WESTRAFO

OUR SHORTLIST OF PROJECTS

TRANSFORMERS & VERTICAL SOLUTIONS

POWER TRANSFORMERS

DESIGNED AND MANUFACTURED IN WESTRAFO - FROM 4 TO 40 MVA/170 kV

POWER TRANSFORMERS

DESIGNED AND MANUFACTURED IN WESTRAFO - FROM 4 TO 40 MVA/170 kV

CASE HISTORY

SET OF FOUR POWER TRANSFORMERS FOR OSHEE

Power:
20/25 MVA 115/6.3 KV
10 MVA 115/38.5/10.5 KV,
10 MVA 35/6.3 KV
7.5 MVA 35/10.5 KV

Application:
Power Distribution

Destination:
Albania

Year:
2017

This set of Power Transformers has been designed and produced by Westrafo in less than 4 months for the Albanian National Distribution Company.

The project consisted in the delivery of 4 different power transformers, to be connected in HV substations of the Albanian power grid.

The challenges of this projects were many: a short delivery time, extreme flexibility in regards to the customer's last-minute modifications of the technical requirements and a lot of team work to make sure to present an impecable set of technical documentation on time and a flawless manufacture.

POWER (MVA)	PROJECT DESCRIPTION	TAPS	COUNTRY	YEAR
9,8	Oil-insulated Power transformer 9,8 MVA 15/6,3 kV , destined to an MV substation	OCTC	ITALY	2015
7,5	Oil-insulated Power transformer 7,5 MVA 35/10,5 kV, destined to an MV substation	OCTC	ALBANIA	2015
10	Oil-insulated Power transformer 10 MVA 35/10,5 kV, destined to an MV substation	OCTC	ALBANIA	2015
7,5	Oil-insulated Power transformer 7,5 MVA 35/10,5-6,3 kV, destined to a mobile substation	OCTC	ALBANIA	2016
20/25	Oil-insulated Power transformer 20/25 MVA ONAN/ONAF 115/38,5-10,5 kV, destined to a HV substation	OCTC	ALBANIA	2016
6,5	Cast resin Power transformer 6,5 MVA 11/0,66 kV, destined to an MV substation	OCTC	SWEDEN	2016
4	Oil-insulated Power Transformer 4 MVA 35/10,5 kV, Destined to an MV substation	OLTC	LITHUANIA	2017
6,3	Oil-insulated Power Transformer 6,3 MVA 35/10,5 kV, Destined to an MV substation	OLTC	LITHUANIA	2017
8	Oil-insulated Power Transformer 6,3 MVA 35/10,5 kV, Destined to a Biogas Plant	OCTC	GERMANY	2018
5	Oil-insulated Power Transformer 5 MVA 115/6,3 kV, Destined to an HV Substation	OCTC	ALBANIA	2018
2,5	Oil-insulated Power Transformer 2,5 MVA 30/10,5 kV, Destined to an MV substation	OLTC	LITHUANIA	2018
4	Oil-insulated Power Transformers 4 MVA 6,6/5,5 kV, Destined to an MV substation	OCTC	ALGERIA	2019
3,75	Oil-insulated Power Transformers Two units 3,75 MVA 11/5,5 kV, Destined to an OIL & GAS plant	OCTC	IRAQ	2019

POWER (MVA)	PROJECT DESCRIPTION	TAPS	COUNTRY	YEAR
10	Power transformer insulated with FR3 natural ester 10 MVA 21/11 kV , destined to a chemical plant	OCTC	UK	2019
2,5	Oil-insulated Power Transformer 2,5 MVA 30/10,5 kV, Destined to an MV substation	OLTC	LITHUANIA	2019
10	Oil-insulated Power Transformer 10 MVA 110/20 kV, Destined to an HV substation	OCTC	ALBANIA	2020
23	Oil-insulated Power Transformer 23 MVA 45/30 kV, Destined to a solar project	OLTC	SPAIN	2020
15	Oil-insulated Power Transformer 15 MVA 45/30 kV, Destined to a solar project	OLTC	SPAIN	2020
25	Oil-insulated Power Transformer 25 MVA 110/20 kV, Destined to an HV substation	OLTC	ALBANIA	2020

POWER DISTRIBUTION
DISTRIBUTION TRANSFORMERS FOR UTILITIES

CASE HISTORY - DISTRIBUTION TRANSFORMERS
AIM SERVIZI A RETE - VICENZA

Project Description:
32 total units - MV transformers
10 Units 250 kVA 10,5-21/0,415 kV
12 Units 400 kVA 10,5-21/0,415 kV
10 Units 630 kVA 10,5-21/0,415 kV

Application:
MV distribution

Destination:
Vicenza - Italy

Year:
2019-2020

Westrafo has supplied 32 Units to AIM, the electricity distribution utility for the municipality of Vicenza.

Westrafo is based in Vicenza, Italy, and supplying distribution transformers to our own city is very exciting for us.

These transformers are being installed in distribution substations across the city and the neighbouring towns, making this project effecively km0.

POWER DISTRIBUTION
COMPLETE SUBSTATIONS

CASE HISTORY - MV SUBSTATIONS
PROJECT MATETE

Project Description:
36 units - MV substations
For the electrification of Matete,
a suburb of Kinshasa

Application:
MV distribution

Destination:
Matete - Kinshasa
Democratic Republic of Congo

Year:
2018

Project Matete is a project initiated by SNEL, the National Electrical Company of Congo, to promote the electrification of the suburbs of Kinshasa.

Westrafo partnered with SNEL and our good customer PPC Congo to install 36 complete MV substations around the Municipality of Matete, a massive suburb not yet reached by a proper electrical grid and water system.

The substations installed are used both to provide electricity to prepaid meters and to energize the water pumps bringing fresh drinkable water to the neighbourhood.

The substations are provided with 630 or 1000 kVA transformers. For the first installation, the Mayor of Kinshasa together with representatives of the Congolese government has presided an official inauguration, attended with great joy by the people living in the area.

MOBILE SUBSTATIONS

DESIGNED AND MANUFACTURED IN WESTRAFO - FROM 2 TO 30 MVA

CASE HISTORY - OUTDOOR MOBILE SUBSTATION

CUSTOM MADE FOR OSHEE, ALBANIA

Power:
7,5 MVA

Voltage:
35/10,5-6,3 Kv

Application:
Power Distribution

Destination:
Albania

Year:
2016

This mobile substation has been designed and produced together with our customer CR Technology Systems for OSHEE, the Albanian National Distribution Company.

