Procurement Code of Practice

A guide for businesses entering the marine renewable energy industry

Deployment of Wave Hub in Cornwall - Image courtesy of Wave Hub

MERiFIC
Marine Energy in Far Peripheral and Island Communities

Prepared by Technopôle Brest-Iroise & Cornwall Marine Network for the MERiFIC Project:
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Contents:

Executive Summary:

This report is for small and medium-sized businesses that are looking to diversify, or increase growth, in the marine renewable energy industry (MRE). The MRE industry covers the creation of energy from marine sources via wave and tide. However, the generation of energy from offshore wind is included for this report because it presents common opportunities.

The MRE industry has an advanced supply chain with potential opportunities for profitable entry through a large array of products and services. Primarily, the report aims to provide (or signpost) the reader with: knowledge of the size and growth of the industry, the products and services it requires and strategies for winning business. During the creation of this report, leading industry buyers have been questioned about their needs and expectations, giving detailed insights into the buying process. Specifically, the report is targeted at readers within the regions of the South West in the UK and Brittany in France.

Of the three MRE industry segments wind, wave and tide, offshore wind is the most mature. Significant investment is occurring across the UK and France as both countries seek to achieve their goal of creating sustainable energy and reduce carbon emissions. Thus meeting the mandatory overall EU target of 20% share of total energy consumption from renewable energy sources by 2020. To give some idea of the growth, the installed European offshore wind capacity in 2011 amounted to 3 Giga Watts (GW); the target for 2020 is 40 GW. Between € 3 and € 4 million will be required per megawatt (MW) installed.

The UK has been identified as the world leader for offshore wind, with more than 700 wind turbines installed across 15 wind farms. France currently has no offshore wind farms but a planned rapid expansion to an installed base of 6 GW by 2020 is predicted within the country's capabilities.

In comparison, tide and wave energy production is at a pre-commercialisation stage with device developers currently deploying at test sites. However, EU targets are looking to achieve up to 1.9 GW of power from tide and wave by 2020. Estimated wave energy resource, just in the UK, has potential of 70 Terra Watt hours (TWh) per year. Many wave and tidal developers are looking for long-term supplier relationships now. They are working with suppliers to create and deploy viable devices. So, even though the industry is in its infancy, there are still opportunities. In this report, we also examine opportunities from other developing technologies including ocean thermal energy conversion and sea-water air conditioning.

The report also details categories of products and services needed during the different phases of constructing offshore wind and tidal parks, including how available, and importantly how critical, product categories are. Specifically with offshore wind, we have sign-posted readers to recommended sources of information which dissect devices into their component parts; essential for qualifying whether products and services are needed.

Whilst this report is keen to support diversification into the MRE industry, we are also keen to ensure that businesses make a profitable transition with their eyes clearly focused on achieving a return-on-investment. There are many variables to consider and profit is not guaranteed. We strongly recommend that a profitable entry strategy is broken down into three phases: a business analysis phase, a product development phase, and a communication phase. We've compiled and customised a number of standard business tools to help assess the segment of the supply chain being targeted so that it can be judged on its attractiveness and how easy, or not, entry will be.

Identifying the different ways customers behave in this new arena is very important and key questions will need to be asked that will affect new product development and the marketing entry-strategy used. We've provided these

questions and links for investigation. Our interviews have identified critical criteria which satisfies MRE industry buyers, such as: experience, safety track record and quality and environmental accreditation. And considering these points, we've suggested how these can be addressed and integrated through your business and marketing messages that your company communicates; not just through the sales team but through all connections with the customer.

As with most business to business scenarios, a key to success is the development of good and long-lasting relationships. Those in customer-facing roles (in most cases the sales team/person), are essential and providing them with the tools in order to do their job effectively is an important aspect of entering this market. The report provides a marketing framework to support the sales team that covers aspects including: recruitment, training and management, customer relationship management and other marketing tools. It suggests key marketing tips to help businesses gain competitive advantage and successfully win new business. Specifically, a special feature on tendering examines critical criteria from the viewpoint of the buyer at each stage of the tendering process and makes recommendations based on the findings. Case studies from businesses that have succeeded in entering the market are used to demonstrate approaches and real experiences.

We conclude with presenting external support that is available to companies wishing to enter the market including opportunities for networking, groups to join and links for further interest.

The report has been developed as a strand of the EU funded MERiFIC project that seeks to advance the adoption of marine energy in Finistère and Cornwall (for this report covering the South West of the UK).

More information about Merific visit: www.merifc.eu

The MERiFIC Project

MERiFIC is an EU project linking Cornwall and Finistère through the ERDF INTERREG IVa France (Manche) England programme. The project seeks to advance the adoption of marine energy in Cornwall and Finistère, with particular focus on the island communities of the Parc naturel marin d'Iroise and the Isles of Scilly. Project partners include Cornwall Council, University of Exeter, University of Plymouth and Cornwall Marine Network from the UK, and Conseil Général du Finistère, Pôle Mer Bretagne, Technôpole Brest-Iroise, IFREMER and Bretagne Développement Innovation from France.
MERiFIC was launched in September 2011 at the National Maritime Museum Cornwall and runs until June 2014. During this time, the partners aim to:

- Develop and share a common understanding of existing marine energy resource assessment techniques and terminology;
- Identify significant marine energy resource 'hot spots' across the common area, focusing on the island communities of the Isles of Scilly and the Parc naturel marin d'Iroise;
- Define infrastructure issues and requirements for the deployment of marine energy technologies between island and mainland communities;
- Identify, share and implement best practice policies to encourage and support the deployment of marine renewables;
- Identify best practice case studies and opportunities for businesses across the two regions to participate in supply chains for the marine energy sector;
- Share best practices and trial new methods of stakeholder engagement, in order to secure wider understanding and acceptance of the marine renewables agenda;
- Develop and deliver a range of case studies, tool kits and resources that will assist other regions.

Summary of key opportunities:

In the UK...

OFFSHORE WIND

- The Crown Estate's Round 3 programme: 9 offshore wind zones around the UK coast, with 2 sites under development in the South West (the Atlantic Array and Navitus Bay)
- Agreements for Lease are now in place for 10 offshore wind energy projects in Scottish waters
- Northern Ireland offshore wind and tidal leasing rounds were released in December 2011. Development rights to winning bidders were announced in autumn 2012
- Construction on Wales's largest wind farm Gwynt Y Mor began in January 2012

WAVE AND TIDAL

- Opportunities exist in supporting the development of technologies as well as facilitating the move from prototype to commercial production implementation. The UK is now moving towards the first commercial projects, with 41 sites now under development or operational for wave and tidal

SUPPORT AND INCENTIVES

- There is a wealth of support and incentive schemes for the development and deployment of large-scale renewable electricity in the UK: from the UK Government and Devolved Administrations, the Crown Estate responsible for leasing the seabed around the UK, and from regional Marine Energy Parks which operate in partnership with local authorities, universities, business support organisations and the private sector
- The UK Government has established Renewable Obligation (RO) Banding which places an obligation on licensed electricity suppliers to source an increasing proportion of electricity from renewable sources
- The Scottish Government has created its Scottish Renewable Obligation regime
- Crown Estate support includes £100m investment into helping develop the Round 3 offshore wind farms, bursaries for post-graduates studying a newly created MSc in MRE and a possible further £20m co-investment in wave and tidal demonstration projects
- The South West and Pentland Firth and Orkney Waters Marine Energy Parks were launched in 2012 to target and cluster investment for technology development, energy generation projects and business growth
- The Department of Energy & Climate Change (DECC) is seeking to unlock private sector investment. DECC is investing £200million for low carbon technologies over four financial years, from 2011 - 2015
- The UK Government's industry Task Force, was launched (with a commitment of up to £30 m of support) to help reduce the costs of offshore wind to £100/MWh by 2020
- See also Chapter 6: Government and local support pg 68

Summary of key opportunities:

In France...

OFFSHORE WIND

- First call for tenders: 4 sites chosen including one in the Saint-Brieuc bay led by the Ailes Marines consortium (Iberdrola, Eole RES, AREVA, Technip, Neoen Marine). The overall capacity will almost reach 2 GW.
- Second call for tenders: 2 sites chosen representing a capacity of 1 GW.
- 3 more GW are to be installed to reach a capacity of 6 GW by 2020.

TIDAL ENERGY

- France to become a leader in tidal energy
- Two main competitors: SABELLA (Sabella D03 & D10) and DCNS (OpenHydro)
- Early 2013: Publication of a call for interest (Appel à Manifestation d'Intérêt)
- 2015/2016: First projects to be installed
- 2018/2020: First call for tenders

WAVE ENERGY

- Low visual and environmental impact, high yield
- One of the most promising technology (many different devices exist)
- Important wave potential alongside French coasts (e.g. Audierne bay)

OTEC & SWAC

- The Naval defence company DCNS has developed a ground test bed now installed in the Réunion Island.
- NER 300 case submitted for a pilot plant in the Martinique Island in 2015

For further details on support and incentives see Chapter 6: Government and Local Support pg 66

Potential hurdles:

Whilst growth is forecast and is necessary to achieve the 2020 energy targets, it is also worth acknowledging that every project may encounter many of the following barriers:

Technological obstacles including:

- Resource assessment
- Sustainability of conversion systems
- Conversion efficiency
- Commissioning, maintenance, de-commissioning
- Life cycle analysis
- Network integration
- Energy storage
- Industrial process

Legal barriers

Development costs

Environmental and social issues

- Environmental impact
- Acceptability by the other marine activities
- Law & regulation
- Cost-benefits analysis

Mass production issues and unknown impacts of large scale operations (eg: parks with hundreds of devices)

Chapter 1:

Background: Electricity landscape in France (Brittany) and in the UK (South West region)

In 2008 the total global electricity consumption was 16,819 TWh. It is expected to increase to 23,180 TWh by 2020 and 30,000 TWh by 2035, based on calculations by the International Energy Agency[1].

Following the same predictions, the installed capacity would increase from 4,772 GW in 2008 to 8,600 GW in 2035 and the share of renewable energy from 19% to 32%. This increase represents an annual investment of about € 250 billion between 2010 and 2030. Two-thirds of the investments will go to the 3 or 4 more mature industries[2].

At European level, the final electricity consumption in 2007 was 2,926 TWh[3], representing almost 20% of world consumption. The IEA foresees the installation of about 800 GW and the withdrawal of 516 GW over the period 2010-2035[1]. 70% of new installations will be for the renewables sector[1].

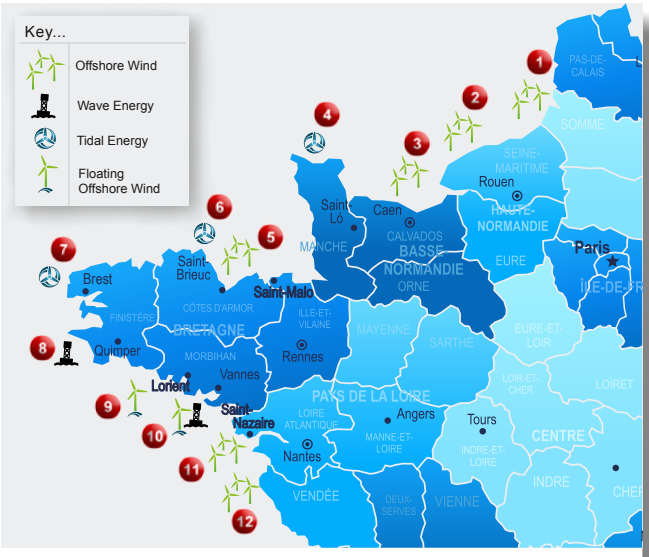
1.1 Situation in France

In France, the electricity consumption was around 500 TWh/year during the last two years[4]. At the end of 2011, the installed capacity in wind power stood at 6.64 GW and the installed capacity in solar at 2.23 GW[4]. By 2020, France has committed to producing 23% of final consumption from renewable energy, this share increasing by up to 50% in overseas French territories[5].

The contribution of marine energy has been estimated at 3%[5] ie: equivalent to producing 17.2 TWh/year, with two-thirds covered by offshore wind and the remaining third by the other marine renewable energy technologies[6].

Case of Brittany

Brittany is unique from the national electricity point of view. The region imports most of its electricity which makes it vulnerable. For example in 2010, only 9.3%[7] of the total



Offshore Renewable Energy Zones - Brittany & Normandy

Number	Park Name
1	Le Tréport: 600-750 MW fixed offshore park
2	Fécamp: 480-500 MW fixed offshore park
3	Courseulles-sur-Mer: 420-500 MW fixed offshore park
4	Le Raz Blanchard: tidal park
5	Saint-Brieuc: fixed offshore park
6	Tidal test site (Bréhat)
7	Ouessant Island: Sabella tidal energy converter
8	Audierne Bay: Experimental wave test site
9	Groix Island: Floating offshore wind test site
10	Le Croisic: test site for wave and floating offshore systems
11	Saint-Nazaire: fixed offshore park
12	Ile d'Yeu et de Noirmoutier: fixed offshore park

consumption was produced. Consumption amounted to 21.7 GWh[7] for a production of 2,011 GWh, of which around 79% came from renewable energy:

- 652 MW of wind generating 905 GWh
- 50 MW of solar photovoltaic producing 29 GWh
- 39 MW of hydropower producing 66 GWh
- 240 MW of tidal power plan generating 523 GWh (Rance tidal power station)

To cope with this feature, Brittany signed, with the French government, the “Electrical Breton Pact” (Pacte électrique Breton). It is based on three objectives:

- Reduction of electricity consumption
- Massive deployment of renewable energy
- Security of electrical supply

The aim is to reach 3,600 MW of installed capacity by 2020[8].

Key Reports

Des énergies marines en Bretagne : à nous de jouer! (2009)
http://www.bretagne.fr/internet/jcms/preprod_35266/des-energies-marines-en-bretagne-a-nous-de-jouer-2009

Des énergies marines en Bretagne: concrétisons la filière (2012)
http://www.bretagne.fr/internet/jcms/preprod_162352/des-energies-marines-en-bretagne-concretisons-la-filiere

1.2 Situation in the UK

UK electricity generation has stood at around 375 TWh/year in the last few years. The UK has committed to sourcing a target of 15% of its final energy consumption from renewables by 2020. Although this is not the highest target for an EU member state, the UK has the largest percentage point increase to achieve.

Since the introduction of the UK Government’s Renewables Obligation (RO) in 2002, the amount of renewables generated has increased from 3.1GW in 2002 to 14.9 GW at the end of the third quarter of 2012[10].

The contribution of all renewables to UK electricity generation in 2012 rose from 9.1% in 2011 to 11.7%. Total generation in 2011 amounted to 34,410 GWh, an increase of 8,565 GWh on 2010. Of this:

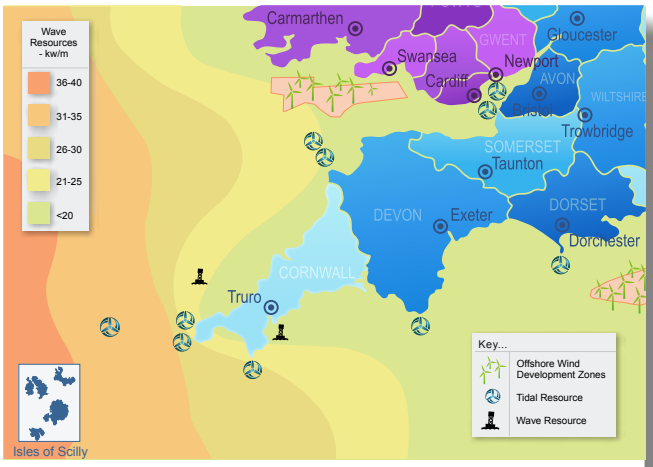
- 10,372 GWh was generated by onshore wind
- 5,126 GWh by offshore wind
- 5,686 GWh by hydro
- 2,964 GWh by fossil fuels

Wind continued to be the leading individual technology for the sourcing of electricity from renewables during 2011, accounting for 45% of renewable electricity generated[9].

By the third quarter of 2012 offshore wind generation rose again by 54.2% on the previous year.

By March 2011, the UK had 3.4 MW of installed marine energy capacity (an almost 50% rise on the previous year). A total of 7.4 MW of prototypes were in the advanced stages of planning and fabrication for deployment . The marine renewable industry is predicted to be worth up to £70bn to the UK by 2050[12].

Case of South West region UK



Offshore Renewable Energy Resources & Development Zones - South West Region, UK

Number	Park Name
1	Navitus Bay: fixed offshore wind park
2	FaBTest: wave energy test site (not connected)
3	Wave Hub: grid connected wave energy test site
4	Atlantic Array: fixed offshore wind park

In the South West of the UK there is the potential to generate up to 9,220 MW of installed capacity of offshore renewables, according to a regional study. Of this, 7,690 MW would be operational by 2030 and a further 1,530 MW by 2035. The report predicts these developments would comprise of 1,240 MW from wave, 4,400 MW from fixed offshore wind, 2,500 from floating offshore wind and 1,080 MW from tide. If it was installed today, this capacity could generate enough electrical power to supply more than five million homes, more than 5% of the UK's current electricity consumption. The Atlantic Array wind farm in the Bristol Channel, the Navitus Bay wind park off the coast of Dorset and the Wave Hub project off the coast of Cornwall are the first large scale projects in development in the region.

In the coming sections we will analyse the main technologies used to produce electricity from the sea, starting with offshore wind which can be categorised as fixed (from 20 to 40 meters depth) or floating (deep water).

Chapter 2:

Overview of marine renewable energy technologies

Historically, the first marine renewable technology to reach maturity was tidal, eg: Brittany's Rance Tidal power station (in operation since 1966). However, tidal advancement has been limited due to scarcity of sites and the potential environmental impact. The remaining marine renewable technologies present substantial opportunities. The following provides an overview of each technology.

2.1 Offshore wind

The global installed capacity of offshore wind energy could reach 180 GW by 2035 with a market of around € 400 billion between 2010 and 2035[1].

2.1.1 Fixed offshore wind

Value and forecast

Offshore wind parks were first installed in Denmark in 1991 with fleets of relatively low power. As the power of machines increases (5 to 6 MW per turbine nowadays to 10MW or even 20 MW in the future), installation costs will drop and facilitate the creation of new parks.

The European target for 2020 is 40 GW. The North Sea Region will account for 83% of the market until 2020. Market maturity should be reached in around 2025[2].

Installed capacity and proposed investments in Europe

In 2011, the installed capacity in Europe amounted to slightly more than 3 GW[14]. Four groups (Dong Energy, Vattenfall, E.ON and RWE) were owners of 60% of installed sites. In 2012, a further 3 GW were due to be installed in Europe[16].

Installation costs have increased: from an average of € 1.5m per MW installed between 2001-2007, to € 3.25m for the period 2008-2010[17]. Costs depend on each wind farm: distance from the coast, depth, soil type, etc. For the next period, the cost per MW installed is expected to be between € 3m and € 4m[18].

