

## LEAVE IT ALL TO US

### Resource Assessment Service Solutions

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Vattenfall Power Consultant (VPC) recently awarded Vaisala a contract to provide two turnkey 100 meter resource assessment tower systems, including sensors, telemetry, preventative maintenance, on-site repairs, and operational data acquisition and management services.

Vaisala and VPC are working together to evaluate wind resource potential for Gothia Airtricity Vind, a rapidly growing wind farm development firm based in Sweden. The resource assessment towers were installed in May 2008 near the west-central Lake Vänern region of Sweden. Vaisala's project management team successfully coordinated the project civil works, erection of the tower via helicopter, installation of equipment, and commissioning.



There is no such thing as a resource assessment tower too tall or challenging for Vaisala. By partnering with established manufacturers and installers across the globe, Vaisala ensures that your resource assessment system will survive the harshest of climates. Vaisala's measurement equipment is the most robust in the industry and will provide the reliability you need for the assessment campaign. (Left) A helicopter installs the VPC / Gothia Airtricity Vind tower near Knappa, Sweden.

The Vaisala resource assessment tower systems were equipped with Vaisala Mechanical Cup and Vane anemometers with MEASNET certification to support bankable data for Gothia Airtricity Vind. The sensors are calibrated and certified by an independent wind test tunnel in Germany to ensure consistent performance. Wind speed and direction measurements are taken at 65 meters, 82 meters, and 102 meters to provide an understanding of the wind resource at hub level and across much of the wind swept area of the proposed turbine blades, so VPC can best estimate the wind power potential at the sites.

Vaisala differentiates itself by providing customers with tailored service level agreements to meet their required data availability and service response times. Vaisala Services acts as the lifecycle partner for VPC's environmental observation requirements. The Vaisala spirit, decades of experience, and close collaboration with VPC and Gothia Airtricity Vind enable a wide range of services to provide easy access to professional support over the lifecycle of the resource assessment towers, along with environmental data generation and management to provide the quality of information needed to make important financial decisions.

Station History Table - Knappa

DATE/TIME	102,0 m				99,0 m				97,0 m			82,0 m							
	WS 1 avg	WS 1 std	WS 1 max	WS 1 min	WS 2 avg	WS 2 std	WS 2 max	WS 2 min	TA 1 avg	RH 1 avg	WD 1 avg	WS 3 avg	WS 3 std	WS 3 max	WS 3 min	WS 4 avg	WS 4 std	WS 4 max	WS 4 min
	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s	°C	%	°	m/s	m/s	m/s	m/s	m/s	m/s	m/s	m/s
2009-05-28 00:00	8,31	1,57	11,90	4,30	8,24	1,51	11,80	4,50	7,4	91 223	9	7,70	1,59	11,00	3,80	7,61	1,71	11,10	3,60
2009-05-27 23:50	8,58	1,42	11,70	5,80	8,43	1,41	11,90	5,60	7,5	91 224	9	7,84	1,27	10,80	4,30	7,64	1,41	10,70	4,00
2009-05-27 23:40	8,75	1,60	13,00	5,00	8,64	1,53	13,10	5,10	7,5	91 228	11	7,58	1,48	10,80	4,10	7,22	1,48	10,80	3,80
2009-05-27 23:30	8,78	1,55	12,30	4,70	8,57	1,55	12,80	5,10	7,5	90 230	11	8,00	1,55	12,70	4,70	7,63	1,63	11,80	4,10
2009-05-27 23:20	9,25	1,52	13,60	5,00	8,99	1,50	12,10	4,20	7,6	88 233	11	8,15	1,60	12,60	4,10	7,50	1,60	12,80	4,20
2009-05-27 23:10	12,20	1,66	16,50	7,50	11,92	1,63	15,70	7,50	7,7	86 242	7	10,96	1,59	14,20	6,10	9,59	1,66	14,00	5,20
2009-05-27 23:00	12,33	1,77	16,70	7,70	12,13	1,84	16,90	7,10	7,7	85 243	7	10,88	1,97	14,90	5,70	9,70	1,87	15,20	5,50
2009-05-27 22:50	12,56	1,92	17,70	7,30	12,39	2,00	17,90	7,40	7,7	85 240	9	11,28	2,20	16,80	6,60	10,09	2,16	16,80	5,50
2009-05-27 22:40	12,02	1,92	16,10	6,20	11,79	1,93	16,30	6,50	7,9	84 243	8	10,89	1,93	15,00	4,10	9,53	1,57	14,10	4,40
2009-05-27 22:30	13,00	2,10	17,50	7,50	12,79	2,05	16,50	7,10	8,0	84 244	7	11,94	1,92	16,20	7,00	10,55	1,82	16,40	5,50

A view of the secured website where VPC can access data from the Vaisala resource assessment towers. The wind speed, wind direction, and temperature measurements from different height levels are shown for a 90-min period. As expected, the wind speeds increase with height at the Knappa, Sweden tower from this example in late May 2009.

Data from the VPC resource assessment towers are collected at the Vaisala EMEA data center situated in Birmingham, UK. Vaisala provides VPC with easy access to the real-time and historic observation data via a



A bird's eye view of the VPC / Gothia Airtricity Vind resource assessment tower in west-central Sweden. Data Management and Data Quality Services provided by Vaisala ensure that the environmental observations are reliable and of high quality to make wind farm investment decisions.

secure, password-protected web interface. VPC has the ability to display the data in tabular and graphical formats as well as carry out CSV-compatible data exports to manipulate the data themselves. Although the data is owned by the customer, Vaisala collects, quality checks, archives and provides performance-related information regarding the VPC systems. The service is monitored and maintained 24/7 ensuring the continuous provision of information. Wind energy industry standard 10-min average, maximum, minimum, and standard deviation wind speeds, and 10-min average and standard deviation wind directions are provided. An incident report containing such parameters as missing data, extreme conditions, and suspect data that are configurable by the customer at the station and sensor level is included. Lastly, VPC is provided with a data availability report on a monthly basis that describes the amount of data being received by the database compared to the maximum amount of observations possible during the time period.

Data Quality Services provided by Vaisala complement the data management offering and ensure that VPC and Gothia Airtricity Vind are only presented with high quality data to support their analysis and decision-making process. After the tower observation data is received by the Vaisala EMEA data center, an automated data quality software engine carries out up to 120 different quality checks. This is done every minute before the data is committed to the database. Any suspected faults or anomalies in the data are presented to the Vaisala Help Desk staff before informing VPC. If the Vaisala Data Quality Services identify faulty data, the technical support staff escalates the issue with an action plan for correction via a site visit or communication to the customer.

Vaisala will provide VPC and Gothia Airtricity Vind with services in support of the resource assessment towers through their entire lifecycle. If Gothia Airtricity Vind decides to build a wind farm at one of the sites, Vaisala can transition its service offering into support of the operational wind farm for power curve monitoring and wind power forecasting applications.

**FOR MORE INFORMATION CONTACT**

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