



Offshore Renewable Energy Systems in a growing Blue Economy

Dr Mark Hemer

CSIRO Oceans and Atmosphere

CRC Offshore Renewable Energy Systems Program Leader

Transforming Australia's Blue Economy

- 🌊 Global Blue Economy value x2 by 2030, \$3t USD
- 🌊 A paradigm shift in how marine protein is produced is needed *now* – scalable, sustainable offshore aquaculture
- 🌊 Offshore renewable energy: solutions for off-grid applications
- 🌊 Offshore engineering: building on experience
- 🌊 This CRC brings together industry, R&D and government to develop compelling triple-bottom-line solutions



The Research Programs



#1 Offshore Engineering & Technology (\$67.9M)



#2 Seafood and Marine products (\$65.9M)



#5 Sustainable Offshore Developments (\$62.8M)



#4 Environment & Ecosystems (\$65.9M)

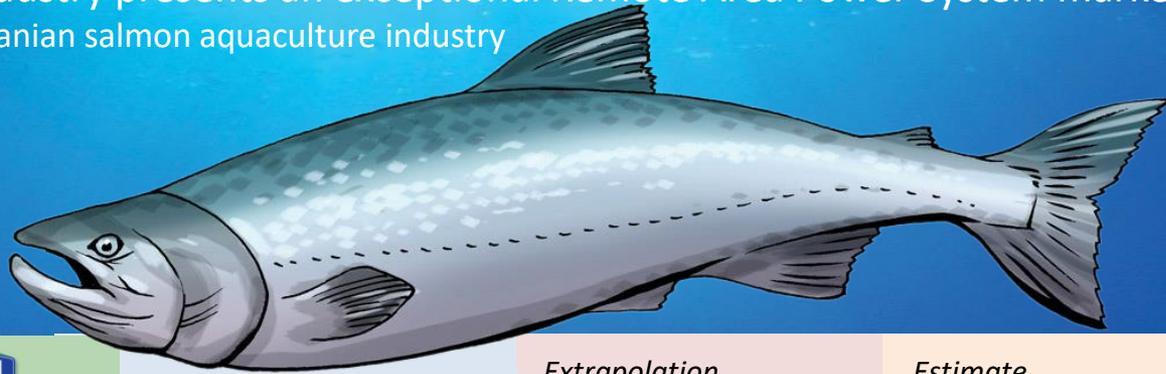


#3 Offshore Renewable Energy Systems (\$66.0M)



Energy Demand

Offshore industry presents an exceptional Remote Area Power System market
e.g., the Tasmanian salmon aquaculture industry



2018 TASSAL Production:
30883 HOG tonne

Energy demand:
14.34 GJ/HOG tonne

Diesel demand:
6.5 GJ/HOG tonne

Emissions:
1.04 T CO2e/HOG tonne

Extrapolation

TSGA 2018 Production:
~63000 HOG tonne

Energy demand:
253 GWh

Diesel demand:
115 GWh

Emissions:
66 kT CO2e

Estimate

**Annual Diesel
Expenditure:**

\$39m

Assumed diesel cost
\$AUD 340/MWh (Lazard, 2017)

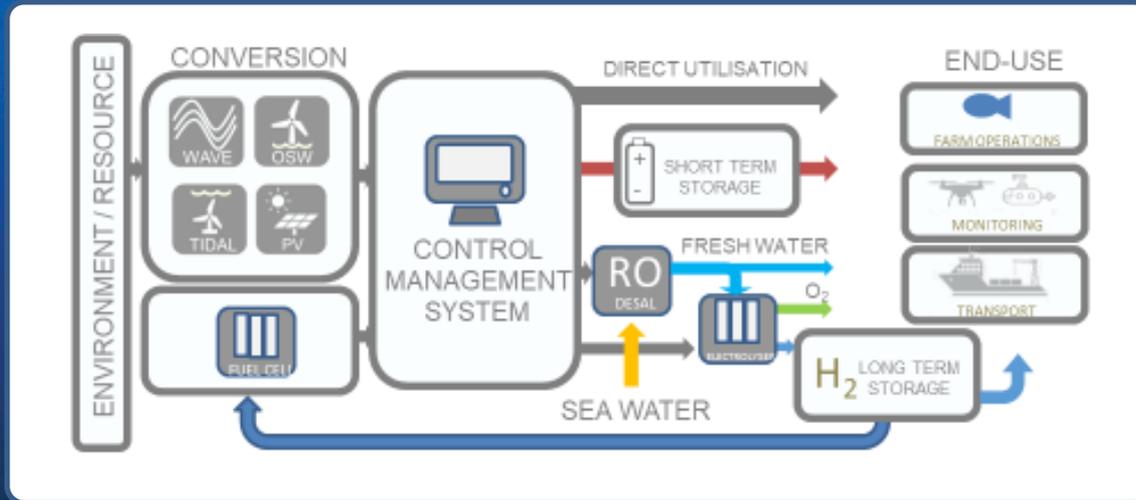
Diesel usage: Predominantly barge operations to service biomass, RO desalination and venturation

