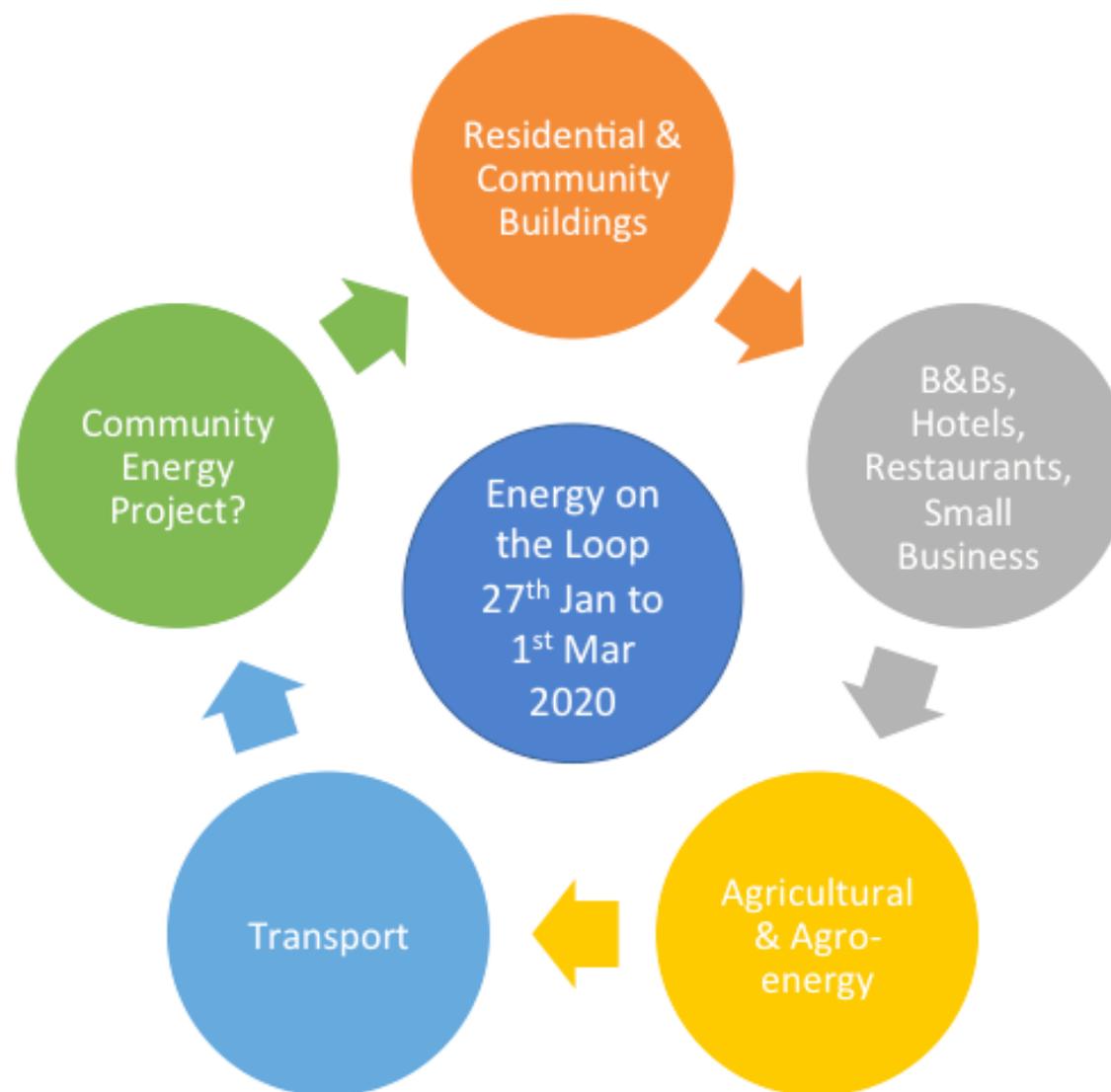


## Energy on the Loop

27<sup>th</sup> January 2020 to the 1<sup>st</sup> March 2020.

A preliminary research plan for consultation with you for the Flensburg University's International Class's Energy Action Academy with the Loop Head community, Co. Clare on different energy-related sectors and their Techno-Economic, Socio-Economic and Environmental aspects.