Mobile substations are a great solution to ensure interim grid connections and temporary power supplies in case of emergencies or planned outages.

The mobile substation shown here is intended to be pulled by a truck tractor and for that reason is mounted on a specially designed semi-trailer chassis.

The substation has been completed on-site with cooling system, high and low voltage switchgears, connection cables, integrated protection devices, AC and DC auxiliary power supply and overvoltage protection.

GREEN ENERGY APPLICATIONS

PHOTOVOLTAIC - WIND POWER - HYDROELECTRIC

DESIGNED AND MANUFACTURED IN WESTRAFO FROM 2 TO 30 MVA

GREEN ENERGY APPLICATIONS

PHOTOVOLTAIC - WIND POWER - HYDROELECTRIC
DESIGNED AND MANUFACTURED IN WESTRAFO FROM 2 TO 30 MVA

CASE HISTORY - PV APPLICATION

HONG PHONG I PV PLANT, VIETNAM

Project Total Power:
48 MW

Transformers supplied:
8 Units 5 MVA ONAF 22/0,6-0,6

Application:
Solar Power / Inverter

Destination:
Vietnam

Year:
2019

The Hong Phong 1 solar power project with a capacity of 250 MW is currently under construction and will be developed on an area of about 350 ha in Hong Phong commune, Bac Binh district, Binh thuan province.

Vietnam's power sector has been expanding alongside its economy—at USD223.9 billion in 2017—one of the 20 fastest growing in the world with year-over-year growth rates ranging from above 5 percent per year to 7.1 percent from 2013 through year-end 2018.

Solar and other renewable energy resources are playing a growing role in the country's energy mix, which to the present was relying massively on coal.

A tremendous amount of untapped solar energy resource potential exists in Vietnam. Estimates have pegged the country's solar power potential at 60–100 GWh per year for concentrated solar power and 0.8-1.2 GWh per year for solar photovoltaic (PV) energy.

POWER (MVA)	PROJECT POWER MW	PROJECT DESCRIPTION	COUNTRY	YEAR
5,1	50	16 Units 5,1 MVA 30/0,66-0,66 kV 50 Hz for the solar plants of Los Belos and Montesol, near Zaragoza, Spain	SPAIN	2019
4,6	Undisclosed	4 Units, cast resin 4,6 MVA 20/0,69-0,69 kV 50 Hz destined to the solar plant of Sucina, Murcia	SPAIN	2019
4,55	9	2 Units 4,55 kVA 15/0,8 kV 50 Hz destined to the solar plant of Villa Alegre, based on 1500 V string inverters PVS-175 with the capacity of 185 kW .	CHILE	2019

Photos from the Villa Alegre plant, Chile.

POWER (MVA)	PROJECT POWER MW	PROJECT DESCRIPTION	COUNTRY	YEAR
2,7	40	14 Units 2,7 MVA 33/0,655 kV 50 Hz for inverter load, destined to Radiant Solar Farm located in the Plateau area, close to Eldoret City in the North-Western part of Kenya.	KENYA	2019
4,5	400	2 Units 4,5 MVA 23/0,55-0,55 kV 50 Hz for inverter load, destined to Klfar Bloom Solar Plant in Israel	ISRAEL	2019
1,68	16,4	9 Units 1,68 MVA 20,5/0,33 kV 50 Hz for Inverter load Destined to Groitsch Solar Plant currently under construction	GERMANY	2019
2,5	10,5	1 Unit for Inverter load 2,5 MVA 12/0,6 kV 50 Hz Destined to Berilo Solar Plant in Chile.	CHILE	2019
2,7	Undisclosed	1 Unit for Inverter load 2,7 MVA 13,2/0,655 kV 50 Hz Destined to Las Chacras Solar Plant in Chile.	CHILE	2019
2,7	Undisclosed	1 Unit for Inverter load 2,7 MVA 15/0,655 kV 50 Hz Destined to Acacia Solar Plant in Chile.	CHILE	2019
2,7	Undisclosed	1 Unit for Inverter load 2,7 MVA 15/0,655 kV 50 Hz Destined to Mariano Plant in Chile.	CHILE	2019
2,7	8	3 Units for Inverter load 2,7 MVA 23/0,655 kV 50 Hz Destined to Sol del Norte Plant in Chile.	CHILE	2019
2,7	42	3 Units for Inverter load 2,7 MVA 23/0,655 kV 50 Hz Destined to Central Solar Desierto I Plant in Chile.	CHILE	2019
2,25	41	4 Units for Inverter load 2,25 MVA 20/0,55 kV 50 Hz destined to the Solar Plant of Saint Pierre in Reunion, an oversea territory of France. The Saint-Pierre power plant was built on 1.3 hectares of former wasteland and will be paired with a storage plant.	REUNION	2019
3,7 2,55	8,5	1 Unit for Inverter load 3,7 MVA 10,5/0,8-0,8 kV 50 Hz plus 1 unit 2,55 MVA 10,5/0,8-0,8 kVA destined to Coevorden PV Plant in Holland.	NETHERLANDS	2019
2,82	84,7	39 Units for Inverter load 2,82 MVA 30/0,55-0,55 kV 50 Hz destined to Totana PV Plant near Murcia, Spain	SPAIN	2019
2,75	31	6 Units for Inverter load, cast resin 2,75 MVA 15/0,6 kV 50 Hz destined to the Porto Torres PV Plant in Sardinia, Italy	ITALY	2019
2,7 5,4	42	1 Unit for Inverter load 2,7 MVA 33/0,655 kV and 1 unit 5,4 MVA 33/0,655-0,655 kV 50 Hz destined to Nonogasta Solar Plant near La Rioja	ARGENTINA	2019
0,3	1	1 Unit 0,3 MVA 11/0,4 kV 60 Hz destined to phase 1 of Monserrat's 250 kW Solar PV Project, composed of two steps: a 1 MW rooftop solar project plus battery storage that will provide 10% of the grid's peak daytime demand, followed by a second phase consisting of an additional 750 kilowatts of solar and 250kW/hr battery storage, which will collectively provide 40% of Montserrat's daytime peak electrical load.	MONTSERRAT ISLAND, CARIBBEANS	2019

