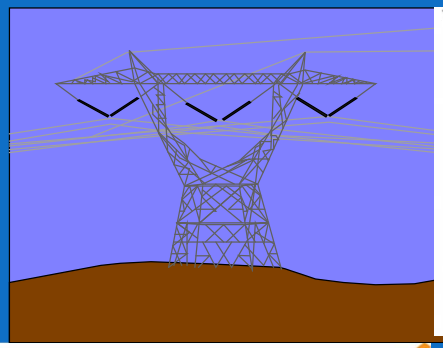
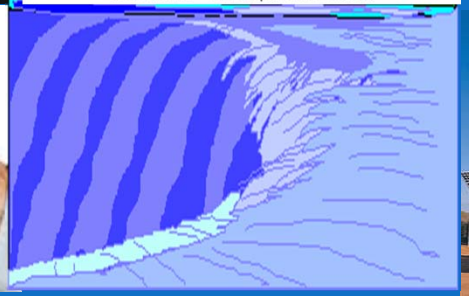
Toward better, more efficient capacity market design





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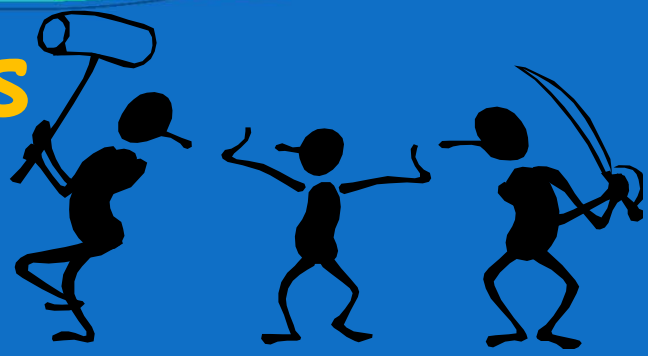
Views expressed are not necessarily those of the Commission

Today's Capacity Markets

- forward reserves markets are needed primarily because
  - there is not enough price-responsive demand in the energy markets
  - energy market prices are suppressed creating the Shanker missing money problem
- capacity markets
  - create a weak call option in the energy markets
  - require more administrative intervention than other markets
  - highly contentious because there is too much money at stake

Administrative Intervention in Capacity Markets



- Designed for summer peak
- Needed non-summer peaks and valleys
- What is the marginal unit?
- Cost of new entry (CONE)?
- What does 1 in 10 mean?
- What is a forced outage?
- Forecast of demand
- Market power mitigation rules
- Choice of zones
- RMR status
- Going forward costs
- What is comparability?

Capacity markets require longer-term forecasts

- Future demand
- Retirements
- Future transmission
- Profits in the energy markets

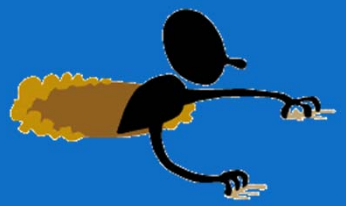
- **forecasts**
  - are inherently wrong
  - puts most of the risk of being wrong on load
  - creates principal-agent problem

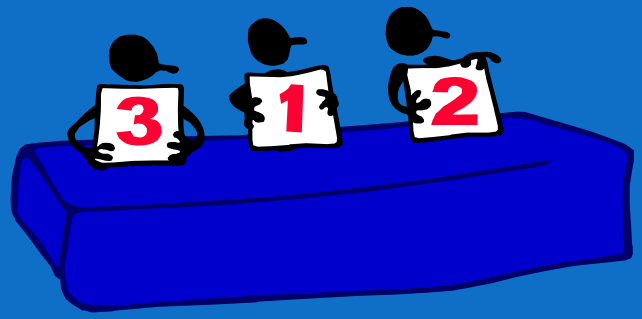
CONE debate

- becomes a massive generic cost-of-service debate on
  - ROE
  - Depreciation
  - Debt-equity ratio
  - Capital costs
  - Revenues for energy markets
- principles are comprised
- Jobs program for cost-of-service consultants

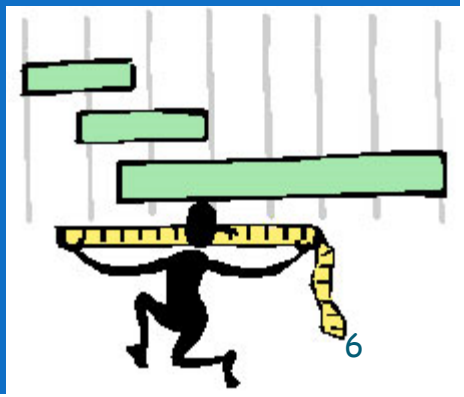
Current Demand Response Programs

- Current DR programs are a weak substitute for 'iron in the ground' or price-responsive demand bids
- get too much or too little
- too late
- in the wrong place.
- At the wrong time





- For example, a resource with a two hour call, lack of locational specificity and limited availability.
- Measurement problems
- DR programs need to evolve comparably