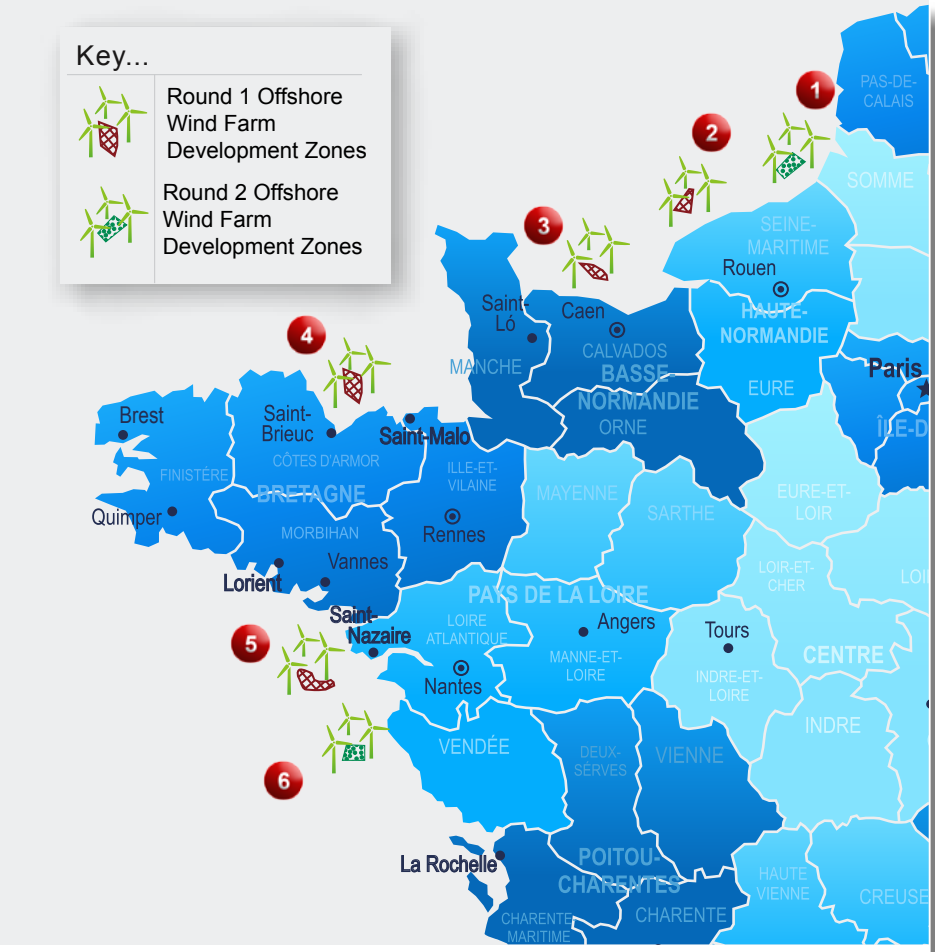
In 2020, the total investments for Europe will be around € 170bn[2] and around € 400bn in 2030[1]. Indeed, each year from 2020, over € 20bn will be invested in offshore wind power.

Fixed offshore wind in France

In France, no fixed offshore wind farms exist at the moment. However, as the second largest maritime territory in the world, opportunities exist. Excluding the targets of 6 GW in 2020 mentioned in the Programmation Pluriannuelle des Investissements (PPI), there is no clear vision in the long-term.

In July 2011, the French government launched a first call for tender to install 3 GW between 2015 and 2020 on the Channel and Atlantic coastlines. This call for tender encouraged the development of the offshore fixed industry and the creation of the following consortia gathering[19].

- One or several energy providers: EDF-EN, Iberdrola, GDF-Suez, Nass & Wind, wpd Offshore, La Compagnie du Vent, Eole-Res or Powéo Direct Energie
- One developer specialised in the offshore industry (Technip) or in the maritime infrastructures (Vinci)



Offshore Wind Farms Under Round 1 and 2 Development - France

Number	Park Name	Sucessful Candidates	Capacity
1	Le Tréport	Not decided (Round 2)	480-500MW
2	Fécamp	Eolien Maritime France (Round 1)	498MW
3	Courseulles-sur-Mer	Eolien Maritime France (Round 1)	450MW
4	Saint-Brieuc	Ailes Marines SAS (Round 1)	500MW
5	Saint-Nazaire	Eolien Maritime France (Round 1)	480MW
6	Ile d'Yeu et de Noirmoutier	Not decided (Round 2)	480-500MW

- One turbine manufacturer: Areva, Alstom or Siemens

After a proposal by the Commission de regulation de l'énergie (CRE) to allocate four parks to the EDF-EN/ Dong/Alstom consortium (named Eolien maritime France), the State decided to allocate three parks to the EDF-EN consortium and one to Iberdrola/Eole-Res (named Ailes Marines SAS).

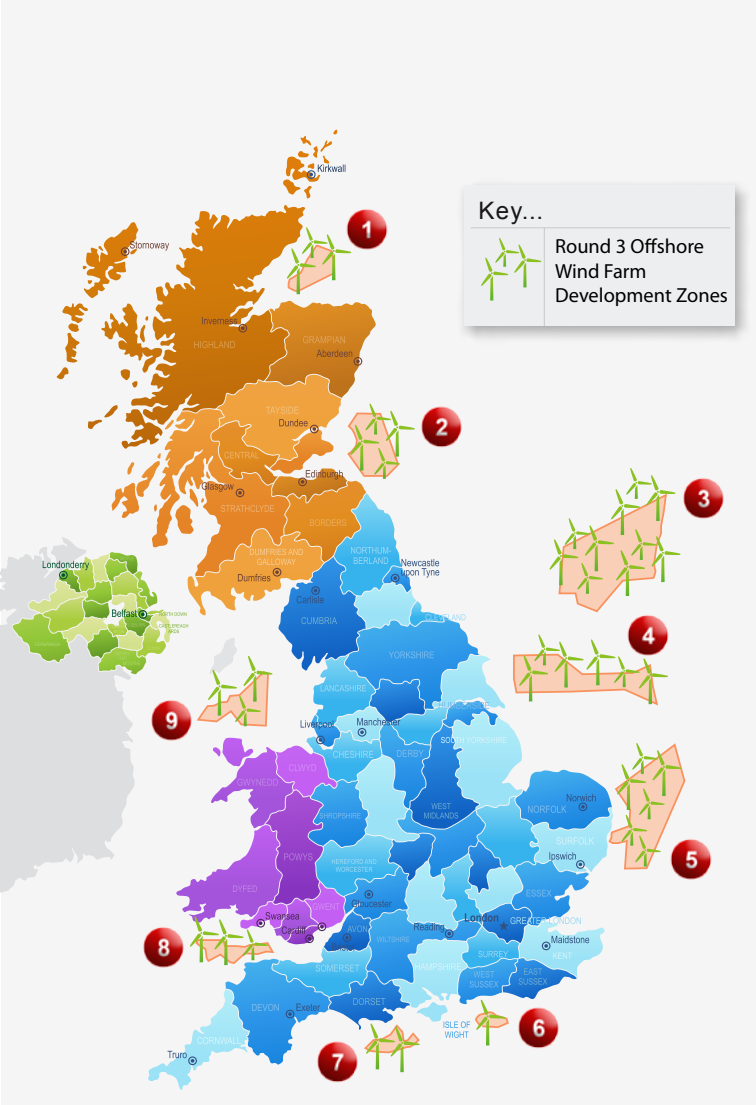
The French government announced a second tender in January 2013 which aims to install 200 offshore wind turbines on two sites: Tréport (Upper-Normandy) and the Island of Noirmoutier (Vendée). The production capacity should reach 1 GW (round 1: 2 GW). Candidates will have to submit their offers at the Commission de Régulation de l'Energie by September 2013. Successful candidates will be selected in January 2014. The two wind farms should begin operating between 2021 and 2023[20].

Fixed offshore wind in the UK

The UK is currently the global leader for offshore wind energy. Five of the ten largest offshore wind farms – including the top two – are in British seas. It has the best offshore resources in Europe, with 1.3 GW of operational capacity and more than 700 turbines installed across 15 wind farms (which generated over 3 TWh during 2010)[21]. In 2012 offshore wind generation increased by 54% on the

previous year[22]. Currently, offshore wind contributes to 1.5% of the UK's electricity supply[23].

A further 4 GW is in the post-consent stage and another 2 GW in the planning system. There is predicted to be 8 GW of capacity installed by 2016, a central range of up to 18 GW by 2020 and potentially more than 40 GW by 2030 (enough to power the equivalent of all the homes in the UK)[24].



Offshore Wind Farms Under Round 3 Development - United Kingdom

Number	Park Name	Sucessful Candidates	Capacity
1	Moray Firth	EDP Renovaveis, Repsol	1300-1500MW
3	Firth of Forth	SEE, Fluor	3465MW
3	Dogger Bank	RWE, SSE, Statkraft, Satoil	9000-12800MW
4	Hornsea	Mainstream, Siemens, Dong	4000MW
5	East Anglia	Iberdrola, Vattenfall	7200MW
6	Rampion	E.On	665MW
7	Navitus Bay	Eneco, EDF	900-1200MW
8	Atlantic Array	RWE	1500MW
9	Irish Sea	Centrica, Dong	4185MW

The Crown Estate, which owns most of the seabed out to the 12 nautical mile territorial limit, has granted leases to developers in a series of rounds:

- Round 1 leases are typically close to shore, and have been mostly installed already – they total around 1 GW of capacity.
- Round 2 identified three strategic areas, totalling 7.2 GW, which are under construction or in development and will be responsible for the capacity additions expected over the next 3-4 years.
- Round 3 leases (launched in 2010) offer up to 32 GW of new generation in 9 zones, which are significantly larger than the areas identified under Rounds 1 and 2 and likely to use larger turbines. Many of the Round 3 zones are in deeper water, further offshore, and are therefore more technically challenging. The Crown Estate also granted exclusivity agreements in 2009 for the development of 6.4 GW in Scottish Territorial Waters. Northern Ireland is considering a leasing round of at least 600 MW, subject to consultation.

In order to provide a stable flow of construction projects to the offshore wind industry, in May 2010 the Crown Estate also announced an additional 2 GW capacity by way of extensions to a number of awarded leases[25].

The average capacity of an offshore wind turbine in the UK is 3.27 MW. The trend is towards turbines with a bigger installed capacity; the average capacity of turbines in construction is 3.54 MW. Each installed turbine produces per year on average electricity which equals the annual consumption of 1,927 households.

2.1.2 Floating offshore wind

Value and forecast

By 2010 globally, around 20 floating offshore wind projects had reached the prototype stage, half of which was reduced scale.

Some 60% of the current tests are being conducted in Europe. The first farms are predicted to be installed by 2015, reaching a globally installed 1.8GW by 2018.

By 2020, the installed capacity in Europe could reach a maximum of 3 GW. According to different scenario in Europe, by 2030 the floating capacity could reach 4 to 26% of the overall offshore (floating and fixed) capacity. The European Offshore Energy Association predicts a potential of 188 GW generating 645 TWh by 2050 in Europe[3].

By 2030 floating offshore wind might produce 450 TWh/year, representing 20% of wind installations in the world[27].

The main market is currently in Europe. The second market will be in Asia: China, Japan and South Korea[1]. Asia aims to develop its parks to reach 8.8 GW by 2020[15]. The United States of America are aiming to reach a 4 GW installed capacity by 2020[15].

Investments worldwide

According to these installation scenarios, the IEA predicts investments worldwide of around € 2.9bn between 2010 and 2020 and just over € 45bn between 2020 and 2035[1]. For its part, the EOEA estimated that for 6 pilot farms to install 40 MW by 2017, it would be necessary to raise € 2.65bn, of which € 1bn should come from a contribution of European bodies[3]. It is estimated that installation costs will decrease from € 11m / MW in 2017 to € 2.8m / MW between 2020 and 2035. This lower cost is realistic because the technologies are expected to follow a learning curve similar to the wind.

In Europe, only 2 MW has been connected to the network (Hywind project, Norway, since 2009). Three European countries are currently working on the development of floating wind: France, Norway and Portugal.

Floating offshore wind in France

The market in France is estimated at 1 GW by DCNS, the French naval defence company, to be around €2bn by 2020[28]. Nénuphar (SME created in 2006, developing the VertiWind project with Technip) estimated 20% of the market share in offshore wind farms will be covered by floating technology by 2030[29], which is about 30 GW. For its part, EDP Renováveis, the Portuguese leading renewable energy company, predicts the development will happen between 2020 and 2025. From the first installations, the cost per MWh is estimated at between € 175 and € 210. It should hover between € 75 and € 125/MWh by 2030[2].

Below are 2 innovative projects using different technologies.

- The **Winflo** project is a pioneering semi-submersible platform with a wind turbine specifically designed for floating offshore, and an innovative anchoring system, suitable for all seabed types. It is a machine suited to depths in excess of 50m[30] . A test farm is scheduled for 2015[31]. Industrial partners involved are Nass&Wind, DCNS (French naval defence leader) and Vergnet (wind turbine developer). Academic partners are IFREMER (French Research Institute for Exploration of the Sea) and ENSTA Bretagne (Post-Graduate and Research Institute based in Brest). The project was certified by Pôle Mer Bretagne in 2008.

Winflo wind farm (two blades version)

- The **Vertiwind** project is an innovative concept of floating wind turbines with a vertical axis, particularly adapted to the conditions of the Mediterranean Sea. Industrial partners are Technip, Nénuphar, EDF Energies Nouvelles and Converteam.

Academic partners are ENSAM Lille and TU Delft. The project was certified by Pôle mer PACA in 2009. A demonstrator should be built in 2014.

Other projects include **HyWind** and **Sway** (Norway), **Winfloat** (Portugal) and French company **IDEOL's** project to develop a moving floating platform solution.

Current test sites in France

The main site in Brittany is the Groix test site (multi-megawatts), developed as part of the French R&D platform named France Energies Marines. This site is expected to accommodate several wind turbines, in particular to test interference. The Winflo consortium is due to be established at this test site. Pending the deployment of this site, a 1 MW test platform from the Winflo consortium was due to be trialled on the SEM-REV off the Croisic (from the Ecole Centrale de Nantes) by the end of 2012. Another test site is also planned in the south of France. It aims to test floats in the Mediterranean Sea conditions. Vertiwind is due to trial its first prototype there.

Floating offshore wind in the UK

In order to harness the UK's huge wind resource, new technology is needed to access waters between 60 and 100 metres deep - too deep for turbines fixed to the seabed, but where wind speeds are consistently higher. The UK's Energy Technologies Institute is commissioning a £25m offshore wind floating system demonstrator, which will require the chosen participants to produce an offshore wind turbine that can generate 5 MW to 7 MW by 2016. The project could be demonstrated off the Cornish coast at the Wave Hub site.

A new Memorandum of Understanding on 'Collaboration in Energy Related Fields'[32], agreed between the UK and US includes collaboration in the area of floating wind to ensure that both countries align their resources to maximise impact. It also enables the sharing of best practice and expertise. Ultimately it is hoped this approach will result in more cost effective, higher yield floating wind technologies being developed.

Key Reports (offshore wind):

Bretagne Pôle Naval (2011), GL Garrad Hassan. Offshore wind energy: the needs and supplies of Brittany companies.
www.bretagnepolenaval.org/modules/kameleon/upload/etudeEN-bpn.pdf

UK Offshore Wind Report (2012), The Crown Estate. A current overview of offshore wind in the UK.
www.thecrownestate.co.uk/media/297872/UK offshore wind report 2012.pdf

Offshore Wind: A UK Success Story (2012), Department of UK Trade & Investment. Illustrating the process of collaboration and innovation.
www.ukti.gov.uk/download/file/310240.html

Towards Round 3: the offshore wind supply chain in 2012. An analysis by The Crown Estate of constraints affecting the delivery of the UK offshore wind.
www.thecrownestate.co.uk/media/357674/towards-round-3-the-offshore-wind-supply-chain-in-2012.pdf

Offshore Wind Cost Reduction: Pathways Study (2012), The Crown Estate. Identifying and quantifying cost reduction opportunities for offshore wind.
www.thecrownestate.co.uk/media/305094/Offshore wind cost reduction pathways study.pdf

A Guide to an Offshore Windfarm, The Crown Estate. An analysis of components and processes involved in the development of a Round 3 wind farm.
www.thecrownestate.co.uk/media/211144/guide_to_offshore_windfarm.pdf

Wind Energy in the UK; State of the Industry Report (2012), RenewableUK
http://www.renewableuk.com/en/publications/index.cfm/SOI2012

2.2 Wave and tidal energy

We have decided to deal with wave and tidal energy in this same section as the industry term 'marine energy' commonly refers to these two technologies. Neither are mature yet.

Wave energy refers to the energy of the ocean surface waves. Tidal energy refers to the energy contained in moving water mass due to tides. This may be tidal stream, harnessing energy from the flow of water currents to power turbines, or tidal range, the power that can be captured from water flowing from high to low. Wave energy has the potential to yield more energy than tidal power as it can be deployed in many more locations. Nevertheless, waves are not predictable, contrary to tidal energy resources.

The EU has a target to deploy up to 1.9 GW of marine energy by 2020, while the USA and Canada are coordinating approaches to develop markets and commercialisation. EU Atlantic-facing countries in particular are focused on developing marine energy, with significant funding allocated to wave and tidal power demonstration projects.

2.2.1 Wave energy

The technical and economic potential of wave energy in the world is estimated at around 1,400 TWh/year for an installed capacity of about 550 GW[33]. Operation times have been evaluated at between 2,500 and 4,500 hours full power equivalent.

Wave Energy in France

In France, the technical and economic potential is estimated at 30 TWh per year[34] which could be produced by 10 to 15 GW installed[33]. To follow the target of 3% of marine renewables, the objective is to install 200 MW generating at least 800 GWh. By 2030, the most optimistic scenario is to reach 2 GW installed in France capable of producing 6 TWh[6].

Technological developments in France

SBM Offshore is developing a wave energy concept using electro-active polymers (EAP) properties at a cost of €18m. This project has the support of ADEME €8m. It is due to be tested on the SEM-REV test site in 2013.

The project SEAREV developed by the Ecole Centrale de Nantes and Rennes ENS Cachan was one of the most advanced in France, but its development appears to be on hold.

In June 2011, Alstom acquired 40% of AWS Ocean Energy and joined partners in January 2012 with SSE Renewables to develop a wave energy site of up to 200 MW by 2020 in the North of Scotland. A first demonstrator of 10 MW is due to be tested in 2016.

Two projects are under development off the Réunion Island. EDF EN, associated with DCNS, should test a version 4 CETO 2 MW of Wave Energy Carnegie Corporation during 2012. Depending on the outcome of trials, the farm will be expanded to 15 MW. In addition, the company Seawatt is exploring options to install a farm of 30 MW Pelamis.

The Bilboquet project, certified by Pôle mer involves the production of a new wave energy system based on the vertical movement of a buoy. This involves creating a new, high-output electricity generating system, based on recycling the energy of the ocean's swell, using the movement of a guided buoy to drive a generator.

DCNS is also working with the energy company Fortum to develop a demonstration site for energy waves in France off the Atlantic coast. Based on the Wave Roller technology of AW-Energy, it should be installed by around 2015. The development is underway at the business incubator unit at DCNS Brest.

Finally, a research project followed by IREX combines several companies and laboratories around the development of sensors for marine energy along coasts and in harbours (EMACOP). The objective of this research program is to assess the possibilities and impacts of the installation of capturing the energy of the swell mainly at dams or coastal port protections. Its budget is €5.6m.

Wave Energy in the UK

The UK has 35% of Europe's wave energy resource. The technical and economic potential of UK wave energy resource is estimated at 70 TWh per year.

In the South West, the Wave Hub was deployed in 2010 to provide a grid-connected offshore facility for the large scale testing of technologies that generate electricity from the power of the waves. Located 16km off the Cornish north coast, the 12-tonne hub holds a 25 year lease of 8 sq km of seabed connected to the grid by a 25km, 1,300 tonne subsea cable operating at 11kV.

Four separate berths are available to lease, each with a capacity of 4-5MW. Wave Hub can readily be upgraded for up to 50MW of generating capacity in the future once suitable components for operating the cable at 33kV have been developed.

In January 2013 Cork-based OceanEnergy Ltd (OEL) was granted a 3 year marine licence for the deployment of the first wave energy device at Wave Hub. The Marine Management Organisation (MMO) granted consent to deploy its €9million OE Buoy wave converter at the site.

