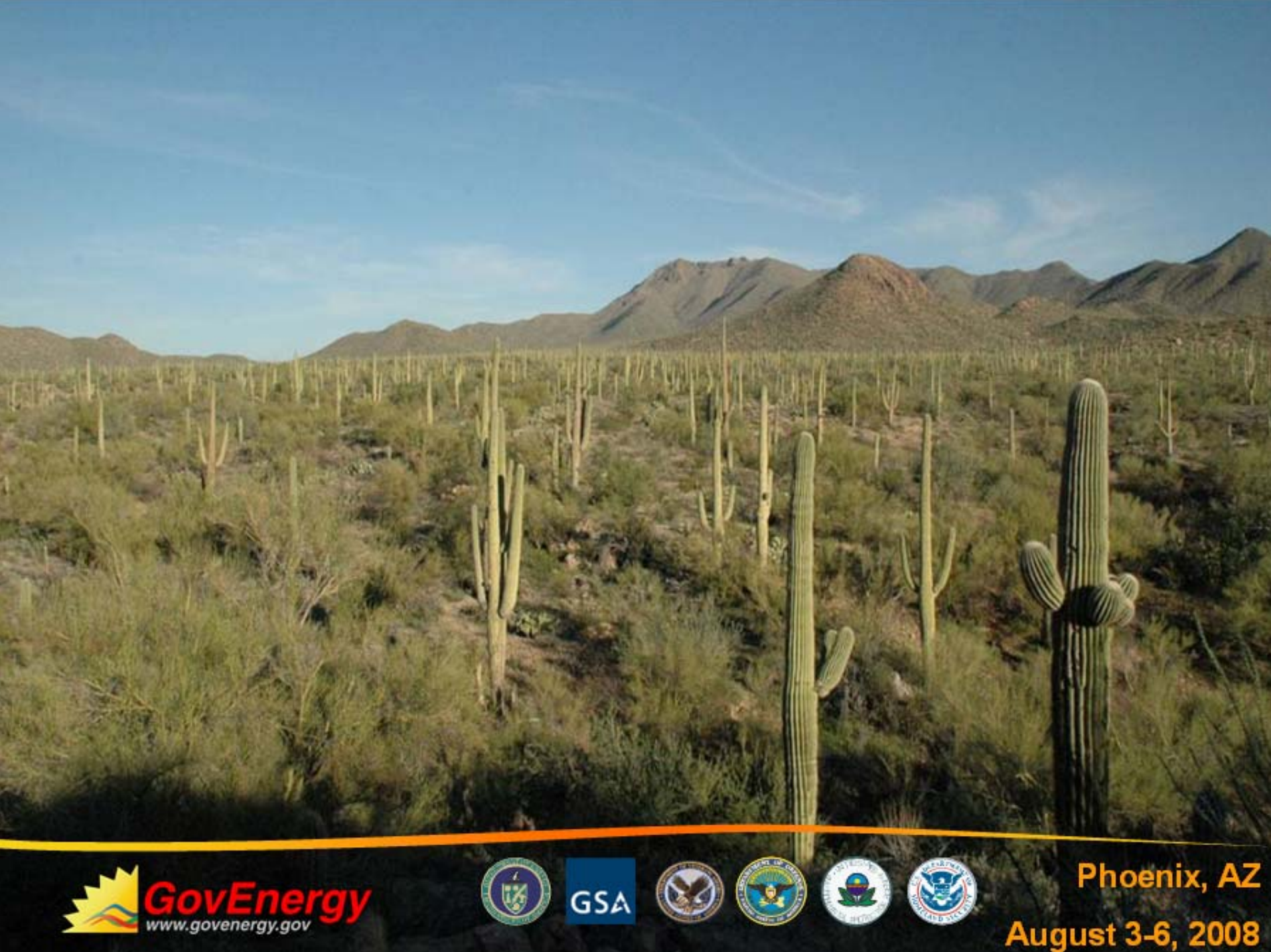
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Phoenix, AZ
August 3-6, 2008

Leveraging Energy Efficiency and Renewable Incentive Programs for Federal Projects

