



Rijksdienst voor Ondernemend
Nederland

WAVE & TIDAL ENERGY IRELAND

*>> Duurzaam, Agrarisch, Innovatief
en Internationaal ondernemen*





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INTRODUCTION

Ireland has excellent renewable energy resources, which will be a critical and growing component of Irish energy supply to 2020. One of the resources with a large potential is ocean energy.

The European Union, the Republic of Ireland and the Northern Ireland Governments have each produced policies in respect of electricity generation which are intended to promote an increase in the amount of electricity being generated from renewable energy sources. One of these sources from which electricity is being generated is tidal and marine energy resource. The Irish waters (for the purpose of this study, Ireland and Irish waters are geographical terms relating to the island of Ireland) are very suitable for testing and further development of tidal energy solutions.

This report describes the Irish market for wave and tidal energy and will focus on the following topics, policy & planning, resources, funding, key players, market approach and tips with regard to doing business in Ireland.



1 POLICY & PLANNING

1.1 IRISH ENERGY MARKET

Electricity is generated in Ireland from a number of sources such as gas, coal, oil and renewable sources. The Commission for Energy Regulation (CER) regulates the electricity market. Electricity services in Ireland are provided by the Electricity Supply Board (ESB), a state body that is owned and controlled by the Government. ESB owns and manages the electricity network and operates 19 major power stations throughout Ireland and a number of smaller stations in 28 sites around the country.

In February 2000, as a result of EU directive 96/92/EC, the electricity market in Ireland was opened to competition. Larger customers using 4 gigawatt hours or more of power per year became free to choose their own electricity supplier. The retail electricity market opened fully to competition in February 2005. In November 2007 a Single Electricity Market (SEM) came into effect with the trading of wholesale electricity in Ireland and Northern Ireland on an all-island basis. All business markets were deregulated from October 2010. From April 2011, the domestic market is deregulated with all suppliers free to set their own tariffs.

The electricity transmission system, commonly known as the national grid, is a high voltage network for the transmission of bulk electricity supplies from the electricity generation sources to transformer stations around Ireland. EirGrid, an independent state-owned body, is the transmission system operator and is responsible for the operation, development and maintenance of the system. ESB Networks, a separate business unit within ESB, is the owner of the transmission system and is responsible for carrying out the maintenance and construction of the system.

The distribution network is the medium and low voltage electricity network used to deliver electricity from the transformer stations to connection points such as houses, offices, shops, and street lights, and is owned by ESB Networks. ESB Networks is also the distribution system operator and is responsible for building, maintaining and operating the entire distribution level network infrastructure. This includes all overhead electricity lines, poles and underground cables. ESB Networks has responsibility to all electricity customers.



1.2 WAVE & TIDAL ENERGY

Renewable energy constitutes a core element of the Government's overarching energy policy. As stated in the Government's Energy White Paper (2007) renewable energy is an integral part of Ireland's climate change strategy and sustainability objectives. The additional diversity which renewables bring to Ireland's energy demand will also make a direct contribution to their goal of ensuring secure and reliable energy supplies.

Renewable energy resources are abundantly available in Ireland. However, only a fraction of these resources have been tapped so far. One of Ireland's energy resources is the ocean. Ocean energy refers to the energy carried by ocean waves, tides, salinity and ocean temperature differences. Wave (power from surface waves) and tidal (power from tidal changes and/or ocean currents) are the predominant forms of ocean energy in Ireland. Ireland has a landmass of around 90,000 square kilometers, but a sea area of around 10 times that size, at 900,000 square kilometers and with its position at the Atlantic edge of the EU has an almost unparalleled offshore energy resource, with suitable conditions available for the development of the full range of current offshore renewable energy technologies. And with the introduction of the White Paper '*Ireland's Transition to a Low Carbon Energy Future 2015-2030*' in 2015 the Irish government showed an increased interest in generating power from the ocean. At that time, in 2015, the ocean technologies (e.g. wave and tidal) were at the pre-commercial stage and the government didn't anticipate they will make a large contribution in the short term. However, the government did expect them to play a part in the energy transition in the medium to long term. The White Paper can be downloaded via the following link,

www.dccae.gov.ie/energy/en-ie/Energy-Initiatives/Pages/White-Paper-on-Energy-Policy-in-Ireland-.aspx

Exchequer support for ocean research, development and demonstration was increased under the OREDP. Subject to EU state aid clearance and Government approval, this plan will provide an initial market support scheme of €260 per megawatt hour, limited to 30 MW of installed capacity, for wave and tidal energy from 2016.



