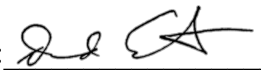
The Future of Texas Offshore Wind: An LCOE Comparison

William David Swales, M.A.

The University of Texas at Austin, 2022

Supervisor: David Eaton

Signature: 

Offshore wind energy can generate renewable energy and already has been implemented as an electricity source in Northern Europe. While some in the United States (US) have been reluctant to embrace offshore wind power, the current US administration has advocated increasing East-Coast offshore wind power generation to up to 30 gigawatts (Eilerin and Dennis, WP) to help meet growing demand. Texas already generates approximately 20 percent of its electricity from onshore wind turbines (energy.gov). Why has there been no substantial offshore wind energy generation along hundreds of miles of available coastline on the Gulf of Mexico.

This study reports on the levelized cost of energy (LCOE) of offshore wind and compares those costs to natural gas combined cycle electricity to examine the comparative costs from those sources through 2050. Such an analysis does not deal with the full costs, benefits, and risks of offshore wind generation, nor does it define the full range of demand and supply options for Texas' electricity supply options. This LCOE approach seeks to understand competitive costs of and offshore wind energy versus natural gas, based on data from the Energy Information Agency and other sources. Future simulations indicate that there is uncertainty as to whether offshore wind energy on the Texas Gulf Coast will compete with natural gas electricity prices by 2050, based on comparative costs. One source of ambiguity is alternative definitions of offshore wind LCOE prices based on federal government and private sector estimates (Shah, 2020).

Texas needs more reliable and stabled electrical energy capacity to meet demands of a rapidly growing population in one of the fastest growing states in the country. The recent winter storm in Texas exposed the vulnerability of Texas' electrical grid. An offshore wind industry could provide much needed security to Texas energy future, but only if represents a wise investment. This study identifies some factors that could influence an investment in Texas offshore wind sources.