Capgemini

How energy microgrids will create more resilient, independent power communities in the US

Challenge
Grid outages and disruptions are becoming increasingly common, due to climate disasters and cyberattacks, leaving communities across the USA vulnerable.
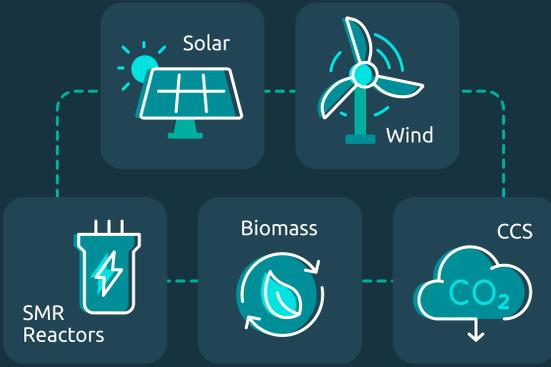
Solution
By the 2030s, AI-driven community microgrids will empower communities to create a more efficient, self-sufficient, and stable relationship with energy.

A distributed energy system
Community chooses from a range of clean energy sources, balancing renewables with abated legacy sources.

Solar

Wind

SMR Reactors

Biomass

CCS CO_2

Optimized with AI management
AI-driven microgrid management optimizes efficiency and cost saving.

Deep reinforcement learning predicts weather patterns and uses renewables accordingly.

Innovatively stored and managed
Fleet providers and automakers' EV batteries provide grid-scale storage.

Green hydrogen manufactured locally when supply exceeds demand.

H_2

Inherent community resilience in an unstable world

Continuous power supply

Commerce

Airports

Extreme weather

AI detects faltering main grid and triggers "island mode"

AI-managed distributed energy microgrid architecture

Cyber attack

AI isolates breached architecture and diverts energy flow

Data centers

Hospitals

Continuous power supply

Local control, local benefits

Reduced risk of cyberattacks without a single point of vulnerability

Critical infrastructure and citizen welfare protected at all times

Energy loss from long-distance transmission and distribution mitigated

Energy purchased directly peer-to-peer, investing profits back into the community