Chuck Goldman

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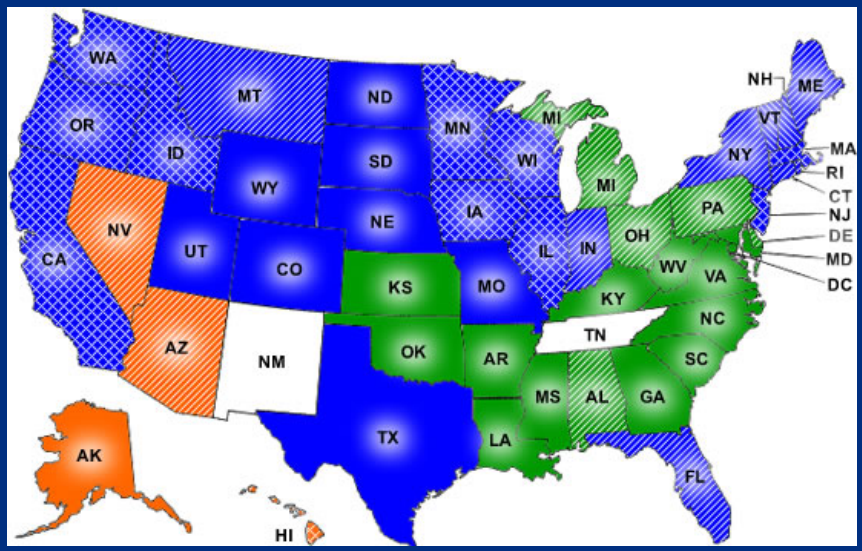
Overview

- Key trends in ratepayer-funded energy efficiency programs
- Renewable energy: Public Benefit funds and Renewable Portfolio Standards
- Opportunities and suggestions for Federal customers

FEMP Energy Management Website: Incentive Programs

www1.eere.energy.gov/femp/program/utility/utilityman_energymanage.html



- State-by-state information on funding opportunities for electric and gas energy efficiency, demand response, and DG programs
- Programs sponsored by Utilities, Public Benefits Fund Administrator, State Agencies, ISOs; summary description and Web link for each program
- Updated annually to reflect changes

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Utility Sector Energy Efficiency Programs: Policy Approach & Funding Sources

- EE funded through utility rate cases or tariff rider (traditional approach; 14 states)
- EE funded through statewide system benefit funds (16 states)
- Electric efficiency resource standard (CT,HI, IL, NM,NV,TX) or Goals (CA, CO, RI, VT)
- New Sources of Funding
  - Organized wholesale markets: ISO-NE Forward Capacity Market
  - Revenue from carbon allowances/markets (e.g. RGGI)

“Old Leaders”: Key Trends

- CA, New England, NY, OR, WA, MN, Iowa, NJ

- PUCs require LT strategic plans (CA) and multi-year program plans
- More aggressive utility sector goals
  - Acquire all cost-effective EE (MA, CT, CA, RI)
  - Aggressive savings targets (NY: 15% by 2015)
- Next generation EE programs must be “much deeper and broader”
  - Savings targets of ~30-35% per house/facility vs. 10-15% today
  - Programs tailored to specific market segments

- EE spending likely to increase from ~1% to 2% of retail revenues

- Struggling with new issues
  - Multiple program administrators (coordination; roles/responsibilities)
  - Much more rigorous and complex M&V (estimating peak demand impacts for ISO-NE Forward Capacity Markets)
  - New product & equipment standards

"2nd time around" States: Key Trends

- Mid-Atlantic (MD, DE, DC); Midwest (IL, MI, IN?, OH?)
- "Abandoned" EE during restructuring
- Rate/shocks + limited success of retail competition = renewed interest in EE
  - EE goals: 0.75 to 1% savings/year of retail sales in some states
- Exploring new administrative models (DE, DC - "sustainable energy utility") and multiple administrators (IL, MD)
  - Partly political but also related to market structure (Default Service)
  - Scope includes EE/Renewables (DE, DC)
  - Aggressive goals and politics leads to multiple administrators (IL, MD)
- Significant RAMP-UP just starting
  - Long-term EE Program Planning driven by goals (MD, IL)
  - Program Implementation & roll-out

