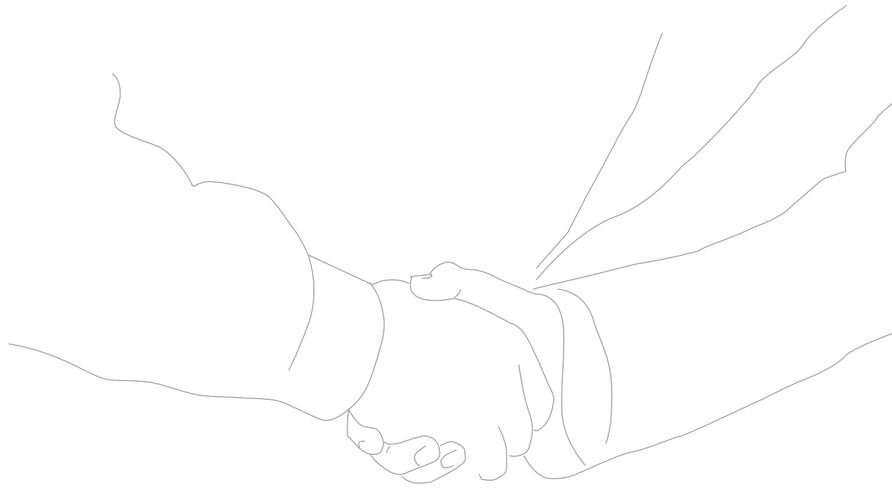

SIEMENS
Ingenuity for life
Powered by partnership.
Sustainable service solutions for your wind power project
siemens.com/energy/wind-service

Invest in a partner who invests in you

We believe sustainable investments are powered by partnerships. Our service teams work closely with you to help you achieve the best long-term returns.



Maintaining performance to sustain your investment

A partnership with Siemens is a partnership with every one of our employees, all of them dedicated to lowering your cost of energy. Our global team continually works hard to create one of the industry's most comprehensive and flexible service portfolios.

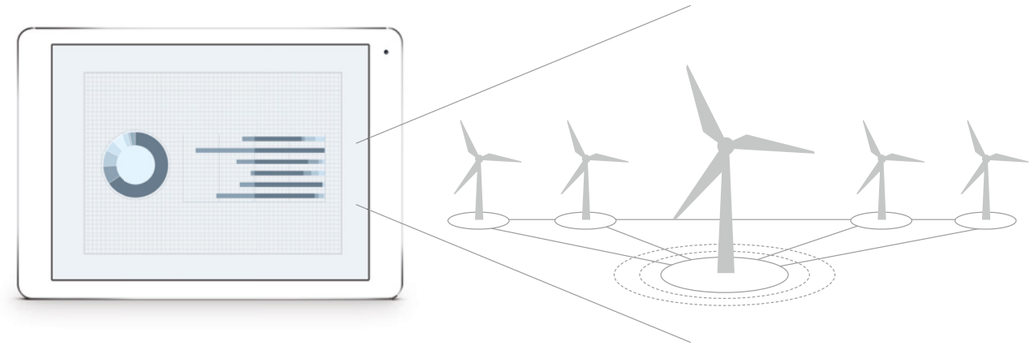
That work continues as we strive to develop our solutions still further. R&D is focused on developing ever-smarter diagnostic techniques to make service more proactive. And on devising new products that optimize the performance of your assets on your behalf.

Tailoring service to your specific needs

Whether you operate wind turbines at inland, coastal, or offshore sites, our service team will fashion an intelligent Siemens service solution that is tailor-made to your needs. We will cooperate with you to deliver reliability and maximum output under any conditions. Our ultimate goal: to optimize your return on investment throughout the lifecycle of your project.

360° care, 365 days a year

Servicing your wind power plants requires dedication to detail, and a long-term partnership with a commitment to care. By adapting our range of services to your specific project, we can deliver 360° care of your asset – around the clock, from day one, for the lifetime of each turbine. When action is needed, we can call on our unique logistics, diagnostic capabilities, and experience to respond smarter and quicker. We're equally committed to the safety of our own greatest resource: our employees. To meet our responsibility to them, we developed a Zero Harm policy that makes their health and safety paramount at all times.



