Community Solar and Car Share
Keswick and Cockermouth

Feasibility Study Report

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1 Executive Summary

This feasibility study is focussed on the towns of Keswick and Cockermouth and investigates the potential for community-owned (or community-led) solar photovoltaic (PV) installations, electric vehicle (EV) charge points and car clubs.

This study has been funded by the Rural Community Energy Fund.

The community groups who are leading the project are Sustainable Keswick and Climate Emergency West Cumbria (CEWC). The advisor team that has delivered this feasibility study includes Cumbria Action for Sustainability, Sharenergy, Charge My Street and Derwent Valley Car Club.

The outcome of the solar PV study identified that the following sites are suitable for solar PV and that the building occupants are interested in a community energy delivery model:

- Keswick School (secondary)
- Cockermouth School (secondary)
- Cockermouth Leisure Centre
- Eaglesfield Paddle Primary Academy

Whilst the combined size of installation is, in theory, sufficient to make this project financially viable on its own, there are significant risks to establishing a new community investment vehicle to deliver this portfolio. The size of the portfolio is small: there are only four sites, of which one, Eaglesfield Paddle Primary School, has marginal financial viability and another, Cockermouth Leisure Centre, is uncertain pending a roof survey. Therefore, it is recommended that Sustainable Keswick and CEWC work with an established community energy organisation to deliver the project. There are several who could be approached, including Baywind Energy Co-operative, Big Solar Co-op, Solar for Schools and the Schools Solar Co-op.

The outcome of the EV charge point study identified that the following sites are suitable for EV charge points and that site owners are interested in a community energy delivery model:

- Wakefield Road Car Park, Cockermouth
- Horse and Farrier Pub, Threlkeld
- Eaglesfield Village Hall
- Friends Meeting House, Keswick

Due to the limited capacity of Sustainable Keswick and CEWC to take on the delivery and on-going management of the charge points, Charge My Street is already working with the site owners to progress the installation. The EV charge points can be installed through existing funding and will not require additional share offers to raise funds.

Of the four sites that were identified as being suitable for solar PV, Cockermouth School and Cockermouth Leisure Centre were also identified as being good sites for EV charge points and may be progressed in the future.

The car club study was based upon an analysis of survey results. 299 surveys were completed, 206 of which were from residents, split fairly evenly between Keswick and Cockermouth, and 93 of which were from visitors. The results of the surveys highlighted that the benefits of car clubs are well understood, however, there is still a lack of understanding around EVs. This is in part due to unfamiliar technology, affordability of EVs, and range anxiety which is not commensurate with actual average car usage.

The benefit of developing car clubs with EVs is the ability to remove barriers to take up, and show that EVs are a realistic alternative to traditional vehicles. The survey has shown a clear need, and desire for car sharing or car club alternatives in the area, with an indicative need for 10-15 car club vehicles.

There is a significant potential to reduce carbon emissions, congestion and parking issues in both Keswick and Cockermouth by not only converting people to the use of EVs but by removing vehicles from the road. It is estimated that between 49 and 136 cars could be eliminated from the roads of Keswick and Cockermouth.

However, EV infrastructure does need to be improved to enable EV sharing to take place. In summary:

- There is sufficient interest from the local residential populations in both Keswick and Cockermouth to make community car clubs, commercial car clubs or car sharing viable in each location. There is also sufficient interest from people willing to offer their vehicle as part of a community car share scheme.

- To facilitate operation of a community car club, it would be possible to make use of a commercial platform. A more informal arrangement is likely to reduce costs for users but would require more volunteer time to run.

- There is interest from visitors in a car club, however there are concerns around the connectivity and integration of public transport to access the area.

- It is recommended that a car club scheme is delivered via either a community car club model, subject to the capacity of Sustainable Keswick and CEWC, or a commercial scheme.

2 Project Overview

2.1 Project Scope

This feasibility study is focussed on the towns of Keswick and Cockermouth and investigates the potential for community-owned (or community-led) solar photovoltaic (PV) installations, electric vehicle (EV) charge points and car clubs.

This study has been funded by the Rural Community Energy Fund.

It builds upon previous work and aims to:

- Identify buildings suitable for hosting community-owned rooftop solar PV across Keswick, Cockermouth and nearby areas. The aim is to build a critical mass of potential solar PV installed capacity to enable the delivery of a Keswick and Cockermouth-wide solar project.
- Identify potential electric vehicle charging point locations to support the uptake of electric vehicles. If these can be linked to the solar PV installations, this could improve the overall business case for the solar project.
- Review the potential for an electric vehicle car club and/or other car share models, focussing on routes to reduced local car ownership. It also aims to increase the number of tourists arriving by public transport, with the promise of accessibility to loan / hire vehicles on arrival.

Therefore, the research questions that the feasibility study aims to answer are:

Solar PV:

- Which sites in Keswick and Cockermouth are most likely to be suitable for community-owned solar PV installations?
- What are the options for delivering the solar PV?
- What are the legal, technical and financial implications of these options, and what would be required of community groups to deliver the project?

EV charge points

- What future public EV charging provision is planned by other parties (especially local authorities)?
- Which sites in Keswick and Cockermouth are most suitable for hosting community-owned electric vehicle charge points?
- What are the options for delivering the EV charge points?
- What are the legal, technical and financial implications of these options, and what would be required of the community groups to deliver the project?

Car club and/or car share

- What are the existing local car hire options?
- What is the level of interest in the local residential populations for accessing a vehicle through a car club or car-share scheme?
- What is the level of interest in the local residential populations for offering their car as part of the car-share scheme?

- What is the likely level of interest in visiting tourists for car hire?
- What are the options for delivering a car club or car share scheme?
- What are the legal, technical and financial implications of these options, and what would be required of community groups to deliver the project?

A significant amount of engagement has been required to identify suitable sites for solar PV and EV charge points and to discover the levels of interest in car sharing within the local residential and visitor populations.

2.2 Evaluation Criteria

Two sets of evaluation criteria were established for the study – site selection criteria for the solar PV sites and for the EV charge point sites, and delivery model criteria for all three aspects of the project.

The site selection criteria for the solar PV and EV charge point sites are set out in the respective sections below.

The delivery model criteria are as follows:

Criteria	**Essential or desirable?**
Do Sustainable Keswick and Climate Emergency West Cumbria have the capacity to deliver this?	Essential
Is there sufficient stakeholder (site/user) support for this	Essential
Carbon savings	Essential For solar PV and EV charge points - already considered as part of site selection criteria. For car sharing – based on likely level of removal of cars from the road and likely inclusion of EVs.
Does it allow local community ownership (ie community share offer to fund the assets and with return on investment)? (and to what extent)	Desirable
Does it generate a community benefit fund? (and to what extent)	Desirable
Is it replicable or expandable, either locally or elsewhere? (and to what extent)	Desirable

The different delivery models for each element of the project have been considered against these criteria, as detailed in the respective sections below. This will help inform decision making about how to progress each element of the project.

2.3 Community Team

The community teams leading the project are Sustainable Keswick and Climate Emergency West Cumbria (CEWC).

2.4 Advisor Team

The advisor team that has delivered this feasibility study includes:

- Cumbria Action for Sustainability (CAfS) – project management and community engagement
- Sharenergy – solar PV study
- Charge My Street – EV charge point study
- Derwent Valley Car Club – car club study

3 Community Engagement

3.1 Approach

At the start of the project, CAfS produced a community engagement plan. This identified the different stakeholders associated with each element of the project including both potential beneficiaries and delivery partners. It then established what we needed to communicate to each stakeholder group and what information we needed from them. Finally, it set out the methods of communication. CAfS worked closely with Sustainable Keswick and CEWC on this element in particular, to take advantage of their knowledge of local communication channels.

The final version of the community engagement plan is provided in Appendix A.

3.2 Community Solar

Before this feasibility study had started, Sustainable Keswick had already done a considerable amount of work to identify potential sites for community-owned solar PV and to make contact with those sites.

It was therefore concluded Sustainable Keswick and CEWC should be the main points of contact for the solar PV sites, with the messaging and requests for information established with CAfS and Sharenergy in advance. Experience has also shown that sites are more receptive to contact from someone within the local community than from an external consultant. Once a site had shown interest, Sharenergy was introduced and liaised directly with the site.

Securing interest from the potential solar sites has been the most challenging aspect of the engagement process. Whilst several showed an initial interest, some of these disengaged. It is possible that the long-term nature of a power purchase agreement might be off-putting, or it might be that the organisations are simply too busy to engage fully.

3.3 Electric Vehicle Charge Points

Charge My Street had already investigated and made contact with several sites in Keswick and Cockermouth. Approaches to new sites were made either by Charge My Street or Sustainable Keswick and CEWC, depending upon whether any relationships already existed and whether there were already conversations with that site about solar PV.

Charge My Street has a mechanism for members of the public to submit suggestions for new charge points on their website. This opportunity was highlighted in general promotional material about the project and via the car sharing questionnaire.

3.4 Community Car Sharing

Assessing the feasibility of a car club required a high number of responses from residents and visitors. It was also important to get a good balance between responses from Keswick and responses from Cockermouth.

Derwent Valley Car Club produced two versions of a questionnaire (one for residents and one for visitors) to gather the required information and this was refined through discussion with CAfS, Sustainable Keswick and CEWC. Once finalised, the questionnaire was disseminated through multiple channels, as identified in the community engagement plan. This included on posters and flyers, in the local press and social media, via email to local schools and other community groups and in person at a market stall and evening event.

As well as establishing the demand for a car club, the survey was used to also gather data on the likely EV usage and demand for EV charge points in the near future.

4 Community Solar

4.1 Identifying sites

4.1.1 Selection criteria

The selection criteria for solar PV sites were as follows:

- A large unshaded roof in a good orientation
- A roof that is structurally sound and ideally not needing to be replaced within the next 20 years
- Sufficiently high electricity consumption, particularly in the day-time, to allow a high percentage of generated electricity to be consumed on site.
- An organisation that shows a good level of engagement in the process

The following criteria were deemed desirable, but an inability to meet all these criteria need not necessarily disqualify a site:

- Site occupant owns the building or has a good relationship with the owner
- Unlikely to have grid connection issues
  — For instance, having no mains power on site or known issues with the supply.
- Unlikely to have planning permission issues
  — For instance, by being a listed building or in a conservation area.
- Roof is accessible, directly or for the erection of scaffolding
- Roof is visible to the general public
- Opportunity to co-locate EV charge point and possibly car club car

4.1.2 Site review

Before this feasibility study had started, Sustainable Keswick had already done a considerable amount of work to identify potential sites for community-owned solar PV and to make contact with those sites. CEWC also identified a number of sites that were added to the list. In total there were 61 sites across the search area on the long list.

Sharenergy reviewed this list and shortlisted 16 sites, based on the above criteria. This shortlist is available at Appendix B. These sites were then contacted by Sustainable Keswick and CEWC to see if they wanted to be part of the feasibility study. Only three viable sites went on to provide useful data on their energy consumption, allowing them to be analysed by Sharenergy. Given the paucity of plausible leads, a further marginal site that had expressed a more active interest was brought back into consideration. These four viable sites are described below.

