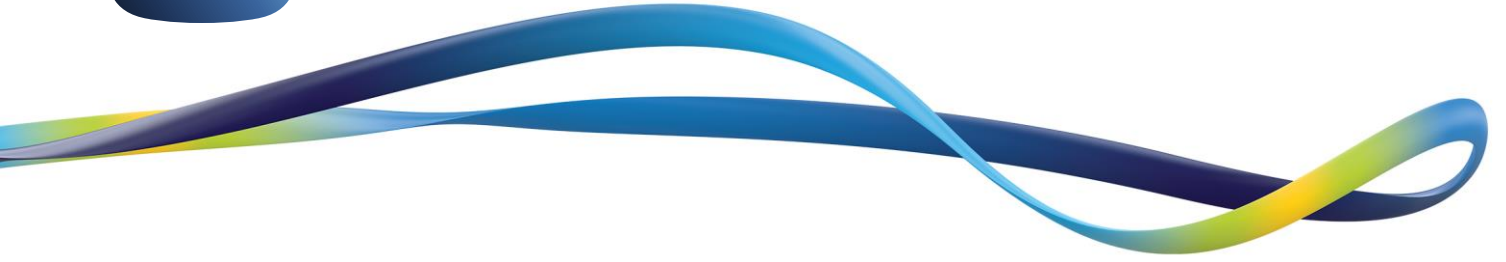




NETWORKS



ESB NETWORKS DINGLE PROJECT – A REPORT ON ACTIVE ENERGY CITIZENSHIP & COMMUNITY ENGAGEMENT



FIGURE 1 – LAUNCH OF DINGLE PROJECT AMBASSADOR PROGRAMME

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Table of Contents

1.0	Executive Summary	3
2.0	Introduction to the Dingle Project	3
2.1	Alignment of Dingle Project to Ireland’s Climate Action Plan.....	5
2.2	Dingle Project Reports.....	5
3.0	The Active Energy Citizen	6
3.1	Importance of Energy Citizenship within ESB Networks’ Dingle Project.....	8
3.2	Dingle Project Achievements	8
3.3	Energy Citizenship Development Strategy.....	11
3.3.1	Engagement.....	11
3.3.2	Empowerment	17
3.3.3	Evaluation.....	21
3.4	ESB Networks’ Observations on Human Behaviours of Trial Participants.....	22
4.0	Barriers to Low Carbon Energy Transformation.....	24
4.1	Local Dingle Enablers to Barrier Removal	25
4.2	Other Potential Enablers emerging from Dingle Peninsula.....	26
5.0	Summary & Conclusion.....	27

1.0 Executive Summary

This report provides an overview of the initiatives undertaken as part of ESB Networks' Dingle Project to drive active energy citizenship across the Dingle Peninsula. It highlights activities undertaken on the three strands of the energy citizenship development strategy: engagement, empowerment, and evaluation, carried out in collaboration with those citizens participating on the project's technical trials and delivered in collaboration with other project partners.

The report also refers to the findings of the engaged research carried out by the social research team at MaREI, which highlights the contribution that initiatives like the Ambassador Programme and EV Trial can have in activating energy citizenship and diffusing low carbon behaviours and technology adoption.

ESB Networks' own observations on trial participants' behaviours with respect to interactions with and their use of low carbon and clean energy enabling technologies are discussed, as these insights may inform outreach initiatives for any future technology trials or flexibility pilots that ESB Networks might initiate with residential electricity consumers in the future.

Blockers to low carbon energy transformation at community level, as highlighted by trial participants and the potential contribution of initiatives undertaken as part of the Dingle Project and Corca Dhuibhne 2030, to remove these blockers are discussed. Additional, transformation-enablers, suggested by collaboration partners are also identified.

Overall and in retrospect, the three-stranded Energy Citizenship Development strategy, implemented for the Dingle Project has been effective for Dingle. Examples of technology diffusion across the peninsula, directly related to the Dingle Project, are now emerging. However, it is considered that the full impact of the Dingle Project in terms of energy transformation may not be evident for a number of years.

2.0 Introduction to the Dingle Project

The primary aim of the 3-year Dingle Electrification Project (the Dingle Project), established in 2018, was to understand the impact of, and potential supporting role of an increasing trajectory of low carbon and clean energy enabling technologies, installed at residential and small business property settings, on the low voltage electricity network. With this overarching aim in mind, the technical objectives of the project were structured to meet this primary objective.

In addition, and with recognition that achievement of significantly increased levels of electrification of heat and transport across society would be dependent on energy use transformation by individual citizens across communities, the project also incorporated a significant workstream focused on the enablers of this transformation by individual citizens at that local community level.

The Governments' Climate Action Plan, published in 2019, with targets of close to one million electric vehicles on Ireland's roads and 600,000 properties to be equipped with electrified heating by 2030, further reinforced the rationale for the Dingle Project.

This report focuses on the work of and learnings from this energy citizenship workstream.

The Dingle Peninsula, Co Kerry, was chosen as the location for the project for a number of reasons, including the emergence of complementary initiatives in the area focused on reducing the peninsula's overall carbon footprint. Recognising that achievement of the Dingle Project's objectives would require the buy-in and collaboration at all levels of the community, choosing Dingle, where community engagement on low carbon transformation was increasing, proved to be a logical decision.



FIGURE 2 – MAP OF DINGLE PENINSULA

The Dingle Project was established with four distinct objectives:

1. **Network Reliability:** With a societal-wide increase in reliance on the electricity network for the provision of electric power to heat homes and power electric vehicles, the Dingle Project wished to trial a number of new technologies on the overhead electricity network across the Peninsula to minimise the instances of and duration of certain types of faults;
2. **Residential Flexibility:** ESB Networks wished to understand the potential for clean energy enabling technologies such as electric vehicle chargers, batteries and air-source heat pumps to be controlled in a way so as to minimise their impact on the electricity network and at times, be operated in a way so as to provide services to the Distribution System Operator, potentially enabling additional electrification of heat and transport without the necessity for significant reinforcement of the network;
3. **Peer-to-Peer Energy:** The project also intended to trial one form of peer-to-peer energy services to determine the impacts, if any, that might arise on the local electricity network and to better understand the infrastructure that would be required to support such services; and
4. **Active Energy Citizenship:** Recognising the transformation in energy usage and behaviours that would be required by individual citizens to enable a low carbon society incorporating extensive electrification of heat and transport, ESB Networks was interested in better understanding some of the blockers and enablers to such a transformation. It was considered that the outcomes of this social research might help inform policy in support of wider uptake of low carbon and clean energy enabling technologies across society.

2.1 Alignment of Dingle Project to Ireland’s Climate Action Plan

These objectives were very much aligned with Ireland’s Climate Action Plan, published in 2019 and updated in [2021](#), which set out profound changes to the systems, practices and networks of services which support our lifestyles across energy, transport, telecommunications, public service, and waste management.

