

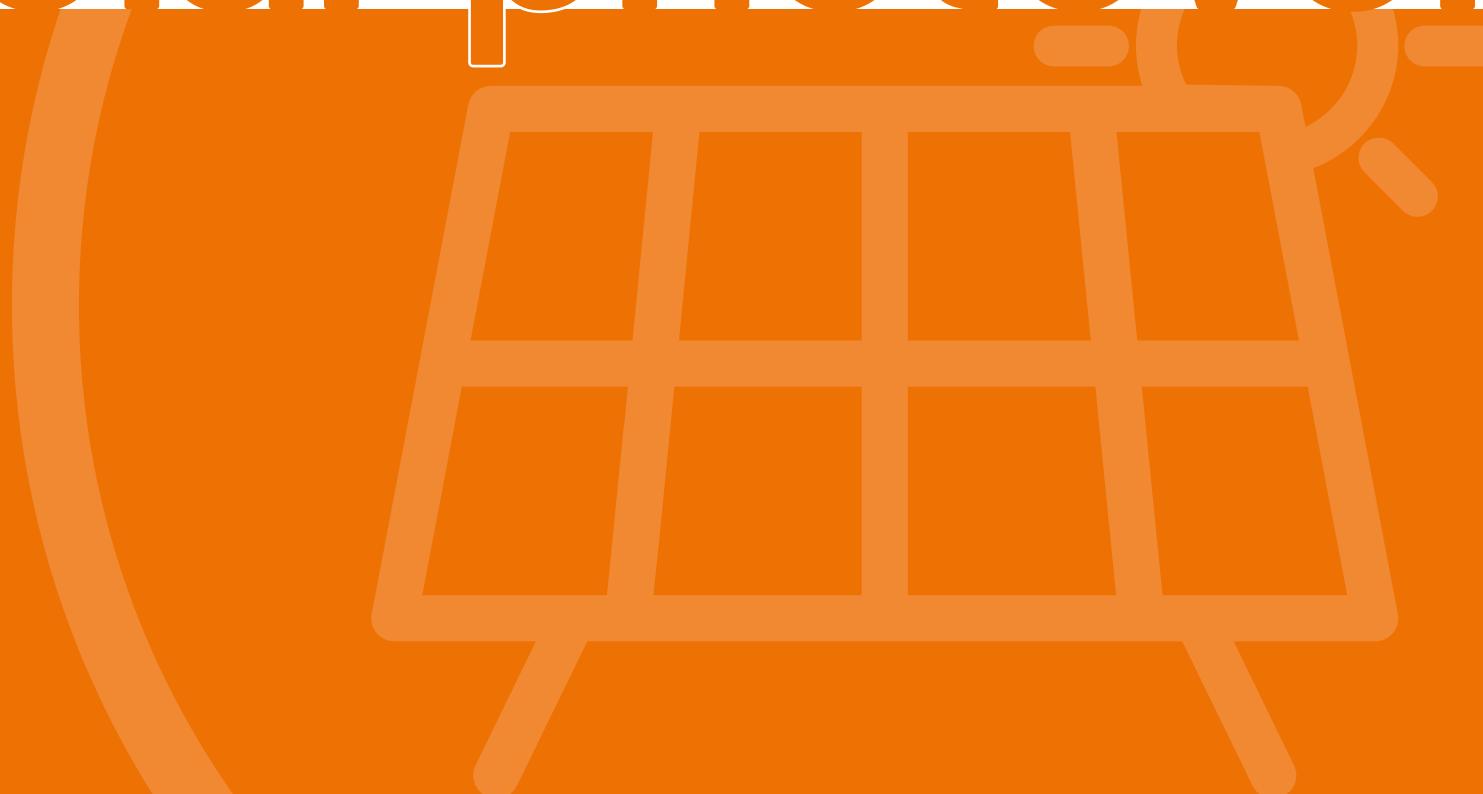
References by activity



Power generation



Solar photovoltaic





elecnor

SOLAR PHOTOVOLTAIC
VALDECABALLEROS



LOCATION ▶ Valdecaballeros, Badajoz (Spain)

CUSTOMER ▶ Siberia Solar (Elecnor)

PROJECT SCOPE:

Engineering, supply and construction of the 10 MW Valdecaballeros solar photovoltaic plant

INVESTMENT ▶ EUR 34 million

START DATE ▶ april 2010

FINISH DATE ▶ october 2010

CHARACTERISTICS:

- ▶ Installed capacity: 11.82 MWp-10 MW
- ▶ Estimated production: 16,600 MWh/year
- ▶ Single-shaft horizontal sun tracking system
- ▶ Surface area: 41 hectares/100 acres



SPAIN

Valdecaballeros. Badajoz (Spain)

SOLAR PHOTOVOLTAIC
VALDECABALLEROS





elecnor

SOLAR PV SÃO JOÃO DE PIAUÍ

LOCATION ▶ State of Piauí (Brazil)

CUSTOMER ▶ Celeo

PROJECT SCOPE ▶

Turnkey engineering, procurement and construction (EPC) project for 6 photovoltaic plants, one electrical evacuation substation and one 500 kV, 16 km connection line

AMOUNT ▶ EUR 181 million

START DATE ▶ october 2018

FINISH DATE ▶ may 2020

CHARACTERISTICS:

- ▶ Installed power: 180 MW
- ▶ Area: 460 hectares
- ▶ Supplying: 190,000 households



SOUTH AMERICA
State of Piauí (Brazil)

SOLAR PV
**SÃO JOÃO
DE PIAUÍ**



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Solar thermal





elecnor

SOLAR THERMAL

ASTE 1A

LOCATION ▶ Alcázar de San Juan. Ciudad Real (Spain)

CUSTOMER ▶ Aries Solar Termoeléctrica

PROJECT SCOPE:

Promotion, design, supply, construction, commissioning, maintenance and operation of a 50 MW solar thermal plant

EPC AMOUNT ▶ EUR 252 million

INVESTMENT ▶ EUR 301 million

START DATE ▶ august 2010

FINISH DATE ▶ may 2012

CHARACTERISTICS:

- ▶ Parabolic trough collectors
- ▶ Heat storage facilities
- ▶ Solar farm, 120,000 m² and 120 loops
- ▶ Thermal fluid system, 30 bar @ 400°C
- ▶ Ancillary heating system with 3 x 16 MWt natural gas boilers
- ▶ 140 MWt dual steam generation unit
- ▶ Siemens steam turbine for HP and LP with preheating facility
- ▶ Tower cooling system
- ▶ Water treatment plant composed of: pretreatment and filtering; reverse osmosis system; electrodeionisation unit
- ▶ Treatment of effluents and hydrocarbon separator with mixing ponds
- ▶ Water storage, 6,000 m³
- ▶ Natural gas feed system to boilers, including 11,429 Nm³/h RMS for natural gas and 4,351 Nm³/h plant RMS
- ▶ Water/steam circuit dosing and sampling system
- ▶ Comprehensive fire protection system
- ▶ Dual system pumping water at 250 m³/h, at a height of 1.245 m
- ▶ OVATION®EMERSON® plant operation and control system
- ▶ Includes 220 kV underground power line and substation

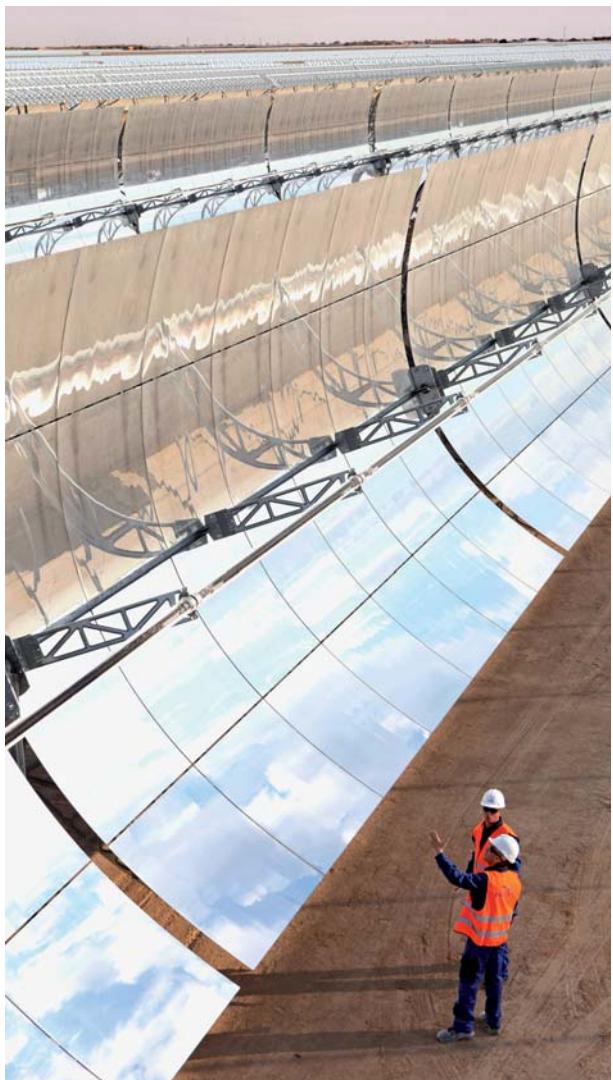


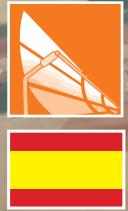
SPAIN

Alcázar de San Juan. Ciudad Real
(Spain)

SOLAR THERMAL

ASTE 1A





elecnor

SOLAR THERMAL

ASTE 1B

LOCATION ▶ Alcázar de San Juan. Ciudad Real (Spain)

CUSTOMER ▶ Aries Solar Termoeléctrica

PROJECT SCOPE:

Execution, design, supply, construction, commissioning, maintenance and operation of a 50 MW solar thermal plant

EPC AMOUNT ▶ EUR 248 million

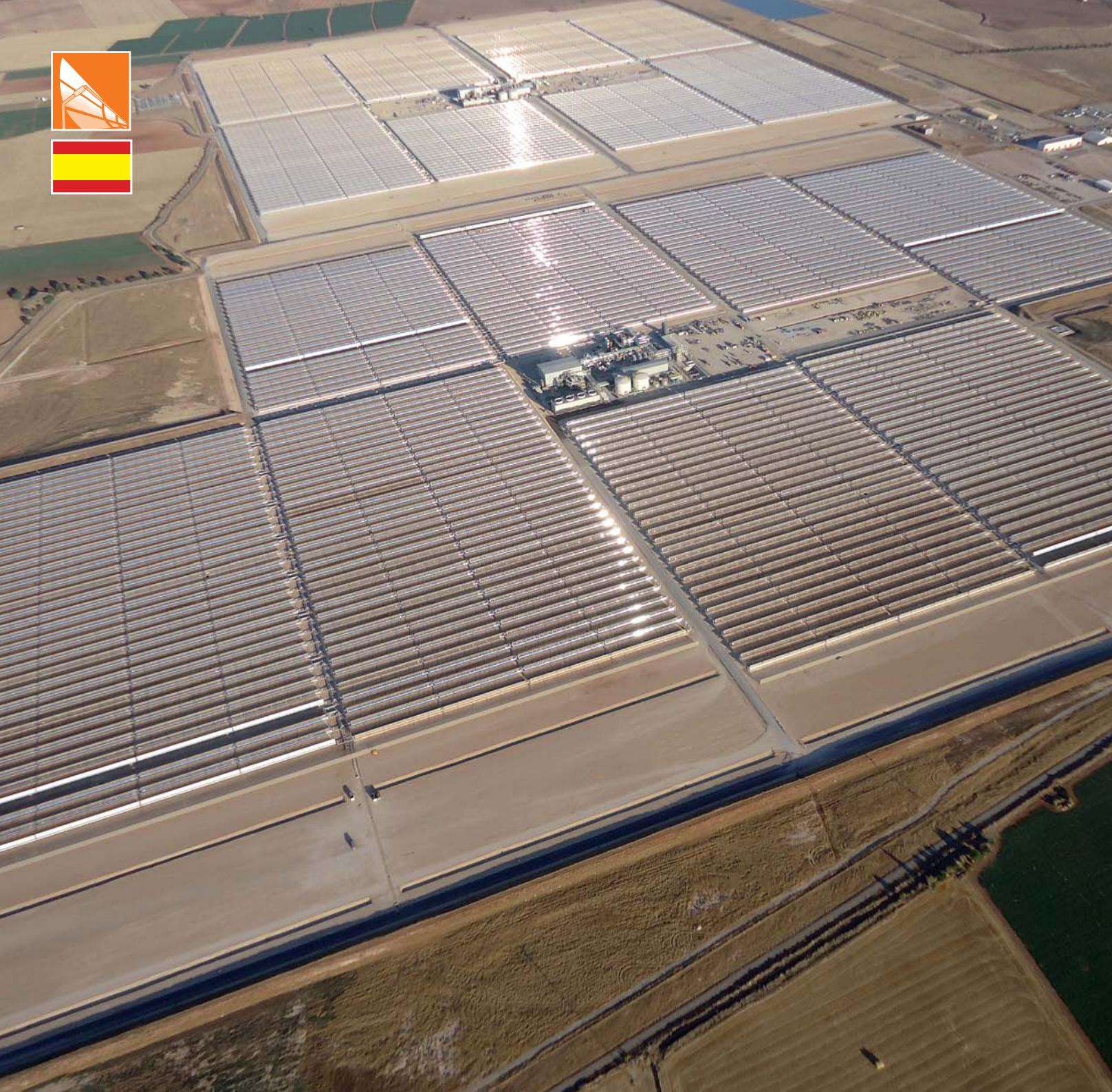
INVESTMENT ▶ EUR 307 million

START DATE ▶ august 2010

FINISH DATE ▶ may 2012

CHARACTERISTICS:

- ▶ Parabolic trough collectors
- ▶ Heat storage facilities
- ▶ Solar farm, 122,000 m² and 120 loops
- ▶ Thermal fluid system, 30 bar @ 400°C
- ▶ Ancillary heating system with 3 x 16 MWt natural gas boilers
- ▶ 140 Mwt dual steam generation unit
- ▶ Siemens steam turbine for HP and LP with preheating facility
- ▶ Tower cooling system
- ▶ Water treatment plant composed of: pretreatment and filtering; reverse osmosis system;, electrodeionisation unit
- ▶ Treatment of effluents and hydrocarbon separator with mixing ponds
- ▶ Water storage, 6,000 m³
- ▶ Natural gas feed system to boilers, including 11,429 Nm³/h RMS for natural gas and 4,351 Nm³/h plant RMS
- ▶ Water/steam circuit dosing and sampling system
- ▶ Comprehensive fire protection system
- ▶ Dual system pumping water at 250 m³/h, at a height of 1.245 m
- ▶ OVATION®EMERSON® plant operation and control system
- ▶ Includes 220 kV underground power line and substation



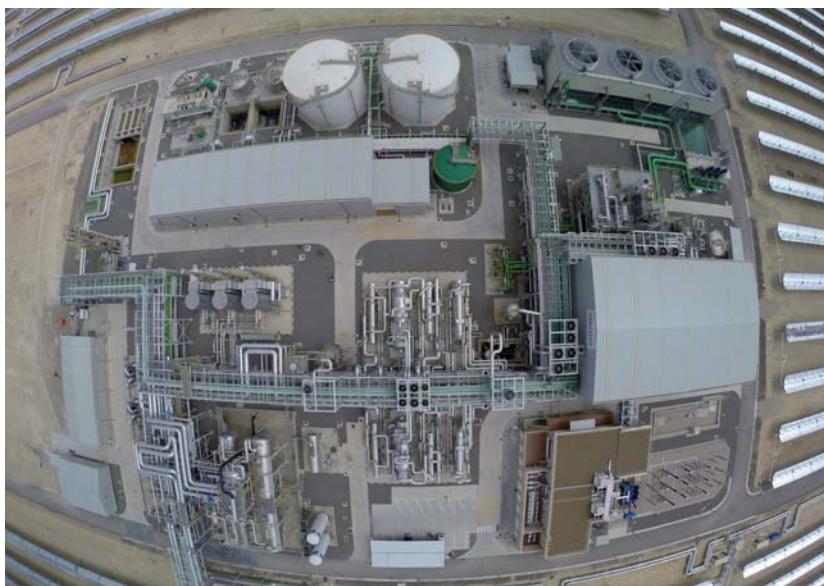


SPAIN

 Alcázar de San Juan. Ciudad Real
(Spain)

SOLAR THERMAL

ASTE 1B





elecnor

SOLAR THERMAL

ASTEXOL

LOCATION ▶ Badajoz (Spain)

CUSTOMER ▶ Dioxide Solar

PROJECT SCOPE:

Promotion, design, supply, construction, commissioning, maintenance and operation of a 50 MW solar thermal plant

EPC AMOUNT ▶ EUR 241 million

INVESTMENT ▶ EUR 320 million

START DATE ▶ july 2010

FINISH DATE ▶ march 2012

CHARACTERISTICS:

- ▶ Parabolic trough collectors
- ▶ Heat storage facilities
- ▶ Solar farm, 510,000 m² and 112 loops
- ▶ CCP Skal-ET 150 collector technology
- ▶ Thermal fluid system, 40 bar @ 400°C
- ▶ 1,200 tm of HTF Downtherm-A thermal fluid
- ▶ Ancillary heating system with 3 x 15 MWt natural gas boilers
- ▶ Automatic degraded HTF regeneration system with a process throughput of 970 kg/h.
- ▶ 140 MWt dual steam generation unit.
- ▶ General Electric steam turbine for HP and LP with preheating facility
- ▶ Tower cooling system
- ▶ Treatment plant with pretreatment and filtering, reverse osmosis and electrodeionisation
- ▶ Treatment of effluents and hydrocarbon separator with 318.5 m³ mixing pond
- ▶ Water storage, 6,000 m³
- ▶ Satellite LNG plant for 5,000 Nm³/h.
- ▶ Satellite nitrogen plant for plant inertisation
- ▶ Facilities for capturing, treating and pumping water from the River Guadiana - 235 m³/h and 70 kW of installed power
- ▶ Collector cleaning system for reflectivities above 92%
- ▶ OVATION®EMERSON® plant operation and control system
- ▶ 220 kV substation and discharge line