2030 Tasmanian Salmon Production Target: 100,000 HOG tonne (Norwood, 2017)

Program 3: Offshore Renewable Energy Systems

Objective:

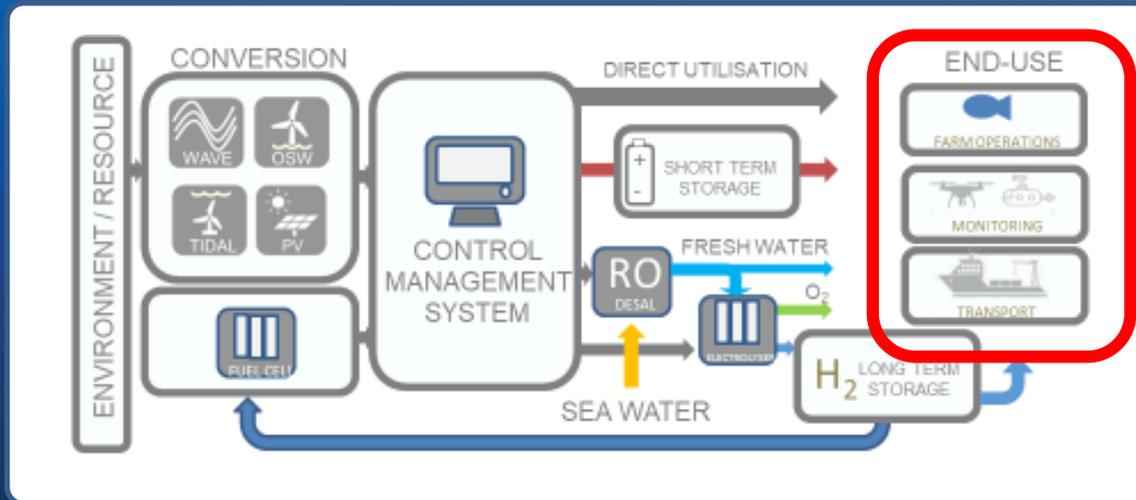
Identify, develop and demonstrate offshore renewable energy systems capturing generation, storage and control aspects optimised for co-located offshore operations.



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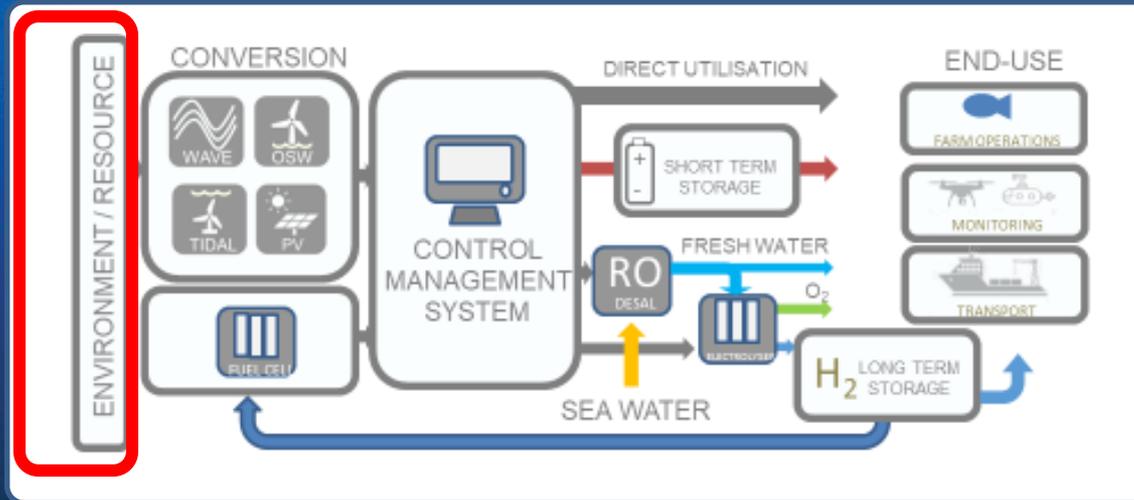
A: Energy demand:

Assess offshore industry energy demand - Market assessment; Energy demand modelling; Future scenarios.

