ACTION – Alternative Community Transport In Our Neighbourhood

Phase 2 Application update report

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ACTION – PHASE 2 APPLICATION UPDATE REPORT

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EXECUTIVE SUMMARY

Caithness Rural Transport provides a Dial-A-Ride door to door transport service for people with mobility problems. Caithness Rural Transport is part of Caithness Voluntary Group (CVG) which exists to support the voluntary sector in Caithness. CVG wants to green its service by using electric vehicles for its service, working with other local transport groups to agree usable locations for new rapid chargers. In 2015 CVG applied to Scottish Government's Local Energy Challenge Fund (LECF) and successfully secured Phase 1 funding to support feasibility work for its ACTION, Alternative Community Transport In Our Neighbourhood, project.

CVG is also hoping to use renewable electricity to charge batteries which would be located at charging points. ACTION is working with local battery manufacturer, Denchi Power Ltd, to develop a renewable energy charging point at their Thurso facility. This will be a pilot project to commercially develop this product for off grid applications. ACTION is looking to help Denchi recruit two researchers to look at the outputs from the pilot.

This new green transport project will have the following key features:

- The use of unused or 'free' renewable energy.
- The use of stranded assets such as wind turbines and batteries that would otherwise be recycled.
- The better use of existing facilities by using them to host charging points.
- Giving the potential for charging point locations to act as a catalyst for community enterprise.
- Supplementing public transport provision with community transport.

Towards the end of 2015 Caithness Renewables, who had successfully prepared the LECF Phase 1 application, commenced work on the Phase 2 application. Although this was not finally submitted, much progress was made with the project and this report was produced summarising the outcomes.

1 INTRODUCTION

1.1 Purpose of this report

The purpose of this report is to summarise the outcomes realised during the preparation of the Phase 2 application for the LECF, outlining a way forward for the next stage of the Alternative Community Transport In Our Neighbourhood, ACTION, project.

1.2 Background to the project

Caithness Rural Transport provides a Dial-A-Ride door to door transport service for people with mobility problems. It's available to the disabled and elderly throughout the county. Mothers with young children and others in rural areas with no personal transport, or reasonable access to any public transport service, can also use it.

Caithness Rural Transport is part of Caithness Voluntary Group (CVG) which exists to support the voluntary sector in Caithness by representing and supporting voluntary groups and individuals interested in or actively volunteering, facilitating co-operation, and enabling citizens to access the decision making processes affecting their community. CVG is well-connected and supported in the Caithness community.

It presents the common policies and concerns of voluntary organisations, to develop new ways of responding to need in partnership with statutory and other health, social work, education, environmental and recreation agencies and others concerned with the social and economic regeneration of the area. We are used to dealing with attracting funding and delivering projects.

One of CVG's projects is Caithness Rural Transport which delivers a much needed Dial-A-Ride service in Caithness. Currently CVG uses fossil fuel vehicles but has potentially has access to electricity from wind and solar, as well as good community support.

CVG wants to green its service by using renewable electricity to charge batteries which would be located at charging points. ACTION would allow the community to work in partnership with the public and private sectors as well as academia to create a green transport project with the following key features:

- The use of unused or 'free' renewable energy.
- The use of stranded assets such as wind turbines and batteries that would otherwise be recycled.
- The better use of existing facilities by using them to host charging points.
- Giving the potential for charging point locations to act as a catalyst for community enterprise.
- Supplementing public transport provision with community transport.

Caithness Rural Transport applied to the Climate Challenge Fund for Phase 1 funding in 2015 and received Phase 1 funding which was used to support the feasibility work.

2 PROJECT DESCRIPTION

2.1 Introduction

In spring 2015 Caithness Renewables Ltd started working with Caithness Voluntary Group's Caithness Rural Transport to explore the potential for green transport as part of the service. An application to Scottish Government's Local Energy Challenge Fund was completed in May 2015 with funding being successfully secured in July. The funder requested that Caithness Voluntary Group work with another group, Transition Black Isle, for the duration of Phase 1. This involved regular meetings and the exchange of information. CVG continues to progress with its project.

