

ENERGY

# Microgrid Assessment and Recommended Future RD&D Investments Workshop

## Preliminary Survey Results

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## There were 119 responses to the survey as of February 21, 2015

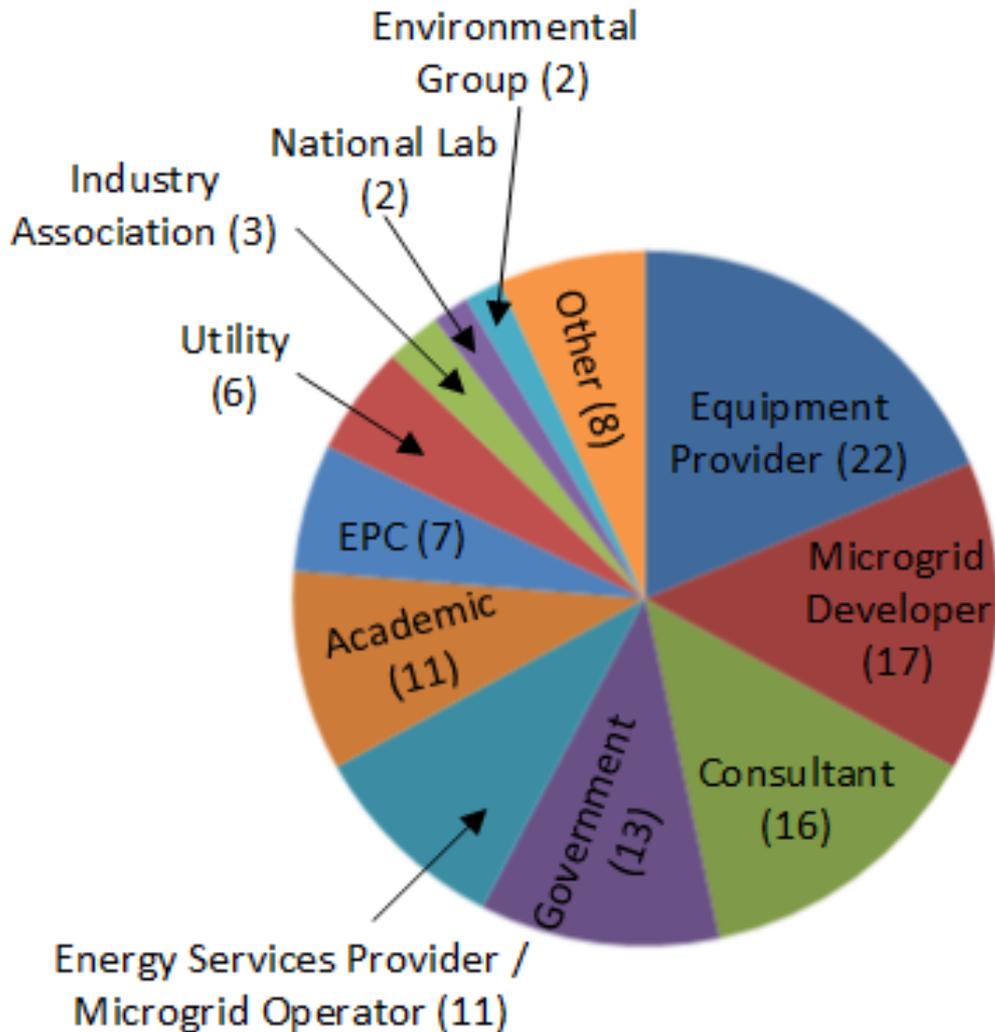
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- Survey open to the public
- 36 barriers identified along 7 topics
- Objective – Gather information about challenges that the microgrid community encounters
- Specific focus – Regulatory, Technology, Standards, Economics
- Input from stakeholders will assist the CEC to prioritize actions and research opportunities that will advance microgrids in California.
- Survey results are still being accumulated. If you've not responded please take the survey:

