

## **ASX Announcement**

**Thursday 26<sup>th</sup> March 2015**

### **South America Carnegie Business Developments**

- **Large potential for wave power and desalination in South America**
- **Agency Agreement signed with MAK Industrial Water Solutions**
- **Carnegie Wave Energy presentation at Latin America Water Week in Chile**

**Wave energy developer Carnegie Wave Energy Limited (ASX: CWE) is pleased to provide an update to its activities in South America including the signing of an Agency Agreement with MAK Industrial Water Solutions (MAK Water) to act as their exclusive agent for South America.**

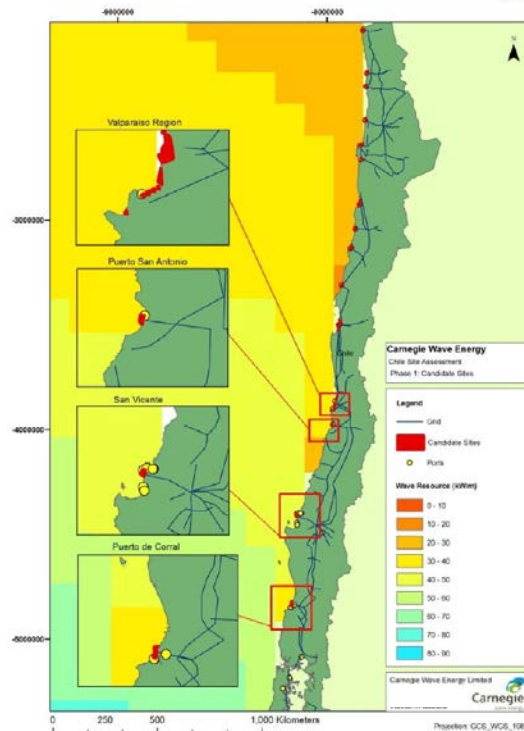
#### Wave energy

Carnegie has been investigating opportunities in South America generally and Chile specifically in the past years through its local 100% owned subsidiary, CWE Chile. Chile is one of South America's fastest growing and strongest economies with strong demand for water and energy that is expected to continue to increase. At the same time, Chile is rich with opportunities for the renewable energy market, including having a world class wave energy sector.

The Chilean Government has previously supported wave energy feasibility studies including the deployment of wave buoys for site specific measurements. Studies have confirmed that the wave resource ranges from 25kW per metre of wave front in the north to close over to 100kW per metre in the south and with very low seasonable variability (less than 10%). Carnegie has separately carried out its own site assessment process which identified a number of suitable sites for CETO power and water projects.

The Government more recently established through its industry development arm CORFO (Corporación de Fomento de la Producción) an International Centre of Excellence (ICE) of Marine Energy. Carnegie was selected as wave technology partner in the winning consortium which was led by DCNS and Enel Green Power.

Carnegie is pursuing a number of relationships and opportunities to develop CETO wave power and desalination projects in Chile at present and will provide further updates as these opportunities develop.



**Carnegie's site assessment of Chilean coastline**

## Desalination

Carnegie has been active in desalination development for some years having first produced zero-emission desalinated water from earlier CETO prototypes and now from its desalination plant on Garden Island. The desalination plant is currently running off grid power and will shortly be integrated into Carnegie's Perth Wave Energy Project. The containerised reverse osmosis plant used in this project is supplied by local Perth based water treatment company, MAK Industrial Water Solutions (MAK Water). Carnegie and MAK Water recently won the Australian Water Association WA (AWA) award for Program Innovation for this project.

Carnegie is now pleased to advise that it has agreed terms to act as the exclusive agent for MAK Water's products throughout the South American market. Carnegie will look to identify and create water and waste water treatment opportunities throughout South America. This agreement was announced yesterday at the Latin America Water Week 2015 in Santiago, Chile in a presentation delivered by Carnegie which also provided an update on the CETO technology as part of the Water and Energy conference program (see attached presentation).

Carnegie CEO Dr Michael Ottaviano said, "This Agency Agreement with MAK Water for South America creates an opportunity for Carnegie to expand its business opportunities in an emerging market. Carnegie has developed a unique capability in technology commercialisation in the marine and clean energy space which combined with MAK's strength in water treatment will create a compelling business opportunity in water treatment and desalination in South America."

Latin America Water Week is the most important annual water event in Latin America and provides a unique platform for business opportunities nationally and internationally. It also focuses on new way of thinking and positive action towards water-related challenges and their impact on the environment, health, climate, economy, and overall community, and where CETO technology represent a promising approach to produce zero greenhouse gas emission power and water.

