Reference projects

CR/JB/JL

01.10.2013

Table of Content

Cold climate, high altitude, icing conditions

Germany, August 2013

Client: confidential
Project: Supply, installation and commissioning of one wind measuring towers (height: 140m, steel lattice tower for ice zone 3 and wind zone 1).

Project description

The customer asked for a 140m tower for a measurement campaign in the central German mid-range mountains (Mittelgebirge). The sensors and data logger were provided by the customer but installed by Ge:Net. The site is app. 485m above sea level in a forest. The static calculation was made for ice zone 3 and wind zone 1. The tower has been installed using a gib stick and a winch, so no crane was needed. This kept the costs low, and due to the installation method less trees had to be cut. The overall footprint of the tower is rather small, trees had to be cut only around the base of the tower and along the guy wires.
During the permission process several official requirements were made by the authorities. To comply with those requirements the tower is equipped with ball markers, red-white painting, aviation lights on three different heights, and bird diverters to prevent birds from hitting the guy wires.

Schedule:

Construction permit	20.06.2013
Shipping	31.07.2013
Start of installation works	31.07.2013
Take in operation of tower	10.08.2013

1. Germany, June 2013

Client: confidential

Project: Supply, installation and commissioning of one wind measuring tower (height: 126,5m, steel lattice tower, designed for ice zone 4 and wind zone 1) including measuring equipment, turnkey.

Project description

The site is located in difficult terrain without any road access – no truck nor car could reach the site. Ge:Net used a forestry vehicle (“Forwarder”) to carry the trusses and the equipment to the site. In addition some archeological excavations during the installation caused a small delay of the project.
The tower is designed for ice zone 4 and wind zone I. It is located at an elevation of about 640m above sea level. It features a small wind turbine to provide extra power for the heating of a 2D-ultrasonic anemometer.

Schedule:

Construction permit	31.05.2013
Shipping	01.07.2013
Start of installation works	01.07.2013
Take in operation of tower	24.07.2013

Germany, March 2013

Client: confidential
Project: Supply, installation and commissioning of one wind measuring tower (height: 125m, steel lattice tower, designed for ice zone 4 and wind zone 1) including measuring equipment, turnkey.

Project description

This tower has been installed at a site in the south-west of Germany at an elevation of app. 440m above sea level in a forest. The ecological impact has been kept as low as possible by cutting only a few trees and avoiding crane installation. Extremely harsh conditions at the onset of winter delayed the installation, snow and ice hindering the installation team to climb the tower, and when the temperatures rose heavy machines could not be used because they would sink in the mud. But at the end of winter the tower has been installed successfully.
The tower is equipped with measurement system, ball markers, aviation lights at two different heights, a heated ultra sonic 2D anemometer, and a small wind turbine to provide extra power for sensor heating.

Schedule:

Construction permit	30.10.2012
Shipping	11.12.2012
Start of installation works	31.01.2013
Take in operation of the tower	10.03.2013

Germany, November 2012

Client: confidential
Project: Supply, installation and commissioning of one wind measuring towers (height: 126,5m, steel lattice tower, designed for ice zone 4 and wind zone 1) including measuring equipment, turnkey.

Project description

The site is located app. 560m above sea level, in a clearing in the forest. The tower is designed for ice zone 4 and wind zone 1 and features a small wind turbine to provide extra power for a heated Vaisala cup anemometer which backs up the non-heated first class sensors.
The outer guy wires are equipped with ball markers to improve visibility for airplane pilots.

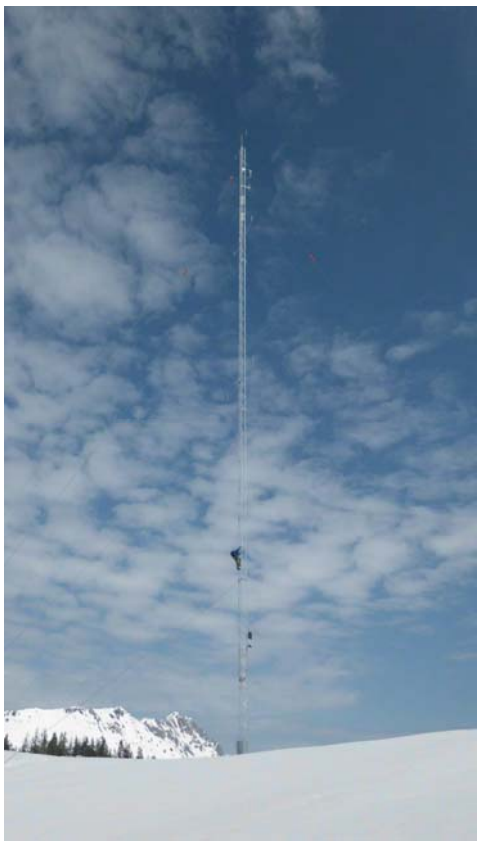
Schedule:

Construction permit	02.08.2012
Shipping	31.10.2012
Start of installation works	31.10.2012
Take in Operation of the Tower	14.11.2012

Austria, November 2011

Client: confidential

Project: Supply, installation and commissioning of one wind measuring towers (height: 80m, steel lattice towers) including measuring equipment, turnkey.



Project description

The site is located in the Austrian Alps at an elevation of app. 1440m above sea level. During the winter this site faces serious amounts of snow fall and icing.
Due to the steep terrain access was very difficult. Ge:Net used its 8WD Tatra truck to get the trusses and equipment to the site. The Tatra also carries a shelter to provide accommodation at the site, so the installation team did not have to move to a hotel each night.
The tower features IEC-standard equipment, heated sensors, and two small wind turbines to provide extra power for the heating.

Schedule:

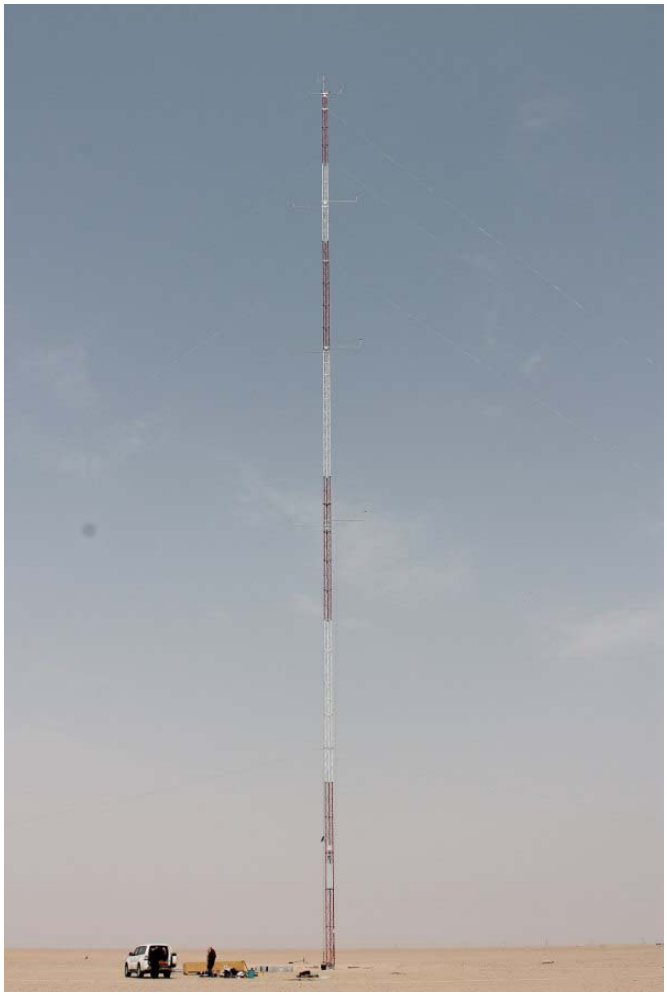
Construction permit	Not necessary
Shipping	19.11.2011
Start of installation works	21.11.2011
Take in Operation of the Tower	28.11.2011

Hot climate, desert conditions

Kuwait Project 2012

Client: confidential

Project: Supply, installation and commissioning of 2 wind measuring towers (height: 100m, steel lattice towers) including measuring equipment, turnkey.



Project description:

In 2012 two 100m steel lattice towers were delivered to two sites in Kuwait to be integrated in two solar measurement stations. Each tower is equipped with five anemometers and four wind vanes.
The towers were installed in the desert during summer, the climate was extreme. Due to the extreme temperatures during the day the installation had to be done during the night. Therefore floodlighting had to be installed at the site.