Of the remaining 13 shortlisted sites, the following chart summarises the reasons for not considering them further:

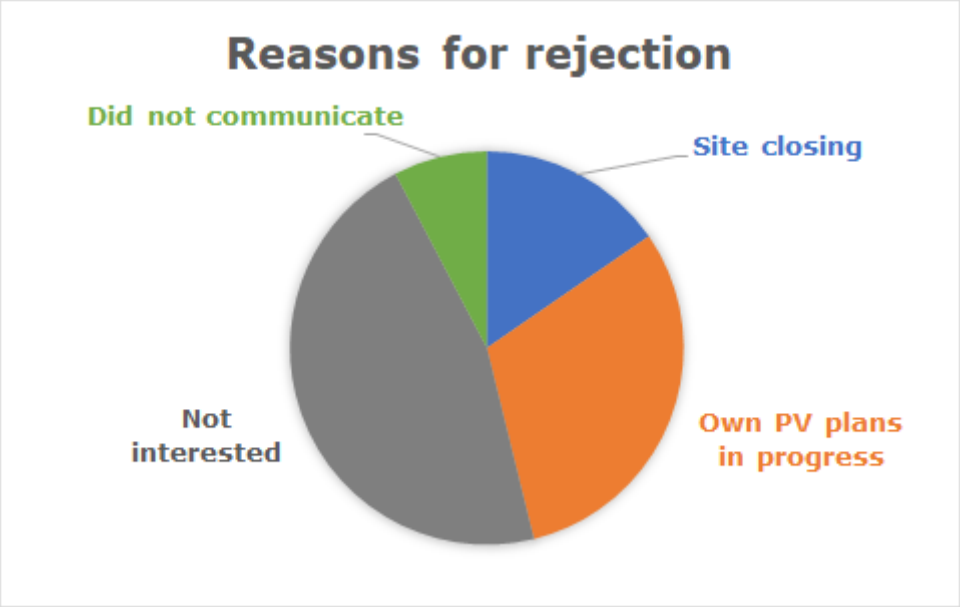


Figure 4.1 - Reasons for rejecting shortlisted sites from detailed consideration

4.2 Viable sites

The four sites that were examined in detail were:

- Keswick School
- Cockermouth School
- Cockermouth Leisure Centre
- Eaglesfield Paddle Primary Academy

Outline PV designs have been created to allow a desktop assessment of the yields and possible returns from a community-owned array. The full details of each site and the analyses are provided in Appendix B, with the results summarised below.

For each analysis, a mid-range solar panel of 375Wp[1] was used, representing a slightly pessimistic case for an installation that is still a year or more away from commissioning. This and many of the other assumptions underpinning the modelling are described in Appendix B.

Electricity North West (ENW), the Distribution Network Operator covering Cumbria, was approached about the sites and confirmed that no significant constraints exist on the local grid, with enough headroom existing to allow firm connections for the arrays named.

An analysis of the use of batteries was outside of the scope of this project.Furthermore, previous experience of such projects has repeatedly shown that at current prices they do not improve the financial viability in most circumstances. Whilst a battery can theoretically compensate for a poor correlation of demand with

[1] A Watt-peak (Wp) is the measure of the efficiency of a solar panel, giving the power output under a standardised amount of simulated 'peak' solar radiation. Array capacities are typically given in kilowatt-peak, kWp.

consumption, the additional cost rarely compensates for the increase in self-consumption[2]. In the case of the school sites featured here, the main factor impacting self-consumption is the low consumption during weekends and holidays, which would not be significantly affected by any plausibly sized battery.

4.2.1 Keswick School

Keswick School is a major regional school with boarding houses and extensive buildings and grounds. The complex roofscape could accommodate a 231kWp array, spread over both the newer pitched roofs and on racked arrays on flat roofs. The possible size and locations of the array may need to be altered following consultation with local planners due to the effect of being within the National Park area.

From the analysis of this array and the figure for annual electricity use and costs supplied, the following estimates were made:

Array capacity	231.4kWp
Total annual yield	182,900kWh
Specific annual yield[3]	790kWh/kWp
Annual onsite electricity consumption	764,400kWh
Self-consumption	80%
Imported energy avoided	26%
Possible energy bill saving[4]	£16,200 in year 1 £250,000 over 20 years[5]

Energy consumption data was only supplied as an annual total, rather than a monthly breakdown, so the self-consumption figure used here is especially uncertain. However, the proposal is still viable should this figure be out by 10%, in which case the energy bill savings become £14,100 in year 1 and £218,500 over 20 years (inflation adjusted as before).

The school has expressed enthusiasm to participate in a community project to install PV, and given the high energy use – only likely to increase with the ongoing electrification of transport and heating – it is an extremely viable location for rooftop PV.

[2] Self-consumption refers to the proportion of generated energy that is consumed on-site. A self-consumption of 100% means that all the energy generated is used onsite, whereas 0% means that all generated electricity is exported.

[3] The specific annual yield is the energy output over a year per kWp capacity installed. It provides a useful comparative measure of the effectiveness of a solar installation: how much value you're getting out of each panel. It is influenced primarily by roof pitch, orientation and location. It is also referred to as the 'peak sun hours' of an installation.

[4] The figures presented in this section are based on being modelled as part of a portfolio. The results obtained for theoretical standalone projects are given in Appendix B.

[5] Figures for 20-year savings are given in today's prices, adjusted for inflation. The unadjusted figure for the 20-year cumulative saving here would be £255,000.

4.2.2 Cockermouth School

Cockermouth School also has a very high level of energy demand and a diverse set of building types. The site was an early mover in decarbonisation thanks to the work of a celebrated former headteacher, already hosting a small existing array of photovoltaics and a small wind turbine (the output of these are not likely to be significant in relation to the overall levels of demand).

Significantly, most of the original pre-1980 school buildings are planned for demolition within the next decade. This could present a threat if the site is depowered for any significant length of time during this work, but also an opportunity to significantly expand a PV array during these construction works. Such an expansion would be able to take advantage of lower installation costs by installing during construction, and the likely rise in electricity consumption of the new building due to the ongoing electrification of transport and heat.

From the analysis of an array designed solely on buildings that are not due to be demolished the following results were modelled:

Array nameplate capacity	216.4kWp
Total annual yield	169,800kWh
Specific annual yield	785kWh/kWp
Annual onsite electricity consumption	645,600kWh
Self-consumption	77%
Imported energy avoided	20%
Possible energy bill saving	£17,700 in year 1 £272,600 over 20 years

The same proviso applies to energy consumption patterns as before in the absence of high-resolution data. Again, if this self-consumption figure is out by 10% the site remains viable but the possible bill savings reduce to £15,400 in year 1 and £237,100 over 20 years.

Cockermouth School again presents a good opportunity, but the redevelopment plans are a significant unknown which present a high level of risk to a such a small portfolio.

4.2.3 Cockermouth Leisure Centre

Cockermouth Leisure Centre comprises three structures of vastly differing constructions and ages, the oldest part being built in the 1880s and the newest part in 2007. The main hall roof is problematic due toits age, but an array may be possible on the two newer roofs, dependent on a structural survey.

The facility is currently managed by Better, under contract from Allerdale Borough Council. Its long opening hours and high energy consumption makes it a good fit for PV generation.

Using supplied monthly energy consumption, the site's opening hours and an array design using the two newer roofs, the following results were modelled:

Array nameplate capacity	106.5kWp
Array annual yield	85,300kWh
Specific annual yield	801kWh/kWp
Annual onsite electricity consumption	212,400kWh
Self-consumption	72%
Imported energy avoided	29%
Possible bill saving	£8,295 in year 1 £128,000 over 20 years

The structural suitability of the 1970s swimming pool hall is by no means assured and will need to be verified by a structural survey. The roof is covered with bituminous felt, which would need to be penetrated and then re-waterproofed to allow fixed-point mounting of the array – all of which will add to the costs and risk of complication during the project lifetime. The yield from the panels is expected to be below average as the available roofs are all westerly facing. There may be the opportunity to extend the array if the main roof of the old hall is replaced during its lifetime.

4.2.4 Eaglesfield Paddle Primary Academy

The maximum plausible capacity for a PV array on this school was modelled as 47.75kWp. This is on the small side for what would usually be considered viable as part of a community energy project, and indeed financial modelling shows that it would not be viable as a standalone project. There is however enough electrical demand to make it pay for itself as part of a wider portfolio for which overheads are shared, though without contributing a lot into the portfolio.

The school was able and prepared to share monthly energy consumption data and also their unit price. From this the following results was obtained:

Array nameplate capacity	47.75kWp
Total annual yield	36,900kWh
Annual specific yield	773kWh/kWp
Annual onsite electricity consumption	82,052kWh
Self-consumption	68%
Imported energy avoided	31%
Possible energy bill saving	£3,200 in year 1 £49,200 over 20 years

The school is reportedly well used for out-of-school activities and private hire. This, along with the condition of the roofs and the circumstances of the school being an independently owned entity mean that it is a significantly better prospect than might be expected for a 200-year-old rural primary school.

4.3 Potential delivery models

4.3.1 Models available

Three delivery models have been considered: local community ownership via a dedicated community investment vehicle, third party ownership, and occupant ownership.

Local community ownership

The 'traditional' model of community ownership is based around the creation of a dedicated community investment vehicle (usually a Community Benefit Society) which raises the capital required for installation through a share issue, thereby creating a membership of shareholders to whom the Society is accountable.

Since the abolition of the Feed in Tariff (FiTs), the viability and risk of community rooftop solar have become harder to manage. Revenue to repay community share capital must come from selling electricity to an on-site user, so the model is highly vulnerable to interruption of this income through site inoccupancy, changing use patterns or the need for roof or other site works. The solution is to balance this risk across a portfolio of properties – ideally a diverse group of properties in which each site is individually viable and likely to be a reliable consumer of electricity over a period of decades. Such a portfolio approach, with shared overheads, may allow some sites to be developed that would not be viable otherwise, perhaps due to small scale, low daytime energy demand or problematic roofs.

Third party ownership

There are several organisations, locally and nationally, who can deliver rooftop solar at low or zero capital cost to site owners. Some, like Solar for Schools and the Schools Solar Co-op, have a specific offer tailored to the educational sector. Baywind Energy Co-op are based locally in Cumbria and are actively looking for rooftop solar sites to develop in the region, whereas the Big Solar Co-op, Solar for Schools and the Schools Solar Co-op all operate nationally. Baywind Energy Co-op has a small community fund which provides grants through the Baywind Energy Community Trust for projects across southern Cumbria which address renewable energy, energy saving or fuel poverty.

No providers without a social enterprise or co-operative model were considered for this project.

Occupant ownership

Many sites will have no technical barrier to solar but do not represent a viable proposition as a community scheme, usually due to small scale and/or low daytime energy demand. Delivering solar on these sites can still be encouraged. As all four are essentially public buildings, they are all eligible for the Public Sector Decarbonisation Scheme (PSDS)[6], a government fund, delivered by Salix Finance, that has been running since 2020 to support work to reduce carbon emissions from public buildings.

[6] See https://www.gov.uk/government/collections/public-sector-decarbonisation-scheme

This scheme will provide £635 million of funding over the financial years 2023-2024 to 2024-2025 to help decarbonise public buildings. A decarbonisation plan is a prerequisite for applying - this is often funded by a separate application to the Low Carbon Skills Fund[7]. None of the sites considered in this report have a decarbonisation plan in place.

The next phase of the funding scheme (phase 3b) is expected to open in 2023. The primary objective of the third phase of the PSDS is the decarbonisation of heat, but PV installations can be included as a supporting measure.

Other sources of funding are periodically available, for instance from other community energy groups, foundations or even crowdfunding; these could support project development costs but not the full capital cost of an array installation.