“Newby” States: Key Trends

- Southeast (AK, NC, SC); Midwest (OK, KS) and Southwest (CO, NM, AR, UT)

- Just beginning to ramp up EE programs: Workshop/collaborative processes to educate, inform stakeholders; discuss program design
- EE Savings goals: ~0.3-0.5% of retail sales in some states
- Litigated, regulatory process to resolve contentious policy issues
- Set of “Quick start” EE programs
  - Res Lighting; C/I Prescriptive Rebates; “Energy Star”
  - More focus on EE programs that reduce peak demand
  - Program offerings often limited for industrials: “Self-direct” or opt-out
  - High load growth states - often focus on new construction; air conditioning load

Forecast of future EE spending

- 2007: Ratepayer funding for electric and gas energy efficiency was ~$2.6B
- BOTTOM LINE - ~2011: Ratepayer funding for EE could easily be in ~$3.5-4B range
- Expect significant ramp up in EE spending over next ~3-5 years
  - CA – $1B (2007) to 1.3B/year in 2011
  - NY – ~$295M (2007) to $700M/yr by 2012
  - NJ – ~$133M (2007) to $325M/yr by 2012
  - IL – $20M (2008) to $125-200M in 3-4 years
  - WI – $97M (2007) to $285M/yr by 2012
  - MA, CT, RI – get all cost-effective EE; spending likely to increase by ~$80-100M/yr in these 3 states
  - MI and OH and IN -- could go from ~0 today to $15-50M in each state
  - Southwest (CO, AZ, NV, UT, ID, WY) – 6 states spend ~110M/year on EE (2007) and could easily increase to $175-200M/yr over next 3-4 years
  - Southeast (FL, NC, SC, AK) – FL has some significant EE programs today; other states likely to ramp up (e.g. Duke)

Renewable Energy Programs

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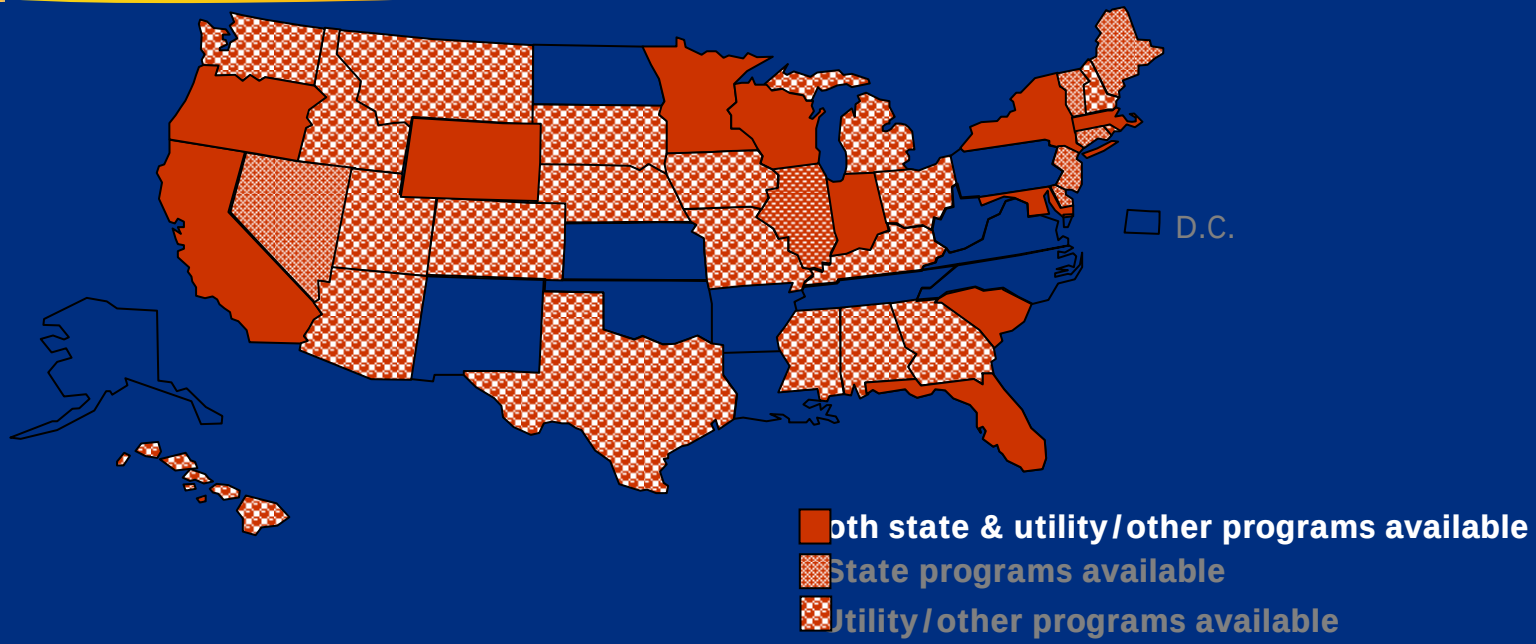
Incentives for Customer-Sited Renewables Available in Most States



