# Boeing, Etihad Airways, Honeywell and Masdar Institute to Establish the First Integrated, Sustainable Bioenergy Research Project for Aviation

## Pioneering system using seawater and desert for bioenergy to be located in Abu Dhabi

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ABU DHABI, United Arab Emirates, Jan. 18 /PRNewswire-FirstCall/ -- Boeing (NYSE: BA), the Masdar Institute of Science and Technology, Etihad Airways and Honeywell's UOP today announced an agreement to establish a major research institution and demonstration project in Abu Dhabi dedicated to sustainable energy solutions. The Sustainable Bioenergy Research Project (SBRP) will use integrated saltwater agricultural systems to support the development and commercialization of biofuel sources for aviation and coproducts.

As part of its initial work statement, the SBRP will undertake research projects that combine the arid, saline-rich environment of Abu Dhabi with innovative saltwater farming practices. The Masdar Institute will host the SBRP and provide laboratory and demonstration facilities both within and outside of Masdar City, which aims to be the world's first zero-carbon city.

"Together with the Abu Dhabi government, Etihad Airways and other industry leaders, we are forging our energy future by developing a renewable fuel supply now, not when fossil fuels are depleted," said Jim Albaugh, president and CEO of Boeing Commercial Airplanes. "Developing and commercializing these low-carbon energy sources is the right thing for our industry, for our customers and for future generations."

Etihad Airways Chief Executive Officer James Hogan said, "The development of carbon-neutral sources of energy is of major importance to Etihad Airways and the aviation industry. We are delighted to be a key member of the Sustainable Bioenergy Research Project, which will be based in Abu Dhabi and will be one of the most innovative schemes of this nature in the world. The SBRP findings will be of great use to Etihad Airways as we look to reduce the use of conventional fossil fuels and to develop a commercially viable alternative that is also able to meet the sustainability principles that we have committed to as a member of the Sustainable Aviation Fuel Users Group."

"The paradigm for energy supply is shifting. To meet the growing demand for energy worldwide, we must identify regional biofuel solutions that are not only sustainable but can actually regenerate the ecosystems where they are generated," said Jennifer Holmgren, vice president and general manager of Renewable Energy & Chemicals for Honeywell's UOP. "This project is a unique opportunity to showcase the viability of a geographically optimized solution and the availability of solutions that produce high-quality, green transportation fuels."

The integrated approach uses saltwater to create an aquaculture-based seafood farming system in parallel with the growth of mangrove forests and salicornia, a plant that thrives in salty conditions. This closed-loop system converts what would otherwise be problematic aquaculture effluent in seawater into an affordable, nutrient-rich fertilizer for both plants. These biomass sources can then be sustainably harvested to generate clean energy and to create aviation biofuels and other products. Developing low-cost, nonpetroleum fertilizers is one of the keys to achieving genuine carbon emissions reductions from any biofuel source.

As an independent research university working in renewable energy development, the Masdar Institute (www.masdar.ac.ae) will lead SBRP operations, bringing strong scientific guidance to the project. According to Masdar Institute Provost Dr. John Perkins, "This project demonstrates the Masdar Institute's strong desire to establish a world-class university dedicated to alternative energy, environmental technologies and sustainability. This project will for the first time demonstrate the commercial viability of using integrated saltwater agriculture to provide biofuels for aviation, and it is consistent with the overall vision of Abu Dhabi to achieve a 7 percent target of renewables by 2020."

The evolutionary seawater farming concept has been pioneered by Dr. Carl Hodges of Global Seawater, Inc., who has been engaged as a special adviser to the project, which will take place over an area of approximately 2 square kilometers (0.8 square miles).

Sustainable biofuel development is a key element of aviation's strategy to reduce carbon emissions. The SBRP will only research biomass sources that do not distort the global food chain, compete with fresh water use or lead to unintended land-use change. All phases of biomass cultivation for the project will be tested against the practices and principles developed by the Roundtable on Sustainable Biofuels and supported by members of the Sustainable Aviation Fuel Users Group (www.safug.org).

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