The Resilient Network - Regulation and Policy Issues

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Initial observations

- Regulators don’t build electric systems -- they create market and legal rules
- Reliability was an issue long before 9/11-- many “reliability” policies are also “security” policies
- Regulators pursue a mix of goals -- cost, environment, equity, reliability, public safety...
- Regulators know that markets won’t solve all problems

Policy Challenges

- Tension between market mechanisms, and public goods & external costs
- How **MUCH** are we willing to pay?
- **WHO** pays? --rate design for security
- Who decides? PUCs, FERC, NERC, ISOs, OHS, NRC?
- Network architecture -- competing visions

Mismatches cloud security responses

Generation	Generation capitalism	Security socialism
Customers	Lowest price	Most reliable, least volatile
Scale	Large regional grids	Local rates & security
Handling Growth	Coordination & energy needs UP	IRP and efficiency DOWN

Building A More Resilient Network

- Vision: Resilient Network, flexible not overbuilt -- graceful failure options
- Identify the few critical links and capabilities-- harden, duplicate, and defend them.
- Guard rails-- “clearly worth it” insurance:
  - pursue policies that improve reliability & price stability, as well as physical security
- Rail lines v. trucks - “We can’t fix the problem by installing more of the problem” -Herman Green

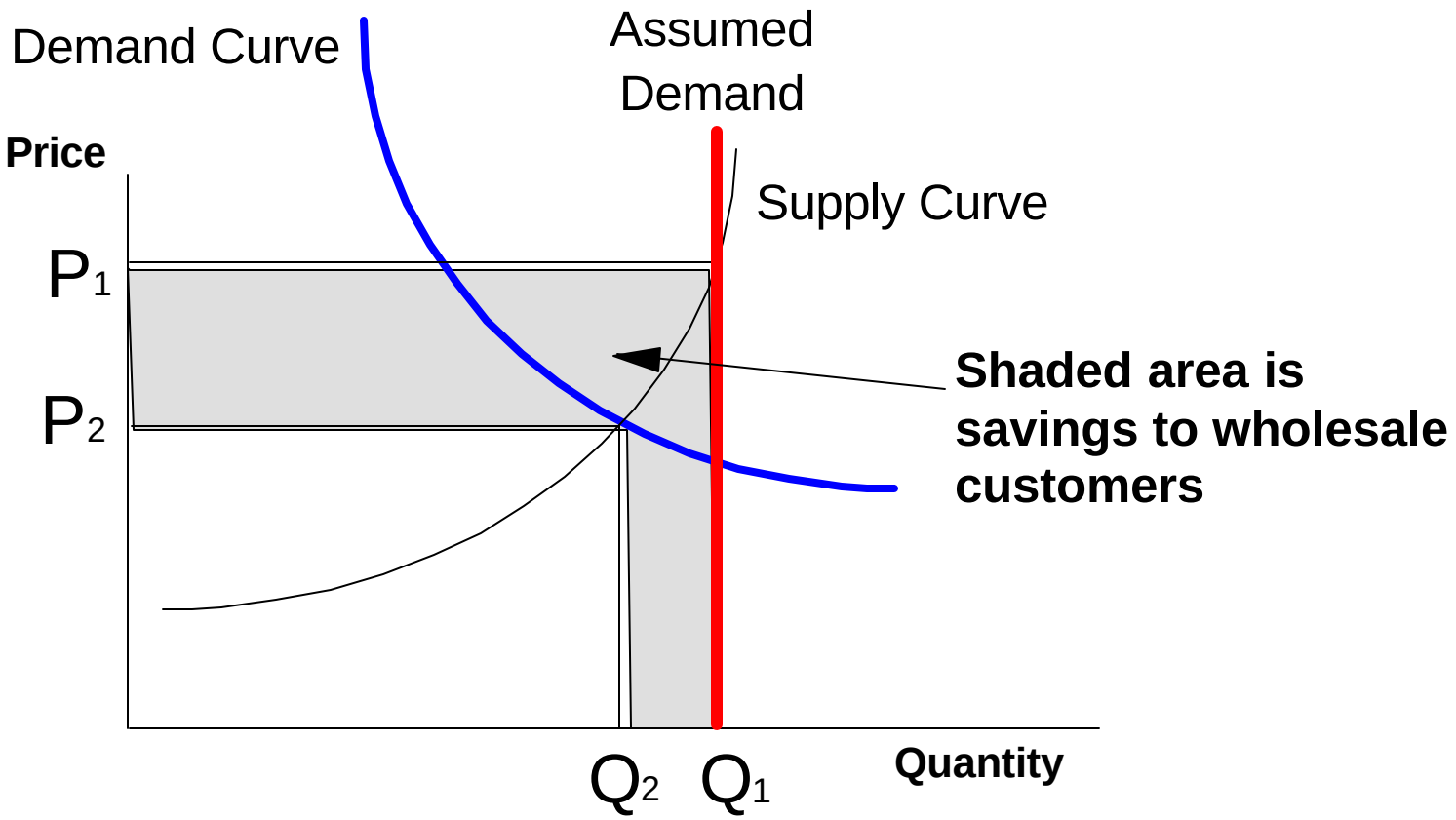
Resilient Network 2: Lighten the Load

- Security & Reliability challenge: ~390,000 MW of new demand by 2020
- First, “Lighten the Load:” 3 elements
  - **price-responsive load & load management**
  - **energy efficiency investments**
  - **distributed generation, CHP**
- Demand-side and distributed resources can meet 40% to 50% of expected peak load growth -- lowering reliability and security problems

Resilient Network 3: Rules for turbines and wires

- Goal: send the right price signals!
- Create market incentives for more reliable, more secure resources
- Basic rule: Cost-causers pay
- Performance-based regulation gives utilities incentives to lower system costs

