To: Council Members

From: Staff

Date: March 6, 2020

Subject: Presentation on Ocean Current Energy – Michael Bornstein, City Manager, City of Lake Worth Beach

Background

The City of Lake Worth Beach in Palm Beach County is a coastal community with Atlantic Ocean beachfront and its own electric utility. Offshore, the Gulf Stream current runs between the Florida coast and the Bahamas and offers an excellent area to explore the generation of electricity using ocean currents. The City of Lake Worth Beach is partnering with FAU’s Southeast National Marine Renewable Energy Center to create an ocean current energy facility connected to the City’s electrical grid.

At staff’s invitation, Lake Worth Beach City Manager Michael Bornstein will provide a briefing about the City’s Ocean Current Energy initiative.

Recommendation

For information only.

Council Action – March 13, 2020

Attachment
The US Department of Energy (USDOE) and the Southeast National Marine Renewable Energy Center (SNMREC) located at Florida Atlantic University (FAU) have been working together for over 10 years towards commercialization of electricity generation from ocean currents. They have determined that the Gulf Stream off the coast of Florida is one of the world’s most accessible and viable locations to begin generating electricity.

The City of Lake Worth Beach joined the collaborative effort in 2017 as the onshore recipient of the electric generation due to its closest land fall proximity to the Gulf Stream; ownership of its own municipal electric utility; and its near shore outfall pipe infrastructure.

New Industry Cluster For State of Florida

There are currently 9 companies, domestic and international, who are negotiating with Lake Worth Beach about getting their devices in the water; all require a mooring to the ocean floor with connections to cables that transmit the electric current back to shore.

While Lake Worth Beach may become the first to effectively use ocean current energy, the goal is to have this technology adopted by Investor Owned power companies.

After Lake Worth Beach has fulfilled the intermediary role of proving the viability of this tremendous offshore resource, companies such as Florida Power and Light should begin developing sites of their own.

5 Year timeline to power first light bulb from test units

The project is in the initial phases of the required permitting process. The data for an underwater land lease is being pursued by application with the Bureau of Ocean Energy Management (BOEM) and a permit to run electric cables on the ocean floor with the Federal Electric Regulatory Commission (FERC).

Financial First Steps

While the state of North Carolina is currently the only state investing approximately $2 million a year in ocean current energy, the North Carolina funding is earmarked for research & development only. The City of Lake Worth Beach/FAU/SNMREC collaboration is for actual commercialization of electric generation.

We are requesting $3.5 million dollars to fund the necessary and critical first step towards actual permitting by conducting and completing the environmental ocean floor and impacted marine life study.

Consistent Power Production

4-6 Gigawatts of Safe Clean Power

Equivalent of 2 or 3 Nuclear Power Plants

Based on a Georgia Tech study commissioned by the U.S. Department of Energy, it was determined that capturing just one thousandth of the volume of water in the Gulf Stream Current would equate to 4-6 gigawatts of electricity. That is enough power to light up 4.14 million homes. Or that would equal 2.3 nuclear plants worth of power; it could supply 3% of the entire state of Florida’s annual electricity demand!

Consistent Power Production

20 Megawatt Production Field With Room To Expand

City Engineers selected a site located 15 miles offshore directly east of the City’s public beach. The area is aligned so that it is within the strongest and most consistent flow of the Gulf Stream. The cables that will connect the offshore generators to our grid will be on the seabed and then will go underground our beach.

The current configuration allows for a 20 megawatt production field with room to expand. There will be multiple berths for companies to connect and conduct R&D and eventually full scale electric generation. Electricity can flow back into the City’s grid and become part of the energy consumed by the city’s residents and customers.