

Innovus Power Microgrid Platforms: Delivering The Highest Penetration with The Lowest Levelized Cost of Energy

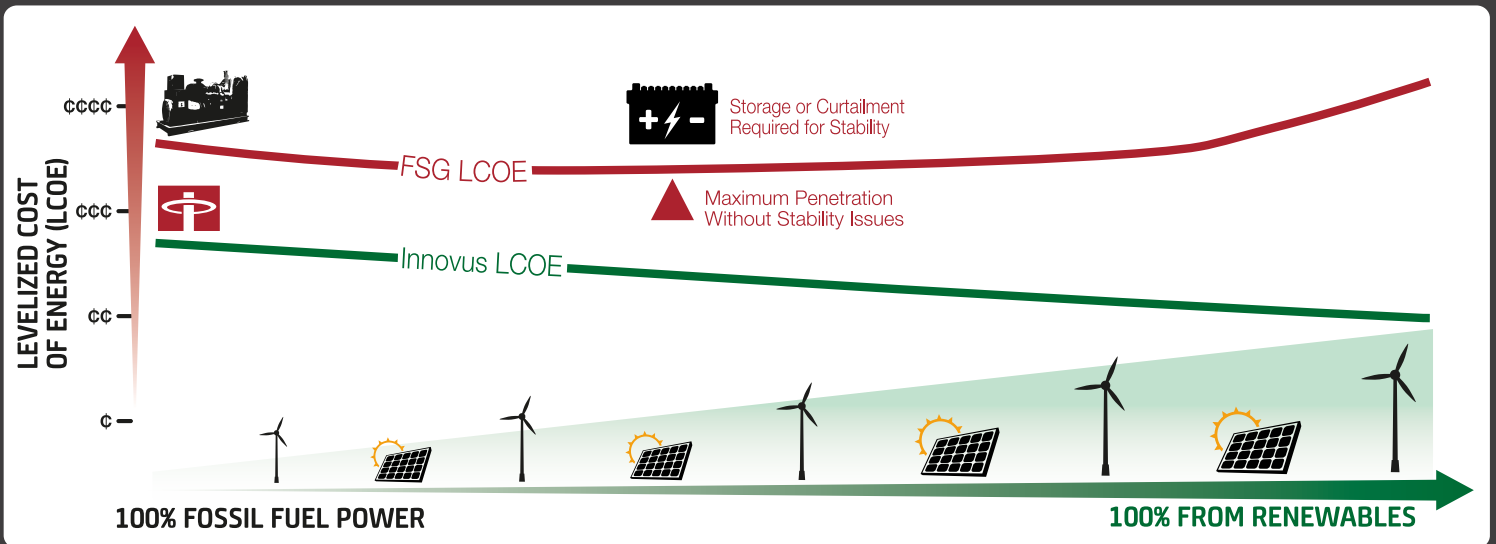
The Innovus Power MVS Series generator and power management platform is the first variable speed generator for primary power and a breakthrough solution for renewable microgrids.

Power system operators are looking for a single integrated solution to provide power surety, stability, lower emissions, and the lowest cost of energy. Innovus Power platforms with our variable speed generator at the heart, allow loads and intermittent solar and wind

to be easily integrated into a scalable, efficient and optimized renewable microgrid.

Renewable microgrids employ assets such as wind and solar with dispatchable power sources to provide energy to communities and industrial applications. Rapidly changing renewable power output calls for a dispatchable power source that can respond instantly and efficiently while maintaining grid stability.

Whether our microgrid platform is producing 100% of the power or leveraging renewables, the Innovus LCOE beats all other solutions – including storage.



Fixed Speed Generators Do Not Meet The Demand Of Today's Microgrids

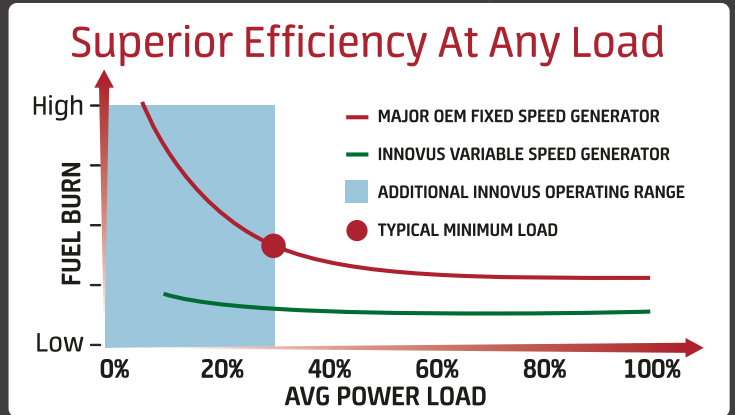
For 125 years synchronous fixed speed generators have operated at one speed to maintain electrical frequency. In deep penetration renewable microgrids, fixed speed generators have difficulty maintaining speed and therefore frequency, when the renewables output changes rapidly due to cloud cover or inconsistent wind conditions. These rapid variations cause synchronous fixed speed generators to “hunt” for frequency, which can destabilize the microgrid. As a result, these conventional systems often curtail renewables or deploy costly solutions such as energy storage, which actually increases the Levelized Cost Of Energy (LCOE).

Fixed speed generators are also increasingly less fuel-efficient and produce more emissions as their load decreases from maximum. In addition, fixed speed generators cannot run consistently below 30% rated capacity without encountering increased maintenance cost due to wet-stacking and coking. This minimum load requirement also reduces the utilization rate of renewables in microgrids.

