

3.2 Kincardine Phase 2

The Kincardine Phase 2 floating OSW project is being developed by Cobra Group and is currently under construction. It is located 9.5 miles off the coast of Aberdeen, Scotland, and consists of five 9.5 MW turbines, for a total project size of 50 MW. The substructure is a PPI WindFloat steel semi-submersible foundation anchored in approximately 200 ft of water.

One unit is complete and has just been anchored in place. The other two foundations are currently being built at the Navantia Shipyard, Port of Fene, Spain. These fabricated foundations will be loaded onto a semi-submersible vessel and floated off. The foundations will then be towed approximately 780 nm to the quay at the Maasvlakte Quay, Port of Rotterdam, Netherlands where the turbine components are being installed on the foundation. The fully assembled structures will then be towed approximately 380 nm to the installation. Figure 3-2 shows the first foundation being towed to the installation site. As the foundation and turbine structures are constructed, the mooring supply is being assembled at Port of Aberdeen.



**Figure 3-2: Completed Kincardine Floating Turbine Being Towed to Installation Site
(Source: Cobra Group)**

3.3 European Fabrication and Installation Methodology

For both projects, multiple port facilities were utilized to perform the fabrication of the foundations and installation of the components onto the foundations. The transfer towing distance between these ports, as well as to the installation sites, was significant. This methodology involved multiple tow legs and double handling of the foundations.

It appears the two projects were utilizing available port infrastructure with the required capabilities to create a workable supply chain for the required tasks. The units were successfully installed; however, the movement of the components to multiple port facilities may have added cost and time to the fabrication and installation process.

3.4 Recommended Improvements

Efficiencies in this process can likely be created via the consolidation of fabrication and assembly activities in one port location. Under this scenario the foundations would be fabricated, placed into the waterway, and the WTG components installed onto the foundations at one location. This methodology eliminates the double handling and increased transit time of the foundation elements and could, therefore, significantly reduce costs. The criteria for floating OSW ports discussed in Section 4 reflects this single port approach.

Construction of the foundations, as well as attachment of the WTG components to the foundations, in a graving dock is possible. However, there are currently no graving docks in the state of Maine of the size required. Construction of a graving dock with required internal pumping systems and sealing caisson was considered prohibitively expensive. This methodology has, therefore, been ruled out.