Dispatching Demand: A Critical Element of Future Electricity Systems?

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Demand flexibility has growing value with increased intermittent generation, but how should it participate in the market?

- Voluntary reductions when asked?
- Dynamic pricing?
- “Dispatchable” demand resources?
- Forward quantity contracts with charges or rewards for deviation?

And in which markets should demand participate? Retail? Wholesale? Both?
Is demand just negative supply?

- Demand starts from a “requirements contract”, right to buy all desired at predetermined price
  - Price differs from marginal cost of supply
    - In California, price on average is more than double marginal supply cost for residential customers not on low-income program
    - In nearly all markets, at super-peak times marginal price to customer is well below marginal cost

- Resulting need to set a baseline quantity for measuring demand reduction raises both *moral hazard* and *adverse selection* issues

- Highly unusual arrangement in markets, with exception of forward contracts and adjustments for deviations
Why isn’t dynamic retail pricing the full answer to demand participation?

- Demand responding to dynamic pricing isn’t “dispatchable”
  - Can’t be treated as a “resource”
  - Electricity is different, need to balance supply and demand every minute

- But by organizing demand participation as payment for reduction from a baseline formed under a requirements contract, how much are we exacerbating the problem we are trying to solve?
  - How much less dispatchability would we need if we started with flatter load profiles from dynamic pricing?
If dispatchable demand is critical, who should implement such programs?

- Is this more appropriately a retail market function or a wholesale market function?
  - asking the economic/operational question not the legal one addressed by FERC Order 745

- If dispatchability is a real-time resource for grid reliability, shouldn’t it be run by grid operator?

- But if aggregated demand quantities are what matter, couldn’t load serving entities do the aggregation and offer net demand to grid operator?
  - Would that more effectively let a thousand demand response paradigms bloom?
How do dynamic pricing and demand response programs co-exist?

- Dynamic pricing is the day ahead market mechanism and demand response is the “emergency” real-time adjustment?
- But then shouldn’t real-time adjustments be priced up and down symmetrically?
- If so, are we back to “demand response” is the name for pricing deviations from a forward contract?
Thanks!

- Very much looking forward to answers from the other panelists and the other esteemed conference participants

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