POWER (MVA)	PROJECT POWER MW	PROJECT DESCRIPTION	COUNTRY	YEAR
5,4	400	9 Units 5,4 MVA 30/0,655-0,655 kV 50 Hz for inverter load, destined to San Severo's CCGT Power Plant	ITALY	2019
2,7	400	3 Units 2,7 MVA 30/0,655 kV 50 Hz for inverter load, destined to San Severo's CCGT Power Plant	ITALY	2019
2,5	8,7	2 Units 2,5 MVA 20/0,6 kV 50 Hz for Inverter load Destined to Quincieux Solar Plant	FRANCE	2019
4	140	4 Units for Inverter load 2,25 MVA 35/0,434 kV 50 Hz Destined to Kirovograd Solar Plant I in Ukraine. The project includes two solar plants in the same area for a total generation capacity of 140 MW	UKRAINE	2019
2	8	1 Unit for Inverter load 2 MVA 11/0,385 kV 50 H Destined to the solar plant of Balcombe, in Sussex. The town of Balcome will be largely powered by green energy after fracking activities which had menaced to destroy the territory. Balcombe is showing how things can be done differently – to the benefit of local people.	UK	2019
2,25	34	12 Units for Inverter load 2,25 MVA 33/0,55 kV 50 Hz Destined to Middlemount Sun Farm in Queensland.	AUSTRALIA	2019
2,7	40	15 Units for Inverter load 2,7 mva 33/0,655 kV 50 Hz Destined to Eldosol Solar Plant in Kenya. The Eldosol Solar PV project is a 40 MW project located in the Plateau area, close to Eldoret City in the North-Western part of Kenya. The project will be connected to the Kenyan national grid via a high voltage transmission line passing close to the project site. The project is under construction.	KENYA	2019
2	2	1 Unit for Inverter load 2 MVA 34/0,385 kV 60 Hz Destined to the power plant at the Joint Task Force Bravo base located at Soto Cano, Honduras. The power plant will be powered by solar energy.	HONDURAS	2019
5,1	50	11 Units for Inverter load 5,1 MVA 34,5/0,66-0,66 kV 60 Hz Destined to Mata de Palma Solar Plant in Dominican Republic.	DOMINICAN REP.	2019
5 2,5	10	3 Units for Inverter load 5 MVA 13,8/0,66-0,66kV 60 Hz and 1 unit 2,5 MVA 13,8/0,66 kV 60 Hz destined to the Solar Plant of Sol de Sonora.	MEXICO	2019
5,1	120	8 Units for Inverter load 5,1 MVA 30/0,66-0,66 kV 50 Hz destined to Sonsonate PV Plant near Acajutla	EL SALVADOR	2019
2,45	Undisclosed	2 Units for Inverter load 2,45 MVA 34,5/0,8 kV 60 Hz destined to Project Costa Rica	COSTA RICA	2019
4	Undisclosed	3 Units, CAST RESIN for Inverter load 4 MVA 20/0,66-0,66 kV 50 Hz destined to project Aldeamajor	SPAIN	2019

GREEN ENERGY APPLICATIONS

PHOTOVOLTAIC - WIND POWER - HYDROELECTRIC
DESIGNED AND MANUFACTURED IN WESTRAFO FROM 2 TO 30 MVA

CASE HISTORY - PV APPLICATION

KITA PV PLANT, MALI

Project Total Power:
50 MW

Transformers supplied:
21 Units 2 MVA 30/0,385 kV 50 Hz

Application:
Solar Power / Inverter

Destination:
Mali

Year:
2018 - 2019

Through one of our best customers we participated in the construction of Akuo Kita PV Plant, the largest PV plant of Mali.

Mali currently has a demand for electricity which exceeds its reliable generation capacity by over 45%. Much of Mali's current power is supplied by imported power and expensive thermal energy.

By creating the Kita Solar Plant, we have contributed to increasing Mali's power supply, increasing electrification rates and replacing expensive thermal generation with cheaper, renewable solar energy.

The €78 million ($96 million) project will include a transmission line that will feed directly into the electricity grid. With such figures, this project will be the largest solar farm yet built in West Africa.

POWER (MVA)	PROJECT POWER MW	PROJECT DESCRIPTION	COUNTRY	YEAR
2.82	Undisclosed	42 Units 2.82 MVA 30/0.55-0.55 kV 50 Hz for inverter load, destined to PV kiosks all over Spain	SPAIN	2019
5	250	8 Units 5 MVA 22/0,60-0,60 kV 50 Hz for inverter load, destined to the Hong Phong solar plant, near Bihn Thuan	VIETNAM	2019
2,7	15	5 Units 2,7 MVA 20/0,655 kV 50 Hz for Inverter load Destined to Amsterdam's Schiphol Airport PV Plant	NETHERLANDS	2019
2	50	21 Units for Inverter load 2 MVA 30/0,385 kV 50 Hz Destined to Kita Solar Farm in Mali. With installed capacity of 50MW it is the biggest solar farm in west Africa. Initiated by the 'R20-Regions of Climate Action' NGO founded by Arnold Schwarzenegger, the project will meet the vital energy needs of a region suffering from significant electricity shortages, and will help the country begin the move towards energy independence that is vital to its development.	MALI	2019
2.7	20	1 Unit for Inverter load 2,7 MVA 13.2/0,655 kV 50 H Destined to El Salitral PV Plant	CHILE	2019
2.7	103	28 Units for Inverter load 2,7 MVA 33/0,655 kV 50 Hz Destined to Midden-Groningen solar park, one of the largest solar parks in the Netherlands. The solar panels with a combined capacity of 103 megawatt peak (MWp) will supply more than 32,000 households with electricity every year.	NETHERLANDS	2019
1.75	2.1	1 Unit for Inverter load 1,75 MVA 25/0,800 kV 50 Hz Destined to the Castelnou PV Plant.	SPAIN	2019
6.125	7.2	1 Unit for Inverter load 6,125 MVA 15/0,8-0,8 kV 50 Hz Destined to the PV Farm of Plasencia de Jalón	SPAIN	2019
4.9	Undisclosed	1 Unit for Inverter load 4,9 MVA 24,9/0,8-0,8 kV 60 Hz Destined to Costa Rica	COSTA RICA	2019
5.1 2.55	39,4	7 Units for Inverter load 5,1 MVA 34,5/0,66-0,66 kV 60 Hz and 1 unit 2,55 MVA 34,5/0,66 kV 60 Hz destined to the Solar Plant of Salsipuedes.	MEXICO	2019
4.4 2.2 4.4	Undisclosed	1 Unit for Inverter load 4 MVA 20/0,66-0,66 kV 50 Hz 2 Units 2,2 MVA 20/0,66 kV 50 Hz, 3 Units 4,4 MVA 20/0,66-0,66 kV 50 Hz destined to PV plants in Spain	SPAIN	2019
5,4 2,7	145	7 Units 5,4 MVA 22/0,65-0,65 kV 1 Unit 2,7 MVA 22/0,65-0,65 kV for inverter load, destined to the Phong Phu-Lac solar plant, near Bihn Thuan	VIETNAM	2018
2,5	17,5	1 Unit for Inverter load 33/0,6-0,6 kV 50 Hz Destined to the Badgingarra PV Plant	AUSTRALIA	2018
5	17,5	3 Units for Inverter load 33/0,6-0,6 kV 50 Hz Destined to the Badgingarra PV Plant	AUSTRALIA	2018

