

A blue-toned illustration of a cityscape with various buildings, trees, and people riding bicycles.

Connecting federal funders, developers, and communities through virtual power plants

15th Annual California Climate & Energy Forum
June 25-26, 2024 • Palm Springs, CA



CALIFORNIA
STRATEGIC
GROWTH
COUNCIL

A blue-toned illustration of a rural landscape with houses, trees, a tractor, and silos.

Overview

- Introductions
- Overview of the Inflation Reduction Act, the US Department of Energy Loan Programs Office, and virtual power plants
- Financing virtual power plants
- Virtual power plants for community resilience
- Q&A
- Breakout session

Who's in the room?

- Tribal government
- Local government
- State government
- Nonprofit / community-based organizations
- Private sector (developers / finance / etc.)
- Other?

California Strategic Growth Council

SGC's work falls under four main categories.



Investment Programs
(~\$4bn)



Collaborative Policy Initiatives



Integrated Policy and Planning



Capacity Building and Technical Assistance

California Strategic Growth Council



Sam Assefa
Council Chair
Director, Governor's Office
of Planning & Research



Frank Cardenas
Council Vice Chair
Public Member, Assembly
Appointee



Nicole Capretz
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Wade Crowfoot
Council Member
Secretary, California
Natural Resources Agency



Yana Garcia
Council Member
Secretary, California
Environmental Protection
Agency



Mark Ghaly
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Health & Human Services
Agency



Karen Ross
Council Member
Secretary, California
Department of Food &
Agriculture



Toks Omishakin
Council Member
Secretary, California State
Transportation Agency



Juan Sánchez Muñoz
Council Member
Public Member, Governor's
Appointee



Tomiquia Moss
Council Member
Secretary, California
Business, Consumer
Services & Housing
Agency

SGC Energy Investments Portfolio

Mission

- Expand the reach and benefits of SGC's energy investments
- Support cross-sectoral coordination for funding and project implementation
 - Federal, State, and local governments; Community organizations; Private sector; Philanthropy
- Identify and pilot opportunities for innovation at scale

Virtual Power Plants for Community Benefit

- In April 2024, SGC entered an agreement with King Energy to leverage federal funding to implement distributed energy resources as virtual power plants at sites and facilities supported by SGC-member programs.
- Initial sites: SGC Community Resilience Centers (CRC) program which funds new construction and upgrades of neighborhood-level resilience centers to provide shelter and resources during climate and other emergencies.
- SGC seeks to enhance site- and grid-level energy resilience while extending benefits such as reduced energy costs and rental income to participating entities and their communities.

Today's speakers



Yakov Feygin
Director of Public
Finance, Center for
Public Enterprise



Jared Snelson
Strategic Account
Executive, King Energy



Jared Genova
Senior Planner, Civix

The Loans Program Office (LPO), Virtual Power Plants and Your Community

Yakov Feygin,
Center for Public Enterprise
yakov.feygin@publicenterprise.org

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What is the Loans Program Office (LPO)?

- The Department of Energy's Internal Mission Driven Lending Institution
- "Bridge to Bankability"
 - Loans and Loan Guarantees at a "Concessionary Rate" of United States Treasury plus 3/8ths
- Title 17 Loans:
 - **Innovative Technology**
 - **State Energy Finance Institution (SEFI) Supported Projects**
 - Innovative Supply Chains
 - Energy Infrastructure Reinvestment
- **Tribal Energy Finance Program**
- Automotive Manufacturing
- C02 Transportation Infrastructure

