



JRL - ORE

Joint Research Laboratory on
OFFSHORE RENEWABLE ENERGY

Bordeaux, 20/06/2019

PRESENTATION: WHO WE ARE



PROMOCIÓN Y PROYECTO



DISEÑO Y FABRICACIÓN DE EQUIPOS Y COMPONENTES

AEROGENERADOR

DISEÑO Y ENSAMBLAJE



INGENIERÍA



ROTOR



TORRE



GÓNDOLA



CONVERSIÓN DE ENERGÍA



CIMENTACIÓN OFFSHORE Y PLATAFORMAS FLOTANTES



VICINAY marine



CONEXIÓN A RED ELÉCTRICA Y SUBESTACIÓN



INGENIERÍA



SISTEMAS DE CONTROL



INSTALACIÓN DE PARQUES EÓLICOS



OPERACIÓN Y MANTENIMIENTO



DOMINION



SERVICIOS Y EQUIPOS AUXILIARES

SERVICIOS Y EQUIPOS PARA OFFSHORE



INGENIERÍA Y EQUIPOS DE ELECCIÓN Y SEGURIDAD



UNIVERSIDADES, CENTROS TECNOLÓGICOS E INFRAESTRUCTURAS DE ENSAYO Y VALIDACIÓN



Universidad del País Vasco



SPOTLIGHT ON THE BASQUE COUNTRY

RENEWABLE
GROWTH



BASQUE COUNTRY: INDUSTRY FOR A WAVE FUTURE

Located in the north of Spain, the Basque Country represents one of the largest industrial concentrations in Europe and is the region with the highest R&D intensity in the country

This industrial and technological positioning has allowed the region to become a worldwide reference in driving the wave energy alternative, both having a complete value chain led by several converter developers and a unique set of R&D infrastructures for testing and validation of marine energy components and systems.

BASQUE COUNTRY: PUBLIC-PRIVATE COLLABORATION BETTING ON MARINE ENERGY

The diversity of stakeholders that are present in the value chain as well as

organisations, consider wave energy as one of its prime commitments.

With its 150km of total coast length,

the Basque coast is in a unique position to benefit from wave energy and to develop and test wave power generating devices. Moreover, the available medium-high level resource facilitates testing in a less aggressive environment than other locations.

This is complemented by the regional existing capacities in marine renewable energy technologies, based on a

project funded by the European Commission through the CC3BME Go international programs, partnering with clusters from Denmark, Sweden, Scotland and Belgium.

UNIQUE TEST-BEDS

Two world-reference infrastructures have been boosted by EVE in the field of wave energy: Mutinu ONC plant and EMEP. In order to develop a technological offer and position the Basque Country as an international benchmark in wave energy, Mutinu ONC is the first grid-connected wave

energy plant in Europe (mainland) and an up-and-coming test site for new concepts. The facility opened in July 2011 and all the power generated is fed into the grid for general consumption. On the other hand, the Bascy Marine Energy Park (BMEP) is a unique

tradition for collaboration and the support of relevant entities such as EVE (Basque Energy Agency), EPH (Business Development Agency of the Basque Government) and the Basque Energy Cluster, which currently coordinates ELEE - Europe Leading

the design, with international

energy plant in Europe (mainland) and an up-and-coming test site for new concepts. The facility opened in July 2011 and all the power generated is fed into the grid for general consumption.

