

Discover the potential of Marine Energy

Marine Energy and its potential | Types of Marine Energy | The Marine Energy Alliance | Company profiles

Project partners:



DMEC Dutch Marine Energy Centre



EMEC THE EUROPEAN MARINE ENERGY CENTRE LTD



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1. Marine Energy: part of the energy transition

If we could effectively harness all the energy in our oceans, we would not have an energy problem. The resource is vast and remains virtually untapped to date. In order to achieve our climate goals by 2030 and 2050 to reduce emissions and limit global warming, we will need all sustainable solutions, including marine energy. So the sector needs to work hard and fast to get marine energy ready to supply utility scale power to our national grids over the next 10 to 25 years.

Unified service delivery

Europe is uniquely positioned to become the global industry leader in marine energy. The Marine Energy Alliance (MEA) unites regional expertise and capabilities of leading organisations with a track-record in ME development. The main objective is to progress the technical and commercial maturity level of 40 SMEs developing ME Concepts (TRL 3-4), reducing the risk in the subsequent capital-intensive demonstration phase.

How?

MEA focusses on the delivery of a tailored suite of integrated technical and commercial services, which is something new to the sector. Each developer is matched with a group of experts, who will engage with the developer to meet their needs.

Various events, workshops and pitching moments will be organised to connect maritime and offshore companies to ME developers and facilitate collaborations. A ME Investment Portfolio enabling investors to diversify risk by investing in multiple ME Concepts simultaneously will be developed.

Impact

These activities are expected to support 120 companies in bringing new products to the market and leverage €8 million of additional funding. To sustain MEA, lessons-learned in the service delivery to individual ME Concepts are used to develop a Technical & Commercial Service Offer, which will be jointly implemented after the project lifetime. This service offer aims to support another 40 ME Concepts in the years after project finalisation contributing to the creation of 300 new jobs and 500 maintained jobs in the NWE region. The ultimate goal is to see as many technologies as possible reach market maturity, and feeding power to the grid and making a difference in our energy transition.



Peter Scheijgrond
Head of Services, DMEC
MEA service delivery

2. Potential of Marine Energy

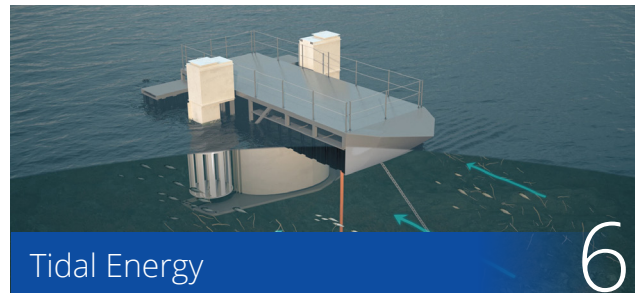
In Europe, Marine Energy could generate 100GW of renewable energy and produce up to 10% of Europe's electricity consumption by 2050. That's enough to meet the daily electricity needs of 76 million households. Deploying 100GW of ocean energy will also mean creating a new industrial sector based firmly in Europe, and 400,000 skilled jobs all along the supply chain.

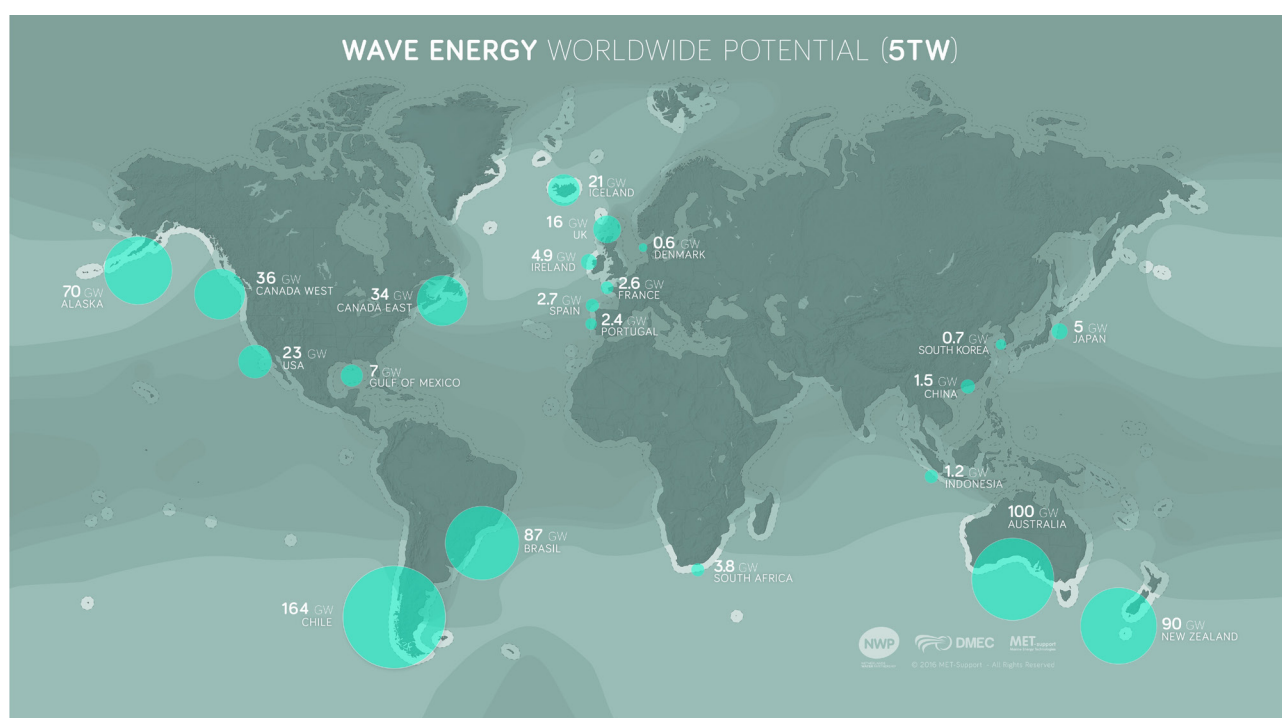
On a global scale, Marine Energy could generate 300GW of renewable energy by 2050. This is enough to supply electricity to 350 million households worldwide. Marine Energy could build an annual market generating >€100 billion of economic value in the entire supply chain and create >650.000 jobs.

Realising this potential is necessary to achieve the ambitious goals set out in the Paris Agreement on climate change.

