



**WIND VALUE**

An Opportunity for Climate Action and for Energy Communities

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***Wave and Wind Energy Day***  
**A Joint Action of the Wind Value, X-Rotor and Safe Wave Projects**

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**Report: Donegal Community Engagement Summer 2023**  
**Work Package 7.3**

**Month 16/48**

**Authors: Nicola Baxter, Kevin Campbell, Peter Deeney, Dorcas Mikindani and Aaron Luke Smith**



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The Wind Value project is based in the Environmental Research Institute of University College Cork (UCC), Ireland with assistance from Cork University Business School, UCC. The PI, Peter Deeney, may be found at the Cleaner Production Promotion Unit, G0.3, Environmental Research Institute, Ellen Hutchins Building, Lee Road, Cork T23 X10. The Research Team comprises: Luca Bernardi, Kevin Campbell, Peter Deeney, Claire Ducourtieux, Niall Dunphy, Fabian Gogolin, Paul Leahy, Dorcas Allan Mikindani, John O'Brien and Rebecca Windemer.

## **Executive Summary**

The Wind Value research project seeks to estimate a financial valuation for onshore wind farms in Ireland. It will develop decision support tools which will assist wind farm managers to decide between decommissioning, repowering and life-extension for the end-of-life of a wind farm. This research will also assist local communities who may be interested in buying part or all of their local wind farm. Wind Value joined with two other research projects, X-Rotor and Safe Wave to deliver the Wave and Wind Energy Day which is described below.

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# 1 Introduction

The [Wind Value](#), [X-Rotor](#) and [Safe Wave](#) projects combined their resources to produce the [Wave and Wind Energy Day](#) which was held in Malin Head Community Hall, Co Donegal during the summer of 2023. The following research team travelled to Donegal to present their research and guide the focus groups: Nicola Baxter (UoS <sup>1</sup>, X-Rotor), Kevin Campbell (UCC, Wind Value), Peter Deeney (UCC <sup>2</sup>, Wind Value and X-Rotor), Dorcas Mikindani (UCC, Wind Value) and A.L. (Luke) Smith (UCC, X-Rotor and Safe Wave).

The three topics, X-Rotor, Safe Wave and Wind Value were presented in sequence. In each case a short presentation was made followed by a focus group. Summaries of the topics and feedback from the focus groups follows in Sections [4](#), [5](#) and [6](#).

## 2 Participants

There were 16 participants including three people from the fishing industry, two local academics from ATU <sup>3</sup>, an engineer from Donegal County Council, two offshore wind developers, three people involved in community development, a local third level student, a surfer and several members of the local community. There were seven female participants (44%), with ages and education levels shown in Table [1](#)

Age Range	35 - 44	45 - 54	55 - 64	65 - 74
Number of People	4	4	5	3
Education	Primary	Secondary	Post Secondary	University or College
Number of People	1	1	3	11

Table 1: Frequency for age ranges and education, see Section [2](#)

The sample of 16 people had over-representation from over 35 year olds and people with higher levels of education. Based on [National Census Data](#) adjusted for this age profile, it would be expected that 28% of the participants would have a university or college education, but 69% of participants had university or college level education. The participants were restricted to people over the age of 18.

It would seem likely that the timing of the meeting may have influenced the selection of participants as several of the local community responded that they were unable to attend due to work commitments. Those who were retired, able to adjust their own work schedule or those who were able to attend as part of their work, were perhaps over-represented for these reasons. While this means that we may not extrapolate the results of this engagement to the general Irish population, it is clear that the level of expertise of participants was very high.

## 3 Dissemination

### 3.1 Reporting Back on the Previous X-Rotor Online Engagement

The first input of the day was to report back to the community concerning the findings of X-Rotor's earlier engagement which happened online due to Covid restrictions. A report of the previous online

<sup>1</sup>University of Strathclyde, Glasgow

<sup>2</sup>University College Cork

<sup>3</sup>Atlantic Technological University

engagement was discussed and is available [here](#). About half of the people present had taken an active part in the previous engagement and were pleased to see their contribution was acknowledged and used. A community engagement was carried out in November 2022 on Islay, Scotland and is reported [here](#). It was similar in many respects to the work done in Donegal, except that its sole focus was the X-Rotor Project for offshore wind energy, not wave energy or onshore wind.