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Wave @ Tidal

ENERGY NETWORK

Winter 2018 | ISSUE 14 | £7.50

COMMUNICATION HUB FOR THE WAVE & TIDAL ENERGY INDUSTRY

SPOTLIGHT ON THE BASQUE COUNTRY

ENERGY FUTURE-PROOFING

SPECIALIST COATINGS

PROTECTING YOUR ASSETS



Mutinu Wave Power Plant
Credit: EVE - Basque Energy Agency

JRL - ORE FACTS



ALLIANCES AND COLLABORATIONS

INTERNATIONAL



NATIONAL / LOCAL



INFRASTRUCTURES



HARSHLAB

APERT LAB

INGRID

SHORT 2D FLUME

LONG 2D FLUME

RTDS OPAL

THOR

CLUSTER ARINA

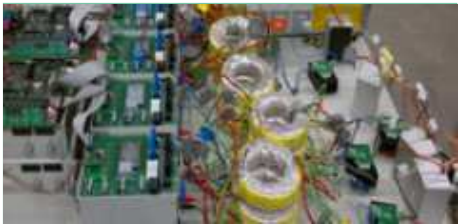
HIPATIA

ELECTRICAL PTO LAB



AREAS OF ACTION JRL - ORE

1



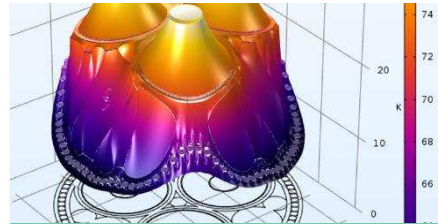
**POWER ELECTRONIC
CONVERTERS**

2



GRID INTEGRATION

3



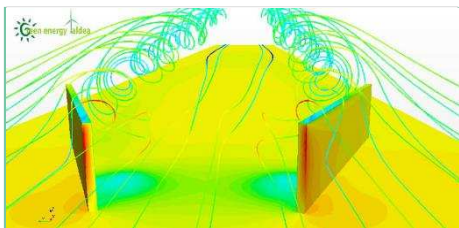
DIGITAL MODELS

4



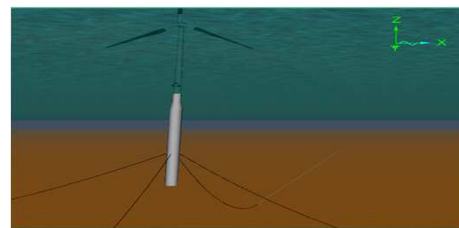
CONTROL STRATEGIES

5



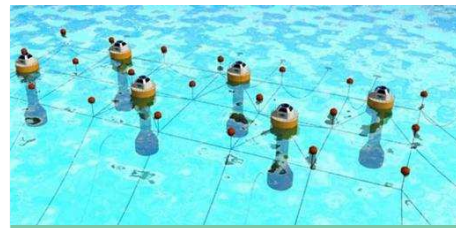
FLUID DYNAMICS

6



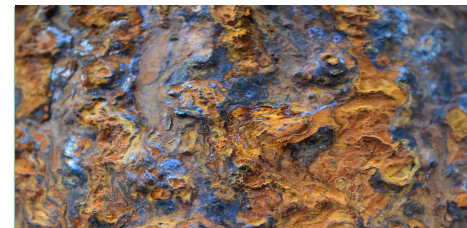
**OFFSHORE RENEWABLE
ENERGY TECHNOLOGIES**

7



**TECHNO-ECONOMIC
ANALYSIS**

8



**MATERIALS FOR OFFSHORE
RENEWABLE ENERGY**

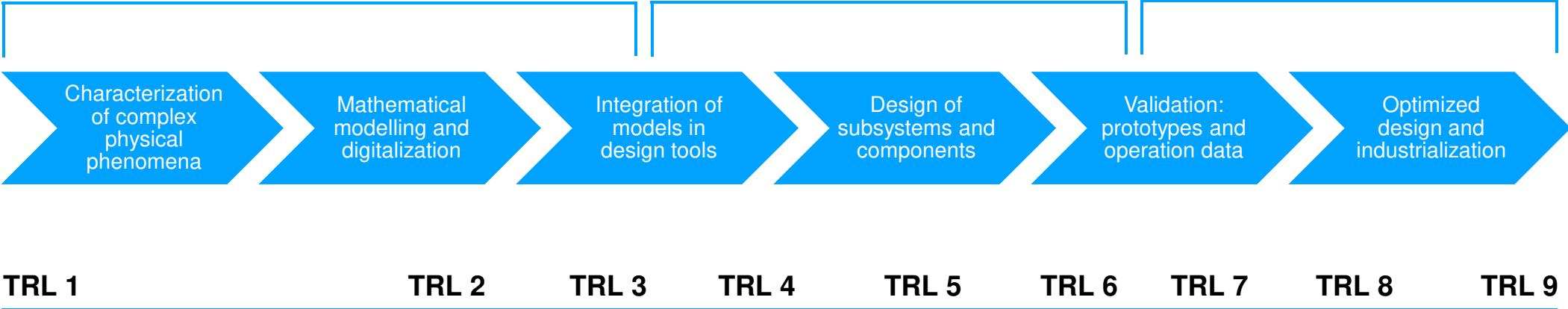
COLABORATIVE PROJECT: MATHEO Intelligent Mathematics for Offshore Wind

- Mathematical models at the **frontier of knowledge** to facilitate the **characterization of the interaction of large structures with the environment**
- Based on new approaches to solve **complex multi-physical problems** that arise due to the **increase in size of both wind turbines and supporting structures** in offshore fixed and floating wind.
- Will incorporate "**deep learning**" techniques from early design stages in order to equip them with **operational information** collection and **self-diagnosis capabilities**.

