BLUE ECONOMY
COOPERATIVE RESEARCH CENTRE

10 September 2020

Tasmanian Government
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RE: Blue Economy Cooperative Research Centre (BE CRC) response to The Draft Tasmanian Renewable Energy Action Plan 2020 (TREAP)

The Blue Economy CRC appreciates the opportunity to provide feedback on the Tasmanian Government's Draft Tasmanian Renewable Energy Action Plan 2020.

The Blue Economy Cooperative Research Centre

Australia's blue economy is worth over $AUD 40 billion per annum and has been reported to be growing at a rate 3 times that of the rest of Australia's GDP (AIMS, 2018). Tasmania, as Australia's island state, has much to benefit from the growth of Australia's Blue Economy. The Blue Economy Cooperative Research Centre (BECRC) recognises the exceptional opportunity to develop sustainable energy solutions for offshore industries to meet multiple objectives: reducing emissions associated with Australian Blue Economy industries; accelerate development of emerging technologies; offering a transition industry with sustainable jobs for a declining offshore engineering sector; contributing to Tasmania's (and Australia's) future green energy export opportunities.

The Tasmanian based BECRC is the largest funded cooperative effort to-date in Australia, and for the first time brings together the aquaculture, offshore engineering and renewable energy sectors to assist in the development of new and emerging technologies, leveraging off Australia's comparative Blue Economy advantages. The BE CRC has received a Commonwealth grant of $70 million, and in addition its 40 participants (organisations) from industry, research and government have committed a further $157 million in cash and in-kind contributions. By drawing together the knowledge, skills and experience of 40 partners from industry, research and government, based around Australia and internationally, over a 10-year period, the Blue Economy CRC will enhance development of Australia's sustainable blue economy through the delivery of world-class, industry focussed research into integrated seafood and renewable energy production systems.

In particular, the Offshore Renewable Energy (ORE) Systems Program of the BECRC seeks to advance the technological and commercial readiness of emerging offshore renewable energy system technologies, so they can fulfil their potential to decarbonise societal demands. Amongst its many deliverables are a number of relevant specific milestones, such as:

- RP3.2 Development of Offshore Renewable Energy Converter (OREC) technologies to increase survivability and decrease environmental impact, capital and operating costs.

- RP3.3 Development of new and integrated technologies suitable for the offshore environment, leading to bench-scale demonstration micro-grid architecture, desalination, oxygen, hydrogen, ammonia and other storage solutions, derived from Offshore Renewable Energy Systems (ORES)
- RP3.4 Successful proof of concept through field demonstration of the operation of novel Offshore Renewable Energy Systems.

The Blue Economy CRC supports and is well placed to support the focus of *The Tasmanian Renewable Energy Action Plan* (the Action Plan), to (i) transform Tasmania into a global renewable energy powerhouse, (ii) Make energy work for the Tasmanian community; and (iii) Grow the Tasmanian economy and provide jobs. The BE CRC appreciates the opportunity to provide its views on the Action Plan.

The Blue Economy is made up of well-established (e.g., Marine and Coastal Tourism, Oil & Gas, Fisheries and Aquaculture, Shipping and Ports, Marine Observations) and emerging industries (e.g., Offshore Renewable Energy, Ecosystem Services, Marine Biotechnology). As the World's global Blue Economy is set to double to $USD 3T by 2030, Australia's competitive advantage (possession of the third largest Exclusive Economic Zone, strong offshore engineering sector, high value marine products) can support Australia to secure its position leading a sustainable Blue Economy, building on the current $AUD 40b sector.

The offshore renewable energy opportunity

Deployment of offshore renewable energy – particularly offshore wind, is increasing rapidly internationally, as a component of this rapidly growing blue economy. The UK Government recently (August 2020) released revised costs of energy technologies, indicating LCOE of offshore wind is now less than that of all fossil fuel derived energy, and is anticipated to become cheaper than onshore wind by the mid 2030's, owing the relative strength and consistency of resource, and the mega-turbines able to be deployed offshore (BEIS, 2020).