Looking beyond the obvious

Our teams listen to wind turbines all over the world, turning big data into the insights required to customize our services to your needs – and optimizing operational performance on your behalf.

Remote monitoring and diagnostics

Remote diagnostics experience since: 1998

Monitored turbines:
Almost 10,000

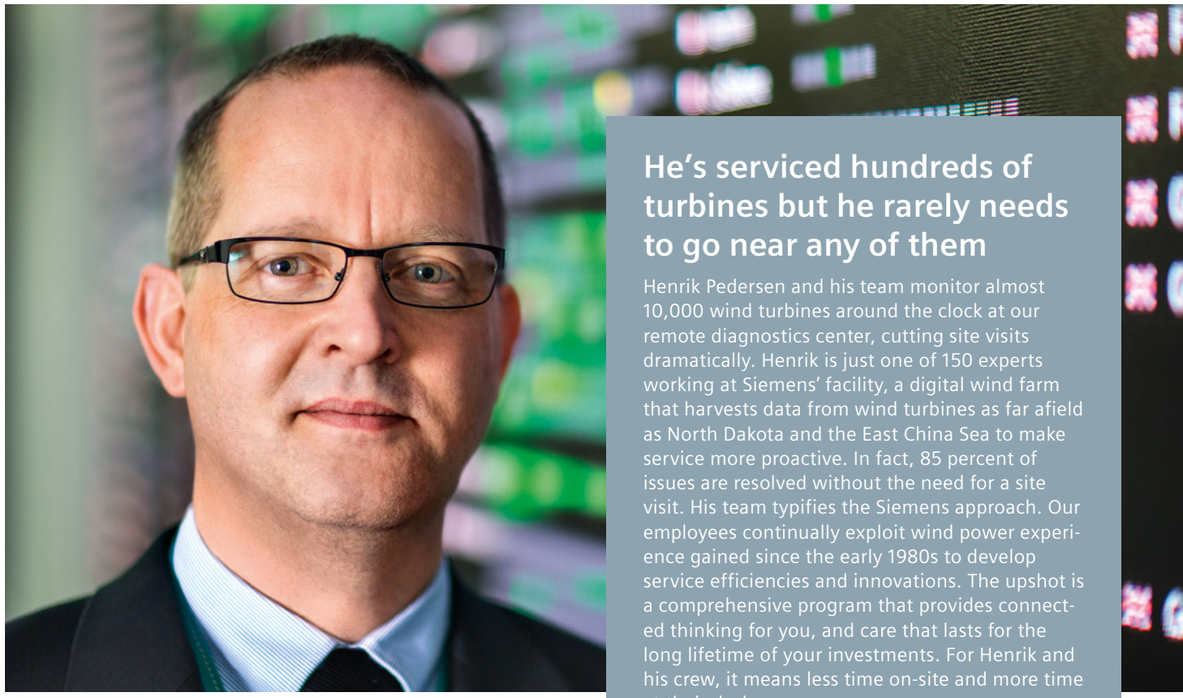
Staff worldwide:
150+ experts

New data collected every day:
200+ gigabytes

Amount of data in the database:
97+ terabytes in total

Number of measured anomalies:
6,000+ per week

Diagnostic warnings to service teams: 500+ per week

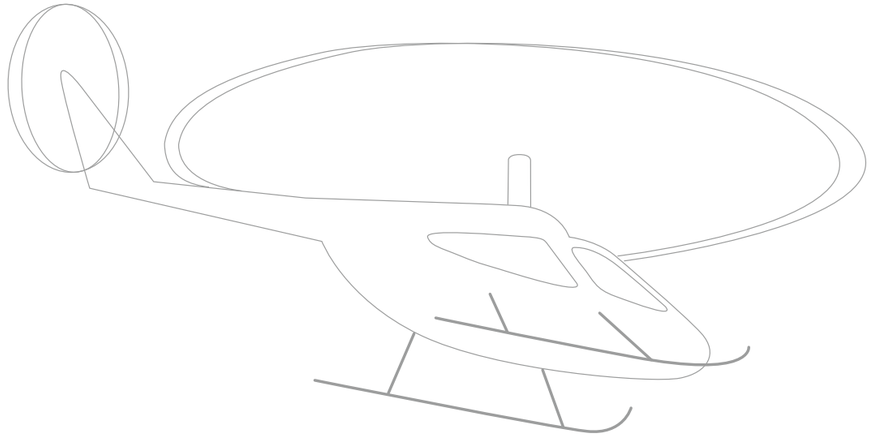


He’s serviced hundreds of turbines but he rarely needs to go near any of them

Henrik Pedersen and his team monitor almost 10,000 wind turbines around the clock at our remote diagnostics center, cutting site visits dramatically. Henrik is just one of 150 experts working at Siemens’ facility, a digital wind farm that harvests data from wind turbines as far afield as North Dakota and the East China Sea to make service more proactive. In fact, 85 percent of issues are resolved without the need for a site visit. His team typifies the Siemens approach. Our employees continually exploit wind power experience gained since the early 1980s to develop service efficiencies and innovations. The upshot is a comprehensive program that provides connected thinking for you, and care that lasts for the long lifetime of your investments. For Henrik and his crew, it means less time on-site and more time at their desks.

Turning big data into smart data

Big data is a great opportunity – for you and for us – that has effectively helped us reinvent routine maintenance. The fact that we operate offshore and onshore wind turbines in more than 30 countries on five continents gives our diagnostics teams not only unrivaled experience, but also access to unprecedented amounts of data on wind turbine performance, fleet operations, weather conditions, and much more. We analyze this data to produce the meaningful insights that minimize risk, maximize safety, and optimize performance of your wind power plant from day one. Using advanced modeling and analytics, we can limit service visits to an absolute minimum, based on the condition of your wind turbines, and without compromising plant reliability. You benefit from unit-specific services that anticipate your needs and optimize your processes.

