



# MAXIMIZING THE VALUE OF VIRTUAL POWER PLANTS THROUGH SWELL ENERGY'S ADVANCED DISTRIBUTED ENERGY RESOURCE MANAGEMENT SYSTEM

## OVERVIEW

The proliferation of DERs and the clean energy transition has created new opportunities for utilities and grid operators managing an increasingly decentralized grid. GridAmp is Swell Energy's proprietary Distributed Energy Resource Management System (DERMS) that organizes and controls DERs, like solar and energy storage, and turns them into Virtual Power Plants (VPPs) that provide a variety of grid services to utilities through greater grid stability and reliability, while maximizing the value of DERs for customers. GridAmp's unique ability to deliver stacked grid services from DERs increases value for both utilities and customers, enabling a more transactive grid.

## ABOUT SWELL ENERGY

Swell Energy is an energy and smart grid solutions provider uniting property owners, industry partners, and utilities behind the shared goal of achieving reliable, cost-effective, clean and flexible energy. In order to serve the needs of these diverse stakeholder groups, Swell Energy provides simple solar+storage solutions and leading grid service programs.



## UTILITY BENEFITS

- ✓ Enables utilities to cut carbon emissions from power generation
- ✓ Can defer transmission, generation and distribution infrastructure upgrades
- ✓ Maximizes revenue across multiple utility value streams
- ✓ Supports interoperability and customization for utility markets and DER integrations
- ✓ Prioritizes utility reliability objectives while meeting customer energy needs



## CUSTOMER BENEFITS

- ✓ Manages customer DERs to provide back-up power, electric bill savings, and a more resilient grid
- ✓ Enhances customer and community participation in generating and consuming energy
- ✓ Delivers unique incentives such as GridRevenue to customers





## TECHNOLOGY FEATURES

GridAmp integrates a variety of software and data management technologies through its DER Fleet Manager and Network Operations Center that enable DER visibility and control, utility interfaces, historical and forecast data, optimization models and multiple grid management capabilities.

## DER FLEET MANAGER

GridAmp is powered by a cloud-based DERMS fleet management system which consists of three functional modules: Device Interface, Optimizer-Dispatcher and Utility Interface. The joint capabilities of the DER Fleet Manager modules co-optimize customer energy savings, grid services delivery, and customer comfort in a secure, real-time environment that integrates easily with utility platforms.



### DEVICE INTERFACE

The Device Interface enables GridAmp to communicate with DERs for both individual device and fleet management and reporting, providing secure connectivity to gather telemetry and issue control signals via a gateway or API.



### OPTIMIZER- DISPATCHER

The Optimizer-Dispatcher creates and controls a sophisticated dispatch schedule for DERs optimizing for both utility and customer needs by forecasting energy production and consumption, using telemetry and weather data, and integrating retail energy tariffs.



### UTILITY INTERFACE

The Utility Interface provides a standard method of integration between GridAmp and utility DERMS/ISO interfaces to receive and manage utility dispatch events through the OpenADR protocol.

## NETWORK OPERATIONS CENTER

The Network Operations Center is a web-based portal that displays all deployed VPP assets by utility contract and enables efficient operations, monitoring and control of customer devices.



Image: GridAmp Dashboards Enhance Visibility and Control

## DIFFERENTIATED DERMS CAPABILITY



### GRID EDGE VPPS

GridAmp delivers grid-edge VPPs through advanced optimization algorithms that analyze a wealth of telemetry and weather data, and customer load profiles to make real-time decisions about DER operations.



### STACKED GRID SERVICES

GridAmp stacks grid services such as capacity build, capacity reduction, renewable energy balancing and integration, fast frequency response and additional ancillary services to deliver maximum DER value to utilities and customers.



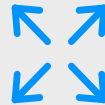
### PROVEN TECHNOLOGY

GridAmp meets the requirements for investor-owned utilities, municipalities and other energy companies to operate and is currently running in one or more markets.



### SECURITY

GridAmp's Information Security program is built upon the National Institute of Standards and Technology Cybersecurity Framework. GridAmp is certified by the American Institute of Certified Public Accountants Subservice Organizational Controls (SOC) 2.



### SCALABILITY

GridAmp's customizable features and integrations, along with its scalable deployment on Amazon Web Services enables low-cost VPP advancement and expansion. Utility integration based on the standard OpenADR protocol ensures quick, efficient, and secure onboarding of additional grid service partners for faster adoption of VPPs across new markets.



### END-TO-END SOFTWARE APPROACH

A comprehensive approach to software solutions integrates GridAmp with Swell's customer acquisition platform called Wave, and its customer engagement platform called Compass, and enables rapid turnkey deployment of Swell VPPs.