



CUSTOMER CASE STUDY

9REN is on a mission to capitalize on the power of the sun

9REN Group - www.9rengroup.com
Industry - Power and utilities

Goals

- The company needed to increase the production levels of its renewable energy generation installations in Europe and the Mideast.
- 9REN wanted to reduce its field operations maintenance costs by minimizing manual supervision of plant operations.

Challenges

- Geographic dispersion of the company's power generation sites throughout Spain, Italy, and the Mideast demanded a centralized approach to system monitoring across differing time zones and weather patterns.
- 9REN required a solution that could easily scale with the projected installation of new renewable energy facilities in new regions.

AVEVA solution

- AVEVA™ System Platform
- AVEVA™ Historian

Results

- AVEVA software enabled 9REN to increase event recognition by 50% and boost the solar tracking capabilities of the photovoltaic systems by 5%.
- AVEVA also helped improve the monitoring report performance, reducing the time it takes to produce the reports from one month to two days.



Madrid, Spain - Eventually the world will shift its energy dependency from fossil fuels to renewable sources of power. New ventures are leveraging inexhaustible sun and wind power to offer clean and renewable energy alternatives for lighting our homes and powering business.

9REN operates 568 photovoltaic installations, mainly in Spain and Italy. In total, 9REN currently generates more than 99,000 megawatt hours of electrical power every year and based on its global growth objectives, that number is expected to rise with each morning sun.

9REN Group designs, develops, builds, and operates renewable turnkey power plants using photovoltaic, solar thermal energy, and wind

To manage and monitor its photovoltaic plant facilities, 9REN created EOSystem, a solution built on AVEVA System Platform. EOSystem is a real-time monitoring technology that provides instantaneous information from all photovoltaic installations operated by 9REN throughout Europe and the Middle East. As a result, 9REN has considerably reduced the cost of its field operations.

AVEVA System Platform is the delivery mechanism for enterprise control and consists of the components necessary to provide a true aggregated view of

information across an organization. This enables a robust foundation for collaboration between people, processes, and installation-generating systems. System Platform provides a single, scalable software solution for all the SCADA, supervisory HMI and MES needs for monitoring 9REN's renewable power-generating installations.

System Platform also provides a simple upgrade path for easily adding new software and hardware to the system from any third-party vendor. By including an industrialized application server, a powerful Historian server and an easy-to-use information server, System Platform easily tackles demanding, precision-driven real-time power generation activities.

9REN leveraged System Platform to save time by creating standardized, reusable templates, which resulted in reduced training time and lower costs

A side benefit of System Platform was its ability to help power plant managers achieve higher levels of consistency and quality across its entire "grid" of photovoltaic and wind installations. Employing five servers, System Platform controls all 9REN installations. Two servers act as redundant object servers with one controlling the plants in Spain and the other controlling operations in Italy. A third server is for historic information and operates the historian database.

The AVEVA Historian is a high-performance real-time database for power generation information and is designed to collect a wide variety of plant data, at full resolution and very high data rates. Delivery of this vital information ensures that decision-makers at all levels have the information needed to take steps to ensure maximum operational efficiency. Another server provides visualization via AVEVA InTouch HMI. InTouch empowers 9REN to quickly and easily develop custom graphical views of its real-time power generation processes. As an open and extensible HMI with high-end graphical capabilities, the software provides the power and flexibility needed for advanced application design with connectivity to a broad range of systems and devices.

With the help of AVEVA, the EOSystem has delivered tangible benefits for 9REN. For example, while the 6-megawatt photovoltaic plant in Bella, Italy generates electrical power, the EOSystem transmits valuable information via satellite to the 9REN Madrid office. The plant, located in southern Italy near Rome, consists of an extensive array of 30,000 solar panels with 12 inverters to convert the DC-generated solar panel electricity into the AC power required to run homes and businesses. The solar power facility has extensive monitoring tools to measure generated energy in real time and stations to record local weather conditions, enabling managers to anticipate reduced power generation due to cloudy or inclement weather.

AVEVA enables one person from 9REN to operate all 568 solar plants, regardless of location

The System Platform enables EOSystem to provide effective collaboration tools that enable standardization, reduced engineering time and cost savings.

“The System Platform lets us access all our installations in real time,” said Antonio Palacios Higuera, services technical manager for 9REN. “Because of this, we only require one person to control the operation of all 568 plants, regardless of location. We also have achieved a significant cost reduction in time per designer and project.”