Schedule:

Signing of the contract	11th May 2012
Shipping	24th May 2012
Start of installation works	7th July 2012
Take in Operation of last Tower	30st July 2012

2. Sudan Project 2012

Client: Ministry of Electricity and Dams of Sudan (MED)
Project: Supply, installation and commissioning of one wind measuring tower (height: 85m, aluminium lattice tower) including measuring equipment, turnkey.

Project description:

The Ministry of Electricity and Dams of Sudan issued an invitation to tender for a measurement campaign at Port Sudan in 2011. Ge:Net was contracted and delivered a 85m aluminium lattice tower including measurement system. The measurement system consists of four anemometers, two wind vanes, temperature, humidity, and barometric pressure sensors as well as a data logger with GSM-communication. The tower was installed by a local team under the supervision of an expert from Ge:Net. The foundations and civil works were done by a local construction company under the supervision of Ge:Net.

Schedule:

Purchase Order from Client	20th September 2011
Shipping	22nd December 2011
Start of installation works	12th March 2012
Take in Operation of last Tower	20th March 2012

Egypt Project 2011/2012

Client: O&K Trading Co., Ltd.
Project: Supply, installation and commissioning of 10 wind measuring towers (height: 80m, aluminium lattice towers) including measuring equipment, turnkey.

Project description:

In 2011a preparatory survey for a project to establish a wind farm at west nile valley in Egypt will be conducted by the Japan International Cooperation Agency (JICA) and the New and Renewable Energy Authority (NREA). This survey includes a wind measurement campaign, for which Ge:Net delivers, installs and commissions 10 wind measurement stations. Each of these stations consist of a 80m aluminium lattice tower GE-L80 equipped with four anemometers, two wind vanes, barometric pressure sensor and temperature sensor. A data logger collects the weater data and transmits them to the customer via BGAN satellite. The whole meteo tower is powered by a solar panel and is customized to withstand the extreme conditions in the desert.

Schedule:

Acceptance of tender	20th January 2011
Purchase Order from Client	19th May 2011
Site Survey	06th June 2011
Shipping	July 2011
Start of installation works	13th January 2012
Take in Operation of last Tower	4th March 2012

3. Libya Project 2010

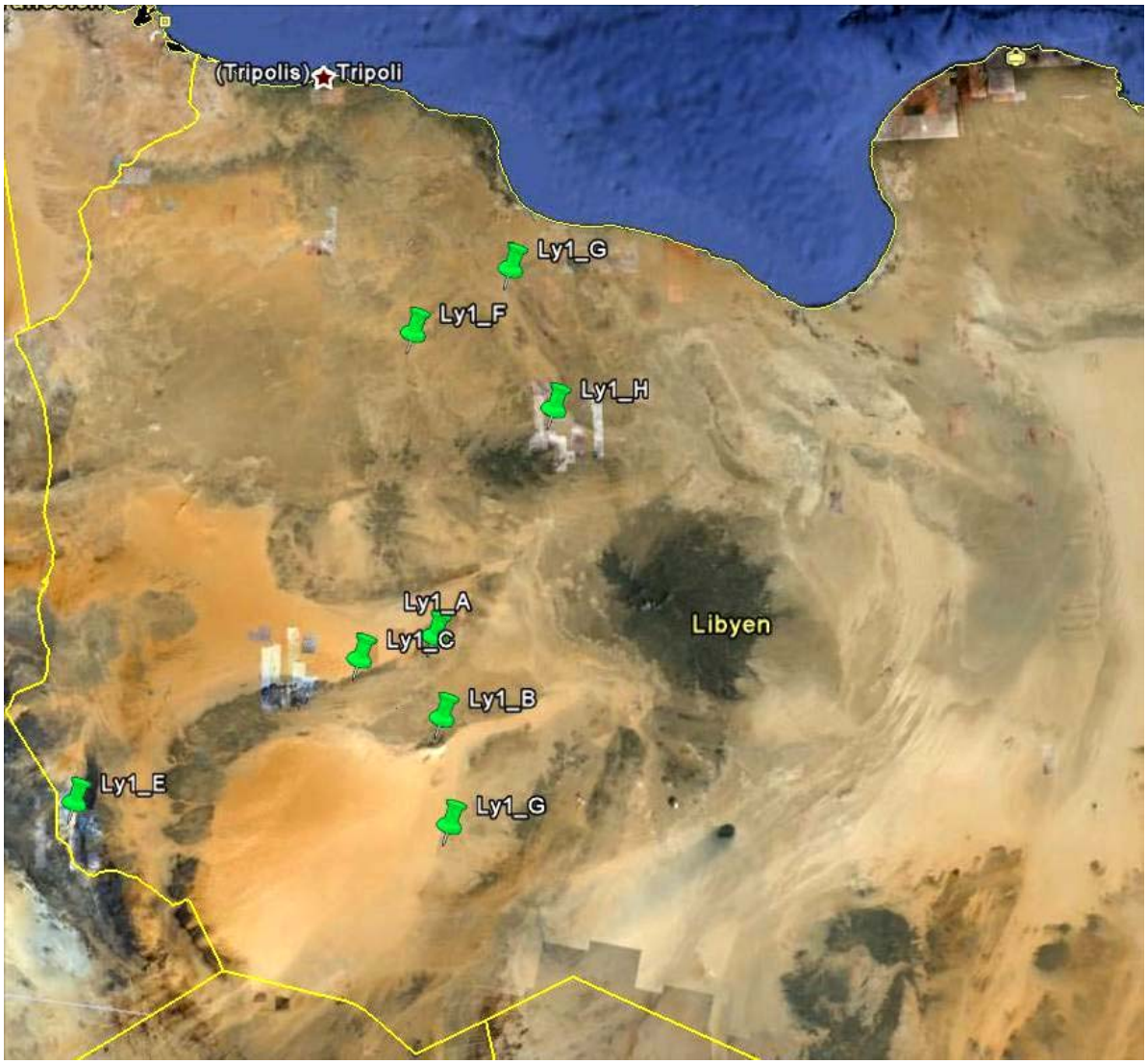
Client: REAOL (Renewable Energy Authority of Libya)
Project: Supply, installation and commissioning of 8 Wind measuring towers (height: 60m) including measuring equipment, Turnkey.

