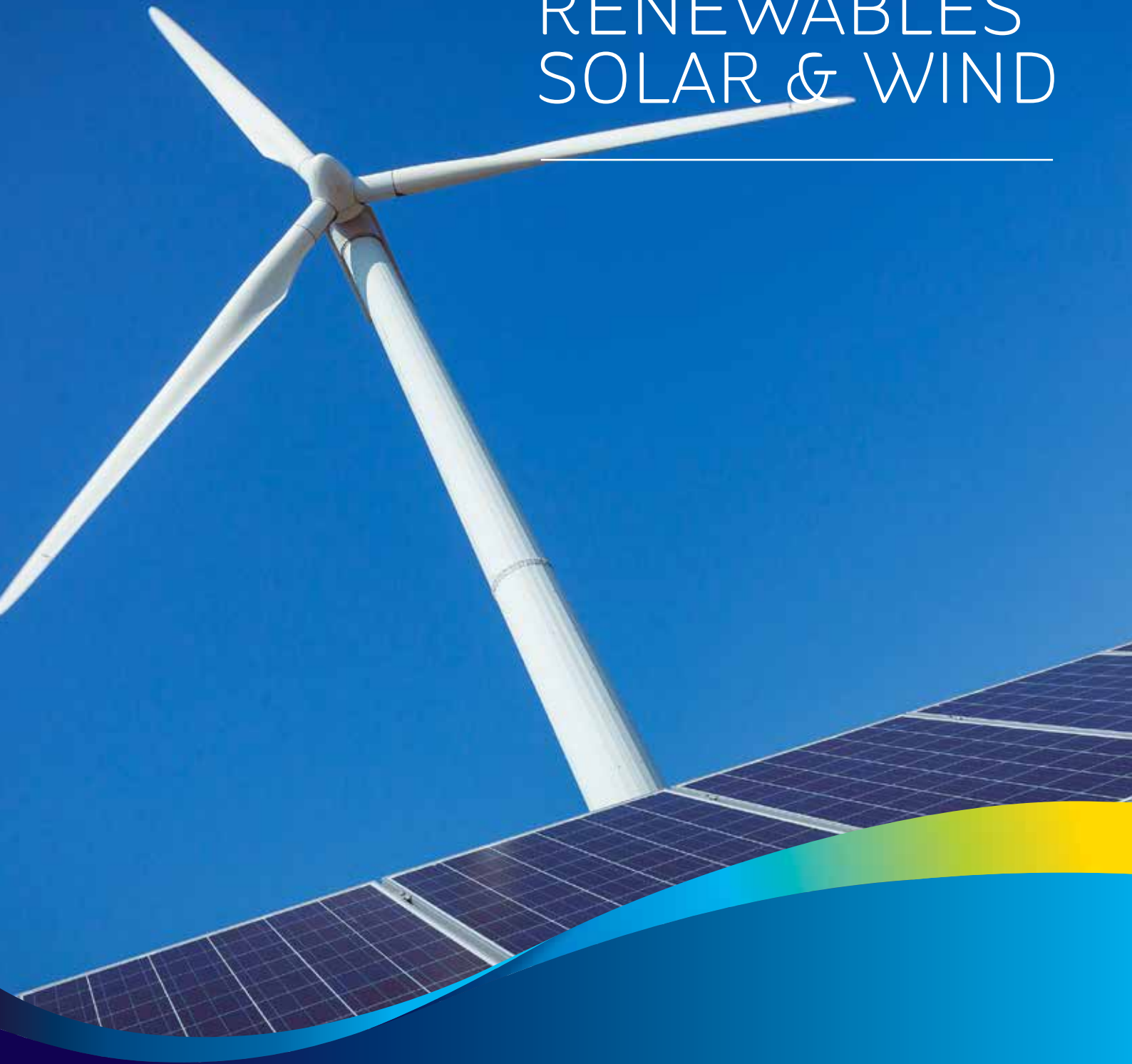

RENEWABLES SOLAR & WIND



INTERNATIONAL



ESB INTERNATIONAL WIND & SOLAR CAPABILITY

ESB International offers a full spectrum of Wind and Solar PV Services from due diligence and feasibility studies to design layout and grid connection.



DESIGN & ENERGY

- > Solar PV and wind turbine technology selection
- > Layout design
- > Cabling and Inverter design and specification
- > Data monitoring, processing and energy yield estimates
- > Detailed design drawings
- > Capex, Opex and Devex costings
- > Technology comparisons on an LCOE basis

GRID CONNECTIONS & ELECTRICAL BALANCE OF SYSTEM

- > Connection studies (38 kV, 110 kV etc.)
- > Route selections
- > Grid applications
- > Techno/economic studies
- > Substation design
- > Transformers
- > Grid code compliance
- > Power system studies
- > Storage

CIVIL & ENVIRONMENTAL

- > Feasibility, site appraisal and selection
- > Environmental impact assessment
- > Planning applications
- > Road design
- > Hydrology and drainage

PROJECT MANAGEMENT & HEALTH AND SAFETY

- > Contractor management
- > Site supervision
- > Health and safety management
- > Procurement management
- > Factory Acceptance Testing (FAT's)

STRATEGIC SERVICES

- > Strategic studies in relation to renewable energy planning
- > National renewables strategy support
- > Model renewables integration with the grid
- > Project sizing

ASSET MANAGEMENT

- > Development and management of Long Term Service Agreements (LTSA's)
- > Performance Ratio validation



INTERNATIONAL

REV: 00 | FEB 2019 | NO. 000

5 MW WIND & SOLAR POWER PLANT

Kingdom of Bahrain

esbinternational.ie

CLIENT Electricity and Water Authority

PROJECT TYPE Owners Engineer

DESCRIPTION

The project concerns a 5 MW Renewable Pilot Power Plant to demonstrate how Wind Energy and Solar Energy can be properly integrated onto the Bahrain grid in accordance with international best practice and local regulations.