### **3.2 Local Media Impacts**

In addition to the meetings with the participants there were other impacts in the local media, notably:

- Highland Radio, which has an average Donegal weekly listenership of 80% , see its [website](#) and the [news article](#)
- The Inishowen Independent, a local newspaper [website](#), [image of advertisement](#),
- The Inish Times, a local newspaper [website](#)
- Donegal Daily, a local news website [link here](#) , and [news article](#).

## **4 X-Rotor**

Nicola Baxter made a slide presentation explaining the operation and design advantages of the X-Rotor. The slides are available [here](#). The following ideas and views were raised. They have been sorted by theme.

### **4.1 Advantages for Community**

- Economic development options for local manufacturers who could adapt to making this type blade
- What about the material from which they are made?
- Developing supply chain manufacturing from local base
- O&M could be locally sourced, as could transport
- X-Rotor development is an opportunity to improve the local electricity grid – make it more reliable and have greater capacity
- Concern over new overhead high voltage power lines – solution offered were using corridors already in use, burying lines, but there would probably be some new overhead lines; those routes could be subject to public discussion to find the best routes
- Offshore structures may become artificial reefs that would improve fish populations

### **4.2 Technical Curiosity**

- Discussion about why if you remove one horizontal axis wind turbine from the X-Rotor for repair your power output does not drop by half, it drops by less than half.
- How far apart they have to be placed?
- Discussion about quayside construction and lower time at sea for installing

- Massive area of Ireland's territorial waters
- What about the history of the device, its predecessors? See Bill Leithead's paper is on the X-Rotor website.
- What is the power output of X-Rotor? What are the cut-in and cut-out speeds?
- No gearbox
- Will there be a sufficient grid connection in Donegal to export energy? There isn't at present. Maybe hydrogen can store the energy? The nearest good power connection is in Derry.

### **4.3 Concerns of Community**

- Impact on the Local Fishing Industry, namely loss of fishing grounds and loss of catch
- Impact on leisure activities and surfing
- Feasibility of X-Rotor in the high waves off Malin Head
- There is too much government pressure to install offshore wind despite local wishes.
- It seems easier to install cables through fishing grounds than to put pylons on farm land.
- Will Marine Protection Areas (MPAs) be used for wind farms or will both the wind farms and the MPAs reduce the availability of fishing grounds?
- Where would the landfall of the powerlines be?
- What about risks?

### **4.4 Environmental Issues**

- Impact on life in the sea, balanced against removal of fossil fuel emissions. This may be an acceptable trade off.
- What about the circular economy?
- Would you be able to see them from shore?
- Would the sounds through the water would affect marine mammals and other sealife? Noise may be good to keep birds away, but bad for marine mammals

## **5 Safe Wave**

A.L. Smith made a slide presentation on the potential of wave energy. The slides are available [here](#). The following ideas and views were raised:

## 5.1 Advantages for Community

- Recognition of the possibilities available from wave energy
- Would seem to be less intrusive than offshore wind turbines
- Easier to work at sea level for wave energy than high up for wind
- Proving areas to be able to test devices for their survivability
- The new clean energy plan has provisions for community energy and Ireland's National Energy Plan that seeks to have 500MW of community owned energy generation by 2030
- It is possible that the proving grounds as a springboard for communities to participate in the transition
- Due to the location of coastal regions, they tend to be at the end of the transmission line, and therefore do not have a large capacity. In addition, the connection to the grid tends to be a single line spur from the grid and so is vulnerable to power cuts in extreme weather. Marine energy development could help improve the grid connectivity and capacity for coastal regions.
- There are micro-grids in Africa, and hence there is a potential for Africa to leapfrog in the energy transition.
- There is community solar in Germany
- General interest in distributed generation

## 5.2 Technical Curiosity

- Requirement for energy storage for wave energy: hot water, hot sand silos, gravity batteries, pumped storage like Turlough Hill. Pumped storage has been done on a large scale in Scotland, could be done here but it's expensive.
- Less public awareness of Wave than Wind energy
- Some people introduced tidal turbines
- Wave energy convertors (WECs) don't seem to work well yet, they haven't settled on a leading technology unlike wind or tidal to a lesser extent.
- Curiosity about tidal energy and we talk about this for a bit – required tidal range (7m), flow velocity (2-3 m/s), and depth for tidal turbines (10 m below low tide mark). These considerations reduce the number of good sites.
- What about extreme sea states and what the WEC does then (basically, it shuts down)
- Devices which are just beneath sea level would have (potentially) better survival rates because the conditions are less harsh.
- Are WEC companies really looking for community partners? That is a good question and needs to be tested. Currently each company will test their devices individually and make individual agreements.
- Wind energy developers have no interest in wave energy because it is untested.

