



**REQUIRED NOMINATION INFORMATION  
IN RESPONSE TO DOCKET NO: BOEM-2018-0045**

COMMERCIAL LEASING FOR WIND POWER DEVELOPMENT ON THE OUTER CONTINENTAL SHELF  
(OCS) OFFSHORE CALIFORNIA – CALL FOR INFORMATION AND NOMINATIONS (CALL)



**Submitted to:**

US Department of the Interior  
Bureau of Ocean Energy Management (BOEM)  
Office of Strategic Resources  
Pacific Region

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## 1. INTRODUCTION AND COMPANY BACKGROUND

This Required Nomination Information (“RNI”) document has been prepared by the Cierco Corporation (“Cierco”), a US headquartered company based in Palm Springs, California in response to the Bureau of Ocean Energy Management’s (“BOEM”) call for nominations to gauge interest in commercial wind leases in some, or all of, the Call Areas of the Californian outer continental shelf; as identified in Docket No BOEM-2018-0045.

Cierco was established in 2001 with the goal to introduce new marine renewable technologies into the commercial market and provide a platform for marine energy and systems integration. Cierco, through its work in Europe, has developed two core competencies – the development of consented and financed marine energy sites and the commercialisation of offshore wind technology (supply and maintenance operations). Cierco has ambitious plans to become a world leading marine renewable energy development leader, directed at building up our current strength in site development, project management, engineering know how and financing to create a unique company capable of working across the globe to develop sites for any type of marine renewable technology, with a particular focus on innovative and integrated energy technology solutions.

Cierco have produced this RFI to inform the BOEM of its interest in the Californian Offshore Wind Leasing opportunity and explain both Cierco’s experience of developing projects with new offshore wind technology and its corporate trajectory to establishing commercial floating offshore wind developments in California and Europe.

## 2. REQUIRED NOMINATION INFORMATION LIMITATIONS

This RNI document aims to provide the BOEM with an outline way forward on the floating offshore wind technology development path (including Cierco’s enabling role) and the appropriate delivery of potential Cierco offshore wind projects in California. However, Cierco need to emphasize that this early stage it is not possible to describe in detail the suppliers and investors (or means of funding) for a project where the area and timescales to securing potential seabed rights are yet to be confirmed and where uncertainty exists on the time requirements to secure the necessary consents and grid access.

In addition, at this current moment in time, there is no process in place for a Power Purchase Agreement (PPA) nor a clear description of how the Federal and State agencies expect to introduce floating offshore wind as a component of the energy mix. As such, the information provided in this RNI document is based on high level targets with several assumptions on the progress of the US/California offshore wind development process and that the necessary requirements are provided within the project programme.

Cierco emphasize that the BOEM need to assess this RNI within the wider context of the time requirements to accommodate the necessary floating offshore wind technology test and demonstration process and the development path requirements of the California offshore wind industry (including the development of the local supply chain). In this context we can assure the BOEM that the Cierco team is well experienced of defining collaborations, growing companies and securing funding to realise both R&D as well as commercial projects.

Hence, the Cierco step by step approach, based on building blocks and technology/project milestones, builds a realistic platform for a credible tender to the California and wider US west coast market. We also take the opportunity in this RNI document to state our aim to be a valuable indigenous contributor to the development of the emergent, and potentially future internationally significant, floating offshore wind sector in California.

### **3. REQUIRED NOMINATION INFORMATION**

#### **3.1. Cierco Technology Development Plan**

Cierco is actively working on a UK based commercial offshore floating wind technology development plan, detailing a strategy of developing the first offshore deployment of the next generation of large offshore wind turbine technology at our Forthwind site in Scotland, leading to the development of a number of floating foundation demonstration projects in the UK which will in turn will result in the development of the first large scale commercially viable floating offshore wind parks.

The technology development plan is aimed at reducing the technology risk through incremental approach stages, allowing confidence to be introduced within the consenting and financial spheres of project development. The path is being pursued on a technology neutral basis; however, Cierco maintains close links with a number of turbine and floating platform technology development companies to ensure that credible technology projects and financial projections are achieved. Cierco is targeting a mid-2020 deployment and operation and is expressing an interest in this leasing opportunity to ensure that suitable scale commercial sites are available for deployment in line with our business plan.

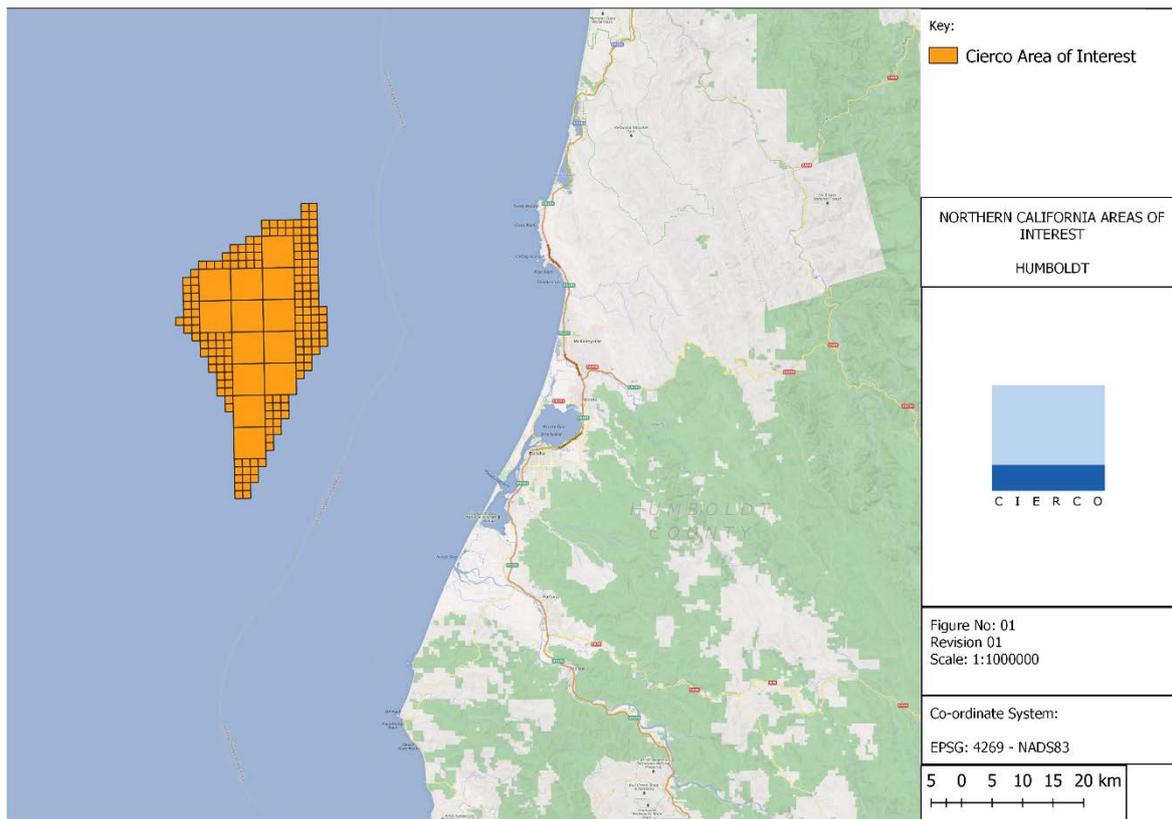
#### **3.2. Development Area(s) of Interest**

