

MASTER IN RENEWABLE ENERGY IN THE MARINE ENVIRONMENT



<http://master-rem.eu/>



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INTERNACIONAL



NTNU
Norwegian University of
Science and Technology



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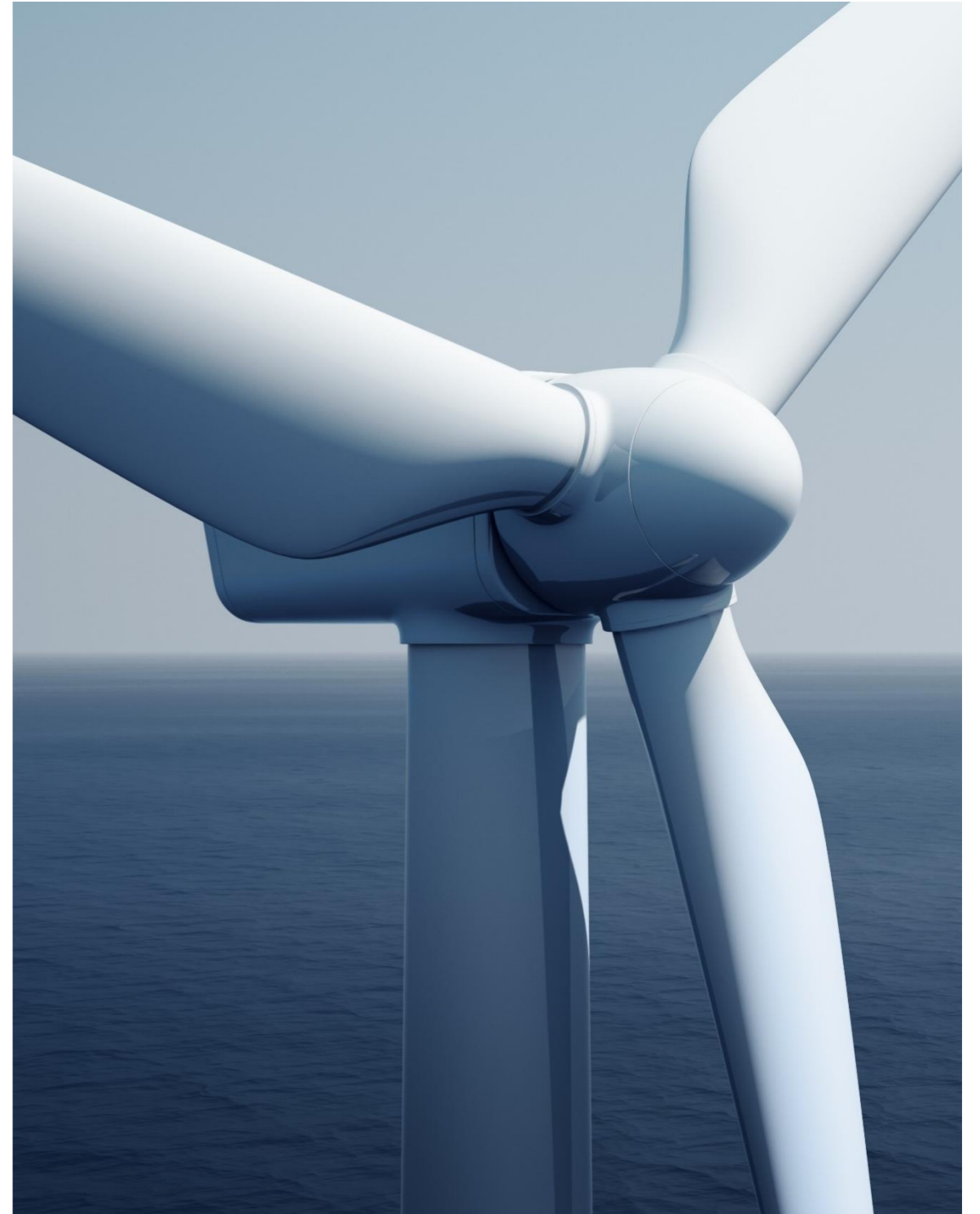
VII. PARTNERSHIP.



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INTRODUCTION



BACKGROUND AND OBJECTIVES (EUROPE)

BLUE GROWTH

71% of the Earth surface is WATER

Why?

Blue Growth is the European Commission's initiative to further harness the potential of Europe's oceans, seas and coasts for:

- Jobs
- Value
- Sustainability

Focus Area

Five sectors with high potential for sustainable Blue Growth are to be further developed:

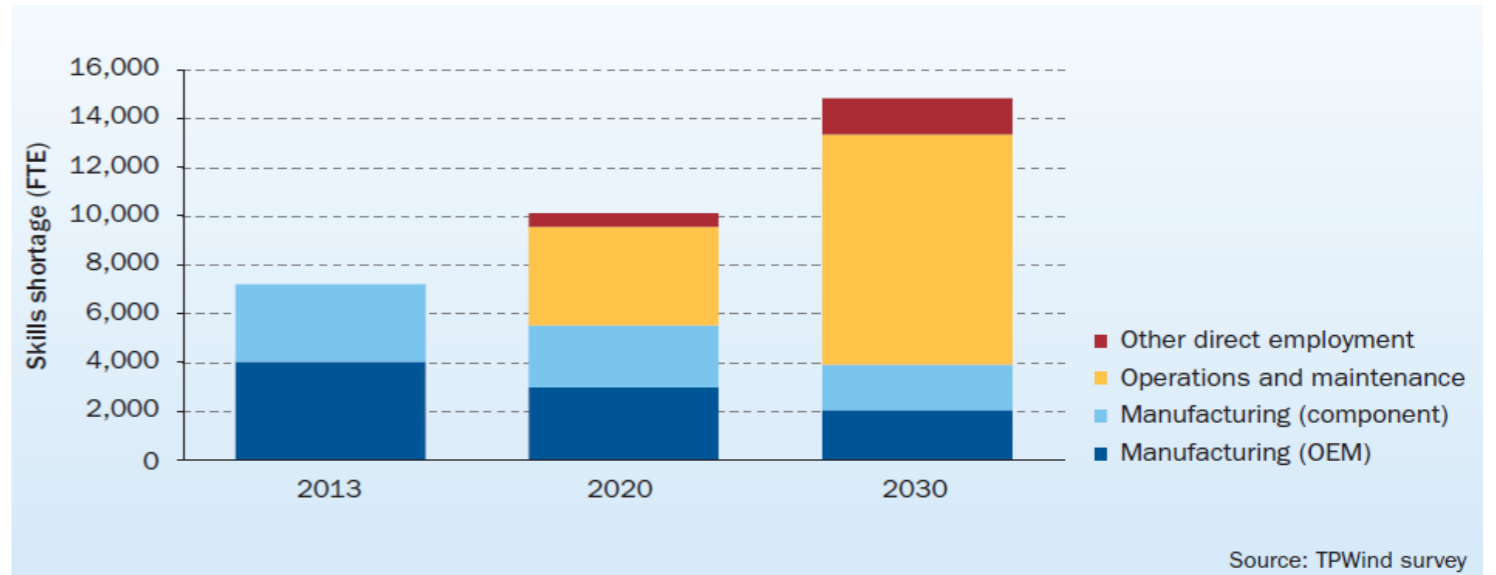
other sectors of the blue economy crucial for value & jobs

Shipbuilding & Ship repair

Transport (cargo & ferry)

Fisheries

Offshore oil & gas

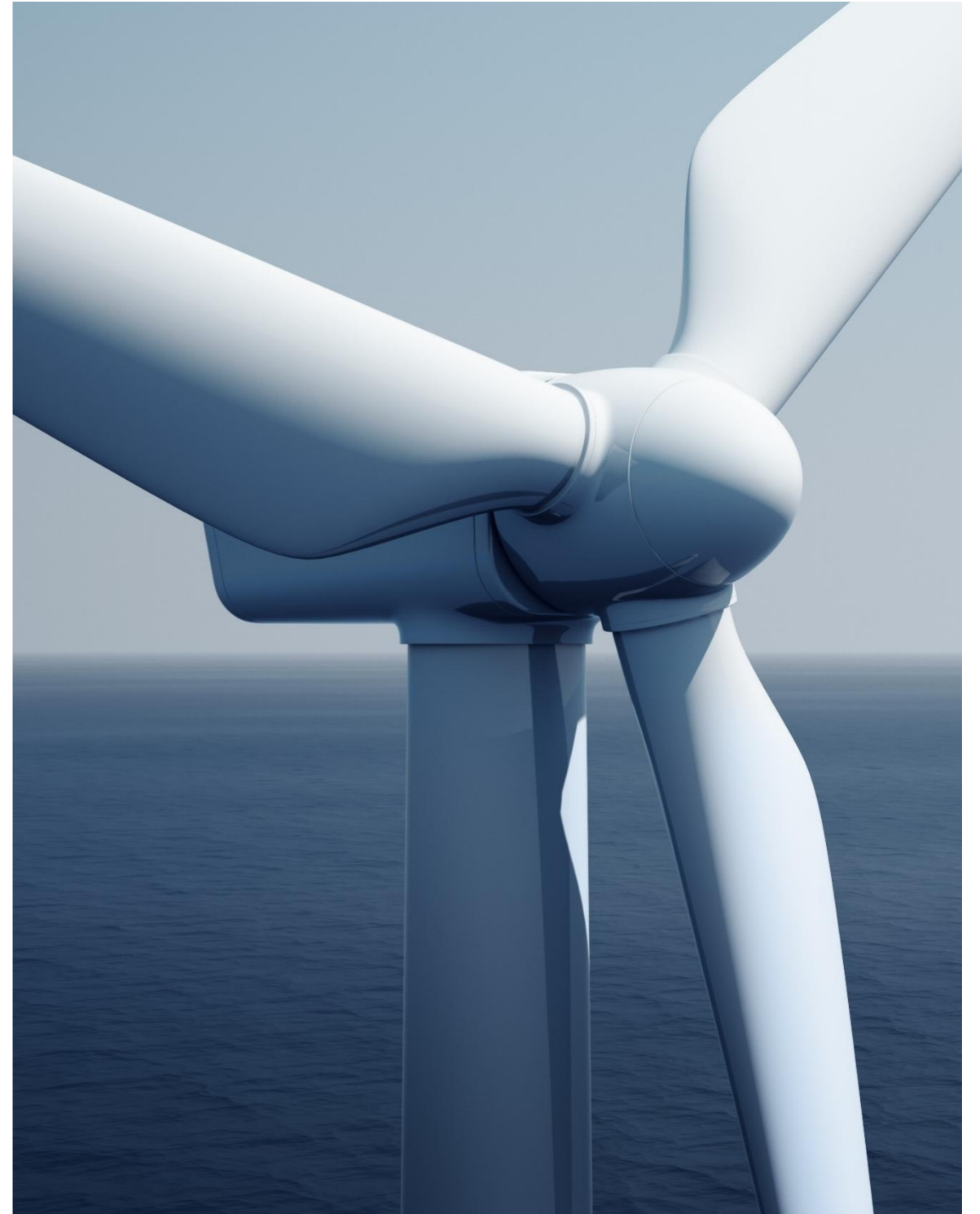


- ✓ Reports from industry highlight the **current shortage and evolution of qualified personnel** in the marine sector:
https://ec.europa.eu/maritimeaffairs/policy/skills-career-development_en
- ✓ Highlights the need for **collaboration between Industry and Education**.
 - **Increase the attractiveness of marine careers through innovative education / training initiatives.**
 - **Improve the professional skills of workers / unemployed people to improve / get a job in the so called "blue economy".**

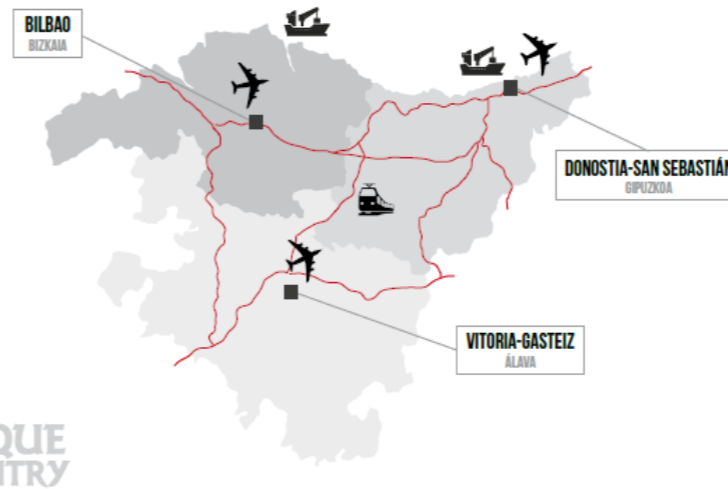
Source: https://ec.europa.eu/maritimeaffairs/policy/blue_growth_en



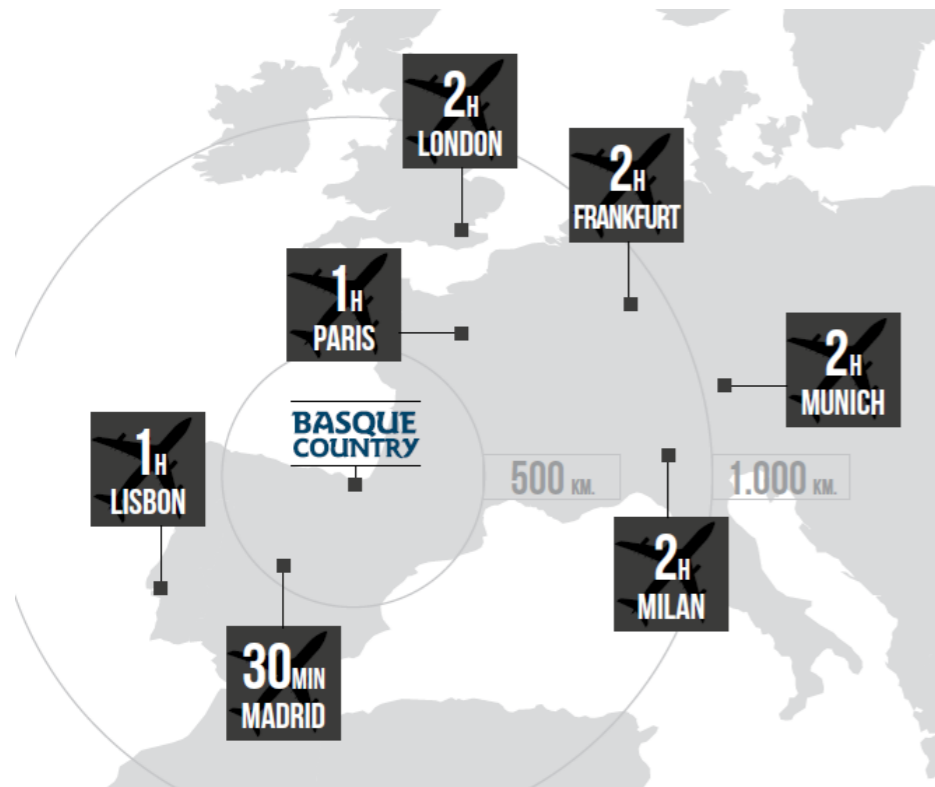
**ALIGNMENT
(BASQUE COUNTRY)**



ALIGNMENT (BASQUE COUNTRY) context



BASQUE COUNTRY



Source: <http://www.offshorewindbasquecountry.com/en>



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Universidad del País Vasco Euskal Herriko Unibertsitatea

