**AutoGrid: The Leader in Global Flexibility Management**

- **50+** Global Energy Customers
- **6,000 MW+** Flexible Resources
- **17 Countries** Operational Systems

**Marquee Customers Across the Globe**

- CPS Energy
- CLP
- Shell
- TATA Power
- Consumers Energy
- nrg
- Sunrun
- PSE
- Pacific Gas and Electric Company
- BC Hydro
- CPA
- GreenStruxure

#1 DERMS and VPP by Guidehouse Insights

2022 Acquisition by [Schneider Electric](https://www.schneider-electric.com)
Century-Old Electric Power Industry is Disrupted

New Variable Generation, Smart Loads, and Storage

Traditional Generation and Loads

Enabling Technologies
Ranked #1 Flexibility Management Platform by Industry Analysts

#1 VPP Platform

Virtual Power Plant Leaderboard

#1 DERMS Platform

Distributed Energy Resource Management System Leaderboard
Virtual Power Plant Definition

VPP: Virtual Power Plants

DERMS: Distributed Energy Resource Management System
(Solar, Storage, EV fleets, Microgrids)
(Renewables & DER Trading, Utility Storage, Virtual PPAs)

DRMS: Demand Response Management System
(BYOT, BDR, C&I DR, Peak Demand Mgmt.)
The VPP Asset Lifecycle

**Program Management**
- System of Record for participant enrollment & resource onboarding

**Enrollment & Onboarding**
- 24x7 ML/AI based Algorithms

**Automated Dispatch**
- Open-Standards & API-based Dispatch and Controls

**Customer Notification**
- Multi-channel notifications at scale

**Post Event Analytics**
- M&V, Settlements & Incentives

**Monitoring, Forecasting, Optimization**
- Program Rules and Constraints

**Comprehensive Functionality**
- Peak Shaving / Shifting, Renewable Balancing
- Capacity, Energy, Ancillary Services
- Voltage & Frequency Based Dispatch
- Residential, Commercial, Industrial Programs

**Advanced Analytics**
- Uses ML, AI, and Big-Data throughout
- Meter & Device Level Data processing
- Monitoring, Forecasting & Optimization
- BI Reports & Utility Dashboards
- Customer Segmentation and Personalization

**Utility-Grade Cyber-Security**
- Highly secure mission-critical deployment
- 24x7x365 Network Operation Center (NOC)
- SOC2 & NERC-CIP attested
- Cleared US DOE & DOD diligence
AutoGrid VPP Rents Residual Capacity in Assets

Customer-sited Asset

Underutilized capacity
- Grid balancing
- Peak shaving
- Renewable firming

Bill optimization
- Avoid peak rate periods
- Maximize rooftop solar

Reserve Margin
- Backup power

AutoGrid pays asset owner for visibility into asset and control under contracted terms, eg:

- Date and time ranges
- Maximum duration
- Maximum hours per year
- Notice lead time
VPPs: A New Model for Energy Asset Development

**Centralized Generation**
- Large scale, colocated assets owned by developer or plant operator
- Plant operator responsible for physical maintenance, upkeep, interconnection

**Virtual Power Plant**
- Assets distributed and owned/maintained by 3rd parties
- Asset owners responsible for siting, construction, and interconnection
- AutoGrid pays asset owner for access/control rights to equipment

In both cases upfront investment to acquire physical assets
Energy AI Systems: Turnkey Grid Services from DERs

- Program Design
- Marketing & Recruitment
- Enrollment and Registration
- Customer Incentive Processing & Settlement
- Program Management
- ISO Market Operations
- 24/7 Network Operations Center

Example offtakers:

- Capacity
- Energy
- Ancillary Services
AutoGrid Simplifies and Accelerates VPP Deployment

Grid Services
- ISOs & Markets
- Utilities

Customer Acquisition
- OEMs
- Microgrid Developer
- EV Fleet Operators
- Solar Installers
- EE Contractors

AutoGrid Systems Inc, - Confidential
AutoGrid Simplifies and Accelerates VPP Deployment

Grid Services

ISOs & Markets

Utilities

Why Attractive to Offtakers?

- Familiar procurement model, similar to PPAs
- Aligned incentives with pay-for-performance pricing
- Fast delivery of MWs
- Scalable capacity sizing
- No appetite or ability to evaluate and contract with full landscape of DER vendors
AutoGrid Simplifies and Accelerates VPP Deployment

Why Attractive to Partners?

- Improves unit economics of hardware sales with program incentive payments
- Offers additional revenue stream to partner
- Obviates the need to build sophisticated inhouse grid services team
- Streamlines or circumvents utility contracting process

Customer Acquisition

- OEMs
- Microgrid Developer
- EV Fleet Operators
- Solar Installers
- EE Contractors
Largest Ecosystem of DER Partners for VPP Supply Assets

Solar & Storage
- solar edge
- Sunrun
- Schneider Electric
- energysage
- Sunnova
- SMA
- TESLA
- (via Sunrun or Sunnova)
- swell
- Generac
- PWRCell
- Sol-Ark

Residential Loads
- Google Nest
- ecobee
- sinopee
- Rheem
- SPAN
- Honeywell Home
- Eaton Cooper
- SkyCentrics
- Mya
- Tuya
- Amazon smart thermostat

Commercial & Industrial Loads
- nrg
- etap
- Microsoft
- NuEnergen
- Willdan
- Schneider Electric
- Industrial

Curtailing Charging (V1G)
- chargepoint
- JuiceBox
- wallbox
- Schneider Electric
- solar edge
- SWITCH
- TESLA
- Chrysler
- Ford
- MINI
- Land Rover
- MINI
- Tesla
- Jeep
- Audi
- MINI
- Hyunday

Charger Networks (V1G)
- chargepoint
- chargepoint
- EV Gateway
- evoconnect
- FreeWire

Discharging EV batteries (V2G)
- Zum
- Fermata Energy
- LION
- Nissan
- Rhombus
- Tullis Power
- dcbel

Offering the widest choice with multi-segment multi-brand offering
Peaker Plant Basics

▪ Able to start and sync rapidly (less than 30 minutes)

▪ Primarily simple cycle combustion engine, fueled with gas or oil

▪ More than 1000 peakers in the US

▪ Operates just a few hundred hours per year (<10% capacity factor)

▪ Most expensive generation source by Levelized Cost of Energy

AND... disproportionately located near low income and marginalized communities
Virtual Power Plants Offer Superior Alternatives to Peakers

- Zero Carbon
- Faster to Deploy. Targeted, Expandable
- Cheapest Resource
- Empower Consumers
- Accelerate energy transition

$150 - 180/kW-yr
$80 - 110/kW-yr

60% goes back to the community to engage customers and create jobs

Fuel

Customer Payments

Variable O&M

Fixed O&M

Capital Investment

Fixed O&M (Systems & Operations)

Capital Investment

Peaker

VPP
The Full Economic Picture Is Much More Stark

2-4x

Social and Health Costs

VS

Social costs include emissions impact of CO2, NOx, and SOx

Health costs include morbidity, mortality, and work days lost

Peaker

VPP
VPP Optimization to Mimic Conventional Generation

- Stack and orchestrate portfolio assets based upon specific constraints
- Daily/hourly availability forecasts incorporate device and program limits, as well as performance derating based on seasonality or fatigue
VPP Barriers and Challenges

1. Open Standards and Interoperability
2. Inconsistent Market Rules and Regulations
3. Customer Education, and not Customer Confusion
4. Well-Designed Incentives
5. Telemetry and Integration Issues
Questions?

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Extra Slides