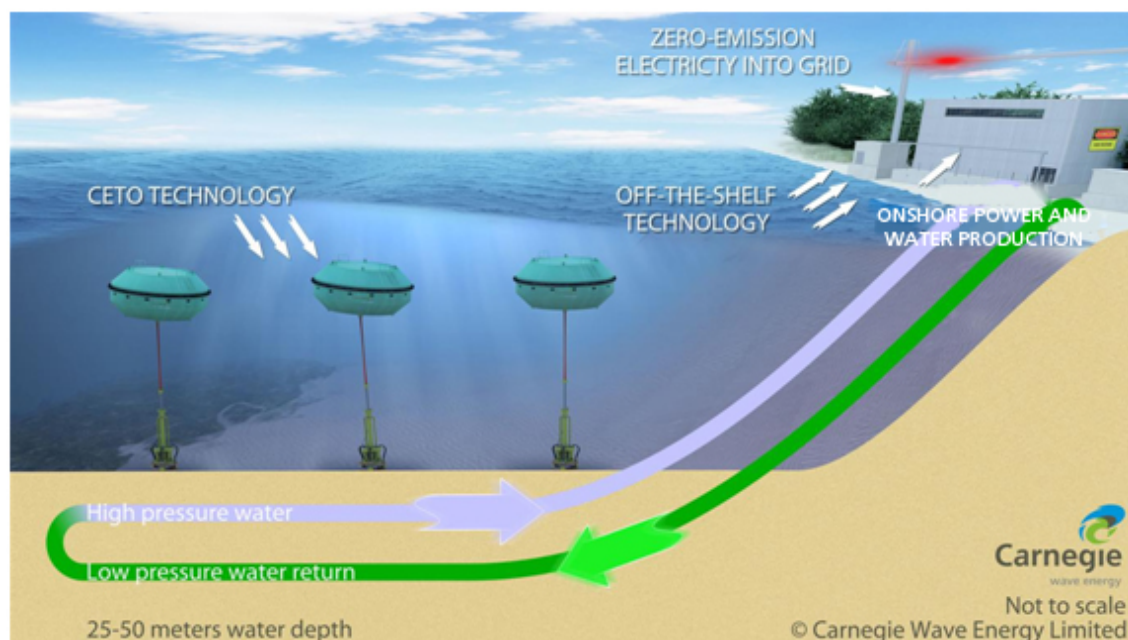
### **About Carnegie**

[Carnegie Wave Energy Limited](#) is an Australian, ASX-listed (ASX:CWE) wave energy technology developer. Carnegie is the 100% owner and developer of the CETO Wave Energy Technology intellectual property.

### **About ARENA**

The Australian Renewable Energy Agency (ARENA) was established by the Australian Government to make renewable energy technologies more affordable and increase the amount of renewable energy used in Australia. ARENA invests in renewable energy projects, supports research and development activities, boosts job creation and industry development, and increases knowledge about renewable energy.

### **About CETO**



**CETO Power & Water**

The CETO system is different from other wave energy devices as it operates under water where it is safer from large storms and invisible from the shore. The technology is capable of generating power onshore or offshore depending upon the specific characteristics of a project site.

CETO technology characteristics include:

- Converts ocean wave energy into zero-emission electricity and desalinated water.
- Environmentally friendly, has minimal visual impact and attracts marine life.
- Fully-submerged in deep water, away from breaking waves and beachgoers, and unaffected by storms.

### **Perth Wave Energy Project ('PWE') Fact File**

- Upon completion, PWE will be the first commercial-scale CETO grid and desalinated water connected wave energy project.
- The Perth Wave Energy Project is supported by \$13.1m in Australian Government funding through the Australian Renewable Energy Agency's Emerging Renewables Program.
- PWE is supported by \$7.3 million from the Government of Western Australia's Low Emissions Energy Development (LEED) Fund. This is part of a larger \$10 million LEED grant, awarded to Carnegie by the Western Australian Government, to support the development of the CETO technology from concept through to completion of PWE.
- The Desalination Pilot is supported by a \$1.27m AusIndustry grant from the Clean Technology Innovation Program.
- Utilising Carnegie's fully submerged and commercial proven CETO wave energy device.
- Providing clean, renewable energy and potable desalinated water to Australia's largest naval base, HMAS Stirling, on Garden Island in Western Australia.

For more information:

Dr Michael Ottaviano

CEO & Managing Director

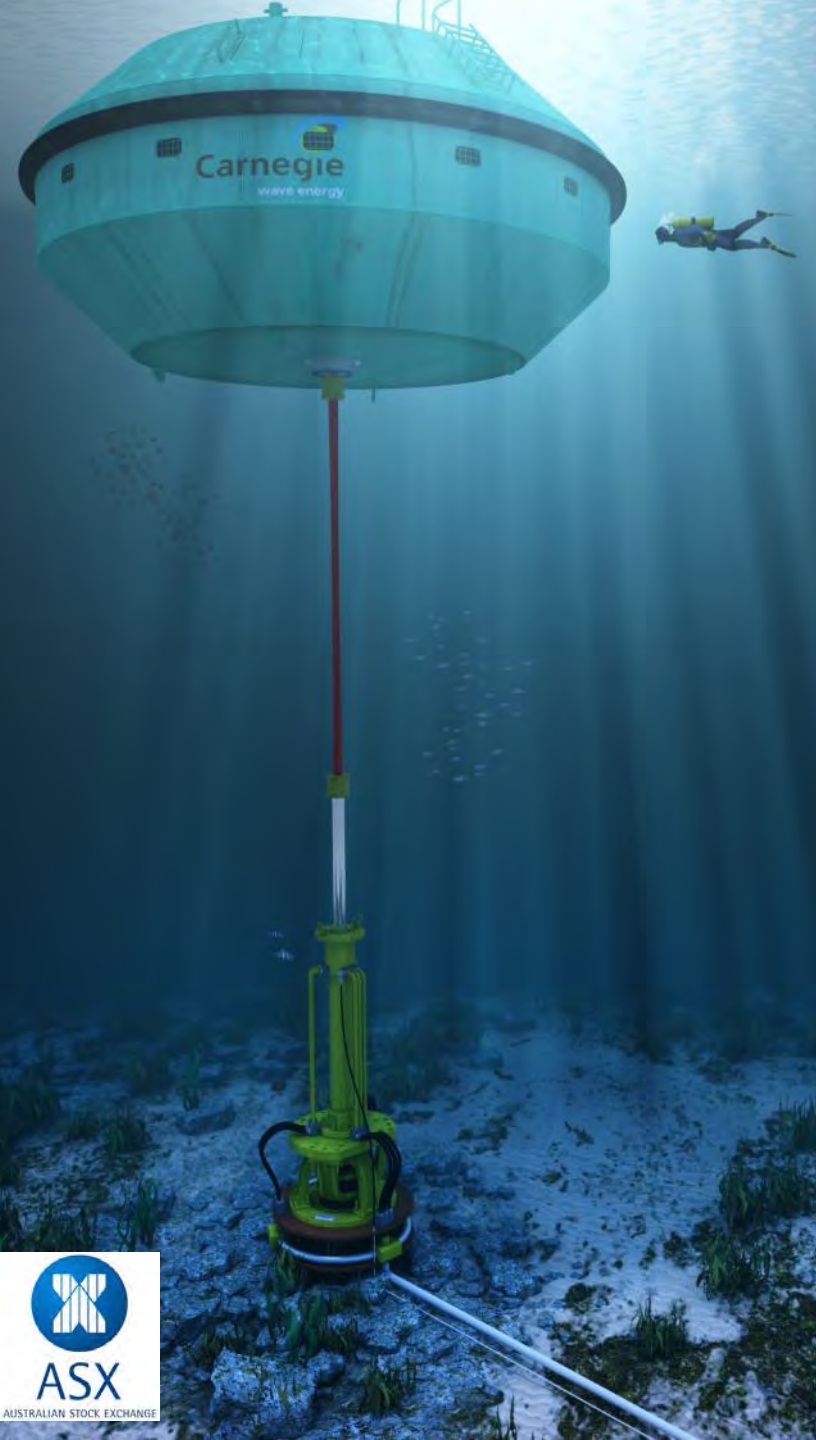
Carnegie Wave Energy Limited

+61 8 9486 4466

[enquiries@carnegiewave.com](mailto:enquiries@carnegiewave.com)

Website: [www.carnegiewave.com](http://www.carnegiewave.com)





# Latin America Water Week

Presented by Edoardo Sommacal  
Business Development Manager - Chile  
March 2015

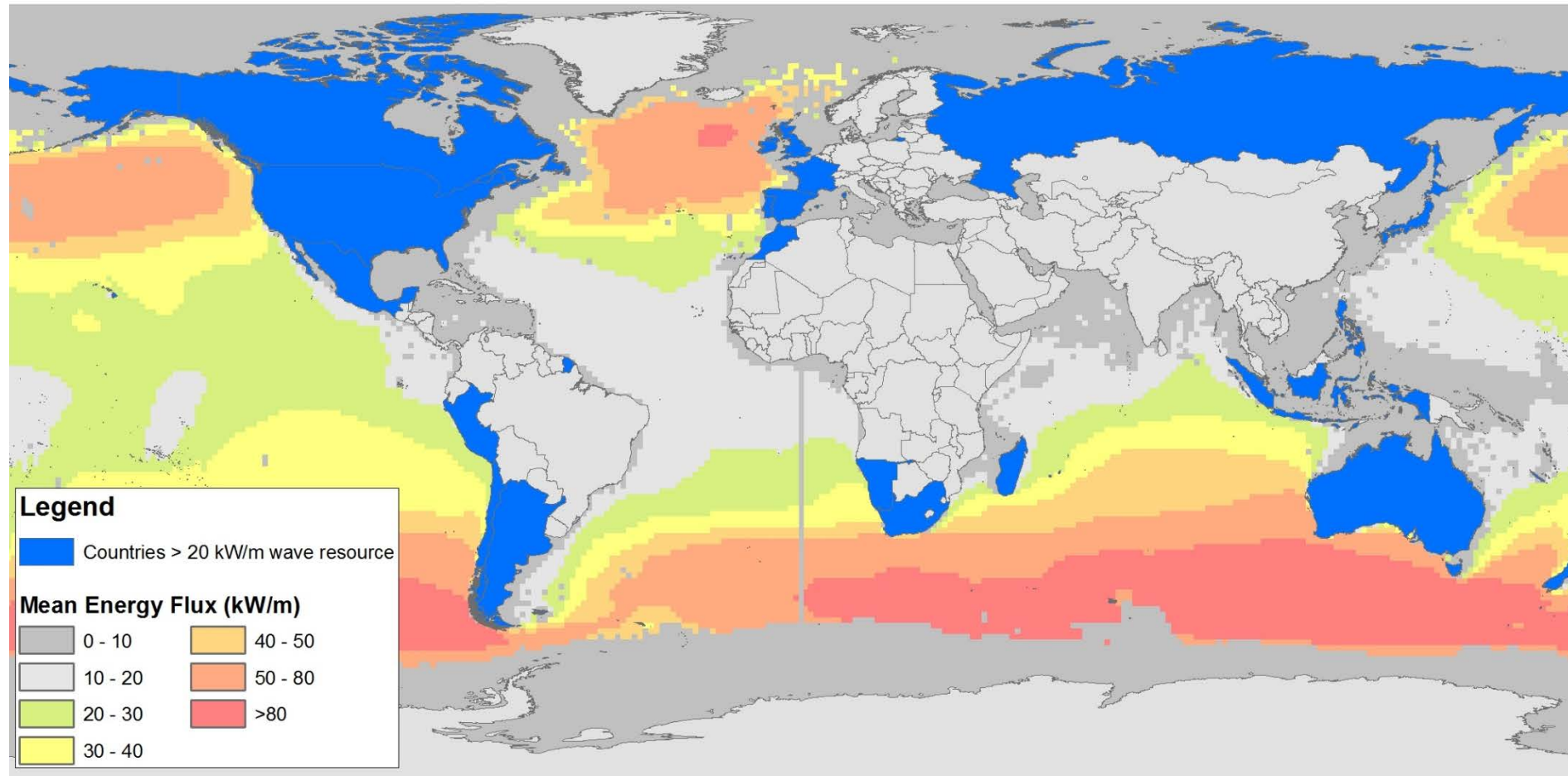


# Disclaimer

---

The information contained herein has been prepared solely for informational purposes and is not an offer to buy or sell or a solicitation of any offer to buy or sell any security or to participate in any trading strategy or to enter into any transaction. If any offer of securities is made, it shall be made pursuant to a definitive offering memorandum prepared by or on behalf of any fund or other issuer which would contain material information not contained herein and which would supersede this information in its entirety.