4.3.2 Analysis of delivery models

In the below table the three delivery models are compared against the project criteria:

Ownership:	**Local Community**	**Third Party**	**Occupant**
Essential Criteria			
Do Sustainable Keswick and Climate Emergency West Cumbria have the capacity to deliver this?	**Unlikely** With their current levels of capacity it seems unlikely that SusKes and CEWC would be able to manage the establishment and ongoing operation of a local energy project.	**Yes** SusKes and CEWC could play a useful and effective role in advocating for, supporting and liaising between a third party developer and local hosts.	**Yes** Suskes and CEWC could support and encourage sites to invest in their own PV installations, highlighting funding opportunities and showcasing success stories.
Is there sufficient stakeholder (site/user) support for this	**Yes**	**Yes**	**Yes** However in all cases, support for the proposal is not likely to translate into delivery without external funding.
Desirable Criteria			
Does it allow local community ownership (ie community share offer to fund the assets and with return on investment)? (and to what extent)	**Yes** If all sites are suitable (and remain so) it should be comfortably possible to offer a 4% return on shares.	**No** Although by involving Baywind the assets would be in regional ownership.	**No**
Does it generate a community benefit fund? (and to what extent)	**Eventually** Given the small size of the portfolio the	**Potentially** If the sites are developed with	**No**

[7] See https://www.gov.uk/government/publications/public-sector-low-carbon-skills-fund

	emphasis would be on capital repay to de-risk the venture, so it would be many years before any community fund could be paid.	Baywind, SusKes and CEWC may be able to secure an agreement to extend the area eligible for the community benefit fund. Other providers reinvest profits in further schemes, though Solar for Schools will return surplus profits to schools.	
Is it replicable or expandable, either locally or elsewhere? (and to what extent)	**Yes** It would be beneficial from the point of view of minimising risk to expand the portfolio in future if the group is able to do so. Future sites are likely to arise through changes in management or a result of the higher profile achieved by first installations.	**Yes** Once a partnership is formed with any third party, the local groups can act as effective advocates to bring forward further projects.	**Yes** One of the biggest determinants of adoption of solar PV is the presence of other nearby comparable sites adopting PV.

At face value, and from a purely financial perspective the portfolio of four sites offers a good prospect for a viable local community energy project. The outcomes of business modelling for the portfolio are summarised below:

Total capital required (development and installation)		£515,500
Total annual yield		475,000kWh
Annual income year 1	Onsite sales	£82,300
	Exports	£7,500
	Total	£89,800
Annual running costs year 1		£30,000
Share interest IRR offered to investors		4.1%
Capital repayment by		Year 13
Surplus by year 20		£511,900[8]

The model shows that offering a 45% discount on electricity bills can provide a reasonable return to investors over a 25 or 30 year project. The priority in the model is the repayment of share capital, so that the exposure to failures or changes in site

[8] This figure is not inflation adjusted to current value; this is the numerical amount for that year.

usage is reduced before any community benefit funds are paid out. However, by year 20 there is the potential to be making significant contributions for community benefit.

The 45% discount used here is toward the upper limit on what could be offered, and it may be possible to make a less generous offer to sites in order to build a more resilient portfolio. As the current import prices for some sites have not been disclosed, the discounts – which need not be the same for all sites – should be revisited during negotiations with the sites.

This process, of negotiating leases and power purchase agreements (PPAs) with each site, can be complex and demanding and the demands made on a volunteer group should not be underestimated. There are a number of dedicated professional organisations (including Sharenergy) which support local groups with the administrative burden of running an energy project, but there will be a level of commitment required over the project period of 25 or 30 years.

A further key consideration is the element of risk involved: this portfolio contains only four sites, one of which (Eaglesfield Paddle School) is marginal in its viability, and one of which (Cockermouth Leisure Centre) needs further investigation to determine its suitability. At any point in future any of the sites may need to remove panels to repair or replace roofs. PV panels are a very reliable and resilient technology but failure, theft or damage cannot be ruled out, not least from storms events that have affected the area significantly in recent years. If the Leisure Centre is found not to be viable following a detailed survey, then the project would be very vulnerable to the loss of either of the two large school sites for any length of time. It would also be beneficial to have a more diverse portfolio, rather than having more than 80% of the generation in the educational sector.

The third party ownership offers discussed above all operate on essentially the same basis as a local community scheme would: energy is sold on-site to the building occupant at a discounted rate, which then rises with RPI inflation over the project period. As third parties operate larger portfolios of sites, the site offer is likely to end up with a similar or better level of discount to what could be possible in a locally-managed scheme. The difference is that the use of third party ownership means that the burden of legal negotiations, administration, ongoing maintenance, and the contractual and financial risk, is not placed upon the local group.

4.3.3 Recommendations

Based on the above analysis, the following recommendations are made to progress community solar:

It is recommended that the sites be offered to one or more third parties for development.

The choice of third party organisation(s) is a decision for the local groups. Working with Baywind Energy Co-operative offers the opportunity to negotiate access to their existing community benefit fund for the Keswick and Cockermouth area, as well as enhancing the potential fund for communities. However, Solar for Schools have a specific offer which includes an educational programme using real data from a school's

PV array to support the science curriculum; this may be an attractive prospect for the three school sites.

There is still a valuable role that can be performed by Sustainable Keswick and CEWC, acting as local advocates and points of contact, and promoting the projects locally to build further interest.

Sites should be encouraged to apply to the Public Sector Decarbonisation Scheme

As all the sites that were examined in detail are public sector buildings, all could in theory make an application to the national Public Sector Decarbonisation Scheme, although the process is not straight-forward and applications are competitive.

Applications are typically made by the Council or Academy Trust, and the fund is very competitive. The result of the funding could be that a school could fund its own self-owned solar array to support its decarbonisation objectives, but equally it would be possible for PSDS funding to part-fund a third-party owned array if it could be shown that this enables a greater carbon reduction and/or improves value-for-money.

4.4 Community benefits

The benefits to the community of progressing these sites via third party ownership are as follows:

- Supporting local schools and community facilities by reducing their energy bills
  - → The total combined savings for all sites over the 30 year lifetime of a solar array could be more than £1.1m
- Making a tangible contribution to local climate and decarbonisation targets
  - → The portfolio could save 78.5 tonnes of carbon dioxide in its first year of operation.
- Potentially gaining access to a community benefit fund (if working with Baywind)

4.5 Next steps

In order to progress these sites, we recommend the following steps:

- The group should select a delivery partner. This need not be a single partner for all sites.
- The group should broker a meeting between the site management and the delivery partner, ideally involving a site visit to review roof condition, shading and the electrical arrangement of the site.
- The delivery partner will then take over the management of the delivery of the project. In the first instance this should involve a structural survey of the roofs.

5 Electric Vehicle Charge Points

5.1 Demand for EV charge points

As part of the residents' and visitors' survey (see section 6.3 below), respondents were asked if they currently own an EV or if they plan to purchase or lease an EV in the future. Of the 206 residents, 16 people already own an EV and 99 people plan to purchase or lease an EV in the next 12 months to five years. Of the 77 visitors who had travelled to the area by car, two had travelled in an EV and five in a hybrid.

Residents were asked to highlight where they plan to charge an EV. The majority (78 people) said they would use an at home charger and public charger where necessary. 19 people have a charger at home (although some have no EV), and 14 would use public chargers.

In total, 191 residents have highlighted future needs for public and home charging, showing a clear demand for more public charging points locally in Keswick and Cockermouth. Supermarkets, council car parks, garages and main streets were highlighted as the most popular areas for public charging points. However, 91 people are not aware of any plans to install charge points within their community, suggesting that more communication between residents and installers may be needed.

In relation to visitors charging, the highest requirement was overnight at their hotel or accommodation with additional requests for rapid charging.

5.2 Potential delivery models

Due to the previous work carried out in the area, clarity was sought early on in the process about preferred delivery models to avoid any conflict of interest between the consultancy aspects of Charge My Street's business and the delivery arm (which installs and operates charge points).

It was felt to be beneficial to make progress on delivering, as well as assessing, new sites through the feasibility phase as this would maintain momentum with the public. Site can take between 6 months and 2 years to install, depending on contractual and technical challenges. Charge My Street's status as a community benefit society and its ability to quickly progress installations of charge points using its funding and investment, made this the primary delivery model.

5.2.1 Models available

There are 3 main delivery models for the installation of charge points, all of which have been used in Cumbria:

- Commercial charge point operator finances, installs and operates
- Site owner finances, installs and operates
- Social Enterprise, such as Charge My Street, finances, installs and operates

There are variations within each model, but the general principles, benefit, and drawbacks are set out below.

Commercial charge point operator finances, installs and operates

This model generally requires a 15+ year lease. The operator manages the charge point and takes the revenue, passing on a small profit share to the site owner. The benefits of this approach are:

- Simple solution – the operator does most of the work after the contract is signed.
- They maintain the charge point.

but drawbacks are:

- Charge point operators generally want a large number of sites, preferring to work with councils who can bring in funding.
- They take time to do due diligence as they have to prove that the site will generate a return on investment.
- Once they are signed up to a 15-year contract, they may not update equipment and innovate.
- The focus at the moment is on rapid chargers.

Typically, there would be three parties in this agreement - the site owner, a land agent (who negotiates on behalf of the site owner with a charge point operator) and the charge point operator. The charge point operator would make an annual payment which would be split between site owner and land agent. This may only be £100 a year so it would probably not be worth Sustainable Keswick and/or CEWC taking on the role of land agent.

Site owner finances, installs and operates

Sustainable Keswick could encourage site owners to install charge points on their land. The site owner would pay for the charge point to be installed and when it is operational, manage support problems, (such as trapped cables and out of hours support) and collect revenue.

The benefits of this approach are:

- Site owners generally do not like signing over rights to third parties to deliver services on their premises when they cannot judge the value of it, so keeping in house avoids that tension.

but drawbacks are:

- Having to find money to carry out the installation.
- Managing the charge point and complexity as technology and customer requirements change.
- Collecting revenue and monitoring usage.

This model is typically used by hotels.

Social Enterprise, such as Community Benefit Society, finances, installs and operates

Sustainable Keswick could work with a social enterprise that would liaise with site owners to install charge points on their land. The social enterprise would manage the charge points.

The benefits of this approach are:

- No need for a site owner to finance the project themselves.
- Site owners know that any future profits will be put back into the community rather than a commercial company, so are more likely to sign up.
- Local people can invest in charge points.
- Can attract other funding.

but drawbacks are:

- Site owner needs to sign a lease (5-10 years).

This model is offered by Charge My Street for the sites around Cumbria.

5.2.2 Analysis of delivery models

In the below table the three delivery models are compared against the project criteria:

	commercial Charge Point Operator	**Site owner**	**Community Benefit Society**
Essential Criteria			
Do Sustainable Keswick and Climate Emergency West Cumbria have the capacity to deliver this?	**Yes** Finding sites for a commercial operator	**Possibly** this involves persuading site owners to invest in charge points	**Yes** Working with an existing Community Benefit Society **No** Setting up a new Community Benefit Society
Is there sufficient stakeholder (site/user) support for this	**Possibly** Challenging when dealing with commercial implications and public sector partners.	**Possibly** Site owners typically concerned about loss of parking bays, cost.	**Yes** Model allows variety of stakeholders to coallesce.
Desirable Criteria			
Does it allow local community ownership (ie community share offer to fund the assets and with return on investment)? (and to what extent)	**No** Assets are owned by charge point operator	**No** Assets are owned by the site host	**Yes** Community investment is welcomed, Charge My Street has already raised investment from Cockermouth / Keswick residents.

Does it generate a community benefit fund? (and to what extent)	**No** But a revenue share is available under some concession models.	**No**	**No** However, surpluses are re-invested in network expansion.
Is it replicable or expandable, either locally or elsewhere? (and to what extent)	**Yes** This is a popular approach for rapid charging.	**Yes** Many businesses are installing their own charge points.	**Yes** Charge My Street are also installing in other parts of Cumbria.

5.2.3 Recommendations

Based on the above analysis, it is recommended that Sustainable Keswick and CEWC work with an existing Community Benefit Society to deliver charge points in the area. Discussions have suggested that the complexity of managing a fleet of charge points across the local area was outwith their capacity and expertise. As a Community Benefit Society, Charge My Street are progressing some sites with funding secured from Lake District Foundation and local investors.

