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GreenBlu Receives \$1.6 million in U.S. Energy Dept. funding to commercialize adsorption desalination technology

New technology to make zero-carbon, zero-discharge desalination and wastewater treatment affordable

June 20, 2018, Hamilton, NJ – GreenBlu, Inc., a water technology start-up commercializing Vapor Adsorption Distillation with Energy Recycling (VADER), a new thermal distillation technique, announced it has been selected to receive a \$1,600,000 award from the U.S. Department of Energy Solar Energy Technologies Office (SETO) to advance solar-thermal desalination technologies, which can reduce the cost and expand the market for creating freshwater from otherwise unusable waters. This award will advance the development of GreenBlu’s new technology, culminating with a scaled demonstration prototype of a commercial product.

GreenBlu’s newly patented technique uses a water vapor adsorbent to improve energy efficiency, overcome the top brine limit, and enable zero-liquid-discharge desalination and water treatment. GreenBlu’s VADER cycle is the only adsorption technology that recycles thermal energy repeatedly, and is estimated to drastically reduce electrical consumption and triple thermal energy efficiency compared to current methods. Using a highly-efficient, thermally-powered method to remove moisture from an input solution will allow GreenBlu to dramatically lower the cost of zero-carbon desalination, zero-liquid-discharge (ZLD) wastewater treatment, and seawater mineral recovery. The SETO award provides a crucial source of funding as GreenBlu readies this technology for commercialization.

“With this SETO award, we will build a water-producing demonstration prototype that will prove not only the efficacy of our new distillation method, but also that desalination can be free from drawbacks,” said Dr. Howard Yuh, CEO and co-founder of GreenBlu.

Prevailing methods of desalination are either electrically-powered, or use both electricity and a large amount of thermal energy. These methods cannot be deployed to solve global water scarcity due to high-cost, a need for electrical infrastructure, carbon emissions from electrical generation, and concentrated brine discharge. GreenBlu is commercializing a new distillation cycle using a newly patented low-cost, nanocomposite adsorbent material to address all of these drawbacks. Powered by solar or waste heat, GreenBlu’s VADER cycle extracts pure water vapor from any input. GreenBlu’s modular product will be packaged in easy-to-deploy shipping containers and will provide low-cost, zero-carbon, zero-discharge desalination while recovering valuable $MgCl_2$ and $NaCl$ salts from both seawater and waste brine from other desalination techniques. Adsorption can fully dry an input stream, so this technique can separate high-concentration wastewaters to a solid while producing highly purified distilled water. Desalination is expected to grow quickly due to increased water scarcity; using thermal energy for desalination will allow solar electricity to fulfill the purpose of displacing fossil fuels and the electrification of transportation.

SETO has selected 14 projects in its [Solar Desalination](#) program to reduce the cost of solar-thermal desalination by performing integrated tests on best-in-class, near-commercial desalination systems that produce repeatable results with clear and quantifiable objectives. Electricity costs account for up to half of the operating expenses for today's desalination operations and require plants to be grid-connected. Using solar-thermal power and low-cost components for integrated designs can enable smaller, more portable systems and expand access to desalination technologies.

"We are very intrigued by the promise of your container based distillation system provides to utilize abundant and cost-effective local energy resources, either sunlight or waste heat from power production, to produce pure water for drinking or industry... Moving away from diesel-driven and chemical-dependent water treatment will not only improve the health of our customers, reduce their dependence on expensive imported fuel, but also reduce the cost of water," commented Mr. Pontierno of Roma Caribbean Hotel and Restaurant Supply Ltd.

Although still early in the development cycle, GreenBlu is optimistic towards possible future applications of adsorption technology including: 1) a distributed, solar desalination water network, 2) retrofitting existing thermal distillers reaching end-of-life, 3) providing a sustainable source of magnesium to improve transportation efficiency.

About GreenBlu

[GreenBlu](#) was founded in 2016 to commercialize adsorption desalination and water treatment. We are passionate about developing a zero-compromise solution for the immense clean water scarcity challenge with advanced but practical technology affordable to all. The team at GreenBlu has garnered several awards, including being one of four top prize winners at the [2016 CleanTech Open Northeast](#) business accelerator, winner of the Water Distinction prize at the 2017 CleanTech Global Forum, one of six teams to be chosen for the UC Berkeley [Cleantech to Market](#) (C2M) program in 2017, and a recipient of the Bureau of Reclamation's [Desalination and Water Purification Research](#) grant in 2017.

About the Solar Energy Technologies Office

The U.S. Department of Energy Solar Energy Technologies Office supports early-stage research and development to improve the affordability, reliability, and performance of solar technologies on the grid. Learn more at energy.gov/solar-office.

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