MATHEO

Transfer to companies

Demonstration projects. Support activities for commercialization



SOME COLABORATIVE PROJECTS ON PREPARATION

EURORÉGION NOUVELLE AQUITAINE-EUSKADI-NAVARRRE

Cooperation between agents from different regions

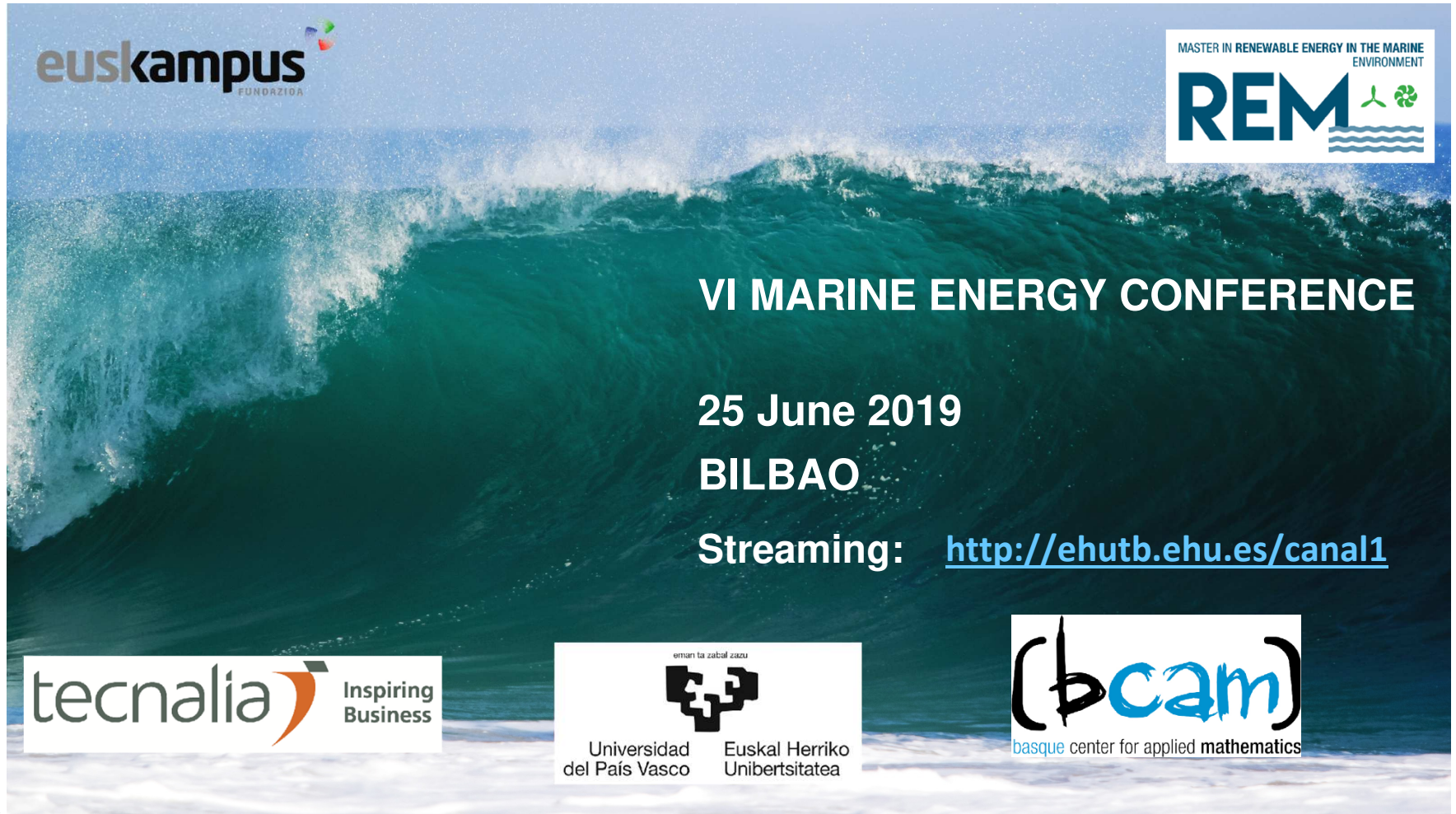


INNOVATIVE TRAINING NETWORKS MARIE CURIE

14 European partners
3 doctoral scholarships (BCAM, UPV/EHU, TECNALIA)
High quality training programme



UPCOMING EVENTS



euskampus
FUNORZIOA