Sources: www.oceanenergy-europe.eu/ocean-energy and www.dutchmarineenergy.com

3. Types of Marine Energy





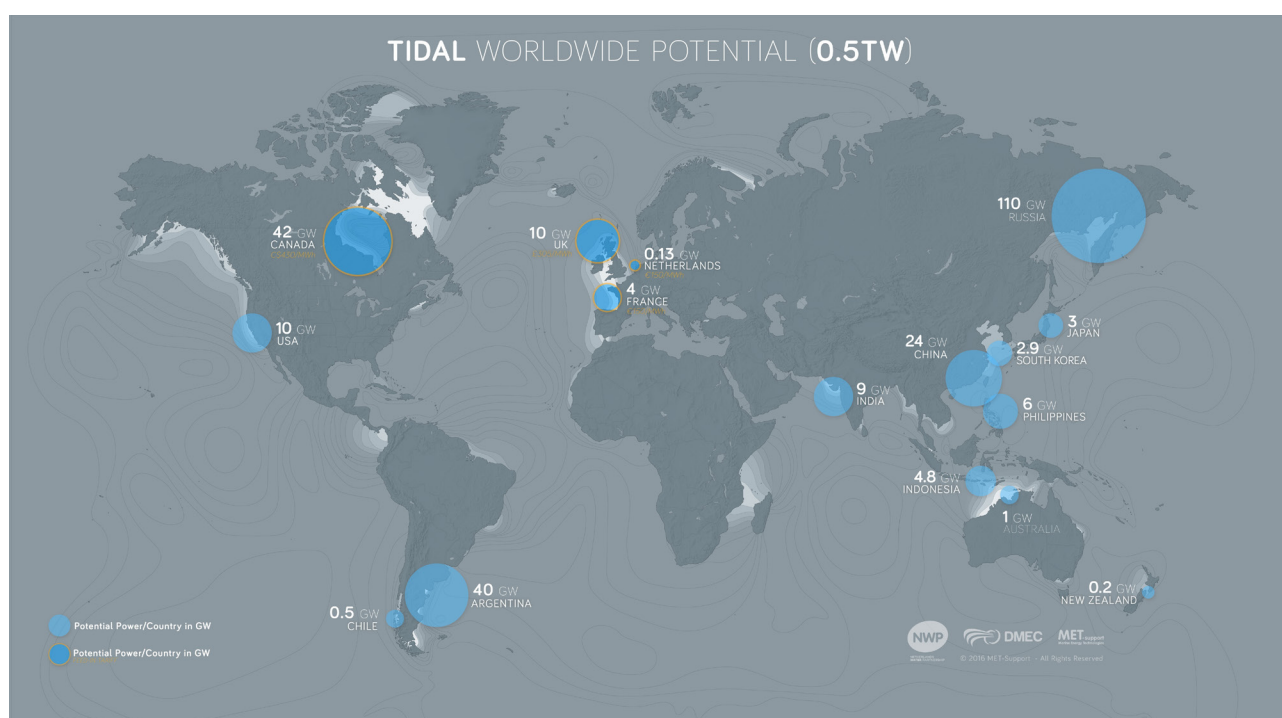
Wave Energy

Wave Energy Converters

Wave Energy Converters (WECs) capture the kinetic energy of ocean waves to generate electricity. The amount of energy that can be extracted from waves is dependent on the height of the waves. WEC devices can be located flexibly - on the shoreline, near-shore, and offshore - to harness the available energy most efficiently. WECs are intended to be modular and deployed in arrays to obtain a significant combined power output. Due to the diverse nature of waves in different regions in the world, it's likely that several different technologies are needed to exploit the potential in all oceanic regions.

MEA SME's working on Wave Energy

Benson Engineering Ltd.	12	Pure Marine Gen Ltd.	22
Centipod Limited	13	Sea Energies Innealtóireacht Teoranta	22
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Tidal Energy

Tidal Energy Converters

Tides are the rise and fall of sea levels caused by the combined effects of the gravitational forces exerted by the Moon and the Sun and the rotation of Earth. The tides also create ocean currents that can reach high flow speeds in certain areas around the world. Both forms of energy can be used to generate renewable electricity.

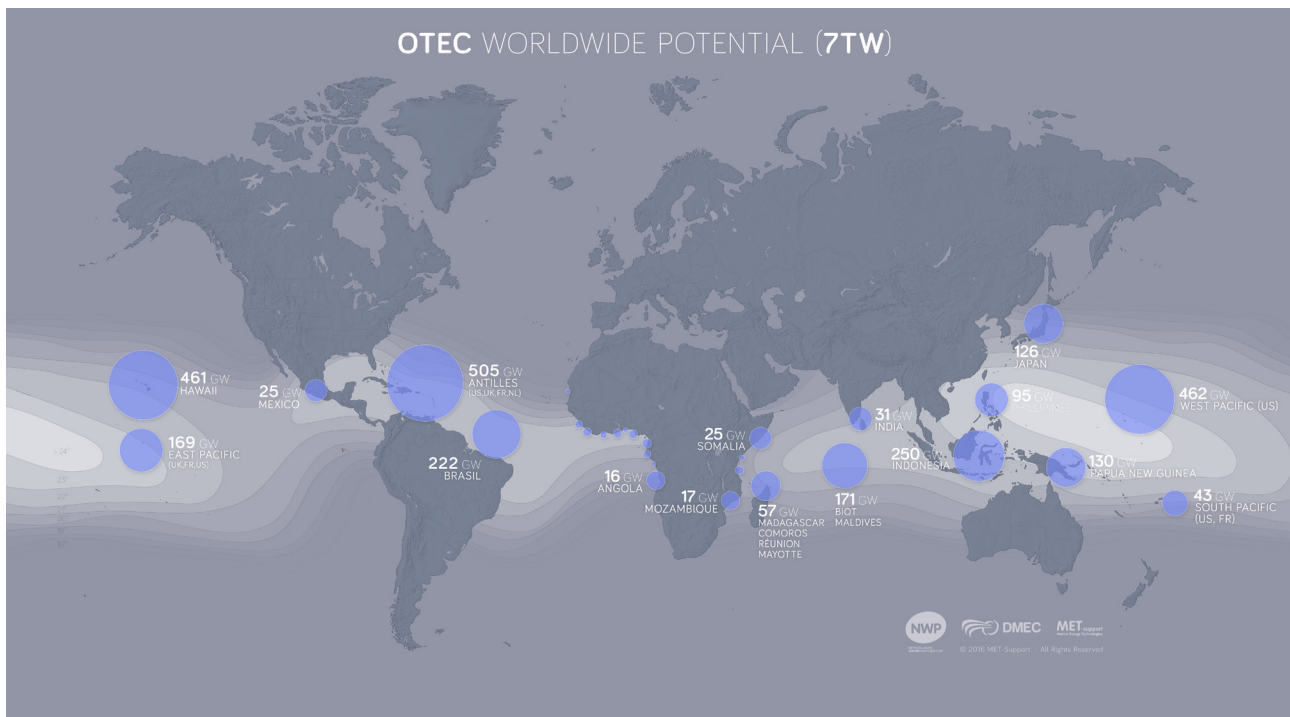
Tidal range technologies generate energy from the vertical head difference between the high tide and the succeeding low tide. The tidal range is the vertical difference between the high tide and the succeeding low tide. Tidal range technology uses the same principles as conventional hydropower and requires a natural or a man-made structure (e.g. a dam or barrier) to impound a large body of water. The difference between the tide height inside and outside the impounded area causes water to be discharged from one side to the other. This water is forced through hydro turbines inside the structure to generate energy. The difference between high and low tide, as well as the size of the area of enclosed water, influence the power output of tidal range technologies. They can be deployed in locations where large water masses flow into compounded areas, such as bays or estuaries.