2.2 Key elements of the project

The key elements of the ACTION project under the LECF Phase 1 work, that involved CVG and Caithness Renewables, were defined as:

- Specify sites in Caithness and work with Caithness Rural Transport
- Creating pilot to use second life turbines and batteries in Caithness
- Phase 2 bid development

2.3 Sites and work with CVG

Through the consultation process, the project was contacted by a number of community groups with the table below summarising the sites that were to be taken forward during the Phase 2 application:

Community Group/ Business	Site Description
Denchi Power Ltd	Installing a renewable energy charging point at their Thurso facility. Incorporating a second life battery pilot, wind turbines (ex-Highland Council). Planning permission to be applied for February 2016) and battery research
Wick Harbour Authority	Want to host vehicle space and a grid connected charging point for CVG within a minute's walk of their office
North of Scotland Childcare Association (NOSCA)	Want to host a grid connected charging point at Castletown primary school where they have a childcare centre.
Transport for Tongue Ltd, T4T	Want to use electric vehicles, host a charging point.
Latheron Hall	Want to host a charging point. Location is very good for a charging point on the A9 where the Wick Thurso roads meet.
Applecross Community Company	A 90kW community owned hydro development in the village with a local grid constraint means only 50kW can be exported. In addition to a local private-wire district heating scheme, EV charging is seen as a key solution to use local electricity and overcome the export constraint. The scheme is built with all the necessary permissions in place.

Preparation of the Phase 2 application gave the following outcomes:

- Positive work with groups to fit travel routes with availability of power
- Development of thinking on how to convert wheelchair accessible vehicles as lift clashes with battery location. Use of a ramp leaves the necessary space and has led to thinking of alternative ways to transport disabled children for Highland Council contract work
- Work with groups to show how renewables can dump power into the electric storage heaters in their facilities

- Establishment of relationship with Wick Harbour Authority who we will continue to work with to put in their charge point for use by CVG
- Two more community groups added (Dunbeath Heritage Centre and Applecross)
- Signposting of CVG to free driver training – FuelGood - which should reduce petrol usage
- Data logging of vehicles at CVG
- Evolution of shared community network of charging points
- Quote obtained for hard standing work
- Incorporation of Applecross into the community network thinking

2.4 Pilot involving Denchi Power and second life batteries

The key to finding a niche for second life batteries is the pricing of other batteries for the renewable energy charging points and any innovative features that Denchi can add.

• At the start of Phase 1, APT and Siemens, who are recognised suppliers to this market, were indicating that the cost of a renewable energy charging point was around £100k. By February 2016 Siemens had dropped their figure to £38k. Denchi are still indicating that they can drive the cost down further.
• Denchi Power has an in house system called REMOTEL that allows them to communicate with their batteries to optimise their performance by seeing when they need to be replaced. During the latter stages of Phase 1 as we were preparing the Phase 2 application, we worked with Denchi to gain a better understanding of REMOTEL and are now proposing that the Denchi system is ideally suited to a community network as REMOTEL can guide vehicle operators to locations that have available charge. This is a USP that communities can take advantage of. This will be trialled in our area.
• Denchi are currently carrying out some linked work on a HIE funded project that will move their proposals further along.
• With regard to the potential cost advantage, second life batteries have a large advantage as they have already been paid for by their first life.
• A research project is planned to look in detail at the effect of intermittent charging on the batteries. Some initial feedback will be obtained on this from the HIE project, informing our pilot.