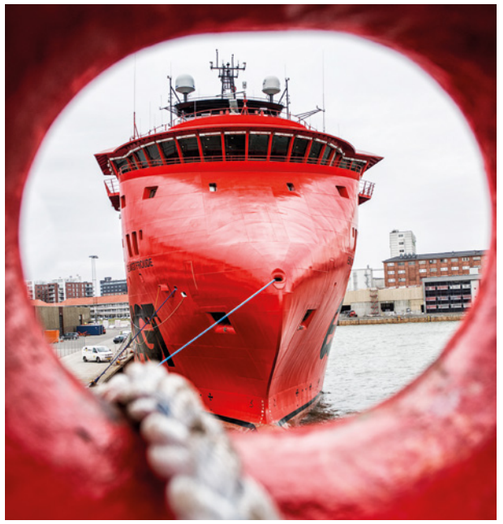


Taking offshore service into new waters

Our unique logistics – including Siemens' industry-leading service operation vessel – offer more efficient protection for your offshore investment.

He ensures smooth service however rough it gets

Andres Chacon commissioned the custom-made service operation vessels that enable us to operate in all weathers and at any distance. Andres decided that when it came to working on increasingly distant and challenging offshore sites, the right ships didn't exist. So he had them built. It was a bold decision, but his confidence has been repaid. The new vessels can keep our technicians safer in an inherently challenging environment, and also allow them to spend more of their time where it counts: on your wind turbines. This is just a part of the industry's most comprehensive service and logistics platform. We now offer an unrivaled level of access that can keep your turbines operating through rain, shine, and high waves.



Service operation vessel

Main particulars: Length: 83.70 m, width: 18 m, speed: 14 knots

Accommodation: 40 service technicians

Hydraulic gangway system: Safe access at wave heights of up to 2.5 m

Yearly offshore weather uptime: 285 days

Effective working hours: 10 h per 12-hour shift

Features at sea: Storage and workshop

Powered by: Siemens BlueDrive diesel electric propulsion system; includes four diesel generators, each capable of generating 1,650 kW of power

Specialized services for new offshore needs

Offshore wind power has come of age. Next-generation wind power plants are larger, more complex, and farther from shore, which demands ever more sophisticated and flexible service to maintain performance. By partnering with Siemens, you put unparalleled offshore experience and innovation to work for your assets. Our dedicated maritime and aviation solution team uses industry-leading software to tailor our unique logistics capabilities to your project. You benefit with more reliable, more cost efficient, and safer work at sea.