Tidal stream technologies convert the kinetic energy in tidal currents into electrical energy. The energy output of these Tidal Energy Converters (TECs) is determined by the speed of the currents. The devices can either be implemented in existing civil structures such as storm surge barriers, fixed directly to the seabed, or can be buoyant and tethered to the seabed. TECs are generally modular and intended for array deployment to obtain a significant combined energy output.

MEA SME's working on Tidal Energy

DHV Turbines	14	GKinetic Energy Ltd	17
EEL Energy SAS	15	Open Ocean Energy Ltd.	21
Fishflow Tidal Power BV	16	Water2Energy	26

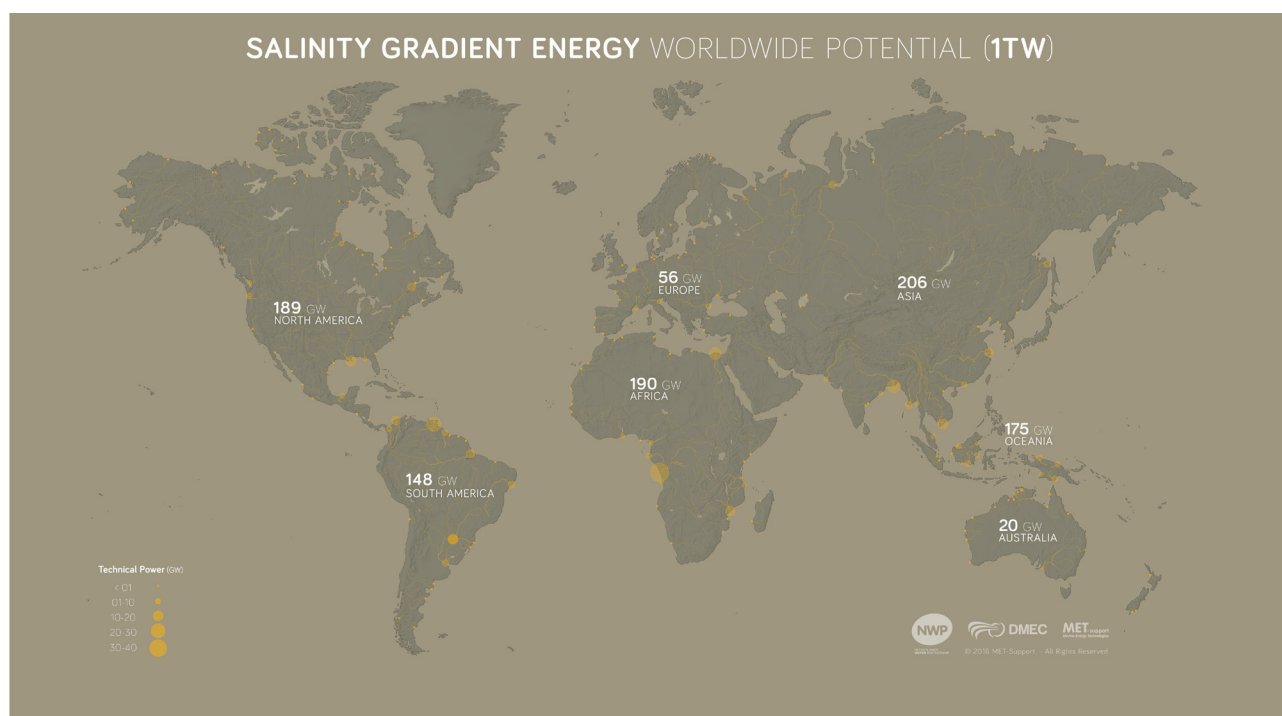
Source www.dutchmarineenergy.com



Ocean Thermal Energy Conversion

Ocean Thermal Energy Conversion (OTEC) technologies exploit the temperature difference between cold ocean water at a depth of 800 – 1000 metres (about 5 °C) and warm surface water (about 25 °C) to produce electricity. The warm surface water of 25 °C is used to evaporise a working fluid with a low boiling point. The resulting vapour pressure drives a turbine-generator which produces electricity. After generation of energy in the turbine-generator, the working fluid is cooled using the cold ocean water of 5 °C and the energy generation circle can start again. OTEC technologies are therefore generating energy in a closed loop, 24 hours a day, all year round.

OTEC technology requires a temperature difference of 20°C to achieve significant energy yields. This means that OTEC technologies can only be efficiently deployed in equatorial and tropical seas and oceans.



Salinity Gradient

Salinity Gradient (SG) – also referred to as “blue energy” – technologies generate power from the chemical pressure difference between two bodies of water. Energy is generated based on the difference in ionic concentration between fresh water and salt water. Two main technology types, Reverse Electro Dialysis (RED) and Pressure-Retarded Osmosis (PRO), can be deployed in deltas or fjords to generate a steady flow of electricity. These technologies make use of a semi-permeable membrane, which generates an osmotic potential that can be used to generate electrical energy. Salinity Gradient technology can either be implemented as a standalone power plant, or as a hybrid energy generation process focusing on energy recovery, for example from a desalination or water treatment plant.

