RIPEET Outer Hebrides Pilot Project – Executive Summary

RIPEET – Responsible Energy Transition
This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 101006295 - H2020-SwafS-2018-2020 / H2020-SwafS-2020-1

Executive summary

The Responsible research and Innovation Policy Experimentations for Energy Transition (RIPEET) pilot project was co-created in the Outer Hebrides by a consortium of the University of the Highlands and Islands North, West and Hebrides (UHI NWH) and Comhairle nan Eilean Siar (CnES) to address a key regional energy need as identified by regional RIPEET stakeholders. RIPEET regional partners Highlands and Islands Enterprise (HIE) and Community Energy Scotland (CES) are overseeing the delivery of the RIPEET pilot in Scotland.

Tasks and milestones for the RIPEET pilot were collaboratively set between the RIPEET Scottish regional team and representatives from UHI NWH and CnES. The purpose of this document is to provide a final report on the progress against these milestones as of November 2023.

The Outer Hebrides Local Energy Economy is a pilot project framed under a call for innovative energy solutions, under the RIPEET project. The solution aims to:

1. Identify and overcome barriers to developing a local energy economy; specifically selling locally generated energy directly to local consumers through existing grid infrastructure via a locally owned energy supply company (ESCo) or alternative solutions.
2. Explore the optimum mix of domestic renewable energy generation technologies.
3. Explore innovative interventions for energy efficiency improvements particularly in hard-to retrofit, island properties.

In the interest of gaining solutions to three main challenges:

1. Fuel poverty
2. Increasing energy prices
3. The mechanism whereby island generated renewable energy is sold to the National grid through export to the mainland UK, with perceivably little benefit to the wider community.

The pilot was divided into six work packages (WPs) as set out below:

1. **Project structure and regulation (led by CnES)** – to identify and address regulatory constraints around the Local Energy Economy.
2. **Energy storage (led by CnES)** – Investigate regionally appropriate long term energy storage options.
3. **Electricity networks (led by CnES) -** Understand impact of removing demand from the electricity network, specifically considering impact of industrial transition to Hydrogen-for-heat.
4. **Energy supply company (led by CnES) -** Investigation of the practicalities of delivering a local licensed supply company.
5. **Domestic energy efficiency (Led by UHI NWH)** - Explore the optimum mix of renewable generation at the household level including solar PV/Thermal, micro-wind solutions, heat-pump technologies, biomass, household battery storage.
6. **Domestic renewable energy (Led by UHI NWH)** - Explore innovative interventions for energy efficiency improvements, particularly in hard-to-treat island/remote rural properties, seeking to target the households hardest hit by Fuel Poverty.

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At the conclusion of the RIPEET pilot (November 2023), CnES produced a report summarising the activity and key findings from WPs 1 – 4 and UHI NWH produced a report summarising the activity and key findings from WPs 5 and 6.

WPs 1 - 4

For WPs 1 – 4 the following broad themed recommendations were made:

- Create a community engagement strategy to increase knowledge base and introduce energy themes ahead of any significant changes to local energy.
- Contact Energy Local Club to further explore a similar model for the Outer Hebrides
- Lobby for more support for Smart meters and renewables installation manpower
- Explore and/or join an existing research group(s) for piloting energy storage solutions / research and attracting further investment.
- Re-connect with existing Local Generator related groups, such as Community Power Outer Hebrides[1] to review the near future energy landscape and proposed Net Zero journey.
- Establish regular communications with SSEN, with a view to creating a tariff arrangement and the stipulations for any mutually beneficial initiatives e.g. data gathering.
- Use the "Fast Followers" project along with existing local initiatives, such as ICNZ[2] and CNI[3], to progress energy solutions e.g. a new energy plan for the Outer Hebrides

A summary of the key action points from Work Packages 1 – 4 can be found below:

WP1 - Project structure and regulation (led by CnES)

1. The Outer Hebrides does not currently have the correct hardware in order to access the cheapest market tariffs available. This refers specifically to the availability of Smart meters and also to local demand data.
2. Gaining a derogation from Ofgem, which might allow a new local tariff to be negotiated directly with the Energy Regulator was not a viable option in the timeframe. This approach will require further relationship building, investigation of new governance and the regulators own recent recommendations. It may be that this line of inquiry would sit better with the Network Operator SSEN.
3. There are not enough stakeholders in the Outer Hebrides to qualify for some of the energy models which require a minimum customer base. These numbers are upwards of 25,000 households. Currently there are ~27,000 total population in the entire island chain.