**Note:** The content herein is as guidance for our conversation and does not represent commitments that all this will be done. After the discussions of the 1<sup>st</sup> February workshop, the research effort will prioritise the area where there has been the most interest with the largest potential community benefit.



**Draft – open for input - to be finalised during the workshop of the 1<sup>st</sup> February in Kilkee Bay Hotel on the Loop.**

**Acronyms:** RE- Renewable Energy, RET- Renewable Energy Technologies, HP- Heat Pump, PV- Photovoltaic, EV- Electric Vehicle, AD- Anaerobic Digester, B&B- Bed and Breakfast, LEAA- Loop Head Energy Action Academy, LEAP- Loop Head Energy Action Partnership, LSEC- Loop Head Smart Engagement Centre, KBH- Kilkee Bay Hotel, TBD- to be decided

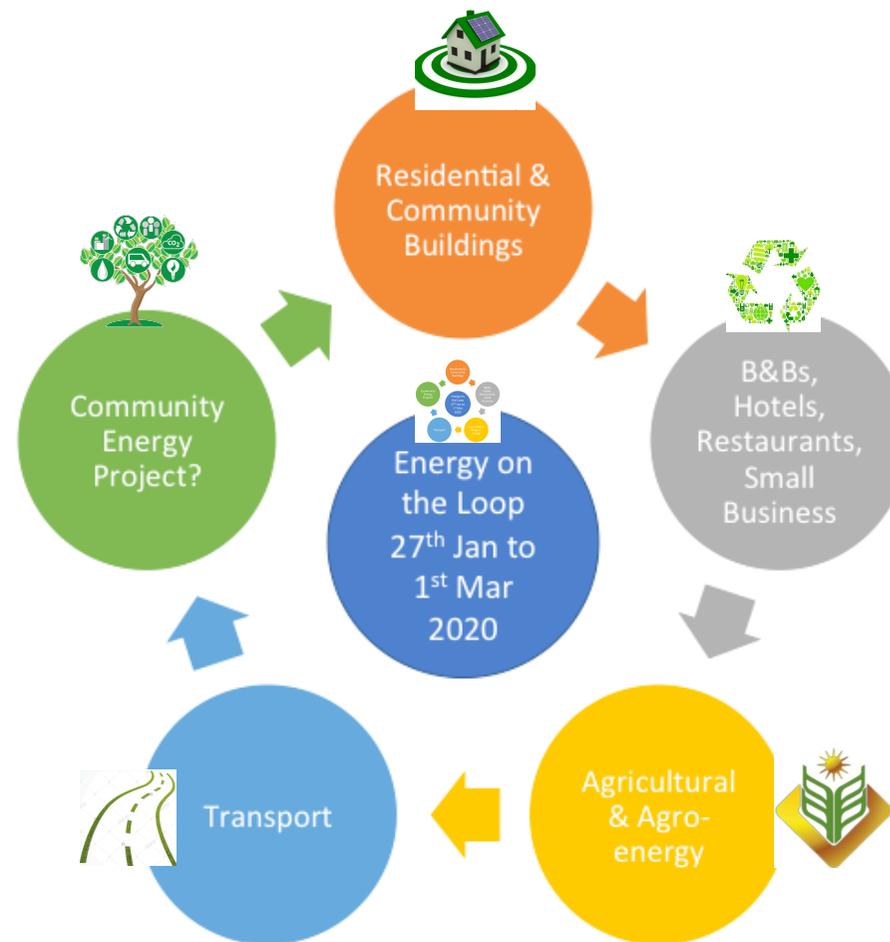
**Timeframe**

- **Tuesday 28<sup>th</sup> January, 9am:** a planning meeting at the LSEC.
- **Saturday 1<sup>st</sup> February:** 1<sup>st</sup> Workshop at KBH - time TBD (to not clash with rugby Ire vs Scot 16:45 – anything else?) introduces everyone, finalises this research plan, creates the focus groups to make sure the research has the data in time to addresses local needs. Social event: introduction to the interaction between local geology and wildlife by Cormac’s Coast + Ireland’s 1<sup>st</sup> six nations game.
- **Saturday 8<sup>th</sup> February:** 2<sup>nd</sup> Workshop at KBH - time TBD (to not clash with rugby Ire vs Wal 14:15 – anything else?) exploring the journey of community energy: a presentation from the Chairperson of the Aran Energy Coop examining their journey over the past 8 years plus a senior person from the Sustainable Energy Authority of Ireland presenting how they support initiatives in the community. Q&As throughout. Social event: networking around Ireland’s 6 nations game.
- Other meetings will be **arranged as required**.
- **Saturday 29<sup>th</sup> February:** Seminar at KBH - time TBD (please let us know anything this must not clash with?) – presentation of the findings of the research and planning of the steps going forward.

**The Content**

The research areas will include 1. Residential & Community Buildings, 2. B&B, Hotels, Restaurants and Small Businesses, 3. Agriculture & Agro-Energy, 4. Transport, 5. Community Energy Projects. There will be a 6<sup>th</sup> umbrella area that covers the bigger picture. Everyone welcome in single or multiple areas.

**WhatsApp info sharing groups have been set up to cover these six areas – represented by the symbols shown in the figure above – these are open groups and all interested parties are welcome - send a WhatsApp message to John Aston +353 85 2153765 if you are open to be included.**



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### **Background**

This is a partnership between the Flensburg University International Masters Class in Renewable Energy, the development organisations of Carrigaholt, Kilballyowen and Kilkee, Loop Head Tourism, the Farming Community of the Loop (Carrigaholt, Kilballyowen and Kilkee parishes), local residents, business owners, individuals and Astoneco Management. The partnership will enlarge as the program advances and as required. The initial aim is to work together to understand the components of the energy revolution enough to master its potential to help us face the economic, social and environmental challenges of our peninsula. And then to identify the priority projects that will bring the most benefit to the area.