Source: Database of State Incentives for Renewables & Efficiency (DSIRE)

- Programs variously administered by utilities, state agencies, or other designated public benefits program administrator
- Eligible technologies may include: solar PV, solar hot water, small wind, geothermal heat pumps, biomass, fuel cells

Incentives for Solar PV at Federal Facilities

State/Utility Incentive Programs

- Most incentive programs for customer-sited renewables include PV
- Size and form of incentive varies across programs, for example:
  - **California Solar Initiative**: performance-based incentive calculated based on actual PV generation over first five years ($0.32-0.37/kWh for systems owned by Fed. customers or $0.22-0.26/kWh for systems financed through a PPA)
  - **New Jersey**: funding provided through sale of Solar Renewable Energy Certificates (currently trading at ~$0.24/kWh) paid out over life of system
  - **NYSERDA**: $4,000-5,000/kW up-front rebate based on nameplate capacity

For complete list of programs, see http://www.seia.org/incentives.php or www.dsire.org or contact local utility

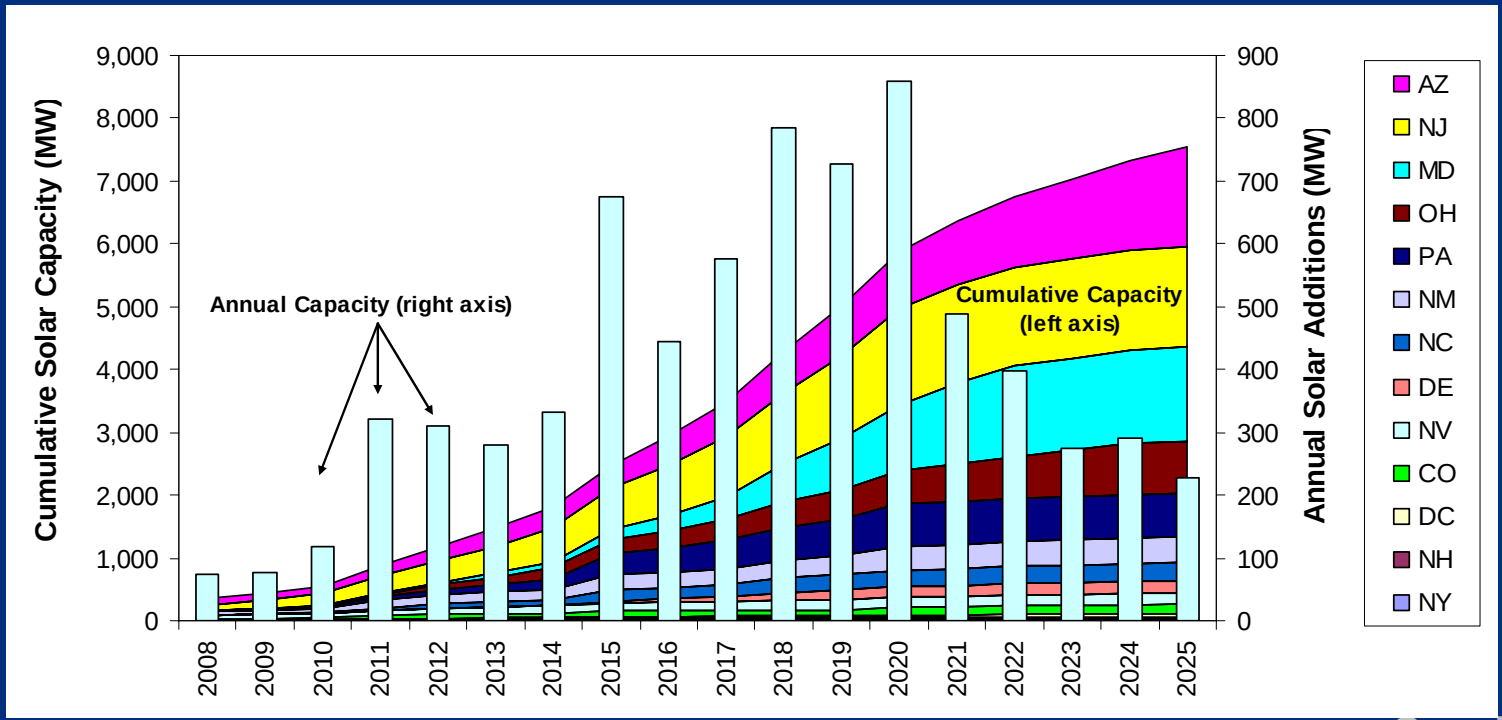
Incentives for Solar PV at Federal Facilities (cont)