- What is the cost of WECs? Theoretically, they should be less capital intensive after the market matures because of less material requirements
- It might just be the nature of sea states that there will not be coalescence around a single technology

### 5.3 Concerns of Community

- Need for local participation in decision making regards planning
- Requirement for government to fund initial research
- No willingness to pay more for renewables, are we not already paying PSO levies?
- Renewables should be cheaper, they're not buying fuel after all.
- WEC technology is not mature enough for community investment yet
- The Irish electricity market is highly regulated about who can and cannot generate power, so communities have their hands tied
- The planning system in Ireland is a problem. It is too burdensome. At the same time, some of the group expressed fear of multinationalists coming in and taking over
- ESB and EirGrid are responsible for substation construction and planning. Could ESB and Eirgrid enter partnerships with communities, but that might require changes in national policy?
- How can communities have a greater role? No one owns the wind or the waves so how can a private company make money from them? Also, about the harsh marine environment and whether there could be different wave energy devices for different predominant sea states.

### 5.4 Environmental Issues

- A tidal device put in at the Bay of Fungi was quickly destroyed by the harsh environment.
- Concern about all the moving parts in some WECs.

## 6 Wind Value

Peter Deeney made a slide presentation on the possibility of community investment in onshore wind farms. The slides are available [here](#). The following ideas and views were raised:

### 6.1 Advantages for Community

- Some people already have solar PV: energy freedom, pride, satisfaction
- Communities do want control of their energy, and want additional energy reliability.
- Benefits are financial and increased job opportunities
- Possibility of developers sharing the output of a turbine rather than giving a fixed rate per MWh?
- Others have done this, why not us?



- A 15 year old farm will have plenty of production and service data. So you know what you're getting.
- Encouraging local energy intensive industries such as ice manufacturing.
- Consider the Dingle Sustainable Energy Community (mainly farmers) as an example.
- The participant with solar panels on the roof, "It was mainly for environmental reasons, climate change reasons".
- Maybe everyone within a certain radius (what radius?) should receive free electricity?
- Any distribution of fiscal benefits would likely require the establishment of some community based governing body
- Green hydrogen may represent an opportunity for Ireland, that it is starting to gain a foothold as a development possibility.

## 6.2 Technical Curiosity

- Grid connection is difficult for a new site, it is valuable on an existing site.
- How do we store excess energy? Batteries do not seem ideal, how about heat storage, sand silos and gravity storage?
- How long can you use existing foundations for wind turbines?
- What is the business model? Sell the electricity locally or sell it to the grid?
- Solar panels on farm buildings are a way to balance energy on calm days.

## 6.3 Concerns of Community

- Difficult to achieve a unified vision from diverse opinions.
- Fear of buying a "money pit", there is a need to know the service history and likely costs. Maybe pay some company to take on the maintenance risk.
- How to define where a community ends? How about seeking funding from the diaspora?
- Poor consultation on wind farms causes distrust, but may not blind people to buying a wind farm they didn't initially approve of.
- What are the impacts to local communities of owning their own offshore wind power development? Some problems come into mind immediately, 1) financial and environmental aspects; 2) NIMBY-ism; and 3) to disseminate to locals information on the benefits and if there are any downsides.
- Would it help if the government chipped in to aid with the finances?
- The dissemination of information ought to come first, before decisions are considered.
- How would you characterize the relationship between communities and developers? Some developers have been accused of buying up houses near where they want to put a farm, this exacerbates the housing crises in Ireland – this happens mainly in the East, meaning that locals get priced out of the market. Wind developers have not in the past always sought community input early or thoroughly enough.

