Electricity Rate Setting in the New Era of Renewables

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Why is cost-based pricing important?

- Gives customers efficient incentives to use or conserve
  - Price should reflect the full social marginal cost of consuming
  - Customer’s private consumption decision then incorporates the full cost of production
- Sense of fairness across all customers
  - Deviations from cost may help some “deserving” customers, but likely to miss many and to help some “undeserving”
What does cost-based pricing look like?

- Fixed charge represents the per-customer cost that does not vary with the quantity the customer consumes
  - Such as billing, metering, service connection
- Volumetric charge represents the marginal cost of delivering power
  - Depends on time of consumption
  - Doesn’t depend on amount of consumption
    - Increasing-block pricing is not cost based
- What about systemwide fixed costs?
  - Want to be both fair and efficient in collection
If we deviate from cost-based pricing, who should benefit?

- The poor
  - Special programs to help low-income

- The disabled
  - If not poor? Different thresholds for disabled?

- The elderly
  - If not poor or disabled?
  - Income-based criteria (as opposed to wealth-based) tend to favor retired.

- Should special rates lower fixed charge or volumetric charge?
How does renewables expansion change the challenges of rate setting?

- Policies for distributed generation from renewable intermittent resources – solar PV
  - Net energy metering versus feed-in tariff
- Cost of meeting a renewable energy goal?
  - Potential value from exceeding the goal
- Systemwide integration challenges as more renewables are on the grid
  - Potential for major changes in timing and types of grid management issues.
Cost of meeting renewable goal

- Around California rising RPS will increase retail bills
- Incremental renewable energy costs more than incremental energy from fossil fuels
  - Wind/solar costs are declining, but gas is cheap
- AMP is in the unusual position of exceeding all renewable goals
  - Raises the question of what to do with extra renewable credits
Integrating large quantities of solar will change the shape of net demand

- The Duck Graph (for March)
Implications of the Duck Graph

- Potential for very cheap power mid-day in spring/fall, also many summer/winter days
  - Lowers the value of power from solar PV

- Extreme ramping constraints for non-solar generation in morning and evening
  - Over-generation in afternoon and steep ramping may lead to curtailing solar

- Peak (net of solar) demand shifts more towards early evening

- “Solutions”: storage, demand shifting, trade
Implications for Alameda

- AMP is less exposed due to less peaky demand and long-term power contracts.
- But the impact of statewide RPS changes and renewables integration will change the environment for all power contracting.
- And will alter the value of distributed generation in ways still not well understood.
- May put more pressure on any tariffs that do not reflect costs.