Other types of Marine Energy

Floating Solar Offshore Wind

MEA SME's working on other types of Marine Energy

HelioRec	18
EOLINK	15
Ocean Grazer B.V.	20

Source www.dutchmarineenergy.com

4. About the Marine Energy Alliance

The Marine Energy Alliance (MEA) is a 4 year European Territorial Cooperation project running from May 2018 to May 2022. The project has a total budget of €6 million and is financially supported by Interreg North West Europe, who provides €3.6 million of ERDF funding.

The aim of MEA is to progress the technical and commercial maturity level of early-stage (TRL 3 – 4) Marine Energy technology companies with the overall goal of reducing the risk of device failure in subsequent demonstration phases.

Via MEA, 40 Marine Energy technology companies receive a suite of tailored expert services that will enable them to realise their ambitions and, more broadly, contribute to the coherent growth of the Marine Energy industry in general.

Through participation in MEA, companies will gain access to the project partners' world-leading expertise in Marine Energy development. They will have the chance to work closely together with a transnational team of Marine Energy experts on both the technical advancement of their technology, as well as the development of their commercial strategy and business plans. Each service offer is intended to put the company's technology and business firmly on the road towards successful commercialisation.



5. Access to the Marine Energy Alliance

MEA Service Offers are awarded to companies via a two-stage application process. The first stage is the submission of an online expression of interest, through the MEA project website. Successful applicants are invited to take part in the second stage of the application process which involves a 30-minute remote (online) pitch and Q&A session conducted by representatives of the MEA partnership.

Applications are evaluated using certain criteria which are explained in the guidance document. Applicants should familiarise themselves with the information in this online document before submitting their expression of interest.

CALL 2 OPENS UP ON JANUARY 1, 2020

Please check nwееurope.eu/MEA.

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6. SME companies supported by MEA

 <p>Overview</p>	 <p>BENSONEngineering Swiss Precision in an Irish Setting</p>	 <p>centipod Wave Energy</p>	 <p>Interreg North-West Europe Marine Energy Alliance</p>
	Benson Engineering Ltd. 12	Centipod Limited 13	Development v Kim Nielsen 14
 <p>DHV Turbines Ltd</p>	 <p>Interreg North-West Europe Marine Energy Alliance</p>	 <p>EOLINK Cost-effective Floating Wind Parks</p>	
DHV Turbines 14	EEL Energy SAS 15	EOLINK 15	EVER 16
 <p>Interreg North-West Europe Marine Energy Alliance</p>	 <p>G KINETIC</p>	 <p>HelioRec THE FLOATING SOLAR POWER PLANT</p>	 <p>JOSPA</p>
Fishflow Tidal Power BV 16	GKinetic Energy Ltd. 17	HelioRec 18	Jospa Ltd. 19
 <p>mocean energy</p>	 <p>OCEAN GRAZER</p>	 <p>OPEN OCEAN ENERGY LTD TIDAL FLYER LOW FLOW TIDAL ENERGY</p>	 <p>Interreg North-West Europe Marine Energy Alliance</p>
Mocean Energy Ltd. 19	Ocean Grazer B.V. 20	Open Ocean Energy Ltd. 21	Pure Marine Gen Ltd. 22
 <p>Interreg North-West Europe Marine Energy Alliance</p>	 <p>SWEL sea wave energy ltd.</p>	 <p>WAVERAM OCEAN POWER TECHNOLOGY</p>	 <p>TEAMWORK TECHNOLOGY</p>
Sea Energies Innealtóireacht Teoranta 22	Sea Wave Energy Ltd. 23	Swirl Generators Limited 24	Teamwork Technology B.V. 25
 <p>tfi MARINE</p>	 <p>W2E Water to Energy</p>	 <p>WFE</p>	 <p>Profiles</p>
Technology from Ideas (TFI) 26	Water2Energy 26	Wave Force Energy Limited 27	

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TECHNOLOGY TYPE

● Wave

Benson Engineering Ltd.

Benson Engineering Ltd is a wholly Irish owned Company established in 1980 By Tom and Betty Benson. Their 6500 FT² facility is set in scenic Killarney in the South West of Ireland, famous for its lakes, mountains and Atlantic beaches. The company is certified to ISO 9001 and uses automated Inspection systems to assure Quality. The Company uses Swiss automatic CNC sliding head lathes to produce precision components for the Engineering, Automotive, Medical, Marine and Gas industries worldwide.

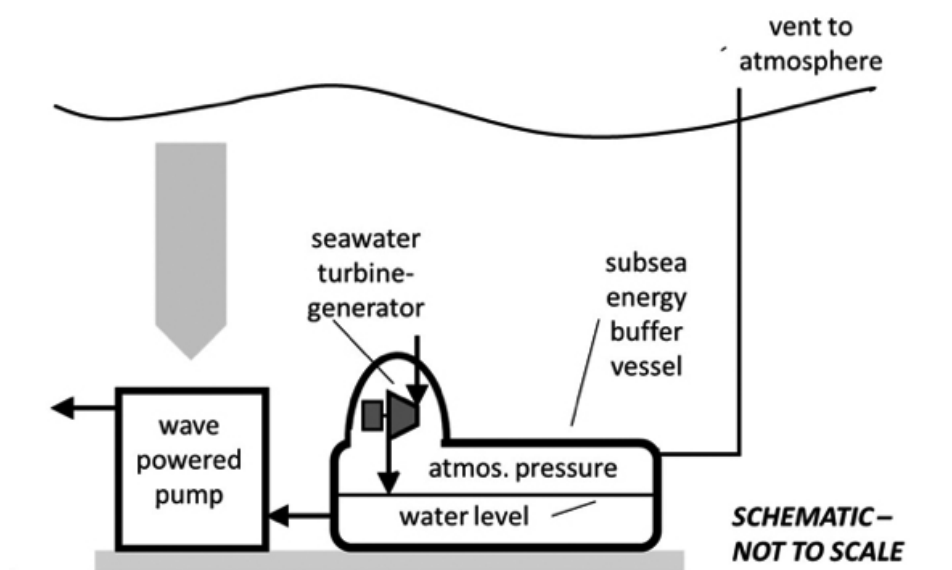
Benson engineering Ltd also provides auditing and consultancy in Quality Management standards such as ISO9001,IATF 16949,Adblue and Lean Six Sigma.