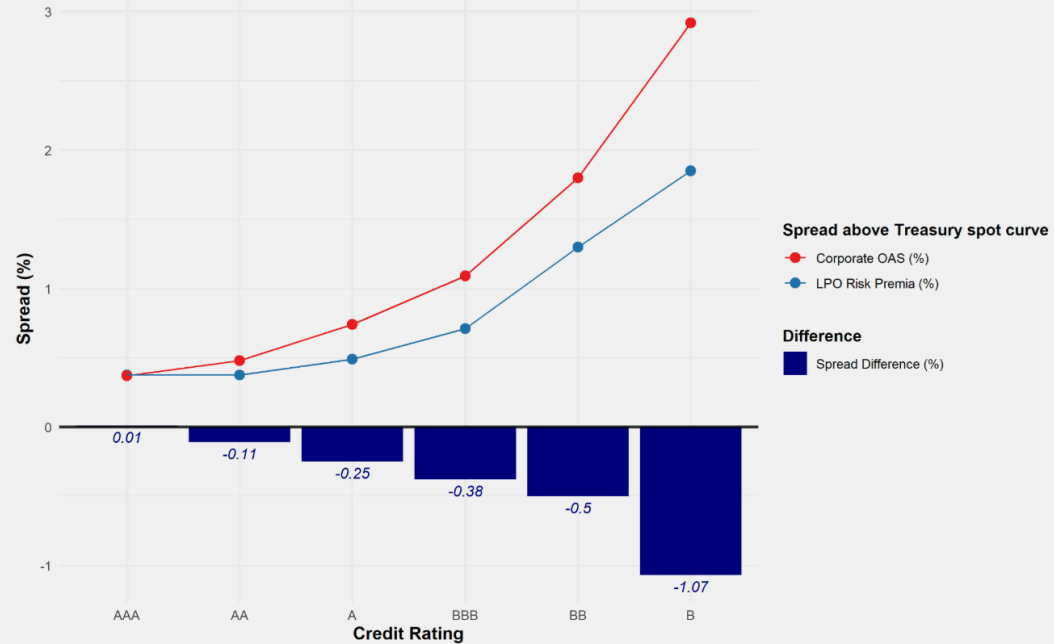
LPO Considerations

- Minimum Loan \$100 Million
 - Can be part of a portfolio of projects
- Has application fees and costs.
 - Some can be paid for out of the loan itself
- Requires at least 5% sponsor equity
- Covers as much as 80% percent of the capital stack but more typically 50 - 75%
- Davis-Bacon, Prevailing Wages
- Tax credits can be in the capital stack
- GGRF funds can be used if structured as equity or as a loan buyout'
 - GGRF isn't "meaningful support" from the point of view of the SEFI carveout

LPO Spreads

LPO's Title 17 lending is extremely concessional for borrowers at lower credit ratings

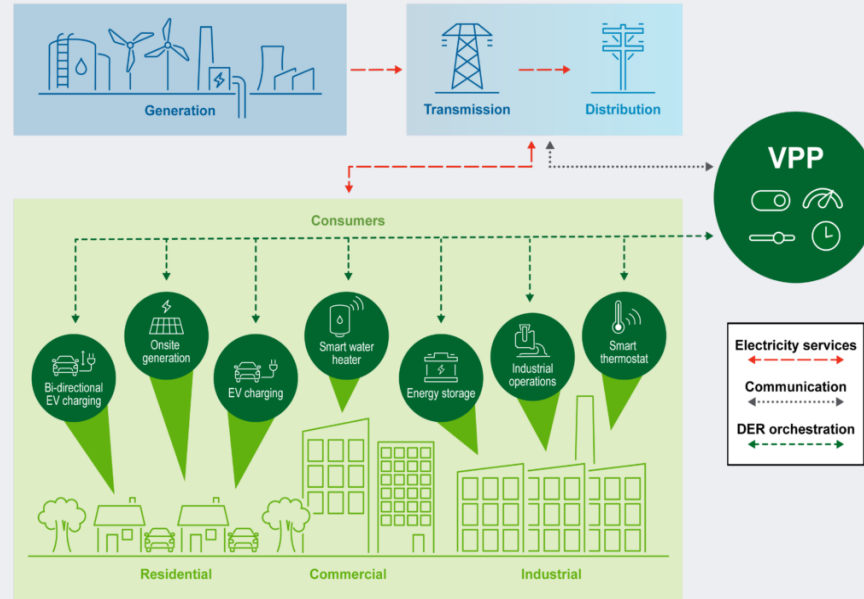
measured as the spread between an FFB loan and FRED's BofA corporate bond option-adjusted spread (OAS) index



Center for Public Enterprise, 2024. FRED data sourced from May 28, 2024.

