

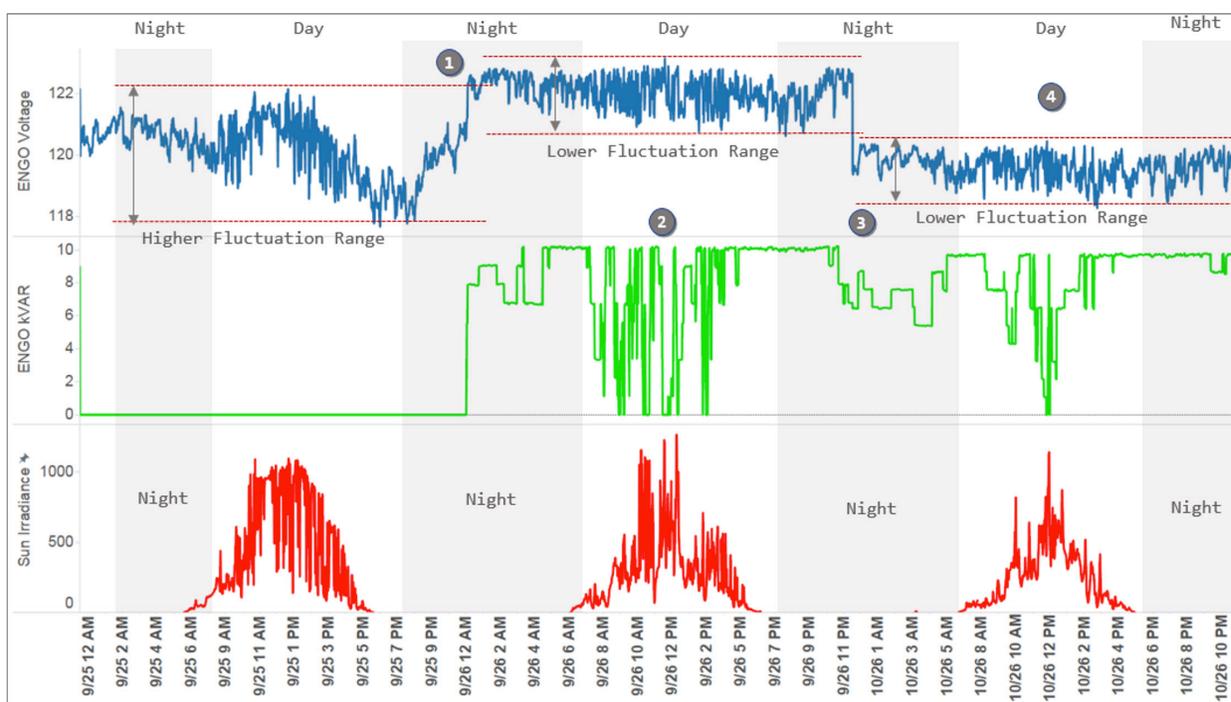


# Optimizing Voltage with Distributed PV Solar

Residential roof top solar applications cause rapid and extreme voltage fluctuations due to solar intermittency and irradiance changes from cloud covers. These variations can create high-band voltage violations and cause power quality issues and customer dissatisfaction. Existing voltage regulation assets are usually too slow and not sufficiently distributed to address widespread fluctuations. The challenge becomes more critical when states legislate aggressive Renewable Portfolio Standard mandates.

## The Grid Edge Control Solution

Sentient Energy's Grid Edge Control includes ENGO-V10 dynamic VAR controller and GEMS management software and addresses the challenge of optimizing voltage on distribution systems with high PV solar usage. The solution optimizes voltage at the edge of the grid for greater precision.



## How It Works

- 1. Reduced Fluctuations** – Adding ENGO-V10 compresses the voltage profile and reduces voltage fluctuations by injecting reactive power.
- 2. Daytime Operations** – During daytime, the ENGO units provide dynamic VAR support to compensate for PV generation fluctuation due to clouds. ENGOs reduce PV induced ramp rates during evening time when solar generation reduces and load increases.
- 3. Nighttime Operations** – For nighttime operation, the ENGO units provide full kVAR support during peak-load times when PV generation is not available.
- 4. Increased PV Integration** – Reduced fluctuations allow utilities to lower load tap changer setpoints to allow for additional PV installations and save energy.

## Results

The Sentient Energy Grid Edge Control solution has been proven in field deployments to reduce voltage fluctuations due to PV generation and enable additional PV solar hosting. Utilities using Grid Edge Control also benefit from greater visibility of edge voltage, energy savings, improved power quality and reduced load tap changer operations.

Sentient Energy®, a Koch Engineered Solutions company, is the premier provider of intelligent sensing, data analytics, optimization, and control technologies for the distribution grid. For more information visit [www.sentientenergy.com](http://www.sentientenergy.com).

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