University of Strathclyde Glasgow

NTNU

CENTRALE NANTES

ALIGNMENT (BASQUE COUNTRY)

Value chain



Source: <http://www.offshorewindbasquecountry.com/en/cadenadevalor-en>



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University of Strathclyde Glasgow

NTNU

CENTRALE NANTES

ALIGNMENT (BASQUE COUNTRY) Singular facilities (I)



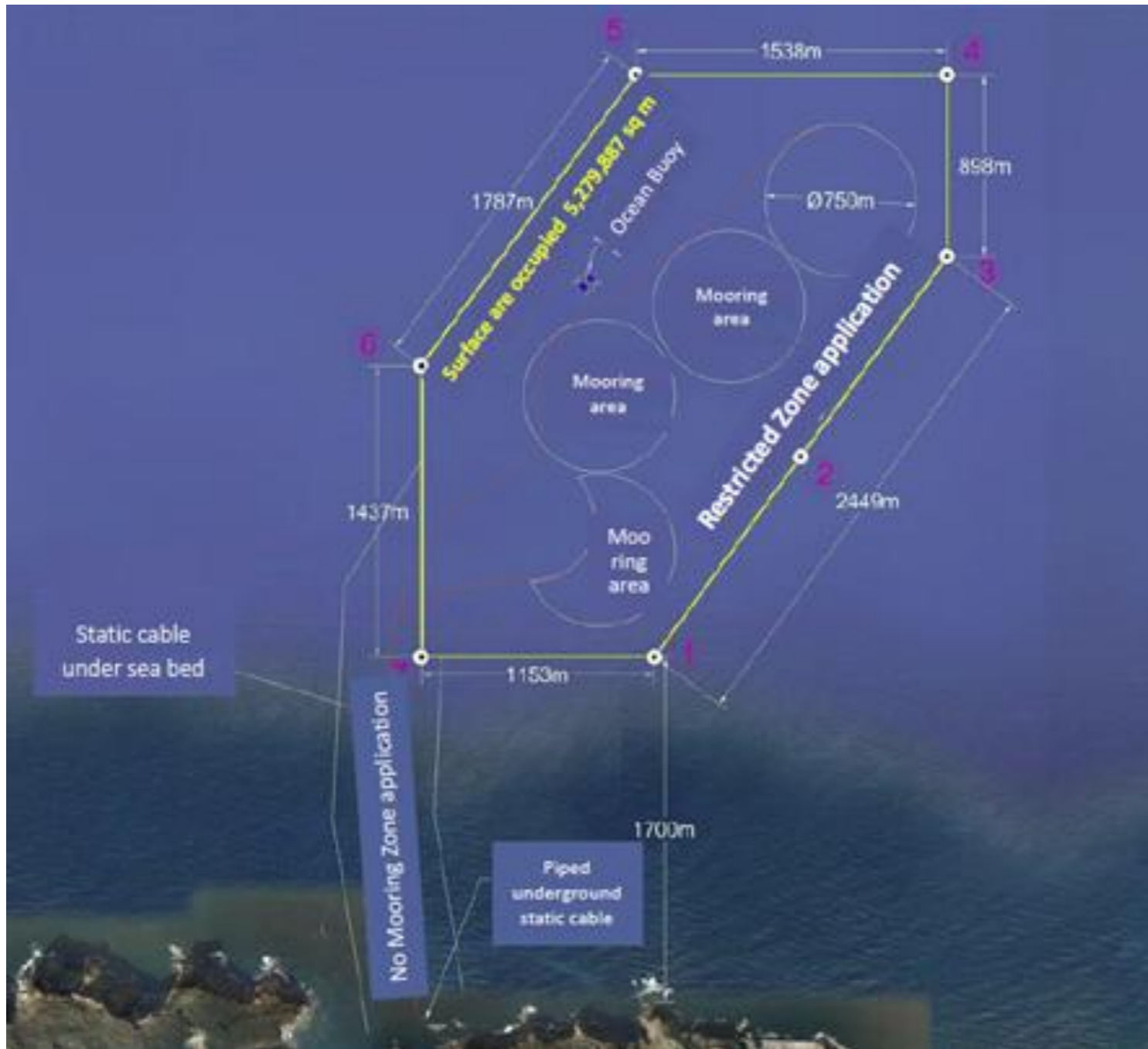
Fully equipped testing facilities to support wind turbine, system and component manufacturers in the development of products with optimal design and high reliability as well as in the consolidation of their design and manufacturing processes.

A set of test benches that allow several critical wind turbine elements to be tested and validated at component and system level, such as pitch systems generator slip rings, blade bearings (including hub and its connections) and yaw systems.



ALIGNMENT (BASQUE COUNTRY)

Singular facilities (II)



Bliscay Marine Energy Platform

Key characteristics

- 20 MW total capacity
- 4 converter connection points
- Facilities for installation, trials, tests and operation
- Associated research centre
- SCADA monitoring and control system
- Research and data control centre
- Depth: 50m---90m



ALIGNMENT (BASQUE COUNTRY) Singular facilities (III)



World's first
commercial
wave plant
(2011)

Uses OWC
technology



16 turbines
with total
capacity of
296kW

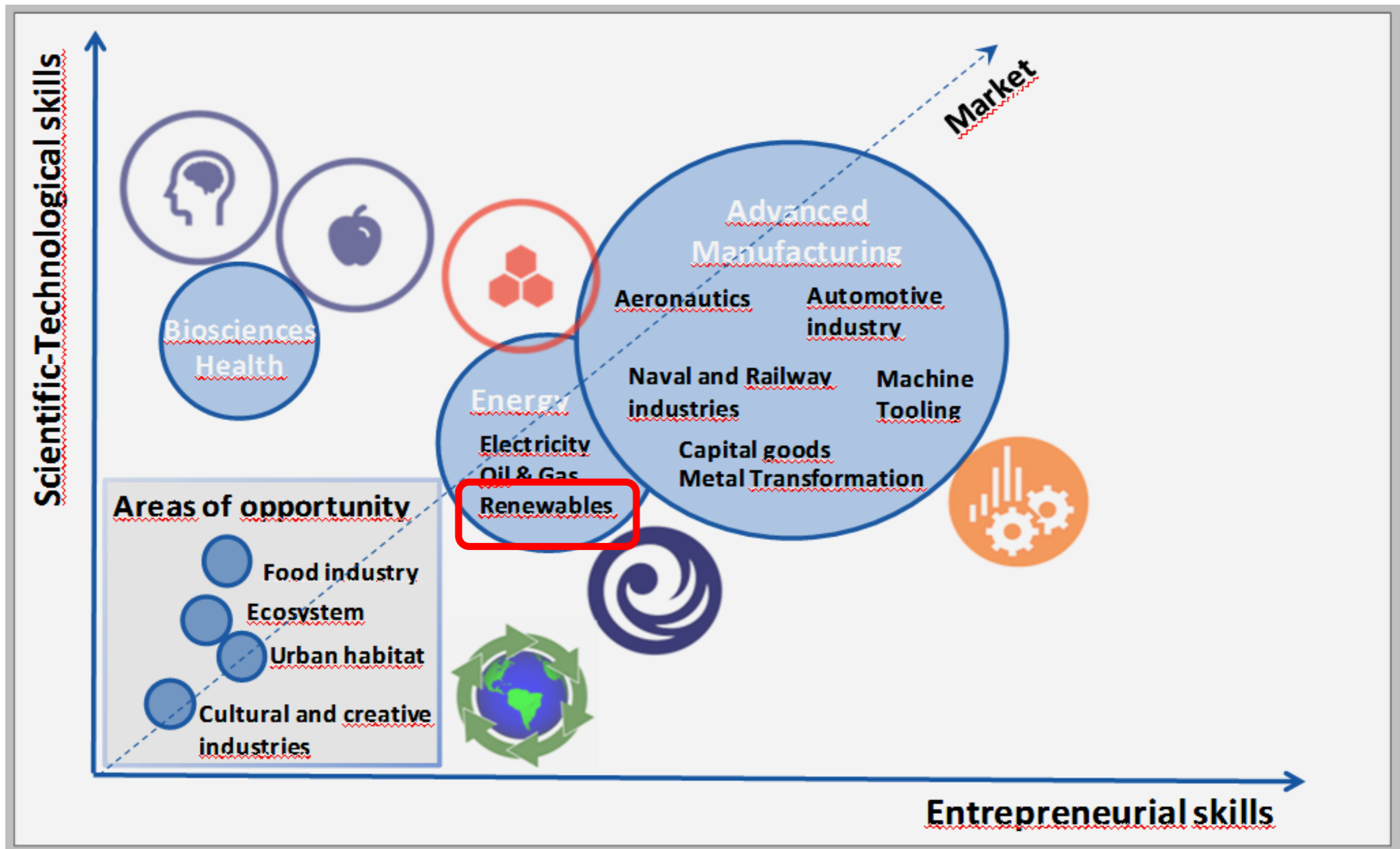
Investment:
€2.3m



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ALIGNMENT (BASQUE COUNTRY) Needs for new skills – RIS3



ALIGNMENT (BASQUE COUNTRY)

Offshore skills needs

Engineering

- Knowledge of mechanical and industrial engineering for professionals with a more electrical profile, and vice versa

Offshore plant

- Specific offshore power plant knowledge, suitably combining training in aerodynamics and hydrodynamics with mechanical and electrical principles, applied to the marine environment

Materials

- Composites: structure lamination, injection, prepreg technology, etc.
- Corrosion: biofouling, coatings, etc.

Health & Safety

- Safety in the marine environment when providing installation, repair and maintenance services

Welding

- Submerged arc welding, which is replacing electric arc welding since towers are higher

Training

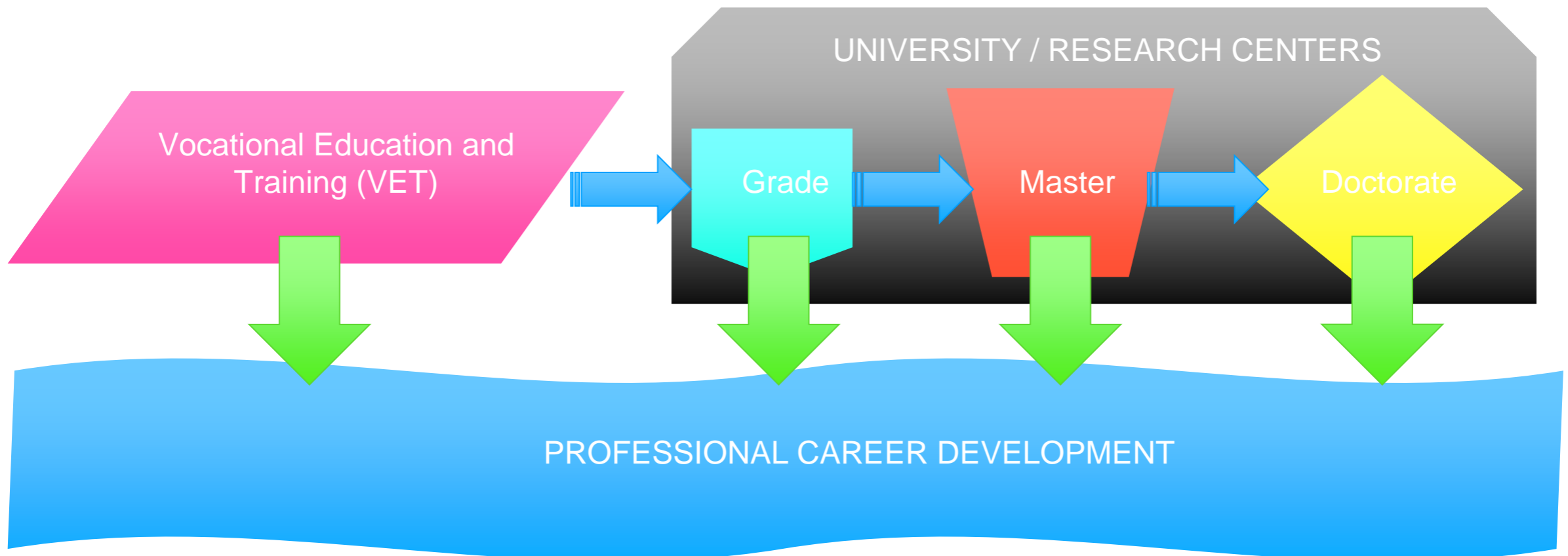
- Offshore training for all professionals who are going to work in the power plant: safety, rappelling & rope access, etc.



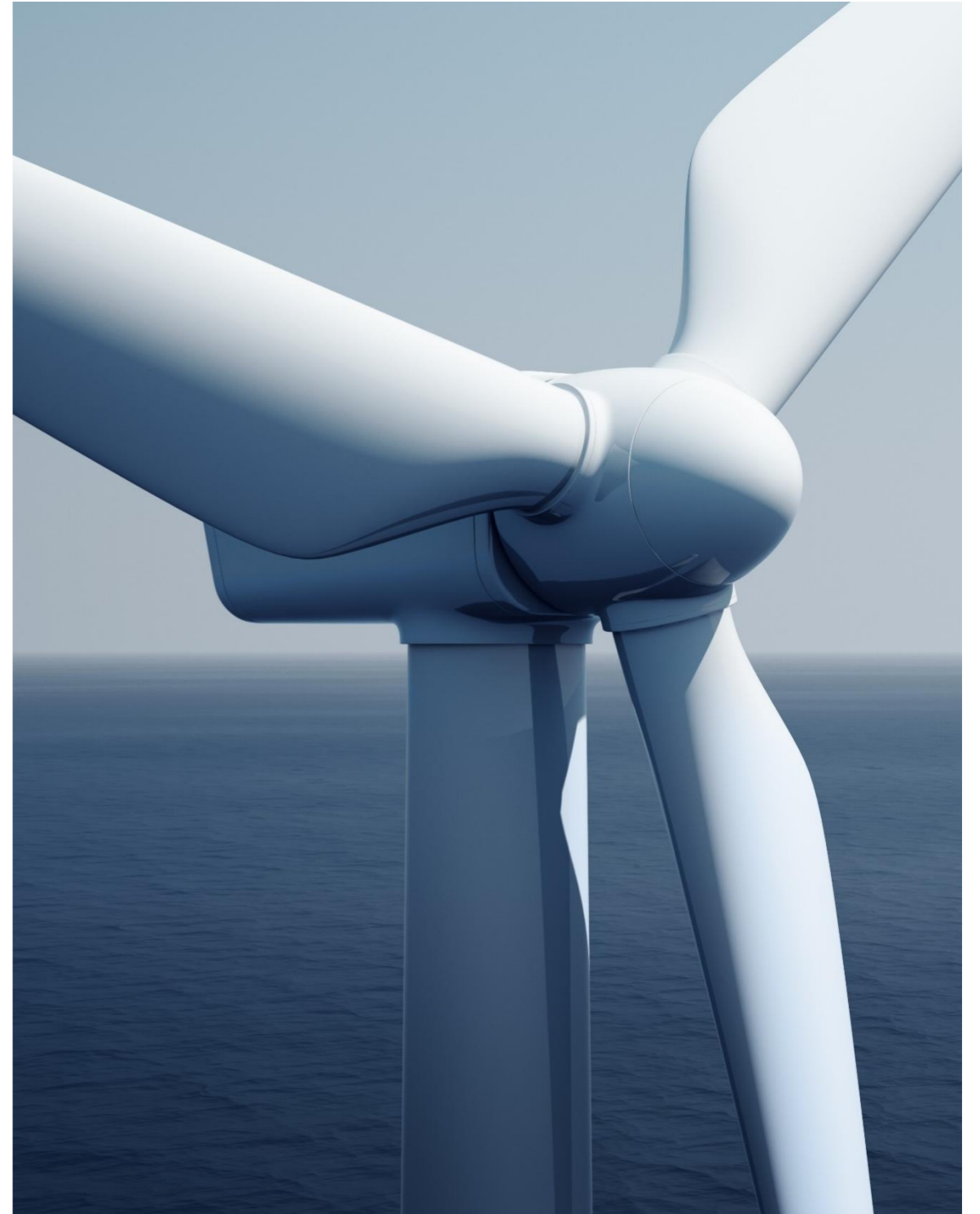
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ALIGNMENT (BASQUE COUNTRY) Training scheme