The High Level Panel for a Sustainable Ocean Economy, a unique initiative of 14 serving world leaders building momentum towards a sustainable ocean economy, of which Australia is a signatory represented by the Prime Minister's Office, recently released a report presenting the benefits and costs of a sustainable ocean economy (HLP, 2020). They found that for every $1 invested in key ocean actions (including offshore renewable energy, conserving, and restoring mangrove habitats, decarbonising international shipping, and increasing production of sustainable aquaculture, $5 in global benefits could be returned. Across these sectors, investment in offshore renewable energy was identified as capable of yielding the highest triple bottom line (economic, environmental, and social, including job creation) returns of $12 for every $1 invested.

Offshore renewable energy technologies include Fixed and Floating Offshore wind technologies, wave, tidal, and floating solar, amongst others less prospective for Tasmania. Globally, offshore wind (OSW) is now a commercial industry, which has seen market growth of on average 21% per year since 2013, with over 25 GW of installed capacity globally, making up 8% of total new wind installations (GWEC, 2019).

Oft-cited global renewable energy technology leaders including Germany, the EU, the US, Japan and the UK have set out long-term, strategic approaches to technology innovation and deployment programs. Each of these plans outline strong OSW targets for 2030:

- Germany has set a 20GW by 2030 (12.5% share of generation) for OSW, despite their limited EEZ jurisdiction (BMWI, 2020).
- The EU is set to harness 35% of its energy from offshore sources by 2050 (EU, 2020), and is set to outline its offshore wind strategy in October 2020. It is anticipated this will have a target in excess of 250GW by 2050 to align with the EU Green Deal.
- Less mature than Europe, several US states have set OSW targets, combining to over 8GW installed capacity by 2030 (IRENA, 2019)
- In November 2019, Japan passed a new bill enabling wind farms to operate in Japan waters for up to 30 years, outlining a long-term commitment to the sector, and an industry target to deploy 10 GW by 2030.
- The UK Government OSW Sector Deal outlines a plan to develop up to 30GW of offshore wind in the UK by 2030 (30% of demand, UK Govt, 2019).
- China deployment of OSW now currently exceeds that of UK and Europe combined, with installed capacity expected to exceed Europe by 2030 (Sherman et al., 2020).

Despite inherent uncertainties in the future global energy landscape and technology development, these targets illustrate a clear trend towards ORE generation, reflecting the distinct advantages offered by OSW resource and technologies to support a stable, secure national energy system, achievable as a result of large-scale reduction in LCOE observed in the sector.

Adjacent to Australia's coasts, Australia possesses immense high quality, temporally consistent OSW resources accessible to floating offshore wind technologies, with a generation potential of approximately 25 PWh/yr (equivalent to that of Europe, US , Japan and UK combined (Eurek et al., 2017). Australia's highest quality offshore wind resources are adjacent to Tasmania's coasts.

OSW resource advantages are reflected in reported capacity factors. Capacity factors for onshore wind farms in the EU average 24%, with new farms reaching 30-35%. Offshore farms have a capacity factor averaging 38%, with new farms reaching 35-55% (an increase of more than 50%; Energy Industry Review, 2019). The capacity factor of Australia's onshore wind farms are reported between 28-38% (AER, 2019). Australia's offshore wind resources would see farms with capacity factors exceeding 55%. This consistency of resource, particularly of Tasmania's available resource, represents significant opportunities to contribute to Tasmania's ambitious renewable energy target. With limited areas of shallow continental shelf accessible to fixed platform OSW turbines, Australia's OSW opportunities lie with floating technologies. BECRC participants include floating offshore wind technology developers and is supporting development of their technology for Australian application.

The Expert Group of the High Level Panel for a Sustainable Ocean Economy, to which Australia is participant, report that ocean based climate action can deliver up to 21% of the annual GHG emissions cuts required by 2050 to limit temperature rise to 1.5degC. Deployment of ORE technologies was identified as the dominant mechanism by which these objectives could be met (accounting for approximately half of the identified cuts), and consequently called for a scale up of deployment (HLP, 2019).