Tax Incentives for Solar PV

- **Federal Investment Tax Credit (ITC)**: Income tax credit equal to 30% of eligible project costs (will expire at end of 2008 if not extended by Congress)
- **Federal Accelerated Depreciation**: 5-year depreciation of capital costs (no expiration)
- **State Corporate Tax Credits** (and exemptions from sales tax) offered in many states
- Federal customers not directly eligible for tax incentives, but can often access them through 3rd-party ownership of the PV system (PPAs or leasing)

Renewables Portfolio Standards in 12 States have a Solar or DG Set-Aside

- 550 MW of solar required by 2010, growing to 7,500 MW by 2025
- Largest markets driven by these policies are AZ, NJ, MD, OH, PA
- In near-term, NV, NM, and CO are also significant



Implications of Solar/DG Set-Asides for Customer-Sited PV at Federal Facilities

- Likely to create strong demand for customer-sited PV, especially in states with fewer prospects for utility-scale solar (e.g., NJ, MD, OH, PA)
- States with solar set-asides may opt for a “market-based” solar renewable energy certificate (SREC) model rather than providing traditional up-front rebates (particularly for large PV systems)
- SRECs may differ from traditional up-front rebates in important ways; for example, in New Jersey:
  - Customers sell SRECs to utilities, often through an aggregator or broker
  - SRECs are sold over the life of the system based on actual production (or estimated production for small systems)
  - SREC price determined through the market (with a price cap); NJ exploring ways to provide more price certainty

Federal Participation in Public Benefit programs?

- Energy Efficiency funds from utility and public benefits administrators:
  ~ $2.6 Billion/year (~ 30 states)
- Renewable Energy funds spend:
  ~ $0.5 Billion/year (~ 20 states)
- Load Management and Demand Response programs:
  ~ $0.6-0.8 Billion/yr.
- Federal agencies use ~1.5% of nation's energy, so a proportional share of these funds would be:
  - ~ $40-50 Million for EE
  - ~ $7-10 Million for RE
  - ~ $8-10 Million for DR/LM

Summary: Suggestions for Federal customers

- Time Horizon and Timing
  - Plan for long-term funding for EE, renewables, and RD&D (5-10 years) in some states
  - Funding is limited in many states (first come, first serve)
  - Check Program rules before starting project
- Develop inventory of EE, renewable & peak-demand reducing projects
- Demand Response – consider Auto-DR (it's coming)
- Assess opportunities for integration of EE, renewable, and DR projects, particularly at larger facilities
- FEMP's Utility Management web site can help you identify what's available in your state

Need More Information?

