal costs associated with the lease of the land.

In addition to this, we have included sums for:

- Installation of High Voltage equipment (transformer and switchgear etc - £80,000 to £100,000)
- DNO non-contestable work in HV connection (£8,000)
- Share offer costs (up to £2,000)
- Contingency (up to £8,000)

Uncertainties:

- *A contract for the build has not yet been formally signed, and the price could change if there are significant movements in solar panel or inverter prices,*
- *DNO non-contestable work and HV connection charges are based on budget figures. Formal quotes need to be obtained for these items.*
- *VAT will be charged on most items. The company intends to register for VAT and should therefore be able to reclaim VAT, so all figures are given without VAT. However, this will lead to a cash-flow problem at the beginning, as the VAT will have to be paid before it is reclaimed. A short-term loan may be required to cover this.*

The total sum of money required for the build should be between £333,000 to £358,000, depending on the final cost of the HV connection, and on whether any money is required to cover contingencies.

Recurring costs

The largest recurring costs each year are rent and rates, maintenance, administration and insurance.

Rent: An agreement has been reached to rent the land for £2,700 per annum, rising in line with RPI. A lease for the land has been prepared on this basis. However, as we have had to down-size the system, the area of land we now require is smaller. We have assumed that we will be able to agree a lease for the same price per unit area of land. However, we may also agree to pay a small amount to the landlords in order to retain the right to expand the system in future. We have therefore allowed between £1400 and £1700 per year for rent.

Rates: We have been advised by the Valuation Office Agency that the current rateable value for field-mounted solar is £8 per kW (http://www.voa.gov.uk/corporate/Publications/Manuals/RatingManual/RatingManualVolume5/sect530/c-rat-man-vol5-s530-app2.html). This gives a rateable value of £2112 for the solar farm. The current multiplier for small business rates is 46.2p in the pound, so the annual business rates payable should be £976.

However, as the site has a rateable value of less than £6,000, it should qualify for small business rate relief. At present this relief is set at 100%, but this is set to be reduced to 50% from 31st March 2015. It may that be a further extension of the 100% relief is granted, and we can also apply to the Council for discretionary rate relief. On the other hand if business rates increase in the future, or if small business rate relief is abolished, the rates could increase. We have allowed between £0 and £488 per year for business rates in our projections.

Maintenance: Midsummer Energy have provided a provisional figure for a maintenance contract of £1,800 per annum. This includes bi-monthly visits and a schedule of checks, along with a 'rapid response' service in case of the system failing. It also includes the cost of providing an internet connection to the site so that it can be monitored remotely.

Administration: We propose contracting out the routine administration – liasing with

investors and submitting VAT returns and annual accounts. ShareEnergy offer a service which would cost £2,500 per year for up to 100 members, plus £10 for each additional member. However, this could be reduced by some of the work being done voluntarily, or a local business may be able to offer to take on the administration for a smaller annual fee. We have assumed an annual administration cost of £1,500 per year.

Insurance: We have budgeted £1,000 for insurance each year.

We have assumed that all annual costs rise in line with RPI each year.

Uncertainties:

- *Lease has not yet been signed*
- *Maintenance contract has not yet been agreed*
- *Administration contract has not yet been agreed*
- *Insurance quotes need to be obtained*

Income

The primary source of income is the feed-in tariff, a fixed sum paid for each kWh of electricity generated. The sale of the electricity generated will also give a significant income each year.

1kW of unshaded solar panels, oriented south at 25 degrees from horizontal, is expected to generate around 940kWh per year in this location, based on the standard Microgeneration Certification Scheme method for estimating generation. Other independent models give similar values – PVGIS (http://re.jrc.ec.europa.eu/pvgis/apps4/pvest.php?lang=en&map=europe) for example gives an expected annual output of 945kWh per year per kW of solar panels.

An allowance of 6% shading should however be made for the lower of the two rows of panels, as they will be shaded in the early morning and late evening by the panels in front.

