

# Distributed Generation

## Benefits, Constraints & Policy Solutions

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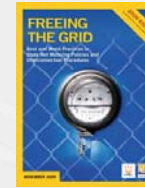
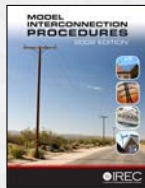
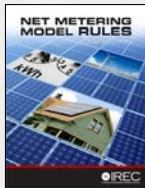
## IREC's Regulatory Work

IREC offers expert advice in public utility commission workshops, rulemakings and other proceedings

- Net Metering (11 states)
- Interconnection (14 states)
- Third-Party Financing (4 states)
- Community Solar (4 states)



■ Active in 2009-10 (and earlier, in many cases)  
 ■ Active in 2007-08



## Benefits of Distributed Generation

- Can be sited quickly and in size needed
- Can be located near customer load
  - PV can be sited on existing structures
  - Does not require transmission
  - Avoids transmission line losses
  - PV can reduce loading on transformers and substations
- Creates in-state economic benefits
  - Creates local jobs
  - Leverages private investment
  - Leverages federal dollars

# Distributed Generation Markets

Retail Market

Wholesale Market

## Retail Market

- Self generation by end use customers
- Largely PV; some wind and biomass
- Systems sized to meet onsite needs
- Typically 0-2 MW system sizes
- End use customer pays for system

## Wholesale Market

- Developers sell power to utility
- PV, wind, biomass, hydro, geothermal
- Systems sized to maximize production
- Typically 0-20 MW system sizes
- Ratepayers pay for system power

# **Retail and Wholesale Market Constraints and Solutions**

## Retail Market Constraints

- Mismatch between generation and load
  - What is the value of excess generation?
- Not all customers can host an onsite system
- Hard to finance up-front costs
- Cost-effectiveness compared to other options

## Retail Market Solutions

- *Policies* that facilitate self-generation
  - Net Metering & Community Solar
- *Policies* that address cost-effectiveness
  - Rate Design & Incentives
- Financing mechanisms
  - Rebates
  - Federal residential tax incentive
  - Third-party ownership through leases or PPAs/SSAs
  - Property Assessed Clean Energy (PACE) financing

## Wholesale Market Constraints

- Transaction costs to obtain a PPA
- Interconnection and permitting must be completed in advance of obtaining PPA
- DG may be disfavored in solicitations
  - Benefits may be overlooked
  - Utility preference for large projects
- Inability to absorb federal tax incentives

## Wholesale Market Solutions

- *Policies* that facilitate wholesale markets
  - Low transaction cost procurement mechanisms
  - Non-negotiable contracts with reasonable terms
- *Policies* that address cost-effectiveness
  - DG or technology-specific procurement targets
- Financing mechanisms
  - Federal commercial tax incentives and cash grant

## Technical Issues

System Interconnection

Facilitating High DG Penetration

- Safe, efficient and low cost interconnection
  - How much is too much?
  - When are interconnection studies needed?
  - Who pays for distribution system upgrades?
- Integrating with smart grid technologies
  - Are smart meters compatible with DG policies?
  - Should inverters be interactive?

# Thank You!!

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