WP2 - Energy storage (led by CnES)

1. Further investigation of storage technologies that can ultimately produce electricity from the stored energy, thermal energy storage systems and phase changing materials (PCM). These

[1] CPOH Community Power Outer Hebrides – Community Energy Scotland
[2] Islands Centre for Net Zero ICNZ | Decarbonising Scotland's islands
[3] Carbon Neutral Islands Carbon Neutral Islands: project progress report - gov.scot (www.gov.scot)

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solutions will become increasingly popular as the islands move towards the electrification of heat and the potential proliferation of time-of-use tariffs.
2. Further assessment to understand the potential economic performance of different storage technologies, especially against CAPEX and finance models for investment.
3. Consider the reliance on heavy metals and ores which are in limited or from geographically disparate supply areas when considering different energy storage technologies. When choosing investment, the current and future supply of materials should be considered.
4. Develop an ongoing engagement strategy with a range of key technologists, including scheduled horizon scanning. Form or join an energy technology steering group, with a view to holding bi-annual stakeholder and public awareness sessions, supplemented with presentations at a national platform i.e. energy conference. The format of co-design should continue.
5. Consider alignment with an International Forum to stay engaged with the Hydrogen aspect of the European Union Horizon Europe research and innovation programme.

WP3 - Electricity networks (led by CnES)

1. Continue to engage with SSEN specifically on the network implications of decarbonising kerosene to Hydrogen and any other electrification modes.
2. Defining the Hebrides Energy "vehicle" and making a firm proposal to SSEN, which meets local requirements but is mindful of their own constraints, would seem to have the highest likelihood of achieving an equitable energy conversation for island resilience.
3. The RIPEET project has confirmed that access to local generation by local consumers will have to be virtual (through use of the local network enabled by regulatory fix) rather than physical (through use of the local network as direct private wire) and work will now be done to develop 'Hebrides Energy' into a licenced, not-for-profit Electricity Supply Company which could ultimately operate on its own peer-to-peer trading platform, delivering locally generated energy to local consumers, albeit virtually.
4. Continue to investigate the possibility of 'Hebrides Energy' becoming the model for a larger, Scottish Islands Electricity Supply Company which will provide the mass of consumers required by Ofgem to consider supporting regulatory change. Further work is required on this and will continue to be a focus, as Ofgem and related regulations move towards a more regional model for electricity supply.
5. Through the Fast Follower project, continue to build on the strengthened relationship with SSEN Distribution which has developed through the RIPEET pilot. This will help to ensure that the Distribution System Operator is held accountable for a Just Transition into fully renewable energy supply for the islands.

WP4 - Energy supply company (led by CnES)

1. Following the cessation of many fixed tariffs and the low-cost service providers ceasing to trade since the Hebrides Energy consumer survey, it would be helpful to understand how tariffs have changed public perception of priority for switching and whether increased vigilance on climate issues, has further informed the importance of local green energy. An updated engagement campaign would benefit any future roll-out of an island's energy club, sleaving, white label or other tariff scheme. An up-to-date data set, with wider engagement and greater participation could better inform the public proposal and therefore, increase chances of greater uptake of future local schemes.

2. The use of a tariff monitoring scheme, such as Energy Monitor (free, through MoneySupermarket) or Switchd, a service which proactively looks for savings based on individual circumstance and which can benefit those without smart meters, could be widely publicised. The Switchd scheme, which has a small yearly cost of ~£30 (different options with different levels of support are available), does not charge the member until a saving of £50 was made.
3. Create, publish and update a definitive list of available grants and support schemes, who qualifies and deadlines for submission. This might remove some of the scepticism and confusion in a heavily congested market where social media channels promise free energy related upgrades.
4. Continued engagement with policy makers at Scottish Government level to highlight the ongoing disconnect between energy support offered to benefit claimants to the exclusion of those experiencing in-work poverty.

A summary of the key conclusions from Work packages 5 and 6 can be found below:

Description of WPs:

WP5 - Domestic energy efficiency (Led by UHI NWH) - Explore the optimum mix of renewable generation at the household level including solar PV/Thermal, micro-wind solutions, heat-pump technologies, biomass, household battery storage.

WP6 - Domestic renewable energy (Led by UHI NWH) - Explore innovative interventions for energy efficiency improvements, particularly in hard-to-treat island/remote rural properties, seeking to target the households hardest hit by Fuel Poverty.

WP5 – Domestic energy efficiency (Led by UHI NWH)

1. Householders in the islands choose Solar PV, Wind and Solar Thermal as their top three technologies they would wish to integrate into their home. Heat pumps and battery storage are considered as a higher area of suitability amongst installers and agencies, but less popular with householders. The reason for heat pumps, in particular, is that the fabric of the housing stock becomes crucial, and major challenges exist for those homes that do not conform.
2. Over 90% of respondents indicated they would be happy to invest in renewable energy technologies for their home, but 71% indicate it is just too expensive. In the rural areas (outside of Stornoway) there is a lack of trained installers and this remains an important barrier to renewable upgrades.
3. Is Solar Thermal a value-for-money investment given days with lack of direct sunshine? Popular potential choice but uncertainty on its appropriateness.
4. Household wind energy generation was identified by both householders and stakeholders as a high priority. Need to investigate further potential technologies in recognition of this natural resource.

