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Connecting wind power to the grid

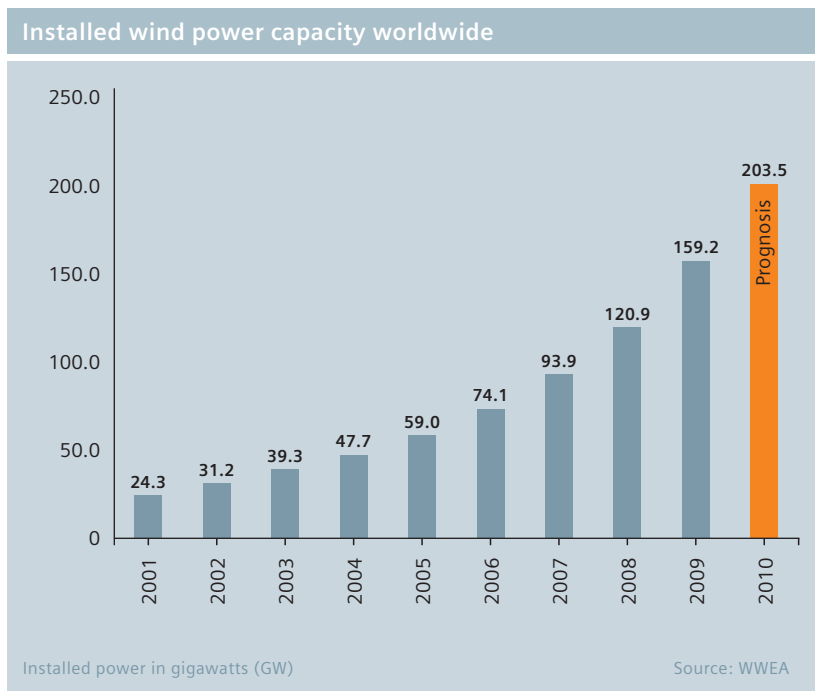
Gas-insulated medium-voltage switchgear for wind farms

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Answers for energy.



Wind power is booming – now and in the future



The international targets for reducing greenhouse gases have led to a boom in renewable energies, with a special focus on wind power. Since the start of the new millennium, the newly installed capacity has increased by up to 30 per cent per year. The European Union's goal is to obtain 20 percent of generated electricity from renewable energy sources by 2020, with the largest share coming from wind power at almost 35 percent. To reach this goal, new wind power capacities with a total output of around 100 GW need to be installed in the EU by 2020.

Market prospects are also promising in other parts of the world. The need and demand for wind power is constantly growing, not just in industrialized but also in emerging countries.

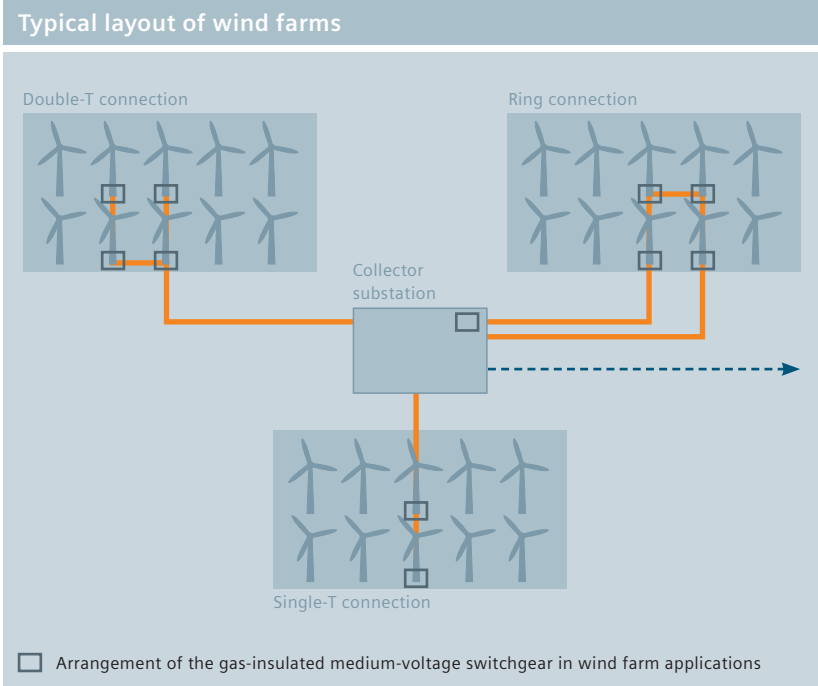




The ideal choice for every application

Gas-insulated medium-voltage switchgear (GIS) are used for various applications in wind farms. Depending on the operator's requirements, different configurations of medium-voltage GIS allow the individual wind turbines to be safely connected to the wind farm's own power grid.