**DESIGN OF A MASTER
PROGRAMME IN
OFFSHORE RENEWABLES**



MARKET STUDY

2013



2014

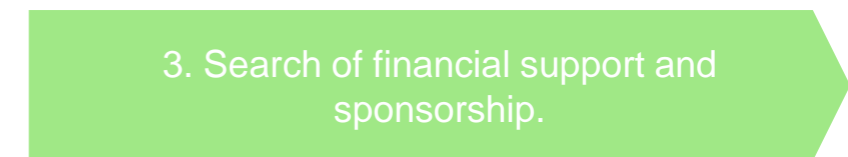
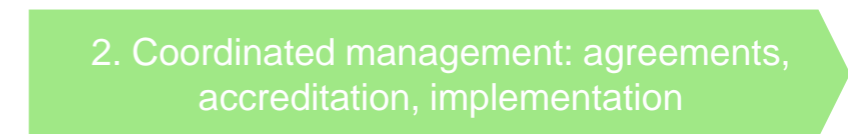
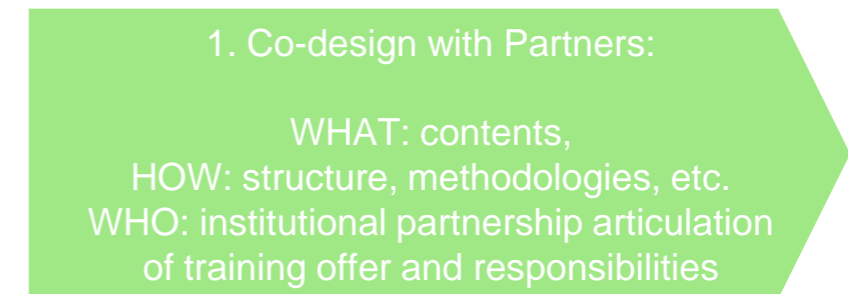
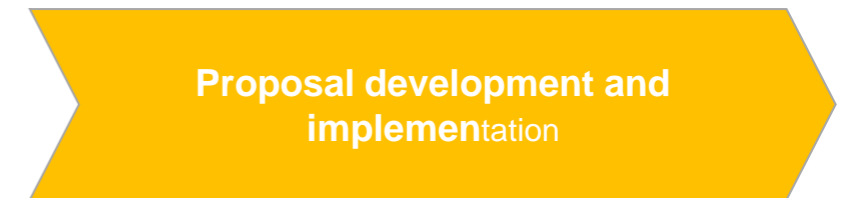
Asistencia técnica en el diseño de un Máster Internacional en el ámbito de las Energías Renovables Offshore



Informe final

euopraxis

2015



RELATED OFFER IN RENEWABLES (44)

• United Kingdom

- M.Sc. in Offshore Renewable Energy (Sustainable Energy), University of Strathclyde
- M.Sc. in Marine Technology (Sustainable Energy), University of Strathclyde
- M.Sc. in Renewable Energy Systems and the Environment (Sustainable Energy), University of Strathclyde
- M.Sc. in Global Energy Management, University of Strathclyde
- M.Sc. Offshore Renewable Energy (Offshore and Ocean Technology), Cranfield University
- M.Sc. Renewable Energy Engineering, Cranfield University
- M.Sc. Renewable Energy Technology, Cranfield University
- M.Sc. Marine Renewable Energy, Plymouth University
- M.Sc. in Sustainable Energy Systems, University of Edinburgh
- M.Sc. Sustainable Energy, University College Cork
- M.Sc. Marine Renewable Energy, Heriot-Watt University
- M.Sc. Renewable Energy Engineering, Kingston University
- M.Sc. Renewable Energy Enterprise and Management (REEM) MSc; PGDip; PGCert, Newcastle University
- M.Sc. MSc Biotechnology and Renewable Energy, University of Abertay Dundee
- M.Sc. Renewable Energy Systems Technology, Loughborough University
- M.Sc. Renewable Energy Flexible Training Programme (REFLEX), Newcastle University
- M.Sc. Renewable Energy and Environmental Modelling, University of Dundee
- M.Eng. Electrical Engineering with Renewable Energy Systems, Brunel University
- M.Sc. Renewable Energy and Resource Management, University of Glamorgan

• Sweden

- M.Sc. Wind Power Project Management, Uppsala University

• Denmark

- M.Sc. Offshore Energy Systems (Sustainable Energy Engineering), Aalborg University
- M.Sc. Wind Turbine Systems (Sustainable Energy Engineering), Aalborg University
- M.Sc. Wind Energy, Technical University of Denmark (DTU)

• Germany

- M.Sc. Renewable Energy Management (REM), University of Freiburg.
- M.Sc. Postgraduate Programme Renewable Energy, University of Oldenburg.
- M.Sc. Renewable Energy and Energy Efficiency for the MENA Region (REMENA), University of Kassel
- M.Sc. Wind Engineering, Flensburg University of Applied Sciences
- MBA. MBA Renewable, Beuth University of Applied Sciences

• France

- Mastère spécialisé Énergies Marines Renouvelables, ENSTA Bretagne
- M.Sc. Hydrodynamics and Ocean Engineering, Ecole Centrale de Nantes
- Master Renewable Energy Science & Technology, ParisTech - Paris Institute of Technology

• Netherlands

- M.Sc. Aerodynamics and Wind Energy, Delft University of Technology
- M.Sc. Offshore Engineering, Delft University of Technology

• Norway

- M.Sc. in Marine Technology, NTNU – Trondheim Norwegian University of Science and Technology
- Nordic Master in Maritime Engineering, NTNU (consortium)
- Erasmus Mundus Master Course in Coastal and Marine Engineering and Management, NTNU (consortium)
- European Wind Energy Master, NTNU (consortium)
- M.Sc. Offshore Technology, University of Stavanger

• Belgium

- M.Sc. in Marine Biodiversity and Conservation, Ghent University (consortium)
- Portugal
- European Master in Renewable Energy, EUREC – specialization en Ocean Energy, Instituto Superior Técnico de Lisboa










• Spain









- Máster Universitario en Energías Renovables, Universidad San Pablo-CEU
- Máster universitario en energías renovables en sistemas eléctricos, Universidad Carlos III de Madrid
- Máster Universitario en Energías Renovables: Generación Eléctrica, Universidad Pública de Navarra
- European Master of Science in Marine Environment and Resources UPV/EHU



Source: Study Portals, análisis Europraxis

...BUT IN OFFSHORE RENEWABLES (7)

Master	University	Country
Offshore Renewable Energy	University of Strathclyde 	
European Wind Energy Master (itinerary Offshore Engineering)	Consortium: •NTNU •Delft University of Technology •Technical University of Denmark - DTU •Universität Oldenburg 	   
Offshore Renewable Energy	Cranfield University 	

Master	University	Country
Marine Renewable Energy	Plymouth University 	
Offshore Energy Systems	Aalborg University 	
Marine Renewable Energy	Heriot-Watt University 	
Énergies Marines Renouvelables	ENSTA Bretagne (*) 	

Only 6 month during the specialization focused in marine renewable energy



- European Master in Renewable Energy, EUREC – especialization in Ocean Energy



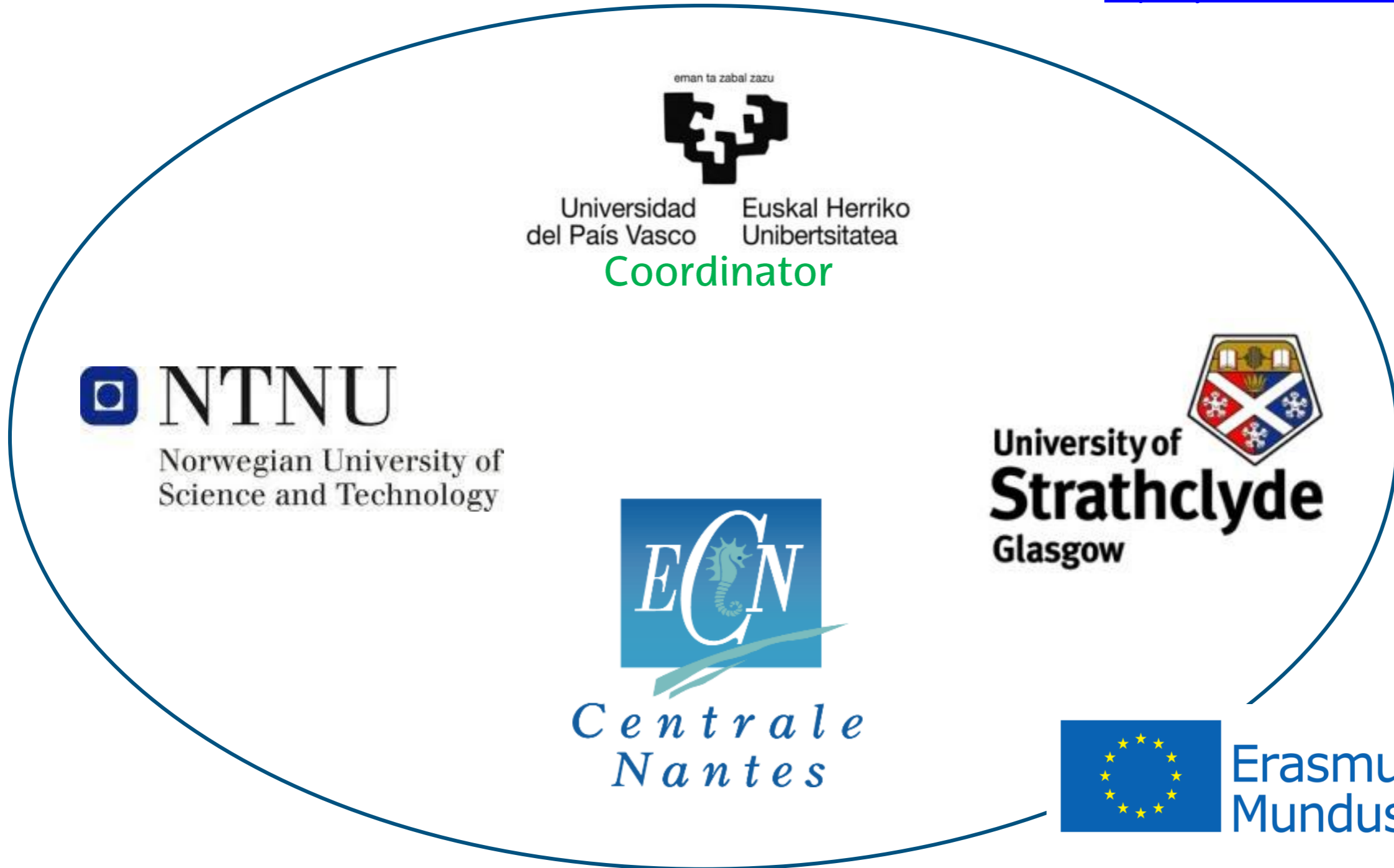

(*) ENSTA: École Nationale Supérieure de Techniques Avancées

Source: Study Portals, análisis Europraxis



CONSORTIUM

<https://youtu.be/4BxTWIVEMfQ>



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Universidad del País Vasco Euskal Herriko Unibertsitatea


University of **Strathclyde**
Glasgow

 **NTNU**

 **CENTRALE**
NANTES

El Máster en Energías Renovables Marinas de la UPV obtiene el sello de calidad Erasmus Mundus

Martes, 07 de noviembre de 2017

Energías Renovables reproduce a continuación la "Historia de un éxito", texto en el que Jordi Campàs Velasco, director de Economía y Planificación del Gobierno Vasco, repasa la cronología de la que, efectivamente, es una "Historia de éxito".

«Uno de los proyectos estrella de Euskampus -comienza Campàs Velasco- ha sido reconocido por la UE. El Máster en energías renovables marinas de la UPV/EHU, Máster MORE, ha obtenido el sello de calidad Erasmus Mundus. Una inmensa alegría por el éxito obtenido y por cómo se logró. He visualizado el éxito pero como con los icebergs, hay una parte sumergida que lo sustenta y que quiero resaltar.

- 1. Visión.** El Campus de Excelencia Internacional de la Universidad del País Vasco/Euskal Herriko Unibertsitatea (UPV/EHU), congregó capacidades científicas y tecnológicas de la UPV/EHU, la Corporación Tecnalia y el Donostia International Physics Center. José Luis Villate, de Tecnalia, apuntó la necesidad de formar personas para un sector emergente y con futuro como las energías renovables en medio marino.
- 2. Escucha.** Fueron los agentes del sector, tanto desde su vertiente de desarrollo tecnológico como de operaciones, quienes expresaron sus requerimientos.
- 3. Pintar constelaciones donde otros solo ven estrellas.** Permitted activar las mejores capacidades docentes y científicas con independencia de ubicación para dar respuesta a las necesidades identificadas.
- 4. Liderazgo.** Trabajó en clave de "ecosistema" y no de "egosistema" para movilizar dichas capacidades más allá de las propias. Jesús Mari Barja llevó el proceso involucrando departamentos y universidades diferentes. Con su persistencia, trabajo minucioso y buen hacer, Jesús Mari ha llevado el proyecto a buen puerto, un gran Capitán.
- 5. Generosidad.** La que demostraron los investigadores del Plentziako itsas Estazioa (Estación Marina de Plentzia) Ionan Marigómez y Manu Sainza ofreciendo toda su experiencia acumulada a lo largo de los años en la preparación, coordinación y dirección del Máster MER (Maritime and Environmental Resources), único máster coordinado por la UPV/EHU que hasta la fecha tenía el sello Erasmus Mundus. La experiencia en dicho máster aceleró el aprendizaje para afrontar un reto muy difícil. El Máster MER logró el reconocimiento al quinto intento. El Máster MORE, fruto del aprendizaje, lo ha logrado en el primero.
- 6. Catalizador.** Euskampus Fundazioa y la Escuela de Máster y Doctorado, que actuaron como catalizadores del proceso, aportando capacidades y recursos para dar función de las necesidades que fueron surgiendo a lo largo de estos cuatro años de trabajo que han sido necesarios para lograr el éxito.
- 7. Tiempo.** Trabajar con visión a medio/largo plazo. Como decía Igor Campillo, el Director de Euskampus, no es país para impacientes».