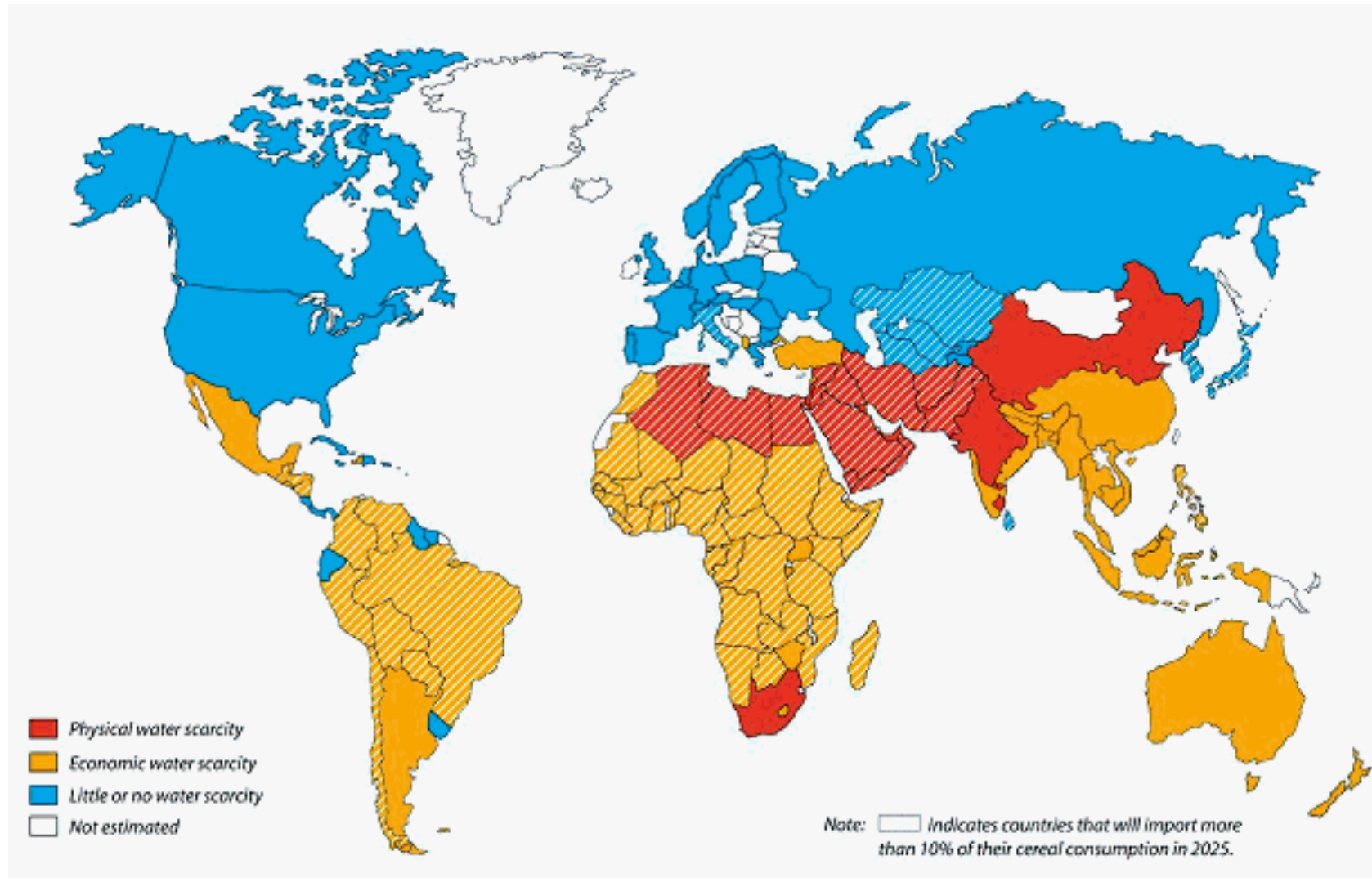
# Global wave resource > current global power use



- Market is global, large and co-located with demand centers
- Resource is more predictable, consistent and available than wind or solar
- Total resource potential = >200TW (200 million MW)