Cables transmit the generated power to a collector substation where another medium-voltage GIS protects the wind farm on the one hand and the power transformer on the other, and therefore ensures a safe connection of the sustainably generated power to the high-voltage transmission grid. Within larger wind farms, reactive power compensation is used to minimize reactive power flow. This system is also connected with the wind farm via gas-insulated medium-voltage switchgear.



For the optimal operation of your system

Gas-insulated medium-voltage switchgear for wind farm applications

- Wind turbine: NXPLUS C Wind, 8DJH, SIMOSEC, NXPLUS, 8DA
- Collector substation: 8DA, NXPLUS, NXPLUS C, 8DJH
- Reactive power compensation: 8DA, NXPLUS, NXPLUS C, 8DJH



NXPLUS C Wind

8DJH

SIMOSEC

NXPLUS

8DA

NXPLUS C

Switchgear type	Voltage (kV)	Short-circuit current max. (kA)	Rated current busbar max. (A)	Rated current feeder max. (A)
8DA	40.5	40.0	5,000	2,500
NXPLUS	40.5	31.5	2,000	2,000
NXPLUS C Wind	36.0	25.0	1,000	1,000
NXPLUS C	24.0	25.0	2,500	2,000
SIMOSEC	24.0	20.0	1,250	1,250
8DJH	24.0	20.0	630	630

Offshore projects



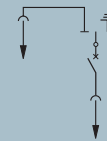
Walney, United Kingdom

Position: Wind turbines

Switchgear type: NXPLUS C Wind, fixed-mounted circuit-breaker switchgear, gas-insulated, single busbar

Electrical data: 36 kV, 20 kA, 630 A

Scope of supply: 51 panels



Scheme 1

Greater Gabbard, United Kingdom

Position: Collector substation and reactive power compensation

Switchgear type: NXPLUS, fixed-mounted circuit-breaker switchgear, gas-insulated, single busbar

Electrical data: 40.5 kV, 31.5 kA, 2,000 A

Scope of supply: 31 panels

Switchgear type: 8DA10, fixed-mounted circuit-breaker switchgear, gas-insulated, single busbar

Electrical data: 24 kV, 40 kA, 2,500 A

Scope of supply: 6 panels

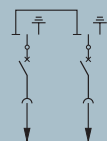
Middelgrunden, Denmark

Position: Wind turbines

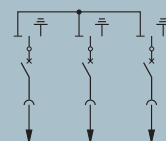
Switchgear type: NXPLUS, fixed-mounted circuit-breaker switchgear, gas-insulated, single busbar

Electrical data: 36 kV, 31.5 kA, 1,600 A

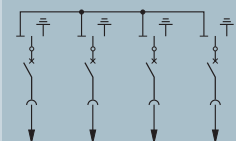
Scope of supply: 59 panels



Scheme 1



Scheme 2



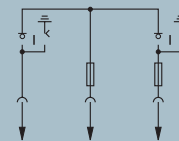
Scheme 3

Onshore projects



Lamèque, United States of America

Position:	Wind turbines
Switchgear type:	Simosec, fixed-mounted circuit-breaker switchgear, single busbar
Electrical data:	15 kV, 16 kA, 630 A
Scope of supply:	60 panels



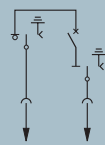
Scheme 1

Bisdorf, Germany

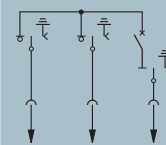
Position:	Collector substation	Electrical data:	36 kV, 31.5 kA, 1,250 A
Switchgear type:	NXPLUS, fixed-mounted circuit-breaker switchgear, gas-insulated, single busbar	Scope of supply:	12 panels

Germinon, France

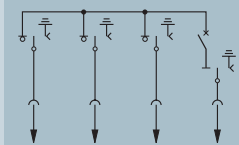
Position:	Wind turbines
Switchgear type:	8DJH, fixed-mounted circuit-breaker switchgear, gas-insulated, single busbar
Electrical data:	24 kV, 20 kA, 630 A
Scope of supply:	32 panels