Virtual Power Plants

- Integrates distributed energy resources (DERS) – including generation, storage, demand response – resources into a network to supply “grid scale” power
- Often integrates these resources through a Distributed Energy Management System (DERMS)
- Structure depends on regulatory environment
- Can also create new sources of revenue for users



Downing, Jennifer et al. September 2023. “Pathways to Commercial Liftoff: Virtual Power Plants.” US Department of Energy. Available at: https://liftoff.energy.gov/wp-content/uploads/2023/10/LIFTOFF_DOE_VVP_10062023_v4.pdf.

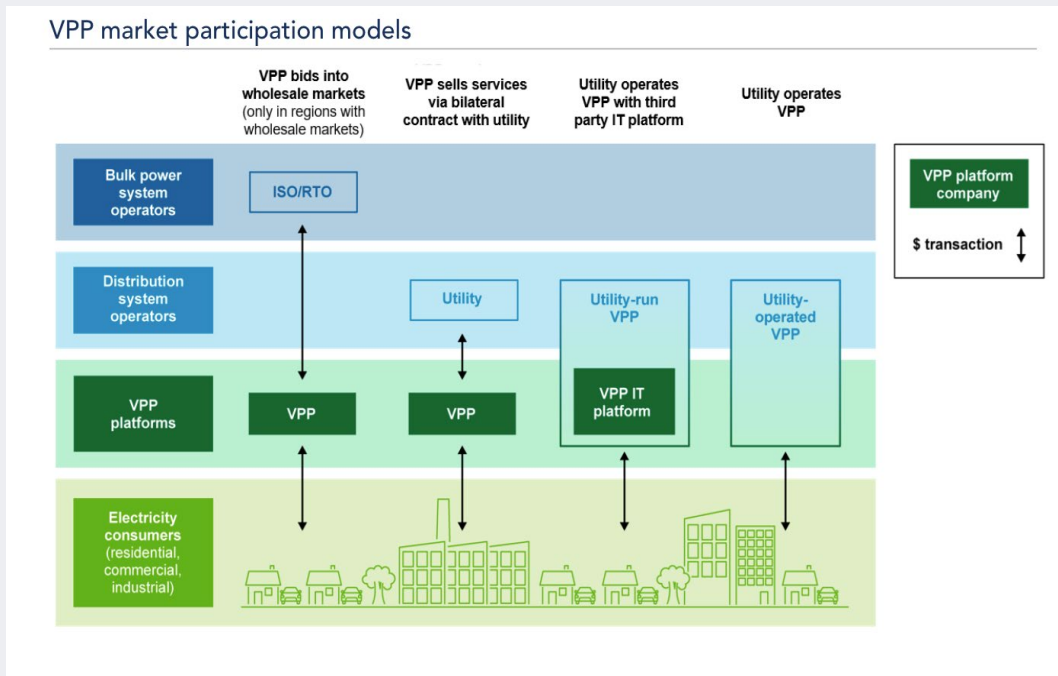
Why the LPO Loves VPPs

- Low-cost solution to getting “more out of the grid we have”
- Efficiencies and increased capacity from resource aggregation
- Creates a better value proposition for DERs
- Alternative to gas powered “peaking” through demand response and storage and solar efficiencies
- 80 to 160 GW by 2030 can save ten billion a year in grid upgrade and capital costs



