

# The World's First Commercial, Primary Power Variable Speed Generator Sets

Innovus Power variable speed generator sets deliver up to 35% lower annual operating costs and emissions.

**Breakthrough in power systems design:  
Lowest Levelized Cost of Energy in the world  
for Primary Power up to 10 MW**

- ▶ Up to 35% fuel savings – quick payback
- ▶ Reduced carbon emissions resulting from lower fuel use and more efficient burn
- ▶ Up to 25% increase in time between overhauls, engine never sees high RPM, low torque condition
- ▶ Reliability benefits of lower engine speed operation
- ▶ Electrical frequency does not change during transient, meets or exceeds ISO 8528 G2
- ▶ 10% minimum load requirement with no wet stacking or coking
- ▶ Simple paralleling with other generator sets
- ▶ User interface with touch screen and data logging
- ▶ Interfaces to 3rd party Supervisory Control And Data Acquisition (SCADA) Systems
- ▶ Up to 30% quieter than fixed speed generator sets
- ▶ Maximizes renewable penetration allowing greater utilization of renewables in diesel hybrid systems
- ▶ Enhances grid stability and provides Volt Ampere Reactive (VAR) control



## Innovus Power MVS Series Generator Sets Applications:

- ▶ Off-grid locations
- ▶ Diesel – renewable hybrid systems
- ▶ High cost on-grid locations
- ▶ Oil platforms, oil service support operations
- ▶ Construction sites
- ▶ Commercial marine
- ▶ Mining, rock crushing
- ▶ Driving large motors, compressors, pumps
- ▶ Military stationary power
- ▶ Rental Fleets
- ▶ Peak shaving

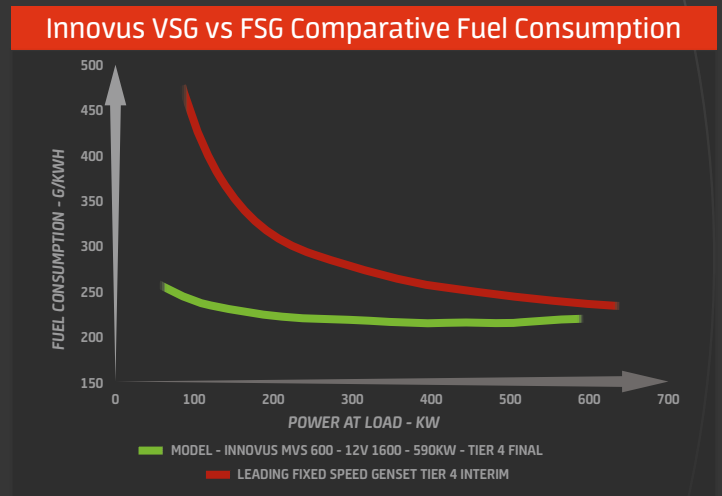
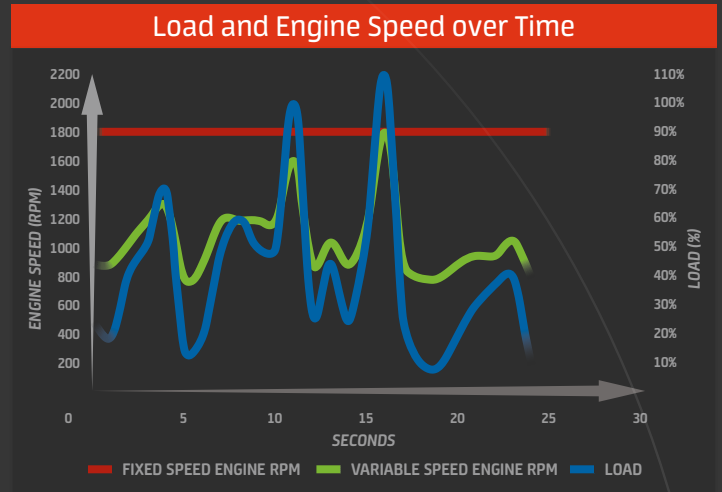
# Addressing the Needs of Primary Power Users

For more than 100 years, generator sets have been designed to run at one fixed speed to assure stable frequency and voltage. At light to moderate loads, the reciprocating engines powering these fixed speed generator sets operate with considerably less efficiency and may suffer maintenance problems such as wet-stacking and coking.

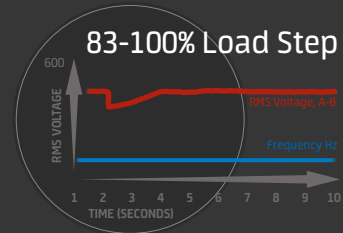
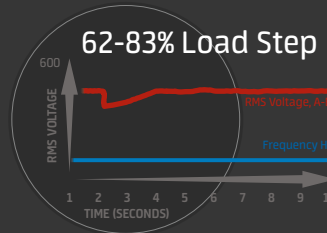
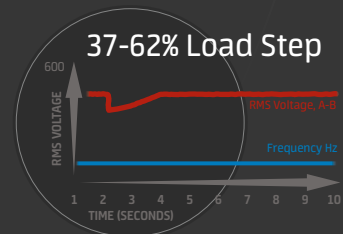
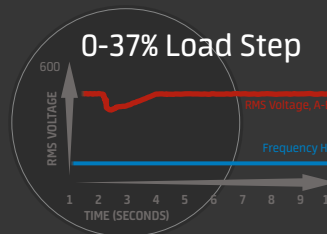
In contrast, the Innovus Power variable speed generator set operates with superior efficiency at all loads while improving engine life. This design decouples engine speed from electrical frequency, allowing the generator set to run at the most advantageous operating speed power at any given load. This leads to greatly improved fuel economy across the generator set's entire power range.

In most prime power applications electrical load varies. Typically, generator sets are sized to meet peak load leaving fixed speed generator sets operating inefficiently when the load varies. In contrast, Innovus Power's generator sets are efficient at any load providing significant advantage over fixed speed sets.

Innovus Power's variable speed operation is accomplished through our proprietary controls and proven power converter technology commonly deployed in the renewable energy industry. Our power converter is designed for high reliability, high efficiency and ease of maintenance. Our proprietary controls and power converter keeps output frequency constant throughout any transient, and voltage droops meet industry standards.



## VARIABLE SPEED GENSET TRANSIENT RESPONSE GRAPHS



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to learn more about our groundbreaking products.