



# The MAESTRALE Project

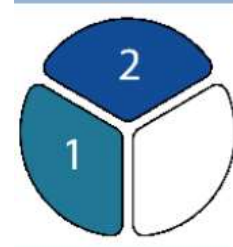
**Simone Bastianoni**

Project Coordinator (LP)

[maestrale@unisi.it](mailto:maestrale@unisi.it)

1st Union for Mediterranean Regional Stakeholder Conference on Blue Economy

- Programme: Interreg MED 2014-2020;
- Priority Axis: 1. Promoting Mediterranean innovation capacities to develop smart and sustainable growth;
- Specific Objective: 1.1 To increase transnational activity of innovative clusters and networks of key sectors of the MED area.
- Type: M1 studying & M2 testing
- Time period: 2016 (01/11) to 2019 (31/10) – 36M
- Budget: 2.4 M€
- Lead Partner Organisation: University of Siena



**Studying and testing**

*Etude et expérimentation*



| Partner                              | Country  | Region                |
|--------------------------------------|----------|-----------------------|
| University of Siena                  | Italy    | Tuscany               |
| CEEI Valencia                        | Spain    | Comunidad Valenciana  |
| IRENA                                | Croatia  | Jadranska Hrvatska    |
| CMMA                                 | Spain    | Andalucia             |
| Aristotle University of Thessaloniki | Greece   | Κεντρική Μακεδονία    |
| GOLEA                                | Slovenia | Zahodna Slovenija     |
| University of Cyprus                 | Cyprus   | Cyprus                |
| INFORMEST                            | Italy    | Friuli Venezia Giulia |
| University of Algarve                | Portugal | Algarve               |
| Friuli Venezia Giulia*               | Italy    | Friuli Venezia Giulia |
| MIEMA                                | Malta    | Malta                 |

\* Associated Partner



Module 1  
Studying

- Blue Energy regulations framework
- Catalogue of Blue Energy Best Practices
- Study visits
- Stakeholders map
- Online MED Blue Energy GeoDatabase