<https://www.surveymonkey.com/s/MicrogridRDD>

**40% (49 respondents) in California**

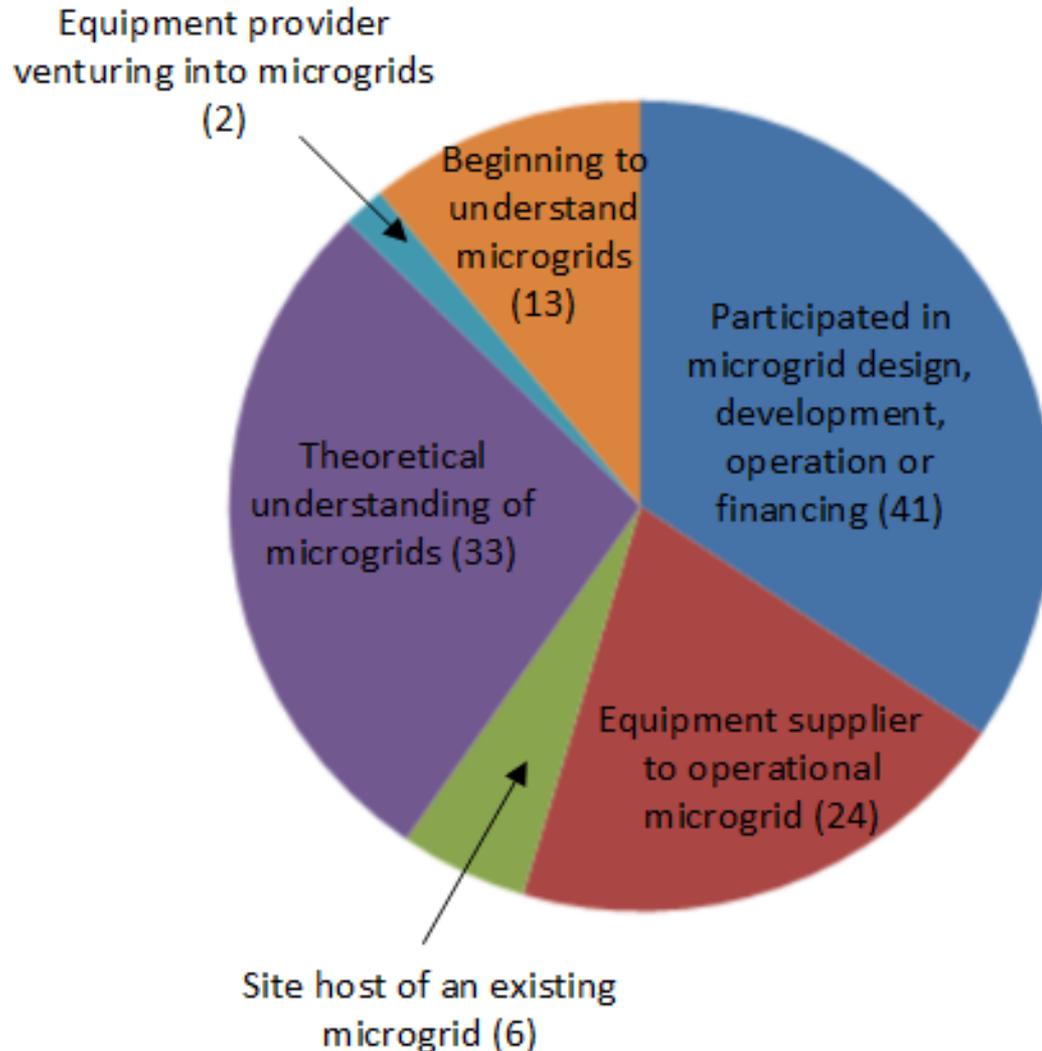
## Responses cover a wide variety of stakeholders



### Other:

- Non-profit co-operative microgrid promoter (2)
- Industrial R&D (2)
- Software solutions provider (2)
- DER Optimization Design Specialists
- Energy Efficiency & Building Standards Specialists

## 60 % of respondents have microgrid experience



- **60% of participants had practical experience with microgrids**
- **90% of participants had a deep understanding of microgrids, suggesting high credibility of findings**

## Role of Microgrids

- Behind the meter
  - Reliability / Resiliency is the primary role
  - Energy cost savings is the secondary role
- System / Grid benefits
  - **High.** Renewable integration (managing intermittent assets and storage at local level)
  - **Medium.** Grid resiliency
  - **Low.** Distribution system / wholesale market services