The FaBTest site, created in 2011 in Falmouth Bay on Cornwall's south coast, is a wave energy 'nursery' test site aimed at also helping device developers on the critical path to commercialisation. The FaBTest site has a 5 year licence from the UK's Marine Management Organisation for mooring marine energy converter devices. Although not electrically connected, FabTest will enable up to 3 device developers to investigate structural integrity, response behaviour, mooring and umbilical behaviour, subsea components, monitoring systems and deployment procedures in moderate sea conditions before deploying devices in more energetic offshore conditions. In April 2012, FaBTest installed Norwegian firm Fred Olsen's BOLT "Lifesaver" wave energy converter. It is currently being tested at the site before potentially being deployed at the grid connected Wave Hub site.

Key Reports (wave energy):

UK Wave Energy Resource (2012), Carbon Trust. Identifying the potential for wave energy generation in the UK
www.carbontrust.com/media/202649/ctc816-uk-wave-energy-resource.pdf

Marine Energy in the UK: State of the Industry Report (2012), RenewableUK. An analysis of policy, financing & funding, projects and device in development and the challenges ahead.
www.renewableuk.com/en/publications/reports.cfm/Marine-SOI-2012

Technological developments in the UK

- UK company Pelamis installed the world's first wave farm off the Portuguese coast in 2008.
- Vattenfall and Pelamis are involved in a joint venture, known as Aegir Wave Power, to develop a project off the Shetland Islands of up to 10MW capacity. The project is currently conducting environmental and resource assessments ahead of an expected planning application to Marine Scotland in 2014.
- Aquamarine Power installed the first 315kW Oyster wave energy device off the coast of Orkney in 2009. It is now working on a number of marine energy projects in various locations around the world.
- OceanEnergy Ltd is working with Wave Hub to deploy its 1 MW device at the site in 2013, in collaboration with technology partner Dresser-Rand. OEL is currently in discussions with local supply chain companies about support with fabrication and deployment, and hopes to operate from the newly refurbished North Quay in Hayle Harbour. This means that two of Wave Hub's four berths have now been reserved as US and UK-based Ocean Power Technologies (OPT) has already signed a commitment agreement to deploy its PowerBuoy device.

Other UK players:

- Checkmate SeaEnergy Ltd
- Dartmouth Wave Energy
- Embley Energy
- Offshore Wave Energy

2.2.2 Tidal energy

Value and forecast

While tidal range technologies are largely proven, they need to be deployed through commercial-scale construction projects to be successful. Developers are currently evaluating a number of specific projects but these are unlikely to be operational and making a significant contribution before 2020, given the high costs and lead times for construction.

Tidal current energy conversion projects are concentrated in a few places in the world. Operational activity in Canada's Bay of Fundy offers Europe strong development opportunities. The Technical and Economic Potential in Europe amounts to 11 GW. The UK has the first potential in Europe with 6 GW. France comes second with 3.5 GW[2].

For a park with 5 to 10 machines, estimated costs are € 4-5 M/MW. These include: € 1 to € 1.15 M for studies and authorisations, € 0.5 M for engineering, € 1M/km for connecting, and € 1.5M for the mobilisation and demobilisation of resources and maritime hazards.

Forecast growth in France

In order to reach its commitments (3% of marine energy[5]) about 400 MW tidal turbines must be installed in France to produce 1.4 TWh/year[6]. Most of these facilities will be in the Raz Blanchard, between the Channel Islands and the tip of the Cotentin. DCNS has submitted a case to NER 300 (financing instrument managed jointly by the European Commission, European Investment Bank and Member States) for a 17 MW project to install a pilot farm[36].

In Brittany, the installed capacity in 2020 could reach 10 MW and produce 10 to 30 GWh per year. It corresponds to an operation between 1,000 and 3,000 hours equivalent full power[8]. Potential sites are the Raz de Sein, the Fromveur and Heaux Brehat[6].

The cost of the original tidal MWh in 2011 stood at around € 250. In 2030 it is expected to fall between € 100 and € 150[2]. DCNS believes the first farm (between 200 and 300 MW) in the Raz Blanchard may be less than €180/MWh[35].

Technological developments in France

In France, several energy companies are interested in the development of farms:

- EDF through its test site Paimpol Bréhat, and
- GDF-SUEZ, through its subsidiary Eole Generation, now called GDF SUEZ Future Energies. A partnership agreement was signed in June 2012 between Sabella and GDF SUEZ.

Three developers are working on large scale turbines:

- The Sabella SME from Finistère developed a full scale demonstrator (Sabella D10) and targets the North American market. Sabella should launch a demonstrator of 500 kW in 2013 in the Fromveur Passage off the Ouessant island[36]. The maritime and land prefecture has given their authorization for the installation of the demonstrator.
- DCNS in cooperation with the Irish SME Open Hydro. In total by 2015, 2 MW should be connected to the Paimpol Bréhat site in Brittany to produce 3.5 GWh/year[8]. EDF is expected to invest €40m for the development of 4 machines[36].
- Alstom for the Clean Current technology. As part of the test site alongside the Paimpol Bréhat farm, Alstom will also test the tidal ORCA tidal turbine in 2013.

Moreover, there are other manufacturers working on models of smaller tidal devices adapted to different configurations: rivers, estuaries, passes in the atolls. Three manufacturers are notable front-runners: Hydroquest (Harvest Technology), Ecocinetic (Hydroomel tide) and Le Gaz Intégral (BlueStream project in the Etel River, Morbihan).

The French government issued a request for information in April 2012. This inquiry should result in a tender in 2014[35]. The first pre-commercial farms are expected to emerge in 2018 with 1.5-2 MW machines.

Sabella tidal turbine

The development of tidal energy in France should follow the schedule below.

Date	Description
September 2012	Delivery of the letter of intention
Early 2013	Publication of a call for interest (AMI)
2013	Businesses to prepare their answers
Early 2014	Selection of winners
2015/2016	First projects to be installed (if the work of services of the State regarding authorisation procedures is prepared)
2018/2020	First call for tenders

Development timetable for tidal energy in France

Key Reports (tidal energy):

UK Wave and Tidal: Key Resource Areas Project (2012), The Crown Estate. Identifying the size and distribution of wave and tidal resources around the UK.
www.thecrownestate.co.uk/media/355255/uk-wave-and-tidal-key-resource-areas-project.pdf

Turning the Tide: Tidal Power in the UK (2007) An analysis of tidal stream and tidal range technologies and development recommendations.
regensw.s3.amazonaws.com/1275817930_728.pdf

Marine Energy in the UK: State of the Industry Report (2012), RenewableUK. An analysis of policy, financing & funding, projects and device in development and the challenges ahead.
www.renewableuk.com/en/publications/reports.cfm/Marine-SOI-2012

Forecast growth the UK

The UK has around 50% of Europe's tidal resource. The Technical and Economic Potential of UK tidal energy resource is estimated at 29 TWh per year.

Technological developments in the UK

- Marine Scotland approved the largest tidal stream project in the world so far in 2011 at Islay.
- Marine Current Turbines Ltd installed the first commercial scale tidal generator, called Seagen, in N. Ireland's Strangford Lough in 2008. It currently has the capacity to generate power for the equivalent of about 1,500 homes each year. Two initial tidal array projects, the 8-MW Kyle Rhea project in Scotland and the 10-MW Anglesey Skerries project in Wales, are now in an advanced stage of development.
- OpenHydro's Open-Centre Turbine is one of the world's first tidal energy technologies to reach the development stage of permanent deployment at sea. The first 6m test unit produces enough energy to supply 150 homes each year. OpenHydro has recently announced major projects in both Europe and North America.

Other players:

- Tidal Generation
- The Severn Tidal Reef Project
- Aquascientific Limited
- Hammerfeset StrØm
- Atlantis Resources

- Scotrenewables
- Voith Hydro

2.3 Ocean thermal energy and sea-water air conditioning

2.3.1 Ocean thermal energy conversion (OTEC)

The principle of the Ocean Thermal Energy Conversion (hereafter OTEC) consists of using the difference of the surface water temperature (around 25°C) and deep water around -1,000 meters (around 5°C). This natural temperature difference enables the production of electricity 24 hours a day, all the year. The potential of OTEC is thus located in the tropical belt where the temperature gradients between layers of water can reach 20°C. Insular territories located in the tropics zone might thus have access to the energy autonomy thanks to OTEC technology. Indeed, in the islands where the price of electricity is high, the first OTEC technologies should be competitive.

The technical exploitable potential is about 150 GW corresponding to a production of about 1,000 TWh[2].

In France, the naval defence company DCNS has developed a ground test bed now installed in the Réunion Island. Beside it, a NER 300 case has been submitted (financing instrument managed jointly by the European Commission, European Investment Bank and Member States) for a pilot plant in the Martinique island in 2015[36].

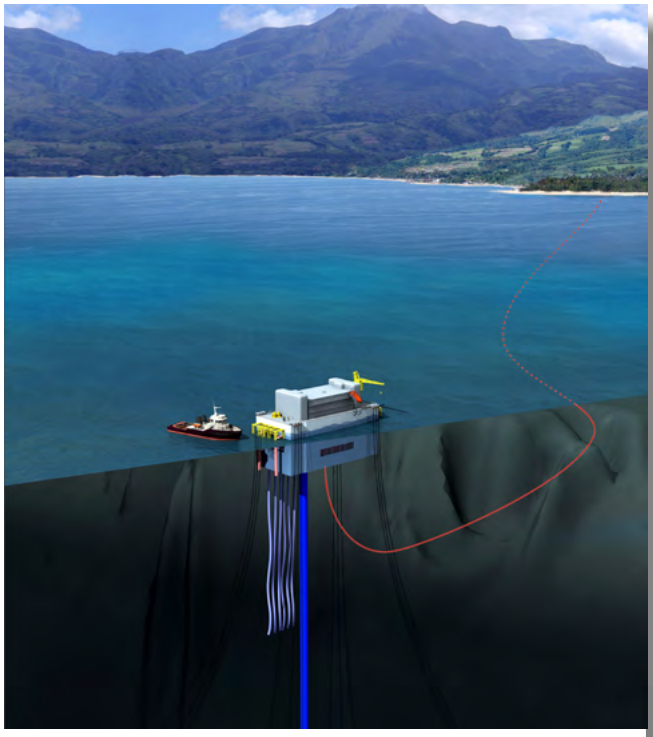
2.3.2 The sea-water air conditioning (SWAC)

The SWAC system operates in the deep waters of seas, oceans or lakes as a cooling source. The principle is simple: a pipeline is installed in sea-water at a depth at which the water is ice-cold year-round. This water is then distributed through the air-conditioning system by means of an exchanger[37].

Several projects have already been developed such as at the Intercontinental Hotel in Bora-Bora (since 2006), but also in the temperate zone such as the example of the air-conditioning system of Stockholm's city-centre. Cities in the Mediterranean area are also working on SWAC projects: Barcelona, Monaco (bay) and Marseille. In France the Deprofundis group is specialized in design/implementation of SWAC technologies.

Opportunities for local businesses

The SWAC technology is largely unknown compared to other marine energy technologies. However, in the future it could represent a source of opportunities for small businesses. It is recommended that they continue to monitor developments in this industry to ensure no missed opportunities.



Ocean thermal energy power station, Réunion Island, DCNS

Further information:

Sea-water Air Conditioning Technology:

- www.pacificbeachcomber.com/sustainability/swac/
- www.makai.com/p-swac.htm

Need to Know:

- Europe is well positioned in terms of natural resources. Many types of technologies exist. However they are not at the same level of maturity. Eg: fixed offshore wind energy reached maturity contrary to wave and tidal energy.
- France and the UK have different strategies in terms of marine energy development, which impacts on regions such as Finistère and the South West of the UK.
- What is important to state is that all of these technologies could provide opportunities for local businesses. Each company wishing to engage must map its location in the marine energy supply chain of each technology.
- It is important for the industry to keep its costs down as it matures, in order to be viable, competitive and profitable. The search to make savings across the finance, technology and services creates opportunities for solution-led and innovative businesses to enter the supply chain.

Projects certified by Pôle mer Bretagne

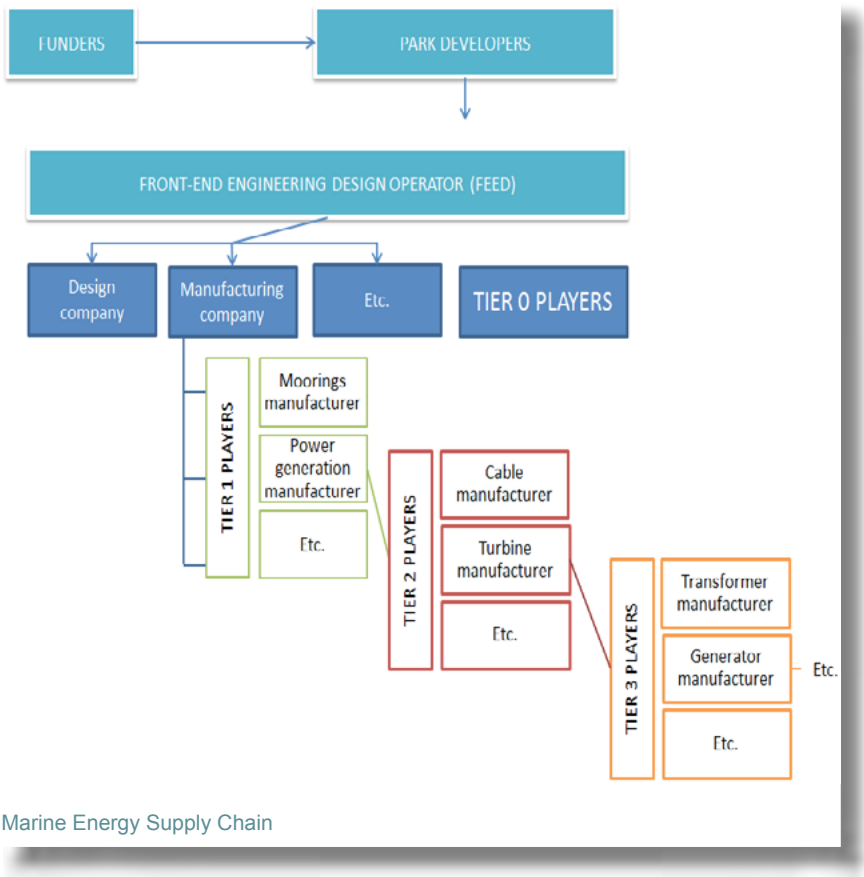
Project Name:	Organisation:	Description:
Floating offshore wind	Diwet	Deepwater Innovative Wind Energy Technology
	Winflo	Deep-water offshore wind turbine floating on a semi-submersible platform anchored using catenary mooring cables
Tidal energy	Marenergie	Harnessing tidal power
	Sabella	Harnessing tidal power
	Orca	Full-scale tidal turbine demonstrator at Paimpol Bréhat
	Megawatforce	Exploiting the power of ocean currents for a predictable source of electricity
	BluStream ®	Innovative second-generation high-output turbine
Wave energy	Bilboquet	Producing electricity by recycling energy from the ocean swell

Chapter 3:

Supply Chain

3.1 Mapping your position in the supply chain

The supply chain is made up of plenty of organisations with hierarchical relationships as shown in the graph below. We thus can identify different strands or tiers.



Marine Energy Supply Chain

Three types of organisations are at the top of the supply chain: **funders** (banks, investors, etc.), **park developers** (eg: Iberdrola, EDF-EN, E.ON, Dong Energy, Scottish Power, Vattenfall, Nass&Wind etc.) and **front-end engineering design operators** (FEED or master-builders). The **FEED** operators are responsible for the entire engineering work of a project. In most cases, they segment the work to be done (designing, manufacturing, installation, etc.). After a tendering process, these segments can then be assigned to different organisations, also called **tier 0** organisations (eg: RWE npower). These **tier 0** players are responsible for their segments. They can either keep the work internally or contract it out to other companies, depending on their strategy, skills, etc.

When **tier 0** players call in external skills, another strand is formed with **tier 1** organisations that are responsible for a specific part (eg: moorings, power generation, etc.) of a specific segment (e.g. manufacturing). The **tier 1** players can also be identified through call for tenders.

Among **tier 1** players, two major trends are noteworthy: a trend towards **outsourcing most studies for a whole segment** (see next section on tier 2 players); and another trend where certain **key skills are kept internally** and a

Useful supply chain reports:

- Marine Energy and Offshore Wind, South West Supply Chain Directory (2012), RegenSW. www.regensw.co.uk/projects/offshore-renewables/offshore-supply-chain
- Offshore Wind Industry Companies in Brittany (2013), Bretagne Pole Naval. http://bretagnepolenaval.org/?langue=en
- Scottish Offshore Renewables Development Sites (2011), Scottish Enterprise. www.scottish-enterprise.com/~/media/SE/Resources/Documents/STUV/SDI-west-coast-clusters.ashx
- Orkney Renewables. An example of a supply chain in operation in northern Scotland. www.orkneymarinerenewables.com/supply-chain.asp
- POWER: Pushing Offshore Wind Energy Regions – Transnational Offshore Wind Supply Chain Study, Douglas-Westwood. http://www.offshore-power.net/Files/Dok/2007-06 power - transnational study update.pdf
- Cost estimation methodology – The Marine Energy Challenge approach to estimating the cost of energy produced by marine energy systems, Carbon Trust. http://www.carbontrust.com/media/54785/mec_cost_estimation_methodology_report.pdf

large number of studies are outsourced (data acquisition and impact studies).

The same procedure can continue as long as a skill is needed externally with **tier 2**, **tier 3** or sometimes even **tier 4** players as shown in the graph.

Small and medium-sized companies will thus mainly work at **tier 2**, **tier 3** or **tier 4** levels. However, **tier 0** or **tier 1** players are not specifically looking for companies having all the skills. Businesses are able to collaborate to create joint-ventures to answer to a call.

3.2 Products and services

The objective of this section is to create a picture of products and services required in the different technologies. This will provide an overview to small businesses on how and where they can intervene in the supply chain.

