



Meeting the Resource Adequacy Challenge: The Case for RICE

After decades of relatively stable energy demand, forecasted load growth – driven primarily by data center development – is at its highest level in the past two decades. Across the U.S., soaring demand is straining available capacity and inflating prices. Simultaneously, grid operators are facing a growing gap between their system's installed nameplate capacity and the accredited capacity resources can deliver during the highest-risk hours.



In 2025, Southwest Power Pool CEO Lanny Nickell emphasized that states are

“

starting to realize the value of generation that has the reliability attributes and a higher degree of accreditation.”

Amid mounting reliability challenges, not all megawatts are equal. Nickell’s remarks underscore recognition that some generation technologies are better suited to deliver reliable, accredited capacity.

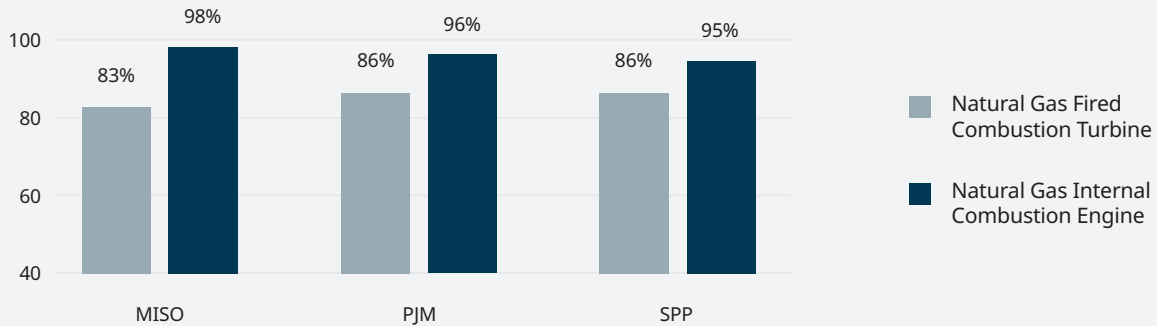
Rapid demand growth is colliding with the retirement of dispatchable resources and their replacement by predominantly intermittent renewables. A Goldman Sachs report infers that AI-driven growth could require another 47 GW of power by 2031, the equivalent of California’s 2024 peak load. Meanwhile, NERC reports that 115 GW – comprised mostly of large, dispatchable resources – will retire by 2034, and 85% of the replacement megawatts will come from weather-dependent resources.

Reciprocating internal combustion engines (RICE), like those produced by global energy company Wärtsilä, belong at the top of the resource adequacy (RA) solution stack for both cost and reliability. As a flexible and modular dispatchable resource, RICE is among the few technologies that can provide reliable capacity while balancing real-time uncertainty.

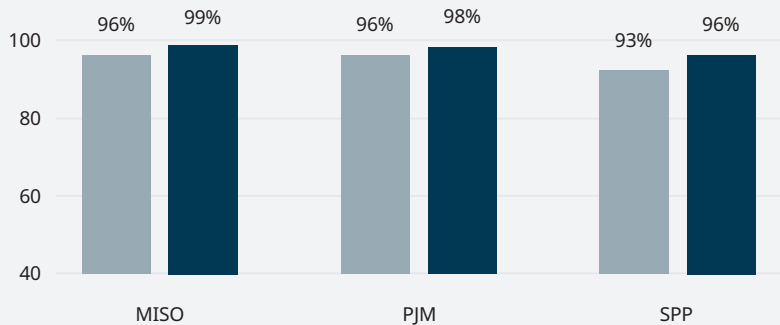
In systems nationwide, the expanding gap between installed and accredited capacity highlights the need for resources like RICE to deliver dependable, dispatchable capacity. Still, this widening resource adequacy delta is not solely attributed to weather-dependent resources. In MISO’s latest Planning Resource Auction, poor availability of older coal and natural gas generation reduced systemwide accredited capacity by nearly 5 GW. Moreover, as high-load events during the shoulder months become more common, planned maintenance removes critical thermal generation during the spring and fall.

As resource adequacy rules evolve to emphasize reliability, flexibly dispatchable resources like RICE are positioned to outperform turbine technologies. For example, 2024 Energy Information Administration

Summer Rated Capacity as a Percentage of Nameplate Capacity (%)



Winter Rated Capacity as a Percentage of Nameplate Capacity (%)



Data from the 2024 Energy Information Administration's Annual Electric Generator Report illustrates that as a percentage of nameplate capacity RICE systems operated at a higher level across MISO, PJM and SPP than combustion turbines.

data shows that across PJM, MISO, and SPP, engine power plants consistently demonstrate strong rated capacity performance – averaging 12.5% better in summer and 2.75% better in winter compared to turbines.

RICE's competitive edge is ascribed to its resilient technological attributes. When turbine output derates as ambient temperature rises, RICE's output remains stable as temperatures climb above 100°F. Conversely, when cold temperatures strain natural gas availability, engines maintain reliability at 80% lower gas pressure than aeroderivative turbines. Additionally, when planned maintenance removes turbine plants from service, modular engine systems enable maintenance to be performed in rotation while continuing to supply megawatts to the grid. During unplanned outages, RICE's modularity provides redundancy that reduces the likelihood of catastrophic, whole-plant outages.

Amid unprecedented load growth and rising costs, grid operators nationwide are implementing market reforms that incentivize resources with higher accreditation values. With resiliency-minded attributes and unmatched flexibility, Wärtsilä's RICE systems should be a contender for any load-serving entity committed to reliability and long-term value.

Engine power plants outperform turbines in rated capacity performance.

+12.5%
in summer

+2.75%
in winter

For more information

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