Critical Peak Pricing: Tariff Elements and Other Considerations

Mid-Atlantic Distributed Resources Initiative

Frederick Weston, 27 June 2008

The Regulatory Assistance Project

50 State Street, Suite 3
Montpelier, Vermont USA 05602
Tel: 802.223.8199
Fax: 802.223.8172

27 Penny Lane
Cedar Crest, New Mexico USA 87008
Tel: 505.286.4486
E-Fax: 773.347.1512

110 B Water St.
Hallowell, Maine USA 04347
Tel: 207.623.8393
Fax: 207.623.8369

Benefits of Dynamic Pricing

- Closer alignment of retail prices with underlying wholesale costs
- Provides truer economic signals to consumers of the costs of electricity production and delivery
  - Reveals the temporal and geographic value of electricity
- Fairer allocation of costs to those who cause them

CPP Tariffs

- California
  - Southern California Edison
    - Optional for C&I customers, > 500 kW
    - Critical Peaks: Moderate (noon to 3:00 pm) and high (3:00-6:00 pm), summer afternoons, max 6 hrs/day, 12 events/yr (inc 4 tests)
    - Rates: Seasonal TOU with CP overlay
      - Choice of CP capacity charges or CP energy charges
    - Triggers: temperature, system constraints, SCE's discretion
    - Bill protection

CPP Tariffs

- California
  - Pacific Gas & Electric
    - Optional for C&I customers, > 200 kW
    - Critical Peaks: Moderate (noon to 3:00 pm) and high (3:00-6:00 pm), summer afternoons, max 6 hrs/day, 12 events/yr (inc. 4 tests)
    - Rates: Seasonal TOU with CP (energy) overlay
    - Triggers: temperature, system constraints, PG&E's discretion
    - Bill protection

CPP Tariffs

- California
  - San Diego Gas & Electric
    - Optional for C&I customers, > 20 kW
      - Choice of “default” or “emergency” CP tariff: CPP-E is marked by significantly higher CP price and lower non-CP prices
    - Critical Peaks:
      - CPP-D: 11:00 am-6:00 pm, summer weekdays, max 7 hrs/day, max 18 events/yr (inc. 4 tests)
      - CPP-E: max 6/hrs/day, 4 days/week, 40 hrs/mo, 80 hrs/yr
    - Rates: Seasonal TOU with CP (energy) overlay
    - Triggers: temperature, system constraints, SDG&E’s discretion
    - Bill protection (NA for CPP-E)
    - Capacity reservation (NA for CPP-E)

CPP Tariffs

- Florida
  - Gulf Power
    - Optional for residential customers
    - Critical Peaks: Anytime, max 1% of hrs/yr (according to website)
    - Rates: Seasonal TOU (low, medium, high) with CP (energy) overlay
      - Fuel cost adjustments applicable
    - Triggers: Gulf Power's discretion

CPP Tariffs

- Virginia
  - Dominion
    - Experimental (pilot) for residential customers
    - Critical Peaks: max 5 hrs/event, 2 events/day, 25 events/yr, max 125 hrs/yr
    - Rates: Seasonal TOU with CP (energy) overlay
      - Fuel cost adjustments applicable
    - Triggers: Dominion's discretion

CPP Tariffs

- Vermont
  - GMP
    - Optional for C&I customers >200kW
    - Critical Peak: 150 hrs/yr, max 8 hrs/event
    - Rates: TOU with CP (energy and demand) overlay
    - Trigger: Company discretion, after market price exceeds $100/MWh

Typical CPP Tariff Elements

- Applicability
  - Demand or energy thresholds
  - Default or voluntary
  - Metering requirements
    - Interval, remote access
- Rates
  - Time-of-use and seasonal differentiation
  - Critical peak prices
    - Pre-determined or market-based

Typical Tariff Elements

- Definitions
- Nature of customer's participation in other demand response programs
- Minimum term of service under the tariff
- Other conditions
  - "Bill protection" for first 12 months
    - The lower of the bill under the CPP rates or the bill under the otherwise applicable tariff

Typical Tariff Elements

- Capacity reservation
  - Option to specify and pay for a maximum amount of demand not subject to CPP charges
    - Priced in $/kW-month
- Critical peak events
  - Triggers: temperature, system constraints
  - Number, duration
  - Notification requirements

Issues for Tariff Design

- Impacts on revenue collection
  - T&D: Recognizing potential changes in billing determinants to assure sufficient revenues
    - Decoupling reduces or eliminates this problem
  - Commodity: Squaring retail prices with underlying wholesale prices (costs)
    - Avoiding windfalls or shortfalls
    - Relationship to bidding for default service

Issues for Tariff Design

- Procurement of default service?
- Typically today
  - Classes and rate designs specified in RFP
  - Suppliers bid prices at which they're willing to serve
    - State-by-state variations on this theme

Dynamic Pricing and Basic Service

- A dynamic rate structure, e.g., CPP, needn't change approach to procurement – or does it? Approach and theory:
  - RFP sets the terms of the CPP program
    - Historic load shapes and billing determinants
    - Underlying rate design: flat rate or TOU?
    - Number and duration of CP events, possibly even the CP price
  - Bidders bear and value the risk (positive or negative?) of price-induced demand response
    - Reflected in bid prices
    - Price-induced demand response should benefit providers by yielding better load factors: cut peaks, cut costs

Dynamic Pricing and Basic Service

- Some experience with basic service procurement suggests that competitive wholesale suppliers (unlike competitive retail suppliers) are not particularly interested in providing products with more dynamic pricing structures
  - In MD, suppliers ignored the request for TOU prices. BGE reverse-engineered TOU prices from the winning bids' flat rate offers
    - Note: both participating customers and suppliers benefit from the demand response that the TOU prices elicit—yet, for whatever reason, the benefits were not enough to cause the suppliers to develop the prices themselves

Dynamic Pricing and Basic Service

- Given this, there's concern that suppliers will ignore basic service RFPs that call for, say, critical peak pricing
  - States may have to specify certain elements of a CPP tariff, including possibly the price
  - Extreme: the state specifies the rate structure and prices for each rate element, then calls on suppliers to say much they'd be willing to provide service at those rates
    - Responses could be positive, negative, or zero
      - If positive, customers would see credits on their bills; if negative, surcharges.
      - Does this address supplier concerns?
  - Or, slice procurement of basic service by baseload, intermediate, and peaking
    - Would this capture the hedge premium?