Project description:

To collect information about the wind and solar potential in Libya 8 wind measuring stations were installed at 8 different sites all over Libya. The measuring stations consist of a 60m Tower with 4 Anemometers, 1 Wind direction sensor, a solar radiation sensor, Temperature, Humidity and Barometric pressure sensor. All sensors are connected to a Datalogger that stores data for more than one year and transmits once per day latest data records via a GPRS Internet connection to a pc in the office.

The installation works were executed in September and October 2010. The installed tower is a tubular tower with 60m height from Ge:Net's own production (GE-L60).

Locations:



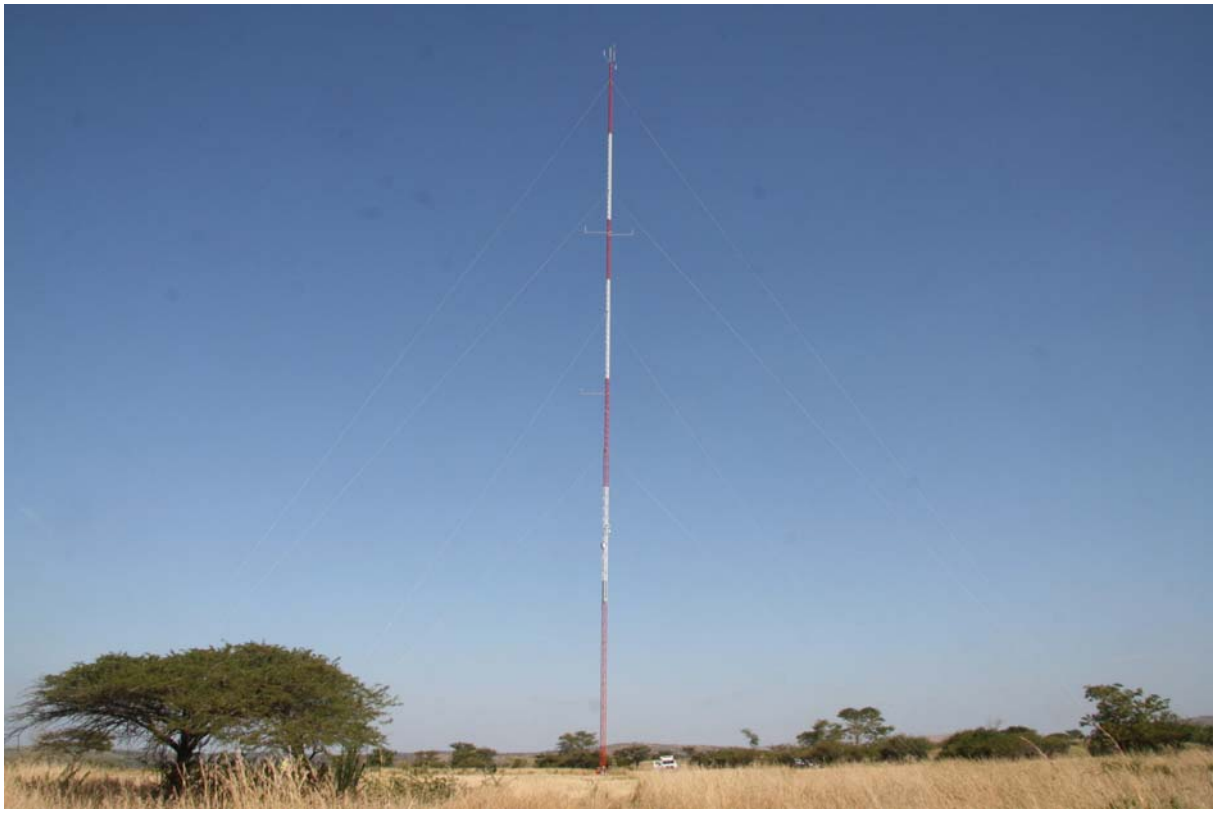
Schedule

Purchase Order from Client	15th May 2009
Acceptance of Letter of Credit from Client	16th March 2010
Shipping of Equipment	08th April 2010
Building permission from Client	05th September 2010
Start of installation works	22nd September 2010
Take in Operation of last Tower	15th October 2010

South Africa Project 2011

Client: eab astrum energy (Pty) Ltd

Project: Supply, installation and commissioning of 2 Wind measuring towers (height: 85m, aluminium lattice towers) including measuring equipment, turnkey.



Project description:

Aim of the project is to collect data about the wind potential for a planned wind farm at the site. For this purpose Ge:Net delivered, installed and commissioned two meteo towers. These meteo towers consist of 85m aluminium lattice towers and measurement equipped with four anemometers, two wind vanes, sensors for temperature, barometric pressure, humidity, and rainfall. A data logger collects the weather data and sends the data to the customer via GPRS. The meteo towers are powerd by solar panels.

Schedule:

Purchase Order from Client	22nd February 2011
Shipping of Equipment	15th April 2011