Generation / Storage Technologies in a microgrid	
<b>Solar PV</b>	<b>88%</b>
<b>Electric Storage</b>	<b>81%</b>
Fossil fuel based turbine generator	57%
Wind turbine generator	41%
Fuel Cell	36%
Thermal storage	29%
Electric Vehicles	26%

## Largest Barriers ( Highest 5, Lowest 1)

Barrier	Rating
Lack of <i>policies or regulations promoting</i> microgrids	4.09
Lack of <i>regulatory definition on whether utility franchise rights</i> prohibit multi-user microgrids	4.01
<i>Interconnection rules</i> impose limitations on microgrids	3.87
<i>Existing retail tariffs</i> do not allow microgrid benefits to be monetized	3.86
Lack of <i>utilities understanding of the impacts</i> of end user microgrid to the utility	3.67
<i>Cost</i> of meeting <i>interconnection</i> requirements	3.62
Lack of <i>clearly defined roles</i> and responsibilities between <i>microgrid operator and utility</i>	3.51
Lack of <i>standardized method</i> to establish the <i>value and costs</i> of microgrids for various stakeholders	3.51
Lack of <i>interoperability standards</i> for microgrid components	3.5
Lack of <i>end user awareness</i> and knowledge	3.48

## Largest Barriers by Topic Area ( Highest barrier rated 5, lowest barrier rated 1 )

Topic Area	Rating
Structural or Regulatory	3.78
Interconnection standards and requirements	3.56
Training and awareness of microgrid impacts and benefits	3.39
Economics, financing and risk	3.32
Technical standards	3.17
Technology maturity	3.00
Technical knowledge	2.90

**High response from technical experts may bias the perceived barriers**

## Stakeholder Key Themes – Regulatory / Policy Barriers

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- What is the long-term vision for microgrids within the energy infrastructure?
- Lack of microgrid specific policies and regulations
  - Policies that encourage and incentivize local reliability
  - Clear definitions on parameters that make a microgrid project successful
- Lack of clarity on the roles of microgrids and utilities
- Utility franchise rights for connecting multi-site microgrids
- Regulatory limits on size and operational rules of microgrids
  - Direct wholesale access to microgrids
- Interconnection rules expensive and prohibitive

**Need for better definition of roles and responsibilities shared between microgrids and utilities**

## Stakeholder Key Themes – Technology Barriers

- Communications and controls platforms
  - Lack of interoperability, vendor specific platforms
  - Lack of maturity and commercialization
  - Insufficient integration of centralized control (scheduling, optimization) and local control (stability, modularization)
  - Lack of communication standards / protocols with macro-grid (utility, area control operator)
- Lack of off-the-shelf, open, configurable SCADA and control platforms able to handle all needs
  - Stability, islanding, reconnection
  - Relaying and protection
  - Forecasting, optimization, scheduling
  - Integration with legacy assets and new assets
  - Communicate with macro-grid
  - Integrate with BMS systems and DR technologies

**Need for open, highly configurable, vendor-neutral platforms and standards**

## Stakeholder Key Themes – Economic & Knowledge Barriers

- Monetization of reliability benefit is a key challenge
  - Need around 5 – 7 years payback
- Need for intelligent tariff design based on location and application
  - Existing tariffs do not allow monetization of all services / applications
- To monetize societal benefits, microgrids have to show tangible benefits to system resiliency and sustainability
- Need for standardized contracting and financing
- Standardized or customized microgrid design?
- Need for education, training and certification

**Need to demonstrate and monetize reliability and sustainability benefits on local and grid level**

## Topics for Discussion

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- Performance metrics for microgrids
  - What makes a microgrid project successful
  
- Value of microgrids
  - Behind the meter
  - Grid
  
- Commercialization of microgrids
  - What are the strategies for success?
  
- Recommended future investments and strategies

# Thank you for your participation!

Complete the survey at:

[https://www.surveymonkey.com/s/MicrogridRDD.](https://www.surveymonkey.com/s/MicrogridRDD)