2 LOCATIONS

2.1 TEST SITES

Ireland has three Ocean Energy Test Sites where wave, tidal and offshore wind energy solutions can be tested and further developed. These facilities are:

LiR National Ocean Test Facility (Ringaskiddy, Co Cork) - www.LIR-NOTF.COM

Lir consists of state of the art wave tanks and electrical rigs that allow for scaled testing in a controlled environment.

Marine and Renewable Energy Test Site Galway Bay - www.smartbay.ie

The Marine Institute is collaborating with SEAI, MaREI (UCC) and SmartBay Ireland to develop a national test and demonstration facility for marine energy and technology at the ¼-scale ocean energy test site, in north Galway Bay, near Spiddal.

Atlantic Marine Energy Test Site (AMETS) - www.oceanenergyireland.ie/testfacility/amets

The Atlantic Marine Energy Test Site (AMETS) is being developed by the SEAI to facilitate testing of full scale wave energy converters in an open ocean environment. AMETS will be located off Annagh Head, west of Belmullet in County Mayo and will be connected to the national grid. SEAI is responsible for the development and management of AMETS.



2.2 RESOURCES

SEAI investigated the tidal and marine current energy resources in Irish waters. A significant proportion of the tidal and marine current energy resource is to be found on the east coast of Ireland. The resource on the west coast is concentrated in the Shannon Estuary. SEAI identified various types of resources of which the “Viable Resources” are of most interest to Tocardo and other companies who passed the test & development stages. Viable Resources are sites which, after taking commercial viability constraints into account, have the greatest potential for exploitation. The commercial constraints include development costs, scale, resource distribution, market reward, timing and other risk which will be variable over time. Viable Energy Resources in Irish waters are,

- Shannon Estuary (111 GWh/y)
- Tuskar Rock & Carnsore Point (177 GWh/y)
- Codling & Arklow Banks (70 GWh/y)
- Inishtrahull Sound (15GWh/y)
- North East Coast (273 GWh/y)
- Ram Race – Copeland Islands (125 GWh/y)
- Strangford lough (130 GWh/y)

The SEAI study can be downloaded via,

www.seai.ie/Publications/Renewables_Publications_/Ocean/Tidal_Current_Energy_Resources_in_Ireland_Report.pdf

The grid lay-out is a very important factor for commercial sites. With this regard the Smart Grid Dashboard might be of interest; a web-based application that enables users to view and compare some of the key all island power system statistics and graphs in one location. A map with an overview of the Irish (all Island) transmission system and generation via wind farms, hydro generators, thermal generators and pumped storage generators can be obtained via, <http://smartgriddashboard.eirgrid.com/>



3 FUNDING & GRANTS

Currently a call is open for applications for the Prototype Development Fund. The prototype fund objective is to accelerate and enhance support for the research, development, testing and deployment of wave and tidal energy devices. Through this fund, SEAI encourages innovative solutions for ocean energy technologies.

More information and the application form can be downloaded via,

www.seai.ie/Renewables/Ocean-Energy/Prototype-Development-Fund/SEAI-Ocean-R-D-Call-2015.pdf

The available funding is mainly based on support for research, development and testing activities. However for companies who are passed the stage of testing and are ready for (commercial) production, a new Feed-in Tariff (REFIT) is crucial. A REFIT for tidal/wave energy would make it possible to compete with other forms of renewable energy.

In Ireland, electricity from renewable sources was promoted through a feed-in-tariff scheme (Renewable Energy Feed-in Tariff - REFIT). In the framework of the REFIT schemes, the entities entitled to the feed-in tariff are those suppliers that purchase electricity from renewable sources from generators with whom they have entered into a commercially negotiated REFIT Power Purchase Agreement (PPA). There were three REFIT schemes, establishing guaranteed support prices for various sources of energy, i.e. minimum prices for each category of electricity (5.1 REFIT 1, REFIT 2, and REFIT 3). The original scheme, known as REFIT 1, only had state aid clearance to accept new applications until 31 December 2009. After that date, no new applications have been accepted under REFIT 1, although projects were granted time extension to become operational. In 2012, two newer schemes (REFIT 2 and REFIT 3) received state aid clearance and were open for new applications. REFIT 2 covered onshore wind (small and large scale), hydro (small scale), and biomass landfill gas (4.1 REFIT 2) whereas REFIT 3 covered the biomass categories of anaerobic digestion, biomass CHP, biomass combustion and biomass co-firing (4.1 REFIT 3). Project developers under REFIT 1 were allowed to apply to transfer their projects to REFIT 2 or REFIT 3 if they met the terms and conditions of these schemes. The closing date for applications for REFIT 2 and REFIT 3 was 31 December 2015.