Specific targets included in the 2019 plan were that 600,000 premises would be equipped with electric heating (of which 400,000 would be retrofitted in pre-existing properties and 200,000 would be in new builds) and for approximately 1,000,000 electric vehicles on Ireland’s roads by 2030. The plan also envisaged active participation in this transformation right across society noting that “**Every home, every community, every workplace and every farm, must be mobilised to get involved**”.

ESB Networks is of the view that part of the “getting involved” by active energy citizens may require, for example, their willingness to participate in initiatives that will use the operational flexibility of those low carbon and clean energy enabling technologies in their homes or businesses to enable the efficient operation of an electricity network infrastructure that supports a low carbon society.



FIGURE 3 - CLIMATE ACTION PLAN

A programme of work was established to engage the community on low carbon transformation and to incorporate an assessment of the effectiveness of the project’s initiatives in driving change and diffusion of behaviours and technology.

2.2 Dingle Project Reports

The Dingle Project has published two additional reports as follows:

- Customer Flexibility Report – an overview of the insights, learnings and observations arising from the Flexibility Trial; and
- [Learnings from the Peer-to-Peer Energy Trading Objective – garnered from the activities undertaken in furtherance of the P2P objective of the project;](#)

Each of these reports is available on the ESB Networks website.

3.0 The Active Energy Citizen

ESB Networks' definition of an Active Energy Citizen is someone who makes conscious decisions, choices and actions related to energy in his / her daily life and who understands that those energy behaviours can have a positive impact on the wider energy system.

Being active may mean different things to different energy citizens aligned with where they are on their individual transition journeys to low carbon. Some recognised traits and behaviours of Active Energy Citizens may include:

- Striving to reduce the carbon content of their energy footprint by transitioning to clean, renewable energy and away from carbon intensive forms such as diesel, petrol, or solid fuel, whether for transport, water heating or space heating;
- Implementing local energy efficiency initiatives, such as insulation, device set-point changes and general energy usage reductions;
- Installation of local renewable energy generation technologies such as Solar PV;
- Optimisation of, or aligning, energy consumption in the home to local generation;
- Investing in clean energy enabling technologies such as energy storage for price arbitrage or carbon optimisation purposes;
- Participation in schemes and initiatives to support the local electricity network including enabling provision of flexibility through ceding control and operation of energy assets at their properties to 3rd parties, at key times;
- Sharing their story, in the interest of encouraging others to become more energy active and sustainability conscious;

For ESB Networks, those decisions, choices, and actions which have a positive impact on the local electricity network are of most interest.

Based on Dingle Project experience, ESB Networks recognises that Active Energy Citizen behaviours can be wide-ranging, spanning from investment in low-carbon technologies to advocacy on low carbon transformation supported by the sharing of the associated "lived experience" at community or national level. Some data-driven behaviour change has also been observed, albeit that it is considered that sustained data-driven behaviour change will require empowerment by innovative technology and digitisation, where key energy usage decisions are increasingly automated and left to those technologies as confidence in their operation and performance increases.



FIGURE 4 - PROJECT AMBASSADOR

Separate to the Dingle Project, ESB Networks' National Networks Local Connections (NNLC) Programme will, over the coming years, transform the future electricity network, enabling citizens to play a part at local level. NNLC estimates that over the coming years, in order to support the smooth operation of the electricity network in accommodating the level of renewable generation that is planned and the envisaged take-up of clean energy enabling technologies, without involving over-investment in network infrastructure upgrades, that this will require 50% of all EV charging technologies and 25% of Heat Pump technologies in the premises of active energy citizens to act on signals either sent directly by ESB Networks or by market agents working on its behalf.

The learnings from the Dingle Project will be taken into consideration by NNLC as its programme proceeds.



**FIGURE 5 - NNLC
PROGRAMME**

3.1 Importance of Energy Citizenship within ESB Networks' Dingle Project

Understanding the Active Energy Citizen and its enablers was considered necessary to support wider diffusion of those behaviours and complementary low carbon and clean energy enabling technologies at a community level. In addition, from ESB Networks' perspective, it wished to better understand how citizen behaviours might affect the use of those technologies deployed at their properties and thereby their potential supporting role or impact on the local electricity network.

A focus on Active Energy Citizenship was therefore important for ESB Networks for the following reasons:

- **To maximise learnings from the technical trials:** ESB Networks' intention was for its flexibility trial to reflect real-life scenarios of energy usage and behaviours by fully activated trial participants. By activating participation by citizens in the trial area, ESB Networks hoped to better understand how their behaviours might affect their use of the technologies provided to them, enabling it to better understand the potential impact on the electricity network;
- **To understand the role of near real-time information in driving behaviour change:** ESB Networks also wanted to see whether the provision of accessible near-real-time information might support active energy behaviour change across trial participants;
- **To identify potential barriers to future flexibility scheme take-up or operation:** ESB Networks anticipated that it could learn how human behaviours or concerns might support or hinder the take-up or operation of future initiatives such as flexibility schemes; and
- **To identify learnings and insights that might support wider low-carbon transformation:** ESB Networks was interested in understanding whether its engagement and empowerment strategy, its Ambassador Programme and the advocacy role of its ambassadors might be templates to enable wider diffusion of active energy citizen behaviours across society.

3.2 Dingle Project Achievements

Over the duration of the project, 35 properties, distributed across the Dingle Peninsula were equipped with low carbon and clean energy enabling technologies as follows:

- 20 properties fitted with Solar PV;
- 10 properties fitted with electric vehicle chargers;
- 5 properties fitted with the suite of EV chargers, batteries, air-source heat pumps and Solar PV; and
- 3 properties underwent deep retrofits;

All properties actively participating on the project were also equipped with home energy monitoring devices, gateway controllers and the property owners were provided a mobile app which displayed near real time information on the relevant electrical energy footprint of those technologies.



FIGURE 6 - RESIDENTIAL SCALE BATTERY



FIGURE 7 - SOLAR PV



FIGURE 8 - ELECTRIC VEHICLE

While at project inception, the Dingle Project had sought to cluster the roll-out of technologies in a concentrated geographical area, thereby creating a focused demonstration and representation of an electrical network supporting a low-carbon community, the recruitment of participants for the trials did not result in the intended clusters. In retrospect, the dispersed distribution of trial participants across the Dingle Peninsula, was considered more likely to support wider local community engagement and dissemination than would have been the case under a concentrated energy community scenario.

Overall, the Dingle Project primed an active energy community through the funding and roll-out of low carbon and clean energy enabling technologies. The degree to which these home and small business owners became increasingly active was influenced by the visibility of the technologies installed, the trials that they were invited to participate in, their increased profile over the duration of the project and their community-wide connections.