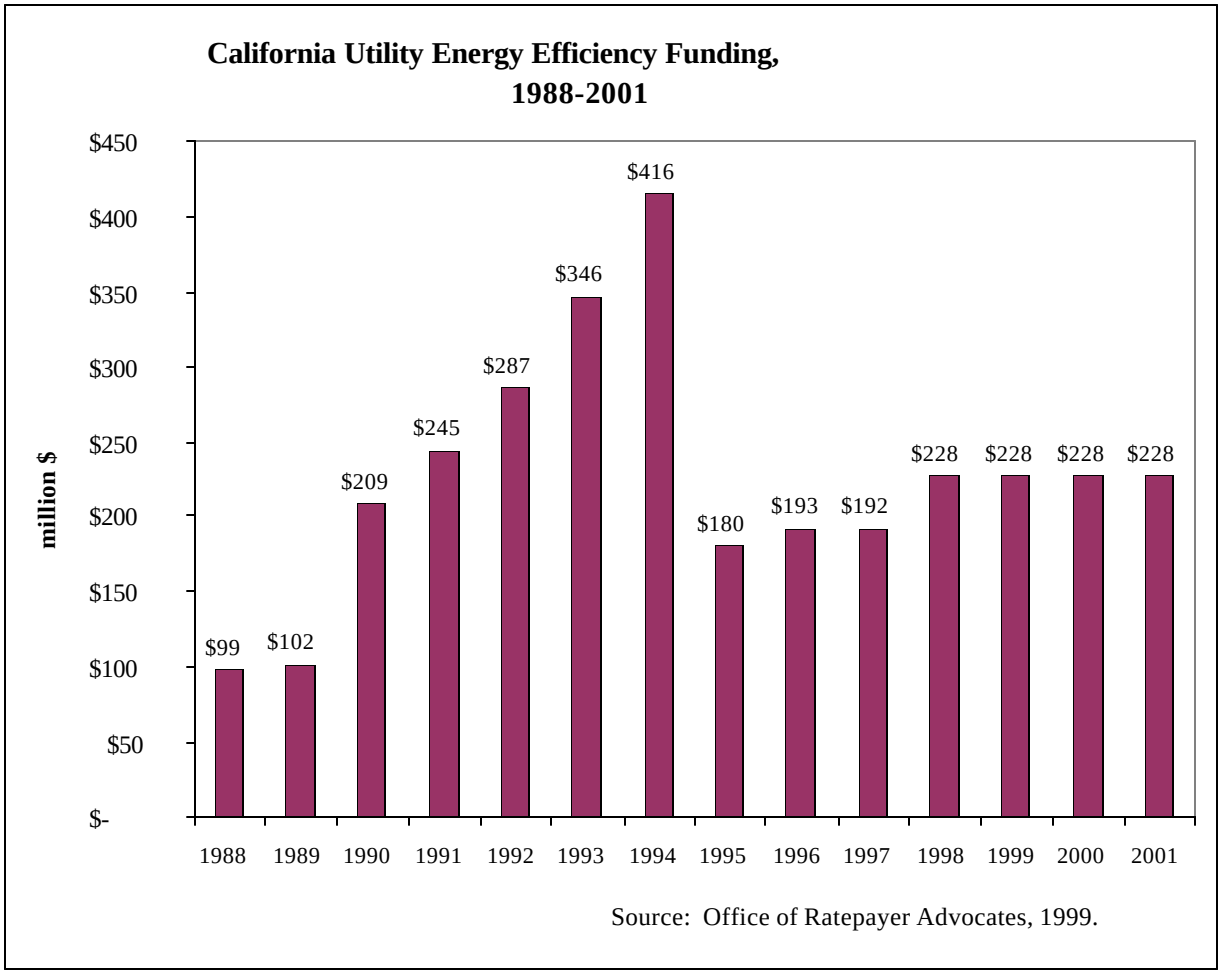
The Public Value of Reduced Load



Who will promote distributed resources in today's electric industry?

- Generators profit from high loads and thin markets
- Franchises: getting lean for the future
- Cost recovery uncertainty
- Wires companies with rate caps or freezes can be addicted to throughput
