Interreg Mediterranean
MAESTRALE
Project co-financed by the European Regional Development Fund
Newsletter n. 5
October 2018

Summary

This 5th issue of the MAESTRALE Newsletter is dedicated to the prosecution of the "Testing" phase of the Project, with a focus on the activities of the partnership developed after the ***1st Transnational Blue Energy Lab (TBEL)*** *which took place in Nova Gorica (Slovenia), 7th-9th May 2018. The main purpose of the TBEL was to compare the experiences of the individual Regional Blue Energy Lab (BEL) teams set up by the 10 Project Partners in view of identifying the Pilot Projects (PPs) for the exploitation of Blue Energy sources in each participating Region. At the time of writing this issue of the newsletter, the majority of Partners have established their BELs and many of them have already identified two PPs to deal with in the following months. Some Partners have focused on an intense activity of dissemination of the MAESTRALE Project and of the opportunities offered by Blue Energy on their marine districts. In the following pages, we present an overview of the state of the art of the regional BELs established until today in the 8 Mediterranean Countries represented by the MAESTRALE project partners.*

THE STATE OF THE ART OF THE REGIONAL BELS

After the 1st BEL, held in Grosseto (Tuscany) last 3rd May, the ***Ecodynamics Group of the University of Siena – UNISI*** (Lead Partner of MAESTRALE) has strengthened its relations with key regional stakeholders, included the Regional Port Authority (Ports of Viareggio, Marina di Campo, Porto Santo Stefano and Giglio Porto), organizing a presentation of the MAESTRALE Project and of the objectives of the Regional BEL, followed by a debate on the opportunities and challenges for development of the BEs in the Tyrrhenian sea. Contacts have been established also with the scientific and academic bodies at the 16th *National Workshop on Environmental and Cultural Heritage Chemistry*, where

UNISI MAESTRALE Team - 1st Tuscany BEL (Grosseto, 3/05/2018)

UNISI presented the poster "*Life Cycle Assessment of BE technologies in the Mediterranean context*", as well as at the 10th *International Conference on Development and Social Planning* organized in September by the Wessex Institute of Technology, where the article "*Categorization and geolocalization of Marine Renewable Energies in the Mediterranean area*" was presented, followed by a discussion on the technological and economic feasibility studies for the Mediterranean area, BE potentials and environmental impact evaluations. Following their participation to the 1st BEL, *Tarquinia nel Cuore* - the Citizen Associa-

tion for valorisation and protection of a small municipality from northern Latium - presented the MAESTRALE Project to the Municipal Council of Tarquinia, advising on effects and benefits from use of BE sources for the environment and for citizen well-being. The perception of citizens on the meanings of BE was also at the core of the participation of *Ecodynamics Group* at the *Festambiente* organized in August by *Legambiente*, one of the most important national associations for environmental promotion and protection. One of the most relevant achievements was the interview made by the *Energy Observer*, one of the most important European Scientific initiatives, to the representatives of the University of Siena: UNISI had the opportunity to talk about MAESTRALE, its main goals, principles and importance in terms of sustainability investigations on marine RES. The magazine said that "*The MAESTRALE Project is preparing the Mediterranean for renewable energy"* and that *"The Mediterranean sea could be a formidable renewable energy source*", confirming that the objectives identified by the Project are in line with the main issues and trends for a better sustainable Mediterranean sea. Finally, MAESTRALE was presented during BRIGHT 2018, the European Research Night Initiative, 28th-29th September 2018. A stand was set up in Piazza del Campo, with a lot of dissemination materials available and a prototype for promoting Blue Energy devices. In fact, as a result of a challenging initiative of knowledge transfer, students of the Higher Technical Institute *Tito Sarrocchi* (Siena) have shown their research on BE. A prototype of a yellow kite was made, showing that it was able to switch on a set of led lights just exploiting a small water stream. A wide audience was captured by the prototype and by MAESTRALE activities: adults, families, children but also local and regional authorities spent time with MAESTRALE staff, asking questions about BE and better understanding mechanisms and principles of the BE sources.