Service innovations break new ground at sea

Every Siemens service contract is different, but our offshore contracts all have one thing in common: By using a software simulation tool, we find the most efficient, long-term logistics solution for your project. Individually tailored to your needs, it can combine several modes like helicopters or crew transfer vessels. Depending on the conditions, you may even benefit from the superior safety and efficiency of our state-of-the-art service operation vessel (SOV). The SOV is a floating workshop, hotel, and spare-parts warehouse in one. Positioned close to your wind power plant, it reduces time spent traveling to and from shore and helps our teams respond faster. Whereas conventional vessels can only transfer technicians to wind turbines in waves up to 1.5 meters high, our hydraulic gangway system lets them literally walk to work in 2.5-meter swells.

Our remote diagnostics team supports service planning to ensure that time at sea is used efficiently – further reducing your costs. When an SOV returns to port, the spare parts, fuel, and specialist technicians are already there – so it can turn around faster and take advantage of targeted service operations. Prediction of potential issues also allows for early mobilization of jack-up vessels – chartered by Siemens for long terms.

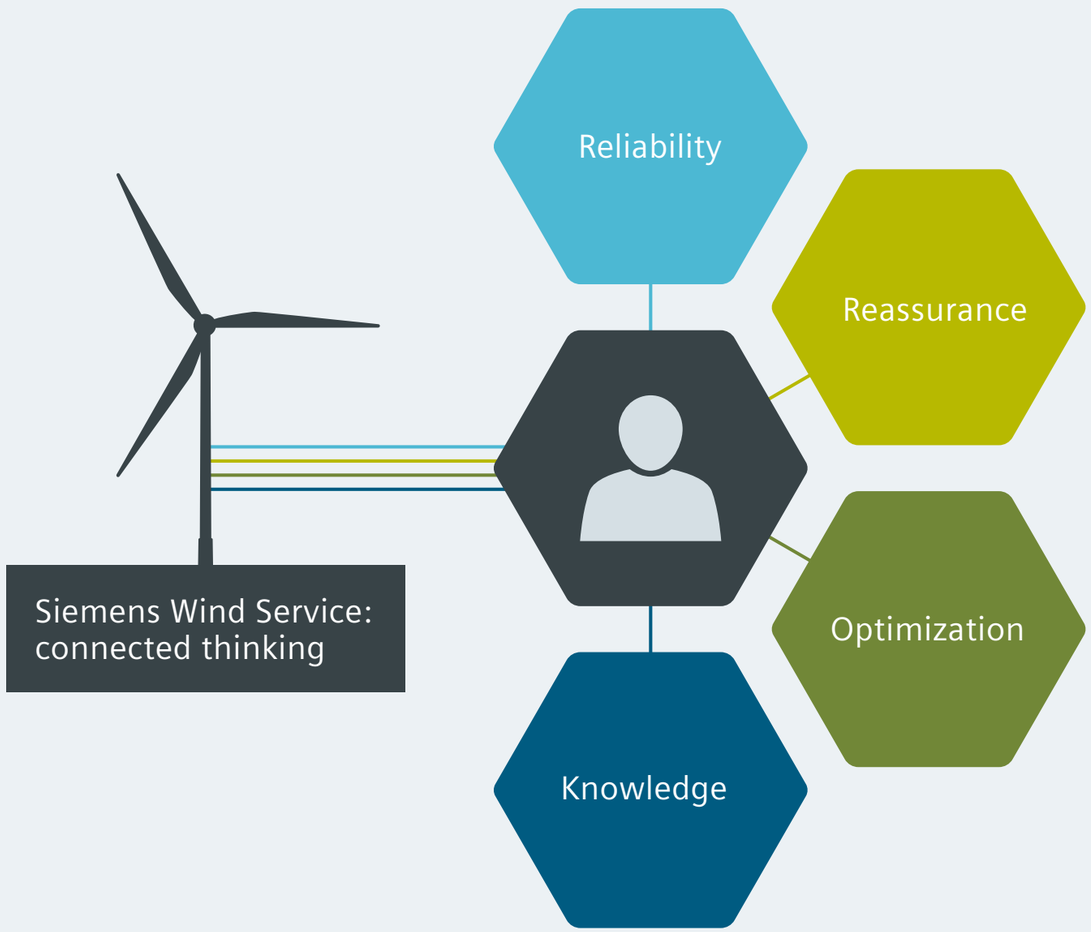
Long-term planning lowers risk

The contract with Siemens you agree to can come with unsurpassed long-term warranty services. Our sheer size and experience gives you access to the resources that ensure supplies of key parts and personnel, as well as the security that your asset can operate at optimum levels over its entire service life. The result is a partnership that minimizes risk, and maximizes peace of mind.