SPAIN

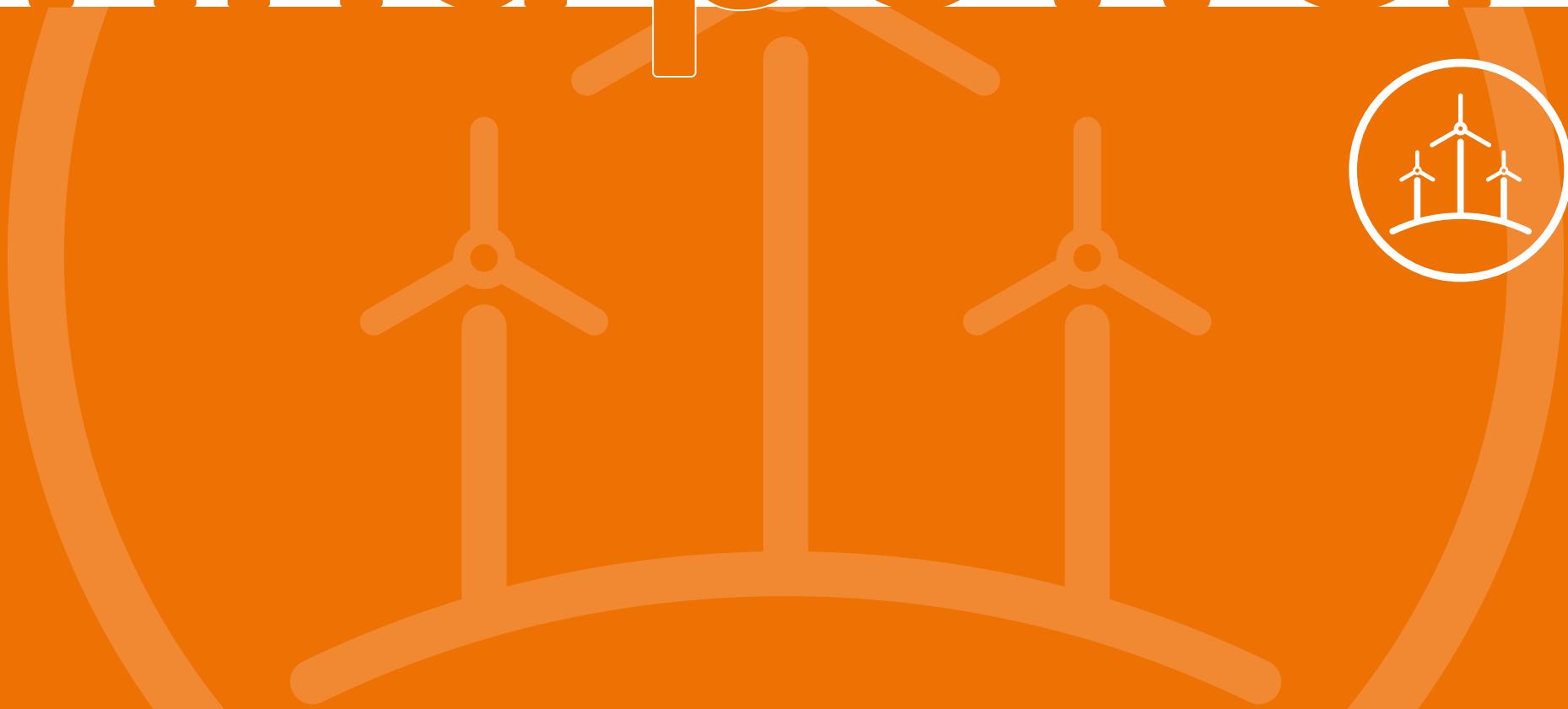
Badajoz (Spain)

SOLAR THERMAL

ASTEXOL



Wind power





WIND POWER **COFRENTES WF**

LOCATION ▶ Valencia (Spain)

CUSTOMER ▶ Enerfín

PROJECT SCOPE ▶

Construction of a wind farm with a power capacity of 50 MW (civil and electrical Balance of Plant, transmission line and substation).

AMOUNT ▶ EUR 53 million

START DATE ▶ March 2020

FINISH DATE ▶ February 2020

CHARACTERISTICS:

- ▶ Construction of thirteen 3.83 MW wind turbine generators (WTG)
- ▶ The energy generated by the wind turbines will be transported through a 30 kV underground network to the 'La Señorita' park substation, owned by the promoter, which will increase the generated power capacity to 132 kV
- ▶ A 3.45 km long overhead line of 132 kV will connect La Señorita SET to the Cofrentes Hydroelectric Power Plant Substation, a connection point to the Spanish electrical system distribution network owned by Iberdrola Distribución
- ▶ It will generate an electricity production of 155,000 MWh, equivalent to the electricity consumption of 43,000 families a year and prevent the emission of 66,000 tonnes of CO₂



SPAIN
Valencia

WIND POWER
COFRENTES WF





elecnor

WIND POWER

FARO-FARELO

LOCATION ▶ Serras Faro-Farelo. Lugo and Pontevedra (Spain)

CUSTOMER ▶ Galicia Vento

PROJECT SCOPE:

Promotion, design, supply, construction, start-up, commissioning, maintenance and operation of four 128 MW wind farms (Penas Grandes 14.4 MW, Chantada 48 MW, Monte Cabeza 36.8 MW and Farelo 28.8 MW)

INVESTMENT ▶ EUR 135 million

START DATE ▶ march 2004

FINISH DATE ▶ september 2005

CHARACTERISTICS:

- ▶ Power output: 128 MW
- ▶ Technology: Ecotecnia (Alstom)
- ▶ Wind turbines: 80 x ECO/1.6 MW
- ▶ Equivalent hours: 2,705



SPAIN

 Serras Faro-Farelo. Lugo and Pontevedra (Spain)

WIND POWER
FARO-FARELO





WIND POWER GALICIA



LOCALIZACIÓN ▶ La Coruña and Lugo (Spain)

CLIENTE ▶ Greenalia

ALCANCE ▶

Construction of five wind farms (Miñón, Ourol, Croa I, Croa II and Monte Tourado).

IMPORTE ▶ EUR 64.3 million

INICIO ▶ July 2019

FIN ▶ December 2020

CARACTERÍSTICAS:

- ▶ Installation of 19 turbines
- ✓ Adding 74.22 MW of power capacity
- ✓ Will provide electricity to 45,000 homes
- ▶ Two substations (132 kV and 66 kV)
- ▶ 8 km HV line
- ▶ Medium-voltage networks
- ▶ Fibre optic
- ▶ Design and construction of civil infrastructure
- ▶ Maintenance, operation and control of the farms during the first 24 months



SPAIN

La Coruña and Lugo

WIND POWER
GALICIA





elecnor

WIND POWER
**MALPICA
REPOWERING**

LOCATION ▶ Malpica de Bergantiños,
La Coruña (Spain)

CUSTOMER ▶ Parque Eólico de Malpica, S.A.