# Projected Water Scarcity in 2025





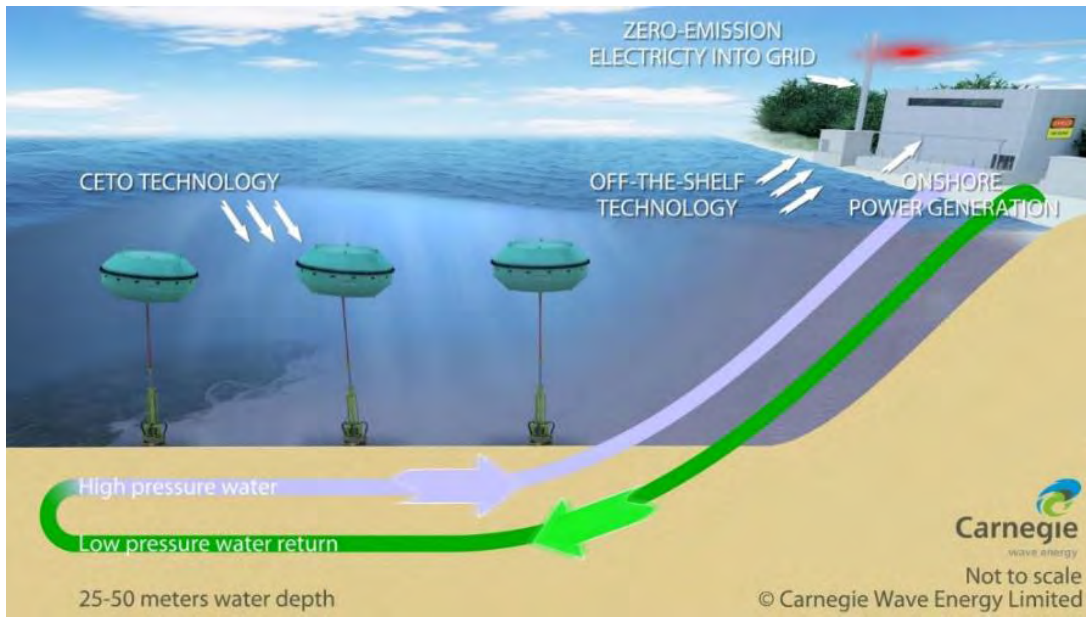
# Carnegie Overview

- Owner and developer of “CETO” wave energy technology
- Integrates off-the-shelf Reverse Osmosis (RO) desalination technology with the CETO infrastructure
- ASX listed, based in Fremantle, Western Australia
- 50 engineering, commercial, administration staff
- International Board of Directors with subsidiaries in UK, Ireland & Chile
- 120 Patents or patents pending globally
- \$100m spent to date on CETO
- EDF (Électricité de France) is a CETO power licensee
- Cooperation Agreement with Water Corporation and Australian Water Association (AWA) member
- Recently signed Agency Agreement with Australia based MAK Water Industrial

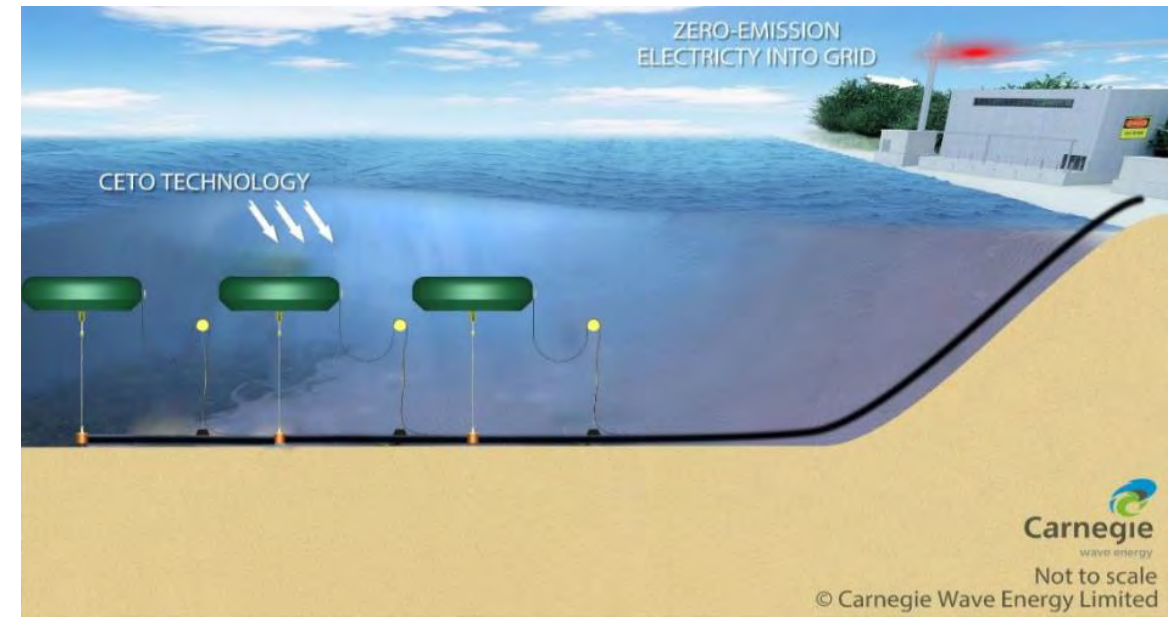


# CETO Technology

- Fully submerged, point absorber
- Near-shore location or deep-water location
- Onshore or offshore power production
- Onshore water production
- Modular design largely using proven subsea components



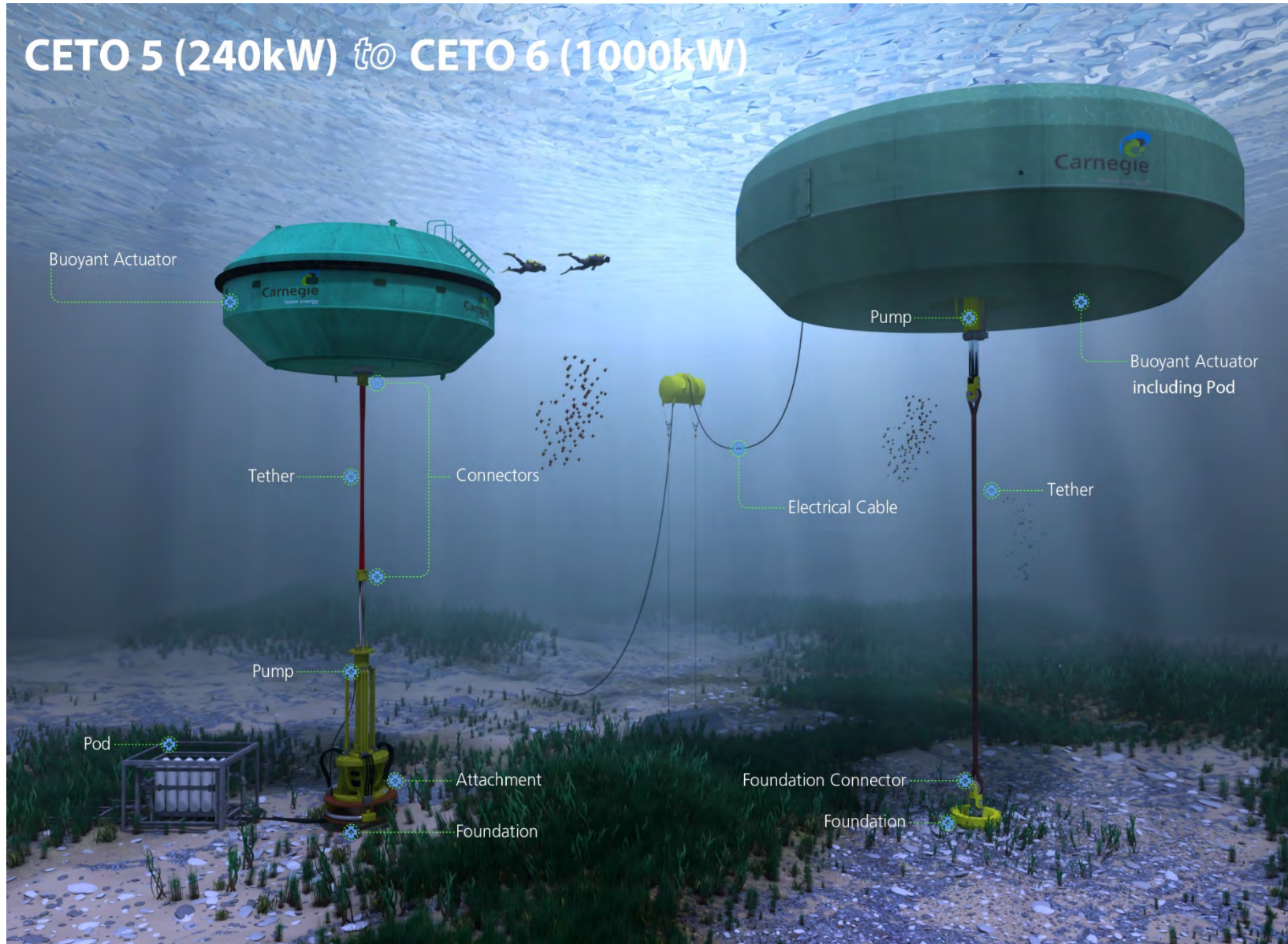
*CETO 5 - Near-shore, onshore power & direct hydraulic energy to desalination*