  - Lost profits math: a 5% increase in sales can increase profits by more than 50%!
- RTOs, Transcos, FERC: No tradition of support for efficiency or DG (but FERC is now working on it)

Efficiency cuts by CA utilities -- 1100 MW lost savings



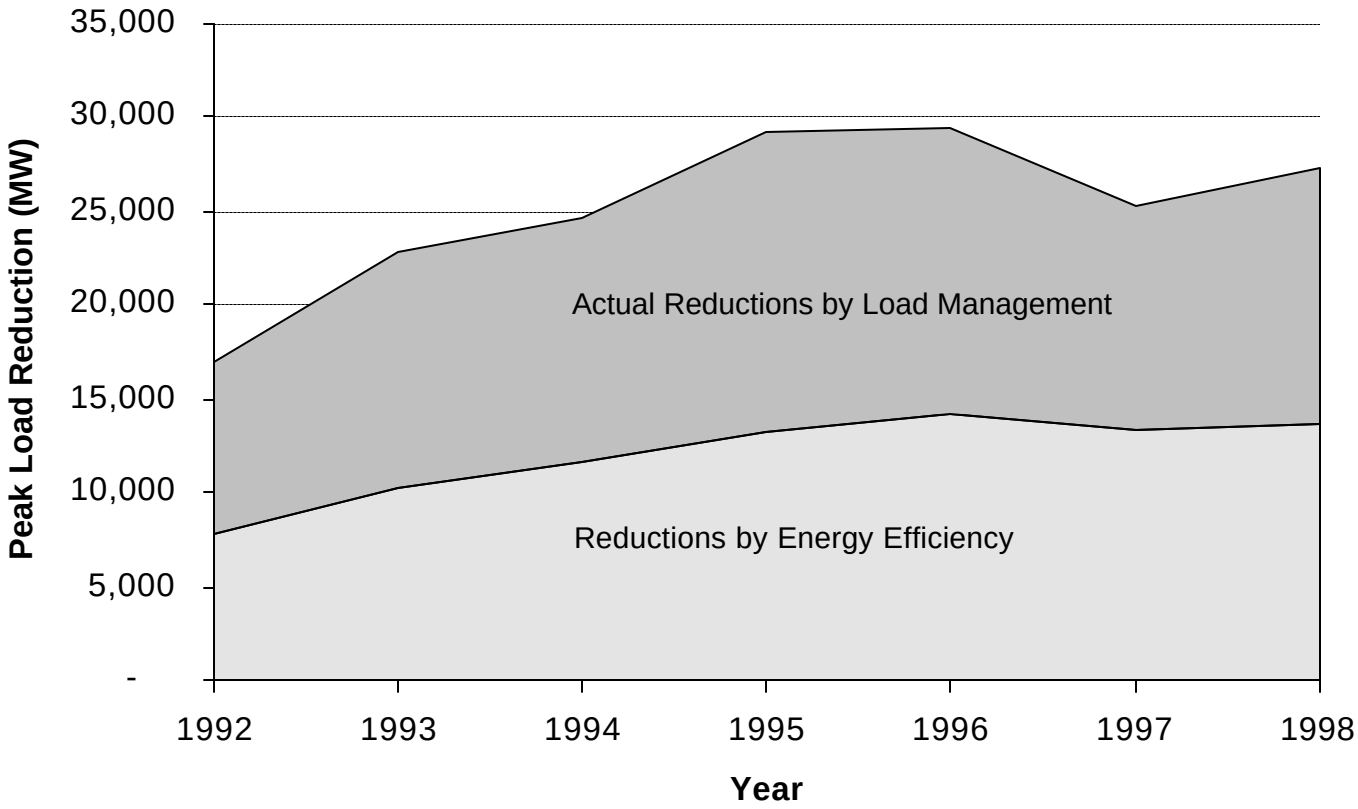
Chasing High Loads: creating new weak links