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A: Energy demand:

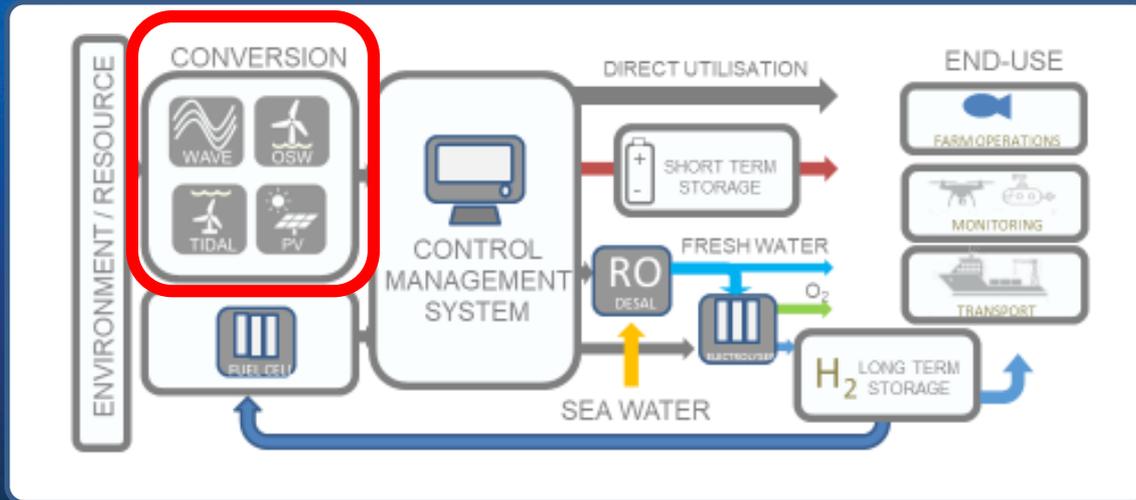
B: Energy availability:

Resource characterisation; Site optimisation; Resource prediction and Monitoring for Energy Management; Climate scenarios.

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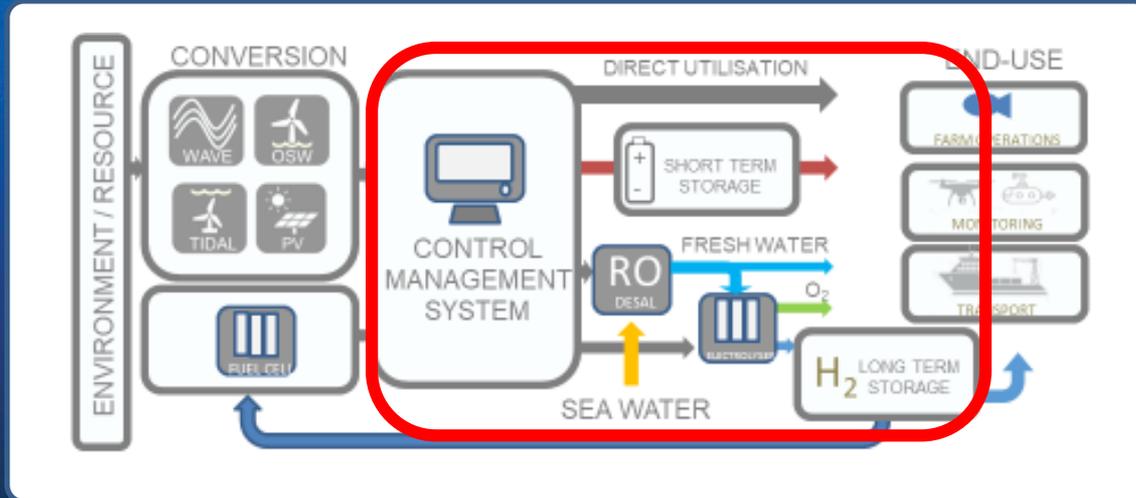
C: Conversion technologies:

Advance the design, performance, survivability, reliability and cost of Offshore Renewable Energy Converter (OREC) technologies (e.g., wind, wave, tidal, solar) with consideration of offshore industry end-user (e.g. aquaculture) requirements.

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A: Energy demand:

B: Energy availability:

C: Conversion technologies:

D: Control systems:

Developing energy management strategies and control systems for integrated offshore renewable energy systems (Hybrid systems; Energy storage, including hydrogen applications; intelligent control to balance generation and demand of e.g., power, freshwater, oxygen)

Expected Outcomes

MARKET OPPORTUNITIES



Australia is well positioned to deliver growth in offshore renewable energy systems in targeted global 'blue economy' markets through Asia and the Pacific.



Development of offshore renewable energy systems can contribute to necessary decarbonisation of Australia's offshore industry sector.



Construction, operations and maintenance requirements of an offshore renewable energy industry will create jobs and transition opportunity for other declining offshore industries.



EXPECTED OUTCOMES



Development and testing of marine energy conversion devices suited to offshore conditions that support energy export and storage, and that support aquaculture.

- » Support offshore aquaculture through supplies of lower cost energy and ancillary products.
- » Contribute to the cost of offshore infrastructure through the development of exportable energy carriers.
- » Design and development of renewable energy conversion devices; optimal offshore storage solutions and export products and micro-grid architecture solutions and control systems for intelligent management of integrated end-user demands.

Please get in touch if you have interest

<http://www.blueeconomycrc.com.au>



@blueeconomycrc

Email: Mark.Hemer@csiro.au