*CETO 6 - Deepwater, offshore power production & standard onshore desalination*



# CETO 5 and CETO 6



# Carnegie's Technology Development



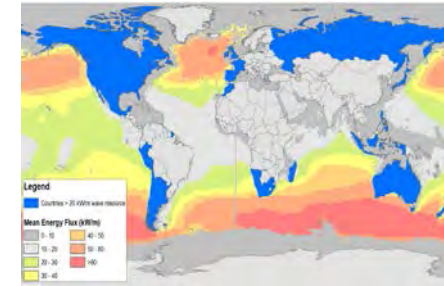
Wave tank testing @  
Fremantle, WA



3 x 1kW prototypes @  
Fremantle, WA



3 x 240kW units @ Garden  
Island, WA. Power & water  
production



International projects



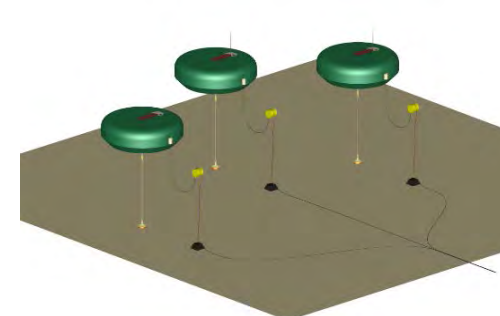
Proof of concept  
prototype @  
Fremantle, WA



80kW prototype @  
Garden Island, WA



3MW demo @ Garden Island  
(3 x 1MW units)





# Perth Wave Energy Project – 2014/2015 Key Achievements

- ✓ Garden Island, Western Australia
- ✓ \$22m in Government grant funding
- ✓ 3 x 240kW CETO 5 units installed and operating
- ✓ Onshore power plant and grid connection
- ✓ Onshore desalination pilot plant operating ahead of final hydraulic connection to the CETO system
- ✓ Power & Water Offtake to Australian Department of Defence (HMAS Stirling)