A series of engagement and empowerment initiatives throughout the project, some led by, and others supported by ESB Networks, enabled sharing of project objectives, progress, experiences and insights with the wider community beyond the active trial participants. These initiatives have led directly to examples of technology diffusion across the peninsula, albeit low in number and scale throughout the project timeline.

The Ambassador Programme and Electric Vehicle Trial completed at end January 2021. The value of these initiatives, in terms of their furthering the promotion of low carbon energy transformation and diffusion of clean energy enabling technologies, has been independently assessed by the social research team from the Marine and Renewable Energy Institute (MaREI). It is anticipated that the full impact of these programmes in terms of diffusion of sustainability, energy citizenship behaviours and technology will become apparent over the coming years.



FIGURE 9 - COMPLETION OF ELECTRIC VEHICLE TRIAL

While the Dingle Project has now been completed, it leaves behind an established platform for low carbon transformation, both in terms of the technologies that have been deployed and trialled at properties across the peninsula, and a wider community engaged on the low carbon transformation of energy.

3.3 Energy Citizenship Development Strategy

There were a number of strands to the strategy designed and implemented to drive active energy citizenship across the peninsula in Dingle:

1. **Engagement:** Initiatives to encourage participation on and raise general awareness and interest in the ideals, objectives, progress, learnings, and insights from the Dingle Project;
2. **Empowerment:** The development of local capability to continue the diffusion of low carbon energy behaviours across the peninsula over time; and
3. **Evaluation:** An assessment of the merits or otherwise of key elements of the project in diffusing active energy citizenship and associated behaviours;

Each of these strands to energy citizenship development is explored later in this report.

Delivery of this strategy required a collaborative approach across other members of the energy community in Dingle. This collaboration evolved as the engagement strand of the energy citizenship development strategy was advanced. The key partners and their roles in this collaboration were as follows:

- **Dingle Innovation & Creativity Hub:** Championed ESB Networks' Dingle Project and established community-wide trust in the project's objectives and the project team;
- **MaREI – Social Research Team:** Carried out research into the effectiveness of the project's initiatives in activating energy citizenship and on the diffusion of technologies across the peninsula; and
- **Corca Dhuibhne 2030:** Activated initiatives complementary to the Dingle Project which supported the engagement and empowerment objectives of ESB Networks' Energy Citizenship Development Strategy;

Collectively, the Corca Dhuibhne 2030 (Dingle 2030) stakeholders collaborated to better understand what the local infrastructure components might need to be, to establish the confidence, capability, and capacity within the community to drive this low carbon energy transition forward and to recommend policy and practice changes to enable top-down mechanisms to better complement citizen driven efforts.

In addition to ESB Networks collaborations with the three organisations identified above, as individual initiatives progressed, other shorter-term activity-specific collaborations involving local media organisations, the educational sector, electrical and other contractor organisations and technology partners developed.

3.3.1 Engagement

There were many initiatives undertaken by ESB Networks to engage all demographics of the wider Dingle community on the objectives and progress of the Dingle Project. Some of these include:

1. **Appointment of full-time Community Engagement Manager:** This demonstrated ESB Networks' commitment to the project but also to the Dingle Community and Stakeholders. It provided a single point of contact for people to get connected to the project. Establishing an ESB Networks presence within the community was seen as critical for the project's success. Having a dedicated resource positioned to work with trial participants as recruitment proceeded and being accessible to the community for interaction on other community initiatives contributed to positive relationship establishment throughout the project.

2. **Partnership with Dingle Creativity & Innovation Hub:** The Dingle Creativity and Innovation Hub is the community enterprise initiative based in Dingle town, motivated to establish sustainable employment across the peninsula. At Dingle Project initiation stage, a core objective of the hub was to support community projects in the area of transition to a low carbon society.

Partnering with the hub provided an office environment with access to services such as high-speed broadband and remote working facilities for the Community Engagement Manager and other members of the Dingle Project team. This also enabled ESB Networks to create a physical presence and facility on the peninsula, where meetings with the Community Engagement Manager could take place, solidifying ESB Networks' presence in the community in the early stages of the project.



FIGURE 10 – DINGLE INNOVATION & CREATIVITY HUB LOGO

This partnership also enabled ESB Networks to take advantage of existing relationships that the hub had across the community and provided the local insights to facilitate tailoring of some of the community-wide initiatives and programmes, to offer greatest opportunity for success.

3. **Promotion of Series of Incentivised Trials:** As ESB Networks wished to understand the impact of specific electrical loads on the local network (electric vehicle charging, V2G discharging, electric heating etc.) and also intended operating and controlling these loads to potentially offer flexibility services to the Distribution System Operator, it decided to fund the installation of technologies to achieve this in a controlled manner. The Ambassador Programme, EV Trial and Solar PV Trial recruitment campaigns arose from this strategy.
4. **Ambassador Programme:** ESB Networks sought expressions of interest from individuals (homeowners and small business owners) across the Dingle Peninsula to participate on its Ambassador Programme. Promotion through local media (newspapers and radio) created awareness and excitement across the community.



FIGURE 11 - PROJECT AMBASSADORS

Choosing Project Ambassadors who were themselves enthusiastic to learn and willing to share their learnings further across the community was seen as being important to the success of the project. Following evaluation of expressions of interest, follow-up survey responses, and interviews, five Ambassadors were carefully selected. The chosen Ambassadors were considered representative of typical demographics and lifestyles across the peninsula including from the Agricultural, Hospitality, Residential, Trade, Education and Remote Workforce sectors.

The Ambassadors agreed, that in return for the provision and installation by ESB Networks of the complete suite of low carbon and clean energy enabling technologies at their properties, which for three of the five also involved a deep energy retrofit, that they would participate fully in activities to share their experience, both locally and beyond. As part of their role as Ambassadors, they agreed to attend events, engage with media and most importantly, share their experiences with family, friends, and neighbours, to support diffusion of active energy citizen behaviours and technologies within their own communities and social circles.

- 5. Solar PV and Electric Vehicle Trials:** ESB Networks ran competitions to select individuals to trial Solar PV and sought expressions of interest from individuals interested in trialling electric vehicles throughout the project. The level of community interest in participating in these trials was considerably higher than that experienced for the Ambassador Programme, considered to be as a result of increased promotion of the project both at local events, on local media and through social media channels. Arising from expressions of interest received and through promotional competitions, twenty individuals were selected to receive Solar PV and ten were selected to receive an electric vehicle and home EV charger. Again, the expectation was that these trial participants would share their “lived experience” of these technologies with the wider community.



FIGURE 13 – SOLAR PV INSTALLATION



FIGURE 12 – V2G COMPATIBLE VEHICLE

ESB Networks also made an additional two electric vehicles available, for periods of between four to six weeks, to a number of other people across the peninsula, so that they could experience electric motoring.