POWER (MVA)	PROJECT POWER MW	PROJECT DESCRIPTION	COUNTRY	YEAR
2	3,9	3 Units for Inverter load 22/0,45-0,45kV 50 Hz Destined to the Koszeg PV Plant	HUNGARY	2018
5	4,4	1 Unit for Inverter load 21/0,6-0,6 kV 50 Hz Destined to the Chaillac PV Park	FRANCE	2018
4,5	4,4	1 Unit for Inverter load 21/0,55-0,55 kV 50 Hz Destined to the Chaillac PV Park	FRANCE	2018
2,25	2,17	1 Unit for Inverter load 20/0,55 kV 50 Hz Destined to the PV Farm of Boisset & Gaujac	FRANCE	2018
2,5	7,2	2 Units for Inverter load 20/0,66 kV 50 Hz Destined to the Tougas PV Plant	FRANCE	2018
2	170	21 Units for Inverter load 33/0,405-0,405, destined to the massive Solar Plant of Minbu in Myanmar	BIRMANIA	2018
2	18,5	10 Units for Inverter load 35/0,405-0,405 50 Hz Destined to the Solar Plant near Bükkábrány, which will substitute gradually the near lignite-fired power plant Matràs, the biggest of Hungary	HUNGARY	2018
2	1	1 Unit for Inverter load 12,5/0,385 50 Hz Destined to the PV Farm of Saba Island, comprehending a 1 MW Solar Plant and 1,5 MW of energy storage for the little island.	DUTCH CARIBBEAN	2018
1,68	52	9 Units for Inverter load 20,5/0,33kV 50 Hz Destined to the huge Waldpolenz Solar Plant near Bennewitz (Eastern Germany)	GERMANY	2018
2	4,5	1 Unit for Inverter load 15/0,405-0,405 kV 50 Hz Destined to the Wind Power Plant of Wałcz City	POLAND	2018
2	2.5	1 Unit for Inverter load 33/0,385 kV 50 Hz Destined to the Solar Farm of Lower Ninestones in Cornwall	UK	2018
2,7	12	2 Units for Inverter load 12/0,655 kV 50 Hz Destined to PV Plants near Calla Larga & Cruz	CHILE	2018
5	10	4 units for Inverter load 33/0,66-0,66 kV 50 Hz Destined to a PV Plant in Great Britain	UK	2018
5,1	30	2 Units for Inverted load 13,8/0,66-0,66 kV 60 Hz Destined to the PV Plant of Delicias, Chihuahua	MEXICO	2018

GREEN ENERGY APPLICATIONS

PHOTOVOLTAIC - WIND POWER - HYDROELECTRIC
DESIGNED AND MANUFACTURED IN WESTRAFO FROM 2 TO 30 MVA

CASE HISTORY - PV APPLICATION

NACAOME PV PLANT, HONDURAS

Project Total Power:
144 existing MW + 50 additional MW

Transformers supplied:
6 units, 5,1 MVA 34,5/0,66-0,66 kV

Application:
Solar Power / Inverter
Destination:
Honduras

Year:
2018

Through one of our best customers we participated in the enlargement of Nacaome PV Plant, already the second largest PV Plant of Honduras.

The challenges of this project were three:

-to reduce the overall dimensions of the complete solution, making it suitable for insertion into standard containers

-simplify commissioning with simpler connections to be configured inside the containers supplied by the customer

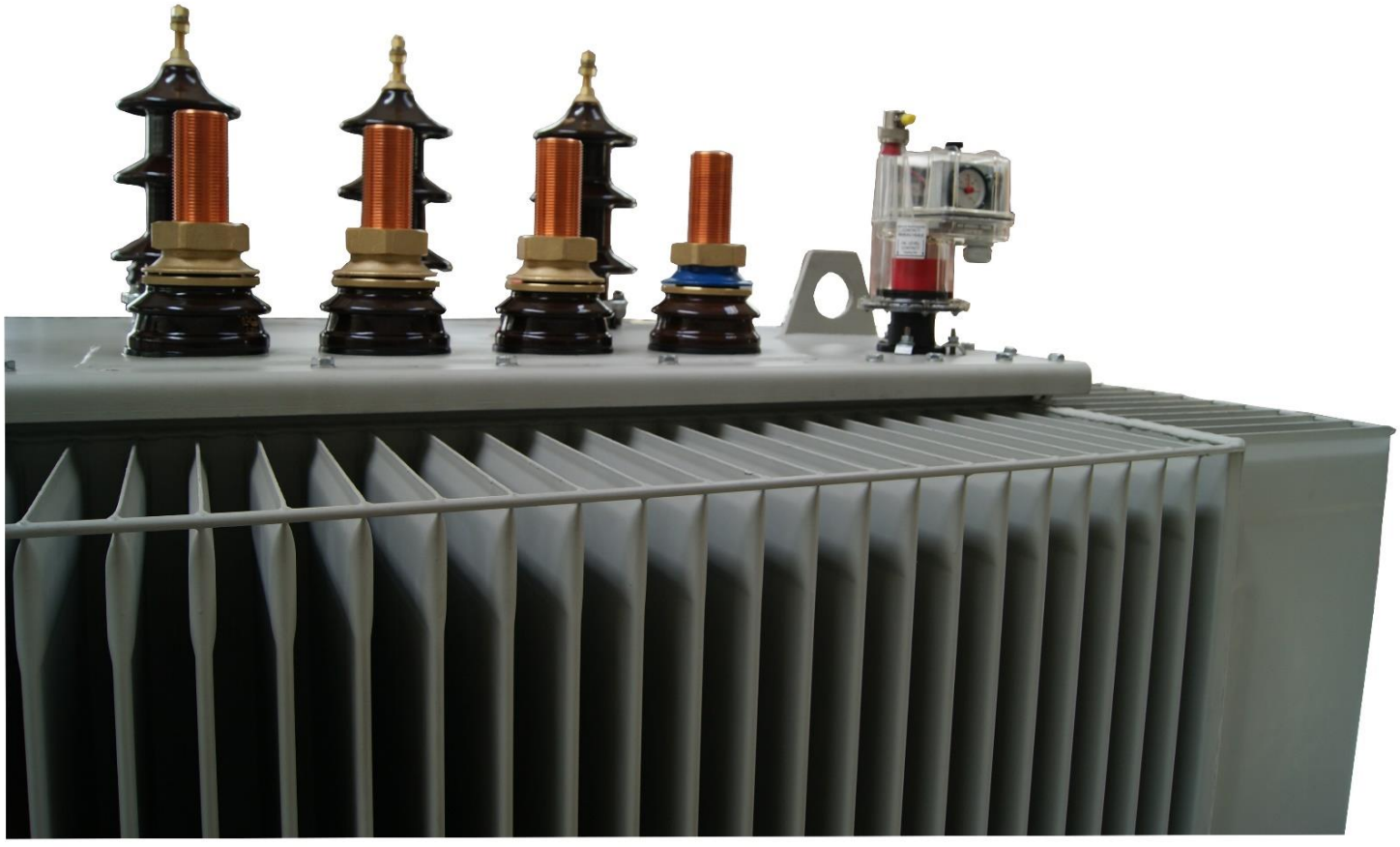
- the development of the complete solution in less than 8 weeks from order, for over 30 MW of installed power.