FEMP Energy Management Web site:

http://www1.eere.energy.gov/femp/program/utility/utilityman_energymanage.html

- Contact:

Chuck Goldman (510-486-4637)

CAGoldman@lbl.gov

Phil Coleman (610-604-0170)

PEColeman@lbl.gov

Lawrence Berkeley National Laboratory

Stephen Walter, FEMP

Background slides - DR

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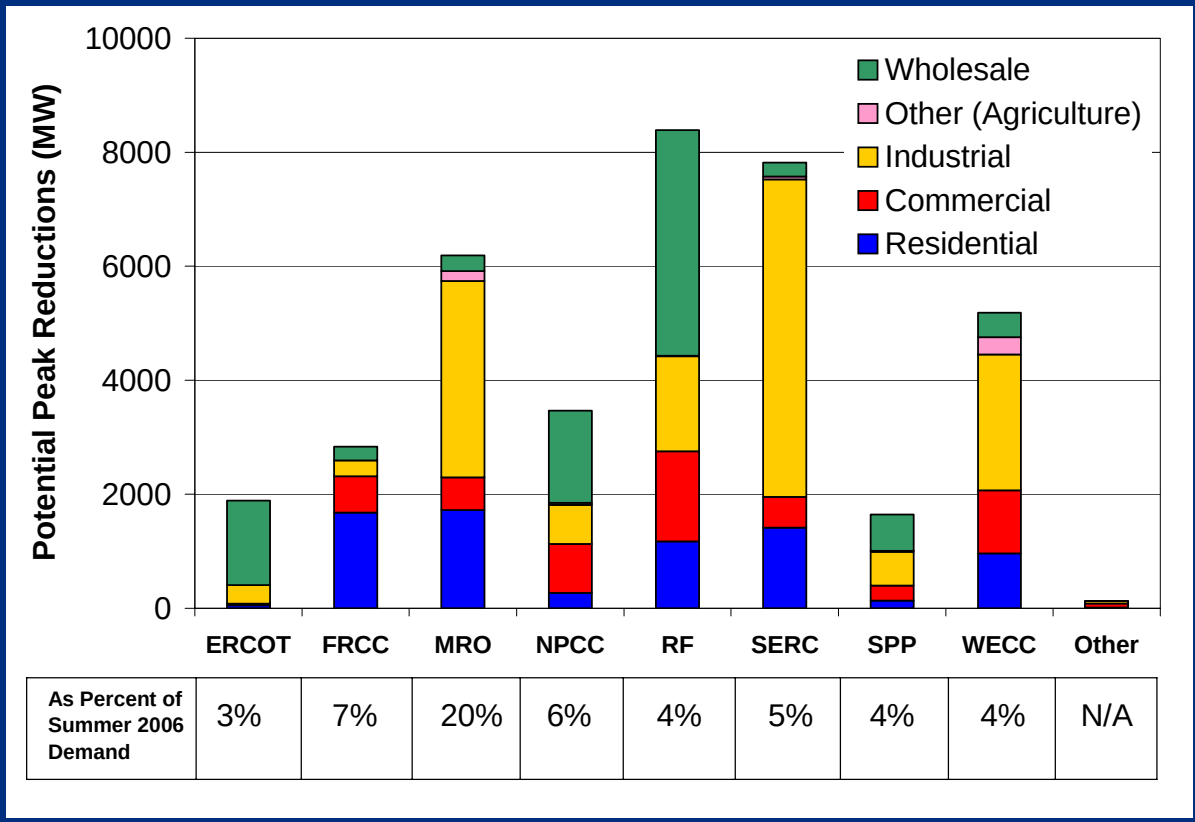
Demand Response targets System Reliability and Wholesale Market Volatility

- **The Old Paradigm: Load Management**
  - Interruptible/Curtailable (Non-Firm) Rates for C/I customers
    - Rate discounts for curtailments to pre-set Firm Service Level
    - Significant penalties for non-compliance
  - Direct Load Control
    - Utility control of customer end use loads (partial or complete interruption of air conditioners, water heaters, pool pumps)
- **The New Paradigm: Demand Response**
  - Emergency Demand Response
    - Customers provide load reductions in response to generation shortfalls or transmission constraints
  - Economic Demand Response (Demand Bidding)
    - Customers submit load reduction bids or simply respond to real-time prices
  - Dynamic Pricing (e.g., real-time pricing)