### **Starting point**

An initial task for LEAA will be the generation of a basic energy-balance model showing energy demand and import into the Loop Head peninsula as well as how it was generated and its environmental and economical costs. This will be used to understand the existing energy reality and will then form a basis to explore scenarios of potential different energy balances on the peninsula. Using this, we can see how energy import can be reduced if identified renewables were added, and its effect on environment and economics. We would also highlight areas where community or economic activities could be supported due to the availability of cheaper and sustainable energy (if and when it is cheaper and sustainable).

### **Common steps for all the 5 sectors**

- Document the energy balance (from an economic, environmental and community perspective).
- Identify suitable technologies that can improve the current energy conditions.
- Identify opportunities for revenue savings, and economic and jobs growth.
- Document what the decision makers for each sector need to know to decide weather to invest into RET.
- Raise awareness regarding the current situation in terms of energy costs and related environmental issues and the proposed solutions to optimize energy use in the relevant sector.

**Note: For each sector, financial feasibility of the technologies that emerge from this study as implementable on the Loop will need close examination of the cost components of each technology (incl cash flow), its route to market, required capital (interest rate, availability), grants and support schemes.**

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The five sectors being research are currently summarised as

Sectors	Main Research Questions	Tasks to be performed / questions to be answered
<p>1. Hotels, B&amp;Bs, Restaurants and other small businesses</p> 	<ul style="list-style-type: none"> <li>• What suitable technologies exist for energy supply to hotels, B&amp;Bs, restaurants, and other small businesses (e.g. Solar PV, Solar Thermal, HP) and what is their technical and economic feasibility?</li> <li>• What are the current opportunities for revenue savings, and economic and jobs growth.</li> <li>• Can RET create job opportunities or benefits?</li> <li>• How does tourism seasonality affect income, energy demand and waste generation in hotels?</li> <li>• What are the costs of the main environmental impacts<sup>1</sup> and current alternatives?</li> </ul>	<ul style="list-style-type: none"> <li>• Data on number of hotels, B&amp;Bs, restaurants and other relevant small businesses</li> <li>• Assessment of the energy demands based on a number of case studies</li> <li>• Study on existing infrastructure for the energy supply in to these businesses</li> <li>• Assessment for Solar PV installation and identification of the possibility of a small district heating system</li> <li>• Emissions and fuel saving from proposed technology (Solar PV, heat pumps, RE, etc.)</li> <li>• Determine current job opportunities, revenue savings for the community</li> <li>• Relation between seasonality, income for tourism and energy demand</li> <li>• Identify emissions and particulate matter associated with current fuel types in this sector in comparison to Irish national standards</li> <li>• Understanding the types of wastes generated and their potential corresponding waste management in the context of energy</li> <li>• Identifying current carbon footprint and offsetting the emissions</li> <li>• Compare costs over time for all energy options</li> <li>• Examine the energy or recycling value of our waste products.</li> </ul>