Phase-by-phase product and service definitions:

The **Feasibility phase**:

- Geological surveying
- Oceanographic surveying
- Environmental assessment
- Human activities assessment
- Resource assessment
- Feasibility assessment

The **Planning phase**:

- Permission aspects
- Planning
- Insuring
- Financing
- Legal aspects
- Purchasing

The **Design phase**:

- Project design
- Offshore design
- Mechanical design
- Hydrodynamic design
- Electrical system design

- Civil (onshore) design
- Control system design

The **Manufacturing phase**:

- Moorings
- Floating/offshore structure
- Energy coupling structure
- Control equipment
- Navigation communication equipment
- Power transmission equipment
- Power generation manufacturing
- Onshore structure construction
- Resource assessment equipment

The **Testing/certification phase**:

- Prototype testing (small scales)
- Full scale testing (near commercial)
- Component testing
- Component verification

The **Installation phase**:

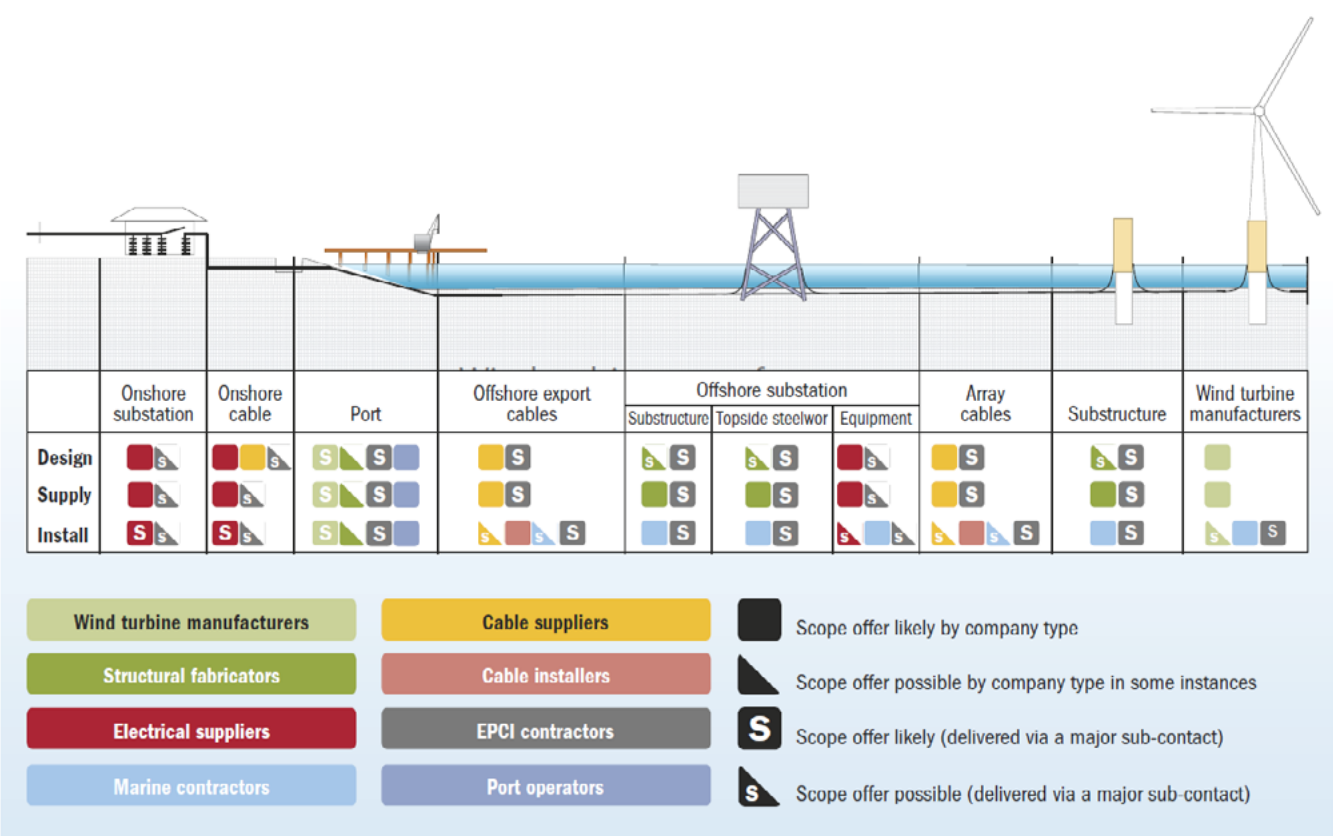
- On site, onshore assembly
- Cable laying
- Transport
- Offshore construction
- Onshore engineering

The **Operation and maintenance phase**:

- Integrity management
- Performance evaluation/maintenance
- Recovery and repair
- Reliability management
- Structural monitoring

3.2.1 Offshore Wind: products and services required

In offshore wind, the fixed technology is mature while the floating technology is still under development. The graph below illustrates the main components and operators



The main components and operators needed for an offshore wind park[39]

Useful guides to offshore wind farms:

A Guide to an Offshore Wind Farm , The Crown Estate
www.thecrownestate.co.uk/media/211144/guide_to_offshore_windfarm.pdf

Siemens Wind Power. 360° interactive offshore wind farm video
www.siemens.com/innovation/pool/features/siemens360/wind-power/index.html

needed for a fixed offshore wind park's deployment. According to the European Wind Energy Association, "It is clear that for the vast majority of the supply chain, there is more than one type of company which could supply the required goods or services. The design and supply of the wind turbine units themselves is the notable exception to this rule, where the manufacturers are currently the exclusive providers. "The supply chain landscape provides the project developer with a reasonable degree of flexibility when approaching the contracting market. The emergence of major contractors from the offshore oil and gas sector as active participants in the upper levels of the supply chain for offshore wind is an interesting recent development.

"In many cases it could be argued that these companies offer the financial strength, offshore project execution experience and strategic assets that some incumbent participants lack.

"However, the difference in the nature of the engineering problem (which for offshore wind primarily consists of serial production processes rather than "one-offs" as for the oil and gas sector), as well as the marginal economics of offshore wind as a technology, are factors which may prove challenging for this class of contractor".

3.2.2 Wave and tidal energy: products and services required

The wave and tidal technologies are in the development phase, compared to offshore wind. Many technologies are currently being tested and on the whole there is no

Research & Development	Feasibility Assessment	Planning	Design	Manufacture	Installation	Operation	Decommissioning
Energy conversion technology	Geophysical	Project planning	Project design	Moorings	onshore assembly	Integrity management	Offshore disassembly
Energy storage/Usage	oceanographic	Permits	Offshore design	Floating/Offshore structure	Cable laying	Performance evaluation	transportation
Prototype testing	Heritage	Insurance	Mechanical Design	Energy coupling system	Transportation	recovery and repair	Recycling/Waste disposal
Investment	Environmental	Finance	Hydrodynamic design	Power generation equipment	Offshore construction	Reliability management	Refurbishment
	Competing use	Legal	Electrical system Design	Power transmission equipment	Civil (onshore engineering)	Structural monitoring	Environmental compliance
	Financial feasibility	Power purchase agreement	Civil (onshore) design	Navigation/ common equipment	Environmental monitoring	Environmental monitoring	
			Control system design	Control equipment			
				Energy storage system			
				Onshore structures construction			
				Resource assessment equipment			
				Component testing			
				Component verification			

The wave and tidal supply chain

consensus in one technology. However, for tidal stream there is a trend towards horizontal axis three-bladed turbines.

The products and services needed depend on the technology chosen. However, it is possible to create a general graph of the wave and tidal supply chain (above) to help businesses position themselves in the market.

3.2.3. Ocean thermal energy conversion and SWAC: products and services required

It is difficult to compile a list of products and services required for the OTEC and SWAC technologies since they are not mature yet. Varying technologies exist at the moment that require a range of products.

3.3 Products and services availability and criticality

This section has been segmented into four parts. We recomend you skip to the section most relevant to your business. Use the tables throughout to quickly identify criticality of components.

One of the aims of this study was to determine whether a component or element is considered critical to the supply chain and if so whether it is easily available for utilities (ie: energy providers and tier 1 organisations) and device developers. This report is a qualitative rather than quantitative assessment of the current state of industry in France and the UK.

A **critical** component or element is one that is regarded as essential to a project. Critical elements are given greater focus by energy providers and park developers. An available component or element is one that you can find or obtain without difficulty.

Key industry players (energy providers, park developers, foundation and turbine manufacturers) were asked to score whether they consider different components of projects as available or unavailable. They used a scale ranging from easily available "++" to not available at all "--". Similarly, we asked them whether they consider a component critical or not.

Important reports:

The findings in this section of our study compliment the results of two other recent research reports in this field:

- Review of engineering and specialist support requirements for the ocean energy sector (2009), the Sustainable Energy Authority of Ireland's Ocean Energy Development Unit www.seai.ie/Renewables/Ocean_Energy/Ocean_Energy_Information_Research/Ocean_Energy_Publications/Engineering_Study.pdf

- "Towards Round 3: the offshore wind supply chain in 2012" The Crown Estate www.thecrownestate.co.uk/media/357674/towards-round-3-the-offshore-wind-supply-chain-in-2012.pdf

Here are some of the key findings, which provide an analysis of the potential opportunities for local businesses in the different phases of project developments: pre-construction, construction, installation, operation and maintenance and decommissioning (to a lesser extent). Please note, French organisations participated greater in providing information for this section of this transnational report. Therefore there is a balance towards marine renewable energy activity in France, which is at a relatively less mature stage to the UK, yet still represents strong opportunities to both countries.

3.3.1. The pre-construction phase

We have divided the pre-construction process into 3 categories: the feasibility phase, the planning phase and the design phase.

Feasibility phase

Component / element	Criticality	Availability
Geological surveying	Critical for PD	-
Oceanographic surveying	Critical for PD	0
Heritage assessment		-
Environmental assessment	Critical for EP & PD	+
Human activities assessment	Critical for PD	-
Resource assessment	Critical for PD	+
Feasibility assessment	Critical for PD	-

Table 1: Criticality and availability of components/elements in the feasibility phase
KEY: PD = Park Developer, EP = Energy Provider, SCALE: ++ easily available to -- not available at all

In the feasibility phase, most of the elements are considered as critical by park developers or energy providers (environmental assessment). Interestingly, geological surveying, human activities and feasibility assessment are all components that park developers or energy providers find difficult to access. Environmental assessment and resource assessment seem easily available.

For tidal energy, the materials used are different from those used for offshore wind (e.g. Acoustic Doppler Current Profiler) and the data acquisition process is predicted to cost 20% to 25% more.

Tier 1 players are used to working with engineering offices and are more aware of the particular constraints linked to marine studies. The weather-dependency for operations is for example better understood. Human risks and the risks linked to the acquisition of data are other examples.

The trend is for tier 0 players to enter partnerships with engineering offices. Engineering offices more often work with the support of large engineering groups, notably to benefit from their legal services when analysing contracts.

The development costs in answering to the specifications (eg: French Round 1) vary widely from one developer to another as the methods used and the sites differ. Some players did not conduct any studies. Others did many studies before the publication of the call's answers and, while respecting the same criteria, therefore produced work of a different quality for Round 1.

Key players in this phase report that costs vary widely and that it is difficult to quantify the cost of the studies in relation to the total costs of the whole project. Further feedback is required to obtain these figures. The costs of studies do not tend to decrease. Indeed, more and more things are asked during the impact studies stage (eg: bat reports).

For **offshore wind studies**, partnerships generally group together tier 1 and 2 players. The relationship between tier 1 and 2 players is difficult to define. Governance of the partnership is not yet formalised. Tier 2 players have difficulties targeting the right spokesperson or getting clear answers to their questions. Answers given by organisations in the same partnership sometimes differ. Tier 2 players identify this problem as a lack of skills inside the partnership in regard to geophysical and environmental studies. The size difference between actors can be an issue for collaborative work. Being a small engineering office can cause problems if absorbed by a bigger company. Partnerships require a stringent legal framework. Specification constraints provide advantages to bigger foreign engineering offices: 2 ships available 24hrs/day that can be deployed at short notice (too short to let small companies compete), payments delays (payments only made upon delivery, sometime a 30% pre-payment is agreed), etc. Mariners (fishermen or those working in marine energy) should not rely on the studies' activities phase being complementary. The use of fishing vessels has constraints as scientific obligations and logistical needs differ from the needs of each sector (24h a day, space to sleep, to eat, etc.).

Planning phase

Component / element	Criticality	Availability
Permitting	Critical for EP & PD	-
Planning	Critical for EP	++
Insuring aspects		++ (EP: -)
Financial aspects	Critical for EP & PD	-
Legal aspects	Critical for EP & PD	+
Power purchase aspects	Critical for PD	0

Table 2: Criticality and availability of components/elements in the planning phase
KEY: PD = Park Developer, EP = Energy Provider, SCALE: ++ easily available to -- not available at all

The planning phase is a critical element of a project according to energy providers and park developers, especially relating to: permitting, planning (particularly for energy providers; component kept internally), financial and legal aspects, and power purchase aspects. The availability of these components varies widely.

The opportunities for local businesses might be poor as it appears that the management of the overall planning - as well as the financial and legal aspects - are often kept internally.

Design phase

Component / element	Criticality	Availability
Project design	Critical for EP & PD	+
Offshore design	Critical for PD	0
Mechanical design	Critical for PD	++
Hydrodynamic design	Critical for PD	+
Electrical system design	Critical for PD	+
Civil (onshore) design		++
Control system design		+

Table 3: Criticality and availability of components/elements in the design phase
KEY: PD = Park Developer, EP = Energy Provider, SCALE: ++ easily available to -- not available at all

In the design phase, most of the components are critical for park developers. The overall project design is also a critical component for energy providers. However, the management of the park design is mainly kept internally by utilities.

Conclusion on the pre-construction phase

The pre-construction phase does not require huge investments and therefore might offer opportunities for local businesses. But they should focus on the feasibility (study) phase as most of the work for the planning and design are kept internally.

In the pre-construction phase, "environmental, engineering and surveying services are traditionally delivered by small to medium local companies. A number of companies in Brittany are well suited to these roles". Furthermore, "a few companies also have relevant capabilities and ambition to design, fabricate and install meteorological masts for projects". It is the same case for South West England companies.

Importantly, in most cases, the studies are paid only when delivered (30% might be paid in advance). The company thus requires a good financial health.

3.3.2. The construction phase

For the construction phase, offshore wind and tidal energy projects are divided into 3 groups:

- Energy harnessing
- Floor/machine connection
- Energy transmission

An assembly site is located near each settlement. This site requires adequate handling mechanisms.

Manufacturing

Manufacturing is another key element of a marine energy project, especially for park developers: moorings, floating/offshore structure, power transmission equipment, power generation manufacturing and onshore structure construction.

Some difficulties are experienced in sourcing suppliers in floating/offshore structure and to a greater degree in moorings, power generation manufacturing and power transmission equipment.

In contrast, resources are readily available in energy coupling, control equipment, navigation communication

Component / element	Criticality	Availability
Moorings	Critical for PD	0
Floating/offshore structure	Critical for PD	-
Energy coupling structure		+
Control equipment		+
Navigation communication equipment		++
Power transmission equipment	Critical for PD	0
Power generation manufacturing	Critical for PD	0
Onshore structure construction	Critical for PD	+
Resource assessment equipment		++

Table 4: Criticality and availability of components/elements in the manufacturing phase KEY: PD = Park Developer, EP = Energy Provider, SCALE: ++ easily available to -- not available at all

equipment and resource assessment equipment (not deemed critical) and in onshore structure construction (deemed critical).

According to a study led by GL Garrad Hassan, "as in the pre-construction phase, consultancy and project management support roles will also be available with project owners, project investors and lenders as the main customers."

Fixed offshore wind products/services

Foundations

Manufacturing foundations will depend on a large company being capable of investing €75M. However, several elements will be potentially produced through sub-contracting: docking components, components of sections, J-tube, transition components. Companies need an insurance quality system. All welds are controlled by ultra-sound.

For the Saint-Brieuc wind farm, the jacket technology is under study and will be validated depending on the results of geological studies which began in October 2012. Local ecomomic impacts will vary largely according to the technology selected (jacket, monopile, gravity foundations, etc.). The engineering division of the Ailes Marines consortium is led by Technip.

Contrarily to what one might think, in France the naval industry is not in the best position to manufacture foundations of offshore fixed wind turbines or tidal turbines. Indeed, constraints are different: serial production is a requirement, specific welding is also needed, etc.

In northern Europe, some foundation manufacturers are currently in financial difficulty. The question for Brittany companies is to analyse whether those investments are relevant to the needs of the region and whether they offer a durable solution.

Blades

Full-scale blades for offshore wind will probably not be produced in Brittany but prototypes blades could be. Brittany businesses have a strong experience with composites e.g. the Coriolis Composites (Lorient) company which work on the development of a technological platform to test blades fatigue. Work opportunities exist for tidal blades which are smaller.

In Denmark, for example, a factory covering 50 hectares has private roads and is able to produce 8 blades a week, each one measuring 75 meters. Opportunities may also arise in the tidal sector where blades are smaller. The example of the blades shows that companies involved in a precise domain (e.g. composites) are not the best suited to respond to the needs of developers. A company from the automobile sector might be more suited to do it as it already deals with automotive processes. To integrate into the supply chain, manufacturers must be prepared to take the risk as they are investing without a mid or long-term vision of the market.

Tower

The value of the tower equates to 7% of the value of the wind turbine. In France, for the Saint-Brieuc project, the manufacturer is chosen by the turbine manufacturer, AREVA. It will be located in Le Havre. 18% of the value should be devoted to SMEs. Indeed, tower components can be made in Brittany: wide crinoline, security and fire system, electric tray cabinets.

Turbines

The turbine manufacturers' target is to find competitive suppliers rather than innovative suppliers, 2-3 suppliers per component. The selection of suppliers of critical components will be closed at the end of 2013 for this phase in France. For other components, the consultation will take place later. Suppliers will have to handle the notion of small series and heavy or large components handling and logistics, as in aeronautics. A quality system is a good indicator of the control of the series. Some intellectual services are also considered critical especially those related to control system and monitoring. Sub-contracting of operation such as sub-assemblies are not decided yet but this choice implies strong logistical constraints. In principle the selection of suppliers will encourage longer term contracts. Volumes for Round 1 in France will depend on the orders received. 18% of the components should be provided by SMEs.
Most manufacturers strive to maximise local sub-contracting. There is pressure to develop components needing a pre-qualification. For components not needing pre-qualification, the delay is 2 years. The procurement policy follows a Pareto approach (to focus on limited tasks that produce maximum effect):

- For critical components: one supplier and one challenger (as a backup and to increase competitiveness)
- For important components, but not critical: two suppliers and possibly challengers
- For common components: the management of these components appear to be external

Electrical/electronic components

Electrical/electronic components are available off the shelf. Their installation should be subcontracted. The level of qualification of Brittany businesses in this sector is of high-value. The Brittany industry could play a role in the electricity game. Indeed, many companies are already dealing with this issue and the marine market does not require huge investments.

Nacelle steel structure and composite housing

Nacelles structures are transportable via road and can be produced by companies used to serial production and the boiler-making industry. Skills in naval manufacturing are not required. For the structure of the nacelles, companies with experience in the series and the boiler will win the market. The construction of safety casings in composites is easier for larger wind turbines than for small ones because instead of a self-supporting structure, it consists of the mantelpiece of a structure that's welded to integrate with the helihoist platform. This work is done by panelling. All the panels fit in a container for transportation. This work is accessible to Brittany companies. In order to be competitive, interested companies must adopt an industrial process and serial production procedures. The investment to obtain these markets must be in place. Some corporations believe in local production and authorities are playing a key role here.

Floating offshore wind products/services

The assembling of a 1 MW demonstrator is scheduled in Brest harbour for 2013. A pre-series of 5 machines of 5MW each are due to be built between 2014 and 2016. The serial production will also be realized in Brest. Many economic benefits are expected in Brittany. The suppliers selected for the demonstrator should be different from the pre-production as skills required are different.
The pre-production will handle multi megawatt involving different masses for nacelles and blades. From the pre-production, developers must implement the process of building closest to the industrial phase. Suppliers will be able to control the series construction. Maintenance intervals for major interventions are 5 years.
For pre-series, project developers are interested in creating strong partnership relations with its suppliers to help meet the challenges of rapidly reducing costs and improving performance. They should also make use of providers' complete sub-assemblies that could sub-contract needs. Developers keep an eye on these sub-contractors and require confidentiality. Innovative SMEs are welcome. An important place is left to them in the industrial scheme.

Tidal products/services

A tidal turbine is composed of three main sub-systems: the blades, the turbine and the base. Some manufacturers place little economic priority in Brittany, more in Normandy. However, companies able to position themselves in the transition components of offshore wind foundations can work on the structure of tidal energy converters.

The blades of turbines could be made in Brittany. For integrated manufacturers, the most important needs for the turbine will be light boiler manufacturing for which Brittany suppliers can intervene. Developers working with foreign assembly manufacturers want to source mainly French components. The key role of assembly manufacturers is the integration of components and the control command system. For France's maritime industry to advance in MRE, it must develop its skills (welding, serial production) and invest in equipment. The building of large components in the Saint-Brieuc zone will encounter logistics issues. One of the solutions could be the construction of a regular train line between Brest and Saint-Brieuc, in case the foundations are produced in Brest. This line would complement the Brest – Cherbourg line.