Owners Engineer role description:

- Contractor management
- Electrical Balance of Plant (EBOP)
- Design and supervision
- Resident engineer site supervision
- Contract negotiation and development
- Asset management





INTERNATIONAL

REV: 01 | APR 2019 | NO. 227

CAPPAWHITE 52 MW WIND FARM PROJECT

Ireland

esbinternational.ie

CLIENT	Cappawhite Wind Ltd
DATES	September 2015 - December 2017
PROJECT TYPE	Owners Engineer

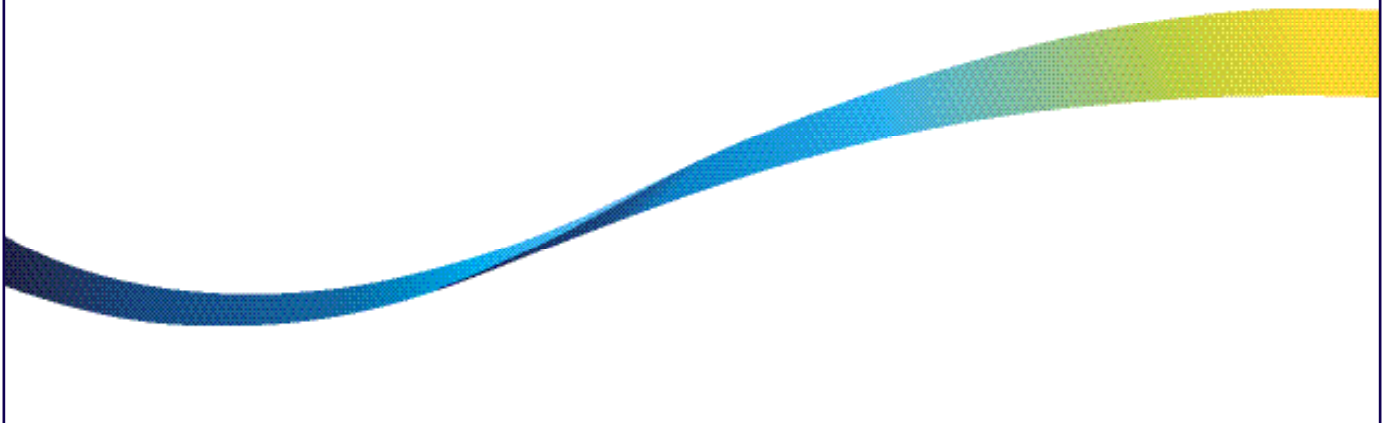
DESCRIPTION

The Cappawhite wind farm involved the installation of 17 Vestas V112 direct drive turbines. The wind farm has an installed capacity of 52 MW and generates enough energy to power 32,500 homes per annum.

OE ROLE DESCRIPTION:

ESB International's main roles include (but not limited to)

- Wind Farm Design - (Civil, Electrical, Turbine layout and Optimisation)
- Planning permission
- Grid connection
- Site supervision
- Safety management
- Management of commissioning works
- Community liaison





INTERNATIONAL

REV: 01 | APR 2019 | NO. 228

MONEYPPOINT 17.25 MW WIND FARM

Ireland

esbinternational.ie

CLIENT Moneypoint Wind Ltd.

DATES July 2015 - July 2017

PROJECT TYPE Owners Engineer

DESCRIPTION

The Moneypoint wind farm involved the installation of 5 Vestas 3.45 MW V112 direct drive turbines. The wind farm has an installed capacity of 17.25 MW. The project is sited adjacent to an operational coal fired power plant on the west coast of Ireland.

OE ROLE DESCRIPTION

ESB International's main roles include (but not limited to):

- Wind Farm Design - (Civil, Electrical, Turbine layout and Optimisation)
- Planning permission
- Grid connection
- Site supervision
- Safety management
- Management of commissioning works
- Community liaison



WIND AND SOLAR REFERENCE LIST

PROJECT	SIZE (MW)	LOCATION	ESB INTERNATIONAL ROLE	PROJECT STAGE
WIND				
Fullabrook	66	UK	Owners Engineer (OE) / Technical Advisor (TA)	Constructed
Raheenleagh	35.2	Ireland	OE / TA	Constructed
Woodhouse	19	Ireland	OE / TA	Constructed
Cappawhite	64	Ireland	OE / TA	Constructed
Castlepook	29	Ireland	OE/ TA	Constructed
Moneypoint	17.25	Ireland	OE / TA	Constructed
Grousemount	114	Ireland	OE / TA	In construction
Oweninny 1	89	Ireland	OE / TA	In construction
Wind farm due diligence	>1000 MW, >20 projects	Ireland & UK	TA	various
Galloper Offshore wind farm acquisition	44 MW	UK	TA	Acquisition completed

PROJECT	SIZE (MW)	LOCATION	ESB INTERNATIONAL ROLE	PROJECT STAGE
SOLAR				
Wind & Solar Pilot Power Plant	5	Bahrain	OE/ TA	In construction
Solar rooftop - completed	1.2 (19 projects)	Ireland & UK	Asset management	Constructed
Solar rooftop - design	35 (11 projects)	Europe & Middle East	Design	Design stage
Solar farm due diligence	80MW, 10 projects	Ireland	TA	Acquisition completed
Grid connection of a solar farm	100	Bahrain	OE / TA	
Large utility solar farm	70	Ireland	Design	Design completed

WE SHOULD BE TALKING TO EACH OTHER

To discuss your Solar or Wind Generation needs, please get in touch with
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