The 10-year BECRC aligns with the UN Decade of Ocean Science for Sustainable Development; and a critical period of necessary emission reductions for Australia and the World to meet its emission targets. This

presents opportunity to leverage Tasmania's immense ocean science activity to support emergence of a sustainable ocean energy industry in Australia.

The Draft Tasmanian Renewable Energy Action Plan

We welcome the Action Plan's openness to welcome all forms of renewable energy technology, as it builds towards the Tasmanian Renewable Energy Target set for 2040. However, the ***BECRC wishes to highlight the exceptional opportunity available to Tasmania to develop its offshore renewable energy resource.*** Australia arguably has the world's largest ORE resources, and Tasmania is blessed with the best of those. Tasmania's offshore wind, wave, solar and tidal resources far exceed the energy demands targeted in the Action Plan, and offer distinct advantages in a distributed energy system, being more consistent, more predictable, and out-of-phase (temporally, and geographically separated) with other variable forms of renewable energy identified in the Plan.

The BECRC recognises offshore industry as an exceptional offshore remote area power system opportunity. Offshore operations in the blue economy are disproportionately dependent on high emission, expensive diesel generation. Liquid fuels currently represent a significant portion of Tasmania's energy demand and contributor to total emissions. The BECRC recognises the versatility of green hydrogen to meet demand of offshore industry, to firm power delivery in a remote hybrid hydrogen microgrid, and as a potential fuel for shipping and other offshore industry activities. Building an offshore green hydrogen production and supply chain to meet the needs of Tasmania's rapidly expanding blue economy is a priority for the BECRC. Development of these offshore components of hydrogen distribution will be integral as Tasmania seeks to contribute hydrogen into larger scale export market opportunities.

These offshore, off-grid operations represent a pathway market for which early stage offshore renewable energy technologies will be cost-competitive at an earlier stage of maturity. This allows these technologies to demonstrate their performance, and advance their technological and commercial readiness, to ultimately be cost-competitive in utility scale markets.

Tasmania, through the BECRC and its over 40 participants including CSIRO, the Australian Maritime College, University of Tasmania and many industrial partners, is incredibly well positioned to support development of an offshore renewable energy sector in Tasmania. Through strong connections with leading international offshore renewable energy research and development sectors, the BECRC's world-leading R&D strengths can maximise Australia's role in a global shift to a sustainable blue economy. This includes not only strengths in developing clean ORE technologies, but also to assist in the development of systems to manage and plan for sustainable operations in Australia's EEZ, monitoring and planning interactions with other sectors, supporting the growth of manufacturing supply chains and associated job creation, and assessing the costs and benefits for communities, the environment, health, maintenance and performance of species, and infrastructure. Capturing the BECRC's offshore renewable energy systems R&D interests within the proposed Renewable Energy Centre of Excellence, will enable a fully integrated perspective on future energy solutions for Tasmania.

Deploying overseas technology will not be a passive process. As recognised in the Roadmap, effective local deployment will require tailoring of technologies to domestic circumstances and changing local regulations to remove barriers to deployment. The BECRC seeks to identify appropriate policy frameworks, address

marine spatial planning requirements, tailor technologies for Australian circumstances, assist growth of the Australian supply chain, to support development of an offshore renewable energy industry and associated jobs in Australia. An offshore renewable energy sector provides a sustainable transition industry for other declining offshore industry sectors, that has potential to grow job opportunities in Tasmania.

The Blue Economy CRC's 10-year research program is clearly aligned with *Tasmania's Renewable Energy Action Plan,* complementing and extending commitments to short, medium and long term initiatives through ongoing development of low emission technologies and piloting practical application of these technologies in Australia's blue economy.

This feedback has been provided through consultation with the Research Director, Professor Irene Penesis, and Research Program Leaders, Dr Mark Hemer (CSIRO) and Professor Marcus Haward (University of Tasmania).

Should you wish to discuss any of the feedback with the BE CRC, please do not hesitate to contact me by email at John.Whittington@blueeconomycrc.com.au or by phone on +61 439 335 429.

Yours sincerely,

Dr John Whittington

Chief Executive Officer, Blue Economy CRC

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