It is crucial that semi-automatic welding tools are created to enhance the welding quality (repetitions) and decrease the monitoring costs.

Testing/certification

The testing/certification phase is a crucial phase for park developers. Two elements of which are not readily available: prototype testing and full scale testing.

Component / element	Criticality	Availability
Prototype testing	Critical for PD	-
Full scale testing	Critical for PD	-
Component testing	Critical for PD	+
Component verification	Critical for PD	+

Table 5: Criticality and availability of components/elements in the testing/certification phase
KEY: PD = Park Developer, EP = Energy Provider, SCALE: ++ easily available to -- not available at all

3.3.3. The installation phase

Component / element	Criticality	Availability
On site, onshore assembly	Critical for PD	0
Cable laying	Critical for PD	0 (EP: -)
Transport	Critical for PD	-
Offshore construction	Critical for PD	0
Onshore engineering		-

Table 6: Criticality and availability of components/elements in the installation phase
KEY: PD = Park Developer, EP = Energy Provider, SCALE: ++ easily available to -- not available at all

In the installation phase, all the elements/components are critical for park developers, except onshore engineering. There are no specifications regarding the modes of transport for heavy materials and port handling. Therefore the offshore wind sector represents diversification opportunities for companies engaging in this market.

The strategy is to capture some of the market share in port handling, coastal transportation and port logistics.

Focus on the installation vessels

The installation and installation vessels rely on tier 1 businesses. Some companies are also considering becoming ship-owners and providing crew services. Park developers prefer catamarans which are more stable. Sea conditions vary per site, so the size and type of vessels vary accordingly. Developers for France have sought 4 ships per site but in England and Germany, this number is double for parks of the same size. The market for support vessels for French sites would initially be 20-30 ships. In accordance with the French Government's energy strategy (eg: decreasing nuclear activity), it is predicted 200 ships (or even 300 to 400 in the longer term) will need to be built to meet demand. From initial contract to the delivery of a boat takes 2 to 3.5 years. Consortia must therefore enter in contract mid-2013 for a delivery date in 2016. Once delivered, it is necessary to train crew (maximum 3 months).

During this phase, there is an installation rate of approximately 1 jacket per day, which requires approximately 30 boats

permanently on site. For the Saint-Brieuc offshore wind farm, Technip is in charge of the installation. Technip signed a letter of intention regarding the local benefits for the Saint-Brieuc zone. In parallel in the UK, offshore wind farms under development in the South West (Atlantic Array in the Bristol Channel and Navitus Bay off the Dorset coast) represent market opportunities.

The use of composites presents difficulties for this kind of extreme working environment. Composite repairs need appropriate atmospheric conditions. Therefore aluminium can present a better solution. In order to win markets, companies must be reactive and innovative regarding the vessels as well as the associated services. Companies will certainly have to invest in research and development. ROVs need to be developed for the installation phase.

The tidal industry requires ships or installation barges with dynamic positioning systems for the installation of demonstrators and pre-commercial farms. Such ships might be financed by all the manufacturers. In a relatively short period of time (maximum 5-6 years) the finances must be raised and conversions undertaken for the maintenance work of a site.

The sea conditions differ from one site to another. Support vessels will thus be adapted for each park. Several shipyards should be involved in the construction of these vessels. The operational and maintenance costs can be secured with MCO (maintien en condition opérationnelle) contracts. This kind of contract enables the owner to off-load their operation and maintenance responsibilities. Usually tier 0 players wish to concentrate on their core business and contract MCO. Few construction shipyards operate this kind of services. Just one exists in Brittany.

Construction & installation phases

In France, industrial schemes for **fixed offshore** wind have not been finalised yet. No specifications have yet been provided, except for feasibilities. It remains impossible to out-source the construction phase. For players involved in the post-feasibility phases, activity should emerge after the risk-assessment phase and the appeal period. It is also impossible to forecast the share of port logistics and transport. The competition will be intense. UK companies are already well-established. For France, there is still little activity for foundations and working at sea. Tier 1 organisations responsible for the construction are generally international consortiums. Brittany's industrial base essentially comprises small sized organisations. This poses difficulties in establishing balanced relationships.

The shipping industry's maritime experience lends itself naturally to being a key player in the emerging marine renewable energy market. However, it suffers from two major disadvantages: technical and technological constraints. The shipbuilding industry rarely produces cylindrical elements or welds seams on thick sheet metal. Industrial tools exist in Brest but obstacles such as the training of welders represent an issue. The shipbuilding industry works on projects with ordering parties that are flexible on cost management and delays. Yet, the construction of marine renewables (especially offshore wind) will be serial production work which will require a high-performance process. Costs and delay will have to be handled. Furthermore, the market is international. Even when working with French actors, it will be required to quickly respond to offers in English.

North European foundations manufacturers currently face a difficult period (eg: Smulders). There are very limited suppliers in Europe able to produce tubes with dimensions and the technical characteristics required for legs and jackets. The steel used should be of type S355. Yet, metallic construction companies generally use S235 type. In Brittany, no rolling device is available to treat sheet metals with a high thickness. The investment for this kind of machine is around €1m. Profitability will probably have to be reached from the first order. Indeed, the integration of panels into containers should enable countries with lower costs to obtain some markets from future orders. Composite vessel builders will not be used by the marine energy industry as the use of aluminium is favoured.

For the other developing technologies (**wave & tidal notably**), the chosen technology remains uncertain. It is

therefore impossible to give a figure regarding outsourcing opportunities. Currently, the only players able to intervene during the deployment phase are established in the field of oil and gas. Supply ship costs are too high. Companies arbitrate between long contracts for oil and gas and very short for the deployment of demonstrators which leads to a lower availability and higher costs. These costs are not sustainable for the launch of demonstrators at sea. Technology subsea connectors are also from the oil and gas industry. They are intended for deep offshore (3000 m) and costs are extremely high.

3.3.4. The operation and maintenance phase

Component / element	Criticality	Availability
Integrity management		0
Performance evaluation	Critical for PD	-
Recovery and repair	Critical for PD	-
Reliability management		0
Structural monitoring	Critical for PD	+

Table 7: Criticality and availability of components/elements in the operations and maintenance phase
KEY: PD = Park Developer, EP = Energy Provider, SCALE: ++ easily available to -- not available at all

Regarding operation and maintenance, 3 elements are critical for park developers: the performance evaluation, the recovery and repair and the structural monitoring. This latter is easily available, contrary to the first 2.
Some 50% of the maintenance is sub-contracted, even if it is handled by the constructor within five years. For developers depending on groups, the preference is given to the use of internal expertise.
Two different models exist for the maintenance of parks. For offshore wind, maintenance is realized in situ. This is not possible for tidal machines which mostly need on-shore maintenance.
For **tidal machine manufacturers**, they must supervise maintenance but can delegate the operational part. The life-span is 30 years, with an intervention every 10 years. Studies are carried out on anti-fouling issues but for now an agreement on its potential impacts does not exist. The tidal maintenance will need sub-marine robots, not necessarily ROV which operates in maximum currents of 1 meter per second.

Need to Know:

- Many different products and services are required for the creation of a wind, wave or tidal energy park.
- A wide range of companies coming from different backgrounds will be required at different stages of a project's development
- Different technologies might require similar components. You could provide products/ services (electrical, studies, etc.) for different technologies. Think outside box!
- Products and services do not have the same availability: if a product/service is already easily available, maybe you should consider not entering in the MRE market, and vice-versa.
- Products and services have varying degrees of criticality depending on their importance during the project development
- Before entering the MRE market, always consider your potential investments compared to possible profit.
- Map your location in the marine renewable energy supply chain in order to target the correct entry point and develop the right contacts. Are you a tier 1? tier 2? etc..

3.3.5. The decommissioning phase

It has been decided not to cover decommissioning in this report because it is at a too early stage for now. Nevertheless, this stage has to be considered by local businesses as a commercial opportunity. Components from the decommissioning phase will be similar to the ones from the installation phase.

Chapter 4:

Winning new business

We recommend three steps to support profitable entry into the MRE industry:

1. Business Analysis	2. Product Development	3. Communication
The decision to enter MRE is based upon analysis of: • The macro business environment • The micro business environment • Customers' behaviour and needs • Your capabilities, ability to add value • Financial viability of entering the marketplace	Development of products that meet customers' needs, at a price they're willing to pay and that delivers profit for your business. • Idea generation relating to customer need • Feasibility and commercial attractiveness • Brand development • Implementation	Creation of compelling messages that address customers' needs and wants Creation of marketing communication tools that will broadcast your message, e.g. websites, brochures, call-scripts through your sales teams, etc.

4.1 Business analysis - deciding to enter the MRE sector

There could be profitable opportunities within the sectors of offshore wind, tidal and wave energy but this might not be true for all businesses: it will depend on many variables and it is strongly advisable to go through a business analysis phase before making the decision to diversify.

Specifically, we recommend that any business focuses on:

- **The macro environment:** discovering what external factors are influencing the sector on a global, European and national level.
- **The micro environment:** what's happening within the industry, where does your business fit, what are the specific needs of your prospects, what competitors will you face?
- **Your business's capabilities:** what's expected from your business, what are the costs of successful entry?
- **Financial viability:** what will be the return on investment and when will this occur? Can you accurately forecast sales? What other investments will need to be made?

4.1.1 The macro environment

We recommend using the popular PEST business analysis method for assessing the macro environment. Assess and score factors that fit into the following categories:

- **Political:** what political factors are affecting the industry, what support is the government giving, is there any beneficial legislation that will support industry growth or inhibit growth?
- **Economic:** what's going on in the economy, what factors will support your new venture and what may increase risk? Look at rates of inflation, cost of borrowing, exchange rates if you're exporting or importing parts.

- **Social:** Are social demographics affecting the MRE industry, for example: a more environmentally aware consumer?
- **Technological:** What technological breakthroughs are affecting the MRE industry?

An example PEST analysis follows:

Political	Economic
Attractive tariff ++ Overseeing body (Crowne Estate) in the UK ++ Equalisation of Renewable Offshore Certificates between UK and Scotland ++ EU targets to deploy 2GW of marine energy by 2020 ++ Electricity market reform ++	UK seen as leading the market ++ Potential investment from cross European funding (e.g. FP7)++ Strong potential in exporting outside of Europe++ Industry growth potential: Carbon Trust forecast future potential value of industry at £340 Billion by 2050++ Low cost of borrowing if finance can be secured++
Social	**Technological**
Pressure to reduce rising energy costs ++ More energy aware consumer ++ Social acceptance and useage conflicts --	Successful commercialisation of wave or tidal +- Testing infrastructure in place + High costs of development – Long-term grid infrastructure planning +- Lack of high-voltage grids on the coastline --

Example Political, Economic, Social and Technological (PEST) analysis

Sources of Information for PEST:

- Marine Energy in the UK: State of the Industry Report (2012) www.renewableuk.com/en/publications/reports.cfm/Marine-SOI-2012

4.1.2 The micro environment – analysing the industry

We recommend using another popular business model for assessing the actual industry: Porter's five forces looks at the power of buyers and suppliers, threat of new entrants, the threat of substitute products and the intensity of rivalry to assess how viable an industry is.

Use the following questions to assess your industry, score each element out of five as per the instructions.

The outputs of the questionnaire will help you evaluate the attractiveness of the industry. It should also highlight areas that require your attention, for example, if your customers are not loyal then that could invoke focusing on what value your product adds and other actions that would boost loyalty.

Power of your suppliers	Score
The more powerful your suppliers are makes the market less attractive because they can push up the price of your products. How many suppliers do you have for critical components? [scale 1(many suppliers) --> 5 (only one supplier)] How much would it cost to switch suppliers? [scale 1 (low cost) --> 5 (high cost)] How unique are your suppliers' products? [scale 1 (not unique) --> 5 (unique)] Could you substitute any of your suppliers' products for different products? [scale 1 (yes) --> 5 (no)] **Supplier Power Score:** Low Total = Low supplier power (industry attractive) High Total = High supplier power (industry attractiveness reduced)	Total Score

Power of buyers	Score
The more powerful your buyers the easier they can push your prices down. How many customers do you have? [scale 1 (many customers) --> 5 (only one customer)] What proportion of your total output does any one customer buy? [scale 1 (small proportion) --> 5 (high proportion)] How much would it cost your customer to switch buying from you to another supplier? [scale 1 (high cost of switching) --> 5 (low cost of switching)] How abundant is market information on your product type? [scale 1 (not abundant) --> 5 (very abundant)] **Buyer Power Score:** Low Total = Buyer has low power (industry attractive) High Total = Buyer has strong power (industry un-attractive)	Total Score

Intensity of rivalry within the industry	Score
How much competition are you facing and how do you compare? How many competitors do you have? [scale 1 (few) --> 5 (large number of competitors)] How valued is your product over and above your competitors? [scale 1 (highly valued) --> 5 (not valued)] How much does it cost for your customer to switch to your competitors products? [scale 1 (high cost of switching) --> 5 (low cost of switching)] How much does it cost to leave the industry? [scale 1 (low cost of leaving) --> 5 (high cost of leaving)] How loyal are your customers? [scale 1 (very loyal) --> 5 (not loyal)] **Intensity of Rivalry Score:** Low Total = Industry attractive (low intensity of rivalry) High Total = Industry un-attractive (high intensity of rivalry)	Total Score

Threat of new entrants	Score
How easy is it for new competitors to enter the industry? If cost of entry is low then expect more competitors. How much time would it take to develop products to enter this industry? [scale 1 (long time) --> 5 (not long)] How much financial investment is required to enter the industry? [scale 1 (high financial investment) --> 5 (low financial investment)] How much specialist knowledge is required to enter the industry? [scale 1 (high amount of knowledge) --> 5 (low amount of knowledge)] What barriers exist to prevent entry? [scale 1 (many high barriers) --> 5 (no barriers)] How protected are your technologies for your products? [scale 1 (highly protected) --> 5 (no protection)] **Threat of New Entrants Score:** Low Total = Low threat of new entrants (industry attractive - expect less competition) High Total = High threat of new entrants (industry un-attractive – expect lots of competition)	Total Score

Threat of substitute products	Score
How easy is it for your customers to use different products instead of your product type, e.g. to use helicopters for offshore transfer instead of boats. How easy is it for your customers to achieve the same results your product provides but using different methods? [scale 1 (not easy) --> 5 (very easy)] How much would it cost customers to switch to new methods of achieving the same outputs as your product? [scale 1 (expensive) --> 5 (not expensive)] **Threat of Substitute Products Score:** Low Total = Industry attractive, low threat of customers substituting your products High Total = Industry un-attractive, high threat of customers substituting your products	Total Score

Summary Table	Total Score
Power of your suppliers	
Power of buyers	
Intensity of rivalry within the industry	
Threat of new entrants	
Threat of substitute products	
Total Score (low score = high industry attractiveness)	

4.1.3 Identifying customer behaviour and needs

This report has identified products and services required by offshore wind, tide and wave energy. It has also signposted other sources of information.

However, we recommend gaining a much greater in-depth understanding of your marketplace and customers to support product development and thus successful entry. See the following questions and sources of information:

Who constitutes the market?	**Objective: Develop your list of potential customers** Sources of information: See diagram depicting tiers of suppliers (see 3.1 Mapping your Position in the Supply Chain) **Trade magazines:** • Maritime Journal • Offshore Wind Magazine • Offshore Wind.biz • Offshore Wind Journal • Offshore Wind Engineering • Renewable Energy World **Websites:** • www.gov.uk/government/organisations/department-of-energy-climate-change • www.renewableuk.com • www.thecrownestate.co.uk/energy-infrastructure/offshore-wind-energy • www.offshorewind.biz • www.emec.org.uk • www.wavehub.co.uk • www.windpowermonthly.com **Groups and organisations:** • Renewable UK • Marine Offshore Renewables • Carbon Trust • RegenSW • SW Marine Energy Park **Conferences & trade shows (event plus catalogue):** • All Energy Exhibition and Conference: Aberdeen, UK, May • Coastal Futures: London, UK, January • EWEA Offshore: Frankfurt, Germany, November • Global Offshore Wind 2012: London, UK, June • Hamburg Offshore Wind Conference: Hamburg, Germany, February • Offshore Vessels and Access: London, UK, May • Ocean Business: Southampton, UK, April • Offshore Wind 2013: Manchester, UK, June • Port Infrastructure for Offshore Wind: Aberdeen, UK, May • Renewable UK: Birmingham, UK, November 2013 • Seawork: Southampton, UK, June • Sea Tech Week: Brest, France, October • Thetis MRE: Brest, France, April • Wave and Tidal 2013: London, UK, February • Windfarm Development, European Offshore 2013: Edinburgh, UK, April • Windforce 2012: Bremen, Germany, June • Windforce Baltic Sea: Stockholm, Sweden, February **Business intelligence businesses and list brokers** **Internet searches**

What does the market buy?	Objective: Identify what products your target customers' purchase Sources of information: • Report: This report, section (see Chapter 3: Supply Chain) • Report: A Guide to an Offshore Wind Farm (see Useful supply chain reports pg 25) • Competitor analysis

Who participates in the buying?	**Objective: Identify which organisational roles are involved in the buying process and what is important to them** Typically industrial buying will involve a number of different roles: e.g. engineers, procurement specialists, finance team etc. They will fall into the following categories: • a) Users of the Product • b) Influencers: people who will influence the buying decision, e.g. technical specialists • c) Deciders: people/teams who will decide on the product specifications • d) Approvers: those who authorize the actions and spend • e) Buyers: people that will negotiate and organise the administrative elements of the buying process • f) Gatekeepers: those that have the power to keep sellers away from the above people (e.g. buying administrators, receptionists etc) **Sources of information:** • Existing suppliers • Supply chain reports

How does the market buy?	**Objective: Better understand how the market buys, what processes are in place** Depending where your business fits in the supply chain and the value of the products you sell will mean you experience different buying situations. You could be involved in any of the following: • Pre Qualification Questionnaires: completion of forms specifying detailed information on turnover, profit, accreditations • Tendering: Submission of formal documents detailing product specifications, pricing and warranties • Sales Presentations: Formal presentations often giving greater detail to the buyer and an opportunity for the buying team to meet you. • Product Demonstrations • Informal Quoting and Selection Sources of information: • Existing suppliers • Supply chain reports • Language expectations (see Language expectations pg 54) The greater the value or the closer your business is to the utility buyers will mean a more formalised buying process taking a longer time.

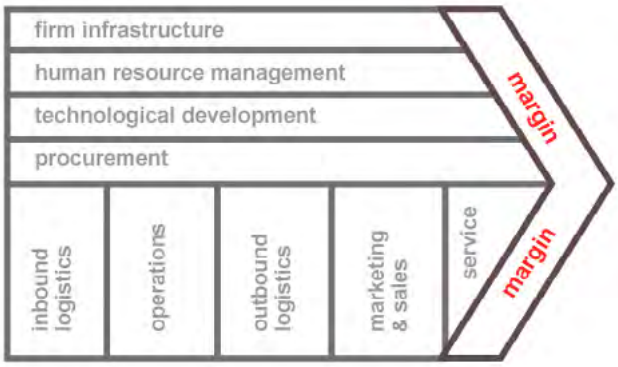
When does the market buy?	**Objective: Identify any specific times or events that kick-start buyer activity** There may be specific times of the year when your buyers are more active. This could be dependent on factors such as: weather, planning consents, government policy releases Sources of information: • Existing suppliers • Industry reports • Trade Shows • Trade magazines

Where does the market buy?	**Objective: Are there any specific locations where the buyers are more active.** For example in the UK, Aberdeen has long been associated with energy creation for oil and gas and now for renewable energy. In addition are there any trade shows where buyers are more active? Sources of information: • Existing suppliers • Industry reports • Trade Shows

4.1.4 Your business's capabilities – adding value

What do your customers value as important to them? Your job is to ensure you understand what's important from the customer's point of view in relation to your business and its products. If you can meet more of what the customer values than the competition, then you'll outperform them. Examine the processes in your business and make modifications so extra value is added, from the customer's point of view, or cost is reduced.