The capacity market could become

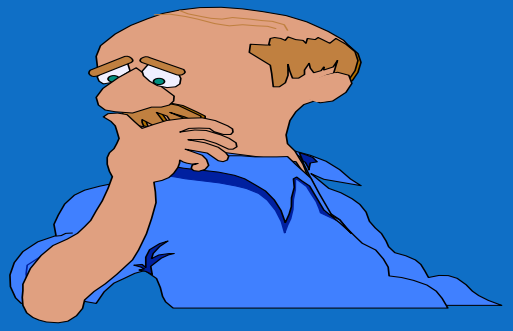
a Rube Goldberg ATM for subsidizing technologies

not a capacity market

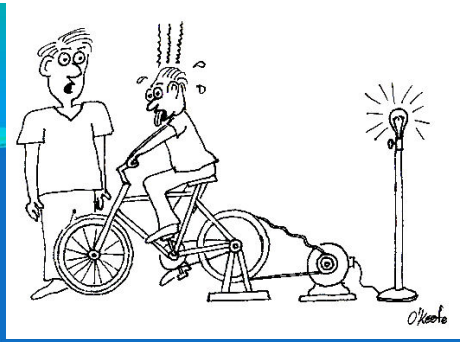
what's in a name?

ISO Market Design Principles

- Maximize benefits to society (market surplus)
  - Suppliers bid marginal costs
  - Demand bids marginal value
- Settlements are
  - non-confiscatory and
  - incent efficient behavior
- Equity focused on need
- Parsimony: as simple as possible but not simpler
- Bilateral markets are used to equilibrate risk



The major problem with ISO markets is the lack of price-responsive demand



- Price-responsive demand is demand that bids into the energy (real-time and day-ahead) markets
- Develop better energy market bidding program for demand
  - Marginal value
  - fixed cost of the call
  - lead time to call and
  - minimum duration time
  - Ramp rates (up and down) and max and min consumption

- Bid into the energy, up and down regulation, and spinning reserves markets

Energy Market Enhancements

- Price-responsive demand participates in energy and AS markets (frequency and voltage regulation).
  - some demand has a very high value
- Energy markets have more efficient pricing
  - no arbitrary caps on bids or clearing
  - energy prices could occasionally reach high prices
- ⇨ stronger mitigation
- ⇨ good shortage pricing to incent participation

Energy Market Results

- New energy markets would cover considerably more of the missing money and ideally eliminate the problem
- Put the money where performance can be better measured
- load factors would improve because price-responsive demand would reduce consumption on peak, so average costs – and the bill for the average customer – could decline

Monitoring Mitigation and Manipulation becomes more important

- Get rid of market share, pivotal supplier, conduct and impact tests they take up optimization time and are second best
- Bid mitigation should be the focus

  marginal opportunity cost and

  marginal opportunity value.
- Done properly marginal cost mitigation fails safe
- Needs discussion

Capacity Market Redesign

⇨Price-responsive demand is exempt from the capacity market

PRD does not need a forward reserve commitment.

The energy market makes the system reliable

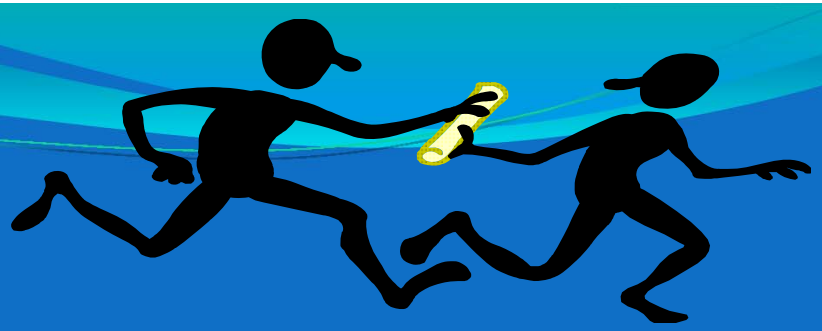
⇨The capacity could require firm fuel and transport capacity to back up the generation capacity, for example, pipeline capacity, oil storage and coal pile.

⇨give the ISO some assurance into the future on

⇨ premature retirements and

⇨new construction when needed

Transition



- Will take 5 to 10 years
- Develop a better bidding program for demand in the energy markets for better comparability.
- shortage pricing should be increased to a level so that it is seldom used.
- the ISO would use price-responsive demand, storage and generation to make the energy markets reliable
- Possible auction to pay a fraction of demand, eg, 20%, to bid into the energy market

Capacity Market Change

⇨Capacity market prices would decrease because they are derivative of the energy market revenues.

⇨With less money at stake, there is less contentious debate

End Results for Generators

- Most of a generator's ISO revenues would be obtained from producing energy and providing ancillary services in the energy markets.
- During periods of high energy and reserve prices, generators will have a stronger incentive to be available.
- generators that are not available during these periods of high prices will lose out on the opportunity for profit
- There will be little need to debate whether the generator deserves to be penalized for not showing up.

End Results for Demand

- Price-responsive demand does not pay for capacity
- ISO revenues would be obtained by providing ancillary services in the energy markets.
- During periods of high energy and reserve prices demand will have a strong incentive to conserve.
- Measurement problems go away

Hedging for generators and load

- Bilateral contracts and state procurement hedge the prices for customers.
- More important since LMPs can be high
- Contracts should have good price-responsive incentives

Equity, Conservation and Environment

- Maximizing benefits to society allows for the greatest distribution of benefits
- Do not subsidize those who don't need it
  - Elderly. Gates and Buffet do not need subsidies
  - Don't subsidize heating swimming pools
- Poor focus the subsidies in the least distorting way, for example, negative income tax
- Price the externalities
- Incentives to conserve.