COVER FOCUS: WIND ENERGY

Changing Winds: Emerging Wind Technologies
Despite the economic efficiency conventional tower-based wind turbines can achieve today, several developers are exploring radically new wind technology concepts that could improve wind power generation. This article will explore a handful of emerging wind technologies that could shake up conventional wind power.

FEATURES

Solar Power Continues to Rise
The U.S. solar industry experienced dramatic growth in the past year despite the challenges of the coronavirus pandemic. Solar led all power sources in terms of added generation capacity, and the story is much the same worldwide. Advanced technologies, in particular the use of perovskite, a crystal-based mineral consisting of calcium titanium oxide, could bring efficiency improvements; the National Renewable Energy Laboratory has confirmed perovskite can convert more incident solar energy into electricity than traditional silicon cells.

How Commercial and Industrial Facilities Benefit from Onsite Power
Historically, the vast majority of commercial and industrial facilities have sourced their electricity needs by connecting to the conventional power grid. Nowadays, however, companies can capture a number of benefits by taking a more hands-on approach, and incorporating solar, wind, and other forms of onsite generation—including combined heat and power schemes—into their facilities’ power supplies.

Smart Condition Monitoring of Analyzers in Power Plants
Emissions monitoring equipment is vitally important for power plant operation. If equipment fails, units must often shut down or face stiff fines for failure to comply with air permit requirements. A new web-based condition monitoring solution could help users better plan predictive maintenance and avoid potential failures, keeping analyzers in top condition and operators out of trouble.

How Thermal Power Plants Can Save 80% of Their Water
Historically, thermal power plants have required a lot of water. As water has become more precious in many parts of the world, plants face a lot of pushback from groups fighting to save the water for other purposes. This article will present a proven method to cut power plant water usage by as much as 80%.

State-of-the-Art Gas Turbine Process Cooling
Gas turbine performance design values are often based on an inlet air temperature of 15C (59F) and 60% relative
humidity. For inlet air temperatures higher than that value, gas turbine performance degrades due to the unavoidable decrease in volumetric air flow. In a very hot installation site, cooling the air entering the turbine is the best way to stabilize performance and efficiency. The concept is quite effective but complex to implement. A network of multi-stage modular chiller units could provide the solution.

How to Prepare Your Workforce for the Future
According to recent economic research, approximately 40% of workers will require reskilling over the coming years. C-suite executives need to reimagine their workforce development programs for continuous learning and upskilling. Innovative learning programs, curated learning experiences, and a culture that nurtures curiosity can help employees prepare for what’s coming next.

Preconstruction Strategies: Subcontractor Prequalification
Formal preconstruction phases have increasingly been employed to control costs for capital projects in the power industry, and they are more important than ever in the current environment, where COVID-19 has caused market disruptions. A recent study found that some material costs have increased greater than 50% in 2021 compared to 2020 prices, and they continue to fluctuate dramatically from quarter to quarter. That’s why having a good strategy to keep costs under control is so important.

Power Plant Repowering with District Heating Supply
Improving reliability and efficiency are two common reasons for power companies to repower plants in their fleets. This article describes two power plant repowering projects that resulted in improvements in heat rate and district heating supplies.

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