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On 20th September 2018 the ***Oceanography Center of the University of Cyprus OC-UCY*** organized the 2nd BEL in Nicosia (the 1st BEL was held on 15th May and co-organized by the *Cyprus Employers & Industrialist Federation – OEB*). During this second meeting, attended by 67 representatives from local authorities, business support organisations, research centres and general public, the national strategy and action plan for the integrated management of coastal zones in Cyprus for the period 2018-2030 was presented. Furthermore, the provisions of the national legislation on Maritime Spatial Planning have been illustrated to the attendees. The MAES-

TRALE Project was introduced to the audience, as well as the in-depth results from the BE potential analysis for Cyprus and the results of the PESTLE (Political, Economic, Social, Technological, Legal and Environmental) analysis. The participants pointed out the importance of creating a single National Plan for maritime spatial planning, which will smooth the current licensing procedures of BE projects in Cyprus. The positive effects of the creation of BE projects were highlighted, while the planning and then the implementation of 2 PPs of BE in the MAESTRALE project were decided. According to preliminary reports presented by OC-UCY and OEB during the 1st TBEL of last May in Nova Gorica and to the outcomes of the BELs - Workshops the 2 following PPs were selected:

PPs of Cyprus BELs

☑ PP # 1 – ***Marine Biomass*** **:**

a Marine Biomass plant, which is going to pump sea water on shore and grow algae in order to be used as biofuel or to be dried and directly used for energy production. ▪ PP 2 - The study of the possibilities offered by the exploitation of microalgae.

☑ PP # 2 – ***Offshore Wave*** :

This Wave Energy device will use an innovative floating technology for wave energy harvesting. This technology has already been tested with promising results in areas with lower energy potential than the optimal areas that exist around the island.

CEEI VALENCIA
European Center for Innovative Companies of Valencia

The 1st BEL of the Valencian Community will be organized in November by the ***European Center for Innovative Companies of Valencia – CEEI***, with the expected participation of national public authorities, local public authorities, enterprises, higher education and research bodies, as well as service providers. As part of the dissemination activity of the Project, on 26th April 2018 CEEI Valencia team presented MAESTRALE during the *Focus Pyme Baix Ninapoló 2018* in Santa Pola (Alicante). Furthermore, on 16th of May 2018 at the headquarters of the *Centro Tecnológico Naval y del Mar* in Fuente Álamo (Murcia), in the framework of the *Workshop on Spatial Planning, Coastal Zone Management and social acceptance of Marine Renewable Energy* CEEI and ENEROCEAN (stakeholder of CEEI for the MAESTRALE Project), participated to the event presenting the report *Challenges in the planning of marine energy facilities in the Mediterranean* CEEI also participated in the seminar on *Maritime Renewable Energy and Risk Prevention* (Valencia-19.06.2018) presenting

the paper "*Strategy to develop Marine Renewable Energies: MAESTRALE Project*". Finally, in the framework of the 37th *International Conference on Ocean, Offshore & Arctic Engineering – OMAE 2018* (Madrid - 22 June 2018), CEEI Valencia participated in the session MAESTRALE presenting the implementation of BE in the Mediterranean Sea and the advances of the Project, In addition to this intense dissemination activity, it should be underlined that, despite the 1st BEL of Valencia has not yet been done, during the 1st TBEL of Nova Gorica last May CEEI has already identified two very interesting "main ideas" that could form the basis for the identification of future Pilot Projects of the Valencian Community, namely:

PPs hypothesis of Valencia BELs

☑ **Hypothesis PP # 1 – *Offshore wind*:**

Offshore wind turbines with gravity base foundations in the marine areas in front of the coast of Cadiz (Andalusia) and Castellón de la Plana (Comunidad Valenciana) where the wind speed is high and the environmental and visual impacts are limited if compared to other Spanish coastal areas;.

☑ **Hypothesis PP # 2 – *Hybrid Wave /Wind*:**

Hybrid platforms for wave and wind energy exploitation: in particular the CEEIs partner ENEROCEAN of Málaga, a company specialised in marine energy engineering, presented the *W2Power* device, a patented technology that uses proven platform technology and offshore wind turbines.