The seventeen electric vehicles, branded with the Dingle Project logo, proved to be the most obvious sign of low-carbon change happening across the community. The trial commenced during a period when nation-wide Covid-19 related restrictions were still in effect, meaning that the number of visitors and accompanying vehicles across the peninsula was significantly lower than normal. As such the electric vehicles being used by the trial participants were more noticeable than would ordinarily have been the case.

6. Participation on local Steering Committees and Working Groups across the peninsula:

By working collaboratively and being part of a broad range of working groups and local steering committees, ESB Networks was in a position to provide support and advice to these groups as they established and explored community initiatives which were complementary to the objectives of the Dingle Project. Some of these groups and initiatives included:

- a. Corca Dhuibhne 2030 – A community wide initiative to promote sustainability and low carbon transition in the Energy, Agriculture, Marine, Transport and Tourism sectors. Corca Dhuibhne 2030 initiated many local initiatives, some only possible because of the existence of ESB Networks’ Dingle Project and its associated programmes, further leveraging the experiences of the Dingle Ambassadors and sharing them with the wider connected circles of its members;



FIGURE 14 – CORCA DHUIBHNE 2030 COORDINATION TEAM

- b. Energy Mentor Steering Committee – An initiative led by Kerry Educational Training Board to upskill individuals on basics of clean energy enabling technologies and equip them to share their knowledge locally;
- c. West Kerry Dairy Farmers Sustainable Energy Community – An initiative to support dairy farmers to better understand and manage energy usage and carbon emissions on their farms;

- d. Dingle Energy Master Plan Steering Committee – An SEAI supported initiative to quantify total energy usage and potential renewable energy sources across the Dingle Peninsula;

By collaborating with these groups and initiatives, the work and objectives of the Dingle Project were further communicated across those communities. This collaboration also introduced the Dingle Project team to individuals with connections at policy setting fora nationally, thereby helping to further promote the work of the project beyond the peninsula.

- 7. **Presence at local / National events:** Throughout each year there are many local events and festivals held across the Dingle Peninsula. Through sponsoring and supporting many of these local community events, for example, local sporting competitions, local food, and film festivals and by having a physical presence at them, this provided an opportunity for the Dingle Project team to meet people on the ground and build sustainable relationships that helped establish trust across the community. This physical presence, helped create further awareness of the objectives of the project and the many initiatives underway while also enabling the team to address questions, eliminate local concerns and establish a directory of local stakeholders supportive of the project.



FIGURE 15 – DINGLE PROJECT TEAM’S MARQUEE

By having a presence at key National Events e.g., National Ploughing Championships, SEAI Energy Show, Energy in Agriculture, National Power Summit, this enabled ESB Networks to share the objectives of the Dingle Project with a wider national audience.

- 8. **Focused Competitions:** Through running competitions locally, for example in respect of Solar PV, the project has shown that people who had little prior knowledge or interest in renewable energy or clean energy enabling technologies, could become engaged wholeheartedly on the topic. By participating in events which engaged secondary school children, the low carbon energy message could become a focus of discussion in households across the community.
- 9. **Social Media:** Social media platforms provided a channel to promote the objectives of the Dingle Project. These platforms provided a valuable mechanism to share the lived experience of the Ambassadors and other trial participants. Social media campaigns, leveraging the wider following of ESB Networks, helped bring the project to life across a wider national and international audience.



FIGURE 16 – PRIMARY SCHOOL ENGAGEMENT

10. **Local and National Press / TV / Online:** Strong relationships were established with local press and media organisations. This enabled the sharing of progress updates across the wider community and profiled some of the people involved, thereby making the project real in the eyes and ears of readers and listeners. Exposure through national press and media effectively brought the ambassador and trial participants' experience to a wider audience.

The introduction of control measures to hinder the spread of Covid-19 infections, including restrictions on travel, resulted in a switch from in-person town-hall style community events to [podcasts](#) on local radio. In these podcasts, the ESB Networks' project team, an industry expert and one of the ambassadors / trial participants would share their knowledge and experience with the wider community, thereby engaging citizens beyond those active in the technical trials.



FIGURE 17 – RADIO KERRY PODCAST

ESB Networks also maintained a website for the Dingle Project, providing periodic updates on progress and highlighting photos, videos, and webinars to share experiences and learnings. Collectively these communication initiatives helped humanize the energy transition.

11. **Targeting key community groups and demographic sectors:** By engaging directly with specific groups and involving them in the project, e.g., at local sports competitions, this stimulated interest and discussion on sustainable energy solutions for these clubs. Also, by supporting other parties' low carbon transformation initiatives, e.g., LED bulb exchange, this enabled the project team to engage with local secondary school students and further share the objectives of ESB Networks' project. Sponsorship of an online animation training course for secondary school students, which enabled them to bring their ideas on low carbon energy transformation to life, further engaged this demographic and by association their social circles on the work of the Dingle Project.
12. **Sharing Learnings through Webinars:** Throughout the project, and in particular since the advent of the Covid-19 pandemic, ESB Networks delivered many webinars to share the objectives of the project and the observations, insights, and learnings as they emerged. Some of the webinars were directed towards specific technical audiences while others were designed to be of general interest to wider stakeholders from the Dingle community, energy sector, policy makers and regulatory bodies, both nationally and internationally.

As an example, in December 2021, ESB Networks hosted the [Dingle Project Webinar Series](#), where project team members shared learnings from the project and other experts presented on topics complementary to low carbon transformation. These webinars also included discussions with Project Ambassadors and EV ambassadors who shared their "lived experience" with attendees.

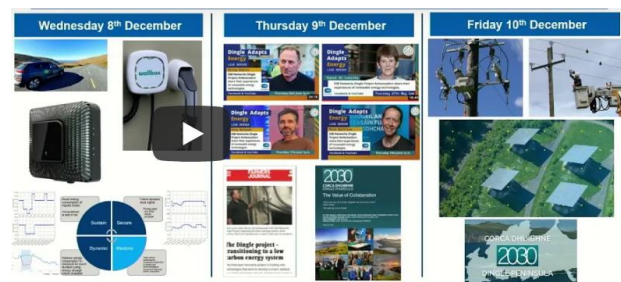


FIGURE 18 – DINGLE PROJECT WEBINARS

The combination of these many initiatives enabled ESB Networks to engage citizens and community groups, across the Dingle Peninsula and at a national level, on the objectives, progress, experiences, and learnings of its Dingle Project.

3.3.2 Empowerment

When the Dingle Project was established, a duration of three years was set for its completion. At that time ESB Networks realised that the energy citizenship achievements of the project, in terms of mobilising citizens across the peninsula to take the first steps on their individual low carbon transformation journeys, would be limited within that project timeline. It also recognised that in the absence of capability building mechanisms on the peninsula, that the conclusion of its Dingle Project could potentially hinder promising low carbon energy transformation initiatives in the area – something that ESB Networks was keen to avoid.