The Local Authorities in Cumbria are also developing EV charging plans[9] which are largely focused on their own estate. Sustainable Keswick and CEWC can contact the Local Authority Officer in charge of the project to recommend sites in the future and find out which sites are planned for the area.

5.3 Identifying sites

5.3.1 Selection criteria

The selection criteria for EV charge point sites were as follows:

- Is there a suitable electricity supply at the premises, accessible to the parking area?
- Is there off-street parking for at least two electric vehicles?
- Are these publicly available, at least overnight?
- Are you, or the site owner, interested in hosting a charge point?
- Is there a broadband connection or good mobile data signal?
- Is it in an area that could see it used well, if not now but in the near future?

These questions cover the main technical, commercial and managerial issues which govern the success of a charge point site.

5.3.2 Site review

In Appendix C, Charge My Street have described the sites that are already being progressed in the area, and the sites that have been suggested and reviewed as part of this project. Discussions have taken place with Local Authorities and other stakeholders to ensure there is no overlap with other planned initiatives.

[9] https://news.cumbria.gov.uk/News/2021/partnershipaimingtoturbocharge.aspx.

The sites that are already operating in the area are:

- Keswick Ministries (live and available for charging)
- Wordsworth Mews, Cockermouth (live and available for charging for guests)

The new sites that Charge My Street consider to be viable are summarised below. Charge My Street have taken this opportunity to progress these four sites, and anticipate that they will be operational by spring 2023.

5.4 Viable sites

5.4.1 Wakefield Road Car Park in Cockermouth

This site is on Allerdale Council land. Two 22kW chargers are being installed and a new grid connection has been ordered from Electricity North West (install cost £10K plus £7,600 connection fee).

5.4.2 Horse & Farrier Car Park, Threlkeld

This site has been provided by the landlord of the local pub. Two 22kW chargers are being installed on the pub car park and a new connection has been ordered from Electricity North West (install cost £10K plus £2,500 connection fee).

5.4.3 Eaglesfield Village Hall

The Village Hall committee are keen to see the charge points installed and are using a local contractor to carry out groundworks for a 7kW charge point (install cost £3K).

5.4.4 Friends Meeting House, Keswick

This site will have a single 7kW connection (install cost £2.5K).

5.5 Integration with solar PV and car club sites

The solar sites were assessed for suitability for EV charge points, but there was little scope to co-locate chargers (see Appendix C). Of the short-listed sites, these two were identified as being good locations for an EV charge point:

- Cockermouth Leisure Centre manages its parking by using permits which are issued by the reception during opening hours. This would restrict access to the charge points to users of the facility. However, if there was positive engagement on a solar installation, then EV charge points should be included in the discussion with centre management. Electricity from the solar PV could be sold at a higher price to users of EV charge points than would be obtained exporting to the grid.
- Charge My Street are in conversation with Cockermouth School about potentially locating a charge point there.

The car club sites were also assessed. The main potential sites were:

- EV charge points at Wakefield Rd car park in Cockermouth could be a site for a car club vehicle. This would depend on Allerdale Borough Council allocating a bay.
- Keswick cinema could accommodate a charge point which would be powered by newly installed solar panels. Due to the limited parking, a single charging socket would be the best solution. However, this is likely to be used solely by the car club vehicle and may be cheaper to install by the car club. Alternatively, Indra have been contacted about the potential to install a charge point as part of a Vehicle to Grid trial. This would enable the car club car to store energy from solar and export it back into the building in the evening, reducing electricity costs.
- Friends Meeting House in Keswick, using the planned single 7kW charge point.

5.6 Community benefits

The benefits to the community of progressing these sites via a Community Benefit Society are as follows:

- Local accountability and ownership.
- Ability to raise investment from local people towards future charge point network expansion.
- Wider educational benefits - helping to drive demand.

5.7 Next steps

We recommend the following steps:

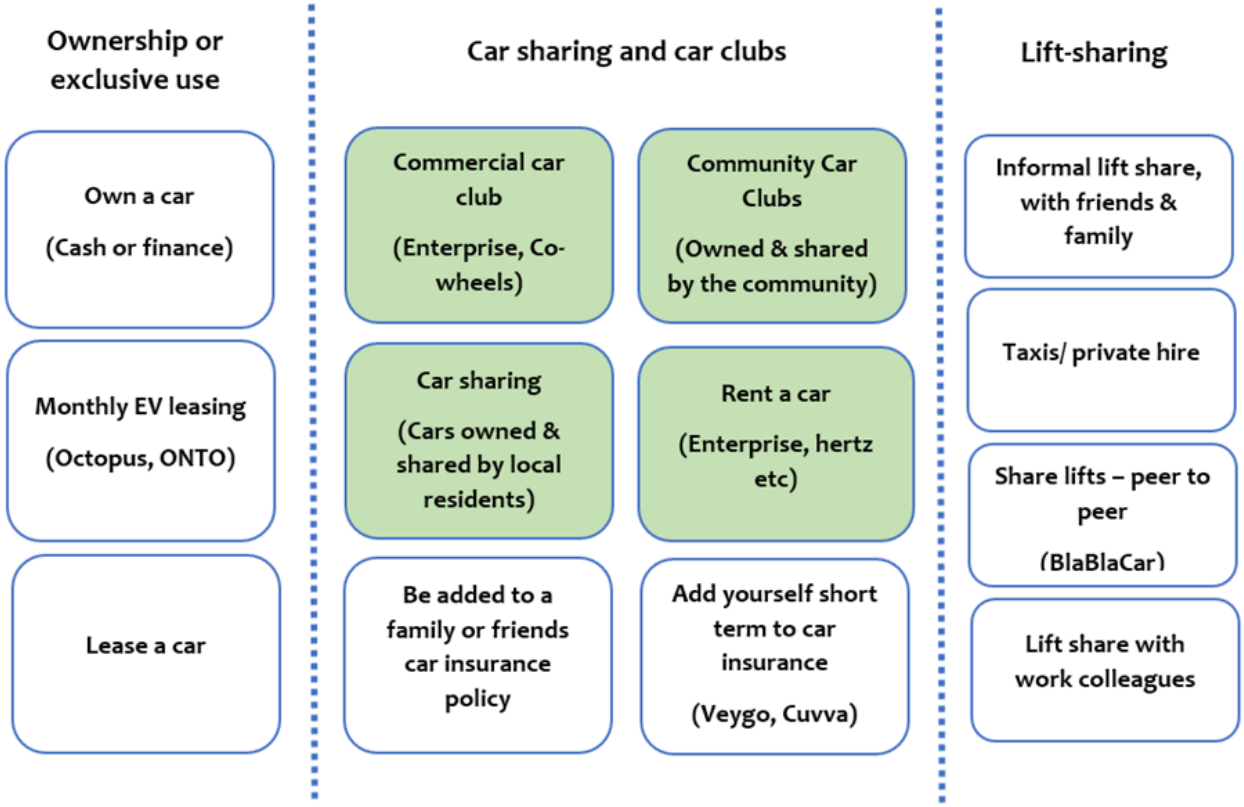
- Support the installation of current EV charge points (as listed above.)
- Raise awareness of existing charge points with people to encourage them to switch to EVs.
- Speak to local businesses around Keswick and Cockermouth to encourage them to have EV charge points installed.

6 Community Car Clubs

6.1 Introduction to Car Clubs

Car clubs provide residents, visitors and or businesses with access to a vehicle when they require it. They are flexible and responsive to members. In many clubs there is a move to electric vehicles to further reduce emissions and support the drive to net zero.

Car clubs sit in the middle of the spectrum of different ways in which cars can be accessed, which ranges from ownership and exclusive use through to lift sharing. This is illustrated in the following diagram:



This study has explored the extent to which different models of car clubs are of interest to the residential population in Keswick and Cockermouth and to visitors to the area.

The term 'car club' is used here as a generic term to include commercial and community-run car clubs and car sharing. The sections below explain the different models, and the difference between car clubs and car rental.

6.1.1 Car clubs v car rental

Car clubs are member based and tend to be hired for short-term rentals by the hour or day. To use a car club you need to register and pay a joining fee or monthly membership fee. Car clubs can offer an array of vehicles including cars, vans, and micro mobility options such as e-bikes, e-cargo bikes and e-scooters (please note that e-scooters are currently limited to where trials are taking place nationally).

Car rental schemes tend to be hired for longer periods of time, by the day or week and do not require membership. They offer a range of vehicle types including vans but not micro mobility. Operators such as Enterprise offer a car club for regular shorter journeys and a discount for car club members when using their rent-a-car scheme for longer journeys.

6.1.2 Types of car clubs and car sharing

Car clubs are run across the country in a number of different formats:

- **Commercial car clubs** are run by larger operators including Enterprise, Hertz and Co-wheels. The operators manage all aspects of the vehicle and booking platforms including insurance, membership and fuel costs. Charges are hourly or daily and include a mileage fee in addition. Traditionally these have been successful in urban localities however operators such as Enterprise are expanding car clubs into smaller towns in the UK.
- **Community car clubs** are run independently by community organisations such as the Derwent Valley Car Club and Tisbury Electric Car Club. They also manage all aspects of their scheme as per the commercial clubs including insurance, membership and fuel costs, charging an hourly or daily rate which they can set locally based on their community's needs. Community car clubs tend to be more price sensitive and charge a lower hourly rate than commercial operators, some choose not to charge additional mileage fees.

  There are also community car clubs which partner with a commercial operator or run under licence from a national operator such as the Enterprise scheme based in Hartlepool. There are also hybrid clubs which run their own schemes but use a commercial platform such as the Karshare platform to manage the interface between the users and the club's vehicles. Strathaven in South Lanarkshire provides a hybrid community car club model using the Karshare system for booking and insurance.
- **Peer-to-peer car sharing models** allow individuals to share their vehicles with other users and do this through a car sharing platform such as Karshare, Turo, and Hiyacar. These national models are particularly popular in urban areas although some operate outside of cities. The users rent vehicles through a dedicated platform which generally takes a commission from the hire which covers the insurance of the vehicles when hired through the scheme.

In addition to the different models of car clubs and car sharing, there are variations in the way they operate:

- **Back to base** is the most common form of car club in the UK whereby cars must be returned to their designated parking space where they are hired from.
- **Back to area or geofenced** is similar to the back to base model, but rather than returning the car to a designated parking space, it is returned to a small defined area, typically a street or two. Geofencing uses technology to ensure that the user leaves the car within a certain geofenced area, so that other

members can access the vehicle, without it having to be returned to a dedicated parking bay.

- **One-way** is becoming more commonplace and is a variation of the traditional scheme. It allows users to pick up a car within a defined area and drop it off elsewhere in an approved location. This can be beneficial for tourists and commuters but can be logistically more difficult for operators to manage as it requires the ability to move vehicles across locations to meet demand.

6.2 Existing local sharing provision

At present, the closest car club options are through commercial operators. Enterprise Car Club have five vehicles in Workington, five vehicles in Whitehaven, three vehicles in Carlisle, two in Penrith, six vehicles in Kendal and a daily rental contract at Seascale. They also have a range of rental cars in Penrith, Carlisle and Whitehaven.

Co-Wheels has one car at Penrith Station, one at Windermere Railway Station and two cars at Oxenholme station near Kendal.

There are no community car clubs locally at present. There is a feasibility study at Brampton near Carlisle which may result in the creation of a car club scheme there.

6.3 Understanding demand

As described above, Derwent Valley Car Club produced two versions of an online questionnaire (one for residents and one for visitors) to gather the required information to understand the demand for different types of car clubs.

293 surveys were completed, 206 of which were from residents and 93 of which were from visitors.

