

Energy



The Role of Community Distributed Energy in Zero Net Energy (ZNE) Compliance In California
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TRC
Results you can rely on

Presentation Outline

- PG&E Project Overview
- Background: Need for the project
 - California's ZNE and Community Solar Mandates
- Community Solar Market
 - Nationwide and in California
 - ZNE Compliance pathways :Barriers & Opportunities
- Recommendations and Path Forward for California

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Research Goals & Objectives

Research goals explore the role of Community Distributed Energy in ZNE Compliance

GOAL I: Community scale photovoltaics (PV):

1. Explore and characterize the current **permitting requirements** associated with siting and sizing community-scale systems
2. Review any current and proposed **tariff frameworks** that equitably allocate costs and generation to individual units, ownership, and financing
3. Potential DER voltage, frequency, and other **impacts on the grid**, including utility role in tracking projects.

GOAL II: Community-scale biomass:

4. Conduct 10 California biomass project case study reviews via a mix of literature reviews, interviews, and other methods

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Research Findings Outline

Community Solar Findings: Literature Review & Interview Research

- Community Solar Overview- Nationwide & California
- Community Solar & CA' ZNE Goals
- Community Solar Business Models
 - Ownership, compensation, location, policies etc.
- Community Solar Barriers & Opportunities
 - Role of planners and utilities

Community Biomass Findings: Case Study Research

- Community Biomass Landscape in CA
- Biomass Case Studies Summary
 - Ownership, Financing, Technologies, Tariffs, Lessons Learned

Future Research Recommendations

- Phase II recommendations and other research

http://www.calmac.org/publications/PGE_ZNE_DER_Phase_1_Project_Report_FINAL_CALMAC-PGE0409.01.pdf

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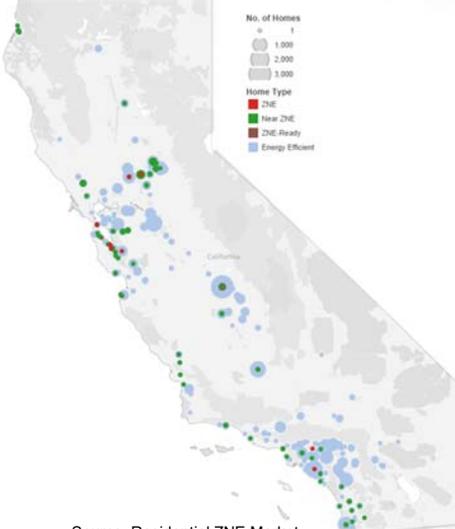
Project Background- Research Need





California has established impressive ZNE Goals

- All new residential construction and all new commercial construction in California will be zero net energy by 2020 and 2030, respectively
- 50% of existing commercial buildings will be retrofit to ZNE by 2030
- All new state buildings and major renovations shall be ZNE by 2025
- 50% of existing state-owned building area by 2025 shall be ZNE



Source: Residential ZNE Market Characterization Study (TRC)



California also has goals for Community Solar

- SB 43 ruling made in 2013 enacted the Green Tariff Shared Renewables (GTSR) Program
- Jan 2015 CPUC Ruling D.15-010051: Implementation of SB43
 - Green Tariff
 - Enhanced Community Renewables (ECR)
- ECR requires 600 MW shared renewables procurement requirement with carve outs for individual utilities

	Percentage of Total IOU Bundled Sales	TOTAL (MW)	Environmental Justice (MW)*	Davis (MW)*	Unreserved (MW)
PG&E	45.25%	272	45	20	207
SD&E	9.87%	59	10	N/A	49
SCE	44.88%	269	45	N/A	224
TOTAL	100.00%	600	100	20	480

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Common Interface between ZNE & Community Solar?

- **2013 Integrated Policy Report (IEPR)**
 - Defined ZNE Code building as a building to include *on-site renewable energy* generation that offsets the time-dependent value of the energy used in the building.
- **2015 IEPR**
 - The ZNE Code Building definition anticipates considering *“development entitlements” for off-site renewables*, as a potential option for builders and developers
 - Need for alternative compliance pathways to ZNE, with the updated ZNE definition clearly allowing community solar as a possibility;
- **2019 Title-24 Part 6 Rule making**
 - Renewable systems deployed for ZNE new construction should be *“dedicated to the house”* or building; *“durable”*; providing the *equivalent benefit* at the same time as a site-based asset would; *quantifiably performing* at a level that is at least as great as the site-based alternative; verifiable (both its existence and performance), and *cost-effective*
 - CEC is proposing a *‘compliance option’* for community solar – a voluntary option that a builder can choose to comply with the code.