MASTER IN RENEWABLE ENERGY IN THE MARINE ENVIRONMENT
REM

VI MARINE ENERGY CONFERENCE

25 June 2019

BILBAO

Streaming: <http://ehutb.ehu.es/canal1>

tecnalia Inspiring Business

ematen ta zabalazazu
Universidad del País Vasco Euskal Herriko Unibertsitatea

(bcam)
basque center for applied mathematics

ORGANIZATION OF EWTEC 2023

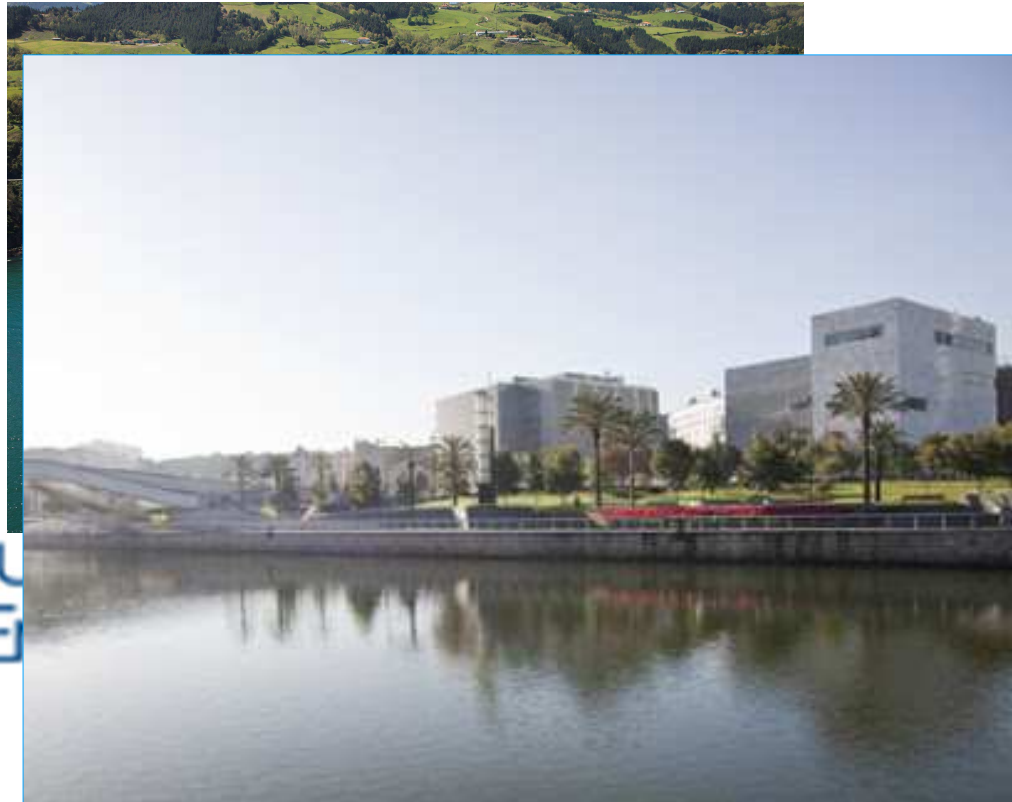
European Wave and Tidal Energy Conference (EWTEC) series are international technical and scientific conferences.