Scheme 1

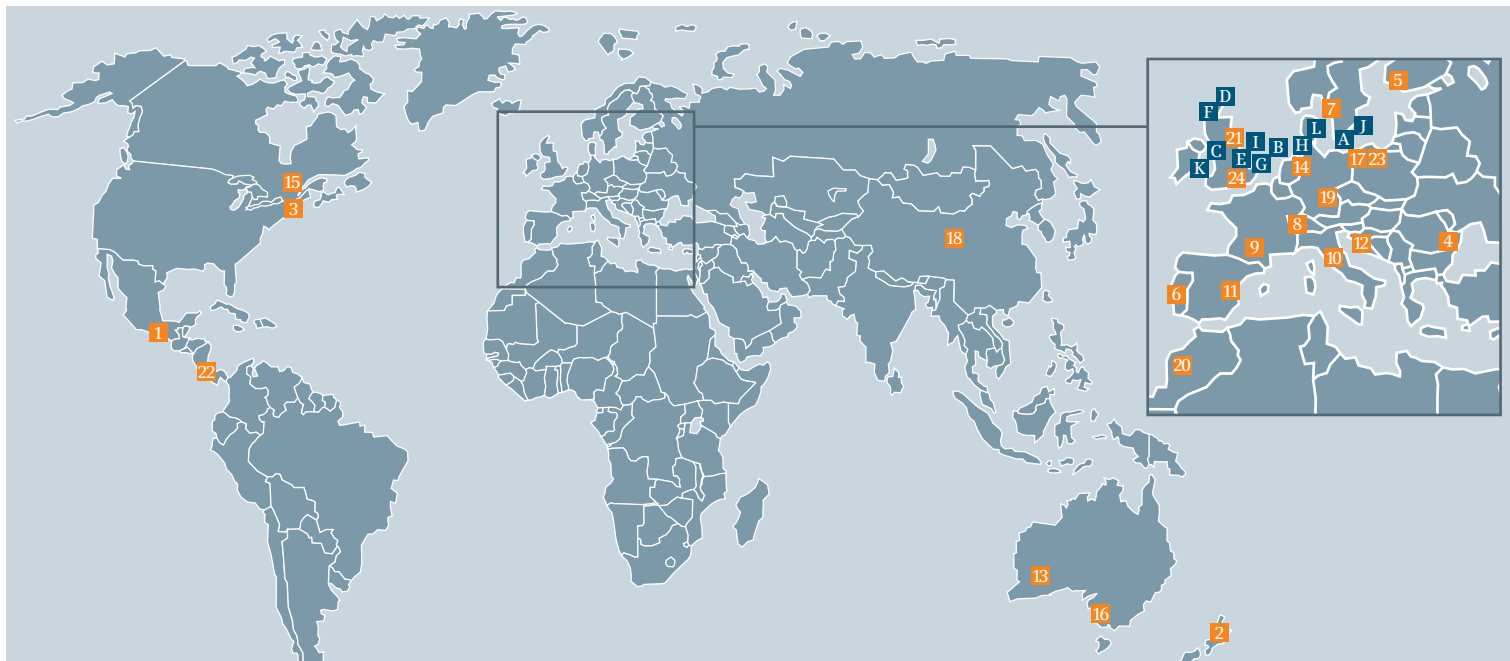


Scheme 2



Scheme 3

Worldwide references



Offshore projects

A	Baltic 1, DE, 2010	21 panels
B	Belwind, BE, 2010	14 panels
C	Walney, GB, 2010	51 panels
D	Lincs, GB, 2010,	26 panels
E	London Array, GB, 2010	20 panels
F	Greater Gabbard, GB, 2009	37 panels
G	Thanet, GB, 2009	30 panels
H	Offshore 1, DE, 2009	120 panels
I	Lynn and Inner Dowsing, GB, 2007	10 panels
J	Lillegrund, SE, 2006	10 panels
K	Arklow Bank, IE, 2003	47 panels
L	Middelgrunden, DK, 2000	59 panels

Onshore projects

1	Oaxaca, MX, 2010	22 panels
2	Te Uku, NZ, 2010	6 panels
3	Lamèque, US, 2010	60 panels
4	Cernavoda, RO, 2010	28 panels
5	Puuska, FI, 2010	22 panels
6	Alto Contada, PT, 2010	18 panels
7	Töftedal, SE, 2010	60 panels
8	Mont Crosin, SZ, 2010	24 panels
9	Germinon, FR, 2010	32 panels
10	Fossa del Lupo, IT, 2010	35 panels
11	La Fatarella, ES, 2010	21 panels
12	Velika Popina, HR, 2010	13 panels
13	Brown Hill, AU, 2009	14 panels
14	Westereems, NL, 2008	6 panels
15	Amherst, CA, 2008	27 panels
16	Hallet, AU, 2007	18 panels
17	St. Karścino, PL, 2007	16 panels
18	Zhangbei, CN, 2006	99 panels
19	Fröhden, DE, 2006	13 panels
20	Parc Eolien, MA, 2006	209 panels
21	Red Tile, GB, 2006	7 panels
22	Turbowinds, CR, 2002	5 panels
23	Darlowo, PL, 2001	12 panels
24	Carno, UK, 1996	3 panels

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