



WavEC

Offshore Renewables

WAVEC PROJECTS FOR THE +ATLANTIC AGENDA

ANTÓNIO SARMENTO

SUMMARY

- ❑ WavEC Offshore Renewables
- ❑ WavEC representative projects.



Monitoring buoy



WindFloat prototype



Pico wave energy plant
(1999 – 2015...)



Underwater inspection at the WindFloat

WAVEC OFFSHORE RENEWABLES

- Private non-for-profit
- Markets
 - Wave energy
 - Offshore wind
 - Ocean technology
- Funded through:
 - Consultancy - 25%
 - R&D projects (EC) – 50%
 - New products and services – 25%



WAVEC OFFSHORE RENEWABLES

- Highly educated staff
 - PhD – 7 out of 25
 - MSc or equivalent – 16 out of 25
- Strong international presence
 - OES and OC5 / IEA
 - Ocean Energy Europe
 - EERA Marine



PROVIDING SERVICES AROUND THE WORLD

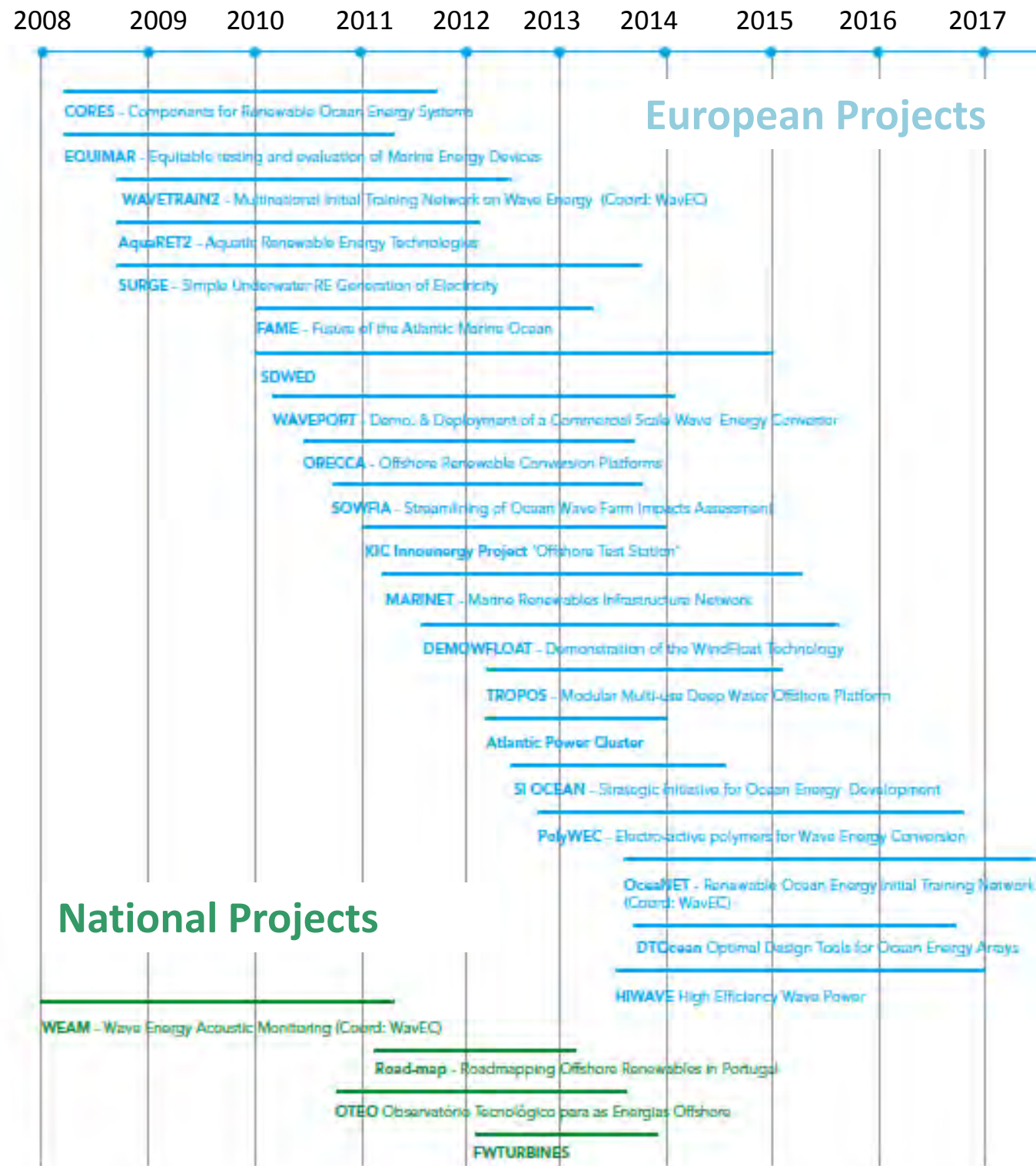


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KEEPING TRACK OF MULTIPLE R&D PROJECTS