- Natural Gas Supply: adding 20 to 25 BCF demand to a 60 BCF base
  - Gas v. Electric competition;
  - Gas Pipeline Capacity; new bottlenecks
- Gas Pipeline Reliability
  - Compressor failure - new 1st order contingency
- E Transmission - New congestion points
- Distribution and substation capacity
- Environmental loading capacity

Efficiency -- A Proven Resource

- Utility DSM programs delivered 29,000 MW savings at a grid cost of 2 to 3 cents per kwh
- Codes and standards have delivered more
- Modular, dispersed, many technologies
- Efficiency lowers customer bills, and lowers the price spikes for everyone
- Lowest in pollution
- Efficiency relieves stressed distribution, generation and transmission constraints
- Programs can be tailored for each market

DSM: Peak management AND Baseload Efficiency



Solution Menu (A): Wholesale Market Features

- (1)Demand-Side Bidding:
  - Price-sensitive load bids reveal a real demand curve
  - Reform load profiles to support demand mgt
- (2)Multi-Settlement Markets:
  - Day-ahead settlement permits economic resales of load reductions
- (3) Demand-Side Reserves:
  - "Dispatchable load" as an ancillary service
- (4) Efficient Reliability Standard:
  - Least-cost approach to reliability charges

Efficient Reliability Decision Rule

- **Before "socializing" the costs of a proposed reliability-enhancing investment through uplift or tariff, PUCs and FERC should first require a showing:**
  - that the relevant market is fully open to demand-side as well as supply resources;
  - that the proposed investment is the lowest cost, reasonably-available means to correct a remaining market failure; and
  - that benefits from the investment will be widespread, and thus appropriate for broad-based funding.

Solution Menu (B): Rates and Rules for the Wires

- **(5) Transmission Congestion Pricing:**
  - **reveals value of DG, EE, and LM**
- **(6) Enhancing Reliability Through Retail Rate Design:**
  - **Artificial price caps and default plans harm efficiency and reliability**
  - **Revenue caps, not rate caps, for wires companies**

Solution Menu (C): Promoting End-Use Efficiency

- (7) System Benefit funds
- Several examples: e.g.,NYSERDA
- (8) Energy Efficiency Utility and other regulated DSM programs
- Key example: Vermont Efficiency Utility
- Utility programs and standards- Texas 10%
- (9) Codes, standards, and market transformation programs
- Regional uplift could enhance reliability, lower power costs

Conclusions

- “A fundamental imbalance between supply and demand defines our nation’s energy crisis.”
  - Vice-President Cheney, National Energy Policy 2001
- “Can we pay for this? We can pay for any damn thing we want to.”
  - Lester Lave, CMU November 2001
- “Let’s pay less and get more”
  - Richard Cowart

Uplift Charges

- Uplift charges are a common element in pool rules and new markets
- Examples: spreading out the costs of congestion; paying for reliability measures that have widespread value
- Question: If the new RTO/ISO/Pool has power to assess "uplift" for imports, reserves or transmission to enhance reliability, why not for efficiency, load management, or DG?

More
Anti-efficiency practices

Load profiling by pools or RTOs

- An LSE charged for usage on a customer profiled basis will not benefit from high-value peak-load reductions unless a new profile is created for those customers

Reliability rules and practices favor turbines and wires solutions--

- "Dispatchable load" often cannot compete fairly with generation in ancillary services markets
- Demand-side options not permitted to compete with generation and wires for uplift and other "socialized" support.