RESEARCHERS



LABORATORIES
BIG SCALE
FACILITIES

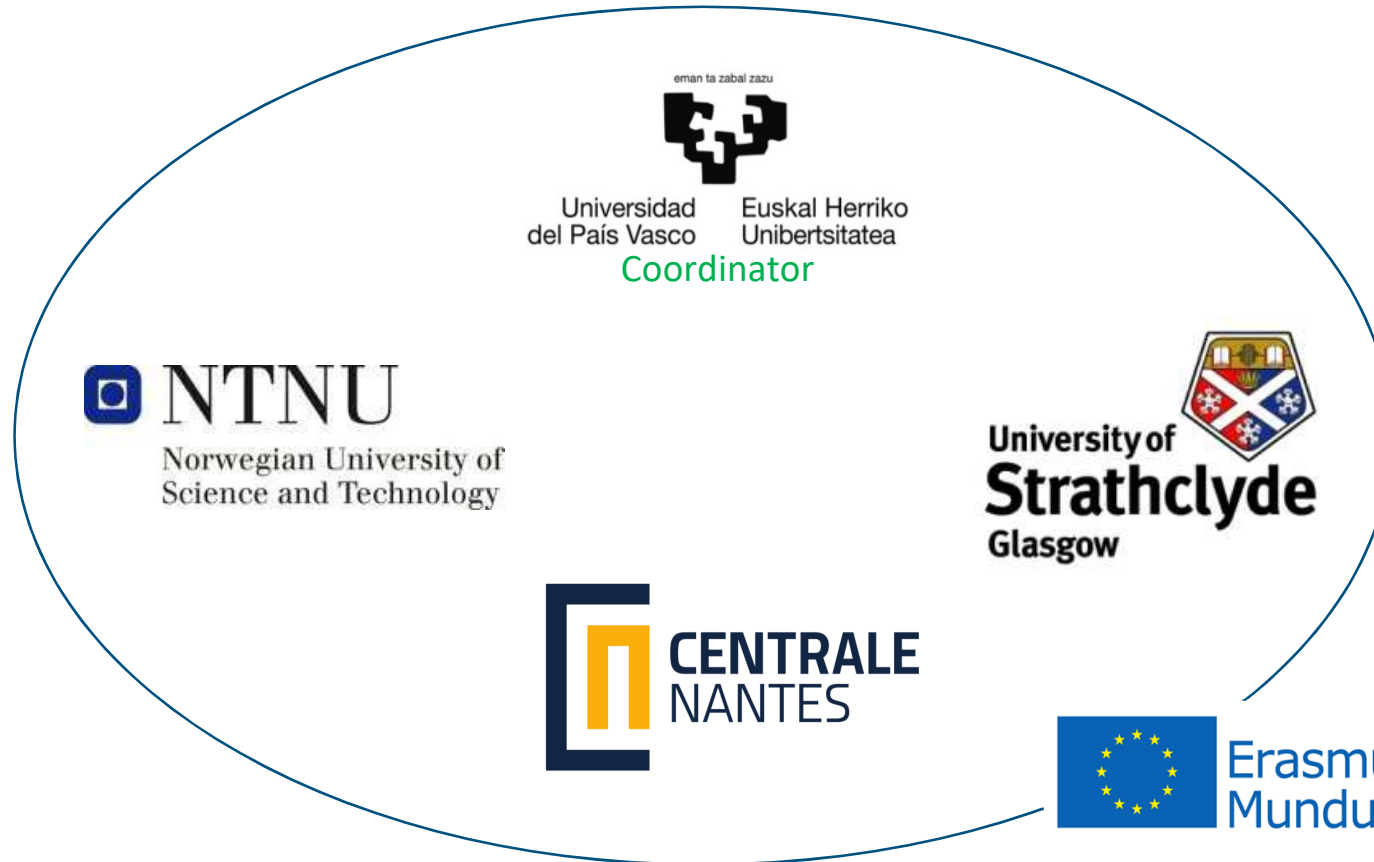
BASQUE
INDUSTRY



**MASTER IN RENEWABLE ENERGY IN THE MARINE
ENVIRONMENT**



CONSORTIUM



REM in the media



Towards the implementation of a new international master's degree in offshore renewable energy

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 express the need for the implementation of this type of training based on specific needs. Our 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. After several years of exhaustive analysis of offering of masters in these subjects in Europe, we 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 grid electricity
4. Engineering, development and management of offshore parks
5. Conversion technologies
6. Environmental, economic and legal aspects of marine renewable energy

With all this, we can say that the commitment to renewable energy offshore in the Basque Country is already a reality to which awaits a promising future, that continues growing and that is supported by three main pillars, infrastructure, research and training, which walk together on a sustainable bet in this changing energy future.