<sup>1</sup> Due to time constraints and the complexity of this aspect- What can be done is an estimation of the cost of environmental impacts (health, crops, materials, ecosystem) of the present and possible future energy consumption based on data provided by the EcoSenseLE tool for the Irish Energy mix

<sup>2</sup> SEAI will present on this on the 8<sup>th</sup> February

<sup>3</sup> We are planning to concentrate on solar, biomass/biogas and wind as these are the most mature and therefore most promising technologies for the time

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Sectors	Main Research Questions	Tasks to be performed / questions to be answered
<p>2. Residential &amp; Community Buildings</p> 	<ul style="list-style-type: none"> <li>• What are suitable technologies for energy supply in residential sector (Solar PV, Solar Thermal, HP) and their technical and economic feasibility?</li> <li>• What will be the willingness to invest in RET by the owners and what will they need to know to make the required decision?</li> <li>• What are the costs of the main environmental impacts<sup>1</sup> and current alternatives in the residential sector?</li> </ul>	<ul style="list-style-type: none"> <li>• Data on number of residential households</li> <li>• Assessment of the energy demand in residential sector based on case study</li> <li>• Study on existing infrastructure for the energy supply in respective sector</li> <li>• Assessment for Solar PV installation and identification of the possibility of small district heating system</li> <li>• Emissions and fuel saving from proposed technology (Solar PV, heat pumps, RE, etc.)</li> <li>• Level of acceptance of residential users for several RET</li> <li>• Awareness of residential users concerning RET</li> <li>• Willingness to pay of residential users for RET</li> <li>• Identify emissions and particulate matter associated with current fuel types in residential sector in comparison to Irish national standards</li> <li>• Examine the energy or recycling value of our waste products.</li> <li>• Advantages of tying in with SEAI Sustainable Energy Community program<sup>2</sup>.</li> </ul>

<sup>2</sup> SEAI will present on this on the 8<sup>th</sup> February

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Sectors	Main Research Questions	Tasks to be performed / questions to be answered
<p>3. Agriculture &amp; Agro-Energy</p> 	<ul style="list-style-type: none"> <li>• What options exist to integrate RET with farming on the Loop?</li> <li>• How energy intensive is agriculture?</li> <li>• What are the main farming activities that farmers are doing?</li> <li>• What is the percentage of people involved in farming?</li> <li>• What are the costs<sup>1</sup> of the main environmental impacts and current alternatives in the farming and agriculture sector?</li> <li>• identify the processes, energy drivers, innovation and people that will drive the movement of suitable RET in agriculture on the Loop.</li> <li>• Use a pre-feasibility study of AD to see if it is a realistic option to be consider by the communities of the Loop Head Peninsula</li> </ul>	<ul style="list-style-type: none"> <li>• Review on different agriculture and crop technique and equipment used for it</li> <li>• Research and survey of local areas</li> <li>• A calculation of how much space available or needed for integrated RE (like Solar PV, Wind, Biogas) with agricultural farming</li> <li>• Determine number of people in farming and agriculture activities based on available statistics</li> <li>• Divide people working in farming into ages, social status, level of education, etc.</li> <li>• Identify main farming activities</li> <li>• Know the final use of products arising from farming and agriculture</li> <li>• Identify sense of innovation and entrepreneurship in the farming and agriculture sector</li> <li>• Identify current knowledge on RET</li> <li>• Identify the current emissions and environmental impacts resulting from the current farming activities status etc.</li> <li>• Identifying the activity with the largest share of emissions</li> <li>• Identify emissions of Methane from cattle farming sector for biogas</li> <li>• What is the economically ideal size for a AD plant, and how much cattle slurry and other feed would be required.</li> <li>• Would it be all year round (cattle are currently indoors in the winter and outdoors in the summer)</li> <li>• What would be required to rise the required funding with the banks, etc.</li> <li>• How many jobs would be created,</li> <li>• What are the pros and cons for having gas as the end product or electricity</li> <li>• Would the AD tanks need to be buried to get planning permission?</li> </ul>