Benson Engineering has for 10 years been involved in developing Wave Energy Devices and in particular the O.R.L.A (Ocean Resource Lever Action) wave pump which, driven by a point absorber buoy, captures energy in heave, surge and pitch. The O.R.L.A wave pump has been tested at 1/50th,1/30th survival, and 1/15th scales at the Lir test facility in Ireland and the wave basin at University of Plymouth. They have developed and validated numerical models of the device and with the results of the tank testing have a robust device power matrix. Currently under the MEA programme we are completing further modelling to evaluate the benefits of latching and mass tuning on the Annual Energy Production and LCOE of the device. They have also extended their WEC concept using a subsea energy buffer which offers the possibility of using the device for desalination applications and data centre energy supply and cooling. Subsequent to tank validation of the MEA results we plan to go to ¼ scale testing in real sea conditions.

Benson Engineering is a founder member of IWEDA the Irish Wave Energy developers association. The Company was one of 3 finalists in the Research category of the SEAI annual awards. Benson Engineering was a member of the SEWEC team, using a different device, which was a finalist in the Wave Energy Prize of the US Dept of Energy recently. They also plan to enter the Wave to Water competition recently announce by the US DOE.

Benson Subsea Description

The Benson Engineering basic concept is shown schematically on the next page. The O.R.L.A wave pump(Ocean Resource Lever Action) is powered by a point absorber buoy and pumps water against ambient head from the seabed reservoir located at depths of 50-80M. Located on the reservoir is a removable pod containing a hydro turbine generator set. The turbine is supplied by the infinite ambient reservoir at 50-80M head. The turbine may alternatively be used to drive a high pressure pump to deliver water at constant pressure and constant flow to an RO desalination plant. The concept is also applicable to supplying cooling water and/or electricity to subsea or onshore Data Centres. The turbine, exhausting into the reservoir, is controlled in relation with the water level in the reservoir and runs at constant speed regardless of the sea state the wave pump experiences. The concept is scalable and each reservoir may support up 5MWatt nameplate capacity with a number of wave pumps.



The wave pump has been tested progressively at 1/50th, 1/30th and 1/15th scale in The Lir Facility in Cork and The Wave Basin in Plymouth University and has a robust Power Matrix with validated numerical modelling. Further numerical modelling is being undertaken under the MEA programme to demonstrate further improvements in Annual Energy Production using Latching and Mass tuning techniques which are readily deployable on the wave pump design.

Centipod Limited



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TECHNOLOGY TYPE
● Wave

Development v Kim Nielsen

CONTACT PERSON

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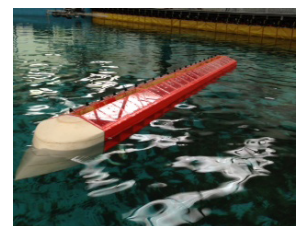
TECHNOLOGY TYPE

● Wave

LOOKING FOR

Mooring equipment, Concrete barge, Air-turbines

Development v. Kim Nielsen is a part-time personal company started in order to solve minor tasks around wave power development and work to develop own ideas for harnessing the wave energy of the sea. The solutions investigated integrates experience with the development of wave power over a period of time more than 35 years in collaboration with companies, developers, associations, universities, etc. supported by various development funds.



After development and testing of a reliable and feasible wave power technology that can produce electricity powered by waves, small wave power plants will be put into production and marketed internationally as the market for wave power is expected to open commercially.

DHV Turbines Ltd

DHV Turbines

COMPANY ADDRESS

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TECHNOLOGY TYPE

● Tidal

LOOKING FOR

Mooring equipment, Concrete barge, Air-turbines

Mission statement:

Tidal Energy development for a greener future.

DHV Turbines Ltd is a renewable energy company based in Glasgow, Scotland. They have been developing a unique downstream diffuser profile applicable to both cross flow or axial flow tidal turbines. The diffuser can be used in both tidal streams and run of river scenarios.



DHV Turbines Ltd utilises a variable pitch cross flow turbine technology resulting in low starting torque, increased efficiency, and reduced costs due to smaller blade size. The design has only minimal parts which suits mass production and can be flat packed for easy transportation. Test results have shown the DHV downstream diffuser increases water flow velocity by a factor of 2.4 - 3.8 times at the turbine. Significantly increasing available power and allowing lower flows to become more economically viable.

EEL Energy SAS



COMPANY ADDRESS

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France

CONTACT

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TECHNOLOGY TYPE

● Tidal

EOLINK



EOLINK develops an innovative floating wind turbine. EOLINK pointed out that floating wind enables to rethink wind turbine architecture in order to easily upsize turbines, the key parameter for competitiveness. In this context, EOLINK patented a pyramidal structure which tackles down design issues and provides the best power/weight ratio. In April 2018, EOLINK performed sea trials with the first French floating prototype.

The device has been designed from scratch to properly emulate a 12MW machine. Results proves that EOLINK concept can produce +12MW using a light and a 66m long semi-submersible foundation. Results also demonstrated that EOLINK concept withstands typhoon events. EOLINK now prepares a full-scale prototype thanks to ADEME support, the French agency for energy. The detailed design should be approved by third party mid-2020.

COMPANY ADDRESS

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29280 Plouzané
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CONTACT PERSON

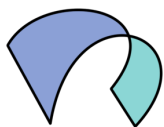
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TECHNOLOGY TYPE

● Floating wind

LOOKING FOR

Investors, offshore companies



EVER (Energies des Vagues Et Renouvelables)

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TECHNOLOGY TYPE

● Wave



Fishflow Tidal Power BV

COMPANY ADDRESS

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TECHNOLOGY TYPE

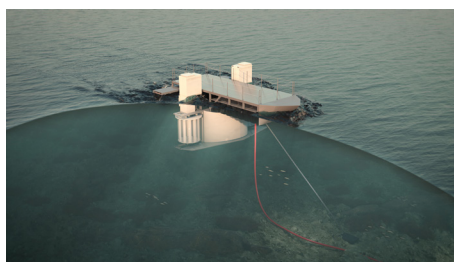
● Tidal

GKinetic Energy Ltd.



GKinetic Energy are developing a range of flow-accelerating hydrokinetic turbines for river, estuary and tidal flows through strategic partnerships and projects to develop out their IP and scale up to commercialisation. The company has demonstrated significant success in raising funding and securing partnerships which has taken the technology to TRL (Technology Readiness Level) 8 in just 5 years.