Start of installation works	19th April 2011
Take in Operation of last Tower	07th May 2011

Reference List Towers / Turnkey projects

Referencelist Ge:Net GmbH - Towers

Year	Client	Country Client	No. Systems	Country Measurement	Mast Height [m]	Tower Design
2001/03	Windsolar	Germany	5	Spain	40	Tubular Steel
2001/06	Windsolar	Germany	1	Spain	80	Tubular Steel
2001/10	DSM Wind	Germany	1	Germany	50	Tubular Steel
2002/05	Windsolar	Germany	4	Spain	40	Tubular Steel
2002/10	DSM Wind	Germany	1	Germany	50	Tubular Steel
2003/02	Windkraft Mannenweiler	Germany	1	Germany	50	Tubular Steel
2003/06	Windsolar	Germany	5	Spain	40	Tubular Steel
2003/07	ABB New Ventures	Germany	4	Spain	40	Tubular Steel
2003/08	Energiekontor Iberia	Spain	1	Spain	80	Tubular Steel
2004/03	Windkraft Mannenweiler	Germany	1	Germany	50	Tubular Steel
2005/08	Renergys	Germany	4	Spain	55	Tubular Steel
2005/09	Renergys	Germany	3	Spain	40	Tubular Steel
2006/03	Renergys	Germany	1	France	80	Tubular Steel
2006/04	Lahmeyer International	Germany	3	Jordan	50	Tubular Steel
2006/05	Renergys	Germany	1	France	65	Tubular Steel
2006/06	United Nations	Kazachstan	8	Kazachstan	50	Tubular Steel
2006/08	Cube Engineering	Germany	1	Greece	30	Tubular Steel
2006/08	Cube Engineering	Germany	4	Greece	60	Tubular Steel
2006/08	Lahmeyer	Germany	2	Jemen	40	Tubular Steel
2006/10	Lahmeyer	Germany	3	Jordan	50	Tubular Steel
2007/02	Grammont	Slovakai	2	Serbia	60	Tubular Steel
2007/02	Grammont	Slovakai	1	Serbia	60	Tubular Steel
2007/02	Nordex	Germany	1	Romania	85	Tubular Steel
2007/03	Luventa	Schweiz	1	Swiss	50	Tubular Steel
2007/03	Luventa	Schweiz	2	Swiss	65	Tubular Steel
2007/04	Renergys	Germany	1	France	85	Tubular Steel
2007/05	Falcon Capital	Tschechien	1	Russia	65	Tubular Steel
2007/05	Renergys	Germany	1	France	80	Tubular Steel
2007/06	Enairtec	Romania	2	Poland	65	Tubular Steel
2007/09	Renergys	Germany	1	France	65	Tubular Steel