As such, ESB Networks offered support to initiatives that would build some of those local capabilities to enable continued diffusion of active energy citizenship behaviours, subsequent to demobilisation of the Dingle Project. Some of the initiatives supported and initiated by ESB Networks included:

1. **Energy Mentor Programme:** In conjunction with its partners on the Corca Dhuibhne 2030 group, ESB Networks supported the roll-out of the Energy Mentor Programme. This 12-week programme, designed to inform citizens on how they might adapt their energy lifestyles, introduced 12 citizens across the peninsula to low carbon and clean energy enabling technologies, explaining what these technologies were, how they operated and the environmental benefits arising from their use, over traditional technologies.

Participants on the programme were introduced to Solar PV, air-source heat pumps and battery technologies. The programme was not designed to equip participants to the capability level of a technical assessor but provided sufficient information to position them to speak with confidence about them in a social setting.



FIGURE 19 - PARTICIPANTS ON ENERGY MENTOR PROGRAMME

The programme also explained the system of state grants available to support low carbon transformation, explained to participants what is involved in a deep energy retrofit and explained how grant applications to SEAI (Sustainable Energy Authority of Ireland) could be progressed.

As ESB Networks' Dingle Project progressed, the Community Engagement Manager directed general queries received from the community to these new Energy Mentors, in order to create awareness across the peninsula of this emerging local capability and support.

2. **Information Sessions & Networking Events:** At the early stages of the project, ESB Networks convened a number of community-wide meetings to provide general information on those low carbon and clean energy enabling technologies intended for installation at trial participant properties. These information sessions enabled members of the Dingle Project team to explain the purposes of the trials and also provided an industry expert to answer any specific questions from attendees. Covid-19 necessitated these on-peninsula meetings to transition to virtual format, delivered through the Radio Kerry hosted pod casts.

ESB Networks also facilitated a number of events where members of the local community with past experience of low carbon and clean energy enabling technologies were available to meet others from the community interested in these technologies. These colloquial discussions were considered to be low risk by attendees as they didn't initiate sales leads and follow-on discussions as might be the case subsequent to enquiries made to a technology provider. While Covid-19 measures resulted in the postponement of these events as the project proceeded, the connections that were established may prove fruitful over time.

Both of these initiatives equipped members of the community, interested in exploring these technologies further, with sufficient information to carry out their own further research into the benefits of these technologies and better understand their applicability to their lifestyles.

- 3. Energy Clinics:** ESB Networks also supported an initiative led by the Dingle Innovation & Creativity Hub which carried out 20 energy clinics for property owners on the Dingle Peninsula, interested in improving the energy footprint of their properties.

An experienced energy consultant engaged with individual property owners to explain options on low carbon technology upgrades for their properties.

- 4. Local Community Engagement Manager:** ESB Networks supported the Dingle Innovation & Creativity Hub in its recruitment of a local Community Engagement Manager. This enduring role will act as a point of contact for individuals, businesses, and community groups, interested in exploring energy transformation and connecting these individuals to local or national resources so as to further inform on the transformation.

- 5. Development of Technical Capability:** Solar Beo is an electrical contractor business, initially established with focus on Solar PV installation across the peninsula, but whose capability has spread to other clean energy enabling technologies such as solar + battery hybrid systems, residential battery, and electric vehicle charger installation. Some of this extended capability has arisen from Solar Beo's success in being awarded installation contracts under ESB Networks Dingle Project.

Solar Beo's local association with the peninsula has generated trust across the community and has enabled it to expand the breadth of the services that it offers and increase its workforce. The Solar Beo case is a real example of technical capability developed locally, serving local needs, and then expanding.



FIGURE 20 - SOLAR BEO COMPANY LOGO

- 6. The “Lived Experience” of Ambassadors:** Research, including MaREI's research on the effectiveness of initiatives as part of the Dingle Project has highlighted the role that the “lived experience” of energy transition can play in diffusion of low carbon technologies and energy citizenship. Many of the 35 participants on the Dingle Project trials (Ambassadors, EV Ambassadors and Solar PV champions) have been empowered by their experience of technology and associated energy behaviour change and are positioned to share this experience with others across their communities.



FIGURE 21 – DINGLE ADAPTS WEBINAR SERIES

- Ambassador Competence:** Throughout the project, ambassadors and champions participated in outreach initiatives where they shared their evolving experience on matters ranging from premises’ retrofits to usage of clean energy enabling technologies. As an example, the Dingle Creativity & Innovation Hub hosted the “[Dingle Adapts Energy](#)” webinar series which provided an opportunity for a number of the ambassadors to share their experience of the transition to low carbon energy.

The Ambassadors also hosted multiple stakeholder visits to their properties, to demonstrate the clean energy and digital technologies deployed and to share their experiences with policy makers, regulators, and energy industry experts. The competence developed throughout the Dingle Project has positioned them to have an influential role in other energy related initiatives across the peninsula in the future.



FIGURE 22 - STAKEHOLDER VISITS TO AMBASSADOR PROPERTIES

8. **Deployed Technology:** As part of the Dingle Project, ESB Networks implemented a digital platform which integrated data from energy monitoring devices, low carbon and clean energy enabling technologies deployed at trial participant properties. A mobile app interface to this platform provided each user with a view of the overall electrical energy footprint of that property, enabling energy decisions and choices to be made at that individual property level. While the digital platform used by ESB Networks has been stood down at the end of the trials, the core components remain and could enable the community to participate in other technical trials, pilots, or market services in the future.

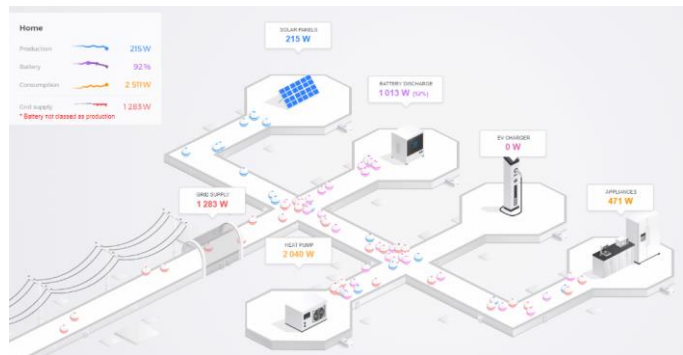


FIGURE 23 - DIGITAL PLATFORM

9. **Platform for Future Research:** At the conclusion of the Dingle Project a platform for further research had been established, both in terms of an engaged community and an infrastructure of low carbon and clean energy enabling technologies deployed across the peninsula. Previous community energy initiatives on the peninsula, such as the StoreNet Project also mobilised other members of the local community and involved the roll-out of Solar PV and residential scale batteries. A local coordinator, such as the Dingle Innovation and Creativity Hub, may be positioned to re-mobilise members of both these project communities and leverage the technologies deployed and their energy citizenship motivations to construct future research and innovation projects.

