Climedec Technology Uses Seawater Desalination Discharge for Hydrogen Storage and Manufacturing CO2 Containing Products

SYDNEY, NEW SOUTH WALES, AUSTRALIA, May 31, 2021 /EINPresswire.com/ -- Technologists at Pact Renewables Pty Ltd have developed a unique zero waste technology platform that uses minerals and metals recovered from reject brine of seawater desalination plants for solid-state storage of hydrogen energy and beneficial use of carbon dioxide for the manufacture of degradable products in an integrated process loop. The technology, known as Climedec, offers the potential to facilitate global efforts to transition from a fossil fuel to a hydrogen economy.

Climedec is driven by a proven saline water and wastewater processing core technology, developed by Dr Aharon Arakel and his team which was piloted at several sites, publicly demonstrated and first licensed in 2000. The technology development efforts have also heavily benefited from Dr Arakel's involvement in global carbon capture and storage (CCS) as well as hydrogen storage technology development projects. Since the inception of the project, the core technology has undergone substantial improvements and is now integrated with complementary technologies which collectively comprise the Climedec technology platform. These complementary technologies enable production of high purity magnesium metal for safe storage of hydrogen energy, specialty potash salts for use in the manufacture of alkaline fuel cells, and integrated production of high purity water in a solar membrane distillation process for use in hydrogen electrolysers. Other proprietary technologies of the platform enable production of mineral-based composites that, once reacted with carbon dioxide (CO2), produce specialised feedstock materials for the manufacture of a wide range of degradable industrial and agricultural products, and consumer goods.

Central to this enabling technology is the beneficial use of massive volumes of reject brines from numerous seawater desalination plants around the globe and CO2 gas from future CCS projects in scalable closed-loop production facilities, using conventional mineral processing equipment.

Aharon Arakel, the director and chief technologist of Pact Renewables said, "Through extensive process and product trials over several years we have confirmed that CO2 gas, when reacted with our proprietary mineral based composites, can produce functional feedstock materials for manufacturing wide-ranging industrial/agricultural products and consumer goods. Interestingly, these products perform equally or even better than their plastic-based counterparts, and being degradable, they eliminate the need for landfilling or incineration after their useful life. More importantly, our feedstock materials are highly flexible, whilst being dimensionally stable, thus

they offer enormous opportunities for product design rethinking in order to conform with stringent Extended Producer Responsibility (EPR) guidelines being introduced globally."

Dr Arakel went on to say, "Our technology addresses three challenges facing mankind for timely transition from a fossil fuel to a hydrogen economy. Firstly, seawater is an infinite source of metals and minerals which would otherwise need to be extracted from mines with limited reserves. Secondly, the options for solid storage of hydrogen energy and incorporating CO2 from future capture processes in useful products is increasingly being recognised globally as a sustainable approach for decarbonising the climate. Finally, almost 3 billion people experience some form of water scarcity and seawater desalination is expected to grow to fill the water shortage. Using brine discharge from desalination provides both a source of metals and minerals and a means to reduce negative environmental impacts on coastal ecosystems.

Dr Arakel went on to conclude, "We are very pleased with our progress with developing Climedec as a sustainable technology with measurable impactful outcomes, and are currently assessing the application of the technology for large-scale carbon farming. We will soon commence seeking strategic partners to accelerate further development and demonstration of this technology platform for commercial deployment. We are keen to partner with organisations having a strong drive to address the impacts of climate change and vested interest in renewable energy and water supply who can provide us with a powerful voice and guide our efforts in turning Climedec into a viable tool for climate decarbonisation."

About Pact Renewables Pty Ltd

Pact Renewables is a private company with a business focus on developing sustainable environmental technologies with impactful outcomes. The Company is at the forefront of waste-to-product technologies for value adding and waste minimisation. Based in Sydney, Australia, Pact Renewables is actively participating in eco-innovation as a pillar of sustainable development by leveraging its IP capital and technical expertise for pursuing selected technology development and commercialisation opportunities through various partnership arrangements.

Aharon Arakel
Pact Renewables Pty Ltd
+61 2 9484 4274
aharon.arakel@pactrenewables.com