Renewable Energy Systems, Ltd.

AirLink® Gateways enable Wind Energy Company to Perform Continuous and Reliable Monitoring

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Renewable Energy Systems, Ltd. (RES) is one of the largest and mostsuccessful wind energy companies in the world and has been at the forefrontof the industry for over 20 years. The company is intimately involved in mostaspects of wind energy projects, including research, development, engineering,construction, maintenance, electricity generation and sales. RES has assistedgovernments, utility companies and investors to design and construct windfarms that are successfully and sympathetically integrated into the environment,while providing a financially attractive source of renewable and sustainableenergy production. To date, RES has built over 1100 megawatts of wind plantenergy capacity across the United States comprising over 800 wind turbines, including the world’s largest mobilization wind farm at King Mountain, Texas.

BUSINESS CHALLENGE

Every wind farm project has a research phase in which data is collected atpotential wind farm sites to assess their suitability for wind production. Oncea site has been identifi ed for evaluation, RES sends a team of wind dataspecialists to collect environmental information such as wind speed, winddirection and temperature. The wind data is used to calculate the potentialusable energy that can be generated by harnessing this natural energy source at the location.

Data is collected by erecting 200 foot meteorological towers on the proposedsite. Traditionally, RES contracted fi eld technicians to retrieve and switch thedata

collection cards from each of the towers every month. The fi eld technicianswould then mail the data card to the RES wind data specialists back at thecompany’s regional offi ces, where the data would be downloaded and analyzed.Since many of the sites are located in remote areas, sending techniciansto the fi eld every month was both a time consuming and costly process. Inaddition, there was a substantial delay between information gathering on-siteand analysis back at the regional offi ces. Due to these delays, RES wouldbe unaware of any equipment malfunctions or technical issues on-site untilafter the data cards had been analyzed, which created an unacceptable lag intechnical response time to repair and maintain the wind monitoring equipment.

RES had previously tried an analog modem solution connected by wirelineservice and powered by a solar battery. This proved to be too high in energyconsumption, and the wireline coverage was not broad enough to cover thedesired geographic areas. The company needed to fi nd a reliable wirelesssolution to remotely manage the wind monitoring equipment and providereal-time, two-way communication for data collection and analysis.

SIERRA WIRELESS AIRLINK® SOLUTION

RES fi rst began researching wireless monitoring solutions in early 2005 anddiscovered the Sierra Wireless AirLink® gateway, an entry-level, low cost,rugged wireless data solution that enabled two-way communication betweenthe wind farm equipment and RES regional offi ces. The company found thatthe device had better coverage and improved power consumption. RES,however, soon realized they needed a more powerful and intelligent wirelessdata solution and discovered Sierra Wireless’s AirLink gateway.

Given the complexity of the solution, RES called on Sierra Wireless partnerMobile Electron, an award-winning wireless data systems integration andconsulting company that specializes in crafting remote telemetry and datacollection solutions. After assessing RES’ current capabilities and futureneeds, Mobile Electron recommended the AirLink gateway as the platformfor both GSM and CDMA wireless data communication over public carriernetworks, with emphasis focused on enabling an IP-based solution.

In addition to recommending the AirLink gateways, Mobile Electron providedturn-key integration and consulting services to RES, including wirelessRF propagation analysis to select the best wireless operator in a givenmarket; negotiating wireless data agreements with numerous operatorsand provisioning the modems with static IP addresses for always-on connectivity.

“The Sierra Wireless AirLink gateways are very straightforward and easy touse,” said Cody Cox, wind data specialist at Renewable Energy SystemsLtd.

“With the help of Mobile Electron, which provided excellent technicalsupport and handled all our questions, we have been able to deploy awireless remote monitoring solution in a phased rollout to multiple wind farm sites around the country.”

RESULTS

RES has completed the fi rst phase of its deployment across North America,with more rollouts planned over the next few years. The company estimatesthat it has taken a mere fi ve to six months for the gateways to pay forthemselves in terms of increasing operational effi ciencies and lowering overhead costs.

The new wireless data solution employing AirLink gateways has resultedin signifi cant benefi ts to RES and the many diverse clients served by thecompany:

- **Simplified remote monitoring solution** – RES now has an automated collection and retrieval of critical data from its sites.
- **Improved communications** – The company has persistent, real-time two-way connectivity and communications between its remote wind farm equipment and its regional offices.
- **Improved operations** – Any operational issues with the wind monitoring equipment can be identifi ed and relayed immediately.
- **Decreased operational expenses** – The new solution has eliminated the need for the fi eld technicians to travel on-site to retrieve the data cards.
- **Better strategic planning** – RES has greater power and control to effectively analyze wind farm sites, enabling RES and its clients to make better business and financial decisions.
- **Immediate ROI** – RES estimates that it will recover the cost of the modems within six months from initial deployment.

APPLICATION:ENERGY MANAGEMENT

CUSTOMER CRITICAL CHALLENGE:

- Difficulty collecting test data from proposed wind farm sites
- Costly and time consuming for research staff to visit remote sites to collect data for analysis
- Unacceptable lag (up to a month) from data collection analysis

SOLUTION:

- AirLink® gateways provides multi-carrier solution to improve coverage and connection to specific cell towers

BENEFITS:

- Persistent, real-time two-way communication between field & offices to reduces operational costs
- Improved operations: technical issues with wind monitoring equipment can be identified and relayed immediately
- *Lower cost of ownership:*eliminate trucks to service AirLink communications devices