- A broad spectrum of activities
- Added value for the development of new products and new services
- More than 100 international partners



SUMMARY

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- ❑ WavEC representative projects.



PARTICIPATION IN MARINE ENERGY PROTOTYPE TESTING

2004



2008



2011 - 2015



Aguçadora

Pilot zone (São Pedro de Muel)
(REN) | Governmental Initiative

1999 – 2015 ...



OWC Pico plant
(WavEC)

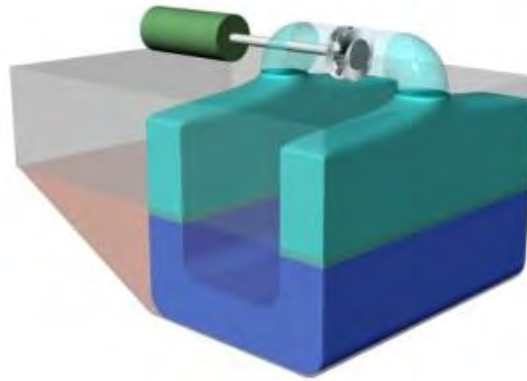
2007, 2011 - 2014



Peniche



Wave energy



Phase I – Lab validation (up to TRL5)

4 technologies	2015-16	2 M€
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Phase II - Validation at sea (from TRL 5 to 7)

2 technologies	2015-18	8 M€
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Phase III – Prototype demo at sea (TRL8)

1 technology	2018-22	26 M€
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Phase IV – 1st demo farm (TRL 9)

1 technology	2020-24	11 M€
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Ocean Sentinel
(1,5 M€)

Underwater electrical
cable(15 M€)