ACADEMIC PROGRAMME

Master Renewable Energy in the Marine environment

First edition: 2018-2022 (MUNDUS)

120 ECTS



Resource and marine environment

Resource assessment monitoring

Theoretical foundations: early marine energy conversion

Aerodynamics

Electrical principles: electrical and electronic equipment

Control principles

Connection and integration into the electricity grid

Integration of renewable energy into the electricity system

Engineering, development and management of offshore parks

Design of parks

Operation and maintenance

Conversion technologies

Offshore wind turbines and wave systems

Environmental, economic and legal aspects of marine renewable energy

Sustainability and strategic environmental assessment

Local culture

Languaje and culture

ECTS (lectures): 90

MSc Thesis

ECTS (MSc Thesis): 30



STUDENTS' MOBILITY

Year	Sem.	ECTS	Specialisation (A)	Specialisation (B)
1	1	30		
	2	30		
2	3	30		
	4	30		

(A) Offshore Renewable Energy Systems Engineering.

(B) Power Electronics and Control for Offshore Renewable Energy Systems.

(*) Associate Centers.



WORKING PLAN (2016-2017)

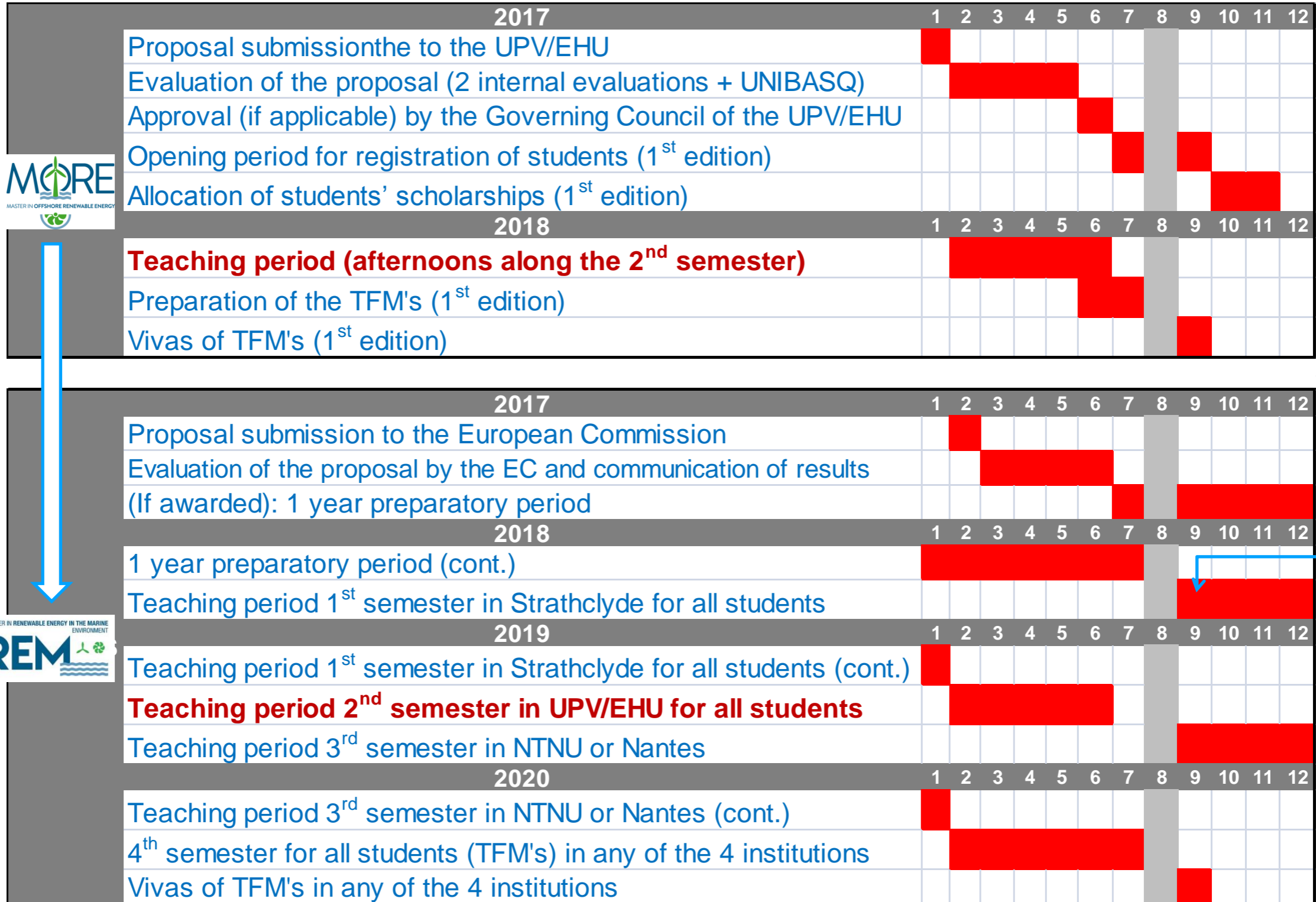
Item	Tasks	2016												2017	
		2	3	4	5	6	7	8	9	10	11	12	1	2	
1	Discussion and final approval of the present working plan by all the parties	█						█							
2	AP collaborative discussions for further improvement, including all the syllabi)		█	█	█	█									
3	CA discussion (Admission requirements, fees, assessment, awards, agreements...)			█	█	█	█								
4	EM joint proposal preparation and discussion (shared documents to be completed)				█	█	█	█	█	█					
5	Coordinator visits the parties (involvement of academic and administrative officers)				█										
6	Joint consortium members meeting in Bilbao (AP + CA + EM further discussions)						█								
7	CA being checked by the external offices of each party (internal meetings desired)								█	█					
8	CA management of the suggested/imposed changes (discussions by the parties)										█				
9	MA preparation and signature process (by all the parties)											█	█		
10	EM joint proposal final review prior submission (latests discussions by the parties)												█	█	

Item	Deliverables	2016												2017	
		2	3	4	5	6	7	8	9	10	11	12	1	2	
1	Working plan report approved by all the parties (subject to further changes)	█													
2	AP documentation approved by all the parties and shared in the Drive (with syllabi)		█												
3	Individual meeting reports including the partners institutional contact fiche				█										
4	Agreements of cooperation with associate centres and external companies						█								
5	CA ready for submission to the external offices of each party (before summer)							█							
6	CA revised by the external offices of each party (amendments to be discussed)									█					
7	CA final version (with the implementation of all the changes agreed with the parties)										█				
8	EM joint proposal preliminary documentation shared in the Drive											█			
9	MA fully signed version												█		
10	EM full documentation ready for submission to the call													█	

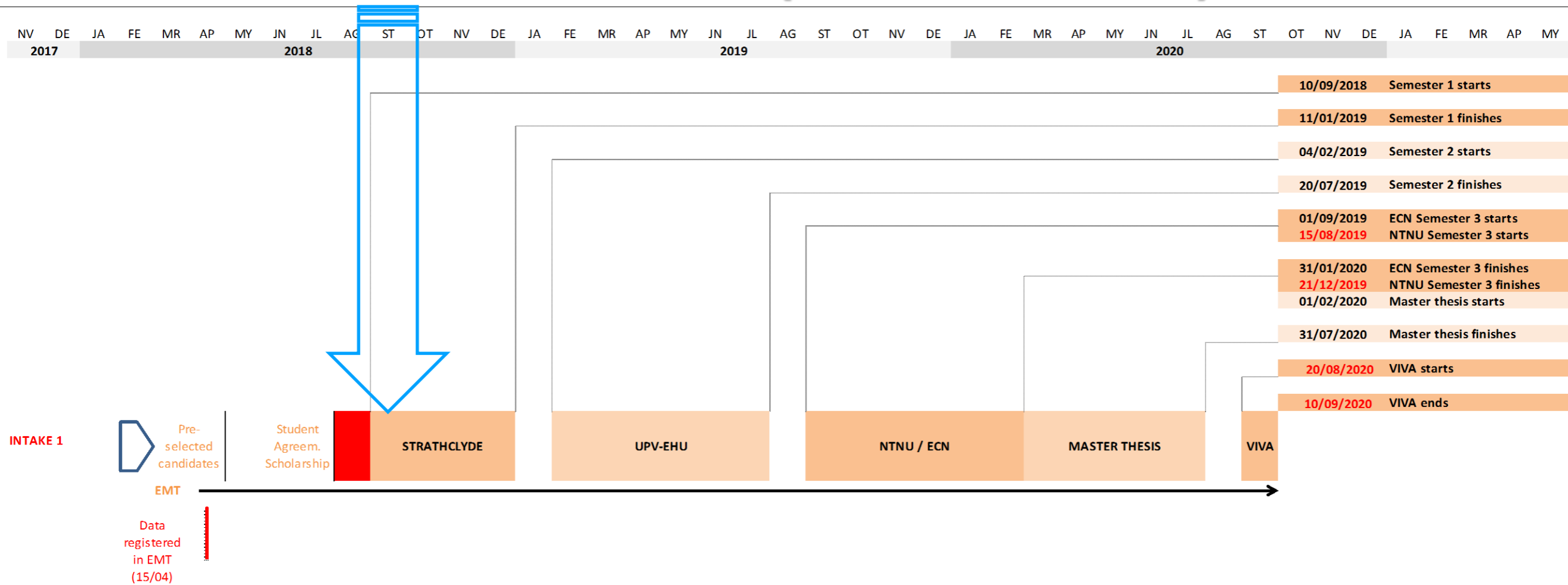
AP: Academic Programme, CA: Consortium Agreement, EM: Erasmus Mundus, MA: Mandate



IMPLEMENTATION SCHEME (2017-2018)



KEY DEADLINES (FIRST INTAKE)



Important dates:

- ✓ 09th-13th April 2018: Preliminary submission of letters of “acceptance / rejection / conditional” to all applicants.
- ✓ 15th April 2018: Deadline for submission to EACEA of the evaluation results (lists) through the EMT tool.
- ✓ 30th April (aprox) 2018: Formal acceptance to the pre-selected candidates awarded with scholarships after approval from EACEA.
- ✓ May-June 2018: Management of VISAS, Accommodation, etc.
- ✓ June-July 2018: Signature of the Student Agreements.