The milestone timings of the technology development plan are crucial in ensuring that credible commercial propositions are put forward for a California Offshore Wind leasing round at an appropriate time. As this current BOEM call for nomination information is at a very early stage, where potential areas have been identified and announced following consultation with several governmental bodies and stakeholder events, Cierco does not want to rule out any area at the present moment in time and is expressing an interest in securing one or more commercial lease in all the areas identified within the BOEM call.

Should BOEM come forward with targeted commercial lease areas, Cierco will review the results from its technology development plan to identify the most appropriate platform technology and turbine combination based on the following characteristics of the proposed area:

- Available grid capacity;
- Wind speeds;
- Technology requirements and feedback from test and demonstration projects;
- Financial modelling;
- Environmental designations and sensitivities;
- Distance to shore and available port facilities;
- Development timelines to secure necessary deployment sites within the Cierco business plan;
- Stakeholder views and uses within the area.

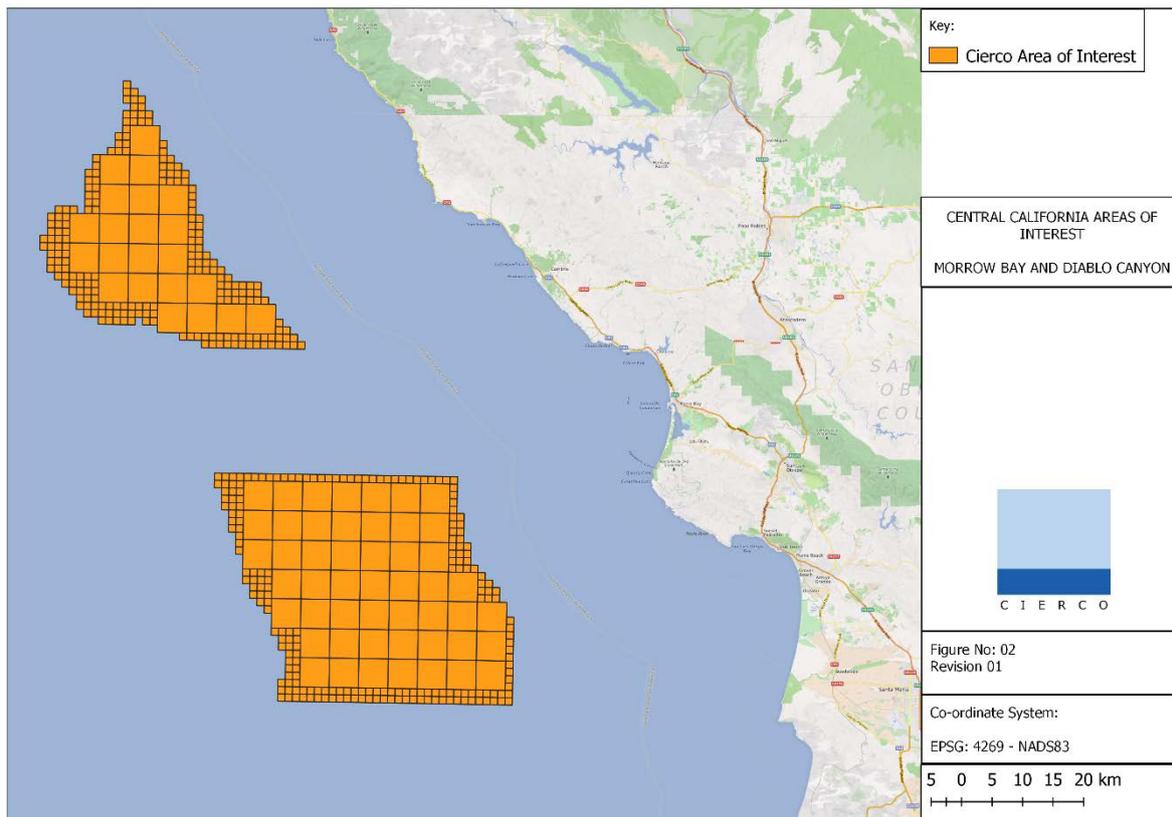
The nominated BOEM Protraction name, number and OCE blocks within the call areas which are of interest to Cierco are as follows:



Call Area Humboldt

Protraction name	Protraction No.	Block No	Sub-block
Crescent City	NK10-07	6975	I, J, K, L, M, N, O, P.
Crescent City	NK10-07	6976	B, C, F, G, I, J, K, M, N, O
Crescent City	NK10-07	7023	L, M, N, O, P
Crescent City	NK10-07	7024	C, D, E, F, G, H, I, J, K, L, M, N, O, P
Crescent City	NK10-07	7025	All
Crescent City	NK10-07	7026	A, B, C, E, F, G, I, J, K, M, N, O
Crescent City	NK10-07	7072	D, G, H, K, L, O, P.
Crescent City	NK10-07	7073	All
Crescent City	NK10-07	7074	All
Crescent City	NK10-07	7075	All
Crescent City	NK10-07	7076	A, B, C, E, F, G, I, J, K, M, N, O
Crescent City	NK10-07	7122	C, D, G, H, J, K, L, O, P
Crescent City	NK10-07	7123	All
Crescent City	NK10-07	7124	All
Crescent City	NK10-07	7125	All
Crescent City	NK10-07	7126	A, B, C, E, F, G, H, I, J, K, L, M, N, O, P
Eureka	NK10-10	6023	D
Eureka	NK10-10	6024	A, B, C, D, E, F, G, H, I, J, K, L, N, O, P
Eureka	NK10-10	6025	All
Eureka	NK10-10	6026	All
Eureka	NK10-10	6027	A, B, C, D, E, F, G, H, I, J, K, M, N.
Eureka	NK10-10	6074	B, C, D, G, H, K, L, O, P.
Eureka	NK10-10	6075	All.
Eureka	NK10-10	6076	All