The client, who was present at the tests, confirmed his esteem for us, congratulating us on the umpteenth positive result and confirming that Westrafo has proved once again to be a reliable and efficient partner.

POWER (MVA)	PROJECT POWER MW	PROJECT DESCRIPTION	COUNTRY	YEAR
4,2	30	2 Units for Inverted load 13,8/0,66-0,66 kV 60 Hz Destined to the PV Plant of Delicias, Chihuahua	MEXICO	2018
2,45	20	1 Unit for Inverted load 34,5/0,63 kV 60 Hz Destined to the PV Plant of Los Remedios	EL SALVADOR	2018
4,9	20	4 Units for Inverted load 34,5/0,63-0,63 kV 60 Hz Destined to the PV Plant of Los Remedios	EL SALVADOR	2018
1	2	2 Units for Inverter load 33/0,27-0,27 kV 50 Hz Destined to a Solar Farm in Ireland	IRELAND	2018
4,8	38,4	2 Units for Inverter load 23/0,66-0,66 kV 60 Hz El Salvador's Las Mesas Plant	EL SALVADOR	2018
2,2	3	1 Unit for Inverter load 34,5/0,66 kV 60 Hz El Salvador's Sol de Opico Solar Plant in San Juan Opico	EL SALVADOR	2018
4,4	8	3 Units for Inverter load 34,5/0,66-0,66 kV 60 Hz El Salvador's Trinidad Solar Plant in Acajutla	EL SALVADOR	2018
5,1	6	1 Unit for Inverter load 13,2/0,66-0,66 kV 60 Hz El Salvador's Marquez Solar Plant in Acajutla	EL SALVADOR	2018
2,5	9	3 units for Inverter load 23/0,6 kV 50 Hz Destined to three Solar farms of 3 MW each in Til Til, Pirque and Los Andes near Casuto	CHILE	2018
2,5	60	4 units for Inverter load 33/0,66-0,66 kV 50 Hz Destined to a Hydroelectric Power Plant in Santa Clara	BRAZIL	2018
0,66	Undisclosed	1 Unit for Inverter Load 20/0,4 kV 50 Hz destined to a Solar Farm in Poland	POLAND	2018
1	Undisclosed	1 Unit for Inverter Load 13,8/0,405 kV 60 Hz destined to a Solar Farm in Brazil	BRAZIL	2018
1,26	Undisclosed	1 Unit for Inverter Load 33/0,315-0,315 kV 50 Hz destined to a Solar Farm in Great Britain	UK	2018
1,2	Undisclosed	1 Unit for Inverter Load 13,8/0,4 kV 60 Hz destined to a Solar Farm in Nicaragua	NICARAGUA	2018
1,2	Undisclosed	1 Unit for Inverter Load 15/0,4 kV 50 Hz destined to a Solar Farm in Cameroun	CAMEROUN	2018
5,18	Undisclosed	1 Unit Cast resin transformer for Inverter Load 33/0,8 kV 50 Hz destined to a Solar Plant in Spain	SPAIN	2018

POWER (MVA)	PROJECT POWER MW	PROJECT DESCRIPTION	COUNTRY	YEAR
5,1	194	6 Units for Inverter load 13,8/0,4 kV 60 Hz Destined to a PV Plant in Nacaome, Honduras	HONDURAS	2018
2,75	Undisclosed	1 Unit for Inverter load 33/0,6 kV 50 Hz Destined to a PV Plant in Germany	GERMANY	2018
1,6	Undisclosed	1 Unit for Inverter load 6,3/0,48 kV 60 Hz Destined to a PV Plant in Cuba	CUBA	2017
1,6	Undisclosed	1 Unit for Inverter load 20/0,36-0,36 kV 50 Hz Destined to a PV Plant in Germany	GERMANY	2017
0,65	Undisclosed	8 Units for Inverter load 12,47/0,4 kV 60 Hz Destined to a PV Plant in Dominican Republic	DOMINICAN REP.	2017
1,25	Undisclosed	6 Units for Inverter load 11/0,93 kV 50 Hz Destined to a PV Plant in Great Britain	UK	2017
1,8	Undisclosed	2 Units for Inverter load 11/0,4 kV 50 Hz Destined to a PV Plant in Namibia	NAMIBIA	2017
1	Undisclosed	3 Units for Inverter load 20/0,48 kV 50 Hz Destined to a PV Plant in Italy	ITALY	2017
0,5	Undisclosed	3 Units for Inverter load 12,7/0,4 kV 60 Hz Destined to a PV Plant in Caucedo, Dominican Republic	DOMINICAN REP.	2017
1,8	Undisclosed	3 Units for Inverter load 33/0,405 kV 50 Hz Destined to a PV Plant in Great Britain	UK	2017
1,8	Undisclosed	3 Units for Inverter load 15/0,4 kV 50 Hz Destined to a PV Plant in Eritrea	ERITREA	2017
5	Undisclosed	4 units for Inverter load 33/0,66-0,66 kV 50 Hz Destined to a PV Plant in Germany	GERMANY	2017
1,2	Undisclosed	Transformer designed to be connected to 4 Inverters, 10/0,33-0,33-0,33-0,33 kV for a Solar Farm, delivered in 6 weeks from order	GERMANY	2017
1	Undisclosed	2 Units for Inverter load, Voltage 22/0,405 kV 50 Hz destined to a Solar Farm	GREECE	2017
2	Undisclosed	2 Units for Inverter load, Voltage 22/0,405-0,405 kV 50 Hz destined to a Solar Farm	GREECE	2017
1,8	Undisclosed	2 Units for Inverter load, Voltage 22/0,405-0,405 kV 50 Hz destined to a Solar Farm	GREECE	2017
1	Undisclosed	1 Unit for Inverter load, Voltage 13,2/0,405 kV 50 Hz destined to a Solar Farm	CHILE	2017
2,2	Undisclosed	1 Unit for Inverter load, Voltage 33/0,420 kV 50 Hz destined to a Solar Farm	UK	2017