It's recommended that you use Porter's Value Chain Analysis model to help you to do this. The model represents all the different activities within a business that operate together to produce products. Your job is to look at each area to identify whether there can be a) cost reduction or b) changes that make your product different (and better!) than your competitors.



FIRM INFRASTRUCTURE: Could you locate closer to your MRE customers?

HUMAN RESOURCE MANAGEMENT: What initiatives have you invested in with your staff to help improve their performance and satisfy customer requirements?

TECHNOLOGICAL DEVELOPMENT: What technological activities have you implemented to give you competitive advantage?

SERVICE: What after sales support do you offer your customers? E.g. do they need 24/7 support lines?

Boosting differentiation strategy

Differentiating your company and its products can be a winning strategy.

Strategies for boosting your product differentiation include:

- Adding more features that customers value
- Increasing the performance of your products
- Improving quality and consistency of quality
- Improving durability
- Improving reliability of products
- Improve ease of repairs
- Improve the style of the product

Strategies for boosting your service differentiation include:

- Improving delivery
- Improving ease of installation
- Customer training
- Consultation services
- Repair services

Low cost strategy

An alternative strategy is to position your business as a low cost supplier. Use the value chain to identify areas for cost reduction so that you can price your products lower than the competition. Combining this strategy with a location advantage has provided some businesses in the MRE market with a winning formula.

4.2. Product development

Having a strong product for entry into the MRE market will underpin success. From your business analysis you have been able to identify the attractiveness of the industry, the needs of your customers and whether your company has the capabilities to enter the market.

But can you develop a product that MRE customers will buy? There are a number of recommended key stages to follow for the development of products:

1. Idea Generation, Concept Development and Testing	**Internal generation of ideas relating to customer need, sources:** R&D departments, marketing and sales teams, production and engineering teams, customer and technical services **External generation of ideas relating to customer need, sources:** customers, competitors, research reports, academia, suppliers, distributors and agents. **Concept Development and Testing:** Develop concept with text, drawings, photography mock-ups, story-boards. Pricing of product. Pilot concept with customers before significant investment is made.
2. Feasibility and Commercial Attractiveness	From the above concept testing stage analysis can be made of the cost of commercialisation, cost of on-going unit production, communication costs and forecasts of sales and projections of profit. Ensure stage 1 and 2 are screened by the board or a strategic team.
3. Brand Development	The identity of your product: its name, its image, its personality, its attributes and benefits. How the product is positioned relative to your competitors. And how your customers will value it.
4. Implementation	Commercialisation of the product. Delivering your product to your customers. Making money.

4.3 Entering the market – marketing communication recommendations

To enter the market you should now have a product that meets your customer's needs, at a price they are willing to pay that provides you with profit at your forecasted sales volumes. Further you understand what your customers buy so that you can ensure your products are easily conveniently accessable.

Many marketeers use the four Ps model as a way of checking these aspects (Product, Price, Place). The final P for Promotion is now dealt with in the following section.

4.3.1 The importance of message

Your message to prospects about your products is critical to developing sales. All too often companies fail to communicate compelling reasons why customers should buy their products.

Your message is communicated with the following:

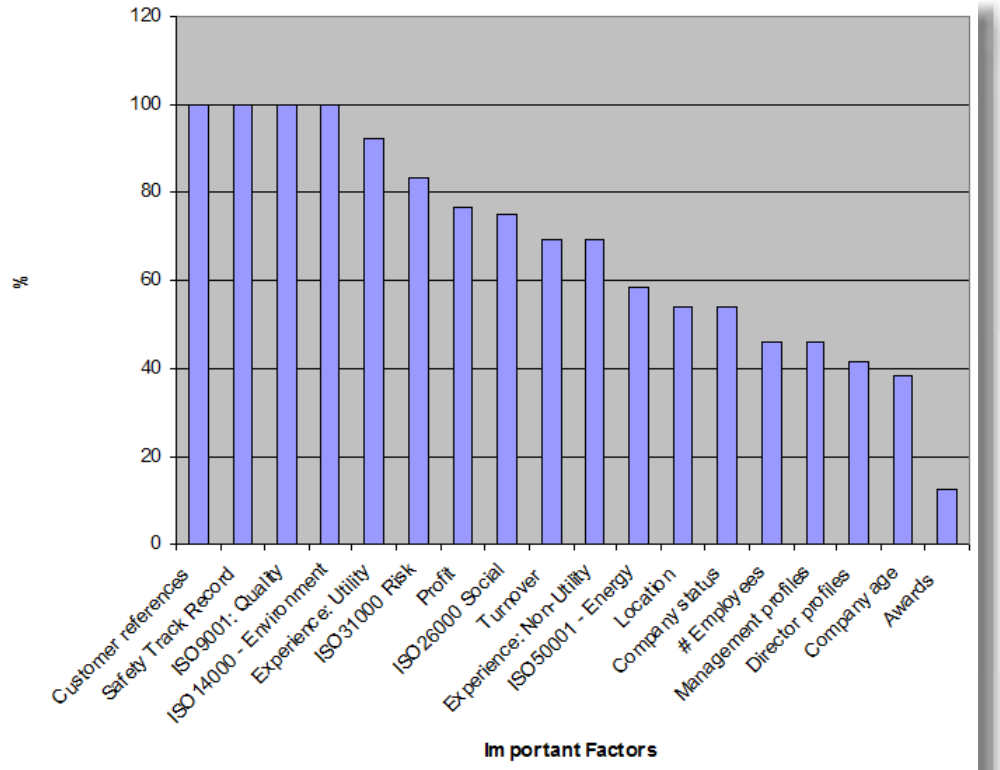
- Written text
- Testimonials
- Visual imagery
- Video
- Logos
- Design
- Verbal dialogue with customers
- Body language

Your message is embedded into every object that interacts with your prospects and customers, not just your marketing tools as you can see from the list below:

- Your sales team and other staff
- Your website
- Your tender submissions
- Your company signage
- Your templates (standard letters, invoices, business cards etc.)
- Your advertising
- Your press releases
- Your call-scripts and voicemails
- Your presentations

Each and every time your customer interacts with your organisation they will be judging your business (whether consciously or sub-consciously) on whether you will meet their needs; from the moment they see an advert to the time they walk in through your reception for a product demonstration. It's critical… make sure you get your message right.

4.3.2 Key findings influencing marketing messages



Very important or important factors for the buyer

Our research specifically asked utility and tier 1 companies how important certain characteristics of supply companies are, for example: how important is company location?

The above chart demonstrates what factors are important. The following table makes recommendations on how to support your message strategy for the top 10 factors.

Factor	Message Strategy
Customer reference	Include customer testimonials throughout your marketing (with permission). Integrate into call scripts: “we’re working with [business name] to help them achieve [value statement]”. Ensure that imagery is taken to record jobs so that it can be used for displays and other promotions. Do joint PR. Write case studies on how your product supports customers achieve objectives, save money or increase safety record. If you have not done any MRE work then ensure you use other sector case studies.
Safety track record	Integrate safety into your mission statement so that the culture of your business holds safety as central to the business’s mission. Ensure that systems are in place to track your safety performance so that these can be discussed during customer negotiations. Ensure that any safety related awards or accreditations are given prime space in your marketing. Ensure that any features of your products that make it safer (than your competitors) are clearly communicated throughout your marketing. Ensure that staff, who are involved in on-site training, have had safety certification and approved training so that risk is reduced. Ensure that staff biographies include these details. Consider adding to business cards. Announce industry leading new systems if they are being installed via your news and sales presentations.
ISO9001 - Quality	Ensure certification is visible in prime space on marketing documentation including website (ensure logo is near to top of page and not hidden in footer). Link certification logo to further information about how your business manages quality. Ensure that sales team can discuss the quality systems in place. If not the norm in your supply chain tier then look for opportunities to integrate into case studies.
ISO14000 - Environment	Ensure certification is visible in prime space on marketing documentation including website (ensure logo is near to top of page and not hidden in footer). Link certification to further information about how your business reduces its impact on the environment in the manufacture of its goods and services. Ensure that sales team can discuss the environmental management systems in place. If not the norm in your tier of the MRE supply chain then look for opportunities to integrate into case studies.
Experience with utility	Provide case studies (datasheets, presentations and web pages) that detail how your products and services have supported utility customers solve their problems using your products and services. Focus on features and benefits solving problems. If no experience with utility businesses, then use case studies from other sectors. Ensure that core competencies can be demonstrated across sectors. If no experience with other sectors, then ensure that team skills and product unique features are highly visible – work harder with your sales effort and be prepared to negotiate a good introductory deal!
ISO31000 (risk management)	Ensure sales team can talk about risk management when discussing safety issues. Currently this standard cannot be used with certification, but naturally could be integrated into sales presentations and discussed on your website.
Company profit	Ensure sales team have access to financial data so that they can be entered into pre-qualification tender documents and tenders, plus discuss profit within sales presentations. Ensure any losses can be explained clearly and succinctly, e.g. last year’s loss was due to investment in xyz which will provide greater efficiency in our factory, or, we are a start-up and we have a three year growth plan with investment from stakeholders. Financial team to support sales, it may be necessary for the finance director to help prepare the financial data for tender documents and to attend sales presentations to help explain any anomalies.

ISO26000 (social responsibility)	No certification available. Ensure sales team can discuss any socially responsible projects that the business is involved in.
Company turnover	See notes regarding company profit.

Clearly it is important to understand who you are selling to and what is important to them, for example, finance will be important to the buyer's procurement team whereas quality will be of more interest to the teams actually using your product. The key here is to qualify who you're talking to and ask them what their areas of responsibility are. Knowing who will be present at sales presentations is key so that you can prepare the messages about your company tailored to the individuals in the room.

4.3.3 Product Solutions & Features

During your product development phase you thought about your customer's needs and how your product or service can address these needs thus helping your customer, for example, to do something more efficiently, or for less money, or something in a safer way.

It's critical that these features are now integrated into your messages that you create so that customers can easily identify why they should be investing in your product (see Boosting Differentiation pg 43)

4.3.4 Key marketing recommendations

A key element of business to business marketing is developing relationships. Specifically many industries are driving towards long-term supplier relationships with buyers looking for credible companies they can trust. It's probably true to say: relationships equal business.

Therefore, marketing strategy in the marine renewable energy industry should support the development of relationships: with the aim of communicating our key messages so that customer uncertainty is reduced or eliminated.

Marketing will be mainly focused through those employees that are customer-facing, typically the sales team, and therefore we have assumed that the sales team are the primary component for our marketing strategy. Marketing tools and campaigns should surround the sales team supporting their objective of building relationships, developing a sales pipeline and converting that into orders.

In addition to the above, tendering is a significant activity that the sales team will be likely to frequently participate in. Due to its significance we have dedicated a section solely to this activity, (see Chapter 5: The tendering process explained pg 53).

Surround the sales team with marketing tools

Sales Team

Recruitment:

Finding the right people for your sales team is critical. Therefore detailing your needs is essential before the recruitment process is begun. The following are typical skills that a sales person engaged in MRE business to business sales activities would require, these skills may be performed by one person (e.g. in a small company) or by a team:

- **Technical Skills:** ability to discuss product specifications with engineers and other technical members of a buying team. Ability to explain key technical benefits and how they solve customer problems.
- **Communication skills:** experience in face-to-face, presentations, telephone and written scenarios. Writing and numeracy skills are specifically important if tendering documents are to be written.
- **Negotiation skills:** overcoming objections, negotiating prices and closing deals
- **Teamwork:** ability to work with other members of your business so that customer proposals can be put together

- **Marketing skills:** Ability to understand marketing and work closely with the marketing team. Some researching may be required if no CRM (customer relationship management) system exists in order to build a customer/prospect database
- **ICT Skills:** so that CRM systems, spreadsheets, and presentations can be completed

Ensure that applicants can demonstrate elements from the above skills. Integrate exercises into the application process to test the sales person before appointing them.

Try and estimate the size of your team and relate this to workload and forecasted revenue, ensure you maximize time selling and not on administration.

Research marketplace salaries so that your offer is competitive.

Training and Management:

Ensure your new sales person receives thorough training on your products and services. Learning key product features and how they meet customer needs, ensure they have an elevator pitch, 90 seconds in which they can confidently sell the business depending on who they are talking to.

Your sales person may need a refresher sales course: we recommend solution selling which encourages sales people to focus on customer pain/problems and how they can resolve it using your products and services.

If your sales person is involved in prospecting then ensure that they are targeted with quantitative measures, e.g. numbers of outbound calls to be made per week. Ensure that regular (suggest weekly) pipeline meetings are held where potential orders can be discussed so that forecasts can be adjusted and decisions made on where effort should be focused.

To maximise performance incentivise your sales team with bonus payments relating to their sales performance.

Website

Key tips:

- Communicates and reinforces key messages using a variety of mediums (e.g. design, text, imagery as discussed above)
- Case studies that support product solutions meeting customer needs that the sales team can link to
- Motivates visitors to register for newsletters by offering free incentives (e.g. receive our report focusing on the 7 best ways of…)
- Strong calls to action throughout to encourage customers to contact you
- Possible multiple languages if export markets are key. At utility and tier 1 level then English is the norm, but further down the supply chain this may not be the case.
- Ensure website is easily updateable via a browser-based content management system. Consider open source solutions such as WordPress and Concrete5.
- Ensure a statistical analysis programme is installed (e.g. Google Analytics) so that campaign click-throughs can be tracked.
- Integrate social media links so that content can be shared and customers can connect with your staff's social media profiles (e.g. LinkedIn)
- Ensure keyword content has been researched so that the correct keywords are used and embedded in the right places (e.g. web tags) to support being found in the major search engines (see Google's publication: Search Engine Optimisation Starter Guide).
- Create keyword rich content
- Consider promoting the website through web advertising, e.g. Google Adwords or Bing Ads

Good website examples:

- www.reflexmarine.co.uk
- www.mojomaritime.co.uk

Exhibitions

Key tips:

- Research possible events to exhibit at. Focus on i) how established the event is ii) number of visitors that fall into your target market categories iii) if competitors are exhibiting iv) are your customers planning on attending.
- Set objectives for the exhibition so that event can be evaluated.

- Set budget for exhibition, if too costly explore collaborating with a partner and sharing a stand.
- Investigate and commit early so that better stand positions are available: look for good footfall areas and/or positions near to complementary products/services or known busy stands.
- Target sales team with personally inviting their customers and prospects, ensure that invites are focused on buyer need and not just a general email. Encourage sales team to arrange appointments.
- Ensure stand is communicated through: website (on headers throughout), on employee email footers, in email campaigns, standard letters, etc.
- Ensure stand design communicates key messages.
- Brief sales team on exhibition objectives, provide team with sales refresher course if they need support with how to deal with enquiries. Ensure that the sales team have a method for recording enquiries and tools to help them with selling (brochures, presentations, demo equipment, video etc.).
- Ensure exhibition catalogue profile communicates key messages and that your business is entered in all relevant index categories. Explore free editorial within guides especially if you have important news to announce.
- Explore possibility of guest-speaking at exhibition conferences and workshops. Consider running a free-workshop if no relevant ones can be piggy-backed on.
- Ensure press-packs are delivered to the exhibition press department
- Explore collaboration with other complementary exhibitors; ensuring that both sales teams are aware of the referral plan. Possibly put your demo equipment on their stand and vice-versa.
- Ensure enquiries make it back to the office and are recorded on the CRM system with future actions associated with them

Exhibitions for you to research:

- All Energy, Aberdeen
- Seaworks, Southampton
- Seatech Week, Brest
- EuroMaritime, Paris
- See list: Who constitutes the market pg 40

CRM (Customer Relationship Management) Tools

Key tips:

- Select online systems that can be accessed by standard web browsers anywhere and from multiple devices, e.g. PCs, iPads, and Smart phones
- Sales team to support selection of tool as they will be main users.
- Grow database of contacts from existing customers, sales activities, and research. Data sources include: LinkedIn, case studies, industry reports. Ensure contacts are marked as opted-in to marketing campaigns or not opted-in to avoid breaking the law
- Customize fields so that data can be usefully segmented. Segmentation is key for personalising of messages
- Fully integrate CRM into sales process: segmenting prospects, logging calls and call-backs, emails and conversations.
- Log other news about customer so that your team can all see a growing picture of each customer
- All customer-facing staff to have a CRM login plus managers and directors
- Link prospect and customer accounts with social media profiles so you can see the latest updates from the prospect/customer (e.g. with LinkedIn)
- Use reporting functions to accurately forecast revenue and measure length of sales cycle so that future reporting is more accurate
- Capture leads from website directly into database
- Run customized email campaigns to opted-in prospects and customers

Example online CRM systems:

- www.salesforce.com/uk
- www.zoho.com

Email Marketing

Key tips:

- Harvest email addresses: through opt-in forms on your website and through your sales activities. Encourage opt-in by linking it to an incentive, for example: free information reports
- Collect as much info as possible so that you can segment campaigns, your CRM system is essential here as it will allow you to target specific groups with a very tailored message
- Create content that is interesting and meaningful to your customers. Include incentives to encourage click-throughs. Ensure that your message is clear and succinct, again focus on benefits and solutions rather than just descriptions of what your products do
- Keep email subject headings short, ensure your core message will be in view within a email windowpane (i.e. before images have downloaded)
- Ensure that landing pages (linked to from the email) are relevant, interesting and have a strong call-to-action to encourage the customer to perform an action
- Don't over-mail customers with repeated over-used messages
- Track click-throughs and share these reports with the sales team for follow up. Ensure that follow-up emails and call-scripts are relevant to the article that was clicked.
- Time your messages so that your business has the resources to follow up the click-throughs. Log results in your CRM system
- For smaller mailings mail direct from your CRM system, for larger mailings send direct from a quality email company

Recommended email marketing systems for you to explore:

- Zoho or Salesforce for small mailings
- MailChimp or Constant Contact for larger mailings

Webinars

Key tips:

- Design content around interesting industry subjects related to your products and services. Use the webinar content to offer free insights and information that customers would value; most likely to be addressing their needs
- Use your CRM system to segment groups of contacts relevant to the subject of the webinar for invitation purposes
- Invest in well designed, structured content that can be re-used. Opportunities may exist to embed quality imagery and video. Again, make sure you provide compelling content that your customers will value
- Choose a convenient time for your customers and prospects
- Sales team to personalise messages (email and phone) to invite customers and prospects to the seminar and follow up with calls
- Use your social media platforms to invite customers and prospects
- Many webinar software platforms can analyse attendees which should then be passed on to the sales team for further follow-up
- Forward links to the webinar to customers that didn't attend. Monitor results to see if they clicked through. Follow up click-throughs
- Have documentation to send on after webinar so that the conversation can be continued

Example of webinar tools:

- www.gotomeeting.co.uk
- www.webex.co.uk
- www.clickwebinar.com

Social Media

Key tips:

- Ensure your staff profiles are up-to-date and include key elements from your message strategies
- Engage in discussion forums by starting conversations and contributing meaningful

content (link to landing pages with solutions)

Example of social media sites:

- www.linkedIn.com
- www.twitter.com

Networking

Key tips:

- Offer to speak on meaningful and valued subjects at networking events
- Consider sponsoring the event on the basis that your sales team can attend, you can introduce and close the event, you can add display material, plus add brochures to networking packs
- Ensure you receive a list of delegates attending so that you identify contacts that you would like to introduce yourself too
- Ensure your elevator pitch is rehearsed so that you can deliver a clear and succinct story about who you are and how your products and services add value – ensure it's simple and straight-forward consider adding business examples
- Have an opportunity for future follow-up… 'we're running a free webinar in a week's time, it's all about [increasing xyz, saving xyz, improving xyz], can I send you an invite to it?'
- Use the networking session to collect email addresses and opt-in: 'We often email handy guides on how to save, improve, increase efficiency, would you like to receive one? I can add you to our database…'

Conferences

Key tips

- Offer to speak on meaningful subjects, offer content that would be valued by your customers
- Invite your customers to attend and pre-arrange times to meet

Brochures

Key tips:

- Stay focused on message: product features meeting customer needs, use a range of assets to communicate message including text, images, accreditations and testimonials
- Link the brochure with other sources of information e.g. video and animations using simple web links or to further online case studies
- Be able to create electronic customizable versions of the PDF in-house so that customers are presented with tailored versions
- Use strong calls to actions to motivate customers and prospects to move on to the next stage
- Choose a size that allows the customer to print the brochure easily

Presentations

Key tips:

- Qualify who your audience is and what their responsibilities are
- Stay focused on message, focusing on elements that add value or answer your buyers' questions
- If slides are required then make them interesting; making use of animation to bring on key points at the right time. Less is more.
- Stick to allotted time; therefore time and rehearse all presentations
- If this is a tender presentation then ensure that sufficiently skilled staff are with you so that questions can be answered, e.g. bring finance team along if you know there will be finance questions
- Use other mediums to support technical queries, e.g. animated CAD. Ensure that CAD or video stays focused on how your product adds value for them.