Protraction name	Protraction No.	Block No	Sub-block
Eureka	NK10-10	6077	A, B, E.
Eureka	NK10-10	6124	D, H
Eureka	NK10-10	6125	All.
Eureka	NK10-10	6126	A, B, C, E, F, G, I, J, K, M, N.
Eureka	NK10-10	6175	All.
Eureka	NK10-10	6176	A, B, E, I
Eureka	NK10-10	6225	A, B, C, D, E, F, G, I, J, K, M, N
Eureka	NK10-10	6275	A, B



Call Area Morro Bay

Protraction name	Protraction No.	Block No	Sub-block
San Luis Obispo	NI10-03	6102	L, P.
San Luis Obispo	NI10-03	6103	M.
San Luis Obispo	NI10-03	6152	D, L, P.
San Luis Obispo	NI10-03	6153	A, B, E, F, I, J, K, M, N, O.
San Luis Obispo	NI10-03	6202	D, G, H, K, L, N, O, P
San Luis Obispo	NI10-03	6203	All.
San Luis Obispo	NI10-03	6204	I, M.
San Luis Obispo	NI10-03	6251	D, H, K, L, O, P.
San Luis Obispo	NI10-03	6252	All.
San Luis Obispo	NI10-03	6253	All
San Luis Obispo	NI10-03	6254	A, B, E, F, G, I, J, K, L, M, N, O, P
San Luis Obispo	NI10-03	6301	C, D, G, H, K, L, M, O, P.
San Luis Obispo	NI10-03	6302	All
San Luis Obispo	NI10-03	6303	All

Protraction name	Protraction No.	Block No	Sub-block
San Luis Obispo	NI10-03	6304	All
San Luis Obispo	NI10-03	6305	A, E, I, M
San Luis Obispo	NI10-03	6351	All
San Luis Obispo	NI10-03	6352	All
San Luis Obispo	NI10-03	6353	All
San Luis Obispo	NI10-03	6354	All
San Luis Obispo	NI10-03	6355	A, B, E, F, I, J, M, N
San Luis Obispo	NI10-03	6401	All
San Luis Obispo	NI10-03	6402	All
San Luis Obispo	NI10-03	6403	All
San Luis Obispo	NI10-03	6404	All
San Luis Obispo	NI10-03	6405	A, B, E, F, G, I, J, K, L, M, N, O, P
San Luis Obispo	NI10-03	6406	M
San Luis Obispo	NI10-03	6451	A, B, C, D, E, F, G, H, I, J, K, L, N, O, P
San Luis Obispo	NI10-03	6452	All
San Luis Obispo	NI10-03	6453	All
San Luis Obispo	NI10-03	6454	All
San Luis Obispo	NI10-03	6455	All
San Luis Obispo	NI10-03	6456	A, B, E, F, G, H, I, J, K, L, M, N, O, P
San Luis Obispo	NI10-03	6457	E, F, I, J, M, N, O
San Luis Obispo	NI10-03	6501	B, C, D, G, H
San Luis Obispo	NI10-03	6502	A, B, C, D, E, F, G, H, I, J, K, L
San Luis Obispo	NI10-03	6503	A, B, C, D, E, F, G, H, I, K, L
San Luis Obispo	NI10-03	6504	All
San Luis Obispo	NI10-03	6505	All
San Luis Obispo	NI10-03	6506	All
San Luis Obispo	NI10-03	6507	All
San Luis Obispo	NI10-03	6508	I, M, N.
San Luis Obispo	NI10-03	6554	D
San Luis Obispo	NI10-03	6555	A, B, C, D, G, H
San Luis Obispo	NI10-03	6556	A, B, C, D, E, F, G, H
San Luis Obispo	NI10-03	6557	A, B, C, D, E, F, G, H
San Luis Obispo	NI10-03	6558	A, B, C, E, F, G, H
Sur Canyon	NI10-02	6340	O, P
Sur Canyon	NI10-02	6390	B, C, D, F, G, H, J, K, L, M, N, O, P
Sur Canyon	NI10-02	6440	A, B, C, D, F, G, H, J, K, L, N, O, P
Sur Canyon	NI10-02	6490	C, D, H

## Call Area Diablo Canyon

Protraction name	Protraction No.	Block No	Sub-block
San Luis Obispo	NI10-03	6756	M, N, O, P
San Luis Obispo	NI10-03	6757	M, N, O, P.
San Luis Obispo	NI10-03	6758	M, N, O, P.
San Luis Obispo	NI10-03	6759	M, N, O, P.
San Luis Obispo	NI10-03	6760	M, N, O, P.
San Luis Obispo	NI10-03	6761	M, N, O, P
San Luis Obispo	NI10-03	6762	M, N, O, P
San Luis Obispo	NI10-03	6763	M, N, O, P.