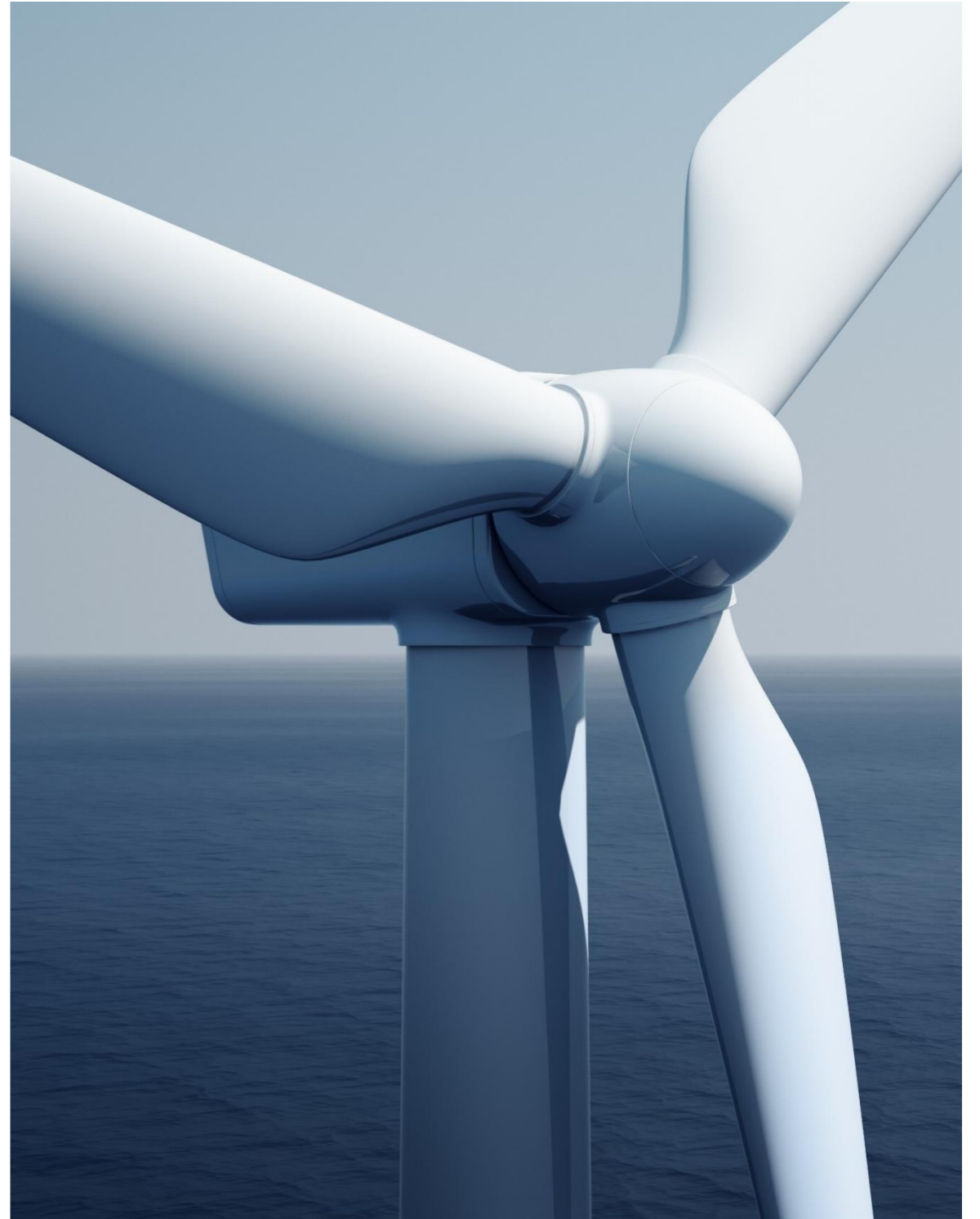
KICK-OFF MEETING - March 2018



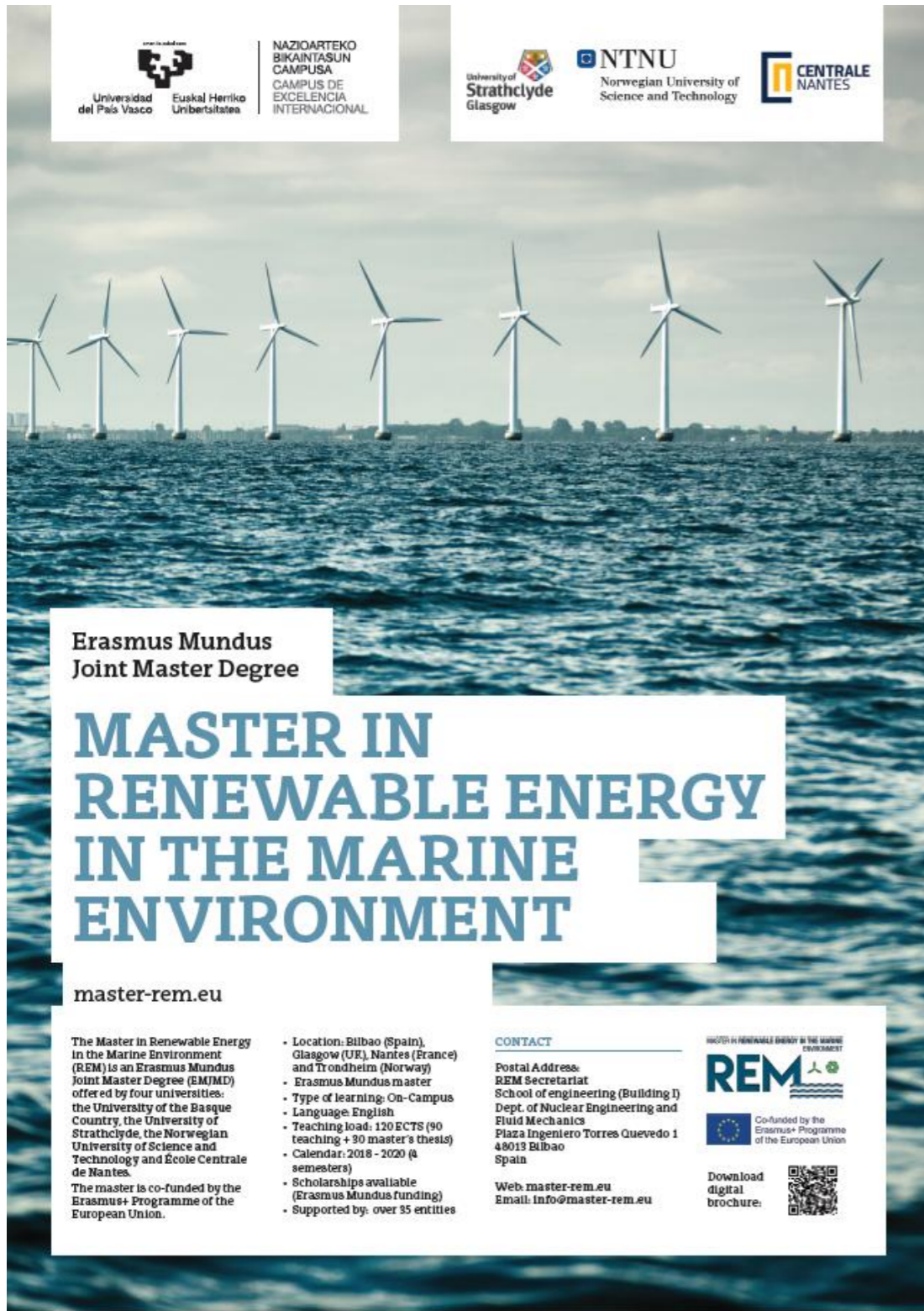
From left to right: Jordi Campás (**Director of economy, Basque Government**), Jose Ignacio Armentia (**Director of the Master and Doctorate School, UPV/EHU**), Igor Campillo (**Director of Euskampus Fundazioa**), Pablo Eguía (**JPB representative, UPV/EHU**), Guillaume Ducrozet (**JPB representative, ECN**), Jesús M. Blanco (**REM coordinator, UPV/EHU**), Josu Sangróniz (**Director of postgraduate studies, UPV/EHU**), Amaia Esquisabel (**Director of Universities and Research ,Basque Government**), Alberto Carrera (**External relations officer, UPV/EHU**), Elisabetta Tedeschi (**JPB representative, NTNU**), Pilar Rodriguez (**REM Secretariat, UPV/EHU**), Margarita Herranz (**Director of the Dept. of nuclear engineering and fluid mechanics, UPV/EHU**), Itxaso Etxebarria (**Project manager, Euskampus Fundazioa**), Olimpo Anaya-Lara (**JPB representative UoS**), Santiago Reyes (**Visiting Validator, ONECO Consulting**).




DIFUSSION ACTIVITIES




DIFFUSION (PRINTED BROCHURES AND POSTER)





NAZIOARTEKO BIKAINTASUN CAMPUSA CAMPUS DE EXCELENCIA INTERNACIONAL



Erasmus Mundus Joint Master Degree

MASTER IN RENEWABLE ENERGY IN THE MARINE ENVIRONMENT

master-rem.eu

The Master in Renewable Energy in the Marine Environment (REM) is an Erasmus Mundus Joint Master Degree (EMJMD) offered by four universities: the University of the Basque Country, the University of Strathclyde, the Norwegian University of Science and Technology and École Centrale de Nantes.


The master is co-funded by the Erasmus+ Programme of the European Union.

- Location: Bilbao (Spain), Glasgow (UK), Nantes (France) and Trondheim (Norway)
- Erasmus Mundus master
- Type of learning: On-Campus
- Language: English
- Teaching load: 120 ECTS (90 teaching + 30 master's thesis)
- Calendar: 2018 - 2020 (4 semesters)
- Scholarships available (Erasmus Mundus funding)
- Supported by: over 35 entities


CONTACT

Postal Address:
REM Secretariat
School of engineering (Building I)
Dept. of Nuclear Engineering and Fluid Mechanics
Plaza Ingeniero Torres Quevedo 1
48013 Bilbao
Spain

Web: master-rem.eu
Email: info@master-rem.eu



Download digital brochure.



ORGANIZING UNIVERSITIES



IMPORTANT INFORMATION

- Location: UPV/EHU (Spain), Strathclyde (UK), ECN (France) and NTNU (Norway)
- Type of master: Erasmus Mundus
- Type of learning: On-Campus
- Language: English
- Calendar: 2018 - 2020 (4 semesters)
- Teaching load: 120 ECTS (90 teaching + 30 master's thesis)
- Scholarships available (Erasmus Mundus funding)
- Supported by: + 35 entities

CONTACT AND INFORMATION

Main contact: info@master-rem.eu
Programme coordinator - Jesús María Blanco: jesusmaria.blanco@ehu.es
Website: master-rem.eu



OVERVIEW

The Master in Renewable Energy in the Marine Environment (REM) is an Erasmus Mundus Joint Master Degree (EMJMD) offered by four universities: the University of the Basque Country, the University of Strathclyde, the Norwegian University of Science and Technology and École Centrale de Nantes.

The master is co-funded by the Erasmus+ Programme of the European Union.

PRESENTATION AND GOALS

Renewable energy plays a more and more important role. At a social level, renewable energy contributes to a more sustainable energy system, by providing a more independent power system and contributing to the reduction of global warming and climate change.

Offshore renewable energy has a vast potential, but they represent a major technological challenge. The harsh conditions offshore demand advanced specific knowledge in various scientific and technological fields, and specifically trained professionals are demanded by this industry.

The aim of the REM master is to form specialists with the required skills to accomplish this technological challenge.

The Master provides the student with skills in assessment, analysis, simulation, development and exploitation of all available energy in the marine environment and in project development of safe, efficient and reliable marine energy generation plants, including operation and maintenance design and study of the integration of the plants in the electric system.

The Master program is fully presented in English and classes are presented by professors of University of the Basque Country, Strathclyde University (UK), École Centrale de Nantes (France) and NTNU (Norway), and professionals from the supporting companies and institutes.

The master also offers the possibility to develop the Master's thesis in one of the supporting entities and it offers a number of scholarships.

PROFESSIONAL OUTINGS

The completion of the master will prepare the student for a leadership role in various renewable energy and marine sectors. Students will be able to carry out high-level technical jobs in engineering companies, equipment manufacturers and other marine industries.

Marine and renewable energy companies and institutions increasingly demand specifically trained professionals with an advanced specific knowledge in various scientific and technological fields. This programme trains the student to face the technological challenges that harsh conditions offshore require.

Likewise, students will also be able to pursue research positions in Universities, Research and Development in technological poles, and other institutes.

Moreover, this programme has a network of associated centres formed by several world-renowned research institutions and companies entailing a great career opportunity for students.

Not only they have a direct participation in the master teaching and hosting students for their master thesis but they also recognise that the learning outcomes of the REM programme are suitable for positions in their institutions/companies.

ACADEMIC PROGRAMME

The Programme is a two years masters' course consisting of 4 semesters of study (120 ECTS) in accordance with the ECTS (European Credit Transfer System).

Student mobility is compulsory so that each student must undertake the Programme by enrolling at three of the four partner universities (including for completion of a master thesis).

ECTS credits are assigned to Modules. Each student will be assigned to a Supervisor. An individual study plan must be then elaborated and mutually agreed between the student and his/her Supervisor.







Erasmus Mundus Joint Master Degree

MASTER IN RENEWABLE ENERGY IN THE MARINE ENVIRONMENT

master-rem.eu



MODULES AND SUBJECTS

MODULE 1. Resource and marine environment

- Ocean wave energy and offshore wind energy assessment
- Water waves and sea states modelling

MODULE 2. Theoretical foundations: early marine energy conversion

- Inspection and survey
- Control Principles
- Advanced fluid dynamics modelling for marine engineering applications
- Theoretical and numerical aspects in fluid dynamics and turbulent flow
- Computational fluid dynamics for turbulent flow
- Modelling of wind/marine current turbine-driven electric generators
- Wave to wire control
- Applied electromagnetics in power engineering
- General concepts of hydrodynamics
- Numerical hydrodynamics
- Experimental hydrodynamics

MODULE 3. Conversion technologies

- Wind Energy and Distributed Energy Resources
- Renewable marine energy systems
- Power electronics in future power systems
- Wind power in electric power systems
- Marine renewable energy

MODULE 4. Connection and integration into the electricity grid

- Power Electronics Devices, Drives Machines and Applications
- Integration of renewable energy into the electricity system
- Operation of transmission and distribution networks
- Power electronics in offshore power systems
- Power electronics
- Power system analysis
- Quality of supply in electrical power systems

MODULE 5. Engineering, development and management of offshore parks

- Physical model testing for offshore renewables
- Advanced Marine Structures
- Environmental conditions for marine renewable concepts
- Operations and maintenance of marine energy arrays
- Wave-structure interactions and moorings

MODULE 6. Environmental, economic and legal aspects of marine renewable energy

- Energy economics
- Environmental Impact Assessment

MODULE 7. Local culture

- Basque language and culture
- French language and culture

APPLICATION PROCEDURE

Applicants are required to complete the online application, providing documents and forms available through the REM website. The procedure has 2 steps:

- Completing the online application form.
- Attaching the required documents to the application form.

The deadline for returning the application form and the required documentation will be announced on the REM website but will normally be before 15th of March every academic year.

ERASMUS MUNDUS SCHOLARSHIPS

Erasmus Mundus scholarships are open to higher education Third Country and European students and academics from all over the world.

Erasmus Mundus scholarship covers tuition fees, participation costs (including insurance coverage), travel cost contribution, installation cost contribution, and monthly allowance.

MASTER'S THESIS

A student may commence research for the thesis project (90 ECTS) just after successfully progressing to Semester 3. The thesis can be undertaken in one of the four organizing Universities or in one of the Associate Centres.

SUPPORTED BY





Co-funded by the Erasmus+ Programme of the European Union






DIFUSSION (WEBSITE-GOOGLE ADWORDS)

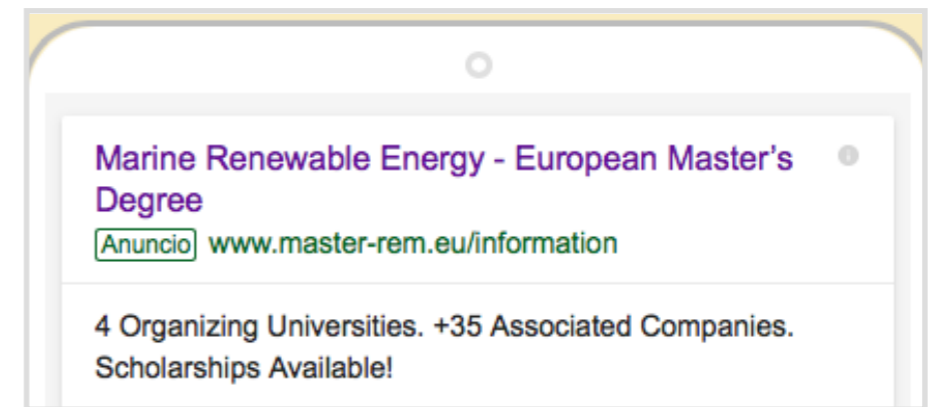
Period: 5 Feb. - 16 March

Total of visits	1.535.920 visits
New users	16.311 (79,8%)
Recurrent users	4.125 (20,2%)
Average duration	2 minutes

Master in Renewable Energy - Application Period Open
[Anuncio www.master-rem.eu/information](http://www.master-rem.eu/information)
 On-site. Erasmus Mundus European Programme. +30 Supporting Companies. Apply Now!



Source	Users	Percentage
Google Adwords (Display and Paid Search):	10.322	62,4 %
Direct:	4.998	30,02 %
Referral:	515	3,1 %
Social:	388	2,3 %
Organic Search:	210	1,3 %
Others:	117	0,7 %



DIFUSSION: WEBSITE-COUNTRIES

1.	 China	3.225 (19,68 %)
2.	 Mexico	2.769 (16,89 %)
3.	 Pakistan	944 (5,76 %)
4.	 India	891 (5,44 %)
5.	 Nigeria	814 (4,97 %)
6.	 Indonesia	647 (3,95 %)
7.	 United States	515 (3,14 %)
8.	 Spain	482 (2,94 %)
9.	 Bangladesh	474 (2,89 %)
10.	 Ethiopia	357 (2,18 %)
11.	 Ghana	272 (1,66 %)
12.	 Chile	221 (1,35 %)
13.	 Somalia	208 (1,27 %)
14.	 Brazil	193 (1,18 %)
15.	 France	188 (1,15 %)

16.	 Algeria	153 (0,93 %)
17.	 Rwanda	153 (0,93 %)
18.	 Egypt	147 (0,90 %)
19.	 Nepal	147 (0,90 %)
20.	 Philippines	137 (0,84 %)
21.	 Vietnam	130 (0,79 %)
22.	 Iraq	119 (0,73 %)
23.	 Colombia	114 (0,70 %)
24.	 Kenya	102 (0,62 %)
25.	 Sudan	102 (0,62 %)
26.	 Afghanistan	100 (0,61 %)
27.	 Italy	76 (0,46 %)
28.	 Tanzania	76 (0,46 %)
29.	 United Kingdom	75 (0,46 %)
30.	 Saudi Arabia	75 (0,46 %)



REM in the media



FORMACIÓN 2017

Jesús María Blanco Ilzarbe

Coordinador del Master in Offshore Renewable Energy (MORE)

“Cuarenta instituciones y grandes empresas ya se han vinculado a nuestro máster”

Doctor Ingeniero Industrial, Jesús María Blanco Ilzarbe es profesor titular de la Escuela Técnica Superior de Ingeniería de la Universidad del País Vasco (UPV/EHU) y, sin duda, el alma mater del Master in Offshore Renewable Energy. Blanco lleva casi cinco años perfilando esta propuesta formativa, que será un título propio de la UPV/EHU, y que está llamada a convertirse –apunta maneras– en uno de los referentes europeos, en materia de formación, para las energías renovables marinas.