# Study Visits





MAESTRALE

HOME

THE PROJECT

DATABASE

OTHER PROJECTS

PARTNERS



WEBGIS

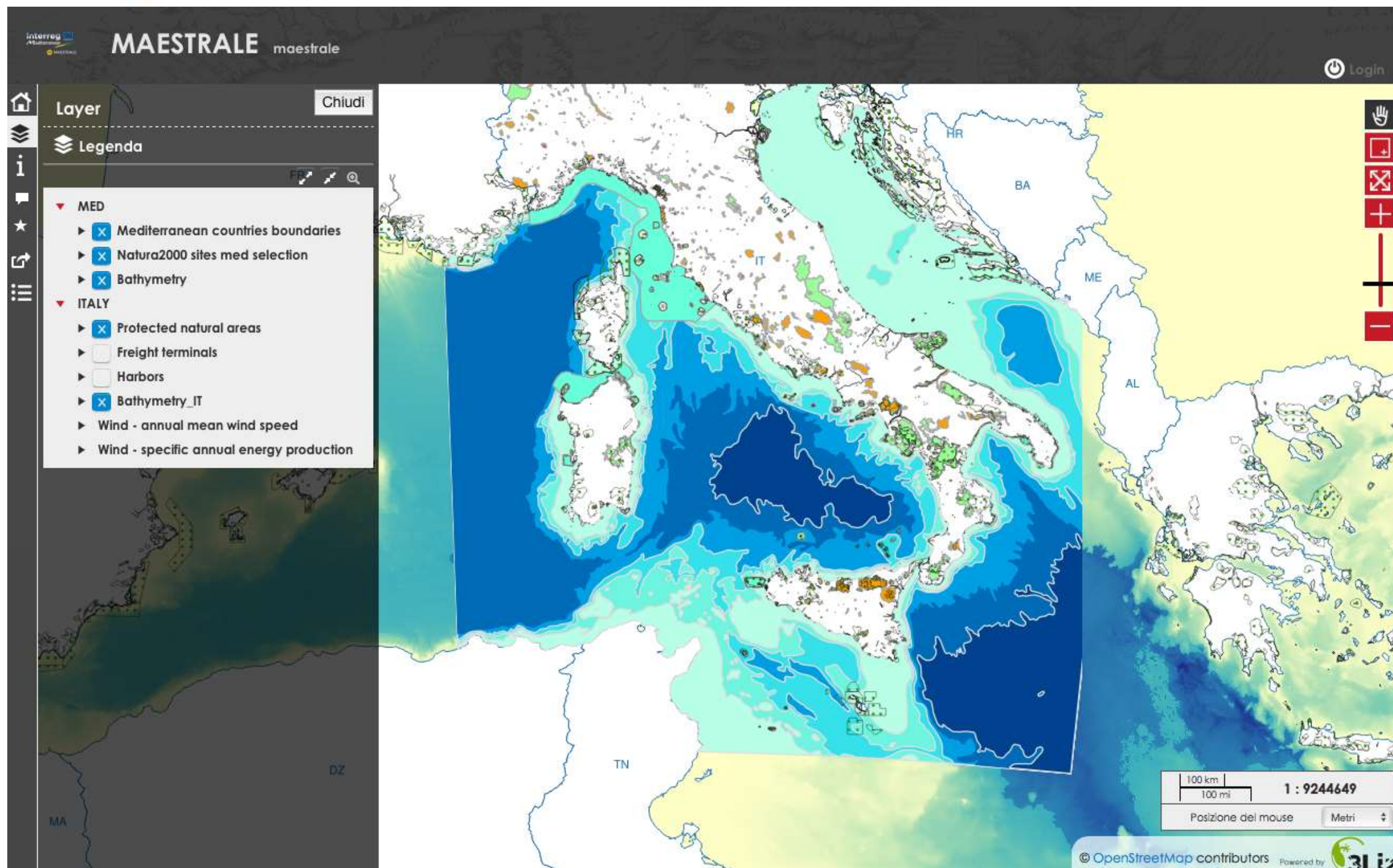


Sustainable Blue Energy  
in the Mediterranean.