Protraction name	Protraction No.	Block No	Sub-block
San Luis Obispo	NI10-03	6764	M.
San Luis Obispo	NI10-03	6806	A, B, C, D, F, G, H, J, K, L, N, O, P
San Luis Obispo	NI10-03	6807	All
San Luis Obispo	NI10-03	6808	All
San Luis Obispo	NI10-03	6809	All
San Luis Obispo	NI10-03	6810	All
San Luis Obispo	NI10-03	6811	All
San Luis Obispo	NI10-03	6812	All
San Luis Obispo	NI10-03	6813	All
San Luis Obispo	NI10-03	6814	A, E, I, M
San Luis Obispo	NI10-03	6856	C, D, G, H, K, L, P.
San Luis Obispo	NI10-03	6857	All
San Luis Obispo	NI10-03	6858	All
San Luis Obispo	NI10-03	6859	All
San Luis Obispo	NI10-03	6860	All
San Luis Obispo	NI10-03	6861	All
San Luis Obispo	NI10-03	6862	All
San Luis Obispo	NI10-03	6863	All
San Luis Obispo	NI10-03	6864	A, B, E, F, I, J, M, N
San Luis Obispo	NI10-03	6906	D, H
San Luis Obispo	NI10-03	6907	All
San Luis Obispo	NI10-03	6908	All
San Luis Obispo	NI10-03	6909	All
San Luis Obispo	NI10-03	6910	All
San Luis Obispo	NI10-03	6911	All
San Luis Obispo	NI10-03	6912	All
San Luis Obispo	NI10-03	6913	All
San Luis Obispo	NI10-03	6914	A, B, C, E, F, G, I, J, K, M, N, O, P
San Luis Obispo	NI10-03	6957	A, B, C, D, E, F, G, H, J, K, L, N, O, P.
San Luis Obispo	NI10-03	6958	All
San Luis Obispo	NI10-03	6959	All
San Luis Obispo	NI10-03	6960	All
San Luis Obispo	NI10-03	6961	All
San Luis Obispo	NI10-03	6962	All
San Luis Obispo	NI10-03	6963	All
San Luis Obispo	NI10-03	6964	All
San Luis Obispo	NI10-03	6965	A, E, F, I, J, K, M, N, O
San Luis Obispo	NI10-03	7007	C, D, H
San Luis Obispo	NI10-03	7008	All
San Luis Obispo	NI10-03	7009	All
San Luis Obispo	NI10-03	7010	All
San Luis Obispo	NI10-03	7011	All
San Luis Obispo	NI10-03	7012	All
San Luis Obispo	NI10-03	7013	All
San Luis Obispo	NI10-03	7014	All
San Luis Obispo	NI10-03	7015	All
San Luis Obispo	NI10-03	7016	I, M.
San Luis Obispo	NI10-03	7058	A, B, C, D, F, G, H, J, K, L, O, P.

Protraction name	Protraction No.	Block No	Sub-block
San Luis Obispo	NI10-03	7059	All
San Luis Obispo	NI10-03	7060	All
San Luis Obispo	NI10-03	7061	All
San Luis Obispo	NI10-03	7062	All
San Luis Obispo	NI10-03	7063	All
San Luis Obispo	NI10-03	7064	All
San Luis Obispo	NI10-03	7065	All
San Luis Obispo	NI10-03	7066	A, E, I, M.
San Luis Obispo	NI10-03	7108	C, D, G, H, K, L, N, O, P.
San Luis Obispo	NI10-03	7109	All
San Luis Obispo	NI10-03	7110	All
San Luis Obispo	NI10-03	7111	All
San Luis Obispo	NI10-03	7112	All
San Luis Obispo	NI10-03	7113	All
San Luis Obispo	NI10-03	7114	All
San Luis Obispo	NI10-03	7115	All
San Luis Obispo	NI10-03	7116	A, E, I, M.
Santa Maria	NI10-06	6008	B, C, D, F, G, H.
Santa Maria	NI10-06	6009	A, B, C, D, E, F, G, H.
Santa Maria	NI10-06	6010	A, B, C, D, E, F, G, H.
Santa Maria	NI10-06	6011	A, B, C, D, E, F, G, H.
Santa Maria	NI10-06	6012	A, B, C, D, E, F, G, H.
Santa Maria	NI10-06	6013	A, B, C, D, E, F, G, H.
Santa Maria	NI10-06	6014	A, B, C, D, E, F, G, H.
Santa Maria	NI10-06	6015	A, B, C, D, E, F, G, H.
Santa Maria	NI10-06	6016	A, E.

### 3.3. Objectives and Facilities

The objective and rationale of the Cierco interest is based on several compelling synergies with Cierco's overall floating offshore wind technology demonstration plan. Ultimately Cierco Ltd views the California opportunity as an enabler to its ambition to support the development of new marine renewable technologies into the international market and as a necessary final step in establishing floating offshore wind as a viable contributor to energy system and expanding the global opportunity for renewable energy.

### 3.4. Technology to be used

A key element of the Cierco technology proposition is the utilisation of the larger wind turbine turbines in combination with floating platform technology. Cierco is facilitating and addressing a void in the current market to provide a consented site with the required infrastructure for large-scale demonstration turbines. The ability to host the larger turbines is necessary to maintain the aggressive industry LCOE levels that have been achieved to date and to meet the planned trajectory over the next 5 to 10 years. The technology step from 7MW to >10MW turbine size in combination with a new floating platform solution is considerable and as such requires pre-commercial demonstration as an array prior to be deployed as a commercial array on the west coast of the US.

Cierco is currently discussing with the UK Crown Estate and other governmental agencies opportunities for establishing a path to demonstrate the larger turbine and floating platform

technology combination to provide an established technology proposition for the deeper waters of the US West Coast by the mid-2020.

### **3.5. Power Integration and Grid Connection**

It is recognised that the Central Californian sites of Morrow Bay and Diablo Canyon have positive opportunities for grid connection, whilst not having as favourable wind resource as the Humboldt area. The Humboldt area by contrast has excellent wind resources but presents more problematic issues for connecting to the local grid at a commercial scale (i.e. 500MW and above).

These contrasting aspects pose an interesting challenge in exploiting the available wind resource in a commercially advantageous way. Through our technology development plan, Cierco aim to gain practical data to feed into their financial projections to ensure that the appropriate technology combination is selected for each area.

Taking this forward, Cierco will explore the potential efficiencies of larger turbines to be utilised in the Central Californian area, which may make up for lower class of wind. Humboldt's current spare capacity to use or export power from the area is significantly less than the capacities which would be targeted for a commercial scale project. Therefore, to undertake an offshore wind project within this area will require significant (and expensive) grid reinforcement (via an offshore export cable or significant overland works). Cierco are exploring the opportunity for alternatives to traditional electrical grid export for power; such as the deployment of fuel cell technology, which in the longer term could be utilised to stabilize the wider energy system by absorbing excess off-peak renewable energy generation during periods of low demand.

### **3.6. Onshore Facilities**

As stated previously, Cierco believe that it is too early at this stage to commit to a specific area. However looking forward, Cierco will conduct an extensive survey as part of the review process to determine the requirements for construction marine spread. A suitable port will be identified, which will be used for marshalling project equipment and servicing marine vessels and equipment. Based on the approach taken with the installation contractors for our Forthwind project in Scotland, local contractors will be tasked under their contract with securing all port facilities and required services. Procurement of all required services, interfaces and facilities will be detailed and documented within the project execution plan - a contractual document subject to the usual controls and mitigation measures.

Cierco will develop and maintain a database of local companies which details goods and services available and records past experience – good and bad. Based on project requirements, Cierco's Procurement Manager will set up supplier meetings to determine further local capability and capacity.