The detailed analysis of the residents' and visitors' survey is provided in Appendix D, and a summary of both is provided below.

6.3.1 Summary of Residents' survey

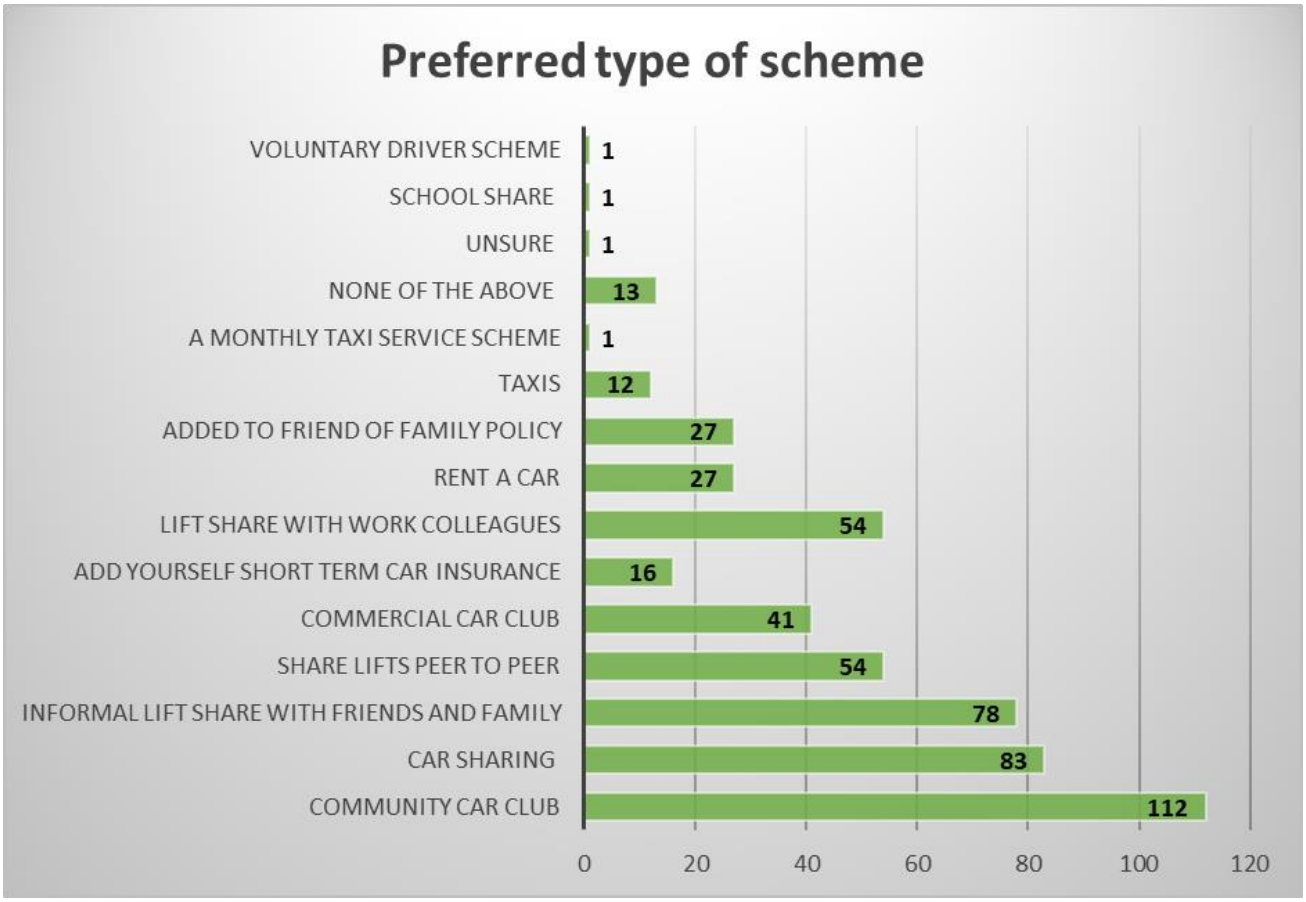
Profile

Of the 206 people who took part in the survey, 94 were living in Cockermouth, 68 in Keswick and the remaining 44 were from Cumbria and Lancashire.

The most common type of transport was walking, followed very closely by use of car or van every day. The third most popular response was use of a car or van two to three times a week, suggesting that vehicles could be sitting unused for the majority of the per week.

Preferences for car clubs and car sharing

185 people had never used a car club or car share scheme before. When asked what type(s) of scheme they would like to see developed, if any, a total of 521 responses were received. This highlights a preference for a community car club scheme, followed by car sharing and demonstrates a willingness to use formal and informal sharing schemes.



The survey evidenced a higher level of interest in Cockermouth than Keswick for a car club or car share scheme, however this is reflected in the number of responses from those respective areas. To understand the potential types of scheme required in each area the data was split by area and by those who said yes they would use a scheme or that they may use a scheme. The results were as follows:

	Yes to community car club	Maybe to community car club	Yes to car sharing	Maybe to car sharing
Keswick	19	17	7	17
Cockermouth	26	25	15	19

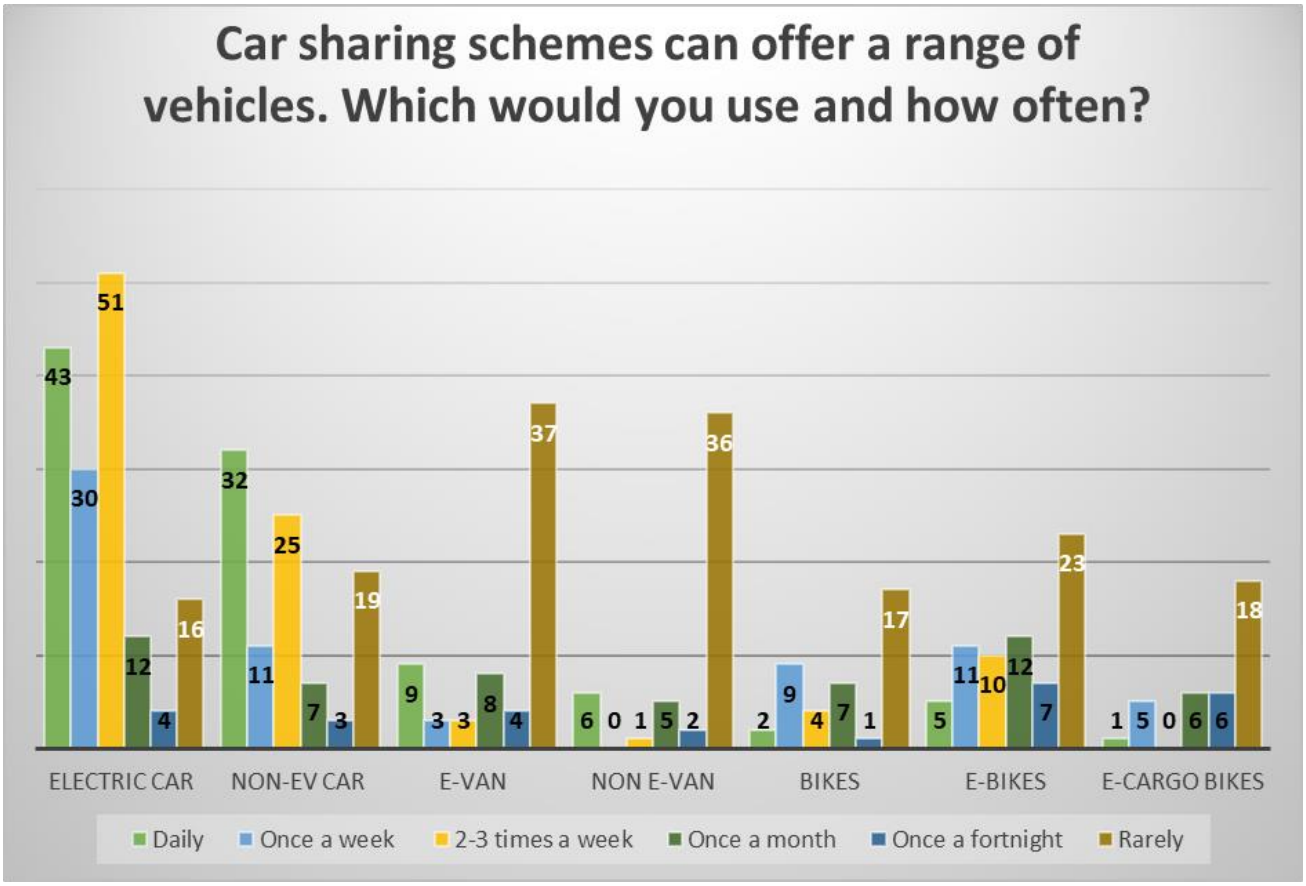
In both Keswick and Cockermouth, the data shows that there is a preference for a community car club followed by car sharing.

Willingness to reduce car ownership

The survey asked *'if a car club or sharing scheme was developed locally would you consider reducing car ownership in your household?'* 73 people said maybe and 49 people answered yes. 13 did not know and one said it would depend on the cost of the car sharing option. This means that there is the possibility of removing between 49 and 136 cars from the roads based on this survey of 206 people. This emphasises a high potential for removing additional vehicles from the road.

Types of vehicle

The different types of vehicles that could be accessed on a scheme were highlighted in the survey. Results showed a particularly high demand for EVs on a daily, weekly bi-monthly and monthly basis. With a total of 124 people requesting usage on at least a weekly basis. This data is highlighted in the graph below.



The usage demand highlighted within the survey indicates a need for around 10-15 electric shared vehicles in the area depending on the hire period required, with non-EVs or hybrids in addition.

Although there is potential need for non-EVs from this data, this could be linked to concerns around range anxiety, the ability to charge or the unfamiliar technology. However, one of the benefits of car clubs and sharing is the benefit of educating people on the reliability and need for EVs as a realistic alternative to traditional vehicles.

Range anxiety is not necessarily linked to actual average vehicle usage, but a perception based on the longest possible journey an individual may consider undertaking. Actual average daily mileage in the UK is 20 miles per day. The average range of an EV in the UK is now 217 miles on one charge. That means that an average EV could accommodate 10 average UK journeys on a single charge.

