

This document was originally a poster presentation at the WINDPOWER 2009 Conference and Exhibition - May 4-7, 2009 in Chicago, IL. The poster is a proposal directed at small wind turbine manufacturers and installers to partner for SCADA solutions rather than developing them in-house.

SIMPLIFYING SCADA TO ENCOURAGE SMALL WIND GROWTH

ABSTRACT

As the small wind sector continues to grow, manufacturers face steadily increasing demand for turbine systems. For those offering remote control and monitoring services, higher turbine volume means more data and hardware to manage as well. Manufacturers who provide this total solution must either become experts in supervisory control and data acquisition (SCADA) software and hardware installations or establish partnerships with companies that already demonstrate expertise.

When small wind companies take on the responsibility of designing a SCADA package, the result is often a "piece meal" solution that is uniquely tailored to a particular site or client. This complicates communication with the remote monitoring facility as well as maintenance of the hardware. Manufacturers must spend time and energy developing relationships with multiple vendors and learning about a host of different products. As the installation base expands, the complexity of the issue compounds.

Choosing to partner for a SCADA solution rather than designing it in-house allows a turbine manufacturer to focus on its core competency rather than the peripheral computing needs. To truly streamline its SCADA platform, a manufacturer should seek a single-source partner specializing in OEM projects that can provide a turnkey solution which is repeatable and configurable. Doing so will simplify the SCADA supply chain and allow the company to grow more rapidly.

SCADA CHALLENGES FOR SMALL WIND

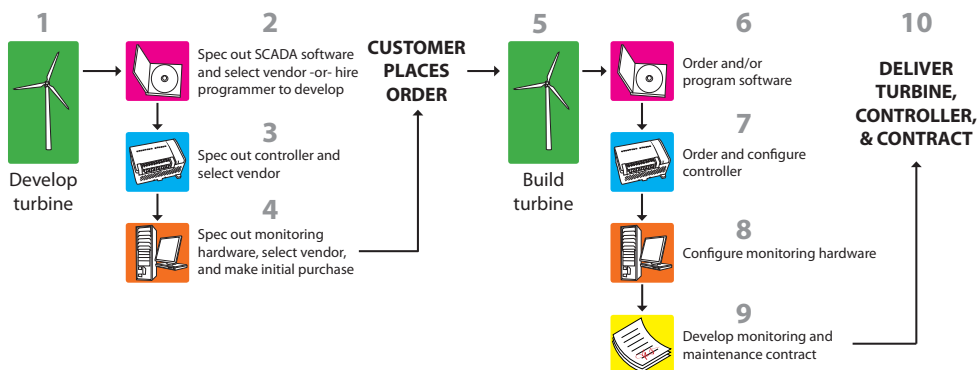
Small Wind faces supervisory control and data acquisition (SCADA) challenges that are different from Wind Farms.

- ▶ A small wind turbine (SWT) manufacturer's "fleet" is spread across a broad geography, not concentrated in a single area.
 - This makes service, support, and monitoring more difficult.
 - Data must be transmitted wirelessly to a central monitoring facility as fiber optic cable (common on wind farms) is only viable for shorter distances.
- ▶ Though a SWT manufacturer produces standard turbines, it has many unique clients which may request/require different levels of SCADA.
 - Some clients will want complete access to their turbine data while others will simply want assurance that it is being monitored to detect problems.
 - Clients are smaller entities (such as businesses, farms, and homeowners) with smaller budgets, so SCADA must be affordable. "Studies consistently identify cost as the single largest factor affecting the industry's growth." (AWEA Small Wind Turbine Global Market Study 2008 p.10)
- ▶ SWT manufacturers are typically smaller organizations with fewer employees than those that supply turbines to wind farms.
 - They have less bandwidth to research and develop relationships with vendors who supply the necessary pieces of a SCADA system - generically, the SCADA software, a controller at the turbine site, and hardware for the central monitoring facility.
 - Overhead costs make hiring a SCADA-specific staff difficult. Currently, IT departments or consultants are responsible for small wind SCADA.