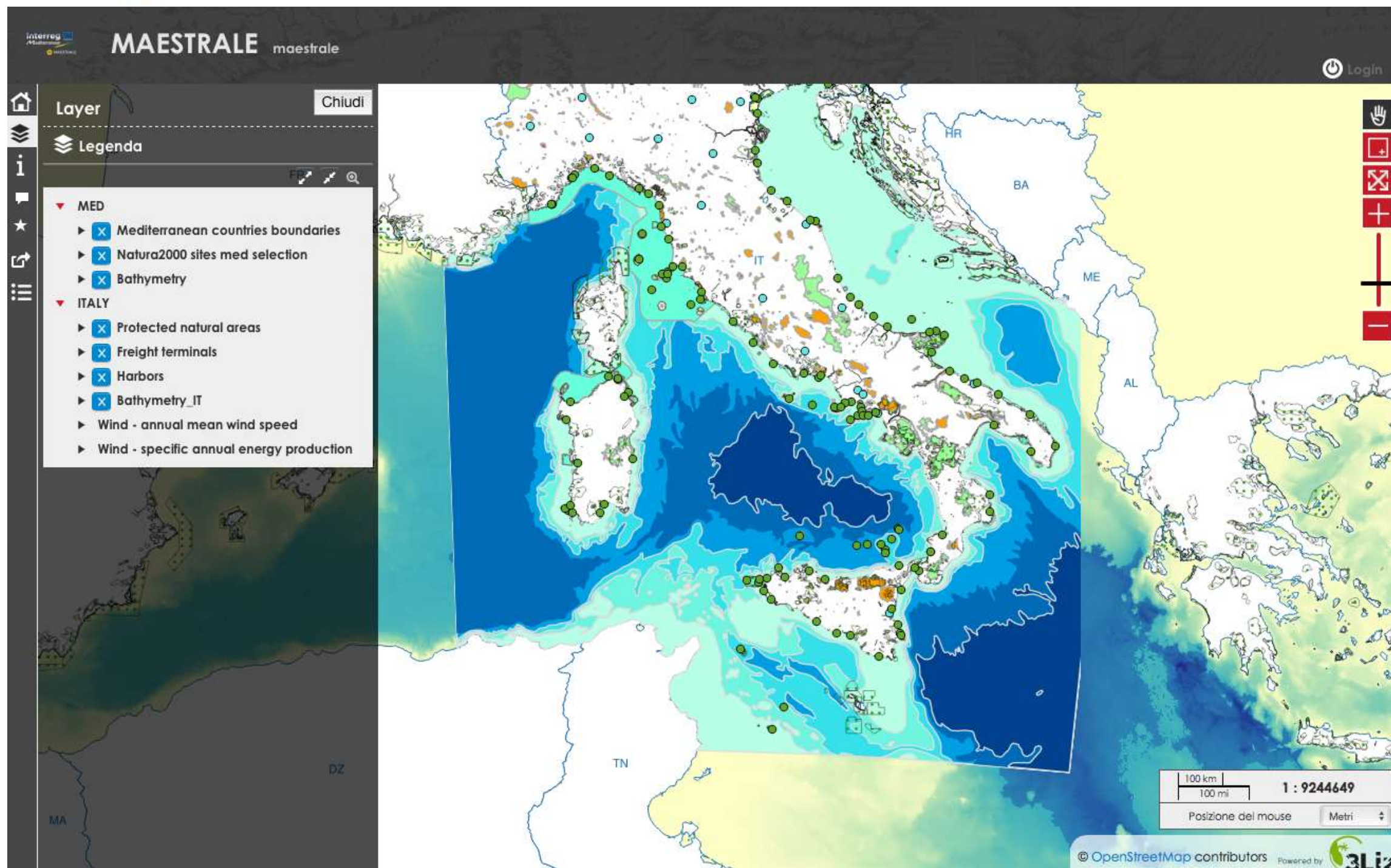
WEBGIS

Project co-financed by the European Regional Development Fund











MAESTRALE maestrale

Layer

Legenda

MED

- Medi
- Natu
- Bathy

ITALY

- Prote
- Freig
- Harb
- Bathy
- Wind - c
- Wind - s

**RESONANT WAVE ENERGY CONVERTER (REWEC3)**

|                            |  |
|----------------------------|--|
| Type of Blue energy source | Wave energy  |
| Type of energy output      | Electricity  |
| Type of project/plant      | Pilot project/plant  |
| Status                     | Under realization  |
| Location                   | 42° 5' 48.49" N, 11° 44' 45.06" E<br>Mediterranean Sea<br>Civitavecchia Port (Rome, Italy)   |
| Nominal power              | 2.5 MW   |
| Annual productivity        | 4000-6000 MWh/km   |
| Size                       | 578 m seafront in the Civitavecchia harbour  |
| Year                       | 2014-2017  |
| Implementation cost        | 6-8,000,000 €  |
| Payback period             | 10-15 years  |
| Web link                   | <a href="http://www.waveenergy.it">www.waveenergy.it</a>   |
| Description                | REWEC3 is an advanced Wave Energy Converter based on the principle of Oscillating Water Columns (OWCs). It is commonly embedded in piers, docks, breakwater or similar monolithic reinforced concrete structures in harbours or marinas. Electricity is generated by self-rectifying turbines driven by an alternate air-flow throughout a duct. Air is compressed and decompressed by the oscillating sea-level within chambers induced by waves. |

**HOTEL PARENTIUM**

|                            |  |
|----------------------------|--|
| Type of Blue energy source | Ocean thermal energy   |
| Type of energy output      | Thermal energy (heating/cooling)   |
| Type of project/plant      | Full operating plant   |
| Status                     | Operational  |
| Location                   | 45°12'13.3"N, 13°35'19.2"E<br>Adriatic sea<br>Croatia, Istria, City of Poreč                     |
| Nominal power              | Cooling: 692 kW x 2 units<br>Heating: 795 kW x 2 units   |
| Annual productivity        | Productivity is estimated and is 723 MWh/a.  |
| Size                       | 20,582 m <sup>2</sup>  |
| Year                       | Year of completion: 2014.  |
| Implementation cost        | 2 mil. €   |
| Payback period             | 6 years  |
| Description                | This case give a significant socio-economic impact on propulsion of usage heat pumps in Croatia. |

**MACROALGAE BIOREFINERY (MAB3)**

|                            |   |
|----------------------------|---|
| Type of Blue energy source | Marine Biomass (algae)  |
| Type of energy output      | Biofuel   |
| Type of project/plant      | Research project  |
| Status                     | Project design  |
| Location                   | 55°39'37.8"N 11°04'39.1"E<br>Kalundborg for demonstration bio-refinery of brown algae from seaweed farms, Denmark.                  |
| Annual productivity        | 100 M kg/yr bioethanol (avg 0.2 kg/kg) or 150 M m3 biomethane (avg 0.3 kg/kg) out of avg 500,000 t/yr biomass treated (brown algae) |
| Size                       | avg 50,000 m2   |
| Year                       | 2012-2016   |
| Implementation cost        | 60M euro (biorefinery treating avg 500,000 t/yr biomass)  |
| Web link                   | <a href="http://www.mab3.dk">http://www.mab3.dk</a>   |
| Description                | Algae harvesting and conversion of the biomass in biofuel through a bio-refinery  |

**DEEP GREEN**

|                            |  |
|----------------------------|--|
| Type of Blue energy source | Tidal stream energy  |
| Type of energy output      | Electricity  |
| Type of project/plant      | Prototype  |
| Status                     | Operational  |
| Location                   | 53° 18' 22.36" N, -4° 37' 55.60" W<br>Irish Sea<br>Wales, Holyhead (Anglesey)  |
| Nominal power              | 0.5 MW   |
| Annual productivity        | 1500-2500 MWh/year   |
| Size                       | 12m wingspan; 9.8m high (top of rudder to end of top joint); 1.5 turbine diameter; dry weight 10t.   |
| Year                       | 2017.  |
| Web link                   | <a href="http://www.minesto.com">www.minesto.com</a>   |
| Description                | Deep Green is particularly interesting as power device because it can work efficiently in both tidal ocean currents. Both conditions can be easily exploitable in the Mediterranean Sea, especially because such a power plant requires slow water flows. Deep Green is the only known technology that cost-effectively can produce electricity from those slower currents. The planned increase of the site to 80 MW installed capacity would increase that figure to almost 70,000 households. |



# The future steps



## Module 2 Testing

- Blue Energy Potential analysis in partner regions (still Module 1)
- Transnational Blue Energy Labs as permanent networks
- Local Blue Energy Labs as participative design practices
- Feasibility testing of 20 Blue Energy pilot projects

Thanks for your attention by

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Interreg  
*M*editerranean



EUROPEAN UNION



MAESTRALE