■ Una nota de 94 puntos sobre 100 es mucho, ¿no? Sí. La Administración acaba de acreditar nuestro máster con esa nota, 94,5 puntos sobre 100, o sea, excelente. Y la verdad es que estamos muy contentos.

■ ¿Por qué un máster de energías renovables marinas? Por la demanda. Hay mucha demanda –de personal formado– en el sector offshore. Y Euskadi es líder en ese sector. Somos uno de los líderes a nivel internacional y queremos profundizar en ello. Queremos dar una formación integral: una formación que nace en la propia FP, porque ya en FP se están implementando en Euskadi módulos que están encaminados a renovables, al sector offshore; una formación en la que ahonda la Escuela de Ingeniería Técnica Industrial de Eibar, que imparte el Grado en Ingeniería de Energías Renovables [que fue hace cinco años el primero en su género de España]; y una formación en la que el siguiente paso sería nuestro máster.

■ ¿Cómo surge el Master in Offshore Renewable Energy? A principios de década la eólica marina empieza a crecer a buen ritmo, y las empresas y centros tecnológicos del País Vasco, que ya están entonces trabajando en el sector, se dan cuenta pronto de la necesidad imperiosa de formación. Es así como surge la idea de crear un máster, a nivel top, para cubrir la etapa final de la cualificación de todos esos profesionales que están llamados a trabajar en este sector. En 2013, la Universidad a través de Euskampus Fundación, encarga a una consultora Europraxis, un estudio sobre la oferta formativa en esta materia de ese estudio cuando empezamos a darnos cuenta de que en Europa hay propuestas formativas que atienden esas

■ La UPV detecta primero pues la demanda; después encara con él se da cuenta de que no hay oferta y... ¿cuál es el siguiente paso? Identificar partners, contactar con ellos, conocerlos, ver quiénes son los actores que pueden colaborar con nosotros en el día a día. Nos lleva un tiempo el analizar los distintos másters que hay en el mercado. La idea es hacer algo que sea diferente de todo lo que tenga un valor añadido. Identificamos en primer lugar a la Universidad de Strathclyde, de Reino Unido, como una de las universidades en el sector offshore. Identificamos después a la universidad noruega [Norwegian University of Science and Technology] que es imprescindible. Identificamos a continuación una tercera, la Ecole Centrale de Nantes, que tiene mucha experiencia en el sector. Y, por fin, en la propia UPV, como líderes que somos delificamos también a todos los posibles partners, gracias a lo que vamos organizando por medio de Euskampus [el Excelencia Internacional de la UPV]. Y, así, hacia el año 2013 a diseñar el máster, que nace tras haber conocido exhaustivamente las propuestas, las ofertas y las demandas de los interesados, con los que ya llevamos años contactados.

■ Pues ha debido salir bien el diseño: 94,5. Sí, estamos muy contentos, como decía. Tenemos cerca de 40 grandes empresas, tanto de aquí como europeas, vinculadas. Hemos trabajado mucho y durante mucho tiempo. Hemos minuciosamente todas las ofertas que hay en el mercado, y que ni siquiera Edimburgo o Strathclyde tienen la oferta para ofrecer nosotros. Porque son muy diversas las áreas desde el diseño básico, o desde la afección al medio ambiente, hasta los aspectos económicos y de generación de recursos humanos.

■ ¿Cuántos alumnos tendrá la primera edición del máster? Entre 10 y 30. Como máximo, 30. Ahora mismo ya tenemos 10 becas confirmadas. La comisión académica del máster las mejores expedientes. El proceso de matriculación se abrirá en

■ ¿Cuál es el perfil de alumno que busca este máster? Variado. Pero, básicamente, el ingeniero industrial, grado en Ingeniería, en tecnologías industriales, ingenieros también, carreras como Físicas.

■ Y, ahora, a por la acreditación Erasmus Mundus... Sí, queremos que la Comisión Europea acredite nuestro máster Erasmus Mundus en el curso 2018/2019. La idea es que los que hayan cursado el máster de título propio se les conviertan en Erasmus. Porque todas ellas van a estar luego en el Máster europeo desarrollaría en cuatro semestres en diferentes ubicaciones: Strathclyde y Trondheim. En fin, que presentamos nubes a la Comisión en febrero y esperamos tener respuesta en julio.

■ O sea, que la UPV ofertará su máster MORE, como título propio 2017/2018 y, si la Comisión da su visto bueno, ofertará Erasmus Mundus al curso siguiente. ¿Es así? Efectivamente. Aquí, a Euskadi, el curso que viene serán los que vengan. Vendrán de Noruega, de Strathclyde o de Nantes del año siguiente, y en el caso de que la Comisión le dé su visto bueno, serán los alumnos los que tendrán que ir a Escocia el primer semestre; pasarán el segundo aquí, el tercer semestre en el centro que les corresponda (en función de la especialidad); por fin, emplearán el cuarto semestre para hacer el trabajo de fin de grado, que ejecutarán en cualquiera de las cuatro universidades, en un centro tecnológico o en una empresa que haya aceptado el compromiso con el máster. En fin, dos años de máster, 120

FORMACIÓN

Renovables en el mar: la cadena vasca de la formación

Poole (Reino Unido) acogió hace unas semanas la décima edición de una de las más relevantes del mundo en lo que se refiere al ámbito marino, la European Conference. Organizada por la Comisión Europea, esta reunión multinacional, atraido a más de 600 asistentes, ha incluido sesiones plenarias, exposiciones, y presentaciones. El profesor de la Universidad del País Vasco (UPV/EHU) Jesús Ilzarbe ha estado allí presentando la propuesta formativa offshore de Euskadi and Fisheries). Blanco Ilzarbe nos trae aquí, en exclusiva, lo que ha contado, enviado del Gobierno Vasco, en Poole.

Muchas y muy diversas han sido las propuestas –conferencias, talleres, exposiciones– que ha programado en 2017 el European Maritime Day (EMD), foro que ha cumplido en esta edición diez años. New skills for the maritime economy (que podremos traducir, un tanto libremente, como “las nuevas habilidades que demanda la economía azul”) ha sido el título del taller que el EMD ha dedicado a la formación en tecnologías marítimas y pesqueras. Organizado por la Conferencia de las Regiones Periféricas y Marítimas de Europa (CRPM) y moderado por Pauline Caumont, secretaria ejecutiva de la Comisión del Arco Atlántico de esta Conferencia, este workshop se enmarca dentro de la denominada blue economy, que, en los últimos años, ha experimentado un importante crecimiento a escala global.

Los ponentes invitados al taller han sido cinco: Kerstin Brunstrom, presidenta de la Comisión del Mar del Norte de la CRPM; Pierre Perrocheau, asesor técnico de SEA Europe; Jacopo Moccia, director de Política y Operaciones de la Ocean Energy Europe (que es la red profesional más importante del mundo en este sector); Jessica Hjerpe Olsson, experta en asuntos del Mar de la

Region Västra Götaland (Suecia); y yo mismo: Jesús María Blanco, coordinador del Master in Offshore Renewable Energy (MORE) del País Vasco.

El taller ha servido para detallar las tendencias del mercado y las nuevas y acuciantes necesidades en materia de formación en offshore (más allá de la costa que se están detectando a todos los niveles. Así mismo, ha servido para mostrar las iniciativas concretas que están surgiendo, a escala regional y europea, para ayudar tanto a los jóvenes como a los trabajadores del sector en la implementación y desarrollo de esas nuevas competencias que son requeridas en la actualidad, incidiendo en la estrecha colaboración que debe existir entre la industria y la educación.

Nuevas habilidades

Yo he sido invitado por el CRPM, a través de la Oficina del Gobierno Vasco en Bruselas, para presentar una ponencia que hemos titulado *Introducing new skills to the offshore energy sector in Europe; a perspective from the Basque Country (Spain)*. Esa ponencia repasa la cadena de valor del sector de las energías marinas y de la pesca en Euskadi, que quiere ser referencia tanto a nivel euro-

peo como internacional, marcados por Euskadi 3E203.

Introducing también las conclusiones del curso, llevado a cabo por una consultora (Xis), que puso de relieve la necesidad de formación específica en el sector que en Europa se está creando por el crecimiento de la actividad en este sector. Múltiples iniciativas de energía renovable en el medio marino (20 créditos ECTS). Impulsado desde la Universidad del País Vasco-Euskadi Herriko Unibertsitatea (UPV-EHU), este máster internacional –Renewable Energy in the Marine environment (Master-REM)– comenzará el próximo mes de septiembre.

Solo 13 de los más de 300 aspirantes han logrado la beca que concede el Master-REM, una beca completa (más de 30.000 euros) que cubre todos los gastos del alumno, incluidos los desplazamientos y salarios en los países en los que se celebre este curso de posgrado, que coincidirá a su vez con el curso de prácticas, durante dos años, por cuatro universidades europeas: Strathclyde (Escocia), la Universidad Noruega de Ciencia y Tecnología, la Ecole Centrale de Nantes (Francia) y la UPV-EHU.

El objetivo primero del máster es dotar al alumno de las competencias necesarias para que pueda abordar con éxito la evaluación, análisis, simu-

FORMACIÓN 2018

producción fundamental en el sistema económico y el funcionamiento de los distintos mercados energéticos; ser capaz de analizar y diseñar sistemas de monitorización y control, de energías renovables en base a las soluciones que hay en el mercado.

Lugar, fecha y duración: Eliche. Noventa créditos ECTS. Un curso académico y medio. El máster se compone de tres semestres consecutivos. Durante el primer curso (semestres 1 y 2) se cursarán los bloques de Ingeniería Energética, Ingeniería Solar, Auditoría Energética y Logística, y Otras Energías Renovables. El tercer semestre se dedica a realizar prácticas en empresas, asistencia a seminarios, conferencias, visitas a instalaciones de energías renovables y a la realización del Trabajo Fin de Máster.

Precio: 3.800 euros, aproximadamente. Preinscripción: primer plazo, hasta el 30 de junio de 2018; segundo plazo, desde el 30 de julio al 14 de septiembre de 2018.

Información: 966 658 489 (Juan Carlos Ferrer Milán).

Correo: e.jc.ferrer@umh.es

Sitio: master.rem.upv.es

Centro Superior de Investigaciones Científicas (CSIC)

Afiliado al Ministerio de Ciencia e Innovación, el CSIC es la mayor institución pública dedicada a la investigación en España y la tercera de Europa. Su objetivo fundamental es desarrollar y promover investigaciones en beneficio del progreso científico y tecnológico, para lo cual está abierta a la colaboración con entidades españolas y extranjeras.

MÁSTER UNIVERSITARIO EN ENERGÍAS RENOVABLES, PILAS DE COMBUSTIBLE E HIDRÓGENO

Organiza: CSIC y Universidad Internacional Menéndez Pelayo (UIMP).
Objetivo: conocer el marco económico/social y las condiciones medioambientales en que se fundamenta la normativa legal y la política específica que afectan al desarrollo, implantación y gestión de la energía renovable; conocer los fundamentos y las herramientas necesarias para la investigación aplicada a la generación de energías renovables (fotovoltaica, solar, de la biomasa, eólica y geotérmica); conocer los fundamentos en que

De la Escuela de Eibar y del resto del mundo

Más de 300 aspirantes de 15 países (Argelia, China, Colombia, Nigeria, la India, Suiza, Venezuela, Turquía...) se han inscrito en el primer Máster Erasmus Mundus de energías renovables en el medio marino (20 créditos ECTS). Impulsado desde la Universidad del País Vasco-Euskadi Herriko Unibertsitatea (UPV-EHU), este máster internacional –Renewable Energy in the Marine environment (Master-REM)– comenzará el próximo mes de septiembre.

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El objetivo primero del máster es dotar al alumno de las competencias necesarias para que pueda abordar con éxito la evaluación, análisis, simu-

lación, desarrollo y aprovechamiento de toda fuente de energía disponible en el medio marino.

El objetivo último es el desarrollo y ejecución en ese medio (de manera segura y económica) de instalaciones de generación de electricidad, su operación y mantenimiento, y la integración de su producción en el sistema eléctrico.

Los estudiantes dedicarán el último cuatrimestre a elaborar los trabajos fin de máster, que podrán hacer en cualquiera de las cuatro universidades mencionadas o en alguna de las 35 entidades asociadas al proyecto, entre las que figuran instalaciones de empresas privadas y centros de I+D europeos.

El máster cuenta con un órgano de coordinación, que ha sido el encargado de seleccionar al alumnado. Este órgano está compuesto por un miembro de cada universidad, más el director del curso, el doctor Jesús María Blanco Ilzarbe, de la UPV-EHU.

Los 13 aspirantes elegidos proceden de México (2), Indonesia (2), Egipto (2), España (2), Brasil, Nigeria, Ghana, Pakistán e Italia. Hay solo dos mujeres, ambas son españolas y ambas logran desde la Escuela de Eibar.

“Ha sido toda una sorpresa. Habíamos repartido el trabajo de selección –cuenta el director del Máster– entre las cuatro universidades, a cada una de las cuales se le había asignado un criterio de selección” (entre los criterios a evaluar estaban los méritos académicos, la motivación, los valores o la experiencia).

“Nosotros calificamos muy alto a esos dos alumnos de Eibar, porque su nivel era extraordinario, pero la verdad es que fue toda una sorpresa, y motivo de satisfacción, al comprobar, cuando abrimos los otros tres sobres con las calificaciones, que los otros tres universitarios también habían calificado alto, como a estos dos alumnos, hasta el punto de haberlos acordados a medias becas”.

Se da la circunstancia, además, de que ambas han estudiado en la Escuela de Eibar (UPV-EHU), una escuela que Energías Renovables lleva aquí por primera vez en octubre de 2012, cuando publicamos un reportaje en el que dábamos cuenta del lanzamiento del Grado en Ingeniería de Energías Renovables, un grado –único en España– que estaba impulsando entonces la Escuela Universitaria de Ingeniería Técnica de Eibar, y que, sólo siete años después, ya está ofreciendo a sus alumnos en lo más alto. El Máster-REM suscribiré en esta su primera edición 24 matriculados.

Más información: master-rem.upv.es



Co-funded by the Erasmus+ Programme of the European Union



REM in the media

ANNUAL REPORT

AN OVERVIEW OF OCEAN ENERGY ACTIVITIES IN 2017



The **University of the Basque Country**, **TECNALIA** and **BCAM** (the Basque Centre for Applied Mathematics) signed, in November 2017, a collaboration agreement between the three organisations to set up a **Joint Research Lab on Offshore Renewable Energy**. The main goal of the initiative is to increase organizations' international visibility, facilitate technology and knowledge transfer to the Basque industry, and to train future professionals for the offshore renewable energy sector. Connected to this initiative, a **Master in Offshore Renewable Energy** was established and approved by the European Commission as an Erasmus Mundus Masters Course in 2017. The Master is led by the University of the Basque Country in collaboration with NTNU (Norway), Strathclyde University (Scotland) and Ecole Centrale Nantes (France) plus the support of some 40 entities from all over Europe.



