MORAY EAST
OFFSHORE WIND FARM

Moray Offshore Windfarm (East) Limited

Supply Chain Plan

Annex 7 – M3 Programme

edp renewables
powered by nature

M3 Programme

Evidence for SCP main report section Evidence for the EDPR M3 programme, SCP main report sections 4.3.8, 4.3.9, 5.8.5 and 5.8.6.

INCREASING EFFICIENCY, REDUCING OPEX/MW -2%

In parallel with the top-line initiatives, the company focuses on strict cost control efforts to improve efficiency and gain additional profitability. Leveraging on the experience accumulated over time and its past performance (Opex/MW -5% CAGR 2010-2013), EDPR has set an ambitious to further reduce Opex/MW by -2% CAGR 2013-2017, despite the natural aging of its installed asset base. To achieve this target EDPR has developed a plan to tackle the main manageable costs in its costs structure. With regards to O&M, representing c. 30% of total Opex, EDPR expects to continue to obtain gains from its M3 system once wind farms are not subject to initial warranty contracts. With regards to SG&A and Personnel Costs, representing c. 50% of total Opex, the focus is to maintain a strict control plant to fully benefit from the economies of scale of a growing company. Levies, representing c. 20% of total Opex is basically non-manageable and increased in recent years, mostly penalised by the introduction of new taxes in some countries.

M3 PROGRAM AND SELF-PERFORMANCE

As EDPR's fleet becomes more mature the initial Operations and Maintenance (O&M) contracts with the turbine suppliers expire. When that happens the company needs to decide between renewing the maintenance service and taking the risk and operate the wind farm on its own, whilst maintaining high levels of availability.

The M3 (Modular Maintenance Model) program answers that question. Based on EDPR's expertise, our O&M teams will decide on the optimal balance between external contractors and in-house maintenance. Usually, EDPR keeps control of high value-added activities such as maintenance planning, logistics and remote operations while outsourcing, under direct supervision, people intensive tasks.

This methodology resulted in estimated savings of around 20% in the wind farms where the M3 system was implemented, which account for 40% of Europe's fleet.

On its turn, in the US the Blue Canyon V wind farm started its own pilot O&M program and is now fully operated by EDPR without any external help, immediately showing savings in operational expenses. Following this success other American plants will follow this model.

An extraordinary example of the new efficiency achieved by the M3 program is the time needed to replace major components, which have being reduced from 5 months to 3 days.

A new 2,000 square meter warehouse located in Castejón, Spain, is serving all the European countries.

INCREASING TURBINE PRODUCTION

EDPR is also creating value by improving its assets implementing new technologies on the turbines to boost the power output without requiring major component changes. EDPR's Performance Analysis teams are collaborating with the manufacturers to determine the best practices to apply this new technology.

By monitoring real-time conditions, the rotational speed of the generator can be increased while staying within the existing loads envelope, thus increasing the power output. The extra output increases the revenues of the wind farm, without major investments needed. This technology has successfully being applied on many turbines and it will keep being developed in the following years.

LEAN PROGRAM

Launched in 2011, EDPR's Lean program focuses on optimizing process across the company's business using the lean six sigma methodology. The objective is to leverage front-line personnel ideas and experience to improve the company's revenues and costs, improve safety and reduce environmental impact.

Within this strategy EDPR has implemented two programs, "Daily Lean" and "Lean improvement". The first, "Daily Lean" applies continuous improvement to the day-to-day activities at our wind farms, with the objective of reducing repetitive and non-value added tasks. The last, "Lean Improvement", developed by our performance engineers and our field personnel, identifies and solves issues that are common to a fleet of turbines or part of a fleet. This program implemented changes that help reduce the impact of lightning damage and reduce gearbox overheating, among others.