POWER (MVA)	PROJECT POWER MW	PROJECT DESCRIPTION	COUNTRY	YEAR
2	Undisclosed	2 units for Inverter load, Voltage 33/0,405 kV 50 Hz destined to a Solar Farm	UK	2016
2	Undisclosed	2 units for Inverter load, Voltage 33/0,405-0,405 kV 50 Hz destined to a Solar Farm	UK	2016
1,8	Undisclosed	Transformer for Inverter load, Voltage 33/0,405-0,405 kV 50 Hz destined to a Solar Farm	UK	2016
0,5	Undisclosed	3 units transformer for Inverter load, 60 Hz Voltage 12,4/0,4 kV destined to a Solar Farm	DOMINICAN REPUBLIC	2016
0,63	Undisclosed	Oil-insulated transformer for Inverter load, 50 Hz Voltage 15/0,48 kV destined to a Solar Farm	ITALY	2016
1,25	Undisclosed	4 units for Inverter load, Voltage 11/0,39 kV 50 Hz destined to a PV Plant	UK	2016
0,85	Undisclosed	2 units for Inverter load, Voltage 11/0,35 kV 50 Hz destined to a Solar Farm	UK	2016
0,5	Undisclosed	3 units for Inverter load, 60 Hz Voltage 12,4/0,4 kV destined to a Solar Farm	DOMINICAN REPUBLIC	2015
1,8	Undisclosed	2 units for Inverter load, Voltage 33/0,405-0,405 kV 50 Hz destined to a Solar Farm	UK	2015



GREEN ENERGY APPLICATIONS

PHOTOVOLTAIC - WIND POWER - HYDROELECTRIC
DESIGNED AND MANUFACTURED IN WESTRAFO FROM 2 TO 30 MVA

CASE HISTORY - WIND POWER APPLICATION

PUERTO GALERA, ORIENTAL MINDORO, PHILIPPHINES

Project scale:
48 MW wind farm
on an area of 1,296 hectares
Phase 1 - 16 MW wind farm installation

Transformers supplied:
2 units, Power 3600 kVA,
Voltage 22,8/0,545-0,545 kV

Application:
Wind Power / Inverter

Destination:
Puerto Galera, Philipphines

Year:
2019

The 48-megawatt Wind Energy Power System consists of three phases each generating 16MW.

The country's largest wind farm starts construction tomorrow on a site overlooking Verde Island, involving a P6-billion private investment on power generation.

The Puerto Galera facility whose service contract was approved by the Department of Energy is located six kilometers from the interconnection point of the 69-kilovolt Mindoro Grid of the Small Power Utilities Group of the National Power Corp.

The Puerto Galera project is a component of the Power Development Program of Oriental Mindoro supported by the Provincial Development Council.

POWER (MVA)	PROJECT POWER MW	PROJECT DESCRIPTION	COUNTRY	YEAR
1,15	Undisclosed	1 Unit 1150/1080-70 kVA 20/0,69-0,398 kV 50 Hz	AUSTRIA	2019
1,85	Undisclosed	6 Units 1850/1780-70 kVA, 20/0,69-0,398 kV 50 Hz filled with FR3 fluid	AUSTRIA	2019
2,2	39,1	1 Unit for inverter load destined to the Windpark of Aisimi in northers Greece	GREECE	2019
2.5	Undisclosed	1 unit for Inverter load, Power 2500 kVA, Voltage 33/0.660 kV 50 Hz destined to Windpark Schashagen	GERMANY	2019
2.5	Undisclosed	1 unit for Inverter load, Power 2500 kVA, Voltage 20/0.660 kV 50 Hz destined to Windpark Koßdorf	GERMANY	2019
2.5	Undisclosed	1 unit for Inverter load, Power 2500 kVA, Voltage 20/0.660 kV 50 Hz destined to Windpark Jetsch	GERMANY	2019
1,15	0,9	1 unit for Inverter load, Power 1150/1080-70 kV, Voltage 20/0,69-0,398 kV 50 Hz destined to a Wind Farm in Aquilonia (AV - Campania)	ITALY	2018
1,15	Undisclosed	1 unit for Inverter load, Power 1150/1080-70 kV, Voltage 20/0,69-0,398 kV 50 Hz destined to a Wind Farm in Vallata	ITALY	2018
1,15	Undislosed	1 unit for Inverter load, Power 1150/1080-70 kV, Voltage 20/0,69-0,398 kV 50 Hz destined to a Wind Farm in Basilicata	ITALY	2018
1,15	Undislosed	1 unit for Inverter load, Power 1150/1080-70 kV, Voltage 20/0,69-0,398 kV 50 Hz destined to a Wind Farm in Puglia	ITALY	2017
0,98	Undislosed	1 unit for Inverter load, Power 980 kV, Voltage 20/0,69 kV 50 Hz destined to a Wind Farm	ITALY	2017
1,15	47,6	3 units for Inverter load, Power 1150/1080-70 kV, Voltage 20/0,69-0,398 kV 50 Hz destined to a Wind Farm in San Severo (FO)	ITALY	2017

GREEN ENERGY APPLICATIONS

PHOTOVOLTAIC - WIND POWER - HYDROELECTRIC
DESIGNED AND MANUFACTURED IN WESTRAFO FROM 2 TO 30 MVA

CASE HISTORY - WIND POWER APPLICATION

SAN SEVERO, FOGGIA ITALY

Turbines:
16 Units LTW80 1.500 kW

Transformers supplied:
3 units, Power 1150/1080-70 kV,
Voltage 20/0,69-0,398 kV

Application:
Wind Power / Inverter

Destination:
Puglia, Italy

Year:
2017

Through one of our best partners for Wind Power applications we participated to the on-shore Wind Park of San Severo, near Foggia.