WP6 – Domestic renewable energy (Led by UHI NWH)

1. Traditional measures such as double-glazing and loft insulation have seen significant uptake in response to the availability of grants and national and local authority funded area-based

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schemes. The next phase of energy efficiency upgrading needs to be targeted and immediate – e.g. external/internal/cavity wall insulation/underfloor insulation.

2. Barriers need to be urgently overcome and are primarily related to understanding complexity of grant availability and application process and also lack of understanding of what is most important for a given house location – e.g. need for energy audits/visits and advice.

WPs 5 and 6

1. Context is important with the lowest salaries and household incomes in UK found in the Outer Hebrides, a rapid and costly upgrading of housing stock by private means may prove difficult. So, there is a requirement to plug gaps where it is possible, in best 'value for money' areas.
2. According to householders the primary factor to entice investment would be the ability to save money on their bills. The potential savings need to be promoted more clearly – e.g. of solar thermal investment in the Hebrides for an average 3-bed household. According to stakeholders, the most important factor they experience on whether people upgrade, or not, is linked to the availability of appropriate funding incentives for householders – e.g. the availability of grant funding as a proportion of total costs.

A summary of the key action points from Work Packages 5 and 6 can be found below:

WP5 - Domestic energy efficiency (Led by UHI NWH)

1. Two technologies in particular were identified by households as being in high demand, but yet lack of knowledge and information on their appropriateness was apparent.

   Firstly, **micro-wind** at the household level seemed an obvious technology to install, given our healthy level of natural resources in this area. Few installations in the islands exist in comparison to other more common technologies. An opportunity here to research the most appropriate technologies in the Outer Hebrides (or even design a new technology) and lead the field in this renewable area, providing performance details and specifications of top choices might help convert the existing expressed demand.

   Secondly, **solar thermal** in the Outer Hebrides – what are the likely outcomes on various South facing perspectives. Is it a sensible investment? Install and monitor for 12 months several systems to develop specification and information sheets to aid investment decisions for households.

2. Five technologies have been identified as being the most sought after (by households) and suitable (by stakeholders). The challenge will be to research and monitor, in some instances and trial in others, to provide specification and performance sheets for several differing setups for each technology in the Outer Hebrides. This will provide the key performance data that householders are seeking prior to investment.

   This will have to be updated tri-annually to ensure future currency of information. Performance sheets needed for several installation variants of the following technologies:

   1. **Solar PV**
   2. **Micro-Wind**
   3. **Solar Thermal**

4. **Heat pumps**

5. **Battery storage**

WPs 5 and 6

1. Given low level of household incomes in the islands then we need to investigate which actions and transition technologies will give us 'most bang for our buck' at the household level. What should be the priorities for cash poor householders located in the Outer Hebrides on a windswept group of islands? Which investments will make most impact in reducing their bills and impact on CO_2 emissions?
2. There is an urgent need for the development of a 'one-stop-shop' service and associated online portal shared by Community Energy Scotland (CES), Tighean Innse Gall (TIG), Comhairle nan Eilean Siar (CnES), Hebridean Housing Partnership HHP – where Outer Hebrides residents can seek advice and information and also get the latest news and updates from the multi-sector partnership on grants, technologies and success stories regarding domestic energy efficiency and renewable energy technologies.
3. Due to an acknowledged lengthy and complicated grant/loan application process to fund the installation of energy efficiency measures and domestic renewable energy technologies, this means only the most able, with the highest capacities in rural areas are able to upgrade. Households with lesser skills and capacities will be excluded from upgrading due to this difficulty yet will arguably be those most in need. The need for social equity in terms of a just transition requires that households are not excluded due to their capacities. Additional support services via a social enterprise (expanding a current remit or new start) should be put in place to support a more just transition in the islands.
4. A recognised barrier from the survey data revolves around the availability and indeed accessibility of installers for household upgrades for energy efficiency and renewable technologies. Even where MCS certified business do exist, they appear to have a low priority for individual household upgrades, unless at scale.
5. Develop a new training facility within the Future Energy Lab at the UHI campus in Stornoway to work with current installers to train their staff at a subsidised rate with the caveat they commit to a certain number of individual household renewable upgrades (with continued aftercare included) within 12 months, for each member of staff trained.
6. In view of the findings of this report and the complex nature of seeking to overcome the challenges, a full 5-year multi-agency plan should be produced to target and focus collective efforts.

Copies of both full reports can be viewed here:

RIPEET OH pilot final report - WP1-4

RIPEET final report WPs 5 and 6 FINAL J

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