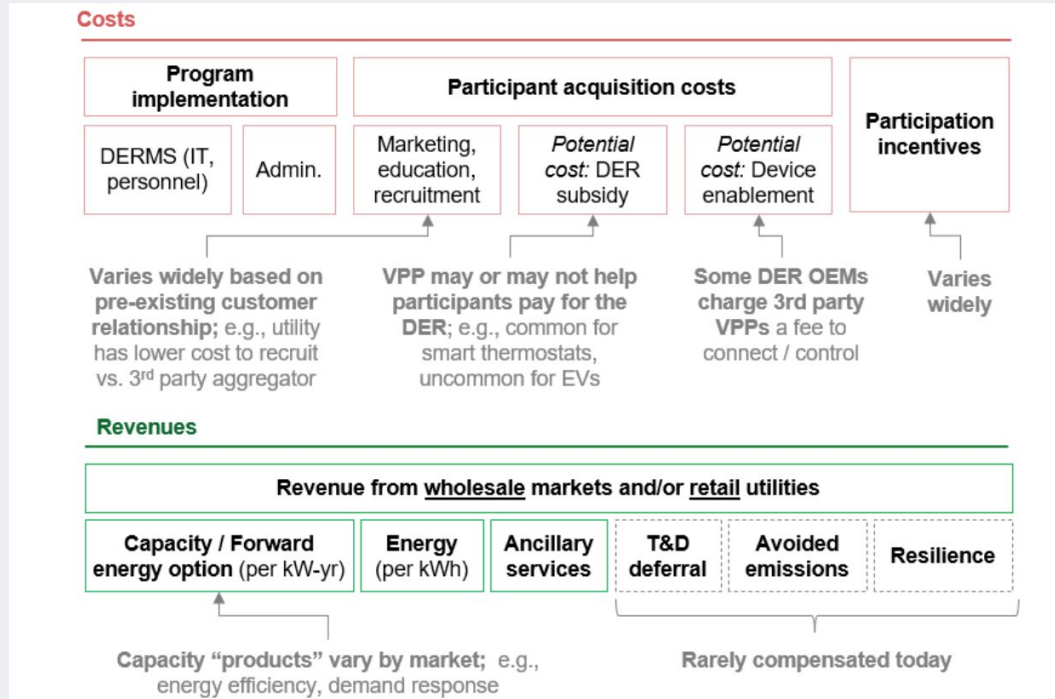
Some Open Questions About VPPs

- Interaction between DER ownership and DER orchestration
 - What is the tradeoff between resilience and value, if there is one?
 - Who owns, finances, operates, orchestrates?
 - What is the value split between DER site owners, VPP operators, and third party contract holders?
- What constitutes a VPP
 - Utility orchestrates DERs in its network
 - Fleets of DERs integrated by a third party
 - Mix of the two in an integrated market



Downing, Jennifer et al. September 2023. "Pathways to Commercial Liftoff: Virtual Power Plants." US Department of Energy. Available at: https://liftoff.energy.gov/wp-content/uploads/2023/10/LIFTOFF_DOE_VPP_10062023_v4.pdf.

VPP Value Stack



Downing, Jennifer et al. September 2023. "Pathways to Commercial Liftoff: Virtual Power Plants." US Department of Energy. Available at: https://liftonn.energy.gov/wp-content/uploads/2023/10/LIFTOFF_DOE_VVP_100_62023_v4.pdf.