Challenge: marketable technology by 2022

Offshore Wind

- ❑ EDP, ASM, REPSOL
- ❑ Principle Power
- ❑ WavEC



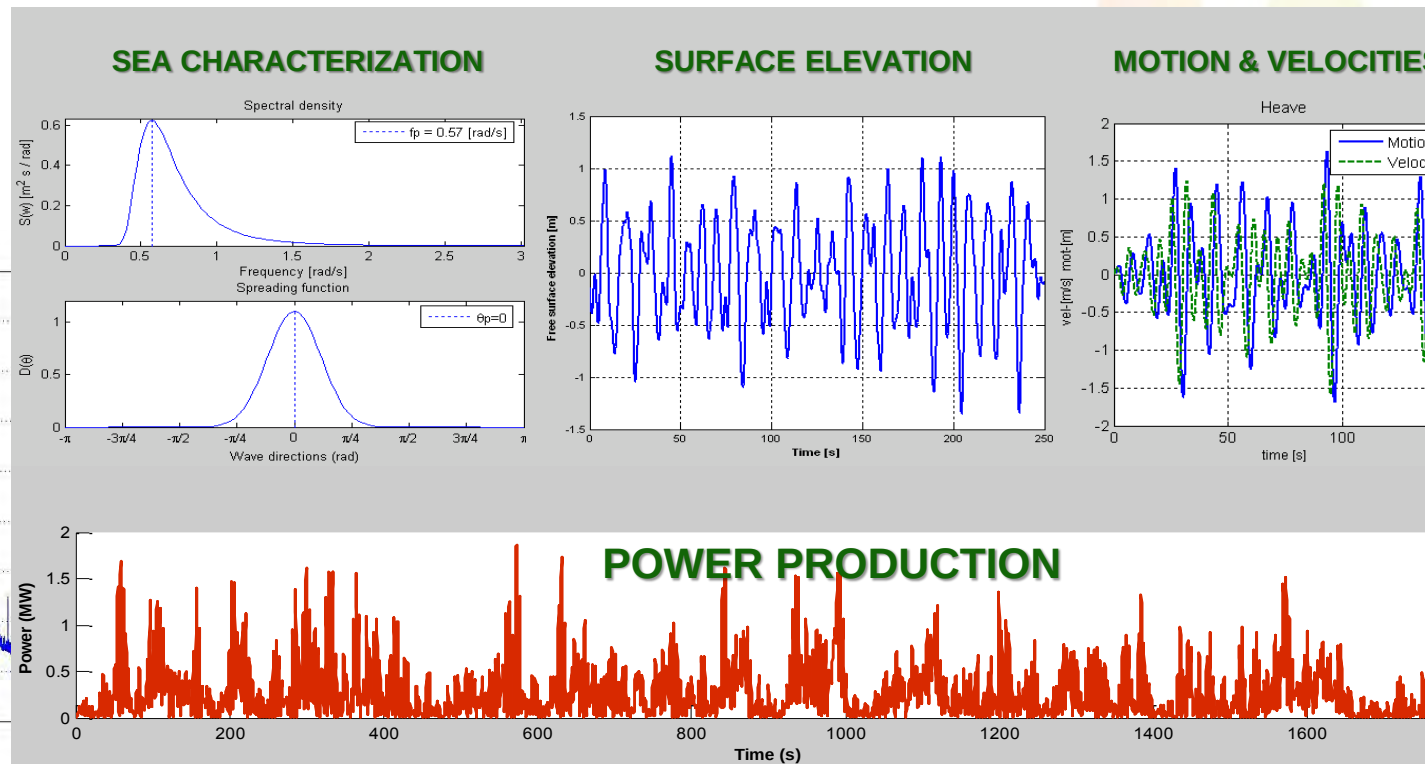
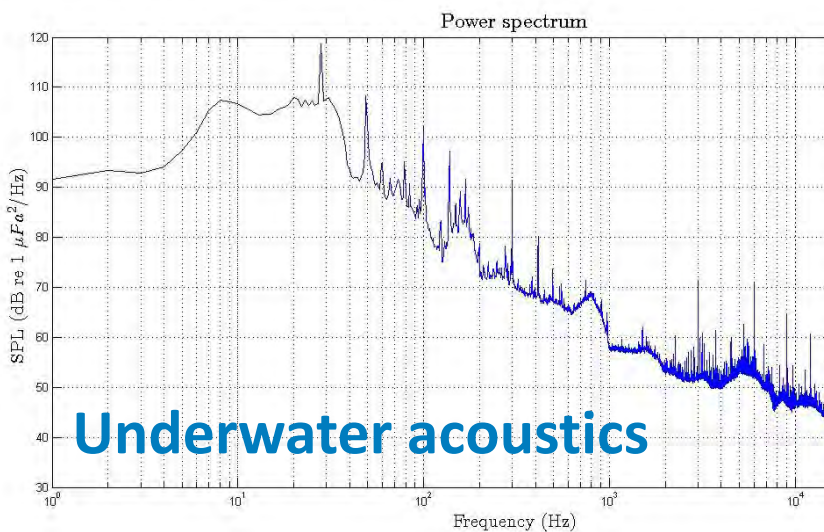
Challenge: commercially viable deeper waters (> 60m) Offshore Wind by 2020