The 2017 Reference Prices for REFIT can be downloaded via the following link,

www.dccae.gov.ie/energy/SiteCollectionDocuments/Renewable-Energy/2017%20Reference%20Prices%20for%20REFIT.pdf

As of January 2016 there is no support scheme available for renewable energies, pending the introduction of a new support scheme which is currently being developed by the Department of Communications, Climate Action and Environment (DCCAE). In this new



Renewable Electricity Support Scheme a range of technologies (including offshore) are being considered. A detailed economic analysis on the viability and cost effectiveness of supporting these renewable technologies is currently underway and a (second) public consultation will be published in Q2 2017 outlining various scheme design options. No decision has been taken yet as regards technologies to be supported. However, before any new scheme is introduced, it will need to secure Government approval and State aid clearance from the European Commission. The new support scheme for renewable electricity is expected to become available towards the end of 2017.



4 KEY PLAYERS

4.1 GOVERNMENT

Department of Communications, Climate Action & Environment (DCCAE)

29-31 Adelaide Road, Dublin 2, Ireland

Tel: +353 1 678 2000

Email: corporateservices@dcae.gov.ie

Web: www.dcae.gov.ie

Department of Housing, Planning, Community & Local Government (DHPCLG)

Custom House, Dublin 1, Ireland

Tel: +353 1 888 2000

Email: qcsofficer@housing.gov.ie

Web: www.housing.gov.ie

4.2 STATE AGENCIES

Commission for Energy Regulation (CER)

Ireland's independent energy regulator with a range of economic, customer and safety functions. The CER is also the economic regulator of Ireland's public water system

Tel: +353 1 4000 800

Email: info@cer.ie

Web: www.cer.ie

Eirgrid Group

State-owned company that manages and operates the transmission grid across the island of Ireland

Tel: +353 1 677 1700

Email: gridwest@eirgrid.com

Web: www.eirgridgroup.com

Electricity Supply Board (ESB)

The ESB is 95% owned by the Irish Government. ESB operates right across the electricity market: from generation, through transmission and distribution to supply

Tel: +353 1 703 8000

Email: marketing@esbi.ie (ESB International Ltd)

Web: www.esb.ie



Enterprise Ireland

Government organisation responsible for the development and growth of Irish enterprises in world markets, as well as start-ups from outside Ireland

Tel: +353 1 727 2000

Email: client.service@enterprise-ireland.com

Web: www.enterprise-ireland.com

Investment Agency Ireland (IDA Ireland)

IDA supports a range of overseas companies from small high growth businesses to large multinationals (foreign direct investment)

Tel: +353 1 6034000

Email: idaireland@ida.ie

Web: www.ida.ie

Sustainable Energy Authority Ireland (SEAI)

Ireland's national energy authority with the mission to play a leading role in transforming Ireland into a society based on sustainable energy structures, technologies and practices

Tel: +353 1 8082100

Email: Info@seai.ie

Web: www.seai.ie

www.oceanenergyireland.com - Ireland's Marine Renewable Energy Portal

4.3 ASSOCIATIONS

Association of Irish Energy Agencies (AIEA)

The Association of Irish Energy Agencies is an all-island body engaging with the LA and communities they serve to meet its energy performance targets through professional development and implementation of good and best practices

Tel: +353 52 7443090

Email: info@aiea.ie

Web: www.aiea.ie

Irish Solar Energy Association (ISEA)

The Irish Solar Energy Association (ISEA) is committed to bringing attention to the value of solar energy's contribution to Ireland's economic and environmental future

Tel: +353 1 791 9684

Email: info@irishsolarenergy.org

Web: <http://irishsolarenergy.org/>



Irish Wave Energy Developers Association

IWEDA represents 11 early stage device developers across Ireland

Web: <http://iweda.ie/>

Irish Wind Energy Association (IWEA)

The IWEA is the National association for wind energy in Ireland

Tel: +353 45 899341

Email: office@iwea.com

Web: www.iwea.com

Marine Renewables Industry Association (MRIA)