PROJECT SCOPE ▶
Development, design, supply, construction,
start-up, maintenance and operation of a
16.45 MW wind farm

AMOUNT ▶ EUR 18.7 million

START DATE ▶ march 2017

FINISH DATE ▶ september 2017

CHARACTERISTICS:

- ▶ Power capacity: 16.45 MW
- ▶ Technology: Enercon
- ▶ Wind turbines: 7 x E92/2.35 MW
- ▶ Equivalent hours: more than 4,000





SPAIN

 Malpica de Bergantiños,
La Coruña (Spain)

WIND POWER
**MALPICA
REPOWERING**





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WIND POWER
**PÁRAMO
DE POZA**

LOCATION ▶ Poza de la Sal. Burgos (Spain)

CUSTOMER ▶ Eólica Páramo de Poza

PROJECT SCOPE:

Promotion, design, supply, construction, start-up, commissioning, maintenance and operation of two 101 MW wind plants (50.5 MW + 50.25 MW)

INVESTMENT ▶ EUR 80 million

START DATE ▶ july 2001

FINISH DATE ▶ may 2002

CHARACTERISTICS:

- ▶ Power output: 101 MW
- ▶ Technology: Ecotecnia (Alstom)
- ▶ Wind turbines: 132 x ECO/ 750 kW + 1 ECO7 1,670 kW
- ▶ Equivalent hours: 1,452





SPAIN

Poza de la Sal. Burgos (Spain)

WIND POWER
**PÁRAMO
DE POZA**





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WIND POWER

TARIFA

LOCATION ▶ Tarifa. Cádiz (Spain)

CUSTOMER ▶ Aerogeneradores del Sur

PROJECT SCOPE:

Promotion, design, supply, construction, start-up, commissioning, maintenance and operation of two 55 MW wind plants, La Herrería and Pasada de Tejada (44.8 MW + 9.6 MW)

INVESTMENT ▶ EUR 59 million

START DATE ▶ august 2003

FINISH DATE ▶ january 2005

CHARACTERISTICS:

- ▶ Power output: 55 MW
- ▶ Technology: Ecotecnia (Alstom)
- ▶ Wind turbines: 34 x ECO/1.6 MW
- ▶ Equivalent hours: 2,111



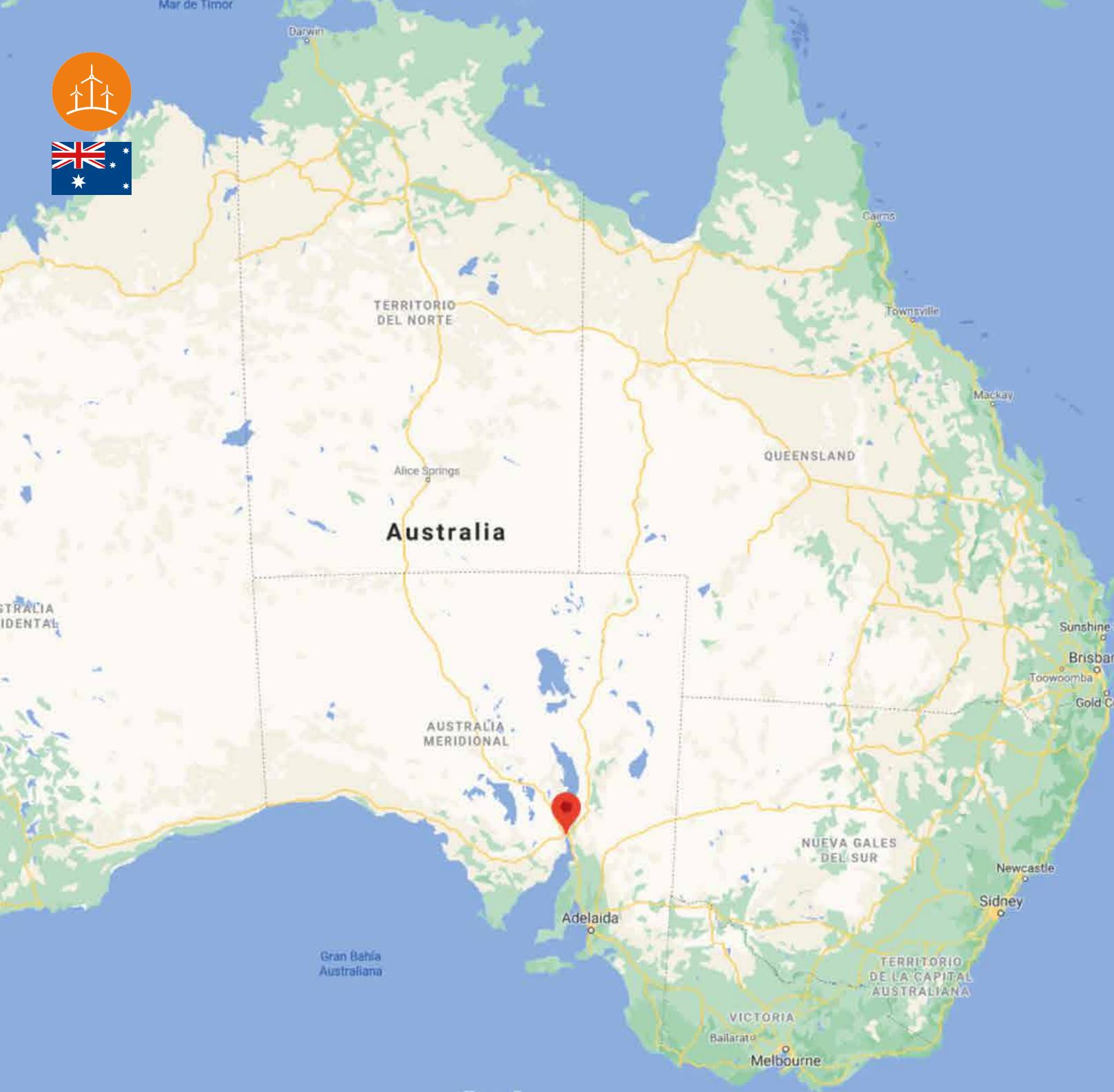
SPAIN

Tarifa. Cádiz (Spain)

WIND POWER

TARIFA





WIND POWER PORT AUGUSTA WF

LOCATION ▶ South Australia (Australia)

CUSTOMER ▶ Iberdrola

PROJECT SCOPE ▶

EPC, BOP, civil engineering and electromechanical work for the start-up of the 210 MW wind farm. This is a pioneering project as it forms part of one of the country's first hybrid wind and solar energy parks.