Other outcome: small ocean platforms for other uses

Offshore Wind

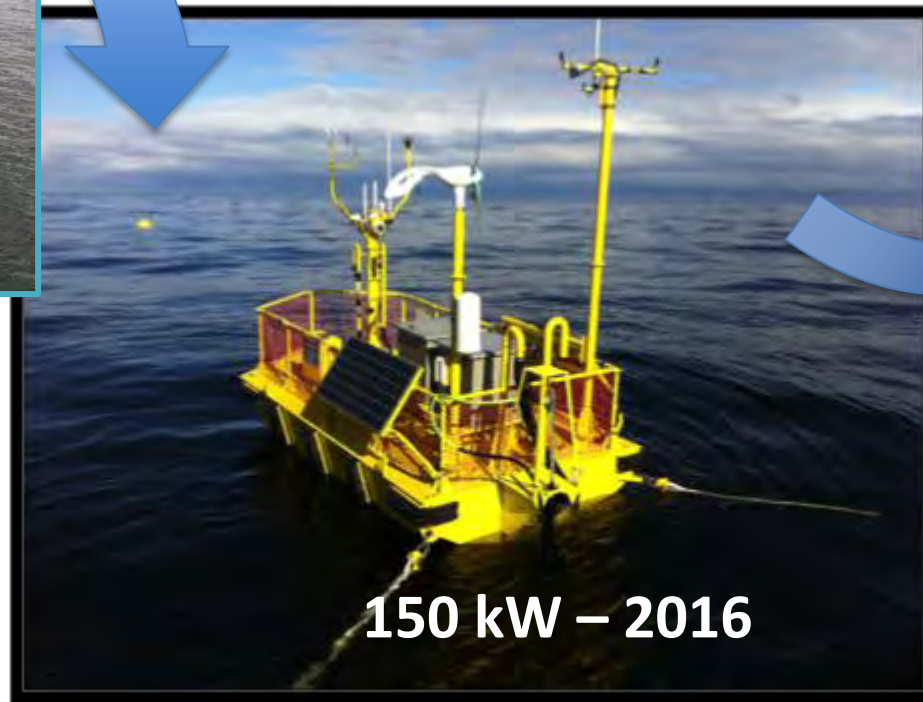
Underwater inspection

- Environmental impacts
- Inspection
- Numerical modelling
- O&M and logistics



Oceanic Monitoring Buoys

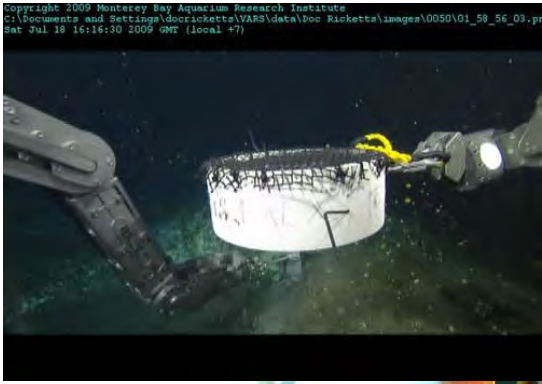
Partners



Auto-positioned (2018)
Resident UAV (2018)
Network integration (2020)

Challenge: Network of 15 buoys by 2020 in the Portuguese EEZ

Empowering small ROVs



Sacrificial Anode Replacement

Biofouling Cleaning

NDT Surveys

Valves Operation

Environmental Surveys and Sampling

Underwater Explosives

Visual Inspection and Survey

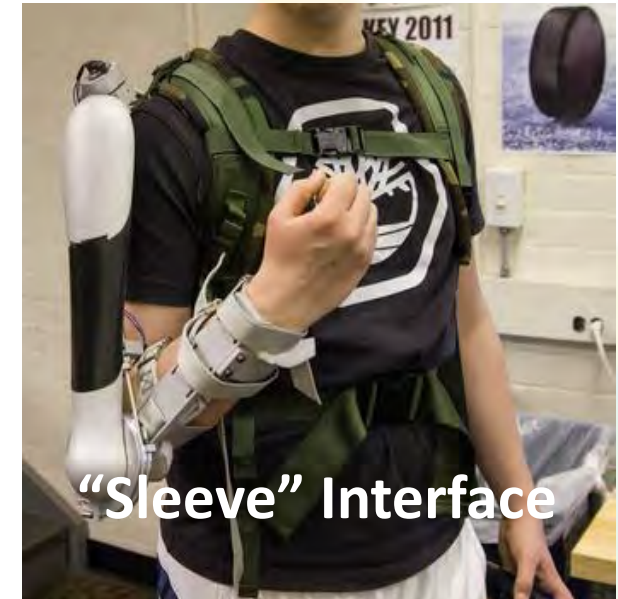
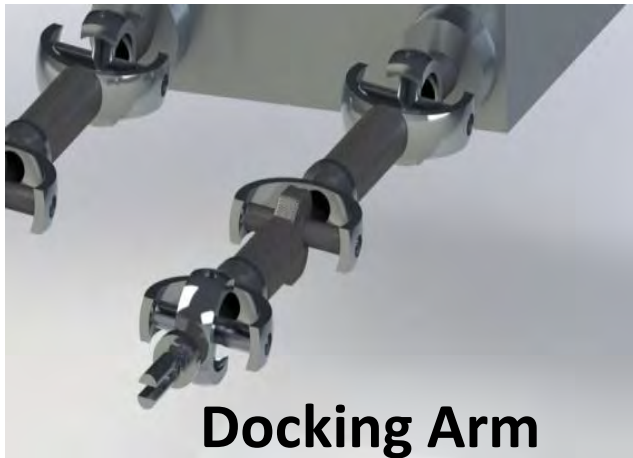
Empowering small ROVs