MRIA represents Ireland's Marine Renewables community in the fields of Wave and Tidal Energy. The Association includes firms engaged in device development and manufacture, developers of projects and sites based on Marine Renewables, academic researchers, consultants, professional firms and contractors

Email: chairman@mria.ie

Web: www.mria.ie

Smartgrid Ireland

Smart Grid Ireland is a not for profit, all-island advocacy network, whose mission is to facilitate the delivery of a secure, affordable and sustainable energy infrastructure, positioning Ireland at the forefront of global smart grid development to create long-term economic wealth for the people of Ireland

Tel: +44 28 9073 7950

Email: info@smartgridireland.org

Web: www.smartgridireland.org

The National Offshore Wind Energy Association of Ireland (NOW)

The National Offshore Wind Energy Association of Ireland was established to promote the development of Ireland's substantial offshore wind resource and to ensure that our island leads the way in building a sustainable, green economy

Tel: +353 42 932 2952

Email: info@nowireland.ie

Web: www.nowireland.ie



4.4 KNOWLEDGE INSTITUTES

Centre for Marine & Renewable Energy (MaREI)

MaREI is supported by Science Foundation Ireland and combines the expertise of a wide range of research groups and industry partners, with the shared mission of solving the main scientific, technical and socio-economic challenges across the marine and renewable energy sectors. MaREI have collaborated with many stakeholders in the tidal energy industry, including Ocean Renewable Power Company (ORPC), OpenHydro, DP Energy, GKinetic, Scotrenewables, Tidal Power

Tel: +353 91 492 609

Email: marei@ucc.ie

Web: www.marei.ie

Dundalk Institute of Technology (DKIT)

Dundalk Institute of Technology conducts research of an international standing in its prioritised established research themes. Research is driven by global needs whilst impacting upon society and the economy

Tel: +353 42 9370200

Email: info@dkit.ie

Web: www.dkit.ie

Irish Maritime & Energy Resource Cluster (IMERC)

IMERC promotes Ireland as a world-renowned research and development location that will unlock Ireland's maritime and energy potential

Tel: +353 21 500 7501

Web: www.imerc.ie

IT Sligo- Geotechnical Research Group

Research in the group falls within two broad thematic areas; onshore geotechnics for infrastructure projects and offshore geotechnics for the energy industry

Tel: +353 71 9155289

Email: info@itsligo.ie

Web: www.itsligo.ie

Letterkenny Institute of Technology- School of Engineering

Tel: +353 74 9186000

Email: info@lyit.ie

Web: www.lyit.ie



Marine Institute

State agency responsible for marine research, technology development and innovation in Ireland. We provide scientific and technical advice to Government to help inform policy and to support the sustainable development of Ireland's marine resource.

Tel: +353 9 138 7200
Email: institute.mail@marine.ie
Web: www.marine.ie

Mobile & Marine Robotics (MMRRC)

The University of Limerick is the only research centre focused on the application and development of marine robotics within the island of Ireland.

Tel: +353 61 202264
Email: info@ul.ie
Web: www.mmrrc.ul.ie

4.5 SHIPYARDS

Arklow Marine Services

North Quay, Arklow, Co Wicklow, Ireland

Tel: +353 402 32126
Email: info@arklowmarine.com
Web: www.arklowmarine.com

Harland and Wolff Heavy Industries Ltd

Queen's Island, Belfast BT3 9DU, Northern Ireland

Tel: +44 28 9045 8456
Fax: +44 28 9045 8515
Web: www.harland-wolff.com



4.6 PORTS

Listed below are ports that have the facilities to provide support and services to marine renewable energy industry and that are in a position to meet almost all the criteria which large foreign investors (renewable energy) are likely to seek from a site location.

Dublin Port Company

Port Centre, Alexandra Road, Dublin 1, Ireland

Tel: +353 1 887 6000

Email: shippingdesk@dublinport.ie

Web: www.dublinport.ie

Larne Harbour Ltd

9 Olderfleet Road, Larne, Co Antrim, BT40 1AS, Northern Ireland

Tel: +44 28 2887 2100

Email: info@portoflarne.co.uk

Web: www.portoflarne.co.uk

Londonderry Port & Harbour Commissioners

Foyle Port, Port Road, Lisahally, Londonderry, BT47 6FL, Northern Ireland

Tel: +44 2871 860 555

Email: info@londonderryport.com

Web: www.londonderryport.com

Port of Cork

Custom House Street, Cork, Ireland

Tel: +353 21 427 3125

Email: info@portofcork.ie

Web: www.portofcork.ie

Shannon Foynes Port Company

Harbour Office, Foynes, Co Limerick, Ireland

Tel: +353 69 73121

Email: info@sfpc.ie

Web: www.sfpc.ie



5 EVENTS

Energy Show

Web: www.seai.ie/energyshow
Date: April 5th - 6th 2017
Location: RDS, Dublin
Info: The show brings together 160 exhibitors of the latest energy saving technologies