Manufacture and installation of floating offshore wind equipment at a commercial scale requires significant resources in terms of material/equipment procurement, component fabrication, onsite assembly, factory acceptance testing, temporary storage and transport services. In order to ensure a reliable and capable supply chain at the scale and volume required for this project Cierco will:

- Use well established suppliers with a proven track record of delivering major projects for similar industries and with a demonstrated ability to scale to meet the total project phasing;
- Investigate options for exclusivity provisions in fabrication contracts to ensure capacity is not jeopardised by other projects in the market;
- Plan for redundancy in the supply chain for critical long lead items or where capacity seems overly constrained;

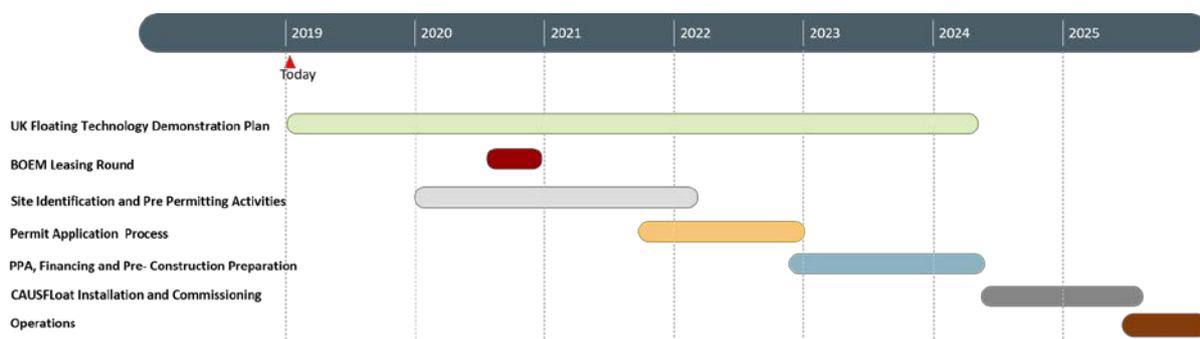
- Work with suppliers many months before contract award to understand material and equipment lead-times and ensure timely manufacturing completion;
- Implement a design-for-manufacture philosophy in the floating technology development process to allow automated fabrication techniques to be used with their improved scalability and quality.

The Cierco team continually seek to reduce the use of specialist vessels where possible during installation. Using readily available vessels ensures that weather windows are used effectively and with reduced cost. The development of offshore floating technology present opportunities for efficiencies within the offshore wind sector, for example, the development of novel installation approaches, equipment and refinements to the ballast systems and foundations, enabling the turbines to be effectively self-deploying and thus independent of the schedules of specialist vessels such as heavy-lift barges.

The approach described limits the scope for delays in project delivery – the Cierco team teams have experience in identifying available facilities, minimising schedule risks and ensuring scalability of marine energy projects.

### 3.7. Development Schedule

Cierco have made a number of assumptions on the development schedule on aspects still to be confirmed, including the timing of the BOEM lease programme, the successful progress of the Cierco technology development programme and timings associated with engaging with stakeholders and gaining the appropriate permits and consents. However an indicative development programme is provided below based on positive progress with a number of assumptions.



## 4. AVAILABLE AND PERTINENT DATA

Cierco has recently engaged in this market, but have consulted with several entities in the decision to move forward with this EOI. There are key elements that makes us believe in the viability of the site options, which divide between:

- “The southern site options”, consisting of Diablo Canyon and Morro Bay project, characterized by relatively low wind speeds but ability to host larger project size and benefit from economies of scale, where grid connection is optimal. This will require an optimization of the next generation of larger wind turbine, driving rotor size increases in relation to the installed capacity in order to reach high performance in combination with lower loads. This will be fundamentally key to reach sustainable and competitive LCOE, acceptable the stakeholders and government in the competition of other renewable energy sources of imported onshore wind, geo-thermal and increasing solar PV with battery storage, all at LCOE of probably half of a conventional floater turbine on these sites. Furthermore, sites are in scrutiny and competition with key range operation areas used by both Edwards and Vandenberg military bases. Our view is that it will be very likely that only one site will be allowed permit. However, should bidding be based on the lowest cost option, we believe Cierco and its collaborators can provide a very competitive and credible bid.

- b) "The northern site" of Humboldt, suffers from very restricted grid connect ability ; however this area remains a key interest to Cierco as it provides the fundamental core component of high wind speeds. As the northern area holds by far the largest California wind resource in combination with far less competing interests, it is very conceivable that grid build-out can be undertaken. The optimization of the next generation wind turbines in comparison to the southern sites, will be significantly more productive which will have a greater effect on Annual Energy Production (AEP) and cost. Therefore, Cierco is interested in pursuing a different approach for the initial stage of the Humboldt site. Through discussions with local parties and considering Cierco current collaborations in the hydrogen and liquid ammonia generation, we believe there is a very interesting technology integration project for grid optimization of the existing restricted grid. However, this is likely to be a technology R&D project with a view towards larger projects in the longer term.

In our considerations for the sites, we have had conversations with CEC, BOEM , DOD (range operation contact persons at both Edwards and Vandenberg bases), Humboldt University, Schatz Research Centre, Berkeley University and others.

## **5. LEGAL QUALIFICATION OF CIERCO CORPORATION TO HOLD A LEASE**

Cierco Corporation, as a corporation duly organized under the laws of Nevada and existing under and by virtue of the laws of the State of Nevada since June 11, 2001, is legally qualified to hold a lease in accordance with the requirements of forth in 30 CFR 585.106 and 585.107(c).

Appendix A includes copies of Cierco's certificate of Incorporation, A certified statement that the corporation is authorised to hold OCS leases and evidence of authority of holders of titled positions to bind corporation. The information shall be consistent with the required documentation.

Cierco is legally represented by Alverson, Taylor & Sanders of Las Vegas, Nevada.

## **6. CIERCOS TECHNICAL CAPABILITY**

### **6.1. Introduction**

Cierco and its competent team prides itself on being able to develop a project from start to finish. This includes the management of all financing, engineering and site development activities; including:

- Raising Capital and Finance;
- Resource assessment and analysis to determine potential sites with appropriate resource;
- Detailed constraints mapping & surveying to select the best sites;
- Consenting sites (including Environmental Impact Assessment);
- Designing, testing and developing the offshore wind technology;
- Managing the installation programme for offshore wind technologies (including onshore infrastructure as well as offshore installation);
- Operation & maintenance of the Offshore Wind developments;
- Development and implementation of Decommissioning Programmes;

Cierco has been involved in the successful development and implementation of several offshore wind projects in Europe with some of the largest utility and energy companies on the continent, including a deeper collaboration of development of a series of offshore wind farms between 50MW to 1GW as a Joint Venture with a leading utility in Europe.