Funding



Kraken – As easy as moving your own arm

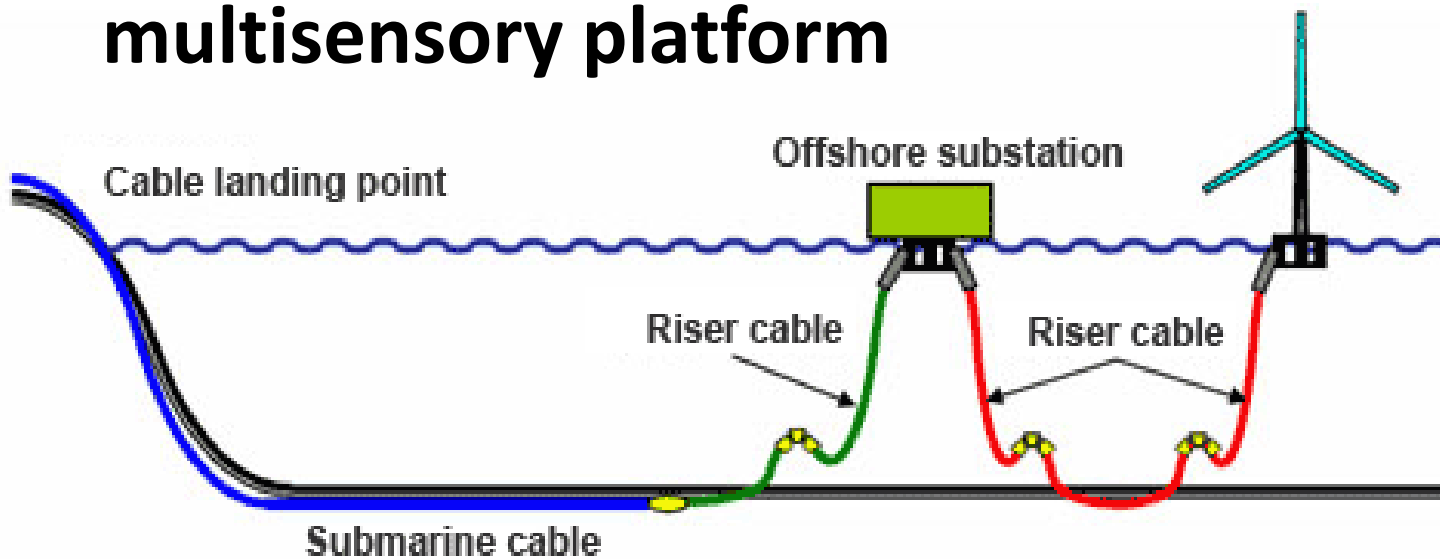


Challenge: A marketable product by 2018 requiring no specialized operator



Symbiotracker: Monitoring underwater power cables & more

Autonomous induction-powered multisensory platform

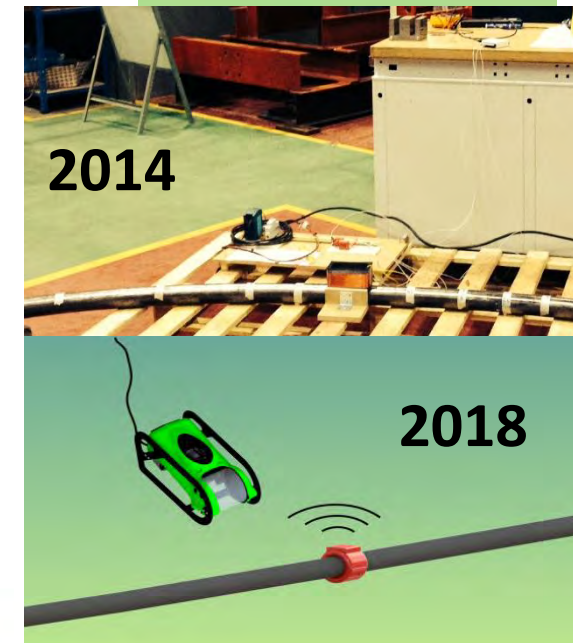


Partial Discharge Detection

Cable Stress Measurement

Environmental Monitoring

Cable Locator



Challenge: A marketable product by 2020

UAV for offshore platforms inspection

PARTNERS

uavision

UAV Manufacturer



Sensor specialist

8.2

Inspection Contractor



Onshore
Wind
Turbines
(2015)

Offshore
Wind
Turbines
(2018)

Offshore
O&G
(2020)