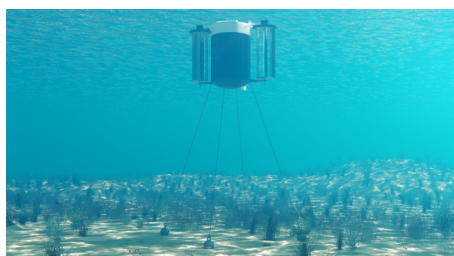
The device design comprises two key knowledge items that are patented in Europe, the US, China and Australia and patent pending worldwide which include the Bluff Body and the Blade Pitch Control System.



The GKinetic turbine harnesses clean, predictable energy from flowing water without the need for expensive and disruptive civil works such as dams. Thanks to its unique 'Bluff Body' component, the flow is accelerated into the turbines resulting in more power from lower flows. The solution provides end users with energy independence, security and contributes to the fight against climate change.

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Learning from failures and past costly mistakes made by similar developers in the industry, GKinetic recognized the advantages of proving out the concept in a planned, staged approach. To date the company has secured over €500,000 in funding support which has allowed them to deploy 3 devices; starting first with a 1:10 scale device tested independently in lab IFREMER in France, then onto a 10kW small-scale device and finally an optimized 10kW device providing invaluable learnings including the optimization of the PTO system.

COMPANY ADDRESS

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TECHNOLOGY TYPE

Tidal

LOOKING FOR

Utility companies, project developers, investors (private, angels etc.)



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TECHNOLOGY TYPE

● Offshore floating solar

LOOKING FOR

Investors, engineering companies, project developers, utility companies, universities, marine ports, plastic recycling companies, marine energy companies, project development, regional organizations.

HelioRec

HelioRec are developers of a new concept: Offshore Floating Solar Power Plant, an innovative and cost-effective solution of green electricity production, based on a circular economy approach.

HelioRec aims to:

- Save land space by deploying the power plant on the sea;
- Produce “green” electricity from the photovoltaic technology;
- Manage plastic waste through using recycled plastic for the floating structures.

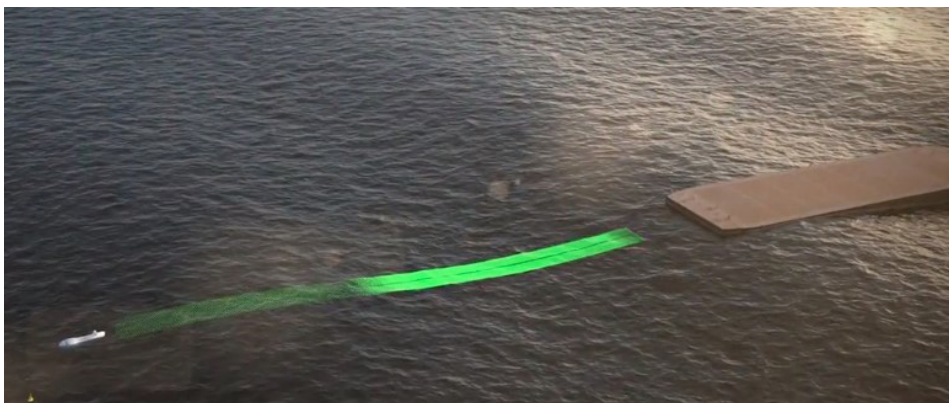
Competitive advantages:

- Offshore installation.
- Low carbon footprint. The process produces 5 times less carbon footprint than competitors' solutions.
- Advanced Design. High efficiency (7-9% in comparison with the common competitors' solution) due to design optimization.
- Comply with 8 SDGs (Sustainable Development Goals).
- Unique circular economy approach (proving that it is possible to build a new energy sector - Off-shore floating solar based on this approach with minimum waste).
- Machine learning (ML) and artificial intelligence (AI) concepts for different purposes.



Jospa Ltd.

Jospa Ltd. is an Irish SME with over a decade of experience in designing and developing systems and products in the marine market. Jospa are dedicated to the development of the Wave Tug, and delivering this disruptive zero-fossil fuel marine transport technology for a number of applications including emergency salvage response, ocean plastic clean-up and open ocean cargo transportation.



COMPANY ADDRESS

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TECHNOLOGY TYPE

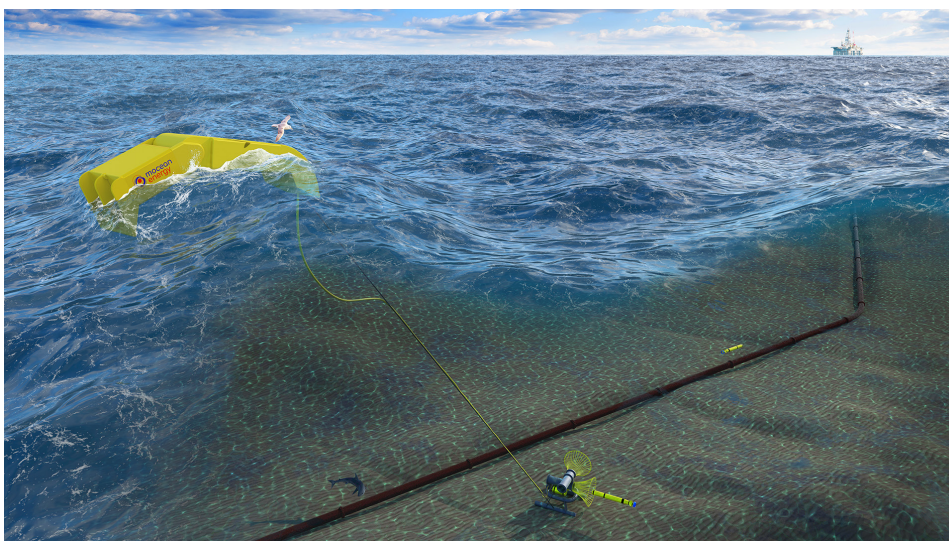
● Wave

LOOKING FOR

Companies in: Shipping, emissions reduction in marine transport, salvage and emergency response, ocean waste clean-up.

Mocean Energy Ltd.

Mocean Energy Ltd. is creating products that provide renewable energy from the ocean for off-shore systems. Their core technology is for harnessing energy from ocean waves.



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TECHNOLOGY TYPE

● Wave

LOOKING FOR

Oil and gas operators, oil and gas tier 1 contractors, investors.