# Perth Wave Energy Project – foundations and pipelines





# Perth Wave Energy Project – onshore power plant





# Perth Wave Energy Project – onshore desalination



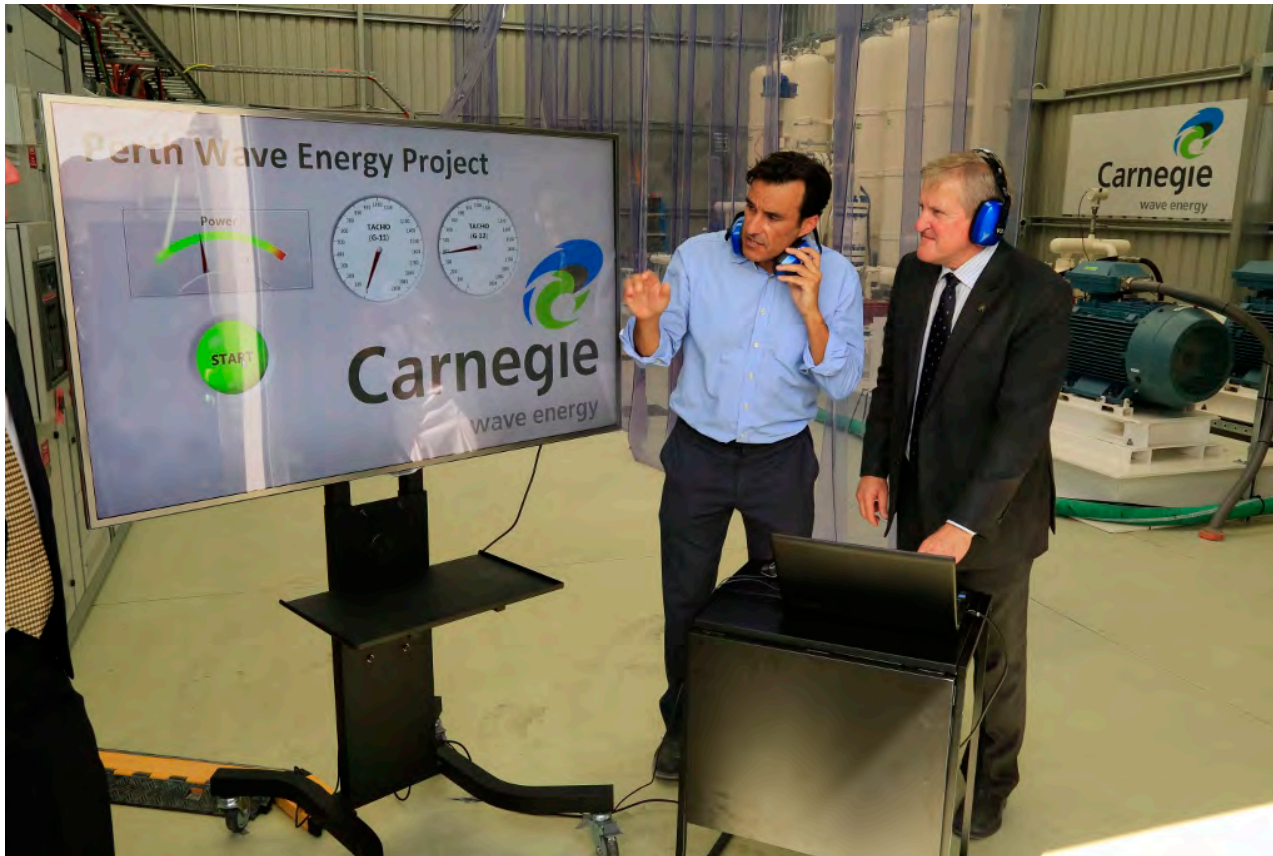


# Perth Wave Energy Project – assembly and testing





# Perth Wave Energy Project – operational



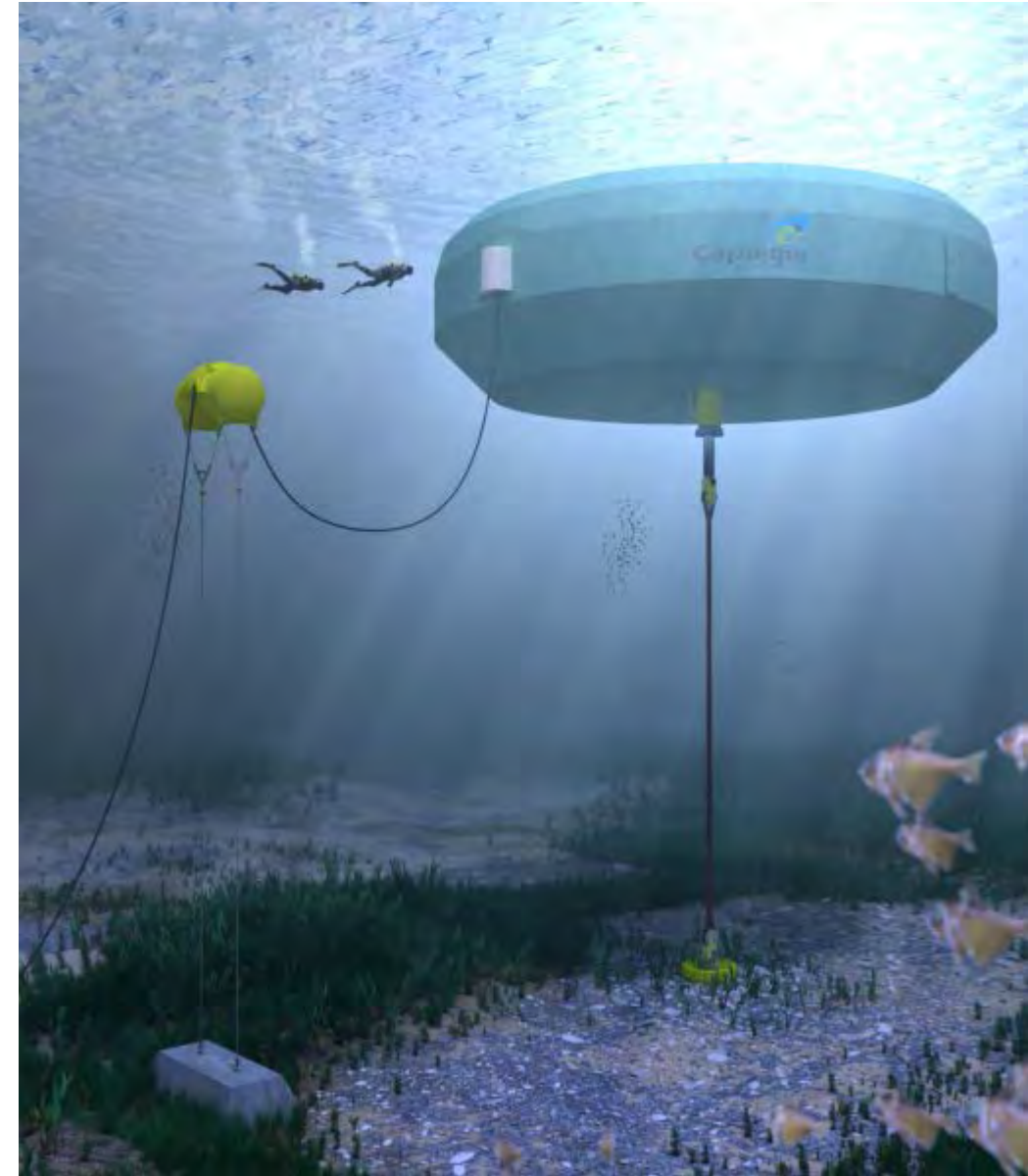
*Australian Minister for Industry & Science, the Hon Ian Macfarlane  
“switching-on” the Perth Wave Energy Project*



*3 x CETO 5 Units operating off Garden Island, Western Australia*

# CETO 6 Next Generation

- 1MW capacity target
- 4 x increase in rated capacity vs CETO 5 => ~50% increase in diameter
- On board power generation
- First commercial production design
- 3MW CETO 6 Project
- Location(s):
  - Garden Island, Western Australia
  - Wavehub, UK