As we are proposing a system where the inverters are under-dimensioned relative to the solar array in order to keep the export below 200kVA, the maximum that UK Power Networks will permit, there will be a small loss of generation at times. We have allowed for a reduction of 2% in annual generation due to this.

After allowing for shading and under-dimensioning, the expected annual generation for the 264kW system is around 236,728 kWh per year.

The feed-in tariff rate is currently 6.38p per kWh, but this will be reduced to approximately 6.22p per kWh in April. This translates to an initial income of £14,725 per year from the feed-in tariff.

In addition to the feed-in tariff, we will receive income from the sale of electricity. Another local community energy project, Gamlingay Wind Turbine Ltd, are currently receiving 5.09p per kWh for the electricity they export, corresponding to an income of £12,310 per year. The price of electricity will change with market rates however.

Solar panels gradually degrade over time. We have assumed degradation in output of 0.8% per year, with a corresponding reduction in income from feed-in tariffs and sale of electricity. However, we have assumed that both the feed-in tariff and the price for electricity will rise each year in line with RPI.

A small source of additional income will be interest on any money the company has in its bank account. We have assumed interest rates are equal to RPI. At present, most current accounts offer less than RPI. However, it is likely that if the company accumulates significant capital it will make longer-term investments which will provide a higher return. It could, for example, invest in other community energy schemes.

Uncertainties:

- *FIT depends on date of installation – it could be lower if we do not meet a target installation date. However, we should be able to apply for Preliminary Accreditation which will fix the tariff at the rate prevailing on April 1st (expected to be approximately 6.22p per kWh) for at least six months.*
- *The price we can get for the sale of electricity depends on the market.*
- *If we have failures of equipment we may have periods when the system is not generating, and hence we have no income.*
- *The amount generated will vary from year to year naturally with insolation*
- *The solar panels may degrade faster or slower than expected.*
- *Returns on any capital accumulated are uncertain.*

End-of lifetime costs

Some money may need to be put aside in order that we can meet our obligations to clear the site and return it to the landowner at the end of the lease period. However, there may be some residual value in the panels at this point, and there will also be a significant scrap value in the mounting frames. Also, it is likely that the solar farm will still be in operation and we will wish to extend its life beyond the initial 20-year period.

Uncertainties:

- *The decommissioning cost is very uncertain*
- *The residual value of the components is very uncertain*
- *We cannot know at this length of time whether the solar farm will still have value as a going concern.*

We have assumed that decommissioning will be cost-neutral, or not required as the project will continue. If this is not the case, and a significant sum is required for decommissioning, returns to investors may have to be reduced in the last few years of the scheme to build up funds to cover these costs.

Share offer and withdrawal of shares

The scheme requires a significant upfront cost, which we propose to raise via a share offer. However, recurring costs are then low relative to the income from the feed-in tariff and electricity sales, so each year a relatively large surplus is made which can be returned to investors.

Our model is for investors to receive an interest payment each year on the value of

their investment, and also receive the full value of their investment back at the end of the project. However, it is very likely that some investors will want to withdraw their capital before the end of the 20 year period. There should be sufficient surplus each year to be able to buy back approximately 5% of the shares. Our rules state that such withdrawal of shares is at the discretion of the board, and are not permitted within the first three years of the scheme.

The rate at which shares are withdrawn has some impact on the finances. If the company has money in the bank it will receive bank interest (which we have assumed is equal to RPI – say 2.5%) on that money. However, if it uses the money to repurchase shares, it will not have to pay interest (at a rate which is likely to be higher than RPI – say 4%) on those shares to an investor. Returns are therefore likely to be improved by using capital to repurchase shares rather than keep it in the bank.