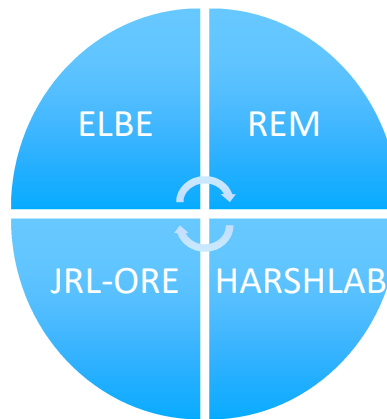


BASQUE STRATEGY



ELBE will focus on consolidating the European alliance with the aim to develop strategic collaborations with companies and R&D entities in other leading countries throughout the world, gathers the most advanced regions in THE EUROPEAN Blue Energy SECTORS: Aberdeen, Denmark, Flanders Västsverige and The Basque Country (leader).

A Joint Research Laboratory on Offshore Renewable Energy that seeks to strengthen the research links between the parties in order to take advantage of synergies between them and to reach critical masses in the agreed scientific and technological areas.

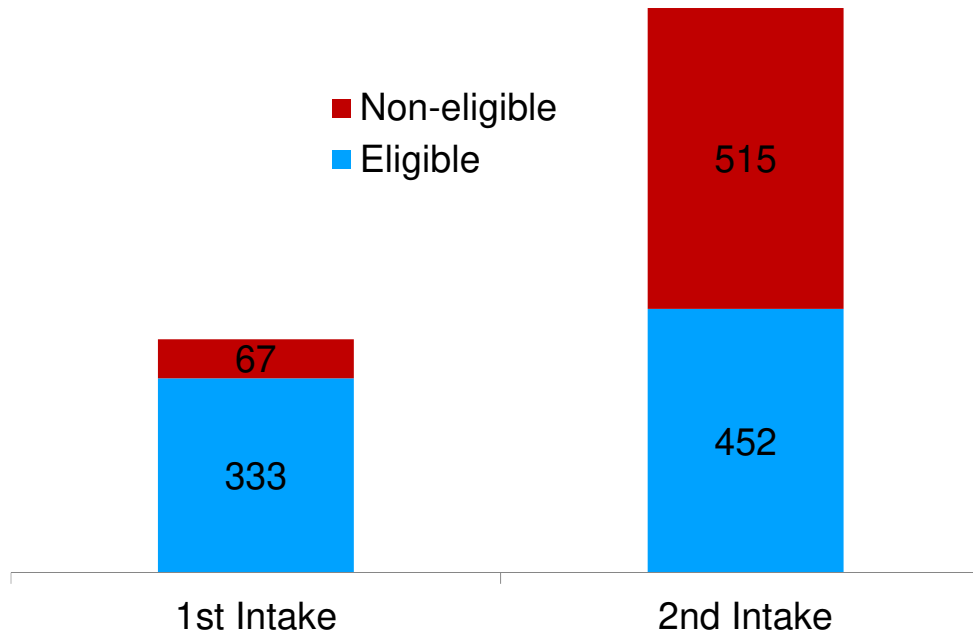


A Master in Renewable Energy in the Marine Environment is an Erasmus Mundus Joint Master Degree (EMJMD) offered by four universities: University of the Basque Country, University of Strathclyde, Norwegian University of Science and Technology and École Centrale de Nantes. It trains the student to face the technological challenges that harsh conditions offshore require.

The first floating laboratory in Europe for the evaluation of standardized probes and components in real offshore environment. With a diameter of 5 metres and weighing 10 tonnes, this infrastructure is capable of housing up to 765 samples of materials and components in three exposure areas (atmospheric, splash and immersion).