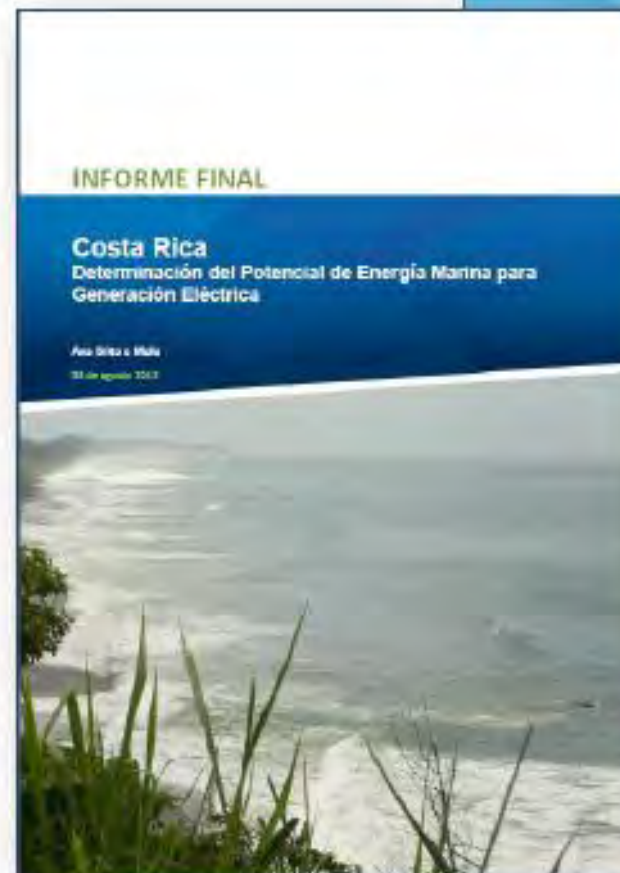
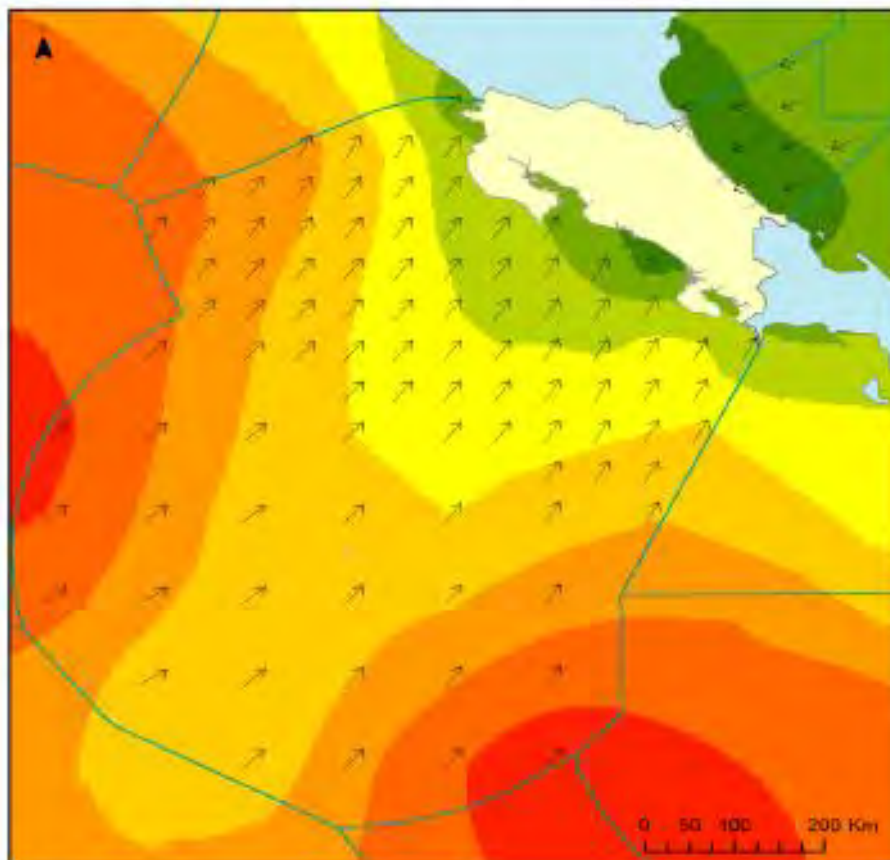
RESOURCE ASSESSMENT

Client: Institute Costarricense de Electricidade (ICE)

Date: 2013



- Determination of ocean energy potential (waves, tidal, currents)
- Site selection
- Research program



THANKS



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