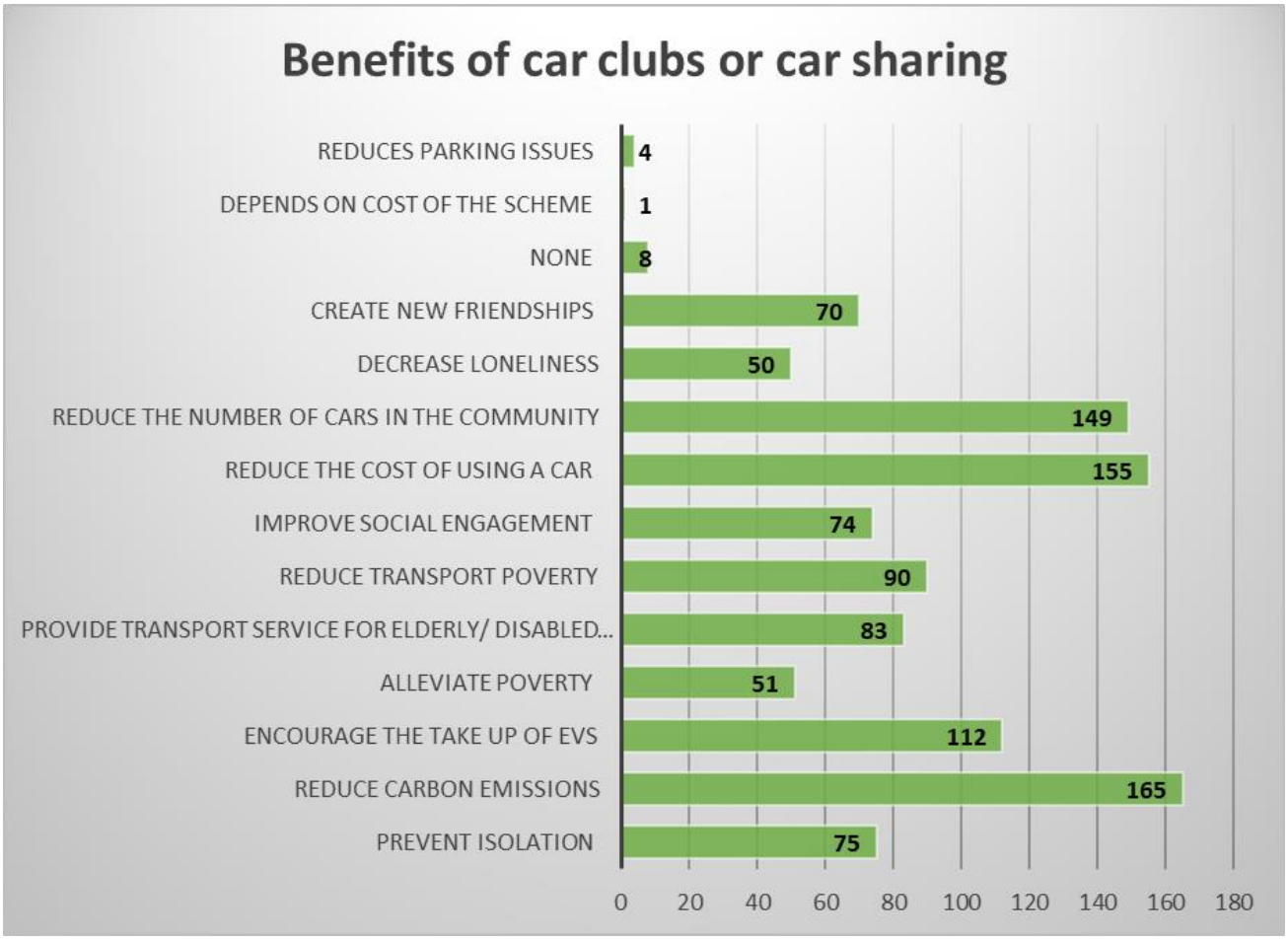
Please refer to section 5.1 above for additional information on the current and planned EV ownership.

Perceived benefits of car clubs and sharing

When asked about the benefits a car club or car sharing could bring to their community, 1087 responses were received.

'Reduce carbon emissions', 'reducing the cost of using a car' and 'reducing the number of cars in the community' received the highest responses. Encouraging people to take up EVs and 'reducing transport poverty' were also highlighted as key benefits.

There was a clear link to social impacts including the potential to 'provide a transport service for elderly and disabled people', preventing isolation and loneliness and improving social engagement, and creating new friendships. The table below shows this information.



Summary

In summary, the benefits of car clubs are well understood, however, there is still a lack of understanding around EVs. This is in part due to unfamiliar technology, affordability of EVs, and range anxiety which is not commensurate with actual average car usage.

The benefit of developing car clubs with EVs is the ability to remove barriers to take up, and show that EVs are a realistic alternative to traditional vehicles. The survey has shown a clear need, and desire for car sharing or car club alternatives in the area, with an indicative need for 10-15 car club vehicles.

There is a significant potential to reduce carbon emissions, congestion and parking issues in both Keswick and Cockermouth by not only converting people to the use of EVs but by removing vehicles from the road. It is estimated that between 49 and 136 cars could be eliminated from the roads of Keswick and Cockermouth.

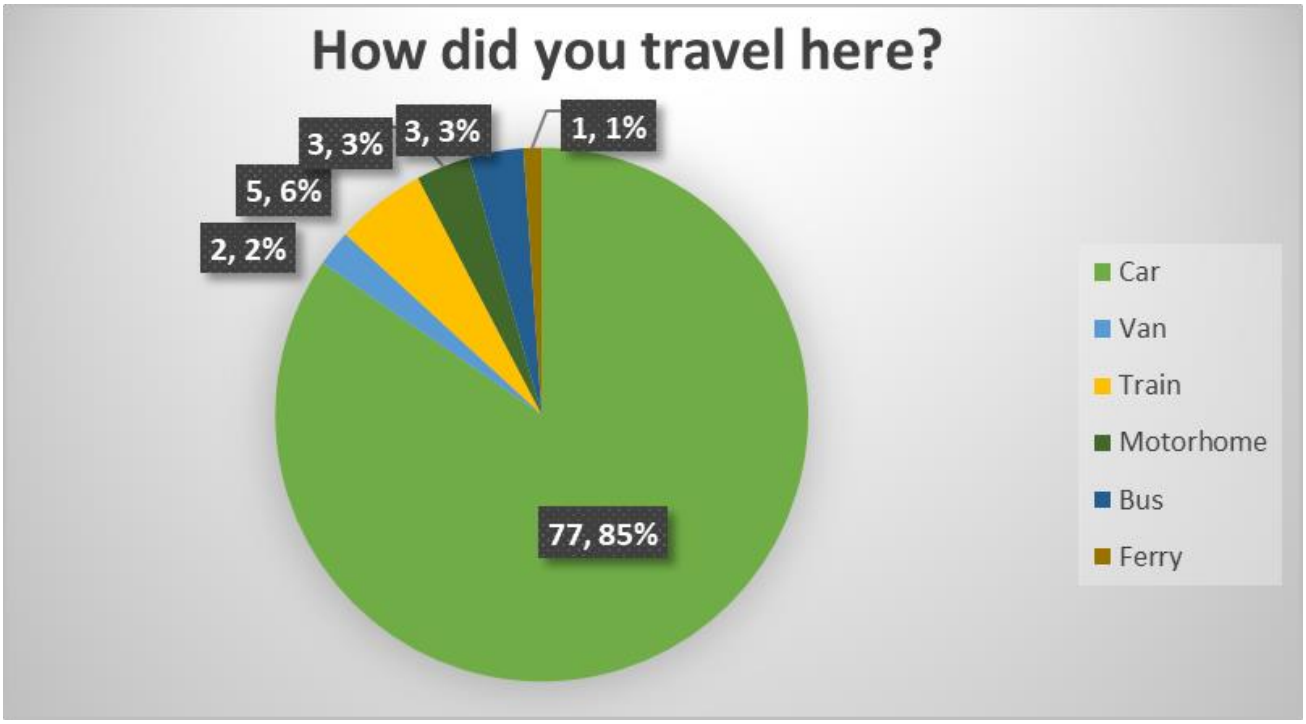
However, EV infrastructure does need to be improved to enable EV sharing to take place.

6.3.2 Summary of visitors' survey

93 responses were received to the visitor survey.

76 people had travelled from the UK, including 24 from the Northwest, 18 from the Northeast and nine from Yorkshire. Three had travelled from various locations in Europe and a further three had travelled from the United States of America.

Respondents were asked how they had travelled to the area. The vast majority (85%, 77 people) had travelled by car. A total of 11 people had travelled by public transport, train, bus or ferry.



The majority said they would not travel to the area by public transport if a car club or car share option was available to them. However, 21 people said they would or may do in the future. This equates to 23% of responses. If 23% of visitors to the area chose not to drive and car share on location, the impact would be significant. Particularly in peak season when issues with parking and congestion are at their maximum.

In terms of the type of scheme visitors would prefer to use, hiring from a community organisation was the highest of all responses. A number of respondents said they would use whichever scheme was most affordable. This highlights the importance of ensuring any scheme is reasonably priced and attractive to users.

The main reason for not using a car club or share scheme was impracticality due to concerns around poor public transport infrastructure. This was highlighted in both surveys.

People have concerns when travelling to the area with equipment and or family, stating that driving is easier. Cost was another area of concern. However, 12 people said there was no reason why they would not use such a scheme.

Visitors were given the chance to submit any additional comments that again highlighted their displeasure in public transport, cost and EV charging infrastructure. It did also show support for sharing schemes including some positive comments in support of public transport. This may suggest that perception of public transport and infrastructure is an issue rather than a reality.

In summary any car sharing or car club scheme should include the option to accommodate visitors to the area. As with all schemes it may not appeal to everyone, however, the option to move 23% of visitors to the area from private vehicles into public transport and shared transport would eliminate a significant proportion of congestion and vehicle emissions from the area.

Improving public transport and the perception of it would be essential. EV charging infrastructure also needs to be further developed and the connectivity to both would be essential to create a suitable alternative for visitors to the area.

While there is a clear preference for a community car club scheme, significant investment would be required to meet the potential full demand. This may mean that a commercial scheme may be more viable. However, it must be considered in terms of the affordability to the user as this has been highlighted as a key determining factor in uptake.

6.4 Potential delivery models

This section provides an overview of the following community car sharing models:

- Commercial car club
- Car sharing
- Hybrid community car club
- Community car club

And then provides financial modelling for the community and hybrid car club models.

6.4.1 Models available

Commercial car club

The feasibility study has included involvement with commercial operators to understand the potential for delivery through this approach.

Enterprise Car Club is the largest commercial operator in the area currently and is continually expanding its operation locally. During the time of the study its schemes have more than doubled in size in both Workington and Whitehaven. Multiple discussions have been held with Enterprise Car Club and there is potential to develop into the areas of Keswick and Cockermouth.

The benefits of a commercial operator includes their national presence in the area which, for visitors, could be a benefit.

Enterprise has the added benefit of linking their rent-a-car and car club models which provides more options for customers. There are other commercial operators that could be considered such as Co-wheels who operate in Penrith, but their operations in the area are much smaller than Enterprise.

Issues have been highlighted in the surveys from residents and tourists who have previously used the Enterprise scheme stating that it was price prohibitive, however their costs are in line with other commercial operators.

Commercial operators are moving towards EVs but initially diesel, petrol or hybrids may be provided. This model currently lacks the options to integrate other micro mobility solutions.

This is a hands-off approach for the community organisations as the commercial operator would choose whether or not to deliver their services in the Keswick and Cockermouth areas. There may be some initial instigation by the community organisation by highlighting the need, to an individual or multiple operators, to encourage them to deliver in the area. Once a scheme was in place the community

organisation could support its delivery by encouraging and promoting the use of the scheme, but would have no control of the scheme.

Car sharing

Informal car sharing is already happening in the area, as evidenced in the survey. There may be options to formalise and expand this offer, however finding a provider who wishes to operate their system in a rural area may be difficult due to current economic conditions.

Sustainable Keswick have been investigating this option for some time, through the Karshare model. Unfortunately the economic conditions have changed over recent months and Karshare are now focussing their core work (residents peer-to-peer sharing) into urban areas.

Karshare has said that it would be possible to run a car club model using the Karshare platform. However they are not currently able to expand their core car share model using resident's private cars in the area. A hybrid model would be possible but a full car sharing model may be more difficult due to the rural nature of the area.

Hybrid community car club

A hybrid model is where the community runs their car club using a commercial provider's platform. Climate Action Strathaven in South Lanarkshire run such a scheme in partnership with the Karshare platform. Initially the concept was that residents could place their cars on to the Karshare platform and a number of community car club vehicles would also be made available through the platform. The scheme has worked well for the car club vehicles, however, the utilisation rates of residents vehicles was less successful, as users preferred to use the community vehicles.

There are benefits to the Karshare system in that the commercial operator runs the booking and insurance elements of the scheme. It is a technology driven system using keyless access and facial recognition to lock and unlock vehicles through a mobile phone device. The operator undertakes all of the onboarding of members, bookings, and payments. The operator then takes a percentage of the income and returns the balance to the organisation.