Diverse needs
Flexible solutions

For increased return on investment throughout a project's life cycle, you need service that is both smart and proactive.

A customizable service portfolio.
With the wind industry maturing and diversifying, one-size-fits-all service contracts should be a thing of the past. To meet your changing and diverse needs, we have redesigned our service portfolio. In four key pillars that are shaped by your needs, you have the flexibility to customize your service package from a range of intelligent and innovative service solutions.



Reliability
Whether wind is steady or stormy, you need to know that your turbines will thrive for their designed lifetime. For your unique requirements, we have developed flexible service solutions to keep your turbines running and enhance your ROI. Smart diagnostics and innovative offshore logistics boost uptime and performance.

Reassurance
To achieve maximum benefit, you need to achieve the highest level of wind turbine availability possible. We have invested knowledge, experience, and technical expertise to produce a range of premium time and yield-based service options that will meet this need and surpass expectations.

Optimization
Service means more than just maintenance and repairs. To offer you permanent asset optimization, once your turbine is installed we continue to improve on it – ensuring that you profit from the ongoing development of our technology.

Knowledge
Especially in the field of wind energy, knowledge truly is power. You can now choose from diverse modules that offer multiple opportunities to investigate and better understand your turbines – from data interfaces to hundreds of training courses. By utilizing Siemens' own decades of experience and expertise, you can reach new heights in the industry.

Smart today, interactive tomorrow

Working with you, we aim to drive down maintenance costs by replacing reactive service models with a new generation of proactive, interactive solutions based on smart data.

More service, less servicing

By collaborating more closely with you, we can develop more proactive, efficient service models that make more intelligent use of your assets. Our collaboration will be enriched by ever increasing amounts of machine and fleet data. With nearly 20 years of experience in fleet diagnostics, we have the know-how to turn this mountain of information into smart data – and apply it intelligently to the benefit of your project.

Turbines talk, we translate

Our employees have patented numerous diagnostic-related technologies and they continue to develop innovative analytical models – the tools that deliver the insights that help us make better choices. Drawing on machine and fleet data, our experts look ahead to help prevent unexpected downtime. They will turn digital information into customized planning that assigns the most suitable people, spare parts, and logistics to your projects.

Your turbines are online

Our online customer portal Wind Dialogue gives you continuous, independent, protected access to operation and maintenance data for your wind power plant. At any stage of your service contract, you can call up and download various figures – from configuration and production data through agreements for your wind power plant to an overview of potential enhancements that maximize performance and profitability.

First time, most times

Smart data also helps us make service operations even safer. Thanks to remote diagnostics, we've already significantly reduced our technicians' assignments – and there may yet be room for another reduction. If technicians have to visit a turbine personally, our aim is that they only have to go once. Thanks to our database and experience, they know beforehand which tools to bring and which knowledge to use, and so increase the first-time fix rate.

Optimization through digitization

Like our service technicians, as a service partner you profit from our ongoing digitization. Thanks to the initiative of Business Improvement Manager Jennifer Dillon, iPads have greatly simplified our technicians' daily business.

Before their introduction, maintenance or repairs could be held up by extensive paper traffic. Now every document is accessible online – and much easier to handle for technicians working in tight spaces. What's more, digitization has streamlined workflows. Our teams can now document their work, e-mail questions, troubleshoot, and give feedback from wherever they are, quickly and directly – without losing precious time.

Committed to a sustainable future

In more than 30 years we have helped transform the wind power sector, but one thing has never changed: our commitment to our partners. You can rely on the support of our teams for the entire lifetime of your wind turbines. On your behalf, we constantly pursue innovation and improve on proven products, ensure availability, and tailor our extensive service portfolio to the specific needs of your project. You can rest assured that your wind power investment is secure in the long term.

Harvest Wind and White Creek, Washington, USA

Working closely with Summit Power Group LLC, Siemens services maintains 132 SWT-2.3 turbines at these major wind projects in Washington State. The result: continued reliability, availability, and cost efficiency since 2007.