Issues for Tariff Design

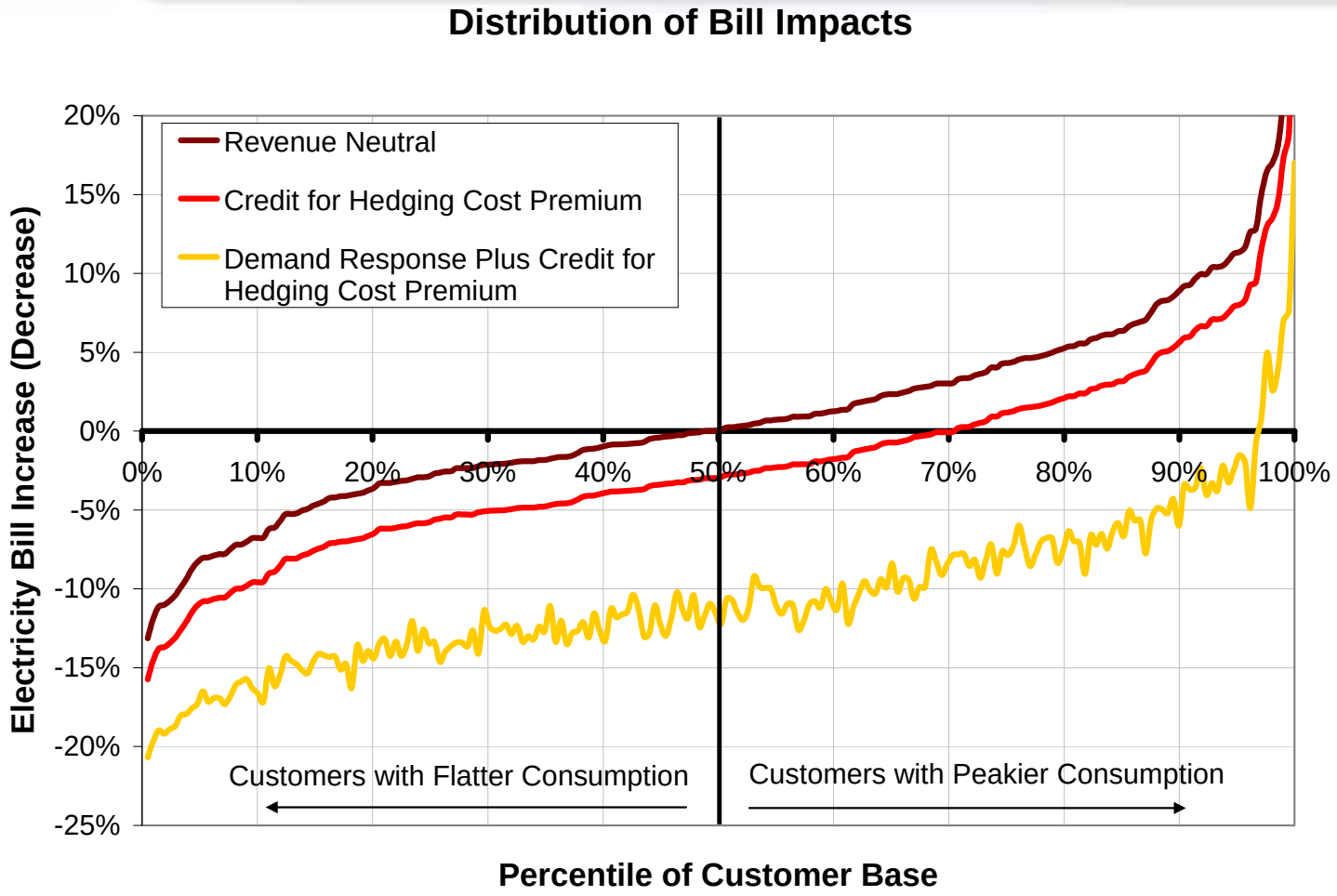
- Impacts on utility billing systems?
  - Difficulties dealing with significant changes to rate structures?
- How to estimate and capture for customers the hedging premium embedded in average rates?
  - Is real-time pricing the answer?

What is the value of the premium for hedged rates?

- Theory and analysis suggests that there is a hedge premium in non-dynamic prices
  - Brattle's work suggests this "insurance premium" ranges from 3 to 13 percent for different types of time-varying rates
  - Illinois used a value of 10 percent in its RTP pilot for residential customers
  - Monte Carlo simulations with a standard financial equation suggest a mean value of 11 percent
  - A conservative estimate is 3 percent
- How can the premium be captured? What costs are avoided? Is this a function of the degree of competition in the market?

Source: The Brattle Group

Even a 3% credit significantly increases consumer welfare



Source: The Brattle Group

Questions

- Would a MADRI model tariff for CPP be of value to stakeholders?
- Guidelines for structuring basic service RFPs?
- Where should our focus be?