It does require community involvement in relation to the vehicle purchase or leasing (leasing can be arranged through Karshare), and the maintenance and insurance of the vehicle (when not in use by a Karshare member) needs to be covered by the community. This means that the community can choose the type of vehicle(s) involved and may have higher carbon savings if choosing to operate with EVs.

This type of operation can make the scheme less onerous for the community but they may also have less involvement with the members of the scheme as this is operated by the commercial provider and the social aspects of such a scheme may be diminished. It is also harder to integrate other services of a community car club such as micro mobility options and a voluntary driver scheme.

It must be noted that Karshare charges a daily rate for insurance costs on top of the hire fee, plus booking charge and VAT which can make the costs, especially for a short

hire expensive to the end user. As cost has been highlighted in both surveys this should be factored into any decision.

Community car club

An independent community car club can be run by a community organisation. There are lots of examples of this model including the Derwent Valley Car Club and Tisbury Electric Car Club. The two models are similar but have different aspects based on the technical platforms used.

Derwent Valley Car Club has been operating in a small rural area of Gateshead, and more recently County Durham, for almost ten years. The Derwent Valley Car Club has created its own online booking system and website to manage the booking and back-office operations. This includes invoicing and payment systems. However, it is a 'low technology' operator in that it does not use telematics within its vehicles. Instead, it has key safes at the vehicle locations, the combination for the key safes are changed on a regular basis, but not after each use. This can be a benefit as the overheads and operational costs are significantly lower than telematic systems and there are no issues with 'blackout areas' when accessing vehicles with poor internet connectivity.

Alternatively, the Tisbury Electric Car Club has been in operation since early 2021 and uses a co-operative booking system called TMF (The Mobility Factory) to manage its operations and has telematic enabled keyless vehicles. This system is effective but involves an initial payment to use the system, purchasing of the telematic equipment for the vehicles and then an ongoing subscription per vehicle. Both operations require coordination at a local level for 'inducting' or 'onboarding' members and general troubleshooting.

The benefits of a community scheme are that it can be run as a social enterprise. As a not-for-profit operation the costs to hire the vehicles can be significantly lower and more affordable than a commercial operator.

The vehicle(s) are chosen by the community and they can determine the type of vehicle(s) involved. If they utilise EVs then the carbon savings are much higher than an operation utilising petrol, diesel or hybrid vehicles.

As the scheme is fully controlled by the community organisation, they can choose to integrate other types of vehicles including micro mobility where appropriate and or a voluntary driver scheme to support members of the community who are unable to drive. This is something that the Derwent Valley Car Club has operated for many years and is a key aspect of its operation. This is not part of the Tisbury scheme as they have a community transport operator in the area.

The disadvantages of a community car club are that it requires more local leadership, drive and commitment with support of a co-ordinator or volunteers to run.

The club needs to lease or purchase their own vehicle(s), insurance and the club would be responsible for looking after and maintaining their vehicle(s). As a social enterprise or charitable organisation it would be possible to look for grants to initiate such a scheme. However, the scale of the operation could be significant, based on demand

highlighted in the survey, and this may be outside of the capacity of the local organisations involved.

In summary the community, hybrid and commercial car club models could be applied in Keswick and Cockermouth, depending on funding, and on the commitment and levels of involvement of the local organisations involved.

6.4.2 Financial modelling of community and hybrid car clubs

In contrast to the commercial car club model (which is a hands-off approach for the community organisation), the delivery of the hybrid or community models will require significantly more input from the local community organisations. For both models they will need to:

- Lease or purchase a vehicle(s)
- Access insurance for the vehicles and public liability (if not already covered through their existing policies)
- Potentially create a suitable organisation to be able to apply for funding and take on a lease if required.
- Expand the EV charging infrastructure, including dedicated charging and parking bay(s)
- Consider and agree an operating system for the club and ways to access the vehicles:
    - Karshare does not require an ongoing fee for its services but takes a percentage of income once the cost of the telematics is covered. Keyless technology.
    - The Mobility Factory system could be investigated in line with the Tisbury approach. Keyless technology.
    - Create a community approach, this can be as simple as a Supersaas online calendar or a more detailed online system could be created such as the Derwent Valley platform. Key safes would be required.
- Create the marketing and branding for the scheme, promote it locally to engage members
- Recruit a co-ordinator or volunteers to set up and operate the scheme.

To make either a hybrid or a community car club model work it will require grant funding initially to set up the scheme. The grant funding will be different depending on whether a car is purchased or leased. The lease model requires less upfront funding than the purchased model. However, through the purchased model the organisations own an asset for the benefit of the community. Both models include a level of funding for either depreciation and vehicle replacement costs or to cover the down payment on the subsequent lease agreement.

Modelling assumptions

All models are based on one vehicle with 20 members paying a monthly membership fee of £5 per month, using the car twice per month at an average hire of 5 hours per hire. This is a low estimate but allows for an appraisal to be created. This model can be scaled for multiple vehicles. Insurance would become cheaper the more vehicles the club has, particularly once over five.

This model does not include mileage fees which could be added on top to bring in an additional income and offset any increasing electricity charging costs. If charged at 20p/ m at an average of 25 miles per trip that would bring in an additional income of £200 per month or £1400 per annum. Again, this is a very modest assumption and likely to be a much higher utilisation rate.

Initial costs are based on a flat rate of £5 per hour; this could be increased which would again bring in a higher income level but may be less affordable. Some additional testing with community members would provide a better understanding of an acceptable price point. Commercial car clubs charge around £7 per hour, plus membership fees and mileage rates.

There is an assumption that a bespoke independent booking and operating system would be created which is estimated at £3550 in the first year with ongoing maintenance costs built in for year 2 and 3. It would also be possible to use the TMF system although the costs may be a little higher for the initial set up.

Corporation Tax

Should the club be created as part of a charity then it is unlikely to have corporation tax liabilities, however, it may need to file a return.

It is a little more complicated if trading as a social enterprise or a CIC. If grant funding is provided to pay for a service which may not happen i.e. "a subsidy for a service that the organisation cannot otherwise afford to deliver. The organisation can give the grant back to the funder if they wish", then it is unlikely to pay corporation tax. If an organisation was created which is not a charity or social enterprise and without the grant funding stipulation, then corporation tax would be payable on any profits at a current rate of 19%. We would advise that a tax accountant is consulted when creating or developing any organisations to ensure that the organisation can meet any tax liabilities.

Community car club – lease model

Income	Year 1	Year 2	Year 3
Annual membership fees	£1200	£1200	£1200
Annual usage fees	£12,000	£12,000	£12,000
Initial grant	£25,000	£0	£0
Total	**£38,200**	**£13,200**	**£13,200**
Expenditure	**Year 1**	**Year 2**	**Year 3**
Vehicle cost	£5,850*	£4,200	£4,200
EV charge point	£5,000	£0	£0
Insurance	£2,500	£2,500	£2,500
Independent operating system	£3,550	£600	£600
Staff costs	£12,000	£0	£0
Service and maintenance	£600	£600	£600
Set up costs, key safe etc	£500	£0	£0
Cleaning	£480	£480	£480
Electricity	£600	£600	£600
Social media advertising	£120	£120	£120
Marketing	£1,550	£600	£600
Replacement fund deposit set aside for year 4	£660	£660	£660
Total	**£33,410**	**£10,360**	**£10,360**
Balance / surplus	**£4,790**	**£2,840**	**£2,840**

*Please note the leasing cost is higher in the first year due to the upfront payment of £1650. This is based on a Nissan Leaf with a maximum annual mileage of 10,000.

This model requires an initial grant of £25,000 to contribute to the year 1 costs, including a coordinator part time (approximately two days per week, self-employed- once set up the schemes can be run by volunteers), initial leasing fee, set up costs for the insurance, operating system, marketing etc. In utilising grant funding for the first year to off-set some of the costs it allows the scheme to grow at a steady rate which means that if the take up is not as quick as planned it can still cover its costs.

A small balance/surplus is forecast for each year, alongside a depreciation fund. This is essential even with a leased model as leasing companies require a non-refundable deposit at the start of the contract.

There are multiple variables in the models particularly around forecasted user numbers and price points which can be amended or changed to allow more income to be generated.

There is also the potential for a local resident to provide a vehicle which would reduce the potential set up costs significantly. It would be essential to understand the parameters around covering the cost of the vehicle.

Community car club – owned model

Income	Year 1	Year 2	Year 3
Annual membership fees	£1200	£1200	£1200
Annual usage fees	£12,000	£12,000	£12,000
Initial grant	£60,000	£0	£0
Total	**£73,200**	**£13,200**	**£13,200**
Expenditure	**Year 1**	**Year 2**	**Year 3**
Vehicle cost	£35,000	£0	£0
EV charge point	£5,000	£0	£0
Insurance	£2,500	£2,500	£2,500
Independent operating system	£3,550	£600	£600
Staff costs	£12,000	£0	£0
Service and maintenance	£600	£600	£600
Set up costs, key safe etc	£500	£0	£0
Cleaning	£480	£480	£480
Electricity	£600	£600	£600
Social media advertising	£120	£120	£120
Marketing	£1,550	£600	£600
Replacement / vehicle depreciation fund	£4,800	£4,800	£4,800
Total	**£66,700**	**£10,300**	**£10,300**
Balance / surplus	**£6,500**	**£2,900**	**£2,900**

This model requires an initial grant of £60,000 (it could be slightly less) to contribute to the year 1 costs, including a coordinator part time (approximately two days per week self-employed - once set up the schemes can be run by volunteers), vehicle purchase costs, set up costs for the insurance, operating system, marketing etc. As with the leased model, by utilising grant funding for the first year it can off-set some of the costs and allows the scheme to grow at a steady rate, which means that if the take up is not as quick as planned it can still cover its costs and become sustainable.

A small balance/surplus is forecast for each year, alongside a depreciation fund. This is essential so that when the vehicle reaches the end of its life there will be a fund available to replace the vehicle. This could be invested over the lifetime of the scheme to bring additional interest into the club.

There are multiple variables in the models particularly around forecasted user numbers and price points which can be amended or changed to allow more income to be generated. It would also be possible to purchase a second hand vehicle to reduce the initial costs.

Both of the models above could be scaled significantly to allow for a larger scheme to be created. It would be possible to charge a variable rate, one for local residents and one for visitors which would allow some additional income to be created yet keep the scheme affordable for residents. This would also acknowledge the fact that the

onboarding of members takes a little time and with visitors there is less chance for regular usage to off-set this cost.

If the scheme is scaled significantly across the area, it would need more coordination and a paid long-term member of staff which would need to be costed at a higher level. At a level of 10-15 vehicles investment of between £250,000 and £1 million would be required. The higher figures take into account additional staffing initially to create the scheme. Depending on ongoing overheads, there may need to be some additional ongoing resource for the first three years to support the additional staffing capacity for such a scheme, or this capacity could be seconded through the Local Authority.

Hybrid community car club models

To understand the differences between an independent car club model and a model using a commercial providers platform, we have modelled the leased and owned models again using the Karshare platform (others could be sourced).

The advantage of the Karshare platform is that there are no upfront fees to the club, whereas other commercial operators charge a fee in excess of £4,000 per annum to use their platforms. This is unsustainable for rural car clubs.

The percentage of revenue charged by Karshare is 30% of the hire cost. There would be savings on the insurance cost and the operating system, however, it does affect the income levels as highlighted in the models below. The income to the car club would be 70% of the hire fee.

