EXCEEDENCE
MAKING RENEWABLES COMMERCIAL

Demo 3 – Wave project

Farm Technology	**Wave energy**
Farm Size	200 MW
Currency	EUR
Operating duration	20 Years
Pre-Development Years	3
Decommissioning Years	4
Location and Year	Belmullet 50m 1995
Device	F-OWC 3310 kW & F-2HB 1000 kW
Energy Calculation	Curtailment: 90% Constraint:91 Transmission: 92% Array loss: 95 & 85 Availability: 90 & 80 *Device Capacity Factor: 7.16% & 8.69%* *Farm Annual Delivered Energy: 105,816 MWh*
CAPEX	'Detailed CAPEX per Device' 'Farm shares Export and Interarray Cabling/Piping' 'Power Export' – Electrical (cabling 'Floating' (Mooring) for both devices F-OWC 3310 kW Device Cost: • PTO (180,000 €/MW) • Structure (225,000 €/MW) • Control Systems (45,000 €/MW) Balance of Plant: • Balance of System (350,000 €/MW) Mooring: • Mooring (150,000 €/MW) Cabling: • Create new Item 'Cabling' (250,000 €/MW) F-2HB 1000 kW Device Cost: • Structure (225,000 €/MW) • PTO (225,000 €/MW) Balance of Plant • Balance of System (350,000 €/MW) Mooring: • Mooring (90,000 €/MW) • Mooring line (30,000 €/MW) • Anchor (30,000 €/MW)

	'Component Lifetime for Salvage' • Mooring 17 years • Cabling/Piping 25 years Staggered CAPEX (10% at -3yr; 20% at -2; 30% at -1; 40% at 0) *TOTAL CAPEX: 1,200,000 €/MW*
OPEX	'Detailed OPEX' Fixed 'Unplanned O&M' 20,000,000 € Variable 'O&M' 20,000,000 € in year 17 *TOTAL OPEX: 103,647 €/MW*
Salvage and Decommissioning	Salvage Device Salvage 5% of Device Initial Costs Other Salvage €1m Cabling/Salvage €10,000 /MW Mooring/Foundation Salvage 10% of Initial Cost Staggered Salvage 20% for each year Decommissioning €500,000 for each year
Revenue Rates	Revenue-Basic Input – FIT (fixed) included €400/MWh
Discounting and Inflation	Inflation 2% & Nominal Discount Rate 6%
Debt/equity	40% Debt / 60% Equity 12 year Debt term 3% borrowing rate Monthly loan repayments Begin repayments at year 0
Tax and depreciation	Tax rate 5% PTO; Structure; Control System • 100% depreciation/Straight line/15 years Mooring; Mooring Line; Anchor • 100% depreciation/single year Cabling • 100% depreciation/variable • 40% Yr1; 30% Yr2; 20% Yr3; 10% Yr4 Balance of System (blank)

Results

Net Present Value €	**55,350,369**
Levelised Cost of Energy (LCOE) £/MWh	457.79
Internal Rate of Return %	9.39%