AMOUNT ▶ EUR 76.3 million

START DATE ▶ October 2020

FINISH DATE ▶ November 2021

CHARACTERISTICS:

- ▶ 50 Vestas turbines
- ▶ 100 km of medium-voltage cables
- ▶ Interconnection of the park
- ✓ 33/275 kV substation
- ✓ 4 km of 275 kV underground transmission lines

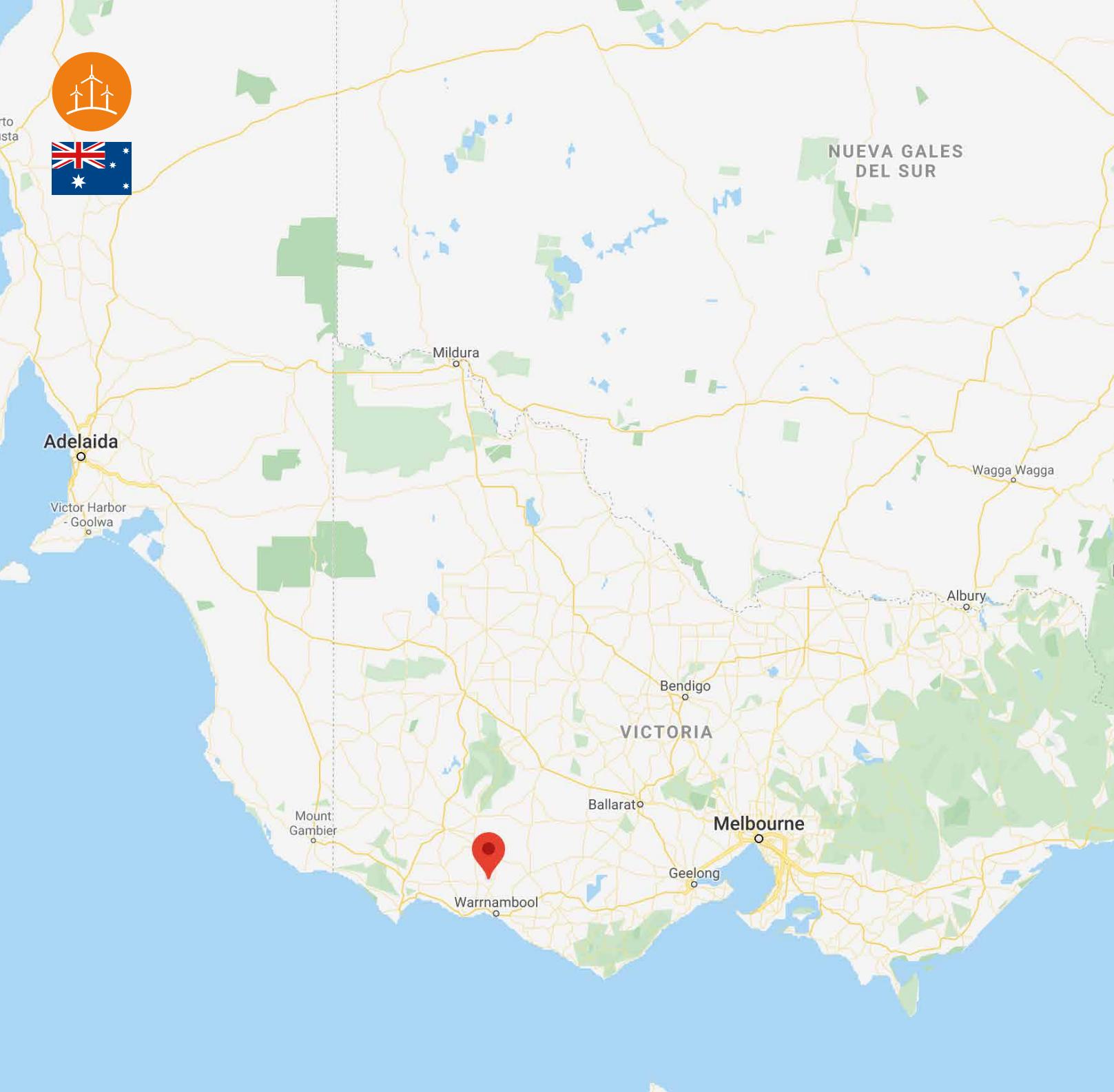


OCEANIA

South Australia (Australia)

WIND POWER
**PORT AUGUSTA
WF**





EÓLICA
PE
WOOLSTHORPE

LOCALIZACIÓN ▶ Woolsthorpe, Victoria (Australia)

CLIENTE ▶ Enerfin

ALCANCE ▶ Balance of plant

IMPORTE ▶ 88 millones de euros

INICIO ▶ Septiembre 2020

FIN ▶ Septiembre 2021

CARACTERÍSTICAS:

- ▶ Potencia instalada: 72 MW
- ▶ Producción estimada: 255 – 270 GWh/año
- ▶ Turbina: 20 x SG132-3.65 MW
- ▶ Superficie del parque: 460 ha



OCEANÍA

Woolsthorpe, Victoria (Australia)

EÓLICA

PE

WOOLSTHORPE





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WIND POWER

DOS INDIOS



LOCATION ▶ Osório. Rio Grande do Sul State (Brazil)

CUSTOMER ▶ Ventos dos Índios

PROJECT SCOPE:

Promotion, design, supply, construction, start-up, commissioning, maintenance and operation of two 53 MW wind plants (Dos Indios 2 and 3)

INVESTMENT ▶ EUR 78 million

START-UP ▶ December 2014

CHARACTERISTICS:

- ▶ Power output: 53 MW
- ▶ Technology: Enercon
- ▶ Wind turbines: 23 x E-92/2.3 MW
- ▶ Equivalent hours: 3,486



SOUTH AMERICA



Osório. Rio Grande do Sul State
(Brazil)

WIND POWER

DOS INDIOS



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WIND POWER

ITAGUAÇÚ DE BAHÍA

LOCATION ▶ Itaguaçú, Bahía State (Brazil)

CUSTOMER ▶ Furnas

PROJECT SCOPE:

Electricity BOP for a 280 MW wind plant

EPC AMOUNT ▶ EUR 31 million

START DATE ▶ 2016

FINISH DATE ▶ 2019

CHARACTERISTICS:

- ▶ Power output: 280 MW
- ▶ Wind turbines: 150
- ▶ 36 km of a 230 kV power line
- ▶ 79 km of 34.5 kV collection systems
- ▶ 2 x 34.5/230 kV substations, each with capacity 160 MVA



SOUTH AMERICA
Itaguaçú, Bahía State (Brazil)

WIND POWER

ITAGUAÇÚ DE BAHÍA



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WIND POWER

PALMARES

LOCATION ▶ Palmares. Rio Grande do Sul State (Brazil)

CUSTOMER ▶ Parques Eólicos Palmares

PROJECT SCOPE:

Promotion, design, supply, construction, start-up, commissioning, maintenance and operation of four 57.5 MW wind farms (Palmares 9.2 MW, Fazenda Rosario-1 9.2 MW, Fazenda Rosario-2 23 MW and Fazenda Rosario-3 16.1 MW)

INVESTMENT ▶ EUR 114 million

START DATE ▶ december 2010

FINISH DATE ▶ march 2013

CHARACTERISTICS:

- ▶ Power output: 57.5 MW
- ▶ Technology: Enercon
- ▶ Wind turbines: 25 x E-82/2.3 MW
- ▶ Equivalent hours: 3,192



SOUTH AMERICA



Palmares. Rio Grande do Sul State
(Brazil)

WIND POWER

PALMARES



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WIND POWER SÃO FERNANDO I AND II

LOCATION ▶ Rio Grande do Norte (Brazil)

CUSTOMER ▶ Ventos de São Fernando I Energia S.A. and Ventos de São Fernando II Energia S.A.