REM in the media



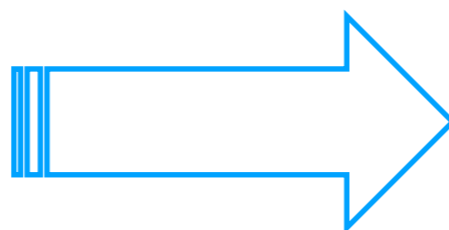
FEATURE SPONSOR **SPOTLIGHT ON THE BASQUE COUNTRY**

HELPING OCEAN ENERGY BECOME A REALITY

The climate change forecasts are leading to a change in the power production model, promoting ocean energy - and in particular wave & tidal energies – however it needs to lower costs in order to achieve a commercially competitive LCoE



COMMUNICATION HUB FOR THE WAVE & TIDAL ENERGY INDUSTRY



AN OPPORTUNITY

Tidal and especially wave energy are nowadays at an initial development stage. This represents a great opportunity for researchers and developers to improve and implement a technology of future.

PERFORMANCE THROUGH CONTROL

This technology is mainly based in turbo-generator modules that must be adequately controlled, not only to increase the efficiency, but also to provide reliable operation and ensure the protection of the plant.

UPV/EHU CAPABILITIES

In this context, the Automatic Control Group of the UPV/EHU is a pioneer in the control of marine power plants, with collaborations with main key players, a strong support from the administration as, for example, the Basque Energy Agency responsible for leading projects such as the Mutriku's MOWC plant or BIMEP- and a longstanding history developing control strategies to contribute bringing Ocean Energy to the market.

NEW INTERNATIONAL MASTER'S DEGREE

At the beginning of 2014, the UPV/EHU proposed the creation of a European master's degree in marine offshore energy, due to the concerns of many companies and both public and private institutions in this sector that expressed the need for the implementation of this type of training based on specific needs.

Their aim is closing the training cycle of specialists with specific knowledge about offshore renewable energy, such as: training in aerodynamics

and hydrodynamics with mechanical and electrical principles applied to the marine environment, composites, lamination structures, injection, corrosion, biofouling, coatings, safety in the marine environment, installation services, repair and maintenance, economic and legal aspects of park implementations, etc.

STRUCTURED TECHNICAL CONTENTS

After several years of exhaustive analysis of offering masters in these subjects in Europe, they combine the participation of several partners that complement the training to meet this lack of specific training. The technical contents are structured in six major blocks...

1. Resource and marine environment
2. Theoretical foundations
3. Connection and integration to the electricity grid
4. Engineering, development and management of offshore parks
5. Conversion technologies
6. Environmental, economic and legal aspects of marine renewable energy



COMMITMENT

The commitment to renewable energy offshore in the Basque Country is already a reality awaiting a promising future that continues to grow and it is supported by three main pillars: infrastructure, research and training, which walk together on a sustainable bet in this changing energy future.

UPV



www.wavetidalenergynetwork.co.uk

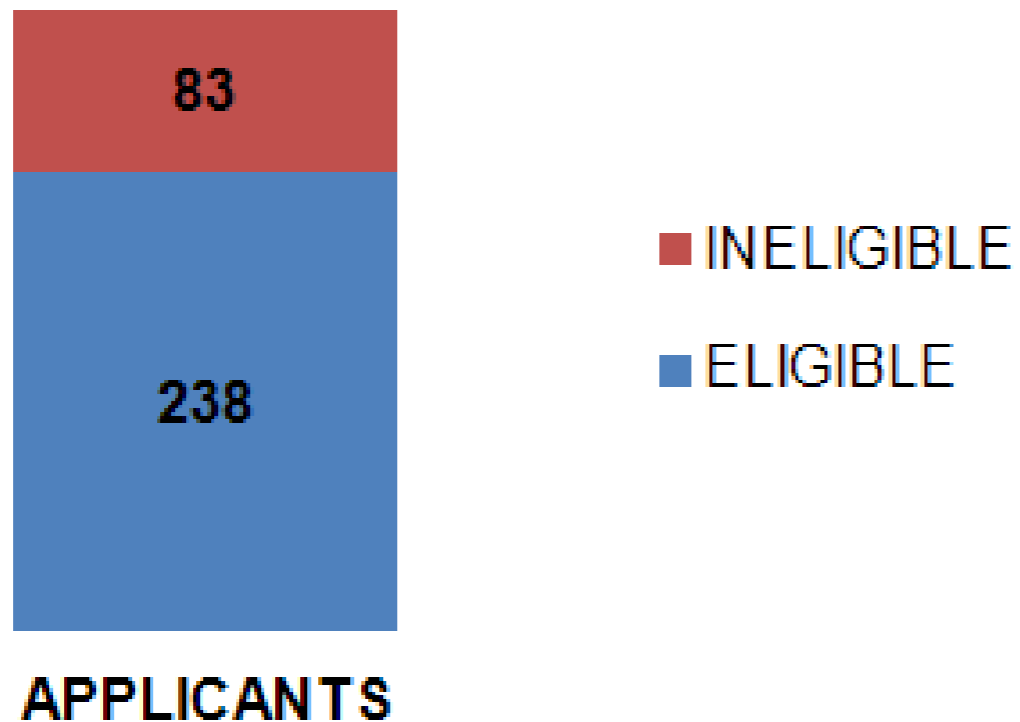


APPLICATION STATISTICS



STATISTICS OF THE APPLICATION

TOTAL: 321 APPLICANTS from 55 COUNTRIES.

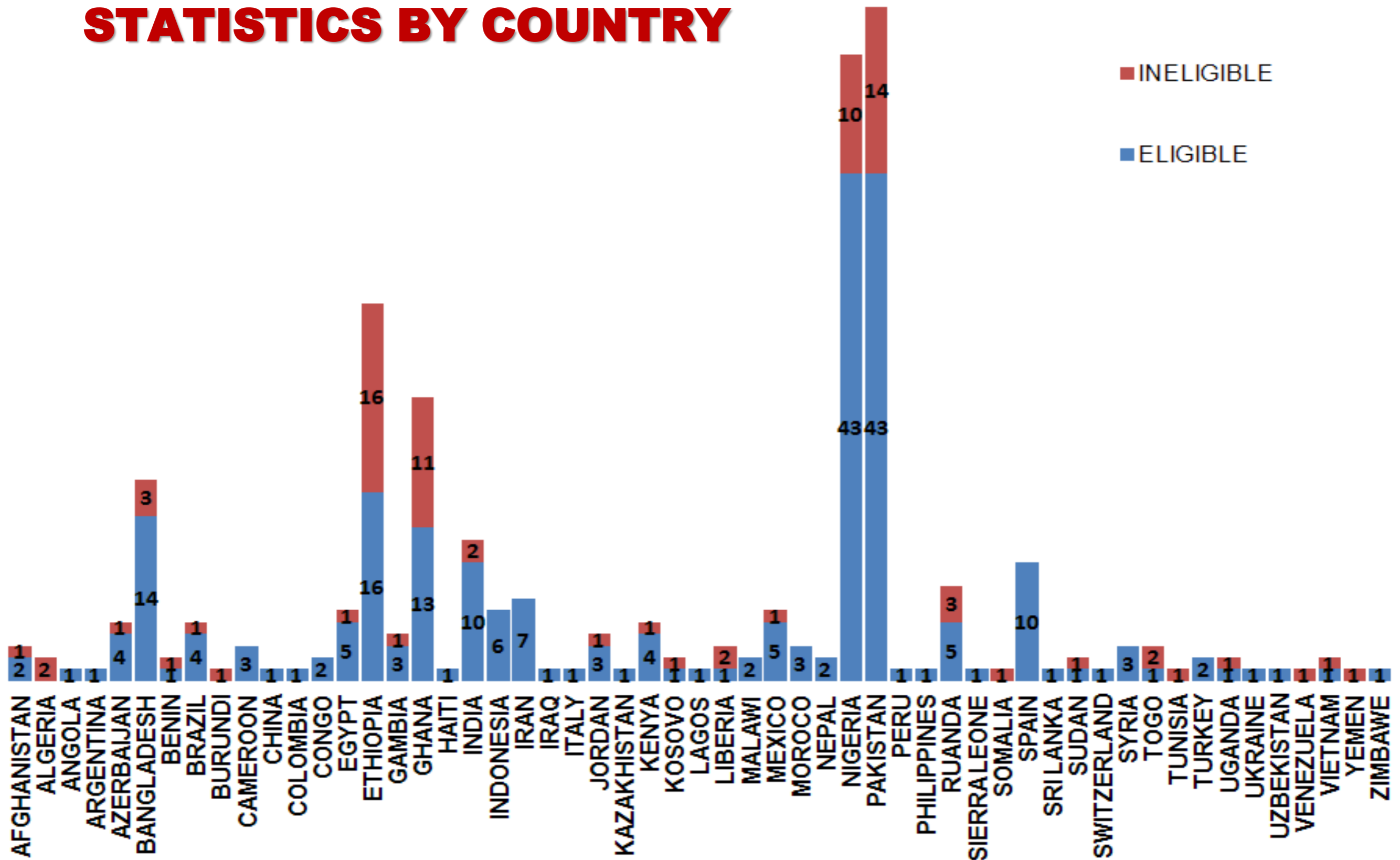


Ineligibility (degrees):

- Biology and Chemistry
- Biochemistry
- Geography
- Agriculture
- Social studies
- Metallurgical
- Urban Planning



STATISTICS BY COUNTRY



Co-funded by the Erasmus+ Programme of the European Union

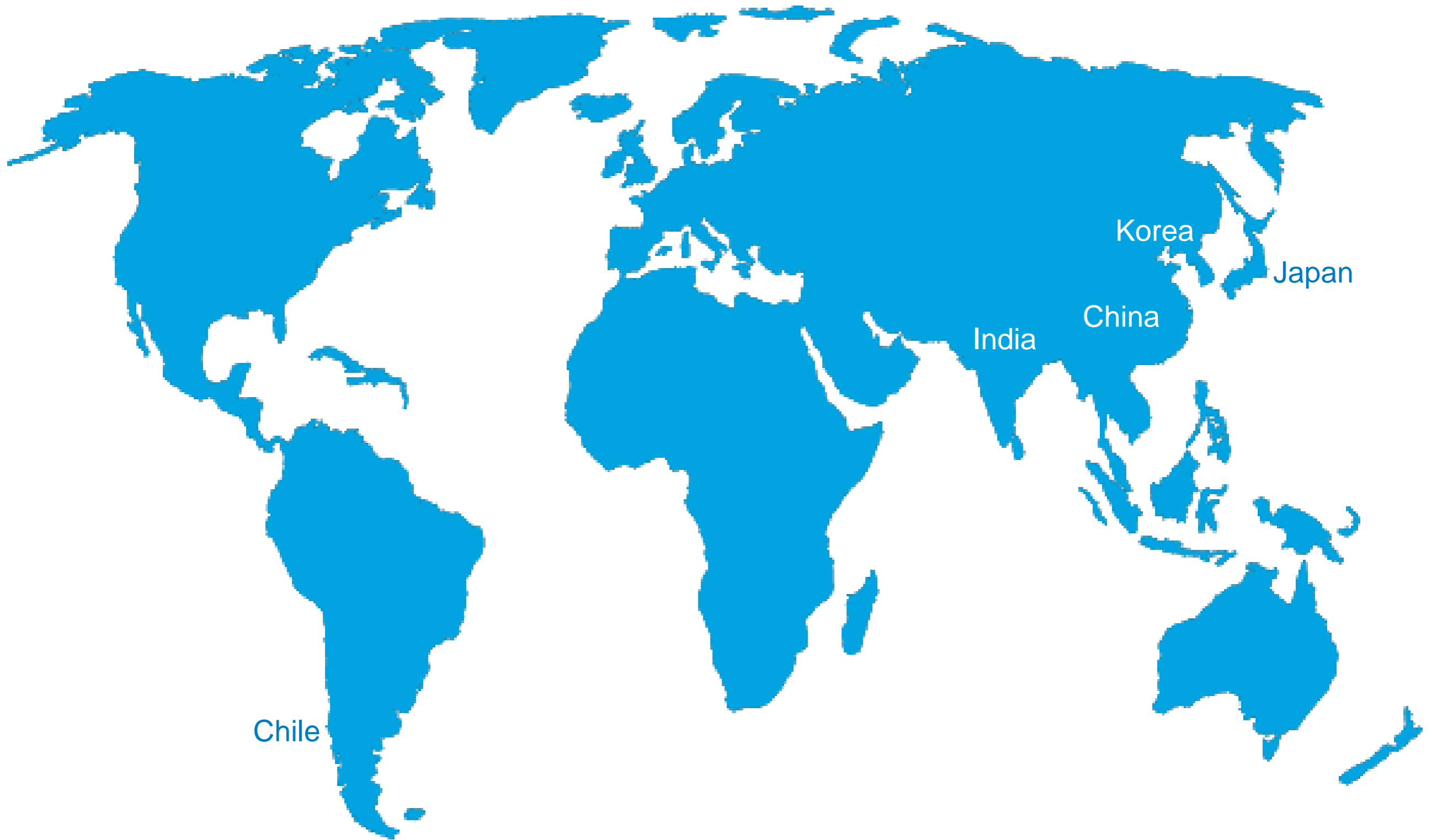
Universidad del País Vasco Euskal Herriko Unibertsitatea

University of Strathclyde Glasgow

NTNU

CENTRALE NANTES

TARGETED COUNTRIES



SCHOLARSHIPS



SELECTION CRITERIA

<i>Evaluation criteria</i>	<i>Evidence</i>	<i>Weight in score</i>
<i>Academic performance</i>	<i>Student Transcripts</i>	<i>30%</i>
<i>Scientific quality of the institution (*)</i>	<i>Ranked university</i>	<i>20%</i>
<i>Professional experience</i>	<i>Student CV</i>	<i>20%</i>
<i>Language level</i>	<i>Language certificates</i>	<i>10%</i>
<i>Motivation</i>	<i>Motivation letter</i>	<i>10%</i>
<i>Recommendation references</i>	<i>Reference letter</i>	<i>10%</i>



EMJMD allocation of Scholarships

		EDITION 1		EDITION 2		EDITION 3		
		Programme country	Partner country	Programme country	Partner country	Programme country	Partner country	
With scholarships		2	10	5	12	3	12	44
Without scholarships			2	1	2	3	4	12
		2	12	6	14	6	16	
		14		20		22		56

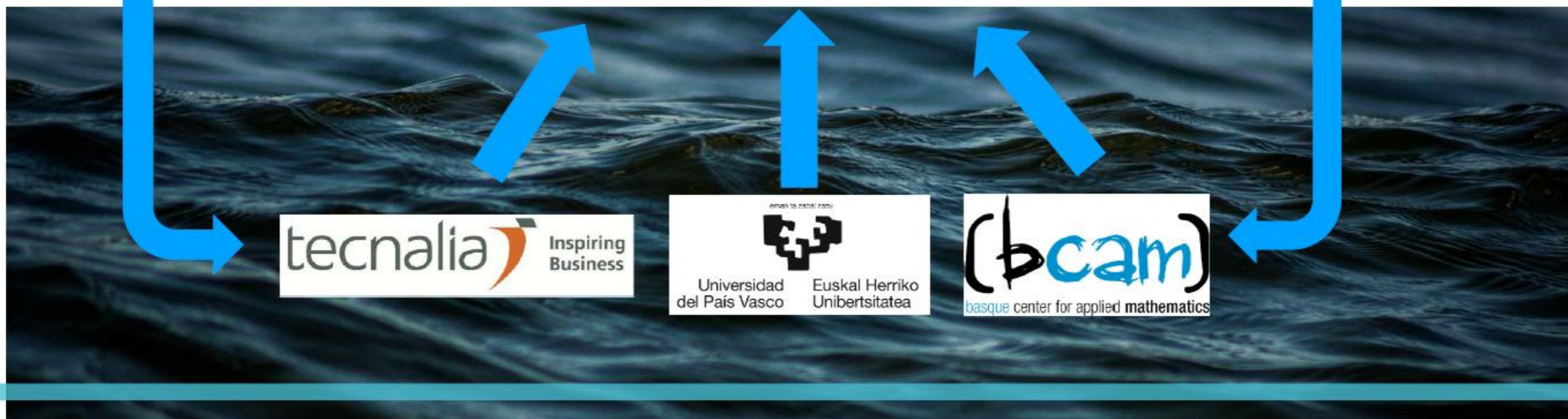
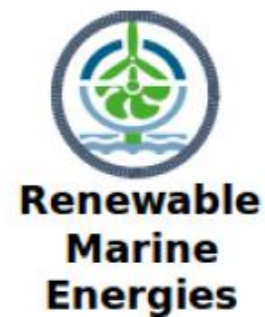
Maximum number of admissions per intake (edition): **24**.