The transformers supplied for this project are designed with electrostatic screen for a better resistance to electrostatic distortions and were supplied in the late stages of the project.

The production of the Wind turbines and installation of this project in San Severo took almost three years, from Sept. 2014 to May 2017.

Located in one of the windiest areas of Italy, the plant will be able to generate a total of 47,6 GWh /year of renewable electricity, equal to the needs of over 18 thousand households, with a CO2 emission saving of about 49 thousand tons a year.

The challenge of this project was to complete the Wind Park despite the orographic complexity of the Italian territory and the scarce accessibility of the internal areas.

ENERGY STORAGE

INTEGRATED SYSTEMS FOR SOLAR ENERGY GENERATION
& STORAGE IN BATTERY CONTAINERS

CASE HISTORY - ENERGY STORAGE CONTAINERS

PROJECT BIGBATT - SCHWARZE PUMPE POWER PLANT

Project Description:
13 BESS containers

Application:
Energy storage

Destination:
Schwarze pumpe power plant
Spremberg (DE)

Year:
2019-2020

Project Big Batt at the Schwarze pumpe power plant is a battery storage facility with a utilisation capacity of 53 megawatt hours (MWh) at the Schwarze Pumpe power plant industrial site.

BigBattery combines modern power plant infrastructures with storage technology in a completely new order of magnitude. In this constellation the project is the only one of its kind in Europe, to date.

The storage facility, which is based on lithium-ion technology, will make power generation more flexible and help protect the power grid from fluctuations.

Westrafo from its side took care of the battery storage units Design, Engineering, Manufacture,of the execution of FAT tests, of the on-site installation in Spremberg (Germany) and the maintenance training of the plant operators.

PROJECT REFERENCE NAME	PROJECT DESCRIPTION	COUNTRY	YEAR
SCHWARZE PUMPE	13 BESS single e-houses The project for these BESS containers included Design, Engineering, Manufacture, Execution of FAT tests, on-site installation in Spremberg (Germany) and maintenance training. This battery storage facility has a utilisation capacity of 53 megawatt hours (MWh) at the Schwarze Pumpe power plant industrial site. On an area of 110 by 62 metres, 13 containers will house the lithium-ion batteries. There are also 13 converter containers, a unit transformer and medium and low voltage switchgear. They are the key features of the storage site. Equally significant are the battery and energy management system as well as the internal control, protection and fire alarm technology. The battery storage facility will be connected to the grid at the high voltage level (110 kilovolts). This will also provide the connection to the extra-high voltage grid on site.	GERMANY	2019 2020
MAYREAU	Assembly service of 2 units complete 20ft container solution including container structure, lighting system, auxiliary electrical panel, installation service of a multicluster panel, N.12+4 inverters, N.32 BMZ batteries, N.2 HVAC, PV-cabinet design, construction and installation as well as the installation of N.4 battery protection boxes, completed with emergency lights and signals, labels and internal cabling and preparation for shipment	VIRGIN ISLANDS	2019
BUFFALO	Assembly service of 1 unit complete 10ft container solution including container structure, LV panel, MV switchgear and an oil immersed transformer 1,2 MVA 34,5/0,48 kV 60 Hz Internal cabling included	HONDURAS	2019
SOTO CANO	Assembly service of 1 unit complete 10ft container solution including container structure, LV panel, MV switchgear and a cast resin transformer 1,35 MVA 34,5/0,48 kV Yyn0 60 Hz Internal cabling included	HONDURAS	2019
KRANICH	Assembly service of 1 MVS-STP unit including a 660 kVA 20/0,4 kV transformer, a substation container, MV switchgear, LV panel and auxiliary control panel. Internal cabling included	GERMANY	2019

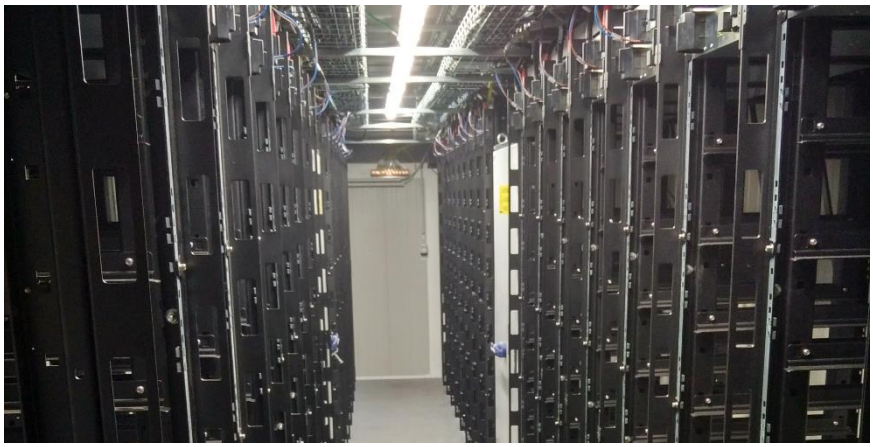
Photos from the Mayreau Project, Virgin Islands

ENERGY STORAGE

INTEGRATED SYSTEMS FOR SOLAR ENERGY GENERATION
& STORAGE IN BATTERY CONTAINERS

CASE HISTORY - SOLAR ENERGY STORAGE

ENERGY SYSTEM FOR ‘THE BRANDO’



Project Description:
1 battery storage container 40ft
HVAC system 2x28 kW

Application:
Energy storage

Destination:
Assembly and finishing: Papeete
Final destination:
Brando Island, French Polynesia

Year:
2018

This project is particularly important for us in Westrafo, as it testifies our ability to provide vertical solutions and to expand our consultancy, design and project management to applications going beyond the supply of power and distribution transformers.

The supply of this battery container solution on Brando Island was rendered particularly tricky because of the remote location.

The container was designed taking particular care about the weight and dimensional restrictions, as it needed to be transported via ship to Papeete and then, on a smaller ship with weight limitations, to The Brando, a private Island hosting an exclusive resort.

The final installation and commissioning was completed by Westrafo Technicians on site.