“9REN has improved the availability of this system using the very reliable solution from AVEVA.”

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Carlo Zuccaro,
Technology and Innovation Manager, 9REN Group

In the solar energy business, everything scales upward

Prior to the AVEVA solution, 9REN managed its solar energy generation plants via a proprietary, web-based system which did not fully meet its need to monitor both thermal and photovoltaic energy resource infrastructures. As a result, the new AVEVA monitoring solution was implemented with very specific requirements. The company needed a control infrastructure which could guarantee full expansion capacity with no scalability limitations. The technology also needed to be flexible in order to support the company's wide range of energy production sources, including photovoltaic, solar thermal, and wind generation installations. In addition, the new control architecture had to respond to the power distribution issues unique to each installation.

From a single control center, 9REN can effectively monitor the operations infrastructure at each facility

With the increasing levels of solar production as more plants go online, the company has relied on AVEVA to provide the technical expertise to effectively manage and expand the control of its plant monitoring systems.

“Monitoring systems are the key to success for a photovoltaic installation,” said Francisco Alija, monitoring and control manager, 9REN Group. “In the past we used a lot of different monitoring systems. That meant a lot of different hardware and software to be installed at our monitoring stations. What we really needed was only one very powerful monitoring system, and this is what we achieved with the AVEVA solution.”



Leading-edge technology offers performance and reliability

9REN managers recognized that a key means for improving solar plant performance was tied to maintaining a continuing focus on updating the control and monitoring technology infrastructure. Performance is achieved in the solution design with every technology update. Reliability depends on using products that have an industry track record and can leverage the availability and performance of the system. During the initial vendor review phase, AVEVA showcased the wide industry recognition and scope of its manufacturing technology solutions.

“9REN has improved the availability of this system using the very reliable solution from AVEVA,” said Carlo Zuccaro, manager of the technology and innovation department at 9REN Group. “If you want to offer the market a better solution, you need to use an up-to-date monitoring system. AVEVA gave us this capability.” 9REN’s vision for its position in the photovoltaic marketplace is to minimize its environmental footprint and maximize community relations.

9REN installs solar panel arrays on rooftops as well as ground-based installations

For a ground-based solar array project near Rome, careful planning has enabled 9REN to install the photovoltaic panel arrays with minimal visual disruption to the surrounding agricultural landscape. The company

encourages local communities to use the land near its projects so that the industrial activities of its photovoltaic installations can harmoniously coexist with local environs.

Going further, in the Puglia region of Italy 9REN hired the unemployed from the local community and trained the new workers on installing and maintaining photovoltaic solar panel arrays, thus building a new labor force for the renewable energy industry. For educational outreach, the company arranges for local schools to tour solar installations so that students can gain greater knowledge of renewable energy options.

Renewable energy empowers success

The AVEVA project implementation was initiated with a single photovoltaic installation in Spain. Once the system was validated, it was quickly replicated to all other 9REN power generation sites.

“Given the scattered nature of 9REN’s installations and the diversity of existing systems, it would have been very costly and difficult to make changes in real time using the prior system,” Alija said. “This is why AVEVA solutions were chosen, because they could adapt to existing software applications without needing to make corrections at each generation plant.”

AVEVA software enabled 9REN to increase event recognition by 50% and boost the solar tracking capabilities of the photovoltaic systems by 5%.

The AVEVA-based solution improved monitoring report development, reducing the time it takes to produce reports from one month to two days

“9REN wanted to improve its profitability and power availability of generation installations enabling the company to produce a greater quantity of energy,” Alija said. “But we also hoped to reduce maintenance costs by limiting on-site control which the AVEVA solution was designed to provide.

“With AVEVA, 9REN has the opportunity to leverage the full expansion and growth capacity available in our business,” Alija said. “Thanks to the significant amount

and availability of information provided by the AVEVA solution, 9REN is now able to streamline management of its various installations, undeniably optimizing personnel costs. From the start, 9REN was certain of its selection of AVEVA as a key component of its overall operations expansion strategy. It has measured up and exceeded our expectations.”

9REN is one company that has assumed a market leadership position, developing strategies to boost renewable energy production and expanding facilities that help reduce consumer and business demand for oil and natural gas. 9REN is betting on the sun and its wager, no doubt, has a bright future.

To learn more, please contact your AVEVA representative or visit us online at aveva.com/en/industries/power-utilities



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