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Sectors	Main Research Questions	Tasks to be performed / questions to be answered
<p>4. Transport</p> 	<ul style="list-style-type: none"> <li>• What are the economic and environmental costs of the current means of transport being used on the Peninsula</li> <li>• Determine potential savings (economic and environmental)</li> <li>• What are suitable and sustainable public transportation facilities?</li> <li>• Determine how sustainable transport will affect tourism and people’s daily life as opposed to the current status quo.</li> <li>• How often do the routes circulate?</li> <li>• Which are the major destinations for tourists?</li> <li>• What are the costs of the main environmental impacts<sup>1</sup> and current alternatives in the transport sector?</li> </ul>	<ul style="list-style-type: none"> <li>• Review on public transport demand and existing infrastructure</li> <li>• Information on future public transport system planning</li> <li>• Identify emission standards</li> <li>• Study on current tariff for public transport</li> <li>• Percentage of people that use public transport</li> <li>• Classification of people that use the transport (elderly, youngsters, etc.)</li> <li>• What is the average distance that people travel per day?</li> <li>• Reasons for use of public transport (work, tourism, etc.)</li> <li>• Relation between transport and tourism development</li> <li>• Willingness to pay fare rise</li> <li>• Schedule and timing of bus routes</li> <li>• Main local destinations for tourism</li> <li>• Raise awareness among people about the benefits of public transport</li> <li>• Increasing awareness of people about environmental benefits of using sustainable public transport systems like EV</li> <li>• Proposing concrete examples of sustainable public transport from other communities</li> </ul>

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Sectors	Main Research Questions	Tasks to be performed / questions to be answered
<p>5. Community Owned Energy Generation</p> 	<ul style="list-style-type: none"> <li>• Identify potential for community energy development (wind, solar, wave, biomass, other?)</li> <li>• What are suitable technologies for community wind projects and what are their technical and economic feasibility within the Loop Head context?</li> <li>• What is the awareness and acceptance of a community-owned renewable energy project?</li> <li>• What are the costs<sup>1</sup> of the main environmental impacts and current alternatives in the related to a community renewable energy generation program?</li> <li>• Proposed solutions to optimize and enhance the Loop Head communities economic, environmental and social realities using community-owned energy projects.</li> </ul>	<ul style="list-style-type: none"> <li>• Resource assessment for the wind energy systems in the existing wind farm on Loop Head</li> <li>• What are the variables to be considered when considering repowering scheme for older turbines (changing old turbines with new ones)</li> <li>• The pros and cons of the addition of a third community owned turbine next to the existing ones</li> <li>• Resource assessment for other energy generation systems on Loop Head<sup>3</sup></li> <li>• Determine the drivers behind community-owned wind turbines and knowledge of people regarding wind turbines effects</li> <li>• Make people knowledgeable regarding acceptance of community-owned wind turbine schemes</li> <li>• Inform about the environmental and economic impacts of the various potential alternatives for generating renewable energy for the peninsula (advantages/disadvantages)</li> <li>• Transparency of disadvantages such as: noise effect, shadow, land use, for wind, and how people living near turbines feel the impact of these, traffic and potential smell for biomass, land fall and visual for waves, etc.</li> <li>• Transparency of advantages like cost reductions or even income, excess electricity that can be used for heating and maybe the production of hydrogen, methane or the charging of electric vehicles, biodiversity impact, CO2 savings and being fully aware of where it is, and where it is not, linked with climate change.</li> </ul>

<sup>3</sup> We are planning to concentrate on solar, biomass/biogas and wind as these are the most mature and therefore most promising technologies for the time being. We will however also look into the technical feasibility of waste to energy. We don't think that we can conduct a resource assessment for wave energy. We have no detailed expertise on this technology and also we think that this is not yet a mature technology