Introduction to King Energy



**King Energy brings financially-viable solar
and storage solutions to commercial and
industrial properties**

Markets Served

150+

Energy programs
managed

20 M

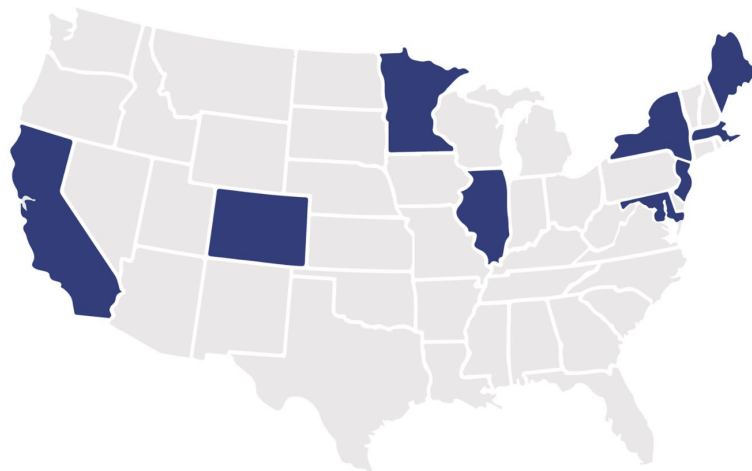
Square feet of tenant
space served

\$200 M

Project funding
secured

85%

Average tenant
enrollment rate

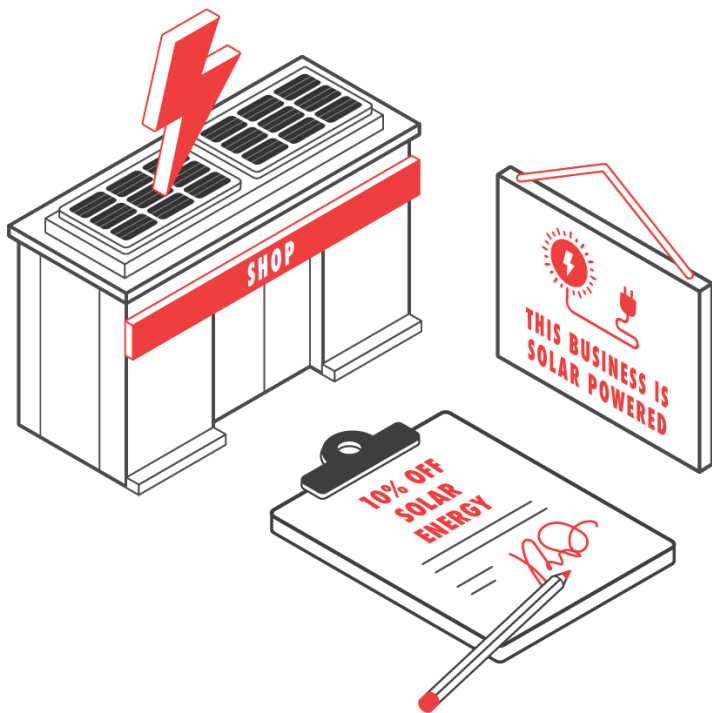


What are Virtual Power Plants (VPP)?

- Distributed Energy Resources (DERs):
 - Small-scale energy generation
 - Energy storage
- Offtakers
 - On-site systems
 - EV charging stations
 - Utility / Grid (Demand Response)
- Centralized control and optimization



Benefits of Distributed Energy Resources



- **Enhanced Grid Resilience:** provide backup power and improve grid stability during outages or emergencies
- **Environmental Benefits:** energy generated by a renewable energy source
- **Cost Savings:** lower energy costs by shaving peak demand charges

King Energy's Goal: Reduce Complexity

Solar

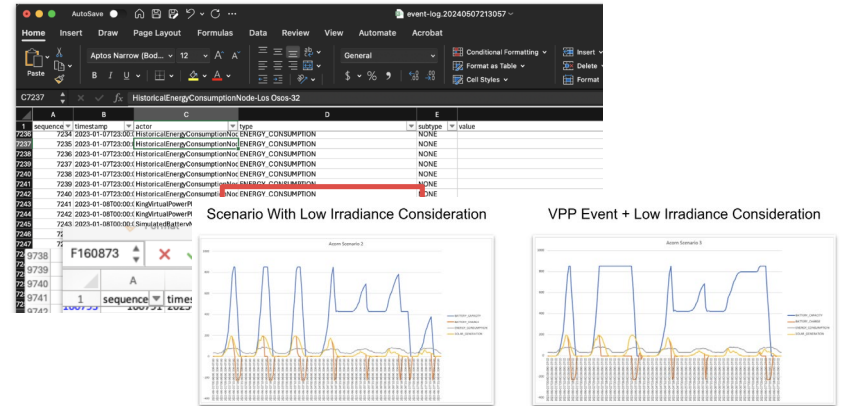
- Simplified billing software integrated with the utility
- Externally finance the program to reduce owner cost

The screenshot shows a King Energy bill for the period Jan 31, 2023 - Mar 1, 2023. A callout box highlights the following items:

Item	Amount
Charges for Period	\$801.71
PG&E Charges	\$410.43
Solar Charges	\$434.76
Your Solar Savings (10%)	-\$43.48
Final Amount Due by Mar 29, 2022	\$801.71
Total Solar Savings	\$43.48

Storage:

- Reduce energy costs through tariff optimization
- Interconnected with the grid for Demand Response
- Integrated decision making software





KING ENERGY

Virtual Power Plants (VPPs) for Community Resilience

- Phase I: Community Resilience Centers (CRCs)
 - \$100M SGC investment in local government and community-based organizations
 - Physical sites to serve communities during acute crises
 - Climate-informed designs and community capacity building
 - Planning, project development, and implementation grants
 - Dovetailing with other SGC and State of California investments



Banning Community Resilience Center



Pogo Park Community Resilience Center

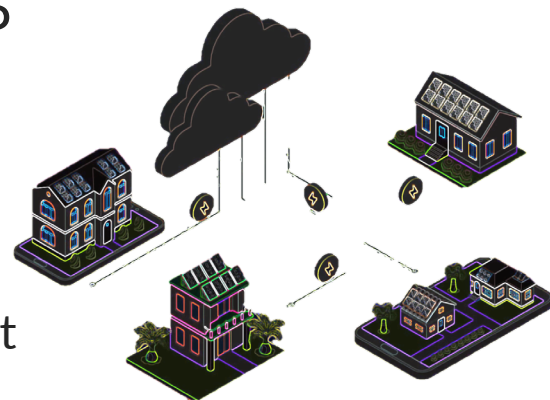
VPPs for Community Resilience

- Why is SGC interested in VPPs?
 - Tool to support statewide climate action programs
 - Additional incentives to encourage local energy resilience measures
 - Lower operating costs for SGC grantees
 - Opportunity to leverage SGC's DOE-designated SEFI status to bring new, but proven technology to California
 - Supports grid resilience/safety



VPPs for Community Resilience

- How can CRCs (and others) benefit from VPP deployment?
 - Traditional energy resilience benefits
 - Backup power during grid downtime
 - Lower energy costs (solar net metering)
 - Potential for rents (paid to CRCs) to further offset costs
 - Right-sizing solar/battery systems for community needs
 - Builds capacity and awareness of new technology deployments



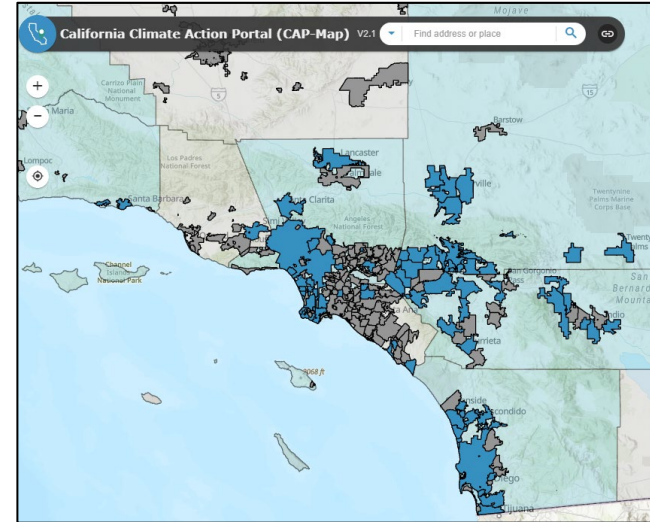
VPPs for Community Resilience

- How can encouraging VPP development achieve local energy goals?
 - Offer an additional value proposition to develop rooftop solar
 - Encourage battery storage (resilience)
 - In line with current CPUC net metering guidance
 - Can induce demand for other DERs, such as heat pumps and EV chargers.
 - Can help quantify energy benefits, track consumption, savings



VPPs for Community Resilience

- What's next?
 - See if action toward local or regional climate goals could be accelerated with more DER deployments
 - Explore Inflation Reduction Act (IRA) and other programs via DOE to see if funding or financing is realistic for your community
 - If you've recently applied to an SGC grant program and have energy goals, let's talk!



Breakout session

- Divide into groups of 4-6.
- Prompts:
 - What are the most pressing energy-related challenges for your community/organization?
 - How might virtual power plants help to address those challenges?
 - What resources and support – and from whom - do you need to move forward?

Thank you

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