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TECHNOLOGY TYPE

 Hybrid wave and wind

Ocean Grazer B.V.

Ocean Grazer B.V. develops an unrivalled offshore energy storage solution that can be expanded into an hybrid renewable energy platform to increase and stabilize the energy yield of offshore renewable energy farms. Their solution has a huge market potential due to the inherent need for utility scale storage solutions and renewable energy production offshore. They provide a feasible hybrid solution for harvesting wind and wave energy, including a storage technology that exploits the hydrostatic pressure at the sea bed to store energy and cancel out imbalances between supply and demand.

The hybrid and modular solution consists of three sub-systems:

1. **Ocean Storage** exploits the hydrostatic pressure at the sea bed to store energy. It stores energy by pumping water into flexible bladders that are exposed to the high hydrostatic pressure at the bottom of the sea. The stored potential energy that has been built up in the flexible bladder can be converted into electricity by channelling the water through hydro-turbines back into the internal reservoir.
2. **Ocean Power** is our innovative wave energy converter, and comprises a densely packed array of floaters powering adaptable hydraulic pumps. This system can easily be integrated with our Ocean Storage technology, using the hydraulic pumps to add potential energy to the flexible bladders.
3. **Ocean Foundation** is a multi-purpose foundation designed to house and support multiple offshore renewable energy technologies like our Ocean Storage and Ocean Power technologies, or integrate it with offshore wind.



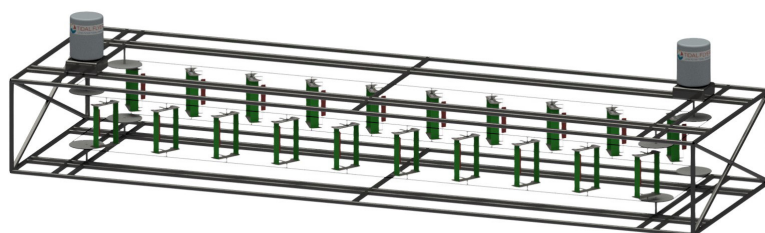
Open Ocean Energy Ltd.



Tidal Flyer is a patented Tidal and River energy converter being developed by Open Ocean Energy Ltd. (OOE) that uses low to moderate flowing water to drive vertical hydrofoils that are connected to upper and lower drive cables. These cables are laid out in a closed loop with 2 No. power take-off (PTO's) systems for every Tidal Flyer system.

The system may span part way or fully across a marine channel and the system can be expanded laterally across the channel by adding foils without changing scale, or scale vertically (at multiple scales) to best suit a specific site. In addition, the large swept area of the system provides a high system efficiency. The system is made up of Flyer units, each consisting of a pair of foils and a self-trimming tail with between 30 and 70 flyers per system (depending upon site constraints). The patented self-trimming tail is a key component of the Tidal Flyer system, controlling the angle of attack (AOA) of the foils and regulating power output of the device i.e. it can increase or shed power.

Founded in 2007, OOE has progressed the Tidal Flyer concept through TRL development. This includes testing at IFREMER on multiple occasions with full system models and individual flyers. A combination of private funding as well as national and EU funding has been used to progress development to date.



Dynamic models were used for early stage proof of concept testing and to establish the systems power curve. Subsequent testing has focused on optimization of individual flyers to assess various foil profiles, endplate shapes, tail size and determine the optimal foil and tail spacing.

Studies undertaken by Black and Veatch and Exceedence have focused on the commercial viability of developing the Tidal Flyer system for the multi-megawatt utility market and OOE are now collaborating through MEA to expand the commercial viability for multiple system sizes. To ensure the TRL programme was followed efficiently OOE worked closely with Brian HOLMES, a senior ocean energy research consultant.

The selected route to market is to pursue smaller scale tidal and river systems for use in remote off-grid areas. Initial market studies show there is large potential across Asia, as well as some regions within Europe and North America for these small-scale devices to provide electricity to remote communities. OOE is seeking partners in manufacturing and/or strategic development to bring Tidal Flyer to the global market.

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TECHNOLOGY TYPE

Tidal

LOOKING FOR

Manufacturing partners, strategic development partners, investors.



Pure Marine Gen Ltd.

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TECHNOLOGY TYPE

● Wave



Sea Energies Innealtóireacht Teoranta

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TECHNOLOGY TYPE

● Wave

Sea Wave Energy Ltd. (SWEL)



Achieving power extraction from renewable sources at a cost lower than the one of fossil fuels is currently a long term dream for the renewable energy industry. But not anymore! SWEL's testing results indicate that this can now be achieved using the power of the wave.

Sea Wave Energy Ltd. (SWEL) is a R&D company based in the UK and Cyprus that has been focused on the design and development of its wave energy converter – The “Waveline Magnet” (WM), a wave energy converter that has been evolved for more than 12 years achieving numerous patents. The Waveline Magnet is the brainchild of SWEL's CEO and inventor – Mr. Adamos Zakheos. The company has modest onshore and offshore testing capabilities and facilities in Cyprus, where the R&D is carried out, and the model devices built in-house by Mr. Adamos Zakheos and his technical team.

SWEL has been developing its technology that is comprised of an array of flexible assemblies linked by a spine power system. Over the years SWEL has been able to refine and learn upon each test and design, developing both a prime mover and power take off system.

Both the PTO & prime mover can be built from recyclable materials and the PTO has been designed to use sea water instead of oil. This renders the WM a fully functional Wave Energy Converter that is 100% recyclable and environmentally friendly.

Our Research & Development has created a device that ‘enclaves’ the surface of the sea, or the wave line as we like to call it, becoming one moving dense mass with the contour of the wave. This interaction allows the device to adopt the mass of the wave water column and fundamentally becoming the wave itself, allowing it to work in harmony and synchronization with the deployed sea area, regulating the optimum energy that can be extracted in a controlled and non-disruptive manner.

Giving a solid body to the wave line allows the same device to work in both high and low waves. This matchless interaction also ensures that harsh wave conditions do not negatively affect the performance of the device, but in contrast actually enhance its performance without survivability complications.



COMPANY ADDRESS

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TECHNOLOGY TYPE

● Wave

LOOKING FOR

Engineering companies,
companies specialising in
hydrogen production, companies
specialising in moorings,
investors.



Swirl Generators Ltd.