PROJECT SCOPE ▶

Full EPC, civil and electrical BOP, transmission line and substation. Supply and installation of turbines

AMOUNT ▶ EUR 42 million

START DATE ▶ May 2019

FINISH DATE ▶ May 2020

CHARACTERISTICS:

- ▶ Rated power:
 - ✓ SF I 76.23 MW
 - ✓ SF II: 72.765 MW
- ▶ Wind turbines:
 - ✓ SF I: 22
 - ✓ SF II: 21
- ▶ Technology: AW-132, height: 120 m



SOUTH AMERICA

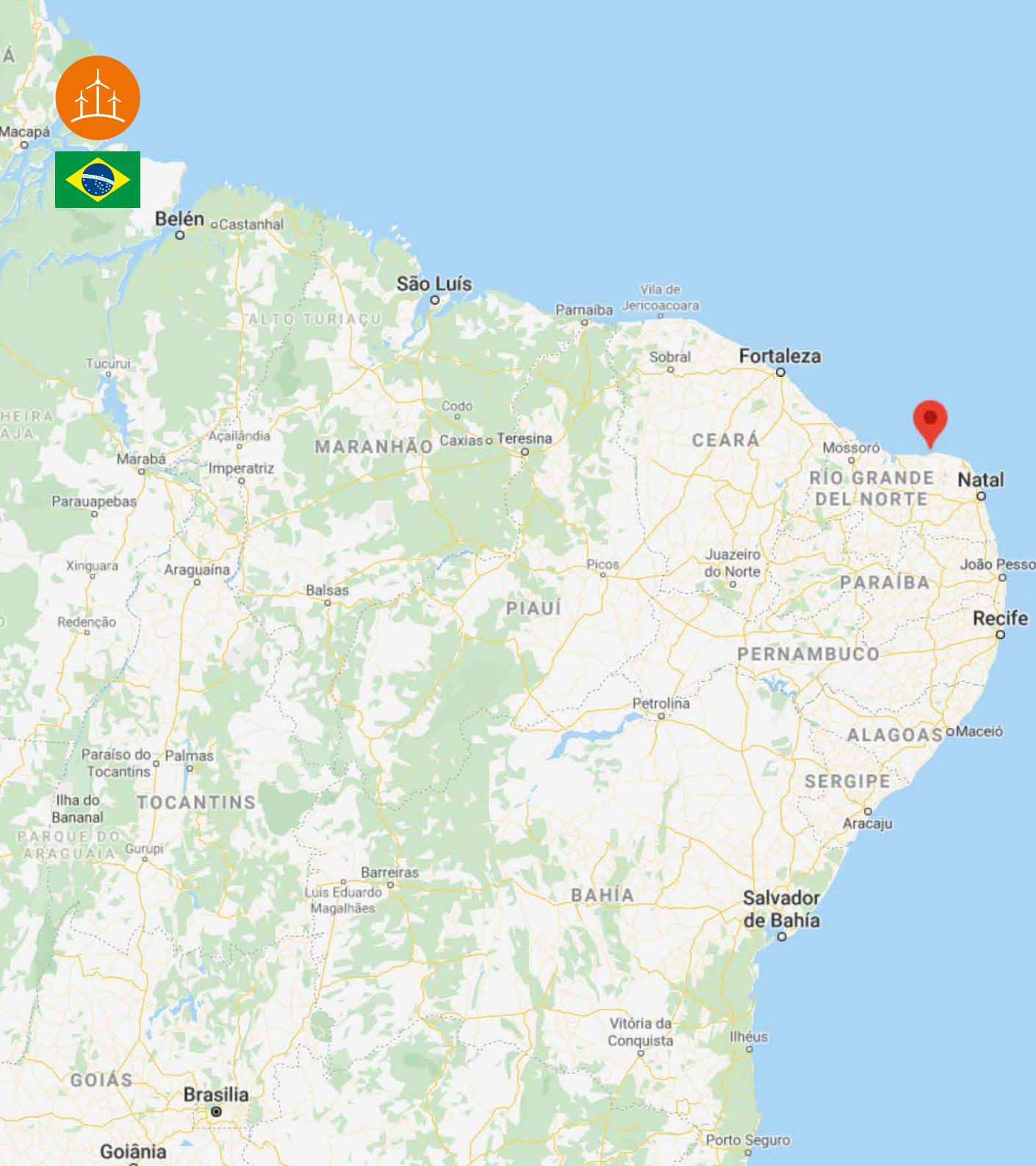
Rio Grande do Norte
(Brazil)

WIND POWER
**SÃO FERNANDO
I AND II**



elecnor





WIND POWER SÃO FERNANDO IV

LOCATION ▶ São Bento do Norte, Nordeste (Brazil)

CUSTOMER ▶ Ventos de São Fernando IV Energia, S.A.

PROJECT SCOPE ▶

Promotion, design, supply, construction, start-up and management of the operation

AMOUNT ▶ EUR 68.6 million

START DATE ▶ may 2020

FINISH DATE ▶ january 2021

CHARACTERISTICS:

- ▶ Power capacity: 83.2 MW
- ▶ Technology: Nordex-Acciona
- ▶ Wind turbines: 24 x AW132/3.465 MW
- ▶ Equivalent hours: 4,318