10. **Enabling and Accelerating other local initiatives:** ESB Networks' Dingle Project has enabled and supported the advancement of other sustainability-focused initiatives across the Dingle Peninsula, such as Dingle Adapts Energy (referenced above) and the Dingle 2030 team's visit to COP26 in Glasgow. These in turn have enabled further national and international recognition of Dingle 2030 and helped establish broader networking and connections with senior politicians and stakeholders on the low carbon transition plans for the peninsula.



FIGURE 24 - CORCA DHUIBHNE 2030 REPRESENTATIVES MEET AN TAOISEACH AT COP 26

In addition, ESB Networks' EV Trial has significantly promoted electric motoring across the peninsula, with a number of trial participants and members of their communities already purchasing electric vehicles since the conclusion of the trial. The success of this trial from the perspective of promoting electric motoring in rural communities has also led to acceleration of other peninsula-wide actions in support of wider sustainable travel on the peninsula with key partners being mobilised and funding sources identified to help deliver significant reduction in emissions related to transport energy use by 2030.

The conclusion of ESB Networks' Dingle Project has not resulted in a hiatus being introduced to low carbon transformation across the Dingle Peninsula. This capability now existing in local communities, in part activated through the engagement and empowerment initiatives led by and supported by the Dingle Project, is enabling other low carbon energy and sustainability-motivated

initiatives led by the Dingle Creativity and Innovation Hub to progress. The decision by Kerry County Council to select the Dingle Peninsula as a decarbonisation zone for the county heightens the potential that the engaged community can be mobilised for further energy citizenship initiatives over time.

3.3.3 Evaluation

The Dingle Project engaged MaREI (the SFI research centre for energy, climate and the marine) to conduct research into the effectiveness of certain project initiatives in activating energy citizenship across those communities where its project trials were taking place and to assess their wider applicability across society.

The MaREI research team was composed of social researchers competent in this area of research. The focus of this assessment was to understand the effectiveness of the Ambassador Programme and the EV Trial in driving community-wide engagement on low carbon energy transformation and also sought to highlight the barriers and enablers of energy citizenship diffusion and technology adoption.

MaREI has produced a report outlining its research methods and findings. The report titled “ESB Networks Dingle Project: Activating energy citizenship through collaboration, participation and technological trials” is published on MaREI’s [website](#).



FIGURE 25 – MAREI REPORT

3.3.3.1 Findings of MaREI research

Some of the findings from the MaREI research highlight the effectiveness of the engagement programme and trials across the Dingle peninsula, including that:

- Initiatives like ESB Networks’ ambassador programme and electric vehicle trial, facilitate the emergence of active energy citizenship;
- Technology demonstration programmes, where the “lived experience” can be shared and understood in a trusted manner across the community, drive diffusion of technology;
- Interactive software, such as the Greencom Networks app deployed as part of the project, can aid customer engagement and participation in energy management initiatives such as demand response;
- Electric vehicles are a good fit for rural community living; and
- Additional complementary initiatives can emerge in communities from projects such as the ambassador programme and EV trial;

In relation to the impact of the Dingle Project on wider diffusion and adoption of technology, MaREI’s research noted that the rate of installation of Solar PV systems across the Dingle Peninsula over recent years was higher than the national average, potentially reaffirming the role of visible demonstration projects such as the Dingle Project in diffusion of renewable and clean energy enabling technologies across communities.

Recognising that energy transformation involves lifestyle change at a citizen level and that such decisions can take time, ESB Networks believes it may be some years before the true impact of the Dingle Project in terms of energy citizenship behaviours and technology diffusion become clear. As

such, ESB Networks is exploring how reassessment of active energy citizenship behaviours and technology adoption levels across the community can be periodically performed over the coming years, so that the medium to longer-term impact of the Dingle Project can be better understood.

3.3.3.2 Additional MaREI Reports

In addition to the “ESB Networks Dingle Project: Activating energy citizenship through collaboration, participation and technological trials” report, MaREI has also published further [reports](#) on the collaborative research activities undertaken between October 2019 and September 2021. Much of this research activity was performed under the banner of the Dingle 2030 initiative, with ESB Networks being one of the members of the coordinating team.

This collation of research outputs includes:

- 13 learning briefs that document and evaluate the lessons learnt from the Dingle Peninsula 2030 (Corca Dhuibhne 2030) initiative. For example, one learning brief focuses on the Community Energy Mentor training course, already highlighted above, and provides an overview of the course content and recommendations on how similar courses might be enhanced for future participants;
- 7 journal papers focusing on the energy engineering, sociological and transdisciplinary aspects of the research; and
- Links to 14 videos highlighting different aspects of the research and partnership activities;

3.4 ESB Networks’ Observations on Human Behaviours of Trial Participants

In addition to the findings which emerged from the social research conducted by MaREI, ESB Networks also gleaned additional energy usage, technology interaction and trial participant behavioural insights from its technical trials which may be relevant should future initiatives requiring residential electricity consumer active participation be initiated.

1. **Local energy saving habits:** A number of participants on the trials displayed a tendency to completely power off all electrical appliances when not in use, e.g., at night-time. This positive energy saving behaviour, at times, extended to powering off Wi-Fi routers thereby prohibiting the issuing of set-point signals to control specific technologies and electrical loads.
2. **Wi-Fi Password Changes:** On occasion, trial participants changed Wi-Fi router passwords without considering the potential consequences for the overall technology solution deployed, thereby hindering the operation of some components of the solution.
3. **Remaining disconnected from the EV Charger:** In order for control signals to be effectively applied for electric vehicle charging and discharging loads, the vehicle must be connected to the charger. On a number of occasions, tests could not be completed during the trials as, although the vehicle was parked at the trial participant’s property, the vehicle had not been connected to the charger.
4. **EV Charging Patterns / Behaviours:** The flexibility trial assessed whether it was possible to move EV charging loads to off-peak times during the night and still provide a fully charged electric vehicle battery to the user at start of day. For those users who charged their EV periodically, i.e., when the state of charge of the battery was approaching depletion, the required charging duration (circ. 5-6 hours) did not offer significant flexibility in terms of alternate night-time periods for rescheduling this EV charging load.

On the other hand, for those users who charged their electric vehicle on a nightly basis, the approximate 1-2 hour charging duration required, offered multiple other time slots during the night when this charging could occur, thereby suggesting an EV charging behaviour that could offer greater flexibility to the DSO.

A side observation from the project related to the impact of Storm Barra in December 2021. A number of the trial participants were without power for up to 3 days as a result of the impact of this storm on the electricity network. For those whose EV charging pattern followed a daily recharge cycle, the impact of the storm was minimal as the battery state of charge supported their driving requirements until power supply was restored.