STATISTICS OF THE APPLICATION (1st and 2nd intakes)

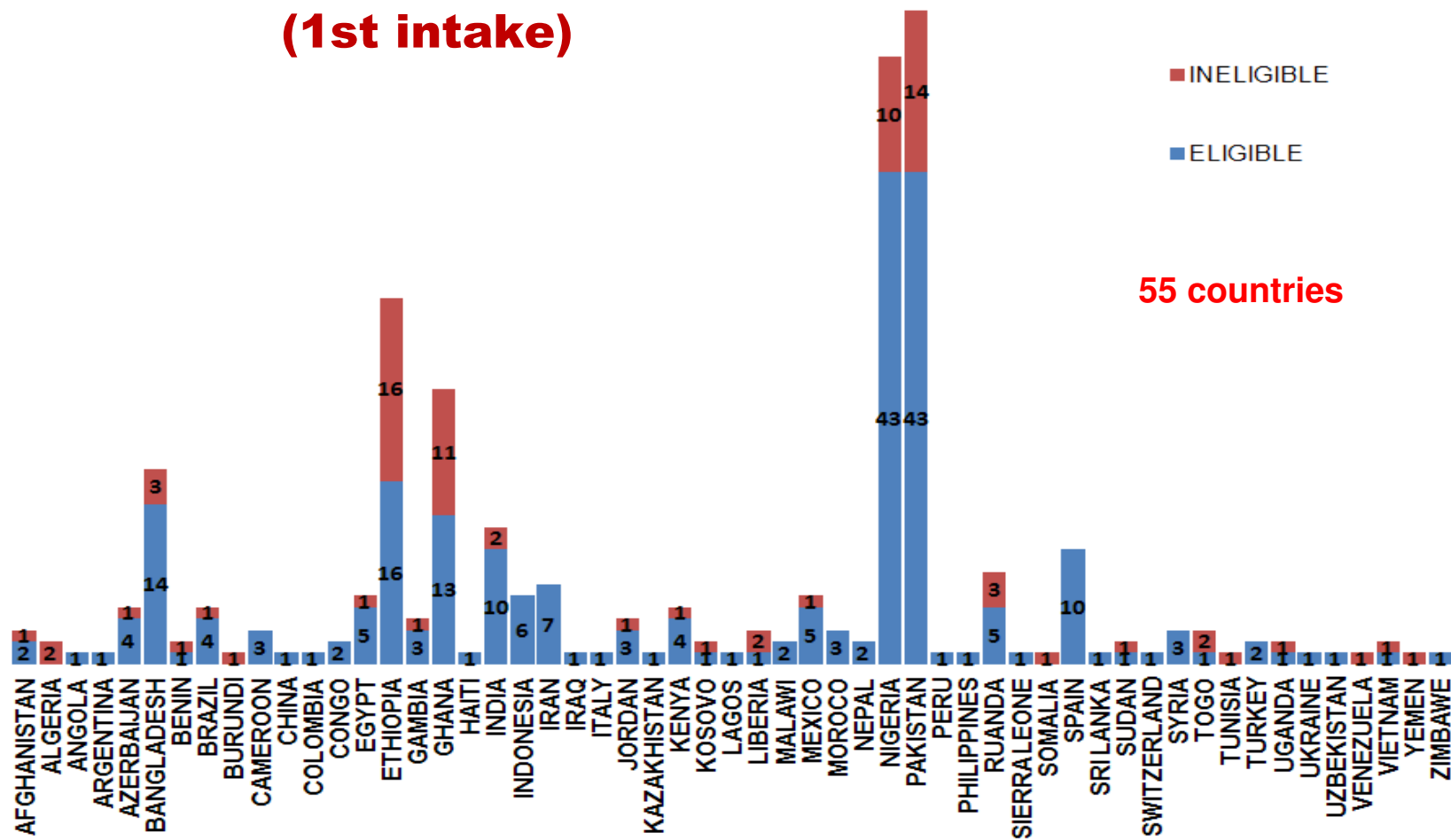


Ineligibility (degrees):