National DR Resource (Customer Class)



As Percent of Summer 2006 Demand	ERCOT	FRCC	MRO	NPCC	RF	SERC	SPP	WECC	Other
	3%	7%	20%	6%	4%	5%	4%	4%	N/A

- Existing demand response potential is ~37,500 MW
  - ~5% of summer 2006 peak demand

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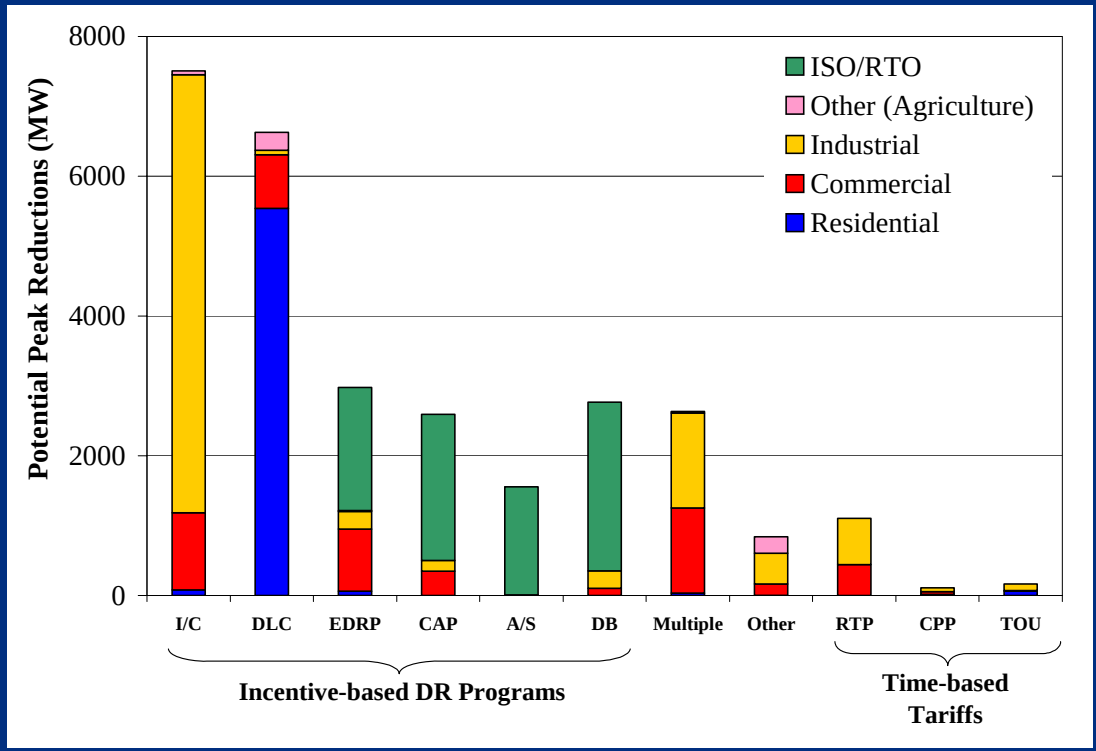
National DR Resource (Program Type)



- Incentive-based DR programs account for 60-70% of DR resource contribution
  - ISO/RTO DR programs represent 9,000 MW

Largest Utility/ISO DR programs targeted to C/I customers

Entity	DR Resource (MW)
PJM Interconnection LLC	3951
Electric Reliability Council of Texas	1485
New York Independent System Operator	1379
Alabama Power Company	1288
Tennessee Valley Authority	1234
Arkansas Electric Cooperative Corporation	1066
Southern California Edison Company	881
Pacific Gas and Electric Company	722
Northern States Power Company	686
Florida Power and Light Company	580
Wisconsin Public Service Corporation	576
MidAmerican Energy Company	512
South Carolina Public Service Authority	507
Detroit Edison Company	435
Duke Power	431