Among the members of the team, the experiences reach from on and offshore wind to wave devices and nuclear decommissioning, technology development of new innovative offshore wind technology, demonstration projects with first of a kind deployment as well as extensive experience from offshore operations and onshore large-scale wind farm operations in California. Whilst Cierco has the staff

resources required to take forward the development of a Californian offshore wind floating site through to full consent and grid-connection being secured; it is anticipated that Cierco will ultimately develop the site under a collaborative agreement with selected key parties.

### **6.2. Resource Assessment**

Cierco's development team have developed a close working relationship with a leading clean energy services company, based in the UK, who have developed a sophisticated offshore wind resource assessment capability with the ability to provide energy production estimates of a selection of technologies and system designs. The company utilize bathymetric survey data and installation specifications to identify potential sites for floating offshore wind installations.

### **6.3. Site Development and Consenting**

Cierco has successfully built an in-house site development team with the skills and experience required to identify and develop sites for all marine energy technologies. The team, led by our Development Director Marc Murray, have extensive experience in developing marine and other low-carbon energy projects. The Site Development team at Cierco is involved in selecting project sites and consenting these sites so that they are ready for marine energy technologies to be installed.

The team, alongside suitably qualified and experienced contractors, work to develop marine energy sites and have been involved in the following activities:

- Submission and award of Seabed Lease Applications to the Crown Estate and Crown Estate Scotland as well as with the Swedish "Kammarkollegiet"
- Negotiation with landowners for leasing land
- Site selection using detailed constraints mapping
- Consultation with key stakeholders, local communities etc
- Environmental Impact Assessment (EIA) including navigational Safety Risk Assessment
- Submission of all consents and onshore planning applications
- Environmental monitoring
- Compliance management, ensuring that all safety requirements and environmental consent conditions are met
- Development of decommissioning programmes
- Grid connection assessment and applications

The Cierco team have been leading consent and development work with multiple projects in parallel with cumulative capacity of over 2GW of marine renewable energy projects across the UK, Ireland and Sweden. The team has also led R&D and site development including:

- the world's first offshore wind turbine in Sweden (Nogersund, Sweden),
- the first commercial scale operating offshore wind farm (Utgrunden, Sweden – see picture below),

- the world's first near shore operational wave power station (Orkney, UK)
- the world's largest consented wave array (Isle of Lewis, UK).

Furthermore Cierco was in project consortium leadership of the BEATRICE project to execute the first 5MW turbines offshore adjacent to the Beatrice oil platform in the North Sea and have recently driven new project development to deploy the very first next generation turbines offshore in Scotland, currently underway.

The team is currently developing a future pipeline of new offshore wind technology (turbine and innovative foundation) test and demonstration projects, as well as actively developing a number of commercial scale projects opportunities within the UK. It is intended to bring the skills, experience and knowledge across to California to ensure that the learning is brought into the west coast US arena.



#### **6.4. Engineering Management and Technology Development**

During 2002-2005, Cierco designed, patented, tested and GL certified a new mooring system for ships to wind turbines. The system called SASH system was the very first to meet certification requirement by the Germanischer Lloyd certification body. The system was tested successfully, exceeding convention system in safety and performance (see picture below).



In 2003, the company under the JV with EDF acquired a Swedish lighthouse and created the very first offshore wind research station. The station was located in the Baltic sea and was the base for a number of leading studies (see picture below).



In 2006, Cierco founded a new company together with its Dutch partner (2B Energy) to develop an innovative, new design for offshore wind turbines. The low-cost, holistic concept includes differentiating designs for the rotor, nacelle, support tower and electrical system. Cierco personnel formed part of the executive leadership up until 2018, which included managing the financing and all aspects of technology and project development, erecting the first 6.2MW demonstration unit in Eemshaven (NL) in 2015. The design, being bespoke with 2 blades, downwind, full jacket (lattice) structure, has operated flawlessly since, shifting corner posts of offshore wind technology and innovation(see picture below).



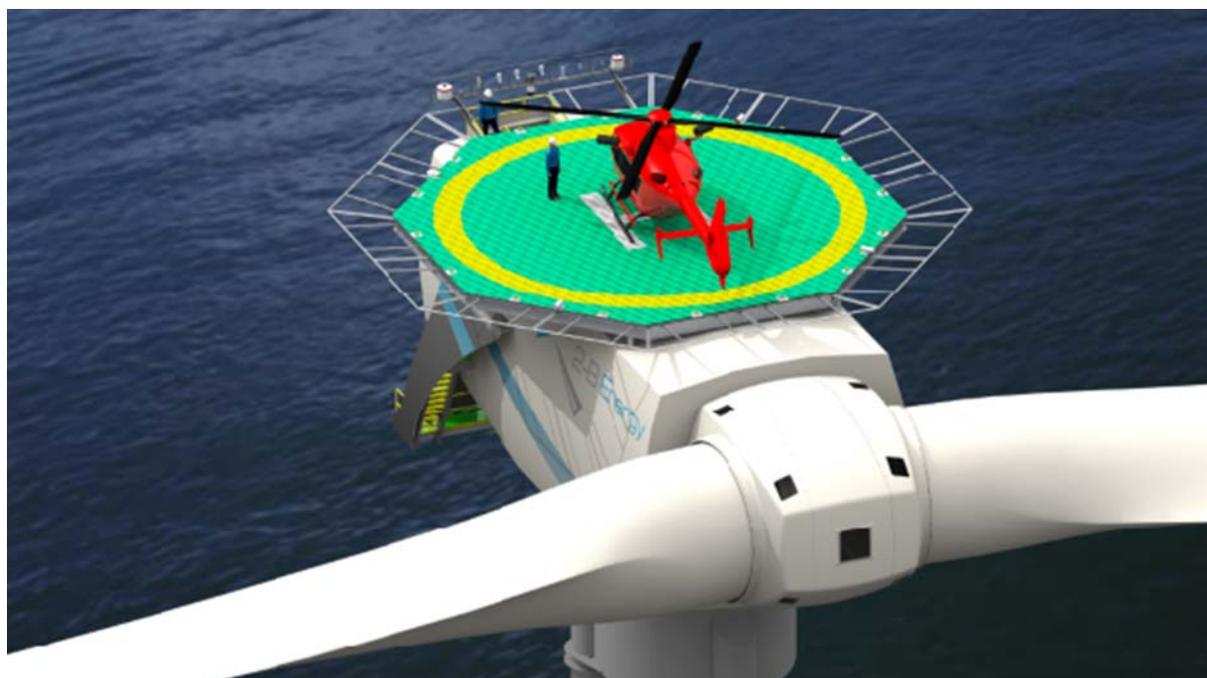
### **6.5. Operations and Maintenance**

The Cierco team have gained significant experience in wind turbine Operations and Maintenance activities over the years, including:

From 1991 to 1996, Mr. Jakobsson was VP for BTM Consult Corp, out of Palm Springs California. The company was responsible for full asset management of several larger wind farms > 100 units with several turbine brands. In the capacity, the company was responsible for all planned and unplanned maintenance and also for design of all retrofit program. This is a bit of relevance as running larger wind farms means industrialization of operations and use of statistics and other means to reach far deeper in to issues and predictive operation. Same principles apply for offshore.