Video

Key tips:

- Use video and animations to simplify technical product issues
- Use video and animations to demonstrate product or service in use with key customers (with permission)
- Ensure video and animations clearly communicate

key value-adding messages, keep short and punchy

- Use formats and distribution that can be easily shared through social media (e.g. YouTube or Vimeo)
- Ensure that video can be played on all devices

Good examples:

- Reflex Marine (http://www.reflexmarine.com/hawk-home.html)
- Siemens (http://www.siemens.com/innovation/pool/features/siemens360/wind-power/index.html)

Chapter 5:

The tendering process explained

According to the results of the Utilities' questionnaire, it takes on average less than 6 months to become a registered supplier with Utilities, i.e. in a position to respond to tender calls. Yet it varies widely between respondents from a few weeks to less than a year. This difference comes from the internal options taken by each organisation for getting new businesses registered, and from the importance of the products/service required.

5.1 The process of selection

The process of selection slightly differs from one kind of organisation to another; from an energy provider to a wind turbine manufacturer or from a park developer to a foundation manufacturer for example, as illustrated below. Nevertheless, the main process is shown in the table below.

The common phase is to get to know the tender. It means to be present in the good networks, to monitor news, etc. The process is identical for all **energy providers:** qualification of the suppliers, technical qualification of the offer, commercial offer analysis. The announcements are made on websites through call for pre-qualification or declaration formula but half of the responses show that this is not a public process. One of the energy providers detailed that for amounts less than €3k, there is no call for tender process.

Park developers are often SMEs or subsidiaries of larger groups with a functioning similar to SMEs. Their procurement process in this case is not strictly defined as two of them did not answer this part of the questionnaire. The pre-qualification seems less arduous than for the other players. Delivery scales for selection are shorter, approximately one month. The selected suppliers are then invited to participate in the call for tender, but for amounts less than €20k, the audit is less stringent. The application has to be made either in English or in French. No use of an IT system is used to select a supplier.

For **foundation manufacturers**, the selection process is not publicly available. The two manufacturers use similar methods: a selection of suppliers in order to complete a panel and then a demand for proposition and a negotiation on the price and the commercial terms. They both use two audits but not at the same moment, one before the panel selection, the other after having selected the supplier in a short list. All the suppliers need to follow the selection process. For one of the manufacturers, the process is less stringent for amounts less than €150k.

For **wind turbine manufacturers**, the process of selection is not public. The process is a little more complex: request for information, non-disclosure agreement (NDA) signature, supplier's audit, request for quotation (RFQ), supplier's ranking, inspection of first articles, qualification of the supplier. The process is different depending on the quantity being bought and the buying frequency. The process of

selection is identical for **device developers**.

5.1.1 Get to know about the tender and communicate with potential clients

Understand who your customers are. Ensure you are registered to hear about any tender annoucements. Complete pre-qualification questionaires, making sure you meet the required standard of detail and deadline.

5.1.2 Get in touch with utilities and potential clients

There are different ways of entering into contact with utilities:

- **Internet/public websites** (recommended by industry buyers)
  - Forewind: www.forewind.co.uk
  - Iberdrola / EoleRES: www.achilles.com/en/Achilles-Spain/
  - EnelGreenPower France: www.enelgreenpower.com
  - Areva: www.areva-wind.com/index.php?id=8&L=2
- **International events**. Eg:
  - EuroMartime, Paris, 5th-7th February 2013
  - Renewable UK Wave & Tidal, London, 27th-28th February 2013
  - Thetis EMR, Brest, 10th-11th April 2013
  - All Energy, Aberdeen, 22nd – 23rd May 2013
  - RenewableUK Offshore Wind, Manchester, 12th-13th June 2013
  - RenewableUK Conference, Birmingham, 5th-7th November 2013
  - HUSUM WindEnergy, Germany, 23rd-26th September 2014
  - Sea Tech Week, Brest, 13th-17th October 2014
  - International Conference on Ocean Energy, Dublin
  - Envirotech and Clean Energy Investor Summit, London
- **Direct contact with the purchasing manager**

5.1.3 Navigating the tendering IT systems

Contacts between ordering parties and suppliers are on the whole non-public. It is important to use the most relevant media to establish contact with ordering parties:

- Public websites where you can find public information and sometimes contacts
- The Official Journal of the European Union (OJEU) where you can find tenders. Accessible at: www.ojec.com

Half of the utilities questioned use IT systems to support the process of a business becoming a potential supplier. They either use:

- a **global and general site** such as
  - "Achilles" (www.achilles.com/en) used by Iberdrola/ Eole-RES and E.ON Climate and Renewables
  - "Sage Accounts" (www.sage.co.uk) and "Sage Manufacturing" (www.sage.co.uk/manufacturing) used by Pelamis Wave Power
  - "SAP" (www.sap.com/index.epx) and
  - "IVALUA" (http://en.ivalua.com/?lang=en) used by ordering parties
- or **customised systems** such as
  - "Click 4 Supplier" (w9.siemens.com/cms/supply-chain-management/en/pages/scm.aspx) used by Siemens.
  - "Areva Wind" (www.areva-wind.com/index.php?id=8&L=2) used by Areva

5.1.4 Language expectations

The results of the Utilities' questionnaire demonstrate without surprise that English is the language used by energy providers and tier 1 organisations to communicate with their suppliers (13 answers). French language comes second (10 answers) but we assume this is mainly due to the origin of the respondents (mainly French people) and the fact that the respondents worked on French projects (e.g. French offshore first round). Other languages used are German (2 answers from wind machine manufacturer) and Italian (1 answer).

Having said that, it is crucial for local businesses that

the people that might be in contact with a potential buyer (management team, secretary, accountant, procurement manager, etc.) are able to communicate in English (basic business English and English related to technical terms) at least.

Recommendations for French businesses

- Where possible, train the supporting staff of the company (secretary, accountant, etc.) to a basic level of English in order to be able to answer to the phone at least
- Where possible, train the managing staff of the company (purchasing manager, management team, etc.) to a technical level of English

5.2 The pre-qualification tender: most important criteria to get pre-qualified and recommendations for SMEs

Pre-qualification is not used for all contracts, only when necessary, i.e.: mainly for large contracts, and those requiring a high level of technical expertise. This is typically the case of the marine renewable energy market.
The pre-qualification process is used to identify potential contractors who would be allowed to tender for a specific contract. It thus precedes the tendering phase. In order to be considered as eligible to tender, a company has thus to be pre-qualified. Pre-qualification works as a filter to exclude unqualified contractors. It speeds up the process of selecting a contractor as a limited number of pre-qualified bids have to be examined.

Most important criteria to assessing the pre-qualification

	Most important criteria	Recommendations for local businesses
Energy Providers	**Financial capacity** (company's health and viability: turnover and profit / company's risk and insurance coverage)	Support evidences how your business can support a long-term relationship Can you provide evidence on the good financial situation of the company (credit-risk)?
	Company's experience (Customer references / technical capacity / experience in the energy sector)	Keep track records of your products / services and highlight them. Have your company sufficient competencies to answer alone? What are your commercial and technical advantages? Do you have experience in serial production? Does your experience fit with the needs expressed? Are you competitive (technical and pricing)?
	Quality and security at work (ISO 9001, 14001, 26000 and HSSE certifications). A supplier not providing HSSE will not be considered.	Have you an ethical behaviour? Certifications have to be highlighted (notably for safety: HSSE) Demonstrate that your (international) management is of quality
Park Developers	**Company's experience** (experience in the energy sector / customer references)	See here above
	Quality and security at work (ISO 9001, 14001 and 31000 certifications). A supplier with no quality system will not be considered.	See here above
Foundation Manufacturers	**Company's experience** (customer references)	See here above
	Financial capacity	See here above
	Time capacity	Be reactive to the pre-qualification phase How can you deliver on time?
	Alternative skills (for long-term relationships)	Is your team able to communicate in English? Do you have other potential activities that could be of interest?
Wind Turbine Manufacturers	**Quality and security at work** (ISO 9001 and 14001 certifications). A supplier with no quality system and not able to have serial production will not be considered.	See here above
	Security management	See here above
	Company's experience (Technical capacity / serial production experience / customer references / experience in the energy sector, notably wind industry)	See here above
	Financial capacity (profits are analysed to evaluate the health and viability of the supplier)	See here above
	Supplier's location	Where is located your office? Do you have outlets?

Most important criteria to assess the pre-qualification from 4 different points of view

The price is an important criteria but is not listed as a top criteria by the respondents. The most recurrent criteria are the company's experience and the quality and security at work.

5.3 The tender document level: most important criteria to answer to a tender and recommendations for SMEs

Tendering is the process of making an offer, bid or proposal, or expressing interest in response to an invitation or request for tender. Organisations will seek other businesses to respond to a particular need, such as the supply of goods and services, and will select an offer or tender that meets their needs and provides the best value for money . Potential suppliers are asked to submit documents outlining the offer they propose including description of the need, experience, pricing, schedules, qualifications, competencies, etc.

Most important criteria to assess the tender document level

	Most important criteria	Recommendations for local businesses
Energy Providers	**Understanding & definition of the need**	Analyse what is expected from the supplier. What are its needs? Can you answer to these needs? How? Define the expectation in the tender document
	Technical & production capacity (product or service features / experience / background / flexibility of production)	Demonstrate your technical capacity (products, services) Are you competitive on the technical side? Provide a full detailed technical analysis
	Presentation of risk analysis	Did you analyse the factors that can jeopardize the success of the contract? Do you have preventive measures to reduce the probability of these factors from occurring? Can you identify countermeasures to successfully deal with these constraints? See FRAP analysis.
	Overall price, price breakdown and calculation	Is the price you propose competitive? How did you calculate your price? Is the calculation clear and easy to understand? Price has to be binding (not only for appreciation)
	Delivery timescales	Provide the tender answer on time. Make sure that the delivery timescales will be respected and prove it.

	Most important criteria	Recommendations for local businesses
Park Developers	**Understanding & definition of the need**	See here above
	Technical & production capacity (product or service features / experience)	See here above
	Human resources and delivery timescales	Do you have sufficient and skilled human resources? Provide your tender document on time and complete (especially legal documents)
	Capacity of intervention in case of failure or mistake	Are you able to intervene at different stages of the products/ services you develop, and able to modify the trajectory?
	Overall price, price breakdown and calculation	See here above
	Suppliers' terms and condition of sales	Read carefully the terms and conditions of the company. Are they in line with what you expect?
Foundation Manufacturers	**Understanding & definition of the need**	See here above
	Technical & production capacity (product or service features)	See here above
	Overall price, price breakdown and calculation	See here above
	Delivery timescales	See here above
Wind Turbine Manufacturers	**Understanding & definition of the need**	See here above
	Definition of marine renewable energy as a strategic development for the supplier (for a long term relationship)	What is the strategy of your company in the marine energy sector? Is your company able to be an innovative source?
	Technical & production capacity (product or service features)	See here above
	Overall price, price breakdown and calculation	See here above
	Suppliers' terms and condition of sales	See here above

Most important criteria to assess the tender document level from 4 different point of views

Please find below some other basic recommendations on the tendering procedure:

- Verify that you have all the relevant documentation;
- Do not hesitate to clarify any uncertainties
- Prepare your strategy to answer
- Be sure that you submit your answer in the right format, on time and at the right location

5.4 The sales presentation level: most important criteria to win a business and recommendations for SMEs

The sales presentation level is not always used. It is the final phase, following the tender document level, to determine which supplier will be chosen.

Most important criteria to assessing sales pitch level

	Most important criteria	Recommendations for local businesses
Energy Providers	**Experience and customer references**	Make a short presentation of the company Highlight your experience in the energy sector (if any) and brands worked with
Park Developers	**Technical expertise & know-how**	Insist on your products and services How you can make the difference with the competition?
	Good understanding of the need	Define the need expressed How will you answer to this need? Give visibility to your offer and promote it Present your own strategy for marine renewable energy
Foundation Manufacturers	**Good understanding of the need**	See here above
	Ability of the sales team to keep to planned presentation time	Limit yourself to the time scheduled Not respecting this criteria is not appreciated
	Technical expertise	Fusion welding of metallic materials (ISO 3834) Metallic construction knowledge (DIN 18800 and ISO 1090-2 3rd level)
Wind Turbine Manufacturers	**Technical expertise**	See here above
	Company's background & experience	See here above
	Price	How did you calculate your price? Can you explain/detail it?
	Clear and visual presentation	Use of a PowerPoint presentation, or Prezi (use of a video is not important) Sales team body language Sales team appearance
	Sales team appearance	Make sure that the first impression of your team is good e.g. the dress code.
	Force de proposition	Ability to provide solutions to potential issues

Most important criteria to assess sales pitch level from 4 different point of views

Conclusion: is the location criteria important?

In the three steps described here above (prequalification, tender, sales presentation), the importance of the location of a supplier is not mentioned as an important criteria to get pre-qualified or to answer to a tender. The location of a supplier always appears after all the criteria mentioned

which seem inconsistant with the park developers' comments. Thus we cannot say that the location of a supplier is not as important as others such as the price, the company background and experience, etc.
However and as an example, it seems hard for a supplier located in central Brittany to position itself in the construction phase (wind turbine or foundation) as it is too far from the main ports and roads needs to be reinforced. For manufacturing, the closest the business is to the port, the easiest and the cheapest. But ports also need to have the space capacity for them, to create continuity in all the activities.

5.5 Success stories: How to succeed in winning MRE contracts

This part will enable us to study 4 success stories of small and medium sized enterprises working in the field of marine renewable energies in Brittany and in Cornwall.

5.5.1 In Finistère

Case Study 1: *IN VIVO, La Forêt Fouesnant, Finistère*
IN VIVO is an oceanographic and marine environment consultancy company. IN VIVO conducts studies, from design to project management. The company's core competency lies in data acquisition and recommendations, especially in the production of decision-making cartographical (GIS) charts, and in the provision of complete packages to its clients.
Founded in 1997, the company has been involved in marine energy projects since 1999, very much ahead of operational projects in France. The company's managers truly believed in marine energies and initially got involved in the R&D project Sabella. Since then, IN VIVO has worked on 45 MRE projects (excluding R&D projects): seabed studies, cable impact, regulatory studies, etc... Both the turnover of the company (€ 3m in 2012) and the number of employees (27) grew together with the development of marine energy activity.
The company's marketing and communication manager Anne-Laure Milhe pointed out some recommendations for

Copyright: IN VIVO

entering the sector. Succeeding requires applying them all.
Network & collaborate. Networks are extremely important to identify and get to know potential partners. In a very competitive environment, it is crucial to collaborate, share information and work in partnership. Getting information at the right time will help to get involved early in projects. In any business, long-term relations pay off.
Watch what occurs in the market. The market is evolving very quickly: technologies, products and services, regulations, etc. Be sure that you are up-to-date to identify opportunities and make decisions (e.g. training your employees on a new technology). Subscribe to MRE newsletters, read newspapers and specific documentation, analyse new regulations, identify and attend professional events (national and international) and speak at conferences (show your expertise). Everybody in the company has to be aware of what is happening in the market.
Identify the right contacts in each organisation. If you are a small company and not yet in the business, do not start alone. Integrate the marine renewables opportunities progressively and identify subcontractors to work with. Several approaches might be required to identify the right contacts for your organisation (director, people in charge of tenders, etc.). Be sure you speak to the right person.
Know your clients' activity, constraints and needs. Ensure that you understand your clients' activity to better

understand their needs and constraints. Show how your background and expertise can solve a potential problem. Clients in marine energies pay careful attention to the financial risk of businesses. You have to prove your company is healthy and can handle the risk related to a contract. Otherwise get involved through bigger partners who can handle this risk.

Safety first and certifications. Make sure you have the correct certifications depending on your activity. ISO9001, OPQIBI (certifying consultancy companies' competences in France), professional certifications and safety management are mandatory if you are to work for energy groups. They will have implemented them long ago. IN VIVO has always carried quality and safety policies and is now in the ISO9001 process.

Get involved in R&D. Working through R&D projects is a good way to enter a potential market and collaborate with partners. They represent an opportunities to identify emerging subjects and trends, understand clients' needs, and learn and develop new services or products. However, R&D projects are non-profitable at first so examine potential funding opportunities. Through the Pôle Mer Bretagne, IN VIVO benefits from partners and increased competitiveness.

Speak English! It is crucial for businesses to be able to work in English. Contracts can be in English, even in France. However, very small French businesses (tier 3 or more) might only be in contact with French organisations (subcontractors) and English is not mandatory. IN VIVO is organising English tuition for its entire staff.

Contact: Anne-Laure MILHE, Marketing and communication manager, al.milhe@invivo-environnement.com

Case Study 2: *Le Béon Manufacturing, Lorient, Morbihan*

Founded in 1923, Le Béon Manufacturing is a specialist manufacturer of forged alloy steel components, serving the offshore oil and gas, marine and heavy metal industries. The company is an international leader in producing long-term mooring connectors such as chain, wire and fibre terminations (open and closed sockets). Its second range of products is for forging heavy lifting equipment such as

Le Béon manufacturing

shackles with lifting capacities of up to 2000T.

With more than 40 years of experience in the offshore oil and gas mooring industry, Le Béon Manufacturing has the expertise to provide global solutions for mooring lines for floating marine renewables energy projects. The company delivered mooring elements for the first full scale floating wind turbine in 2008 (Norwegian project HyWind). It generated a € 12m turnover in 2011, of which 60% came from abroad (Brazil, Angola, etc.). For now, the marine energy share of the turnover is relatively reduced due to the low volume of floating renewables solutions at industrial stage.

85 people are currently working in the company and Jean-Paul Zoliec, managing director, says growth predictions should lead to the recruitment of 20 people a year until 2014.