The Innovus Power Solution: Ushering In a New Era of Microgrids

Innovus designed its renewable microgrid platform to achieve power certainty and stability while enabling deep penetration of solar and wind. When renewable power is unavailable, the Innovus microgrid platform burns less fuel at any demand load. The result of a stable deep penetration microgrid with lower fuel usage, is a dramatically lower cost of energy, lower emissions, power surety, and a hedge against the uncertainty of future costs in fossil fuels.

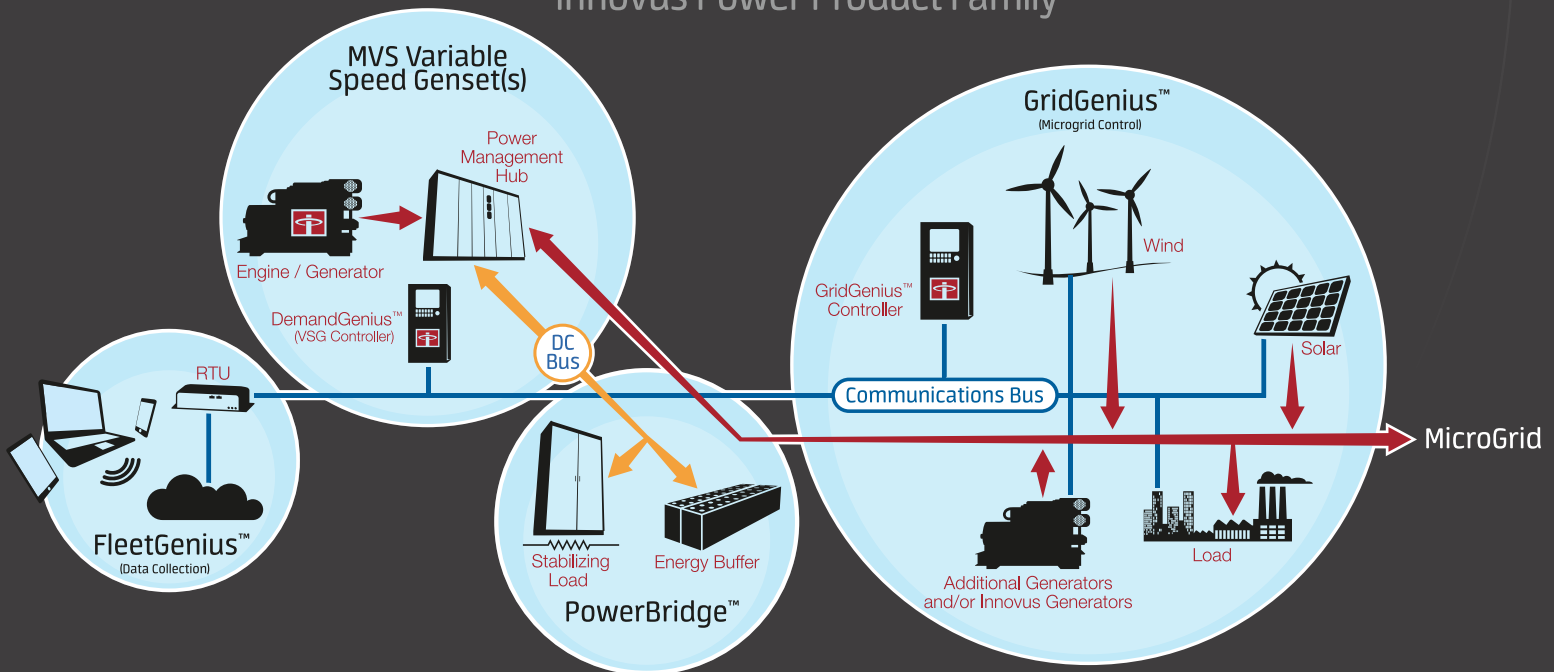
The Innovus renewable microgrid platform is completely stable at any renewable penetration level. Our power management hub with advanced controls will always hold frequency constant during any power or load transient without the need for storage or curtailment. In addition, our variable speed generator efficiently follows the net load requirement down to zero and can be turned off utilizing PowerBridge when the renewables meet the load demand. PowerBridge effectively provides virtual spinning reserve allowing the generator time to restart from off when needed, reducing fuel waste and emissions. The platform enables deep and stable penetration of renewable generation, provides superior low load efficiency, and eliminates unnecessary consumption of fuel. It all adds up to a dramatic improvement in microgrid LCOE.



Key Features:

- ▶ Lowest Levelized Cost of Energy (LCOE)
- ▶ Stable and simple renewables integration at any penetration
- ▶ Integrated control and management of all microgrid assets
- ▶ Management of real and reactive power flow to and from the microgrid and a larger grid
- ▶ Secure supervisory management and monitoring accessible from any Internet connected device
- ▶ Virtual spinning reserve allows engine-off generator operation, buffers power fluctuations and limits voltage during excess generation

Innovus Power Product Family



PowerBridge™ is our energy buffer and stabilizing load system which manages overproduction of renewable generation and allows engine off and stabilization of third party fixed speed generators.

GridGenius™ is our renewable microgrid control solution, which manages connected assets and loads delivering the lowest cost of energy in complex renewable systems.

Rev. 150819D

Call 510.683.6122 or email info@innovus-power.com to learn more about our groundbreaking products.