Configuration
- 132 turbines (SWT-2.3, 304 MW)
- Service since 2007
- 15-year long-term service extension in 2014

DanTysk

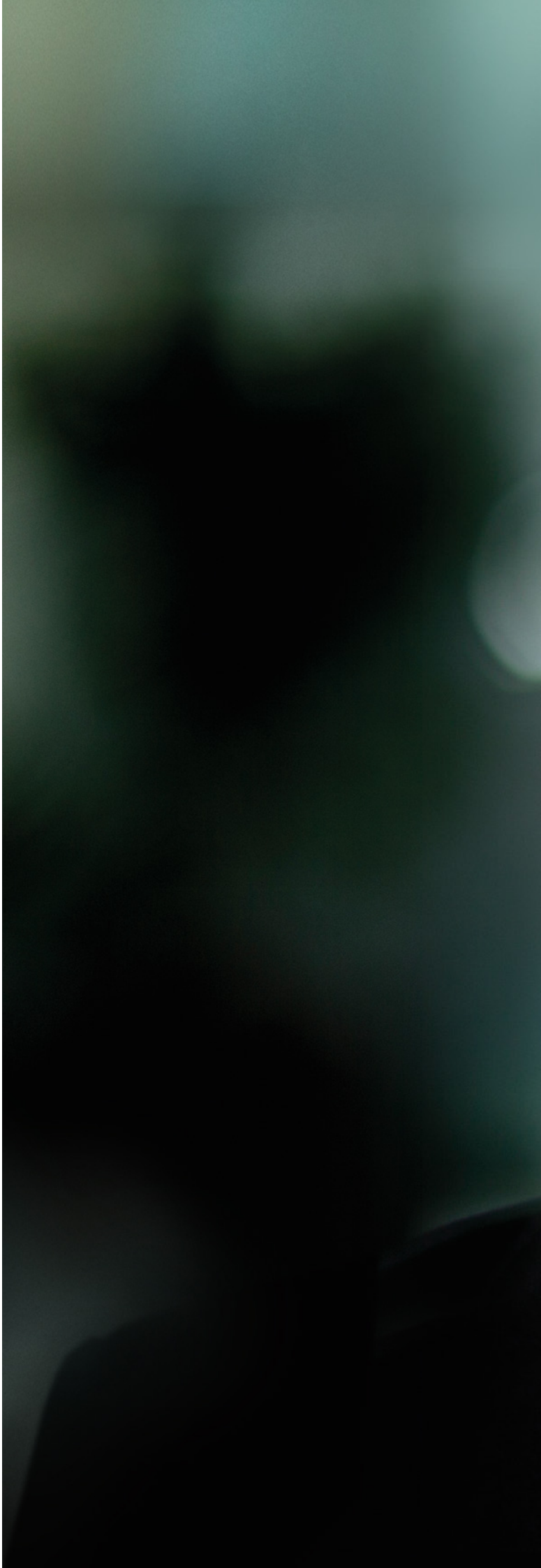
In 2008, Kruger Energy awarded Siemens Canada Ltd a four-year service and maintenance contract for 88 wind turbines spread over two sites in Ontario. In 2012, a satisfied partner extended that contract by 10 years – and ordered a power-curve upgrade for both sites.

Configuration
- 88 wind turbines (SWT-2.3, 200 MW)
- Service since 2008
- 14-year service agreement with power-curve upgrade

Gemini

Siemens will provide 72 SWT-4.0-130 turbines for Vattenfall's new Sandbank offshore wind power plant. A pioneering service logistics concept will generate synergies from Sandbank's proximity to the DanTysk site – and drive down the maintenance costs of both projects. The joint service operation will use our industry-leading service operation vessel that was specially designed for this type of deployment.

Configuration
- 72 turbines (SWT-4.0, 288 MW)
- Service starts in 2016
- SOV share with DanTysk



Published by
Siemens AG 2016

Wind Power and Renewables Division
Beim Strohhause 17-31
20097 Hamburg, Germany
siemens.com/wind

For more information, please contact
our Customer Support Center.
Phone: +49 180 524 70 00
Fax: +49 180 524 24 71
(Charges depending on provider)
Email: support.energy@siemens.com

Article-No. PSWP-B10023-00-7600
RS1551241BR