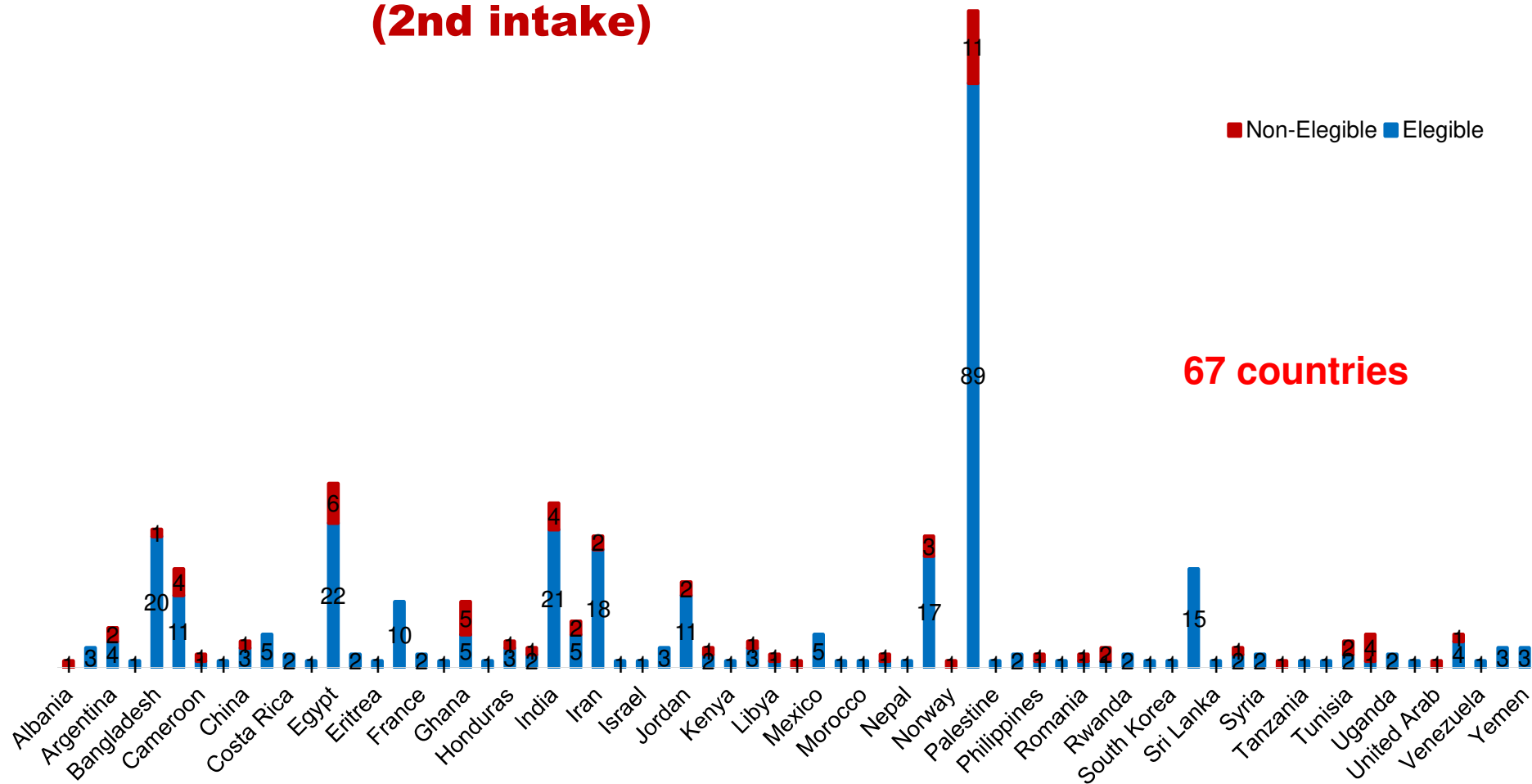
- Biology and Chemistry
- Biochemistry
- Geography
- Agriculture
- Social studies
- Metallurgical
- Urban Planning
- ...



STATISTICS BY COUNTRY (1st intake)



STATISTICS BY COUNTRY (2nd intake)



TARGETED COUNTRIES (2nd Intake)



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

 Universidad del País Vasco Euskal Herriko Unibertsitatea

 University of Strathclyde Glasgow

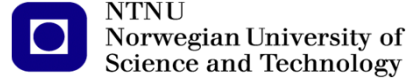
 NTNU

 CENTRALE NANTES

PARTNERS (REM)



CAMPUS OF INTERNATIONAL EXCELLENCE



MASTER IN RENEWABLE ENERGY IN THE MARINE ENVIRONMENT



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

Thank you / Eskerrik asko



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