SeaFest / Ocean Wealth Summit

Web: www.ouroceanwealth.ie/oow-summit
<http://seafest.ie>
Date: June 30th - July 2nd 2017
Location: Bailey Allen Hall, Galway
Info: The 'Our Ocean Wealth Summit' will take place in Galway this year as part of SeaFest 2017, Ireland's national maritime festival. Speakers with international perspectives on how Ireland is transforming its marine sector through and new thinking both as a means of achieving economic prosperity for the world and as an imperative to protect marine resources for future generations

European Wave & Energy Tidal Conference (EWTEC)

Web: www.ewtec.org/ewtec-2017
Date: August 27th - September 2nd 2017
Location: UCC, Cork
Info: The European Wave and Tidal Energy Conference (EWTEC) series are international technical and scientific conferences, focused on ocean renewable energy and widely respected for their commitment to maintain high standards of academic and industrial contributions



6 MARKET APPROACH

Ireland has excellent renewable energy resources, which will be a critical and growing component of Irish energy supply to 2020. One of the resources with a large potential is ocean energy. However, engagement and encouragement from the government is necessary in order to make the transition to commercial production with ocean energy. There are a few pending government decisions which might be crucial for the Irish ocean energy sector as well as for the industry.

First of all future funding. The currently available grants are mainly based on support for research, development and testing activities. For companies that are passed the stage of testing and are ready for (commercial) production, a new Feed-in Tariff (REFIT) is crucial. A possible REFIT will be included in the new *Support Scheme for Renewable Electricity*, which is currently being developed by DCCA and expected to become available towards the end of 2017.

Secondly, changes in the Irish planning regime need to be put in place in order to be able to install larger (< 5MW) ocean energy solutions. According to the responsible Department (DHPCLG) the legislation in which this should be implemented is the *Maritime Area and Foreshore Amendment Bill*. It is expected that this legislation will be brought to Cabinet seeking approval to publish it in late March/ early April.

It is very important to meet up face to face with the key players in the sector. Personal contact is appreciated when entering the Irish market; therefor an informal event can be a good starting point. Events like the *SeaFest/Ocean Wealth Summit* (Galway, June/July 2017) are an excellent opportunity to meet up with decision makers and the Irish industry in an informal setting.



7 DOING BUSINESS IN IRELAND

7.1 BUSINESS CULTURE

As a small, open economy with a strong reliance on international trade, the introduction of products and services into the Irish market is relatively uncomplicated. Standard international marketing and distribution practices are widely applied in the Irish business community. However, some features of the Irish business culture are important to keep in mind.

In general, Irish business executives are less formal than their UK or Dutch counterparts and the use of first names at an early stage of a business relationship is acceptable. Friendship and mutual trust are highly valued and once trust is earned, a productive working relationship can usually be expected. It is therefore important to meet up face-to-face sooner rather than later.

It is important to keep in mind that the Republic of Ireland and Northern Ireland / UK are two different countries with separate markets. This is a sensitive matter. For this reason it is advisable to avoid speaking about politics or religion in the early stages of the business relationship.

Before setting up a meeting, it is important to spend some time getting to know people in order to become part of their network. Often an unprepared business meeting may prove to be useless as the necessary social network has not been developed. It is advisable to discover the relationships in the company/organisation first in order to find out who is the key decision maker. This will help to ensure that only competent people are involved in the meeting. A good way for making business contacts is to attend trade events and to join professional associations.

7.2 SUPPORT NETHERLANDS EMBASSY

The Economic Team of the Netherlands Embassy in Dublin assists Dutch companies looking for market opportunities in Ireland. This is done by providing reliable market information, answering specific trade questions and offering a local network.

This report gives an overview of the Irish market for tidal & wave energy and its key players. If required the Embassy can assist further with the providing of additional contact details and arrange business introductions. Finally, the Embassy can assist in case you would like to organize a seminar or workshop for the Irish market, e.g. accommodate your audience.



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