RECHARGE STATIONS

SUSTAINABLE PEAK LOAD TRANSFORMERS FOR ELECTRIC CARS RECHARGE STATIONS

RECHARGE STATIONS

SUSTAINABLE PEAK LOAD TRANSFORMERS FOR ELECTRIC CARS RECHARGE STATIONS

CASE HISTORY - SPL TRANSFORMERS FOR RECHARGE STATIONS

AFFI SUPERCHARGER, VERONA - ITALY

Project Total Power:
16 superchargers available 24/7
fed by a sustainable peak load transformer
insulated with FR3 natural ester

Transformers supplied:
1 Unit Power 1550 /1400-150 kVA
Voltage 20/0,48-0,40 kV

Application:
Supercharger

Destination:
Verona - Italy

Year:
2018

This project for the supply of transformers designed for electric cars battery chargers is proving Westrafo to be a transformer Company capable of designing a solution exactly for the type of application requested by the end customer.

In particular, our Sustainable Peak Load transformers are able to sustain effortlessly the high energy peaks needed to recharge completely an electric car in less than 30 minutes, without damaging the transformer (and, naturally, the Superchargers) in the long run.

The new Superchargers are now being installed all across Europe with the contribution of Westrafo's transformers.
These devices will exploit the new 350 kW DC technology to ensure very high-speed refills with just slightly longer stop times compared to what is used today at a normal fuel distributor.

Westrafo's SPL application fits perfectly to the purpose, guaranteeing great performance and reliability in every Supercharger station across Europe.

POWER (kVA)	VOLTAGE (kV)	PROJECT DESCRIPTION	COUNTRY	YEAR
800	11,4/0,48	1 Unit destined to the Supercharger station of Weinebrugge, Bruges (opening in Fall 2018)	BELGIUM	2018
1000	30/0,48	1 Unit destined to the Supercharger station of Alcacér do Sal, feeding 10 Superchargers available 24/7 up to 120 kW	PORTUGAL	2018
1000 Nominal 1250 SPL	15/0,48	1 Unit filled with FR3 natural ester and destined to the 'Como - The electric Lake' project, a 170 km emission-free circuit around lake of Como (CO). The recharge station will host 15 Superchargers (opening in Fall 2018)	ITALY	2018
630 Nominal 800 SPL	20/0,48	1 Unit destined to the Supercharger station of Carsoli Oricola (AQ) - (opening in Fall 2018)	ITALY	2018
800	15/0,48	1 Unit filled with FR3 natural ester destined to the Supercharger station of Amendoeira, (opening 1 st quarter 2019)	PORTUGAL	2018
1250	15/0,48	1 Unit Cast resin destined to the Supercharger station of Sondrio (SO), feeding 8 Superchargers available 24/7 up to 120 kW	ITALY	2018
1550	20/0,48-0,4	1 Unit filled with FR3 natural ester destined to the Supercharger station of Affi (VR), feeding 16 Superchargers available 24/7 up to 120 Kw	ITALY	2017
1550	20/0,48-0,4	1 Unit filled with FR3 natural ester destined to the Supercharger station of Brennero (BZ), feeding 16 Superchargers available 24/7 up to 120 Kw	ITALY	2017
800	15/0,48	1 Unit filled with FR3 natural ester destined to the Supercharger station of Guarda, feeding 8 Superchargers available 24/7 up to 120 Kw	PORTUGAL	2017
1600	15/0,48-0,4	1 Unit filled with FR3 natural ester destined to the Supercharger station of Firenze (FI), feeding 8 Superchargers available 24/7 up to 120 Kw	ITALY	2017
1000 Nominal 1250 SPL	15/0,48	1 Unit filled with FR3 natural ester destined to the Supercharger station of Imperia (IM), feeding 10 Superchargers available 24/7 up to 120 Kw	ITALY	2017
800 Nominal 1000 SPL	15/0,48	1 Unit filled with FR3 natural ester destined to the Supercharger station of Piacenza (PC), feeding 8 Superchargers available 24/7 up to 120 Kw	ITALY	2017
1000	25/0,48	1 Unit Cast resin destined to the Supercharger station of Aguadulce (Malaga), feeding 8 Superchargers available 24/7 up to 120 kW	SPAIN	2017
1000	30/0,48	1 Unit Cast resin destined to the Supercharger station of Miranda de Ebro (Malaga), feeding 8 Superchargers available 24/7 up to 120 kW	SPAIN	2017
1000	30/0,48	1 Unit Cast resin destined to the Supercharger station of Porto (opening 1 st quarter 2019)	PORTUGAL	2017

POWER (kVA)	VOLTAGE (kV)	PROJECT DESCRIPTION	COUNTRY	YEAR
1600	15/0,48-0,4	1 Unit filled with FR3 natural ester destined to the Supercharger station of Firenze (FI), feeding 8 Superchargers available 24/7 up to 120 Kw	ITALY	2017
1000	20/0,48	1 Unit destined to the Supercharger station of Cerignola (FO), feeding 8 Superchargers available 24/7 up to 120 Kw	ITALY	2017
630	20/0,48	1 Unit destined to the Supercharger station of Palmi (RC), feeding 4 Superchargers available 24/7 up to 120 Kw	ITALY	2017
1000	15/0,48	1 Unit destined to the Supercharger station of Roncadelle (BS), feeding 12 Superchargers available 24/7 up to 120 kW	ITALY	2017
1250	20/0,48	1 Unit destined to the Supercharger station of Trento (TN), feeding 10 Superchargers available 24/7 up to 120 kW	ITALY	2017
1000	15/0,48	1 Unit destined to the enlargement of the Supercharger station of Campogalliano (MO), feeding 10 Superchargers available 24/7 up to 120 kW	ITALY	2017
800	20/0,48	1 Unit destined to the Supercharger station of Morano Calabro (CO), feeding 2 Superchargers available 24/7 up to 120 Kw	ITALY	2017
1000	20/0,48	1 Unit destined to the Supercharger station of San Giovanni Teatino (CH), feeding 8 Superchargers available 24/7 up to 120 Kw	ITALY	2017
2250	20/0,4-0,48	1 Unit cast resin destined to the Supercharger station of Mogliano Veneto (TV), feeding 8 Superchargers available 24/7 up to 120 Kw	ITALY	2016
1040	20/0,4-0,48	1 Unit cast resin destined to the Supercharger station of Occhiobello (RO), feeding 8 Superchargers available 24/7 up to 120 Kw	ITALY	2016
500	20/0,48	1 Unit destined to the Supercharger station of Mercato San Severino (SA) feeding 6 Superchargers available 24/7 up to 120 Kw	ITALY	2016
630	15/0,48	1 Unit destined to the Supercharger station of Forte dei Marmi (LU), feeding 8 Superchargers available 24/7 up to 120 Kw	ITALY	2016

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