IN-HOUSE SCADA DEVELOPMENT

Existing small wind SCADA systems developed in-house demonstrate the "piece meal" approach used to create them.

- ▶ Most are one-off solutions that require design time for every project/client, including making the central monitoring station "talk" with each system.
- ▶ Many use custom software/coding that causes problems when scaling up to accommodate a growing client base.
- ▶ Service and support vary from project to project.

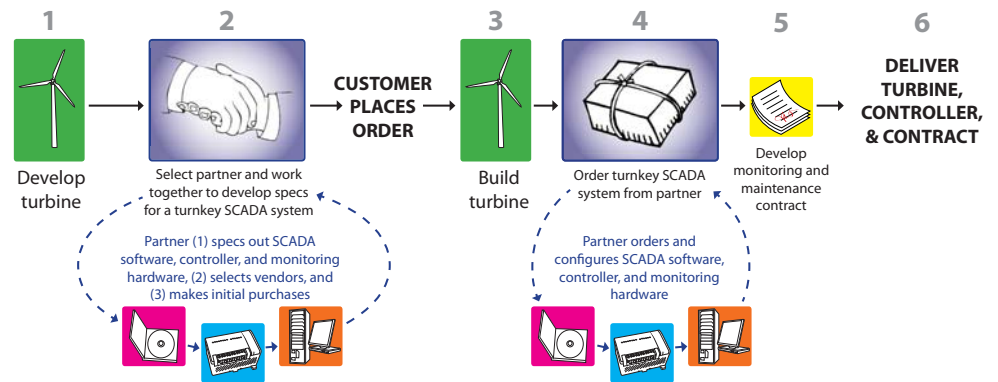


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PARTNERING TO DEVELOP SCADA SOLUTIONS

Rather than using internal resources or hiring multiple consultants to design its SCADA systems, a SWT manufacturer could choose a partner who would develop and deliver turnkey SCADA solutions.

- ▶ An ideal partner would:
 - work *with* the manufacturer to define all requirements.
 - be a single-source provider of software and hardware.
 - manage the SCADA solution lifecycle (in case components go EOL, etc.).
 - establish the range of solutions needed (from most basic to most complex).
- ▶ A turnkey SCADA solution should:
 - be repeatable and configurable. (Each system is essentially the same but can be modified per the customer's requirements.)
 - work with a common platform (e.g. Microsoft® Windows®).
 - include a central monitoring system to process/display information from various turbines, weather sources, video feed, etc.
 - log work orders and maintenance history.
 - be delivered ready to "plug and play."



BENEFITS OF PARTNERING

SWT manufacturers that choose to partner for SCADA solutions (all necessary hardware and software) will reap many benefits and pass them along to their customers and the small wind community.

- ▶ Turbine Manufacturers will:
 - be able to focus on turbine – rather than information – technology. Project scope will be more defined.
 - have more time for innovation efforts, research and development.
 - leverage vendor relationships of the partner without expending the time/effort needed to create them. This provides access to better pricing, access to roadmaps, etc.
- ▶ Small Wind Customers will:
 - receive timelier, more reliable service and support.
 - have the choice of more cost-effective solutions.
- ▶ The Small Wind Community will:
 - see more pro-small wind legislation and extensions due to more and better turbine productivity data.
 - create more awareness and gain public acceptance and buy-in.
 - earn more credibility by appearing less "home-grown"

CONCLUSION

Small wind will experience more long-term success if it chooses now to outsource and partner for its SCADA needs. In doing so, turbine manufacturers will be able to focus on product improvement and innovation without spending time or money on developing controls and data collection systems. Small wind needs to concentrate its efforts and resources on energy generation and utilize a partner for everything that falls outside of that scope. The results will show small wind as a clean energy sector that grows and evolves quickly and fluidly.