MIEMA
Malta Intelligent Energy Management Agency

The 1st regional BEL of Malta was organized by the ***Malta Intelligent Energy Management Agency - MIEMA*** on 5th April 2018 in Valletta (Conference Center MSpace) with 24 participants representing several university departments/faculties, research bodies, national and local Authorities. During the meeting MAESTRALE was presented to the audience as well as the Maltese situation regarding energy in general, and the BE potential (findings of the BE potential analysis) and most promising BE sources to be developed in the Country. During the 1st TBEL in Nova Gorica MIEMA (together with the stakeholder *Malta Marittima Agency*) has taken up these topics, deepening the issue concerning the possible BE source to be applied to the 2 Maltese Pilot Projects. In particular, the MIEMAs presentation showed that the floating offshore wind is the most promising BE source for Malta. However, *Malta Marittima* stressed that the floating wind farms would cause problems to two sectors of particular importance for the Maltese economy: the coastal tourism and the aquaculture. Therefore, a careful choice of the marine site for a possible setting up of a floating wind farm is needed. MIEMA indicated two other hypotheses for the possible exploitation of BE in the sea of Malta, namely:


1st Malta BEL (05/04/2018)

PPs hypothesis of Malta BELs

☑ Hypothesis PP # 1 – *Offshore wind*:
Floating offshore wind turbines: detailed feasibility studies are needed regarding grid connection, installation & maintenance logistics, environmental impacts, more suitable technology, optimal location

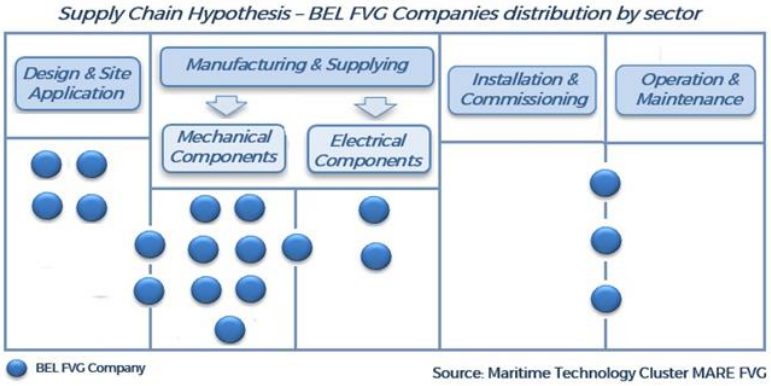
☑ Hypothesis PP # 2 – *Marine Geothermal gradient*:
Marine geothermal plants for heating and cooling in hotels, residential and ter-tiary centres situated along the coast. An in-depth assessment of regulatory constraints is needed. A pilot project could be implemented in a residen-tial/tourist complex under design;

☑ Hypothesis PP # 3 – *Wave*:
Wave energy conversion systems embedded in breakwaters: cost-effective in new port infrastructure or in ports where major developments are scheduled

INFORMEST
Agency for Development and International Economic Cooperation

On 12th September 2018 ***INFORMEST (Agency for Development and International Economic Cooperation)*** and the *Maritime Technology Cluster MARE FVG* (technical partner of INFORMEST) have organized at the headquarters of *MARE FVG* in Monfalcone (Gorizia) the 2nd Regional BEL of the Friuli Venezia Giulia Region involving the regional stakeholders already active or interested in operating in the BE. The main purpose of this 2nd meeting was the deepening and the evaluation of the feasibility and the economic and environmental sustainability of the 2 Pilot Projects already identified in principle during the 1st BEL of last 15th February (see also MAESTRALE Newsletter n. 4 - page 4). The 1st Pilot concerns the regional supply chain related to the design and production of maritime engineering components and/or innovative materials for wind turbines, wave and marine current converters. The supply chain include companies that can transfer their consolidated experience in other seas, also thanks to the R&D activity of several R&D regional bodies. It should be emphasized that, compared to the 1st BEL, the number of companies interested in being part of this supply-chain increased from 10 to 19 units mainly concentrated in the design/site application and manufac-turing and/or supplying activities (mostly in the mechanical components sub-sector). This means that the regional components supply chain concentrates its skills more in design and manufacturing than in the installation/commissioning and operation/maintenance of a potential plant for the exploitation of BE in the Northern Adriatic sea.