Community car club using Karshare platform – lease model

Income	**Year 1**	**Year 2**	**Year 3**
Annual usage fees	£8,400	£8,400	£8,400
Initial grant	£25,000	£0	£0
Total	**£33,400**	**£8,400**	**£8,400**
Expenditure	**Year 1**	**Year 2**	**Year 3**
Vehicle cost	£5,850	£4,200	£4,200
EV charge point	£5,000	£0	£0
Telematic cost	£195	£0	£0
Insurance	£400	£400	£400
Staff costs	£12,000	£0	£0
Service and maintenance	£600	£600	£600
Cleaning	£480	£480	£480
Electricity	£600	£600	£600
Social media advertising	£120	£120	£120
Marketing	£1,550	£600	£600
Replacement fund deposit set aside for year 4	£660	£660	£660
Total	**£27,455**	**£7,660**	**£7,660**
Balance / surplus	**£5,945**	**£740**	**£740**

Again, there is also the potential for a local resident to provide a vehicle which would reduce the potential set up costs significantly. However, that would not entirely account for the drop in income levels.

It would be essential to understand the parameters around covering the cost of the vehicle.

Community car club using Karshare platform – owned model

Income	**Year 1**	**Year 2**	**Year 3**
Annual usage fees	£8,400	£8,400	£8,400
Initial grant	£60,000	£0	£0
Total	**£68,400**	**£8,400**	**£8,400**
Expenditure	**Year 1**	**Year 2**	**Year 3**
Vehicle cost	£35,000	£0	£0
EV charge point	£5,000	£0	£0
Telematic cost	£195	£0	£0
Insurance	£400	£400	£400
Staff costs	£12,000	£0	£0
Service and maintenance	£600	£600	£600
Cleaning	£480	£480	£480
Electricity	£600	£600	£600
Social media advertising	£120	£120	£120
Marketing	£1,550	£600	£600
Replacement / vehicle depreciation fund	£4,800	£4,800	£4,800
Total	**£60,745**	**£7,600**	**£7,600**
Balance / surplus	**£7,655**	**£800**	**£800**

Through the Karshare model it would be possible to apply for a lower grant amount initially for the set-up costs. However, the income levels and overall balance are significantly lower in subsequent years in the leased and owned schemes with the Karshare model. This is partly due to the loss of membership fees. They could be recovered by charging members a higher hourly or daily rental.

However, it must be noted that there are additional costs for the user when booking a vehicle through Karshare, which can make the hire more expensive. These are highlighted in the tables below:

Petrol car	**2-hour hire cost**	**Day hire costs**
Hire fee	£10	£32.00
Insurance fee	£9.97	£9.97
Booking fee	£8.00	£8.00
VAT	£1.60	£1.60
Total Cost	**£29.57**	**£51.57**

Electric car	2-hour hire cost	Day hire costs
Hire fee	£10.00	£27.00
Insurance fee	£18.12	£18.12
Booking fee	£8.00	£8.00
VAT	£1.60	£1.60
Total Cost	**£37.72**	**£54.72**

The figures are based on the Strathaven vehicles current rates. The day rate (£27/ £30) and hourly rate (£5) are reasonable, however the additional costs that the user pays on top can make a short journey rather expensive. A single two-hour EV hire works out at £37.72, which equates to a £18.86 hourly rate.

There is also a £250 damage deposit to be paid 48 hours before the booking. However, it must be noted that with the additional charges of insurance, booking fee and VAT the costs for a short booking are already substantial for the user and are higher than the equivalent hire period with a commercial car club.

Due to the very low income levels, it is hard to see how this model could become sustainable without increasing costs for the user, but with the high insurance costs this would be a difficult price point to achieve.

6.4.3 Analysis of delivery models

In the below table the three primary delivery models are compared against the project criteria:

	Commercial Car Club	**Hybrid Model**	**Community Car Club**
Essential Criteria			
Do Sustainable Keswick and Climate Emergency West Cumbria have the capacity to deliver this?	**Yes** Little capacity or involvement from the community required.	**Possibly** Medium level of involvement and commitment required.	**Possibly** High level of commitment and capacity required.
Is there sufficient stakeholder (site/user) support for this	**Yes**	**Yes**	**Yes**
Carbon savings (based on likely level of removal of cars from the road and likely inclusion of EVs)	**Yes** Removal of 18-20 private cars per car club vehicle. May be less likely to utilise EVs resulting in lower carbon savings.	**Yes** Removal of 18-20 private cars per car club vehicle. Significant carbon savings if EVs are used.	**Yes** Removal of 18-20 private cars per car club vehicle. Significant carbon savings if EVs are used.
Desirable Criteria			
Does it allow local community ownership (ie community share offer to fund the assets and with return on	**No** No potential for community ownership and	**Limited** Model is less financially viable	**Yes** Highest potential for community

investment)? (and to what extent)	little or no involvement within the schemes.	with significantly smaller returns.	ownership, and returns.
Does it generate a community benefit fund? (and to what extent)	**No**	**Unlikely** due to the small returns.	**Possibly** This has the most potential if the model is scaled, however significant investment is required to initiate.
Is it replicable or expandable, either locally or elsewhere? (and to what extent)	**Yes** Based on the commercial operator expanding into new areas.	**Yes** There would be potential to include other areas within the Karshare model.	**Yes** Potential to develop a county-wide scheme.

6.4.4 Recommendations

Based on the above analysis, it is recommended that further discussions take place between the two community organisations involved to define their preferred scheme. If there is appetite to create a community car club, the potential to scale is significant. However it relies on pump-priming funding and significant local commitment to ensure a successful delivery model.

There could be the potential to work with the new Local Authority to create a community scheme across the rural areas of Cumbria which could be supported by the Local Authority with a seconded member of staff to coordinate the scheme's development.

Should there not be sufficient capacity to develop such a scheme then the commercial car model would be sensible. Due to the current expansion of Enterprise within the area, it would be logical to consider sharing the study with Enterprise who may wish to continue their growth into the area.

The levels of income with the Karshare model are too marginal to recommend that approach.

6.5 Community benefits

The benefits to the community of progressing a community or commercial car club model are as follows:

- removing the costs and hassle of vehicle ownership (insurance, MOT and servicing costs, fuel, and repair bills) and avoids vehicle depreciation costs (cost savings of between £1,000 and £3,500 per annum depending on the type of club, vehicle usage rates, and charges)
- reducing congestion by removing 18-20 vehicles from the road per car club vehicle. (If scaled to 10-15 vehicles this could remove 180-300 vehicles and if a

visitor scheme is included this could be scaled significantly removing approximately 23% of visitor vehicles from the road)

- reducing vehicle usage as car clubs and car share users think proactively about the most efficient way to make their journey and will walk, cycle, bus, or train before using a car
- providing access to newer, safer, and more environmentally friendly vehicles (car club vehicles are an average age of 1.8 years as opposed to average age of 8 years for a private vehicle)
- removing issues related to car parking in communities and EV charging for homes with a lack of off-street parking
- supporting electric vehicle infrastructure (charge point) development and installation in communities which brings benefits to car club users and private EV owners
- allowing access to a range of vehicles which are most appropriate to the journey e.g. city cars for smaller shorter trips, family vehicles, and vans
- supporting a fair and just transition to EVs in communities and allows users to try EVs without needing to purchase one; and
- where a car club replaces a second vehicle, if and when the primary household vehicle is replaced, making the option of purchasing or leasing an EV more likely to be considered.
- reducing carbon emissions and air pollution through the combined impact of fewer vehicles and fewer miles, newer and more appropriate vehicles, and conversion to EVs.
- providing access to employment, training opportunities and services where public transport is less viable
- reducing community isolation and increases access to services where a voluntary driver scheme is operated as part of a car club

Carbon savings

Carbon savings for EVs versus 'ICE' (traditional petrol and diesel) vehicles are around 67%. It is difficult to calculate the precise savings without comparing specific vehicles against each other, understanding the mileage driven and fuel consumption. However, the average annual carbon dioxide (CO_2) emissions of a typical passenger emits about 4.6 metric tons of carbon dioxide per year.

Vehicles which operate exclusively on electricity (EVs) do not emit any tailpipe emissions. There are emissions linked to the creation of vehicles and the emissions linked to the energy production to power EVs. Where vehicles are charged using clean energy this reduces the linked CO_2 emissions.

In the UK, average CO_2 emissions per ICE car are 221.4 grams per mile. This has been compared to a 30kWh EV using a carbon footprint calculator of electric cars The

calculator uses a UK grid electricity emission level of 0.17kg CO_2/kWh, and we have assumed an annual mileage of 7,000 miles. The annual CO_2 savings would be 1.1437 tonnes.

This figure is per person based on average UK mileage, and could be much higher depending on the number of users who move to a car club, which could be up to 20 per vehicle. If scaled to 10-15 EVs this could remove 180-300 ICE vehicles from the road. This could theoretically have carbon savings between about 206 and 343 tonnes of CO_2 per year. However, savings may be at a much lower level, as this figure is based on the annual average mileage of car users in the UK. We know that car club users drop their mileage when moving to a car club vehicle as they utilise active travel and alternative ways of undertaking their tasks. Car usage is generally a last resort, therefore any response that reduces an individual's mileage will have a positive carbon saving impact.

6.6 Next steps

Before the next steps in progressing a community car club can be defined, Sustainable Keswick and CEWC need to decide which model, if any, they wish to pursue. The analysis provided in section 6.4 above should help inform this decision.

Research should then be done into what grant funding might be available at the time to support a community car club. Discussion would need to take place between the applicant and funder to understand their priorities and eligibility criteria. Initial suggestions for funds that could be explored are:

- **The National Lottery** has a wide range of programmes which may be suitable for a car club project including the Reaching Communities Fund. It is advisable to speak directly to the funder to understand their priorities before applying.
- **Local Authority Grants** may be available, but due to current Local Government reorganisation within Cumbria, it is unknown what opportunities might emerge.
- **Zero Carbon Cumbria – Community Climate Grants** fund projects focused on: reducing carbon emissions including those relating to energy use, food, buying things and/or travel; engaging with more people and building knowledge and understanding of climate change within your community; and/or linking with other projects or activities which will help achieve the target of a Zero Carbon Cumbria by 2037. ***Grants of up to £10,000 are available, but please note that the deadline for applications for these large grants is 31st January 2023.***
- **Cumbria Community Foundation** distribute a wide range of funds across the County, or which some might be suitable for a community car club.
- **The Morrisons Foundation** funds charity projects which make a positive difference in local communities. The funding is up to £25,000.

7 Conclusions

7.1 Feasibility of an integrated project

The feasibility study has not identified any sites that are suitable as hosts for all three elements of this project. However, there is potential to:

- develop community owned EV charge points alongside the community solar PV installations at Cockermouth Leisure Centre and Cockermouth School.
- locate the car club at:
    - the EV charge points at Wakefield Rd car park in Cockermouth, which would depend on Allerdale Borough Council allocating a bay.
    - Keswick cinema, which could accommodate a charge point that would be powered by newly installed solar panels. Due to the limited parking, a single charging socket would be the best solution. However, this is likely to be used solely by the car club vehicle and may be cheaper to install by the car club.
    - Friends Meeting House in Keswick, using the planned single 7kW charge point.

7.2 Feasibility of separate projects

The following separate projects are considered to be feasible:

Project type	**Town**	**Site**	**Recommended delivery model**
Community solar	Keswick	Keswick School	Via an established community energy organisation
	Cockermouth	Cockermouth School Cockermouth Leisure Centre	
	Eaglesfield	Eaglesfield Paddle Primary Academy	
Community EV charge points	Keswick	Friends Meeting House	Via an established Community Benefit Society (Charge My Street)
	Cockermouth	Wakefield Road Car Park Cockermouth School (potentially) Cockermouth Leisure Centre (potentially)	
	Threlkeld	Horse and Farrier Pub	
	Eaglesfield	Village Hall	
Community car club	Keswick	N/A	Either via a new community car club or via an existing commercial car club
	Cockermouth	N/A	