

# **Rates That Encourage or Discourage Distributed Generation**

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# Introduction

- Definition of Distributed Generation
  - Generation of electricity by facilities sufficiently smaller than central generating plants as to allow interconnection at nearly any point in the electric power system
- Many different applications & technologies

... HAPPY  
ANNIVERSARY  
HON!



# Types of DG

- Combustion Turbines
- Internal Combustion Reciprocating Engines
- MicroTurbines
- Fuel Cells
- PhotoVoltaic
- Wind Turbines
- Other

# Uses of DG

- Standby or Backup Power
- Owners Own Use (Full or Partial reqmts)
  - Peak Shaving
  - Base Load
- Wholesale Market
- Power Quality or Reliability Improvement
- Reactive Power & Other Ancillary Services

# Key Perspectives

- Despite wide array of DG applications, there *is* a consistent process to guide the evaluation of cost and development of sound rate schedules
- Cooperatives *can* design rates that recover DG-related costs *and* encourage the growth of DG in a way that benefits the entire system
- Coordination and cooperation with Distribution Cooperatives and G&T is required

# DG Potential to Reduce Cooperative Costs

- Displace the production of energy
- Delay / eliminate need for new infrastructure
  - Generation additions
  - T&D improvements
- Reduce / eliminate need for purchase power
- Supply ancillary services

# DG Potential to Increase Cooperative Costs

- Require upgrades to Distribution system protection
- Require system studies for generator interconnection, safety inspection, maintenance, restoration procedures, etc.
- Increase load volatility
- Administrative & General



# DG Costs Directly Assigned

- Interconnection
- Special metering equipment
- System Protection
- Control equipment for remote start
- Cooperative testing & monitoring to ensure compliance with applicable standards for safety and operations

# DG Costs Not Directly Assigned

- Distribution O&M
- Consumer Accounts
- Customer Service
- Administrative & General
- Depreciation
- Interest
- Taxes

# Rate Design Objectives

- Provide the requisite total revenue
- Reflect the cost of providing service & avoid class cross-subsidization
- Promote installation of DG in a way that maximizes benefits
- Other

# Rate Components

- Facilities/Basic Services/Customer Charge
  - Ensures consistent treatment among similarly situated customers
- Energy Charge
  - Provides incentive for consumption behavior
- Demand Charge
  - Provides incentive for installation/operation of DG to benefit the system

# Tariff Options

- DG Rider

- Delivery Charge
- Capacity Credit
- Energy Credit
- Distribution Credits
- Line Loss Credits
- Renewable Credits
- Size Limits
- Alignment with G&T  
DG Rate
- Avoided Cost

# Rate Structure and DG

- If utility is recovering fixed cost and margin in the energy charge, there is potential for under-recovery
- If fixed costs and margins are recovered through the distribution demand and customer charges, with energy as a pass-through, under-recovery is avoided

# The Rate Continuum

No Volatility

High Volatility

No Price Signal

Strong Price Signal



**Flat  
Energy  
Rates**

**Time of  
Use Rates**

**Demand  
Rates**

**Real Time  
Pricing**

On-Peak  
and  
Off-Peak

Multiple Tiers  
with Critical  
Peak

Single  
Demand  
Rate

Time  
Differentiated  
Demand Rates

# Incentive Rate Structures

- *Critical Peak Pricing (CPP)*
  - Higher rates for load at peak hours
  - Penalizes peak load
- *Peak Time Rebates (PTR)*
  - Rebates for load reduction at peak hours
  - Rewards peak load reduction



“CPP !”



“PTR !”



# Evaluation Process for DG

1. Identify the services required after DG installation
2. Determine interconnection requirements
3. Evaluate cost of providing service
4. Determine any potential cost savings
5. Develop tariff or contract that specifies rates, terms and conditions of service, consistent with steps 1-4

# Integrating DG

- Concerns about all-requirements contracts
- PURPA with purchases at avoided cost may not provide sufficient incentive
- Existing wholesale and retail rates based on average imbedded costs may not provide sufficient incentive
- The difference between the retail rate and the value of electric energy in the market at a particular point in time

# Conclusion

- Different DG applications will have different cost impacts on the Cooperative
- Consistent process exists for establishing sound DG rates, terms & conditions
- Rates must balance factors to avoid cross-subsidization, prevent utility revenue shortfall, and provide incentives for DG

# Questions?

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