- 5. EV Charging Override Facility:** ESB Networks commenced its flexibility trial tests circ. 6 months after distribution of the EVs to trial participants. Over that initial 6-month period, trial participants had become accepting of the reliability of the home EV charging hardware and software. However, once ESB Networks commenced controlling the timing of vehicle charging, trial participants expressed concerns that EV charging would not be completed by morning. To counteract these concerns, an EV boost facility was implemented whereby the user could override the charging schedule developed by ESB Networks' optimisation software and issued via the gateway in the home to the EV charger.

The observed level of use of this override facility, over the last 3 months of the trial, suggested that trial participants were not comfortable that the optimisation algorithms implemented as part of the project would always ensure completion of battery charging by morning time.

- 6. Ceding Control of Technologies to a 3rd Party:** The MaREI field research had been completed before the flexibility tests were substantially underway. In ESB Networks' discussions with ambassadors and EV trial participants during the latter stages of the flexibility trial, there was little support expressed for ceding control to a 3rd party, whether that was ESB Networks or another party, for the operational scheduling and control of technologies in the home.

In this regard, it should be noted that the Dingle Project did not explore business models or market / financial incentives to encourage participation in flexibility schemes. The National Networks Local Connections programme aims to pilot flexibility initiatives for residential consumers of electricity, where this sentiment and support can be validated.

- 7. EV Daily Distances Driven:** ESB Networks analysis of total daily distances driven by each of the electric vehicles determined that less than 0.5% of driving days (total distance driven by an EV per day) involved total distances driven of greater than 400 Km. This distance is within the battery range of those electric vehicles used for the trials and suggests that recent-to-market EVs coupled with home charging solutions (such as were used for the Dingle Project trials), provide a solution that substantially reduces reliance on the public EV charging infrastructure.

This analysis shows the suitability of EVs for people living in rural communities where home chargers can be facilitated.

- 8. Mobile App Dynamic Energy Footprint:** The provision of the Greencom Networks Mobile App to all trial participants significantly enhanced their awareness of their energy footprint. This app graphically displayed the near real-time energy consumption and energy production of the monitored clean energy enabling technologies and that of the overall premises. This near real-time data equipped trial participants to make decisions and energy behaviour

changes to further maximise the capabilities of the clean energy enabling technologies installed at their properties.

The information provided in the app also enabled trial participants to advocate, with greater confidence, the benefits and impacts of the deployed technologies in their premises.

9. **Economic Optimisation:** The flexibility trials incorporated site-specific, economic optimisation of the suite of technologies deployed at each property, in order to maximise those economic benefits for the electricity consumer.

This optimisation, at its simplest level ensured Solar PV production was used to meet demand in the property with any additional production being stored in the residential battery. In addition, discretionary electrical loads such as those required for hot water heating and electric vehicle charging were scheduled to occur at the lowest priced periods of the day. To facilitate this scheduling, the optimisation engine was populated with a notional daily time-of-use tariff profile incorporating morning and evening peaks and a super off-peak period during the already off-peak night-time period). In addition, batteries were configured to export power to meet demand at peak times.

This optimisation reflects a possible future scenario where electricity suppliers might offer a bundled technology, tariff and optimisation / control service enabling operation of clean energy technologies (EV charging, electric water heating and residential battery control) aligned to favourable wholesale electricity market-pricing signals.

With the exception of concerns shared in relation to the time scheduling and control of electric vehicle charging, Ambassadors were accepting of the economic optimisation implemented as part of the flexibility trial.

So, while MaREI's research highlighted the willingness of Ambassadors and EV Trial participants to share their experiences, advocate for technology adoption and encourage diffusion of active energy citizenship behaviours, ESB Networks' Dingle Project team's own observations throughout its technical trials suggest that human behaviours including those listed above may challenge the operational effectiveness of energy management initiatives across residential communities.

4.0 Barriers to Low Carbon Energy Transformation

The Dingle Project Team has had multiple interactions with the trial participants throughout the project, in particular the Project Ambassadors and EV ambassadors. These engagements have highlighted, in ambassadors' opinions, three main barriers to low carbon energy transformation and the adoption of clean energy enabling technologies across communities:

1. **Trusted Information:** Multiple information sources, multiple sales brochures, non-validated on-line recommendations, combined with a lack of understanding as to what measures are required or most advantageous for each individual or property, can introduce confusion and indecision when considering low carbon energy transition;
2. **Workforce Capability:** The perceived low scale, accessibility, and availability of work force competent in low carbon and clean energy enabling technology installation and commissioning, supported by trusted recommendations may be delaying the activation of energy transition;

3. **Cost / Finance:** In a society with a high and increasing cost of living (examples cited include property prices, child-care, and energy) many individuals and families do not have ready access to the level of finance needed to transition to low carbon energy;

4.1 Local Dingle Enablers to Barrier Removal

A number of the local initiatives on the peninsula, led by both ESB Networks Dingle Project and Corca Dhuibhne 2030 have shown promise in breaking down the identified barriers.

Trusted Information is considered key to establishing confidence in the mindset of citizens that are considering embarking on low carbon energy transition, to ensure that decisions and choices made will be in their best long-term interests:

- Local advocates' experiences (particularly where these individuals started from low-carbon ground-zero) provide concrete warts 'n' all insights into what was involved and the performance / fit of technologies with their lifestyles;
- Capturing these experiences on video allows for widespread and iterative dissemination of learnings and insights;
- The shared experience of and best practices observed by other citizens, communicated through local sustainable energy communities, energy mentors and connected hubs can forearm citizens in relation to the specifics of works to be carried out, e.g., correct sizing of fuse-board to accommodate phased roll-out of clean energy technologies over time;
- Validated recommendations / referrals of contractors to install technologies or implement energy saving measures, based on quality of work delivered, safety practices adhered to, warranties provided and service experienced, particularly where the contractors are local to the area, provide added confidence;
- Local energy mentors can provide general information and guidance on the function of, and potential technology needs of property owners, based on their training and experience;
- Mobilisation of a Community Engagement Manager, positioned to share local practices and connect interested citizens with those who are more advanced along the energy transition journey aids activation and diffusion;
- Access to information designed specifically for that local community, e.g., retrofit guides relevant to property types and footprints common in that community, can provide comparable and relevant case studies to aid citizen understanding;

Being confident about the **Capability** of the selected contractors and installers is critical in making the decision to implement low carbon and energy transformation plans:

- Dingle Project Ambassadors have highlighted the community-wide interest in their energy transition experience from peers, family, and neighbours and as a result consider themselves to be trusted sources to validate the capability of those organisations and individual contractors that implemented / installed low carbon measures at their homes or businesses;
- The Dingle Project's Community Engagement Manager acted as a connector, linking citizens with potential contractors having verified their credentials through works delivered as part of

the project, in areas of technical engineering capability, communications and digital experience, together with adherence to safety and quality standards;