Frame of the TV report on the presentation of the 2nd BEL FVG aired in the 19.30 edition of the RAI regional news - TGR (12/09/2018)
Source: Radiotelevisione Italiana - RAI FVG



The second Pilot concerns the exploitation of microalgae of marine origin. In particular, the *National Institute of Oceanography and Experimental Geophysics - OGS* of Trieste which carries out activities of selection, isolation of native micro-algal strains from the sea and biomass production thanks to photobioreactors, pays particular attention to the use of micro-algae marine for the production of biofuels, such as biodiesel, precisely because they have a higher lipid content than freshwater microalgae. *OGS* is willing to collaborate on the Pilot Project by making available the competences of its staff as well as the photobioreactors that eventually can be installed at sea. In addition, the *AgriFood & Bioeconomy Cluster Agency* of S. Daniele del Friuli (Udine) proposes to use the exploitation of microalgae to make the autonomous lagoon islands from an energy point of view by exploiting the areas once used for the breeding of fish for the cultivation of micro-algae.

PPs of FVG BELs

☑ PP # 1 – *Regional supply-chain for BE devices :*

Design and production of maritime engineering components and/or innovative materials for wind turbines, wave and marine current converters.

☑ PP # 2 *Marine Biomass :*

The study of the possibilities offered by the exploitation of microalgae

Finally, as part of the dissemination activity of MAESTRALE, on 16th May 2018 MARE FVG, in collaboration with the FVG Region, the University of Trieste and OGS organized a meeting in Trieste in which the Polytechnic of Turin presented the report "*Blue Energy - design and construction of a wave energy converter*", a detailed analysis of the ISWEC device installed in Pantelleria, one of the 45 case studies selected by MAESTRALE in the "*Study*" phase.

IRENA
Istarska Regionalna ENergetska Agencija
Istrian Regional ENergy Agency
Istrian Regional Energy Agency

On 31st August and 29th September 2017 in Rovinj the ***Istrian Regional Energy Agency - IRENA*** from Labin organized 2 BELs for Istria Region with a total of 32 participants (excluding IRENA staff), representing several regional public authorities, infrastructure and (public) services providers, SMEs, 1 university and 1 interest group. The main goal of the 2 meetings was the definition of the 1st PP, namely the *THERMOSTECH INSTALLATION PROJECT*, a technical solution for energy refurbishment of a building of the Orthopaedic and Rehabilitation Hospital "*Prim. dr. Martin Horvat*" in Rovinj, a 4-floors structure for a total of 3,200 m² built in 19th century and in bad general conditions. Briefly, the technological solution provides

for the utilization of sea water thermal gradient as a primary source for the heating and cooling of the facility, of electric energy for functioning of inverter water to water heat pump as secondary source and of natural gas as complementary source. The 1ST BEL defined a focus group as a methodology of development of technical solution that is to become MAESTRALE pilot action: Hospital "*Prim. dr. Martin Horvat*", Istrian region (department of economy), Regional conservation office, Faculty of Mining, Geology and Petroleum Engineering, City of Rovinj port authority, several external experts for technical issues (chosen by public procurement procedure). On the 2nd BEL the discussion about THERMOSTECH INSTALLATION PROJECT continued and main topics remained the same as of the need for resolving problems and solutions better and due to more time needed for these topics. The second Pilot will be defined among the work groups in November 2018.

PPs of Istria Region BELs	
	☑ PP # 1 – *Marine Thermal Gradient*: utilization of sea water thermal gradient as a primary source for the heating and cooling of the Building n° 7 of the Orthopaedic and Rehabilitation Hospital "Prim. dr. Martin Horvat" in Rovinj
	☒ PP # 2 – To be defined

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Goriška Local Energy Agency – GOLEA has organized the 1st Transnational in Nova Gorica on 7th -9th May 2018 that was the first important event for exchanging experiences among all MAESTRALE Partners. The 1st Regional BEL in Slovenia will be organized by the 5th November 2018 in order to discuss with the selected stakeholders on the developments of the MAESTRALE Project objectives. The 1st Regional BEL in Slovenia will be held on 5th November 2018 in order to discuss with the selected stakeholders on the developments of the MAESTRALE Project objectives. Many local stakeholders have been invited to the 1st BEL: the 4 Primorska region municipalities (Piran, Izola, Koper, Ankaran), several LEs and SMEs, 2 National Public Authorities, 1 Higher Education and Research body and 1 Business Support organization. During the 1st BEL the current legislation and funding sources will be discussed with the purpose of identifying obstacles and opportunities for the development of BE in the Slovenian sea. BE Potential Analysis will be also presented (offshore wind, waves, thermal energy, currents) to find most promising BE source and technology to exploit marine energy. During the BELs, GOLEA will try to define the most suitable technology for exploita-