PARTNERSHIP



JRL-ORE



JRL-ORE (FACTS)

- The JRL-ORE seeks the scientific excellence
- High impact publications, PhD thesis, industrial property assets, etc.
- Seek ways to transfer the knowledge and technology generated in the JRL to the nearby business sector
- Highlight the value of the PhD degree in the technology management tasks
- Contribute to the training of new professionals specially through the Master on Offshore Renewable Energy
- More than 50 researchers

<http://jrl-ore.com/upv-ehu/>



JRL-ORE (ALLIANCES)



PARTNERS (REM)



CAMPUS OF INTERNATIONAL EXCELLENCE



NTNU
Norwegian University of Science and Technology



MASTER IN RENEWABLE ENERGY IN THE MARINE ENVIRONMENT



<http://master-rem.eu/>



ROLES OF PARTNERS (Summary)

- 🌍 Signing of the collaboration framework agreement.
- 🌍 Providing students to the Master from their own staff.
- 🌍 Granting scholarships.
- 🌍 Awarding prizes (best curriculum, best Final Master Thesis on a specific topic, ...)
- 🌍 Providing challenges for companies to be addressed through projects.
- 🌍 Providing tutors to the final Master projects.
- 🌍 Providing our own staff for seminars, talks, etc.
- 🌍 Making available assets of companies (facilities, equipment, etc.).
- 🌍 Sponsoring the Master.
- 🌍 Developing a joint renewable energy classroom at the UPV / EHU.
- 🌍 Promoting a Cathedra at the UPV / EHU.
- 🌍 ...



ROLES OF PARTNERS (Complementary training offer)

1. Monday, April 23:

Visit to BIMEP in Armintza.

2. Monday, May 7:

Visit to the control center of IBERDROLA in Larraskitu

3. Tuesday, May 8:

Seminar given by Mr. Iñaki Zabala from SENER: "Towards a more realistic assessment of offshore renewable energy plants" (2 hours)

Seminar given by Mr. Joao Henriques from IST Lisboa: "Air turbines and power take-off control for oscillating-water-column wave energy converters". (2 hours)

4. Wednesday, May 9:

Seminar given by D. Markel Peñalba from the Center for Ocean Energy Research (Maynooth University, Ireland): "Wave Energy Resource Variations and its Impact on Wave Energy Conversion" (3 hours).

5. Thursday, May 24:

Visit to TECNALIA control test bench, in Derio.

6. Wednesday, June 6:

Seminar given by: Mr. Carlos Gironz from Ingeteam. "Grid Codes and their influence in the design of power converters" (1.5 hours).

7. Thursday, June 7:

Seminar given by: Mr. Jesus Bernal from Iberdrola. "Grid connection studies for offshore wind farms" (1.5 hours).

8. Friday, June 8:

Visit to the MUTRIKU wave plant.



ROLES OF PARTNERS (Fiche)

#	Company Name	Company Logo	Website	Responsible	Position	Type of Collaboration	Details	REM Subjects Involved	People Involved
1	Ingeteam Is a company specialising in power and control electronics (converters, frequency converters, controllers and protections), generators, motors and pumps, electrical engineering and automation projects, electrical parts and medium voltage cells. In addition to business and solar thermal plant engineering. The company specialises in offer with operation & maintenance services, and installation services.		www.ingteam.com	Eduardo Gimenez	Corporate Marketing Director	Seminars	3 seminars: "Converter topologies for wind turbines" "Balancing Services with Wind Turbines" "Fault Ride Through Strategies"	Power electronics in offshore power systems Integration of renewable energy into the electricity system	Alberto Bacia Gonzalez Carlos Girones Ramirez
2	Tecnalia Research & Innovation Offers knowledge and expertise in areas such as modelling and analysis of floating oil columns, mooring systems, electric transmission, materials, resources or environmental impact assessment, focusing on the development of cost-effective marine energy farms throughout their lifecycle. TECNALIA has accumulated extensive experience in the development of devices for harnessing wave energy and offshore wind.		www.tecnalia.com	Luis Pedrosa Rebolledo	Energy and Environment Division Director	Multiple	Accept students for MT Lectures Access to installations and laboratories		
3	Environmental Hydraulics Foundation (IH Cantabria) Is a joint-research center that carries out research, knowledge transfer and training of specialists in the fields of fresh and saltwater. This work has allowed IH Cantabria to be at the forefront of national and international organizations working in the water cycle in its various facets. At IH Cantabria there are over 140 researchers and the center has over thirty years of experience.		www.ihcantabria.com	Higo J. Losada Rodriguez	Director	Multiple	Accept students for MT Lectures		
4	Basque Center For Applied Mathematics (BCAM) Is a world-class interdisciplinary research center on Applied Mathematics. The center started operations in 2008 and is located in the Basque Country (Spain). It is able to count on a solid network of international collaborators, promoting mobility and exchange of researchers, pre and postdoctoral training basis and the organization of dissemination events and knowledge transfer.		www.bcamath.org	Luis Vega Gorzalez	Scientific Director	Multiple	Scholarships Lectures Accept students for MT Seminars		
5	Erte Vasco de la Energia (EVE) The Basque Government first created its own energy agency, the Erte Vasco de la Energia (or EVE) to lay the foundations for an energy policy that has been grounded, in different degrees, at different stages, on energy efficiency, diversification of energy sources and promotion of renewables. Since then Erte Vasco de la Energia has been in charge of developing projects and initiatives in the with government policies.		www.eve.eus	Higo Ansoa Kereaga	Managing Director	Multiple	2 Scholarships Accept students for MT Seminars		
6	IHOBE Ihobe is the public agency of environment, belonging to the Department of the Environment, Territorial Planning and Housing of the Basque Government. Its mission is to support the Basque Government in developing environmental policy and spreading the culture of environmental sustainability. The headquarters are located in Bilbao (Basque) but our jurisdiction covers the whole of the Basque Country.		www.ihobe.eus	Jesus Losada Besteiro	Managing Director	Multiple	Accept students for MT Seminars Access to installations and laboratories		
7	Cluster de Energia del Pais Vasco The Basque Energy Cluster is made up of the leading companies in the energy sector located in the Basque Country (energy operators, component and equipment manufacturers), agents of the Basque Science, Technology and Innovation Network and public administration bodies involved in the energy field to foster the competitiveness of the industrial sector. It is currently made up of over one hundred companies.		www.clusterenergia.com	Jose Ignacio Homache	Managing Director	Other	Award for best Master Thesis		
8	Biscay Marine Energy Platform (BIMEP) Is sited in one of the areas of highest energy potential on the Basque coast (21 kW/m ²), very well communicated and with no impact on surrounding beaches or environmentally protected areas. Provides manufacturers of wave energy device with the opportunity to install their equipment in open sea conditions for demonstration and operational (power generation) purposes or for testing.		www.bimep.es	Yago Torre-Enciso	Technical Director	Multiple	Accept students for MT Seminars Access to installations and laboratories		
9	Basque Maritime Forum The Basque Maritime Forum was established as a non-profit making organization, which includes companies, associations, banks, research centres and universities. It was officially recognized as a Priority Cluster by the Basque Government in 2008. The BMF's mission is to represent, defend, coordinate, promote and improve the competitiveness of the companies in the Basque maritime sector by means services it offers.		www.forummaritimovasco.com	Javier Lopez de Lacalle	Managing Director	Seminars	Seminars Access to installations and laboratories		
10	Viciny Marine Innovation Is the world leader in the supply of floats and mooring systems for the offshore industry. Today, Viciny Marine has more than 600 people working in the marine and offshore mooring business. Its world-wide representation and product quality are recognized by the most well known companies in the industry, exporting to more than 30 countries.		www.vicinymarine.com	Onintze Matias Garmendia	General Director	Multiple	Accept students for MT Seminars Access to installations and laboratories		
11	Siemens Gamesa Renewable Energy Is a global technological leader in the wind industry, with a footprint in 55 countries and more than 15,000 MW installed. Its comprehensive response includes also the wind turbine's operation and maintenance services that manages for more than 22 GW. The company has production centres in the main wind markets: Spain and China.		www.gamesa.com	Jon Lazamiz Cortazar	Institutional Relations Director	Multiple	Scholarships Accept students for MT Seminars Access to installations and laboratories		
12	Iberdrola Having a track record that spans over 170 years, today Iberdrola is a multinational group leading the energy sector: the company produces and supplies electricity to some 100 million people in the countries in which it operates. Furthermore, the company has become the leader in clean energy. Iberdrola is the first renewable producer amongst European utilities and the clearest power company in the USA, with almost zero emissions.		www.iberdrola.com	Kepa Zubiete Jauregi	HR Director	Multiple	Scholarships Accept students for MT Seminars Access to installations and laboratories		
13	Nautilus Floating Solutions The structure needs their advantages in its design that allows the manufacturing in conventional shipyards, the assembly of the wind turbine generator in ports and the launching and installation with conventional tugboats and Anchor Handling Vessels. NAUTILUS can support 8 MW wind turbines with the objective to scale up to 12MW, being an opportunity for its industrial stakeholders to access a new global emerging market.		www.nautilusf.com	Jesus Maria Busturia Rodrigo	General Director	Multiple	Accept students for MT Seminars Access to installations and laboratories		
14	Centro Nacional de Energias Renovables (CENER) The National Renewable Energy Centre is incorporated as a non-profit foundation, which is called "CENER-CENAT Foundation". All its bodies are public institutions, such as the Ministry of Business Affairs and Competitiveness, Climate, Ministry of Industry, Energy and Tourism and the Government of Navarre aiming to support renewable initiatives throughout Spain.		www.cener.com	Antonio Ugarte Oiarreaga	Wind Energy Department Head	Multiple	Scholarships Accept students for MT Seminars		
15	Oceantec It was the first Spanish company to test its own 1:4 WEC prototype in the marine environment. The complete R&D and testing process provided with both experience and knowledge in the development of wave energy converters. Technicians and engineers work in conjunction with technology developers, service, investors and producers, supporting projects through all stages.		www.oceantecenergy.com	Borja de Miguel Para	R&D Director	Multiple	Accept students for MT Seminars		
16	SENER It offers a large range of professional marine engineering services related to carrying out conceptual, basic, classification, detail and construction projects of any type of ship or marine device. Likewise, is fully equipped for offering consultancy and technical assistance services to shipbuilders, operators and official bodies. A Marine CAD/CAM system, was designed and patented by SENNER, used in the design of offshore structure.		www.senner.es	Yolanda Gutierrez	R&D Director Power, Oil & Gas Unit	Multiple	Accept students for MT 1 Seminar: "Towards a more realistic assessment of offshore renewable energy plants"	Advanced fluid dynamics modeling for marine engineering applications	Itxaki Zabela (Senior researcher in offshore engineering)
17	Saltec SALTIC is one of the most prestigious engineering firms in Spain at present. It carries out its activities from a professional and independent standpoint, with a strong commitment to innovation, sustainable development and respect for the environment. It provides a wide range of top quality engineering services, from a comprehensive multidisciplinary perspective, having participated in the most relevant projects undertaken in Spain.		www.saltec.es	Luis Gonzalez-Pinto Bamerchea	Director	Multiple	Accept students for MT Seminars Access to installations and laboratories		
18	Astilleros Murueta MURUETA SHIPYARD has two fully operational production facilities, the original Murueta shipyard in the River of Deva, and the new recent Murueta shipyard in the River of Bilbao. Besides, the R&D&I management system guarantees that the Astilleros de Murueta is always on the cutting edge in technology and at the forefront of the development of innovative projects in European ship and marine device design.		www.astillerosmurueta.com	Itxaki Fuldain Arana	General Director	Multiple	Accept students for MT Seminars Access to installations and laboratories		
19	Euskampus Is a non-profit foundation formed by UPV-EHU, TECNALIA FOUNDATION and DONOSTIA INTERNATIONAL PHYSICS CENTER (DIPC), whose main objective is leading to carry out a collaborative analysis to work with the so-called "frontier of knowledge", which are open spaces created for multidisciplinary and inter-institutional collaborations, aiming to solve worldwide global challenges. It is devoted now to give support to the MRE.		www.euskampus.ehu.es	Igor Campillo Santos	General Director	Multiple	Awards Scholarships		



CONCLUSIONS

- ✓ The current shortage and evolution of qualified personnel in the marine sector worldwide has been highlighted.
- ✓ Close collaboration between “Industry” and “Education” and “Administration” must be reinforced in this field.
- ✓ The integral formative strategy in the Basque Country focused in offshore renewables was shown in close collaboration between different actors, such as: UPV/EHU and EUSKAMPUS and the Regional Government and Euro region (transborder and regional cooperation).
- ✓ The University of the Basque Country (UPV/EHU) and EUSKAMPUS have identified the opportunity to promote an International Master's degree in Offshore Renewable Energy following a complete market analysis (offer-demand).
- ✓ The Master's degree in Offshore Renewable Energy would fit in with the Basque Government's aim to promote offshore renewable energy skills, aligned with the Basque smart specialisation strategy.
- ✓ The Master's degree would aim to meet leading companies' needs in this area, reinforced with the participation of world-renowned universities and experts.
- ✓ Excellent feed-back to this initiative has been received from companies and future students.
- ✓ The first edition of the Master was successfully launched last academic course 2017-2018 while the ERASMUS MUNDUS was launched recently (September 2018).



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Thanks for your attention

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