2007/10	Eole Autan	France	1	France	85	Tubular Steel
2007/10	NAR	Kazachstan	2	Kazachstan	50	Tubular Steel
2007/10	Windkraftkontor	Germany	1	France	60	Tubular Steel
2007/10	Windkraftkontor	Germany	2	France	85	Tubular Steel
2007/11	Green Energy	Slovakai	1	Slovakai	50	Tubular Steel
2007/11	renergys	Germany	1	Spain	40	Tubular Steel
2007/11	renergys	Germany	3	Spain	55	Tubular Steel
2007/11	Roslyn Capital	Bulagria	1	Bulgaria	85	Tubular Steel
2007/12	Abu Dhabi Future Energy	V. A.E.	1	V. A.E.	50	Tubular Steel
2007/12	University Alba Iulia	Romania	1	Romania	85	Tubular Steel
2008/03	Interconsult	Slovakai	1	Slovakai	80	Tubular Steel
2008/03	Teknam	Turkey	4	Turkey	50	Tubular Steel
2008/04	Turcas	Turkey	3	Turkey	65	Tubular Steel
2008/04	Vortex	Germany	1	Poland	85	Tubular Steel
2008/05	renergys	Germany	1	France	85	Tubular Steel
2008/05	Teknam	Turkey	3	Turkey	75	Tubular Steel
2008/05	Windkraftkontor	Germany	1	France	85	Tubular Steel
2008/06	Teknam	Turkey	2	Turkey	50	Tubular Steel
2008/07	Unigea	Germany	3	Greece	65	Tubular Steel
2008/08	Arca	Romania	1	Romania	85	Tubular Steel
2008/08	RenGen	UK	2	Greece	20	Tubular Steel
2008/08	RenGen	UK	1	Greece	40	Tubular Steel
2008/08	Rick Service	Romania	3	Romania	85	Tubular Steel
2008/10	Teknam	Turkey	6	Turkey	65	Tubular Steel
2008/10	Teknam	Turkey	2	Turkey	75	Tubular Steel
2008/10	Teknam	Turkey	1	Turkey	75	Tubular Steel
2008/10	ProWind	Germany	5	Romania	85	Tubular Steel
2008/11	Eole Autan	France	1	France	85	Tubular Steel
2008/11	RenGen	UK	1	Greece	40	Tubular Steel
2008/11	RenGen	UK	3	Greece	40	Tubular Steel
2008/11	Teknam	Turkey	1	Turkey	85	Tubular Steel
2008/11	Turcas	Turkey	1	Turkey	65	Tubular Steel
2008/11	Unigea	Germany	6	Turkey	65	Tubular Steel
2008/11	ProWind	Germany	5	Romania	85	Tubular Steel
2008/11	Teknam	Turkey	1	Turkey	50	Tubular Steel
2008/12	GE Wind	Germany	1	Spain	80	Tubular Steel
2008/12	Teknam	Turkey	4	Turkey	65	Tubular Steel
2008/12	Teknam	Turkey	6	Turkey	85	Tubular Steel
2008/12	Teknam	Turkey	2	Turkey	70	Tubular Steel