- An offshore wind developer representative said that his company has a Community Relations Manager and that this role would not have come about if his company did not realize the vital importance of public engagement. The representative also said that you need to have someone in the community dedicated to listening to people's ideas, asking people how they feel, and then feeding that back into the project team to make sure that decisions on the project are reflective of views in the local community. The wind development company would wish to promote the idea in communities that they, the company and the community, are developing something together rather than the company doing it alone. It doesn't mean that every company has done this particularly well, but the developer representative said it was an important part of the project development process.
- Is community engagement and consultation part of the planning process? The developer said that it is. If you are seeking permission to build a wind farm, you have to demonstrate that you have conducted a public consultation process and stakeholder interaction. The developer thinks it represents an opportunity for communities if the finances are there. The developer brought up Denmark as a good example of how community ownership of wind farms could be accelerated.
- Perhaps it should be compulsory for communities to have a piece of the wind farms they are supporting.
- The general difficulty of planning permission was brought up as a reason Ireland is a laggard in offshore wind power. The difficulty is not really public opposition, it is more a financial consideration because there were plenty of places onshore to develop and Ireland was meeting its energy needs so developers did not see a reason to go offshore where costs are higher.

## 6.4 Environmental Issues

- How can blades be disposed of ?
- Some participants want to do their part for the environment. It is good to keep a wind farm operating for longer.
- Participants were winning to begin to talk about end-of-life opportunities for wind farms.

## 6.5 Risk Appetite Questionnaire

Participants were invited to complete an anonymous online questionnaire to assess their investment risk appetite. This was based on work by Colasante and Riccetti<sup>4</sup> whose questions are available on the Wind Value project website, [here](#). Analysis of the questionnaires produced scores for each participant to measure their risk aversion and risk loving attitudes, in both cases a higher score means more intense attitude.

Initial results in Table 2, indicate that there is a wide range of risk appetites among the participants, with stronger risk aversion than risk loving attitudes. There was no significant difference in either risk aversion or risk loving scores between males and females, despite this being suggested by the literature. However this null result may be due to the relatively small sample size of 16. <sup>5</sup>

<sup>4</sup>Colasante, A. and Riccetti, L. (2020) Risk Aversion. Prudence and Temperance: It is a Matter of Gap Between Moments, *Journal of Behavioral Finance*, 100262; Colasante, A. and Riccette (2021) Financial and Non-Financial Risk Attitudes: What Does it Matter? *Journal of Behavioral and Experimental Finance*, 100494.

<sup>5</sup>This result was found using a two sample t-Test which yielded a t statistic value of zero and -0.265 against the null hypotheses

	<b>Female</b>	<b>Male</b>
N	6	10
<b>Risk Aversion</b>		
Mean	7.5	7.5
Standard Deviation	2.17	2.17
<b>Risk Loving</b>		
Mean	3.8	4.2
Standard Deviation	3.06	1.87

Table 2: Risk aversion and risk loving scores by gender

## 7 Areas for Future Research

The first suggestion for future research is to encourage the attendance of a more representative selection of people possibly by running events in the evening when most workers are free to attend. This would necessarily mean having a shorter event.

From the participants' concerns there is clearly a need for further research into the effects of crab and lobster catches near offshore wind farms. There are many offshore wind farms in operation around Britain and it should be possible to carry out a literature search to find out the current state of knowledge regarding the effect of offshore wind on fish and shellfish catches.

## 8 Conclusions

### 8.1 Offshore Wind Farms (X-Rotor)

The fishing community has real concerns about access to fishing grounds and the effect of offshore energy on their livelihoods. There were concerns regarding the imposition of national decisions on local people, this was found in the Islay focus groups too. There were hopes that nearby offshore wind might improve the local grid connection, offer jobs and possibly produce artificial reefs for fish.

### 8.2 Wave Energy (Safe Wave)

There were similar hopes for an improved grid connection if offshore energy is generated locally. Also there were similar concerns that local input into decisions may not be effective. It was felt that wave energy converters would have less impact on the locality.

### 8.3 Onshore Community Wind Farms (Wind Value)

Some local people have already invested their own money in solar PV, and there was a general acceptance for the need to generate renewable energy. There was concern about the possible financial risks being taken on by a community.

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of no difference in means for the risk aversion and risk loving scores, giving p-values of 50% and 40%, neither of which is significant.

## **8.4 Environmental Concerns**

There were some concerns about the effect of offshore energy on wildlife as well as concerns about the survivability of offshore devices. There was recognition that environmental impact is a balance of reduced greenhouse gas emissions compared to any local effects.

## **9 Acknowledgments**

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