Uncertainties:

- *It is up to individual investors to request withdrawal of shares. We cannot say what proportion of shares will be repurchased each year – it may be that most investors will aim to keep their shares for the duration of the project.*

Future expansion

We had originally envisaged a larger scheme, but we were restricted by the capacity of the local electricity network to accept generation. UK Power Networks have indicated that further capacity may come available in the future if the local substation is upgraded, or if trials of technologies that increase the network capacity are successful and are extended to the area.

If we are able to expand the system in future, the cost per kW of expansion is likely to be significantly lower than the initial build as the substation and HV connection will already be in place.

Any decision to expand would need to be approved by the members at an AGM, and would require additional investment to be raised via a further share offer or a loan.

Model

The financial projections have been modelled with a spreadsheet. The model analyses how the finances will evolve over the 21-year lifespan of the project. In the first year, money is raised with a share offer and spent on the build of the solar farm. In subsequent years, the company receives income from the generated electricity and from bank interest, expends money on maintenance and administration, and makes interest payments to investors and donations to a community benefit fund.

As costs and income cannot be predicted exactly we have used three different scenarios with 'pessimistic', 'realistic' and 'optimistic' figures for income and expenditure. These then give a range of returns to investors and to the community benefit fund.

Scenario 1: The Pessimist

This scenario predicts the returns that will result from higher-than-expected costs, and lower-than-expected energy generation. Interest payments and payments to the community benefit fund are relatively low to reflect the lower surplus each year.

Assumptions

- A contingency of £5,000 is required for the build
- The panels generate 3% less than expected
- We receive 4.8p per kWh for the sale of electricity
- Small business rates relief is set at 50%
- One-off costs of £4,000 are allowed for in years 12 and 16 to cover failed equipment

Results

With these assumptions, the company is able to pay interest of 1.7% to investors, and make a donation of £300 per year to the community benefit fund. It should be noted that this interest payment is below RPI, which is assumed to be 2.5%.

Scenario 2: The Realist

This scenario uses our 'best-guess' figures for costs and for income.

Assumptions

- A contingency of £3,000 is required for the build
- The panels generate the amount of energy modelled above each year
- We receive 5.3 p per kWh for the sale of electricity
- A one-off cost of £5,000 in year 15 to cover failed equipment
- Business rates average £244 per year.

Results

Under this scenario, the company would be able to pay around 3% interest each year to investors, along with a £500 donation per year to the community fund.

Scenario 3: The Optimist

Assumptions

- We don't have to break into contingency funds for the build
- The panels generate 3% more than models predict
- We receive 5.8 p per kWh for the sale of electricity
- No money is required for equipment replacement through the project
- 100% Small Business Rates Relief is extended throughout the lifetime of the project.

Results

This scenario gives an upper limit to the returns we may be able to give to investors and to the community benefit fund. In this scenario we could donate £800 per year to the community benefit fund, whilst paying over 4% interest on shares held.

EIS / SEIS

Our model gives financial projections from the point of view of Reach Community Solar Farm Ltd. Individual investors who are taxpayers may be able to benefit from EIS or SEIS tax relief. Where these tax reliefs apply they in effect give an investor a discount on the purchase of the shares by reducing the investors tax liability in the financial year that the shares were purchased. The effective rate of return for those shares will therefore be higher.

EIS and SEIS are beyond the scope of this document. More details can be found on the HMRC website at http://www.hmrc.gov.uk/eis/ and http://www.hmrc.gov.uk/seedeis/.

Summary

The three scenarios are useful in predicting the range of returns that the company is likely to be able to offer investors. Depending on the assumptions made, it is likely that returns of slightly above RPI can be achieved – although this cannot be guaranteed, and if costs are at the higher end of the spectrum then the rate of return may be slightly below RPI.

In all scenarios we have included a donation to a community fund. This will be voted on by the members at the AGM each year. Large donations will impact on the rate of interest that the company is able to pay.

Investors may be able to benefit from tax reliefs which will increase their effective returns.

If expansion of the solar farm in line with the original proposals is possible in the future, returns to investors may be improved although additional finance would be required at that point.