For the installation and operation of the Utgrunden project, described above, Cierco team member was responsible for full maintenance setup under the company Enron Wind, today GE wind. This included procurement of vessel and refitting of such to facilitate the operations, including tooling and operational strategy.

Thereafter since its formation of Cierco in 2001 the company gained extensive experience in operating and maintaining offshore wind installations via its subsidiary SASH System AB. The company operated a number of vessels from 2002 to 2006, providing O&M services to several offshore wind installations in the Baltic Sea; including providing services to larger offshore wind projects in Denmark.



Another unique and leading development was under the 2B Energy, where Jakobsson led development with the HCA (Helicopter Certification Agency) and the CAA (Civil Aviation Authority) to develop process and design for secure and approved landing of helicopter on wind turbines and the design of helideck (see illustration above). This was undertaken in close collaboration with expert pilots from the leading UK offshore helicopter operations companies.

The maintenance knowledge and skills that have been utilised for previous Cierco developments can be directly translated into maintaining offshore wind technologies off the US west coast as the maintenance issues are essentially the same (i.e. dealing with weather windows, working in challenging sea conditions, development of port side infrastructure etc).

#### **6.6. Decommissioning**

As a responsible developer Cierco is committed to meeting all requirements for navigational safety and environmental protection in accordance with current relevant legislation. As part of this process

Cierco consults with all relevant stakeholders and will devise and maintain a Decommissioning Programme as appropriate to take account of any relevant feedback from consultation.

Cierco's in-house team possess both practical decommissioning offshore energy infrastructure experience (e.g. decommissioning of the Oyster 1 wave machine in Orkney, 2011) as well as multiple planning and detailed calculation exercises for offshore project decommissioning. This decommissioning experience is further augmented by writing regulatory approved Decommissioning Plans for offshore wind and wave energy developments – encompassing the procedures required for safe, timely decommissioning, whilst following all regulatory and environmental monitoring requirements.

## **7. CIERCO KEY PROJECT PERSONNEL**

The technical knowledge and capabilities of Cierco to successfully develop a project are as described above. However, the extensive experience gained by the members of the Cierco team is critical to the successful development and deployment of innovative technologies. The key company personnel whom would be involved in project development are listed below with a brief 'flavour' of the experience and capabilities they bring to the Cierco Team.

### **7.1. Mikael Jakobsson, Managing Director**

A highly experienced business leader, Mikael Jakobsson founded Cierco Corporation in 2001 following a number of senior technical and management roles in the renewable energy sector. Mikael holds an MBA in Agricultural Mechanics and Equipment/Machine Technology from the Swedish University of Agricultural Sciences and has been involved since 1982, when he was the secretary and treasurer of the Swedish Wind Energy Association. Mikael has been in the vanguard of the offshore wind sector since its very beginning, acting in 1989 as Swedish Country Manager for Wind World A/S, a Danish wind turbine manufacturer involved in the first offshore wind turbine installation in Sweden. He has been active in the US wind energy industry since the early 1990's, where he managed several California wind farms in the area of Palm Springs as Vice President of BTM Consult Corp.

Mikael joined Zond System Inc. of Tehachapi, CA in 1996 (1996-2001) to lead their offshore wind team and advance the company's growth in Europe. He continued to lead this team through its different incarnations from Zond Systems to Enron Wind (1997 – 2001), and eventually GE Wind Energy (2001 to present). In his capacity as Director for Offshore wind, the team developed, built and financed the Utgrunden project in 2000, being the very first of its kind with 1.5MW turbines. Mikael was also in the development of a new offshore wind technology utilised in the Arklow project in the Irish Sea (Republic of Ireland), where GE was the first company to deploy 3.6 MW turbines offshore.

Since founding Cierco in 2001, Mikael established the offshore wind development company Airicole AB, a joint venture (JV) with the French utility EdF, acting as CEO for the duration of the JV. Developed projects included small and large offshore wind projects of between 50 MW up to 1 GW projects and the development of European undersea cable infrastructure. Airicole was sold to E.ON (Germany's/EU's largest utility) in 2005; however Mikael (through Cierco) continued to advise the E.ON for a year thereafter.

Mikael was part of the 2B Energy executive team, acting as Chief Operations Officer (COO) and leading the technology development team from 2006 to 2018. Since June 2018 Mikael has concentrated his efforts in evolving the Cierco proposition to take a lead in forging the commercial path of large scale floating wind technology.

## **7.2. Scott Harper, Chief Operations Officer**

A Chartered Surveyor, Scott spent over 12 years with Scottish Enterprise (Scotland's national economic development agency and a non-departmental public body of the Scottish Government) procuring and delivering infrastructure and large-scale industrial developments; having lead responsibility for the delivery of National Priority Projects.

During this period Scott has led the management of a number of port and renewable energy infrastructure developments; including the Fife Energy Park Development, Methil Dock Redevelopment, Rosyth Waterfront Redevelopment (including support for the International Ferry Link). Scott also managed the delivery of necessary infrastructure to support business park developments and transport infrastructure projects throughout Scotland and was the Project Manager for the development of 100,000 sq. ft of mixed commercial property for Alsherra Investments at Methil

Scott holds a B.Sc. Quantity Surveying from Abertay University and is a Member of the Royal Institution of Chartered Surveyors (RICS).

Scott has a proven track record in raising finance and operating in developing markets and initially provided consultancy support to 2B Energy before joining Cierco as Commercial Manager in 2014. Since joining, Scott has been responsible for the production of management accounts, grant funding programmes and loan drawdowns including the DECC Offshore Wind Component Technology Demonstration Scheme and the Demowind2 programme. Scott currently has responsibility for the commercial funding strategy for Cierco projects in relation to the Forthwind Project delivery.