Jean-Paul Zoliec and export manager Clément Mochet recommend that to succeed in the marine energy market you must:

Develop high quality products. To develop long-term relationships in a highly competitive market, you need to develop products of a high standard: R&D, innovation, traceability, control and testing, certifications depending on your activity (eg: from Lloyd's, Bureau Veritas, ABS, DNV)…

Demonstrate a strong safety culture. Security at Le Béon Manufacturing is paramount as people are dealing with heavy components. The company applies Health Safety Security and Environment procedures (HSE) for personnel

security, prevention training, compliance with the rules and reliability of company equipment.

Be flexible and customer orientated. Depending on your activity, you should be able to answer at any moment to the clients' needs. Clément Mochet says it is a corporate culture. Eg: Le Béon Manufacturing's production runs on three shifts to match customers' requests.

Identify the people responsible for the tenders. It is crucial to identify clients' decision-makers ie: people who are in charge of the tenders. Identify them and stay in contact. Jean-Paul Zoliec suggests it would be useful for Brittany companies to have a national database gathering all the marine energy projects, test sites, tenders, etc.

Watch what's happening in the market. Being present at international events is crucial. Le Béon Manufacturing attends events as visitors to identify new products and potential markets.

Finally, Jean-Paul Zoliec added that the **price** should of course be considered to win a business. However, the top criteria are product quality and security at work.

Contact: Clément MOCHET, Export Manager, c.mochet@le-beon.com

5.5.2 In Cornwall

Case study 3: *Mojo Maritime, Falmouth, Cornwall*

Mojo Maritime specialises in project management and consultancy services to the offshore renewable energy sector; providing support and management on marine operations, marine construction, engineering, installation and health and safety.

The company has built a successful track record on several high profile projects in the offshore wind, wave and tidal sectors. Mojo aims to deliver innovative-led solutions to the emerging sector, based on strong practical experience. It grew from one employee in 2004, to 20 in 2012. It has recently opened a new office in Edinburgh and is a founder member of the South West's Marine Offshore Renewables (MOR) Group and Falmouth Bay's FaBTest steering group, and a stakeholder of the South West Marine Energy Park. Mojo is confident that the wealth of expertise in the South West will place the region on the MRE map as a global centre of excellence.

The company's Business Development Manager Matt Hodson describes the innovation-led and fledgling industry as having a positive "buzz", with a lot of remaining room for growth. He recommends that to succeed in the emerging sector you must:

Understand your clients' needs. Ensure you fully comprehend what they are trying to achieve within the MRE environment. Show how your expertise can provide

Bauer Renewables & Mojo Maritime monopile installation

technical solutions to potential industry challenges. Be prepared to invest in long-term relationships, demonstrating a can-do attitude.

Have a commercial strategy that is in tune with the industry. It is necessary to be sensitive to clients' financial parameters, especially when operating in an emerging market and on highly-innovative and pioneering projects that require flexibility and cost-effective solutions. As a small company, Mojo needs to be realistic when allocating commercial risk. Therefore, it outsources some of the large costs, in particular vessel hire, to focus on the project management, design and consultancy. Negotiate contracts effectively from the outset. Ensure intellectual property rights are protected.

Be innovative and think outside the box. Mojo established its reputation for its lateral-thinking approach

while working in challenging environments; for example successfully delivering solutions for the Round 1 Rhyl Flats wind farm project in 2007, SeaGen tidal turbine installation in 2008 and the Voith/Bauer EMEC monopile installation in 2011. Work closely and be honest with clients. Don't be afraid to suggest solutions that could improve their ideas, based on your experience.

Demonstrate a strong safety culture. Ensure (prior to tendering) you have a comprehensive Health & Safety paper trail: examples, documentation, H&S policy and procedures, etc..

Get involved early. Taking time to keep ahead of the market and new opportunities can pay off. As a small business, it is important to meet potential partners and clients, attend/speak at MRE events and lend support to R&D projects. Have your own non-disclosure agreement (NDA) and be prepared to sign other companies' NDAs.

Collaborate. Especially where involved in early stage developments with lots of R&D work. Invest in partnerships such as with the South West's Marine Offshore Renewables (MOR) Group and Marine Energy Park and with academic institutions.

Be persistent. You might need to write a lot of bids, and be prepared for rejections. But, as in Mojo's case, persistence pays off and once you start winning contracts you can build a track record to attract future clients.

Case study 4: *How to succeed in winning MRE contracts with device developers: Fred Olsen, Cornwall*

Fred Olsen (FOL) – a UK based technology development company of the Norwegian Fred Olsen Group - has successfully generated electricity from its wave energy converter, the BOLT 'Lifesaver' during its test phase off the Cornish coast. The on-going focus of the multi-million pound project is to drive down risk and cost, while enhancing technical ability, in order for it to achieve commercialisation. The 16 metre steel prototype was installed in March 2012 at the FabTest site, a designated area off Falmouth's shores that allows developers to trial concepts in relatively sheltered and easily accessible waters.

Fred Olsen's BOLT 'Lifesaver' wave energy device

Tests: investigating structural integrity, response behaviour, mooring configuration, subsea components, monitoring systems, and deployment, operational and maintenance procedures.

Components and services required for: buoyancy, coatings, control systems, fabrication (composite and steel), generators, moorings, navigation risk, seabed surveying, transmission systems, electrical engineering, hydraulics, and deployment. Instrumentation, operation and maintenance in general.

FOL envisages having a long-term presence in Cornwall and the next step is to work towards an array of devices installed at the grid-connected Wave Hub, off its north coast, in the next few years.

The project is a partnership between FOL, Supacat Ltd, Scotrenwables, Tidal Turbines Limited, the University of Exeter and the Technology Strategy Board. It has drawn on a huge range of suppliers, many of whom are from the South West region of the UK, and continues to seek companies that want to engage in the emerging industry.

The size of the supplier company is not a determining factor in winning a contract. FOL places greatest emphasis on: experience, quality, price and the responsiveness and professionalism of the sales team during tendering.

Project Manager Alan Taylor says: "It is about forging long-

term relationships, demonstrating the right attitude and developing a mutual understanding and trust."

To become an approved/repeat supplier you must:

Get pricing right. Cost certainty is essential, particularly for publically-funded projects such as FOL's. Therefore pricing needs to be as accurate as possible.

Demonstrate good office management. For large projects that require a lot of suppliers, simple mistakes such as not invoicing on time can have a detrimental impact. FOL seeks long-term relationships with suppliers who have a positive attitude. Poor office management creates a negative image, which in turn can result in failure to win repeat contracts.

Prioritise health and safety. FOL has its own safety rating system for suppliers to comply with. Demonstrating the correct attitude towards safety is crucial.

Be professional. Demonstrate an interest and a positive attitude towards servicing a new industry and show a willingness to develop and adapt. Ask questions, be engaged in the project's objectives. Create confidence in your ability to meet deadlines and get the job done on time and within budget. Respond to problems with a positive, flexible and solution-led attitude.

Chapter 6:

Government and local support

6.1 At European level

SMEs from Brittany and Cornwall can get EU funding to develop common projects. One of the most notable projects is the EU Framework Programme for Research and Innovation, now called Horizon 2020.

Horizon 2020 (former FP7 – Framework Programme for Research and Development) is the financial instrument implementing the Innovation Union, an EU 2020 flagship initiative aimed at securing global competitiveness. Running from 2014 to 2020 with an €80 billion budget, the EU's new programme for research and innovation is part of the drive to create new growth and jobs in Europe.

Visit: http://ec.europa.eu/research/horizon2020/index_en.cfm'

For SMEs from Finistère that need support in developing EU projects, please contact Jérémie Bazin from Technopôle Brest-Iroise (jeremie.bazin@tech-brest-iroise.fr).

Key Report

- EU project development from a former Interreg IVB project named POWER cluster: http://pdf.power-cluster.net/

6.2 In France

A large number of support organisations are able to help SMEs in the MRE sector in relation to R&D, scientific or funding. The organisation that could assist you will differ according to your need and type of project. While not exhaustive, the list below includes organisations which are entry points for SMEs.

For further information on the **legal context at local and national levels and funding support**, please contact:

- The Ministry of Ecology, Sustainable Development and Energy (Direction Générale de l'Energie et du Climat
- The French Environment and Energy Management Agency (ADEME)
- The French National Research Agency (ANR)
- The Regional Council of Brittany
- OSEO
- The Technopôle Brest-Iroise

If you have a **research and development project**, contact:

- The French Institute of Excellence in Carbon-Free Energy France Energies Marines
- The Pôle Mer Bretagne
- The Technopôle Brest-Iroise

For a **scientific project**, your entry points would be:

- The French Research Institute for the Exploitation of the Sea (Ifremer)
- The French Institute of Excellence in Carbon-

free Energy France Energies Marines

- The French State Graduate, Post-Graduate and Research Institute (ENSTA Bretagne)
- The Naval Academy Research Institute (IRENav)
- The University of Western Brittany/European University Institute of the Sea (UBO/IUEM)

For **diversification** or **business development** projects, contact:

- The Chamber of Commerce and Industry of Brest
- The Technopôle Brest-Iroise
- Bretagne Pôle Naval

Contacts:		
	Organisation Name	Contact Details
	Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME), Direction Générale Bretagne	www.ademe.fr +33 (0)2 99 85 87 00
	Bretagne Pôle Naval	www.bretagnepolenaval.org Anne-Marie Cuesta, +33 (0)2 97 02 40 96, contact@bretagnepolenaval.org
	Chamber of commerce and Industry of Brest	www.cci-brest.fr Jean-Hervé Lacroix, +33 (0)2 98 00 38 00
	Conseil Régional de Bretagne	www.bretagne.fr
	France Energies Marines	www.france-energies-marines.org Yann-Hervé de Roeck, contact@france-energies-marines.org, +33 (0)2 98 49 98 69
	French National Research Agency (ANR)	http://www.agence-nationale-recherche.fr/en/project-based-funding-to-advance-french-research/
	French Research Institute for the Exploitation of the Sea (Ifremer)	www.ifremer.fr
	French State Graduate, Post-Graduate and Research Institute (ENSTA Bretagne)	http://www.ensta-bretagne.fr/ Jean-Yves Pradillon, jean-yves.pradillon@ensta-bretagne.fr

Contacts:		
	Organisation Name	Contact Details
	Ministry of Ecology, Sustainable Development and Energy (Direction Générale de l'Energie et du Climat)	http://www.developpement-durable.gouv.fr/ Julien Thomas, +33 (0)1 40 81 96 83
	Naval Academy Research Institute (IRENav)	http://www.ecole-navale.fr/The-Naval-Academy-Research,1804.html Christophe Claramunt, +33 (0)2 23 38 37
	OSEO	www.oseo.fr/international/
	Pôle Mer Bretagne	www.pole-mer-bretagne.com Stéphane Alain Riou, contact@pole-mer-bretagne.com, +33 (0)2 98 05 63 17
	Technopôle Brest-Iroise	www.tech-brest-iroise.fr Eric Vandenbroucke, contact@tech-brest-iroise.fr +33 (0)2 98 05 44 51
	UBO/IUEM	http://www-iuem.univ-brest.fr/ +33 (0)2 98 49 86 00

6.3 In the United Kingdom

The UK Government and Devolved Administrations (Scotland, Wales & Northern Ireland) have published a Renewable Energy Roadmap[41] which sets out a programme of actions aimed at a four-fold increase in renewable energy consumption by 2020.

The Government has established an industry Task Force to help reduce the costs of offshore wind to £100/MWh by 2020. It is committed to providing up to £30m of direct Government support for offshore wind cost reduction (between 2011 and 2015)[42].

A total of 11 MW of marine energy projects have been awarded consents and an additional 23 MW has entered the planning system. With continued Government support, there is the potential to deploy 2.17 GW of marine energy projects by 2020[43].

Ambition is equally strong across all areas of the UK, where the Devolved Administrations have set themselves challenging domestic targets for both the level of renewable electricity and heat consumption by 2020:

- The Scottish Government has introduced a target to deliver 100% renewable electricity by 2020
- The Northern Ireland Executive has a target to deliver 40% renewable electricity

and 10% renewable heat by 2020
- The Welsh Government has indicated that it has the potential to produce twice the amount of electricity it currently uses from renewable sources by 2025, and deliver 4 GW of this from marine energy[44]

In support of marine renewable deployment, the United Kingdom has:
- introduced the "banded" Renewables Obligation (RO)[45]
- helped reduce non-financial barriers, for example improving grid connections
- supported supply chain development and business opportunities

The **Renewables Obligation (RO)** is an obligation on electricity suppliers to source a specific and annually increasing proportion of electricity from eligible renewable sources or pay a penalty; this is intended to incentivise an increase in the level of renewable generating capacity and so contribute to the UK Government's climate change targets.
The Office for Gas and Electricity Markets (Ofgem), which administers the RO, issues Renewables Obligation Certificates (ROCs) to qualifying renewables. These certificates may be sold by generators directly to licensed electricity suppliers or traders. ROCs can be traded separately from the electricity to which they relate. Suppliers present ROCs to Ofgem to demonstrate their compliance with the obligation.
When the Obligation was first introduced, 1 ROC was awarded for each MWh of renewable electricity generated. In 2009, 'banding' was introduced into the RO, meaning technologies now receive different numbers of ROCs depending on their costs and potential for large scale deployment.
Following an early review of the banding for offshore wind, the level of support for this technology further increased from 1.5 ROCs/MWh to 2 ROCs/MWh for stations or capacity accredited between 1 April 2010 and 31 March 2014.

In July 2012 the UK Government announced changes to the Renewables Obligation, confirming that support for offshore wind farms will fall gradually over the course of the decade. The level of support for offshore wind will be set at 2 ROCs/MWh in 2014-15, reducing to 1.9 ROCs in 2015-16 and to 1.8 ROCs 2016-17[46]. Separately, the DECC announced that support for marine energy technologies will more than double from 2ROCs to 5ROCs per MWh, bringing the UK into line with the subsidy regime in Scotland.

In Scotland, financial incentives include:
- £70m National Renewables Infrastructure Fund (N-RIF), to support the development of port and near-port manufacturing locations for offshore wind turbines and related developments (including test and demonstration activity), with the overall aim of stimulating an offshore wind supply chain in Scotland.
- £18m Marine Renewables Commercialisation Fund (MRCF), to help develop Scotland's first commercial wave and tidal power arrays
- £103m Renewable Energy Investment Fund (REIF), part of which is earmarked by the Scottish Government to support wave and tidal developers with the development and deployment of array projects.

In the South West of the UK, the **South West Marine Energy Park (SWMEP)**[47] was launched in January 2012 to provide a collaborative partnership between national and local government, the industry and academic bodies that are committed to developing the sector. Its geographic scope extends from Bristol to Cornwall and the Isles of Scilly, with a focus around the ports, research facilities and industrial clusters found in Cornwall, Plymouth and Bristol. The SWMEP's objective is to create a positive business environment that fosters business collaboration, attracts investment and accelerates the commercial development of the marine energy sector. It aims to become a 'strategic area' for offshore renewable energy, with a strong facilities base linked to an integrated supply chain.
The SWMEP recently signed a memorandum of

understanding with the Pentland Firth and Orkney Waters Marine Energy Park to support the development of the wave and tidal renewable industry. It will work together to promote the commercial development of marine energy technologies.

Further initiatives are addressing the skills shortages within the sector in the UK, including a £1.2m Renewables Training Network launched by RenewableUK in October 2011.

Also supporting MRE development in the South West of the UK, is the Marine Offshore Renewables Group (MOR)[48], a collaboration of MRE member businesses that champion the region as an international centre of excellence for the sector.

And sustainable energy experts at Exeter-based Regen SW compile an up-to-date directory showcasing the wealth of MRE supply chain activity in the region[49].

Contacts:		
	Organisation Name	Contact Details
	The Crown Estate	London: +44 (0)20 7851 5000 Edinburgh: +44 (0)131 260 6070 www.thecrownestate.co.uk enquiries@thecrownestate.co.uk
	Department of Energy & Climate Change (DECC)	+44 (0)20 7979 7777 correspondence@decc.gsi.gov.uk www.gov.uk/government/organisations/department-of-energy-climate-change
	RenewableUK	+44 (0)20 7901 3000 info@RenewableUK.com www.renewableuk.com
	South West Marine Energy Park (SWMEP)	Regen SW Johnny Gowdy +44 (0)1392 494 399 jgowdy@regensw.co.uk http://www.regensw.co.uk/projects/offshore-renewables
	Marine Offshore Renewables (MOR) Group	+ 44 (0)1326 211382 info@morenewables.co.uk http://www.morenewables.co.uk

Appendix: Methodology

Our research objectives were to:

- Broadly quantify the value of future energy investments in marine energy within Western Europe
- Identify the products and services required for the above investments
- Determine the process for becoming an approved supplier to utility (energy) providers and tier 1 suppliers
- Identify the utility (energy) providers' and tier 1 suppliers' key criteria for selecting suppliers during:
  - Pre-qualification tendering
  - The tender
  - The sales presentation / pitch
- Establish which IT systems are used within the tendering process
- Where possible, to detail supplier collaborations that have won contracts with energy providers or tier 1 suppliers
- Understand professional codes of conduct whilst delivering to contract
- Identify organisations that can provide information and support to the sector

Sampling was from the following groups (all samples are per region):

- Purchasing Managers from utility (energy) providers
- Purchasing Managers from tier 1 suppliers;
- Marketing and sales managers from winning tier 2 / 3 supply chain businesses
- Purchasing Managers from wave and tidal device manufacturers

Consultants advising supply chain businesses

The research was conducted through: desk research, telephone research, an online survey, telephone interviews and face to face interviews.

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- Eiffage
- Enel Green Power France
- Eole Generation
- Eon Climate and Renewables
- Forewind
- Hydroquest
- Le Gaz Intégral
- Neoen marine
- Pelamis Wave Power
- Siemens
- STX France SA
- Agence Maritime de l'Ouest
- GDF Suez
- Hocer
- In Vivo Environnement
- Nass&Wind Offshore
- Piriou
- Sabella
- Mojo Maritime
- Fred Olsen

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- Chambre de commerce et d'industrie des Côtes d'Armor
- Chambre de commerce et d'industrie de Brest
- Chambre de commerce et d'industrie de région Bretagne
- Syndicat des Energies Renouvelables
- Conseil Régional de Bretagne, antenne portuaire et aéoroportuaire de Brest
- Ifremer

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- The Crown Estate (energy): www.thecrownestate.co.uk/energy-infrastructure
- RenewableUK: www.renewableuk.com
- South West Marine Energy Park prospectus: regensw.s3.amazonaws.com/1059_sw_mep_prospectus_2nd_ed_finalv2_lowres__c1f9e42c172e10fa.pdf
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- Peninsula Research Institute for Marine Renewable Energy (PRIMaRE): www.primare.org
- Regen SW: www.regensw.co.uk
- Marine Management Organisation (MMO): www.marinemanagement.org.uk
- Pôle Mer Bretagne: www.pole-mer-bretagne.com

Appendix: With contributions from the MERiFIC Advisory group

- Jean-Didier Hache, Conference for Peripheral and Maritime Regions
- Jean-Yves Pradillon, ENSTA Bretagne
- David Krohn, Renewable UK

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Meet us: Maison du Technopôle Brest-Iroise, site du Vernis – 40 rue Jim Sévellec – Brest, France

Contact us: Technopôle Brest-Iroise – CS 83809 – 29238 Brest Cedex 3 – contact@tech-brest-iroise.fr

Call us: +33 (0) 2 98 05 44 51

www.tech-brest-iroise.fr

TECHNOPÔLE BREST-IROISE

Contact us: Cornwall Marine Network, Unit 7a, Falmouth Business Park, Bickland Water Rd, Falmouth, Cornwall, UK

Call us: +44 (0) 1326 211 382

networkoffice@cornwallmarine.net

www.cornwallmarine.net

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