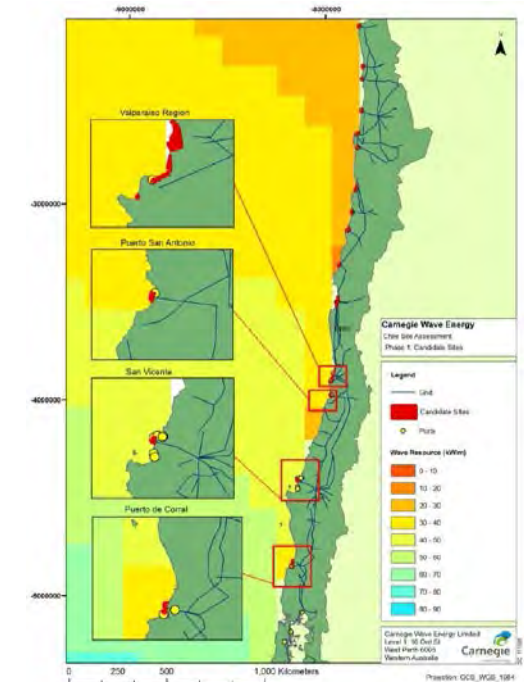
# CETO 5 Fully Dedicated Desalination

- CETO 5 hydraulic infrastructure fully dedicate to desalination
- 3 CETO 5 Units to power 1ML/day RO Plant
- Possible first location(s):
  - Chile (incl. islands)
  - Bermuda

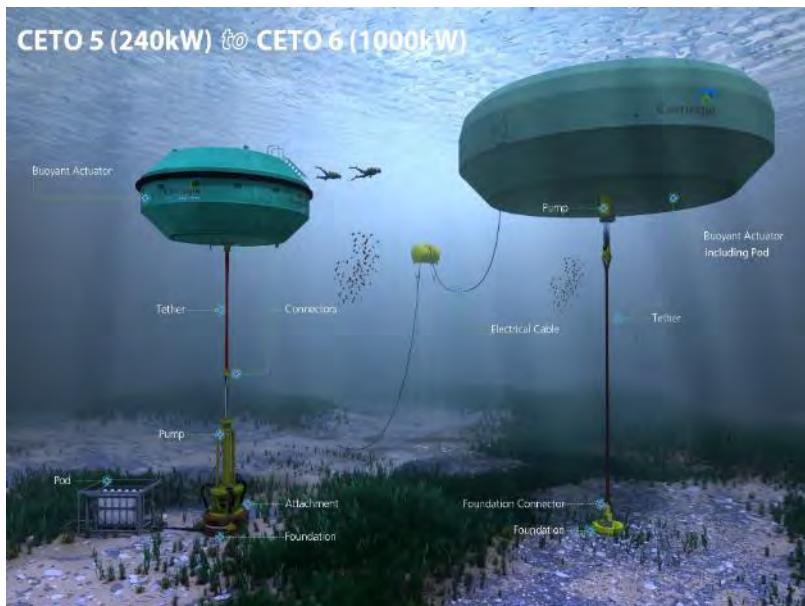
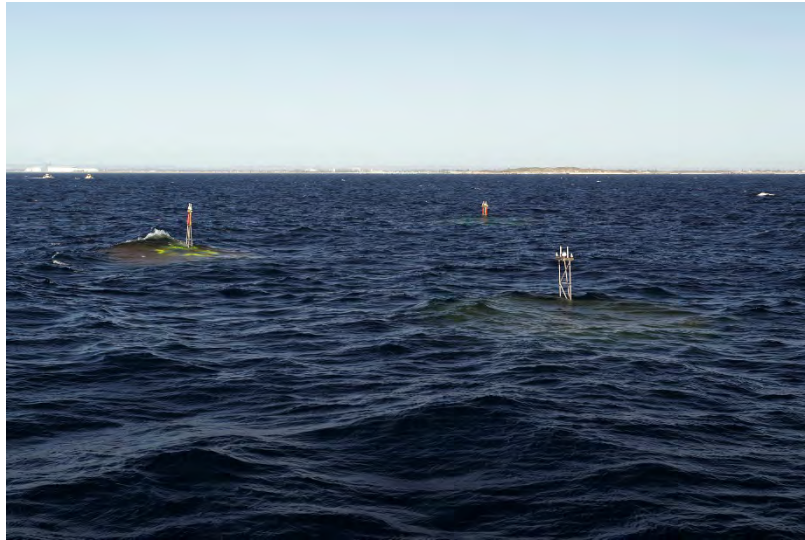


# CWE's development in Chile

- Chile is one of Latin America's fastest growing and strongest economies with a Gross Domestic Product (GDP) expected to grow at an average rate of 5% per year until 2018 (source: COCHILCO)
- With Energy and Water's demand expected to increase, Chile is rich with opportunities for renewable energy companies.
- CWE's development activities in the last 4-5 years:
  - Engagement of South American Development Manager (2010)
  - First assessment of wave & water resource and opportunities (2011 – 2012)
  - Completion of Chilean first site selection study (2011 – 2012)
  - CWE (Chile) subsidiary established (2013)
  - Agency Agreement with MAK Water Industrial (2015)



# Upcoming Milestones



## 2014:

- ✓ Construction & operation of the Perth Project
- ✓ CETO 6 project concept design and funding

## 2015:

- ✓ PWEF Construction Complete
- ✓ PWEF Grid Connection & Operation
- Commissioning of the Desalination Hydraulic Interface
- CETO 6 technology development
- Feasibility study and funds rising for a First South America Wave Desalination Project

## 2016/18:

- Construction of 3MW CETO 6 project (Western Australia & UK)
- EPC progress on the First South America Wave Desalination Project



# Some of the people we work with



Australian Government  
 Australian Renewable  
 Energy Agency

