

DATA CENTER OPERATIONS CASE STUDY

Sustainable and Reliable Energy 100% of the Time

Case Study 2: You can have green energy 100% of the time even when the sun is not shining or the wind is not blowing.

The data center industry is a significant purchaser of green electricity through power purchase agreements to minimize its impact on greenhouse gas emissions. Due to the unpredictable nature of variable renewable sources like wind and solar PV, it is necessary for energy providers to store the generated electricity for delivery when needed.

While a battery energy storage system investment can provide a solution, it may not be a practical option due to the amount of energy required to be stored and its high cost.

Microgrid to control carbon footprint

A solution to this challenge is to leverage the fuel flexibility of gas turbine data centers. These data centers can use alternative fuels, such as hydrogen, biogas, biomethane, renewable natural gas, bio-propane or hydrotreated vegetable oil to deliver green electricity when variable renewables are unavailable.



In some countries, renewable natural gas or biomethane sustainable benefits are also available through renewable gas certificates of origin, eliminating the need for physical delivery of the gas.

Potentially, the microgrid could also deliver hot or chilled water to the data center or the nearby community.

Ultimately, the integration of intermittent renewable energy threatens the regular operation of data centers until balancing equipment and storage capacities are available in the public grid to absorb fluctuations and resolve the availability gap.

The microgrid or primary power plant can operate both in island mode when the grid is down, enabling the data center to be immune to grid instability, as well as in parallel with the main grid providing support to stabilize the regional grid in case of need (participating in demand response and balancing services).