1st Transnational BEL (Nova Gorica 7th-9th May 2018)

tion of energy from the sea, considering that currently the only BE source which is already exploited in Slovenia is the seawater thermal energy, used with heat pump technology. Up to now, this remains the most promising technology, with the greatest energy potential in Slovenia. For this reason during the 1st Transnational BEL held in Nova Gorica last May, GOLEA invited the company NOMBIRO of Koper, a design firm of mechanical and electrical installations, also in the energy sector and in the marine thermal gradient sub-sector in particular. NOMBIRO presented the advantages (i.e. sea water temperature is more constant than that of air, etc.) and the disadvantages (i.e. periodical and expensive cleaning by divers, etc.) of the seawater heat pump and presented 2 good practices using this kind of technology: the installation of a seawater heat pump at the 4 stars Hotel Palas situated in Petrovac (Budva – Montenegro) and the installation of a heat pump for the swimming pool heating and the Kneipping therapy pool cooling of the Spa Soline of Portorož (Slovenia).

PP hypothesis of Slovenia PEL's	
	☑ PP # 1 – *Marine Thermal Gradient*: utilization of sea water thermal gradient based on the heat pump technology
	☒ PP # 2 – To be defined

Marine Maritime Cluster of Andalusia

On the occasion of the *European Maritime Day* held at the Port of Málaga on 24th May the ***Marine Maritime Cluster of Andalusia - CMMA*** presented the MAESTRALE Project to attendees representing several national and local public authorities, universities and research centres, SMEs and general public. CMMA illustrated the BE sources situation in the Mediterranean, the synergies of MAESTRALE with other projects. On 16th October 2018 CMMA presented MAESTRALE also in the 1° Encuentro Nacional de Clústeres del Sector Naval Español, placed in Cádiz with the participation of 32 attendees. On 19th October 2018 CMMA organized in the Port of Málaga the first Regional BEL. During the meeting several papers and round tables were developed all with a focus on opportunities for the development of new marine energy technologies. At the time of writing this issue of the newsletter CMMA has not yet identified the 2 Pilot Projects, However, during the 1st TBEL of Nova Gorica the company ENEROCEAN of Málaga (Stakeholder of CMMA), specialized

in marine energy engineering from feasibility studies to commercial exploitation (offshore wind, wave and tidal energy), presented its floating offshore wind *W2Power* device. In particular *W2Power*, developed since 2012, is a patented technology that uses proven platform technology and offshore wind turbines available today. It can be installed, maintained and repaired worldwide, at any sea depth. The plant is large but light-weight semi-submersible: up to 12 MW wind power on one foundation. A prototype will be demonstrated at sea in Canary Islands (Project DEMOWIND WIP10+).

Next Steps

The MAESTRALE future activity calendar foresees, first of all, the prosecution of the BELs, above all for the Partners who have not yet identified the Pilot Projects (AUTH, CMMA and UALG). From this perspective, the next 2nd Transnational Blue Energy Lab "Transferring knowledge on Blue Energy: technology innovations, clustering, funding opportunities and environmental challenges" in Malta (12th -14th November 2018) will surely be the ideal opportunity for a comparison between partners on the progress of the "Testing" phase of the Project. Another important event is the MedaWeek Barcelona (Mediterranean Week of Economic Leaders, 22-23 November 2018), in particular the Blue Growth forum "the blue way of life" that aims to outline the state-of-the art of the Blue economy in the Mediterranean. Stay in tune!

Our Communication Activities

In order to disseminate the Project development and a more comprehensive understanding of Blue Energy on various aspects: actual potential, existing regulations, availability of innovative technologies and perspectives, a Facebook page and a Twitter account have been created. We are going to share all important updates of the Project, news and research articles on Blue Energy and the practices that have been successfully implemented in that field. Moreover, we aspire to create a virtual community where scientists, policy makers, entrepreneurs and citizens can contribute with their knowledge and ideas with regard to prompt effective actions and investments for Blue Growth.

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We are online!

Project partners