Preparation of the Phase 2 application gave the following outcomes:

- Pricing from Siemens, now £38,000 rather than £100,000 quoted at the start of Phase 1
- Identification of potential additional jobs at Denchi
- Identification of new markets for Denchi
- Establishment of working relationship between Denchi and other suppliers in their field
- The Denchi project has evolved and will now start in 2018 subject to funding
- Evolution of working relationship with Denchi
- Negotiations with APT and Siemens for use of their battery housing and software
- Interesting discussions between Denchi and their landlord, HIE, which confirm that HIE would support a planning application for the installation of wind turbines at Denchi and they would support a charging point on their estate
- Development of new thinking by Denchi on how to use REMOTEL to direct groups to available power

The most notable of these is that we significantly drove down the cost of renewable energy charging points from APT and Siemens, originally talking about £100k per point, to Siemens now confirming £38,000 per point, probably linked to ACTION's potential order.

One of the most important developments for the Denchi pilot is the use of the latest logistics management technology from Denchi's military batteries. This technology connects to the batteries through the internet, GPRS or (for remote installations) satellite phone to Denchi's logistics management system, REMOTEL (REMote Optimisation To Extend Life).

Denchi's original intent was that REMOTEL would analyse the usage, performance and health of the batteries to provide advanced warning of degradation and potential safety issues. Having continuous or even intermittent access to data detailing the actual use of these SLICE batteries would also enable Denchi to remotely optimise elements of the system such as the charging algorithm, for the purpose of extending the life of the battery for as long as possible. In addition, the ACTION project worked with Denchi to look at using this system to allow a network of community users to interrogate each other's batteries to determine where power is available for charging vehicles on journeys around the north.

The ability to remotely monitor the usage of SLICE batteries enables the use of a leasing model in addition to an upfront purchase of the battery. A leasing model will eliminate the uncertainty barrier surrounding the purchase of a battery and allow Denchi to have the confidence to re-use batteries in cases where batteries do not generate the payback revenue during their first installation. Indeed these batteries could be used in any number of installations until the battery capacity was sufficiently depleted to make further installations uneconomical.

SLICE addresses the needs of the DDSM market but also addresses the requirements of the remote, micro-grid market in the developing world. Reliability and cost are crucial for this market and remote monitoring and remote optimisation will enable battery life to be extended maximising the return on investment (ROI) for consumers, local governments and NGOs.

In addition to being able to address the domestic developed and developing world markets SLICE will also be able to be configured for industrial applications as it is a modular system which can be stacked to create much larger (>MWh) batteries for integration with renewable power sources to create micro-grids or use for grid backup/ support on an industrial scale.

The pilot project can consist of the following phases:

- Development and qualification of a 5-10 kWh module based on Denchi's existing military batteries. (Month 1-12)
- Installation and testing of a number of individual units in a typical UK domestic 'behind the meter' configuration. (Month 13-24)
- Installation and testing of a large battery built from individual SLICE modules at Denchi Power / Thurso Business Park. (Month 16-24)

2.5 Bid development

Preparation of the Phase 2 application gave the following additional outcomes:

- Encapsulation of thinking on State Aid for this type of project
- Start-up of productive discussions with other funders (notably CNSF)
- Evolution of working relationship with CES

As the Phase 2 application approached completion it was realised that the programme would have to be revised such that a Phase 2 application was not submitted.

Key dates for the subsequent project are as follows:

- 2016 - 2017 Look at HIE project feedback on energy storage
- 2016 Start discussions with funders and research institutions
- 2016 – 2017 Review renewable energy charging point market to look at costs/ technology
- 2017 Ask Scottish Government to confirm existing charging point usage
- 2017 Review EV market

- 2017 Data loggers in CVG vehicles
- Summer 2017 Revisit community group participation
- Late 2017 Finalise project details
- 2017 Finalise funding applications

3 NEXT STEPS

Given the interest that we have seen, not only in Caithness Voluntary Group's plans to green its community transport provision but in interest from other northern transport groups, we have determined that we will continue to progress ACTION. In addition we will continue to work on the Denchi Power renewable energy charging point ideas.

The key dates/ actions are likely to be as Section 2.5 above.