Scott managed and secured the first offshore wind Section 36 consent in Scotland; today occupied by the Levenmouth turbine. Scott has over 10 years' experience in managing stakeholder and regulatory issues in the offshore wind sector.

Scott has a significant background in construction procurement and related activities throughout all career roles, in a wide variety of project areas, from site development and infrastructure engineering, commercial property development, housing, health and educational facilities and latterly holding responsibility for procurement of the Forthwind project for the 2B Energy technology.

## **7.3. Marc Murray, Projects Director**

A Chartered Environmentalist (CEnv) and full member of the Institute of Environmental Management and Assessment (IEMA), Marc holds a BSc (hons) in Environmental Science from the University of Ulster, an M.Sc. in Environmental Management from Sheffield Hallam University and brings more than 20 years' experience of managing complex multi-stage energy projects in the nuclear and low carbon space.

Marc joined Cierco as a Project Manager in 2015 and was responsible for the successful securing of the necessary seabed lease from the Crown Estate, consents from Marine Scotland and grid connection agreements from the local utility for the 18MW Forthwind Offshore Wind Demonstration Project at Methil in Scotland (just offshore Edinburgh).

Prior to joining Cierco, Marc was the Commercial Development Manager for the wave energy technology company Aquamarine Power (APL), successfully gaining consent for the UK's first near shore wave array at Billia Croo in Orkney and the world's first commercial scale wave array at Lewis.

Marc has extensive experience of working with the owner of the seabed in the UK (the Crown Estate) having managed a 240MW portfolio of marine energy projects within the UK. Marc has also delivered compliance arrangements at the APL Oyster demonstration site in Orkney and overseen the

consenting process for marine energy projects in Ireland and the US. Marc was also responsible for managing the APL Development Project JV arrangements with one the largest utilities in the UK and Ireland (SSE) and grant application, consortium development and administration processes within the UK and Europe. Prior to Aquamarine Power, Marc spent 12 years in the nuclear industry fulfilling several senior project delivery roles, providing technical advice and working with site and corporate management teams on commercial and reputational issues. In addition to gaining an MBA from Lancaster University, Marc has earned the APM Project Management Professional certificate (APMP) and is a qualified PRINCE II practitioner.

#### **7.4. Anish John Paul, Senior Structural Engineer**

Anish was integral in the design, development and execution of the full truss support structure of the 2B Energy wind turbine (including the successful 2B6 demonstration turbine at Eemshaven). Prior to joining Cierco in 2010, Anish worked as a Consulting Engineer with Tata Consulting, providing technical input on a number of design and integration projects for Thermal Power Plants in India. Anish has extensive knowledge in cost of energy analysis, jacket and structure design and has developed a new methodology and models for the design of offshore wind jacket structures that has independently certified by DNV and DEWI. Anish holds an MSc, Sustainable Energy Technology, Delft University, the Netherlands.

### **8. CIERCOS FINANCIAL CAPABILITY**

Cierco team has a background in managing projects from early stage to execution. Having realized several projects, we have an excellent track record in raising development and operational finance, raising over \$100 million of public and private sector funding to support both offshore wind technology development and project development activities. Funding sources ranged from debt, equity, convertible loans and grants as well as raising capital from investors like utilities, oil and gas companies, banks and governments, we have a reasonably good experience on project sculpturing and execution.

The approach for the US west coast projects will not differ in this regard. As a clearer picture of the tender and conditions for the project emerge, a development team will be established with our partners, together possessing the capability of taking the project through its full development to FID under a SPV (Special Purpose Vehicle). The SPV will be funded by the partners/collaborators and secure both in-house and external resource and staff to execute the development process. This will be presented in the formal tender in due course.

Once studies are completed and permits and necessary building blocks are in place including the project procurement and FID stage has been reached, the long term funding parties will be concluded and finance will be closed. The development team will stay on-board to assure compliance with the relevant permit conditions and delivery of the project plan. A recent trend being experience in Europe is that the longer term funding parties and owner have tended to attract institutional investors with lower return requirements, replacing the traditional utilities with normally higher requirements, causing a shift and LCOE reduction. Therefore, a clear offering to the investors will take place at an appropriate time where a traditional intermediary will work to close the transaction between Developer and Buyer.

Cierco has a network of potential collaborators for the development phase of larger scale commercial projects with a proven track record in similar projects.

Without a view to the potential leasing round timetable, area to be competed (including the site wind speed and consenting requirements) and potential development schedule, it is not possible at this

stage to provide a definitive financing plan. A more detailed financing plan will be provided at the time the formal leasing round.

Should the Cierco JV be successful in securing a lease, appropriate consents, grid and/or alternative power supply access and pending approval by the respective boards, it is expected that a mix of debt and equity funding options will be sourced to finance the project. The ratio of debt and equity once detailed financial modelling is completed and project return and risk components has been defined and PPA offtake is clear.

This document is hereby undersigned:

Place: Palm Springs

Date: 01/24/2019



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Mikael Jakobsson  
Managing Director

**CONFIDENTIAL**

**APPENDIX A – DOCUMENTATION DESCRIBING CIERCO’S LEGAL QUALIFICATIONS**

Documentation attached:

Exhibit 1

Original certificate from the State of incorporation stating the name of the corporation exactly as it must appear on all legal documents:



**CONFIDENTIAL****APPENDIX B – DOCUMENTATION DESCRIBING CIERCO’S FINANCIAL CAPABILITY****B1 Organization Details**

	Principle Contact	Deputy Contact
Name	Mikael Jakobsson	Marc Murray
Title	Managing Director	Project Director
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Email	mikael.jakobsson@cierco.uk	marc.murray@cierco.uk
Website	www.ciercoenergy.com	www.ciercoenergy.com

**B2 Company Profile**

Cierco was established in 2001 with the goal to introduce new marine renewable technologies into the commercial market and provide a platform for marine energy and systems integration. Cierco, through its work in Europe, has developed two core competencies – the development of consented and financed marine energy sites and the commercialisation of offshore wind technology (supply and maintenance operations). Cierco has ambitious plans to become a world leading marine renewable energy development leader, directed at building up our current strength in site development, project management, engineering know how and financing to create a unique company capable of working across the globe to develop sites for any type of marine renewable technology, with a particular focus on innovative and integrated energy technology solutions.