SOUTH AMERICA



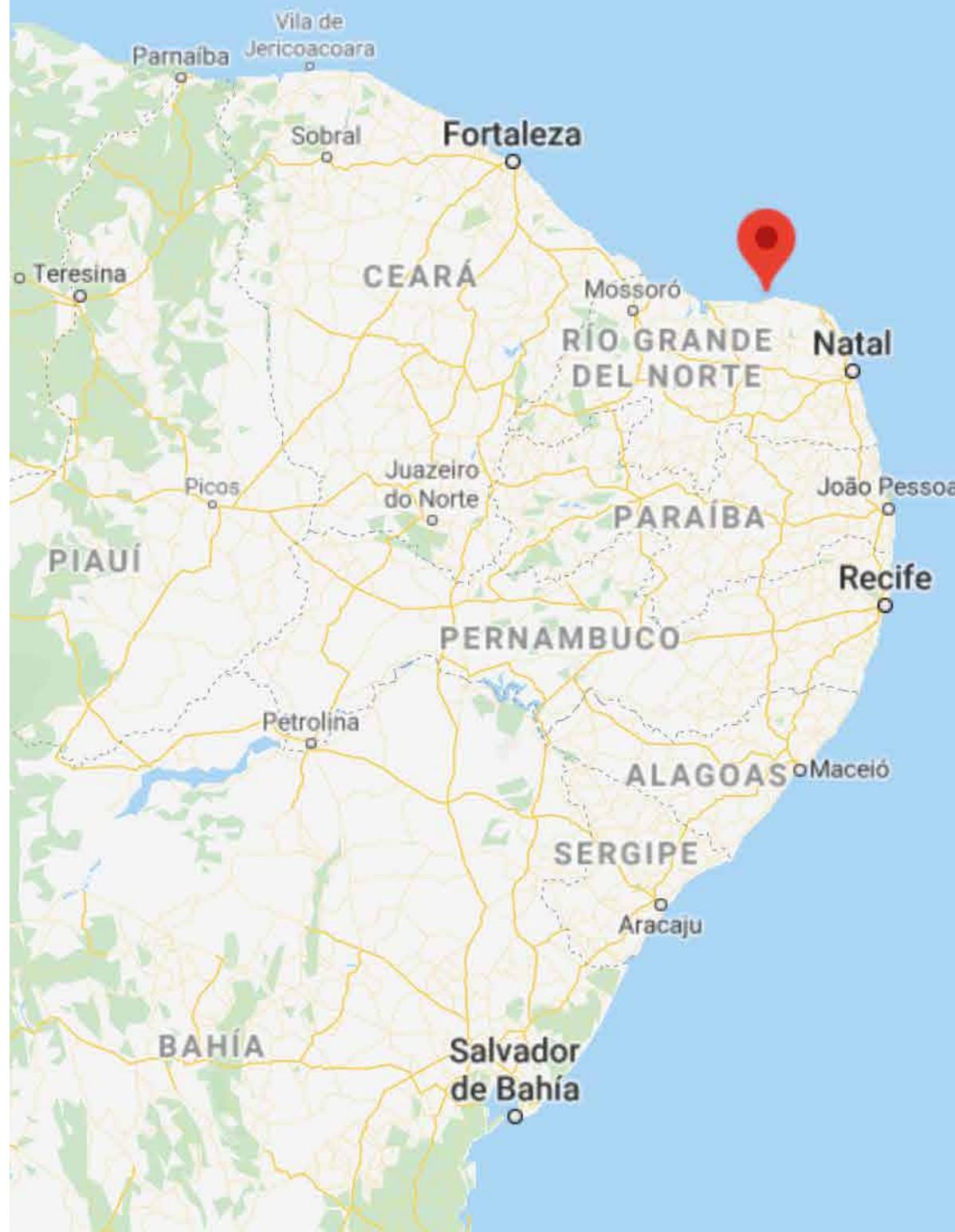
São Bento do Norte, Nordeste
(Brazil)

WIND POWER

SÃO FERNANDO IV



elecnor





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WIND POWER

VENTOS DA LAGOA

LOCATION ▶ Osório. Rio Grande do Sul State (Brazil)

CUSTOMER ▶ Ventos da Lagoa

PROJECT SCOPE:

Promotion, design, supply, construction, start-up, commissioning, maintenance and operation of two 57.5 MW wind plants (Sangradouro 2 and 3)

INVESTMENT ▶ EUR 96 million

START-UP ▶ may 2012

CHARACTERISTICS:

- ▶ Power output: 57.5 MW
- ▶ Technology: Enercon
- ▶ Wind turbines: 25 x E-82/2.3 MW
- ▶ Equivalent hours: 3,036



SOUTH AMERICA
Osório, Rio Grande do Sul State
(Brazil)

WIND POWER

VENTOS DA LAGOA





elecnor

WIND POWER

VENTOS DO LITORAL



LOCATION ▶ Osório. Rio Grande do Sul State (Brazil)

CUSTOMER ▶ Ventos do Litoral

PROJECT SCOPE:

Promotion, design, supply, construction, start-up, commissioning, maintenance and operation of two 57.5 MW wind plants (Osório 2 and 3)

INVESTMENT ▶ EUR 98 million

START-UP ▶ february 2013

CHARACTERISTICS:

- ▶ Power output: 57.5 MW
- ▶ Technology: Enercon
- ▶ Wind turbines: 25 x E-82/2.3 MW
- ▶ Equivalent hours: 2,955



SOUTH AMERICA

Osório. Rio Grande do Sul State
(Brazil)

WIND POWER

VENTOS DO LITORAL



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elecnor

WIND POWER

VENTOS DO SUL

LOCATION ▶ Osório, Rio Grande do Sul State (Brazil)

CUSTOMER ▶ Ventos do Sul

PROJECT SCOPE:

Promotion, design, supply, construction, start-up, commissioning, maintenance and operation of three 150 MW wind plants (Sangradouro, Osório and Dos Indios, 50 MW each)

INVESTMENT ▶ EUR 228 million

START-UP ▶ 2006

CHARACTERISTICS:

- ▶ Power output: 150 MW
- ▶ Technology: Enercon
- ▶ Wind turbines: 75 x E-70/2 MW
- ▶ Equivalent hours: 2,463





SOUTH AMERICA

Osório. Rio Grande do Sul State
(Brazil)

WIND POWER

VENTOS DO SUL



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WIND POWER

L'ÉRABLE

LOCATION ▶ St. Ferdinand, Ste. Sophie, St. Pierre-Baptiste. Quebec (Canada)

CUSTOMER ▶ Eoliennes de L'Érable

PROJECT SCOPE:

Promotion, design, supply, construction, start-up, commissioning, maintenance and operation of a 100 MW wind plant

AMOUNT ▶ EUR 266 million

START DATE ▶ december 2011

FINISH DATE ▶ november 2013

CHARACTERISTICS:

- ▶ Power output: 100 MW
- ▶ Technology: Enercon
- ▶ Wind turbines: 50 x E-82/2 MW
- ▶ Equivalent hours: 3,466



NORTH AMERICA
St. Ferdinand, Ste. Sophie, St.
Pierre-Baptiste, Quebec (Canada)

WIND POWER

L'ERABLE





elecnor.com