2009/02	Anemos	Germany	1	Poland	85	Tubular Steel
2009/02	Ensar	Italien	1	Lettland	60	Tubular Steel
2009/02	Lahmeyer	Germany	11	Turkey	60	Tubular Steel
2009/02	Teknam	Turkey	3	Turkey	75	Tubular Steel
2009/02	Wind 7	Germany	2	Panama	75	Tubular Steel
2009/02	EEF	France	1	France	60	Tubular Steel
2009/02	EEF	France	2	France	85	Tubular Steel
2009/03	Sparinvest	Germany	1	Poland	60	Tubular Steel
2009/03	Teknam	Turkey	5	Turkey	75	Tubular Steel
2009/03	Windkraftkontor	Germany	1	France	60	Tubular Steel
2009/03	Windkraftkontor	Germany	2	France	85	Tubular Steel
2009/04	PNE	Germany	2	Hungary	85	Tubular Steel
2009/04	DK Energy	Greece	3	Bulgaria	85	Tubular Steel
2009/05	Interconsult	Slovakai	1	Slovakai	85	Tubular Steel
2009/06	UNIDO	Austria	4	Cuba	50	Tubular Steel
2009/07	EximProd	Romania	1	Romania	85	Tubular Steel
2009/07	RenGen	UK	3	Greece	40	Tubular Steel
2009/08	RIG Service	Romania	2	Romania	85	Tubular Steel
2009/09	Nordex	Germany	1	Romania	85	Tubular Steel
2009/09	Luventa	Switzerland	1	Switzerland	65	Tubular Steel
2009/09	Eole Autan	France	1	France	50	Tubular Steel
2009/10	Lahmeyer	Germany	3	Kenia	60	Tubular Steel
2009/11	Lahmeyer	Germany	3	Uruguay	60	Tubular Steel
2009/11	SC Eolian	Romania	1	Romania	85	Lattice Aluminium
2009/12	Türktek	Turkey	1	Turkey	65	Tubular Steel
2010/01	Innovative Windpower	Germany	1	Germany	68	Tubular Steel
2010/01	GE Wind	Germany	1	Spain	85	Tubular Steel
2010/02	Latinus	Germany	2	Chile	68	Tubular Steel
2010/03	PNE	Germany	1	Romania	70	Tubular Steel
2010/04	Balkanwind	Bulagria	1	Bulgaria	85	Lattice Aluminium
2010/04	Ensar	Italy	1	Romania	70	Lattice Aluminium
2010/08	PNE	Romania	1	Romania	70	Tubular Steel
2010/08	ABO Wind AG	Germany	1	Germany	100	Lattice Steel
2010/08	EPG	Spain	1	Kazachstan	75	Tubular Steel
2010/10	PNE	Romania	1	Romania	70	Tubular Steel
2010/10	REAOL	Lybia	8	Lybia	60	Tubular Steel
2010/11	Crenersol	Germany	1	South Africa	85	Lattice Aluminium
2011/01	AboWind AG	Germany	1	Belgium	80	Lattice Aluminium
2011/02	Lahmeyer International	Germany	1	Namibia	85	Tubular Steel