COMPANY ADDRESS

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TECHNOLOGY TYPE

● Wave

Resonant heaving buoy point absorber for deep water offshore sites.

Teamwork Technology BV



Teamwork Technology develops innovative, sustainable concepts into businesses. It is a product developer for a variety of technologies relating to renewable energy and energy efficiency. The company has a long track record in marine energy, having been involved in both Archimedes Wave Swing (AWS) and Tocardo from their inception. Currently, Teamwork is developing a sustainable heat pump, and a wave energy converter, called Symphony.

Symphony

Symphony is a novel technology based on more than 20 years of experience in wave and tidal business. The technology is a product of co-makship between science and industry headed by Teamwork Technology BV in the Netherlands. It represents the knowhow of a network of expertise over Europe and beyond. Developed with support of the European Commission and with the expertise of the offshore industry.

The Symphony Wave energy Converter (WEC) technology is robust enough to survive the worse case conditions and dedicated enough to convert wave energy into electricity in a highly efficient way. For the offshore industry it is believed to be a great opportunity with a potential market equal or bigger than offshore wind.

COMPANY ADDRESS

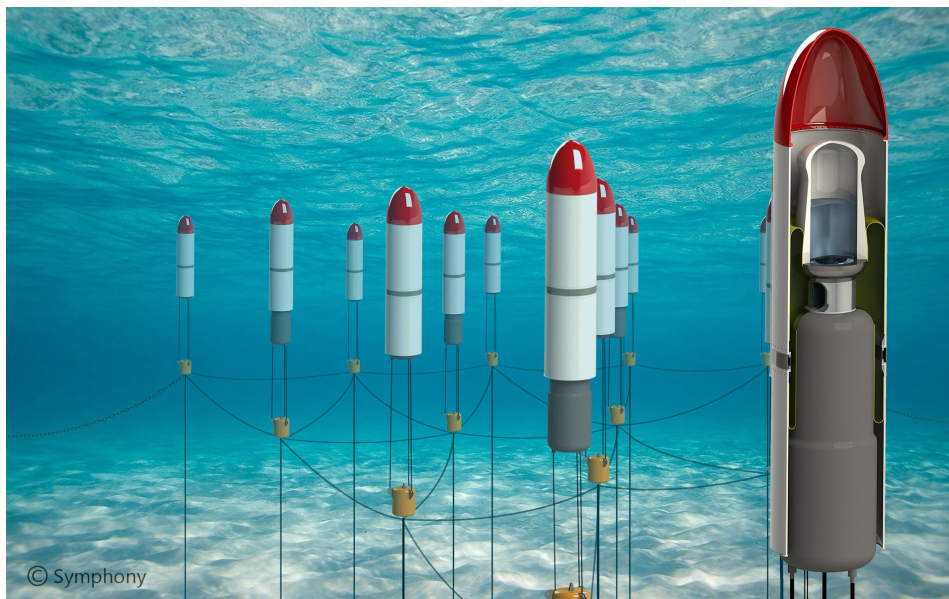
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TECHNOLOGY TYPE

● Wave





TfI Marine

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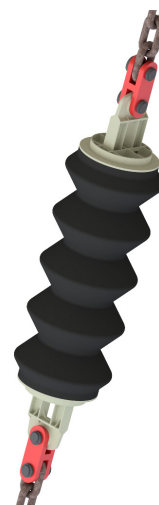
TECHNOLOGY TYPE

Wave, tidal, OTEC, salinity gradient, other types

LOOKING FOR

We are especially interested in any projects looking for ~50% load reduction in the mooring lines, through the sue of our polymer components. We are especially interested in FOWT, where we are currently involved in a range of projects deploying components for platforms ~8MW platforms.

TfI Marine is a mooring design company that specializes is supplying innovative mooring solutions to commercial floating structures. Tfl Marine's mission is to change the traditional approach to mooring design forever, through the use of our innovative technology. Our ambition is to make our polymer based mooring systems the first choice for companies within the aquaculture, ocean energy, aids to navigation and oil & gas industries. We are focused on bringing a durable, cost-effective and efficient solution to the commercial mooring market. Tfl Marine is aiming to deliver the next generation mooring systems that will challenge the current industry on performance. Based in Dun Laoghair harbor, Tfl Marine has access to a wealth of maritime knowledge from an area steeped in marine innovation and history. Tfl Marine designs and manufactures polymer, mooring tethers that are built to protect floating structure and ensure survivability in the worlds harshest environments. Our moorings were developed to be scalable for large and small structures alike, offering significant peak load reduction and elimination of snatch loads. Our tethers provides a reduction or wear and tear resulting in reduced lifetime costs due to its innovative, dynamic design and materials.



Water2Energy

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TECHNOLOGY TYPE

Tidal

LOOKING FOR

Investors, port authorities, water bodies are all important stakeholders in this stage of our introduction into the market.

Water2Energy is developing, testing and delivering Vertical Axis Water Turbines (VAWT). These turbines has the benefit that the electronics can be placed above the waterline and therefore can be more cost effective. The VAWT's fit perfectly in existing channels and ducts which have mostly a rectangular cross section. Through several selection procedures, the turbine of Water2Energy was selected as the best to fit in existing channels like the drainage channel alongside the lock of Kallo in the Port of Antwerp. Water2Energy developed and tested, together with DeMeyer Construction, a 200kW water turbine. This test showed the great potential of the VAWT's.

With its strong connections in the market, Water2Energy is able to take a project from the first initiation to the maintenance. Due to the perfect fit in existing constructions, Water2Energy is looking for port authorities or waterboards to deliver sustainable energy by the turbines. This can play a big role in having energy-neutral water works.



WaveForce Energy Ltd.



Founded in 2011, WaveForce Energy Ltd. (WFE) is dedicated to developing a simple, cheap OWC wave converter that is tuned to the wave environment where it is to be deployed. Tuning and design are undertaken using their proprietary software and unique design philosophy. Tuning guarantees the optimum power absorption and generation for the prevailing environment. It also delivers survivability in all wave sizes recorded at the site. The founders include leading academics in the fields of numerics and hydro dynamic. Their mission is to design cheap, easily maintained buoys for the industry.



COMPANY ADDRESS

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TECHNOLOGY TYPE

● Wave

LOOKING FOR

Power takeoff designers,
manufacturers, investors.

Project partners:



Total project budget:
€6 million

Total budget received from Interreg North-West Europe (2018-2022):
€3.6 million of ERDF