- Experience from Dingle, suggests that the more locally based a contractor / installer is, the more likely the work will be perceived to have been carried out to a high standard and the more accepting the individual citizen will be to its standard of completion;
- Accreditation of installers and contractors to standards bodies and associated representative organisations, offers a degree of comfort that work will be carried out in line with National Standards, and that contractors will have all necessary insurances in place to safeguard the works carried out;

Ambassadors and trial participants highlighted that the **cost** of technology and measures to transition towards low carbon energy, together with access to **finance**, remain a barrier to low carbon transition. In the absence of technology roll-out, funded by an organisation such as ESB Networks, the following were highlighted by trial participants as the most relevant and readily accessible sources of finance in this regard:

- State-grants, administered by the Sustainable Energy Authority of Ireland (SEAI) will continue to support the energy transition. Recent announcements by Government in relation to increased grants for premises retrofits are recognised and welcomed at a community level;
- Credit Unions, in line with their local and sustainable principles, provide a source of finance for small scale and potentially self-funding investments by citizens;

4.2 Other Potential Enablers emerging from Dingle Peninsula

Discussions between the Dingle Project Team and the other coordinating organisations under Corca Dhuibhne 2030, have highlighted other potential enablers to activating low carbon transition including:

- The establishment of an Energy Advisory Bureau (akin to a MABS for low carbon energy) in each county, to provide impartial advice and help citizens plan for and validate low carbon transition plans, may remove challenges in relation to trusted information sources;
- There may be an opportunity for Education and Training bodies to expand their role in developing the skills and capabilities of the existing workforce in line with evolving standards and technology advances. This may result in a scaled-up workforce of competent technicians and engineers, to implement projects at residential and small business properties. There may also be an opportunity for new Apprenticeship Programmes to grow the basic workforce with the capabilities for this evolving sector;
- The emergence of Local Authority decarbonisation zones may act as enablers for other community-centric demonstration projects, similar to the ESB Networks-led Dingle Project, with the effect of wider diffusion of behaviours and technologies;
- The Banking Sector may see opportunity to develop new financial products or refine existing products to encourage citizen investment in low carbon transition, recognising the value add to properties;

- Commercial business models may emerge to activate new citizen-centric energy support services, such as flexibility on electricity networks, which may make the case for investment in controllable low carbon technologies more justifiable;
- National Research Funding will continue to be required to support Research Performing Organisations as they identify emerging blockers and enablers of wide-spread low carbon energy transition across society and support engagement with stakeholders across all policy areas to maintain this transition;

5.0 Summary & Conclusion

The Dingle Project has accelerated low carbon energy transformation for 5 citizens across the Dingle Peninsula. The completion of energy retrofits and installation of low carbon and clean energy enabling technologies at their residential and small business properties, together with the provision of digital devices and a supporting mobile phone app, has provided the lived experience and supporting data to enable these citizens confidently perform the role of advocates for clean energy transformation across their communities.

To a lesser extent, an additional 30 families have moved one step further along their own individual energy transformation paths enabled by the installation of either solar PV at their properties or the provision of an electric vehicle for their use for 12 months, supported by a home charging solution.

The most obvious sign of energy transformation on the peninsula has been the electric vehicle trial. The provision of fifteen electric vehicles has allowed these families to fully experience electric motoring, together with home charging of their vehicles and share their experiences. Two additional electric vehicles were made available on a managed basis so that others, not directly participating in the EV trial could also experience electric motoring over a shorter timeframe. The distribution of the electric vehicles for the purposes of the trial, coincided with overall traffic volumes on the peninsula being significantly lower than normal due to the Covid-19 related travel restrictions in place nationwide. As a result, the relative concentration of electric vehicles on the peninsula, together with Dingle Project branding on the vehicles, heightened awareness of this trial across the wider peninsula community.

Analysis of EV trial data clearly shows that the battery range of those EVs used in the trial (recent model Hyundai Kona and Nissan Leaf electric vehicles), when coupled with home charging, provides a clean energy motoring solution for individuals and families living in rural communities. Data analysis has shown that for 50% of days, the total distance driven by each vehicle was less than 200 Km with only 0.5% of days seeing individual vehicles exceed 400 Km driven daily, i.e., a distance approaching the maximum range of the vehicles' batteries.

MaREI's research has highlighted the effectiveness of initiatives and demonstrations such as the Ambassador Programme and the EV trial in engaging the wider community on low carbon energy transformation, diffusion of sustainability in general and diffusion of low carbon and clean energy enabling technologies. Examples of technology diffusion across the peninsula, in terms of solar PV installations and electric vehicle purchases are now emerging. Some of these can be directly attributed to the Dingle Project's technology trials and demonstrations and others to the advocacy of project and EV ambassadors. It is considered that the full impact of the Dingle Project in terms of low carbon energy behavioral change and accompanying investment in clean energy enabling technologies may not be evident for a number of years and arrangements are being put in place to enable continued monitoring of change across the peninsula over the coming years.

ESB Networks own engagements with ambassadors, EV trial participants and solar PV champions have provided lots of additional insights on human behaviors and human interactions with technology throughout the trials. These insights will help inform outreach plans for future pilot programmes by ESB Networks, such as in the provision of flexibility by residential customers to the Distribution System Operator.

In relation to the flexibility trial undertaken as part of the Dingle Project, while the citizen-focused economic optimization objective was of interest to the trial participants, reluctance to cede control of technology operation, in particular EV charging, to ESB Networks, began to emerge. The short timeline for flexibility trial tests coupled with the lack of participation incentives, may have partly led to the less than total confidence across trial participants in the optimization of the EV charging scheduling, contributing to this reluctance, something which will require to be considered in any future flexibility trials involving residential electricity consumers and EV charging.

Overall and in retrospect, the three-stranded Energy Citizenship Development strategy, implemented for the Dingle Project, incorporating activities to engage the community on low carbon transformation, empower the community to lead and support local initiatives, and to evaluate the effectiveness of the community-centric initiatives, has proven to be effective for Dingle. While this effectiveness may have been enhanced by the community-wide support for low carbon across many tranches of society on the peninsula that pre-existed the ESB Networks' project, this template, or at a minimum, the engagement and empowerment elements, could be followed in other communities and tailored to align with local circumstance.

A number of blockers to low carbon transformation across communities have been highlighted, by trial participants throughout the trials and during engagements with other collaborative partners on the project: trusted information, capability to deliver and cost. However, a number of initiatives trialed under both ESB Networks' Dingle Project and the Corca Dhuibhne 2030 initiative are showing promise in dismantling these barriers.

ESB Networks' Dingle Project has now completed. However, the platform that has been established, both in terms of technical infrastructure deployed at trial participants' properties and an engaged community mobilized for further low carbon transformation, may position the Dingle community to lead other policy informing initiatives and projects over time.