2011/02	RenGen Energy	UK	1	Italia	65	Tubular Steel
2011/03	South African Renewable Green Energy	South Africa	1	South Africa	85	Tubular Steel
2011/05	Astrum Energy	South Africa	3	South Africa	85	Lattice Aluminium
2011/05	Alpha Wind Energy ApS	Denmark	3	Germany	100	Lattice Steel
2011/06	TÜV Süd	Germany	1	Slowakia	85	Lattice Aluminium
2011/07	Ingenieurbüro Ulli Scheuenstuhl	Germany	1	Romania	65	Tubular Steel
2011/07	Energiepark Bruck/Leitha	Austria	1	Hungary	85	Lattice Aluminium
2011/07	WSB neue Energien GmbH	Germany	2	Germany	100	Lattice Steel
2011/08	JICA	Japan	10	Egypt	80	Lattice Aluminium
2011/09	Vortex Energy	Germany	1	Poland	100	Lattice Steel 2
2011/09	AboWind	Germany	1	Belgium	80	Lattice Aluminium
2011/09	Energiepark Bruck/Leitha	Austria	1	Austria	85	Lattice Aluminium
2011/11	TÜV Süd	Germany	1	Switzerland	85	Lattice Aluminium
2011/11	ABO Wind AG	Germany	1	Germany	100	Lattice Steel
2011/11	Activity	Germany	1	Russia	85	Lattice Aluminium
2011/11	Verbund Renewable Power	Austria	1	Austria	80	Lattice Steel
2011/12	WSB Projekt GmbH	Germany	1	Germany	100	Lattice Steel
2011/12	RengEn GmbH	Germany	1	Ukraine	70	Tubular Steel
2012/02	WKN Windcurrent SA Ltd.	South Africa	1	South Africa	100	Lattice Steel
2012/03	Lahmeyer International GmbH	Germany	1	Sudan	85	Lattice Aluminium
2012/03	Alpha Wind	Denmark	1	Tunisia	80	Lattice Steel 2
2012/03	Regenarative Energien	Germany	1	Belgium	50	Lattice Aluminium
2012/04	Geo-NET	Germany	1	Austria	60	Tubular Steel
2012/05	Astrum Energy	South Africa	2	South Africa	85	Lattice Aluminium
2012/05	Alpha Wind	Denmark	1	Bosnia	80	Lattice Aluminium
2012/05	Astrum Energy	South Africa	2	South Africa	85	Lattice Aluminium
2012/05	Resource Management	Sri Lanka	1	Sri Lanka	80	Lattice Aluminium
2012/05	Ensar S.r.l.	Italia	1	Italia	60	Tubular Steel
2012/05	EnBW	Germany	1	Kenia	60	Tubular Steel
2012/05	NEK	Germany	1	Kosovo	60	Tubular Steel
2012/06	Anemos	Germany	1	Poland	85	Tubular Steel
2012/06	ABO Wind AG	Germany	2	Germany	125	Lattice Steel
2012/07	Fichtner GmbH	Germany	2	Kuwait	100	Lattice Steel
2012/08	TÜV Süd	Germany	1	Germany	100	Lattice Steel
2012/08	ABO Wind AG	Germany	1	Germany	100	Lattice Steel
2012/08	ABO Wind AG	Germany	1	Germany	125	Lattice Steel
2012/09	NES GmbH	Germany	1	Germany	140	Lattice Steel
2012/09	WKN	Germany	1	Germany	140	Lattice Steel
2012/09	ABO Wind AG	Germany	1	Germany	125	Lattice Steel

2012/11	Windguard	Germany	1	Germany	140	Lattice Steel
2012/10	ABO Wind AG	Germany	2	Germany	125	Lattice Steel
2012/10	WSB	Germany	1	Germany	140	Lattice Steel
2012/11	GermanProfEC	Germany	6	Honduras	60	Tubular Steel
2012/11	GermanProfEC	Germany	2	Honduras	80	Tubular Steel
2012/11	ABO Wind AG	Germany	1	Germany	125	Lattice Steel
2012/11	PNE	Germany	1	Germany	140	Lattice Steel
2012/11	Proen	Austria	1	Austria	80	Lattice Steel
2012/12	Energie Südwest AG	Germany	1	Germany	125	Lattice Steel
2013/01	DoArm Engineering Co. Ltd	South Korea	1	South Korea	85	Lattice Aluminium
2013/01	Uni Göttingen	Germany	1	Indonesia	30	Lattice Aluminium
2013/02	Arge Hüselitz	Germany	1	Germany	100	Lattice Steel
2013/03	Greencity Energy AG	Germany	1	Germany	140	Lattice Steel
2013/04	Max Bögel	Germany	1	Croatia	100	Lattice Steel
2013/04	EOL	Germany	2	Germany	100	Lattice Steel
2013/05	Windguard	Germany	1	Germany	130	Lattice Steel
2013/05	SBSenergy	Iran	1	Iran	85	Lattice Aluminium
2013/05	University St. Petersburg	Russia	4	Russia	40	Tubular Steel
2013/03	Abo Wind AG	Germany	1	Germany	125	Lattice Steel
2013/03	Cube Engineering	Germany	1	Germany	100	Lattice Steel
2013/04	Abo Wind AG	Germany	1	Germany	125	Lattice Steel
2013/04	Cube Engineering	Germany	1	Germany	100	Lattice Steel
2013/06	Stadtwerke Weilburg	Germany	1	Germany	140	Lattice Steel
2013/07	WSB AG	Germany	1	Germany	140	Lattice Steel
2013/07	Abo Wind AG	Germany	1	Germany	125	Lattice Steel
2013/09	Anemos	Germany	1	Germany	100	Lattice Steel
2013/09	Alpha Centre	Germany	1	Karzastan	85	Tubular Steel

Total Number of Installations **327**

Installation of a 85m aluminium lattice tower in South Africa

View from an installation site in Austria