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Is ZNE achievable –Some Key Facts

- California ZNE goals are technically feasible- but might be hard to achieve via the rooftop solar model
- Estimates show that 49% of households and 48% of businesses in the U.S. are currently unable to host a rooftop solar system
 - Tenants
 - Buildings without access to roof space (e.g., multi-unit housing, malls)
 - Occupants of buildings with insufficient
 - Weather
 - Shade
- Shared solar could represent 32%–49% of the distributed solar market in 2020
- Need for a supportive regulatory environment at the federal, state and local level to stimulate growth













Project Findings

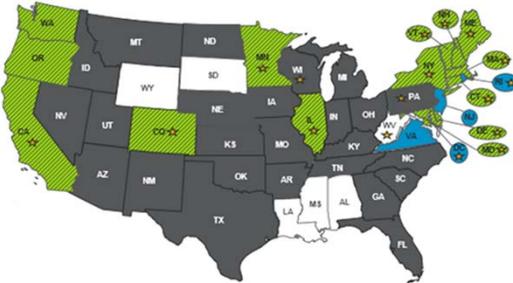


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Community Solar Landscape

- In 2017, 40 states across the country had at least one community solar project online (Navigant 2017)
- California, Colorado, Massachusetts and Minnesota expected to lead (SEIA 2017)
- Potential to grow more than 50-fold from 2016 capacity to between 5,500 MW and 11,000 MW by 2020 (NREL, 2015).
 - Drivers include new small scale solar customers, policy drivers, new business models and utility involvement



■ Community Solar Legislation Enacted (3 States +DC)
■ Active Community Solar Programs (25 States)
■ Both (13 States)
★ Virtual Net Metering

Source: Navigant Consulting Inc. 11



CA's Community Solar- Nascent Stage

- 2013: Senate Bill 43 (SB-43) mandated the creation of the Green Tariff Shared Renewables (GTSR) Program
 - Green Tariff and Enhanced Community Renewables (ECR) programs



- Jan 2015 CPUC Ruling D.15-010051: Implementation of SB-43 begins
- ECR requires 600 MW shared renewables procurement requirement, but implementation has to overcome barriers

	Percentage of Total IOU Bundled Sales	TOTAL (MW)	Env. Justice (MW)	Davis (MW)	Unreserved (MW)	Number of Bids Received	Number of Bids Shortlisted	Number of PPAs Awarded
PG&E	43.23%	212	45	20	207	8	3	0
SOLE	9.87%	50	10	N/A	49	2	1	0
SCE	44.83%	269	45	N/A	224	5	0	0
TOTAL	100.00%	600	100	20	480	15	4	0

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California Community Solar- Mixed Results

Current Challenges – GTSR Implementation:

- Slow Implementation
- Bill Credit
- Community Commitment
- AmLaw/Securities Law Compliance

Current Successes:

- Municipal Community Solar Programs
 - o Sacramento Municipal Utilities Department (SMUD)
 - o Los Angeles Department of Water & Power (LADWP)
 - o City of Palo Alto Utilities (CPAU)

Other Local Government Efforts:

- Municipal plan changes to incorporate solar- San Diego, Santa Clara
- Expediting permitting- San Jose, CA.
- Fees waivers- Irvine CA
- Lancaster ZNE Ordinance and solar mitigation fee compliance option

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ZNE Compliance Pathways

- The current community solar program structure was developed without taking into consideration the state's ZNE goals and the Title-24 ZNE requirements
- The ZNE mandate in Title-24 could provide an additional market impetus for the growth of this market and represent an untapped value stream for community solar.
- The community solar market can support ZNE implementation in California, but more work is needed to align California's community solar program with the emerging ZNE regulatory model.
 - Valuation of community solar
 - Role of RECs
 - Ownership and financing
 - Energy tracking mechanisms

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ZNE Compliance – Some Possible Solutions



Community Group Purchasing

- Locating the solar within the subdivision and bundle the community solar with the house or building at time of sale, included in any mortgage.



Offsite Shared Solar

- Allow community solar systems authorized through the GTSR to meet the ZNE code mandates. The utility or a third party would thus own the community solar system but the customer would be credited for the solar energy produced



Community-Driven Financial Models

- Create Local Government Community Facilities District (CFD) to own and administer a community solar option for all new residential developments within a given local community.

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Next Steps



Future Research Recommendations

- Develop a California-specific planning guide for community solar in the residential and commercial markets to support the ZNE goals, including tariff options for different ownership models.
- Examine the role of Community Choice Aggregation (CCA) on the future of ZNE and the community solar market in California.
- Investigate the role of disruptive Energy Cloud platforms such as building-to-grid, transportation-to-grid, and transactive energy, i.e. blockchain, in advancing ZNE and community solar goals.
- Identify opportunities to more fully integrate community solar planning efforts into the utility distribution planning and integrated resource planning processes .

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Thank you

Questions?

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