As electricity demand from data centers, artificial intelligence (AI), and electrification continues to accelerate, utilities and data center developers are increasingly evaluating cost-effective ways to expand generation capacity. One technology that looks very attractive is **Turbine Inlet Cooling (TIC)**, which can significantly increase the output capacity and efficiency of gas turbine-powered generation facilities.

Recent industry reports highlight the magnitude of the challenge. According to *POWER Magazine*, U.S. electricity demand associated with data centers and AI development reached approximately **42 GW by the end of 2025**, with an additional **32 GW under construction**. Total demand could exceed **90 GW by 2030**. At the same time, most available gas turbine manufacturing capacity has already been committed through the remainder of the decade, while new nuclear generation would require substantially longer development timelines.

Compounding the issue, *Power Engineering* reports that prices for new gas turbines have risen sharply due to unprecedented demand from data centers and electrification initiatives, as well as limited manufacturing capacity. Global gas turbine orders reached approximately **110 GW by the end of 2025**, while annual gas turbine manufacturing capacity remained only **60–70 GW**, creating a significant supply imbalance.

As a result, the installed cost of combined-cycle gas turbine systems is projected to reach over **$2,000/kW by the end of 2027.** Many original equipment manufacturers (OEMs) report that their gas turbine production slots are effectively sold out through 2027 and beyond.

Under these market conditions, solutions that can increase output from existing and planned gas turbine installations have become increasingly attractive.

TIC could be the most cost-effective option for adding generation capacity. It can typically increase power output by **5-15% or more during hot weather**, while also improving efficiency. Since peak electricity demand often coincides with the hottest periods of the year, TIC provides valuable additional capacity precisely when it is needed most.

Unlike building new generation assets, TIC can often be implemented on existing gas turbines with significantly lower capital investment, shorter project schedules, and minimal permitting requirements. For new power projects serving data centers and industrial facilities, TIC can also reduce the number of gas turbines required to meet a specified power demand, thereby lowering overall project costs.

Sources: POWER Magazine and Power Engineering reports on data center power demand growth, gas turbine market conditions, and generation capacity expansion trends.