

Assuring Resource Adequacy: Concepts, Options and the SMD

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Agenda

Paying Resources in Theory

Clearing Short-Term Markets

Using Long-Term Requirements

The FERC SMD Proposal

Conclusions

How Are Resources Motivated and Compensated in Theory?

The Resource Problem

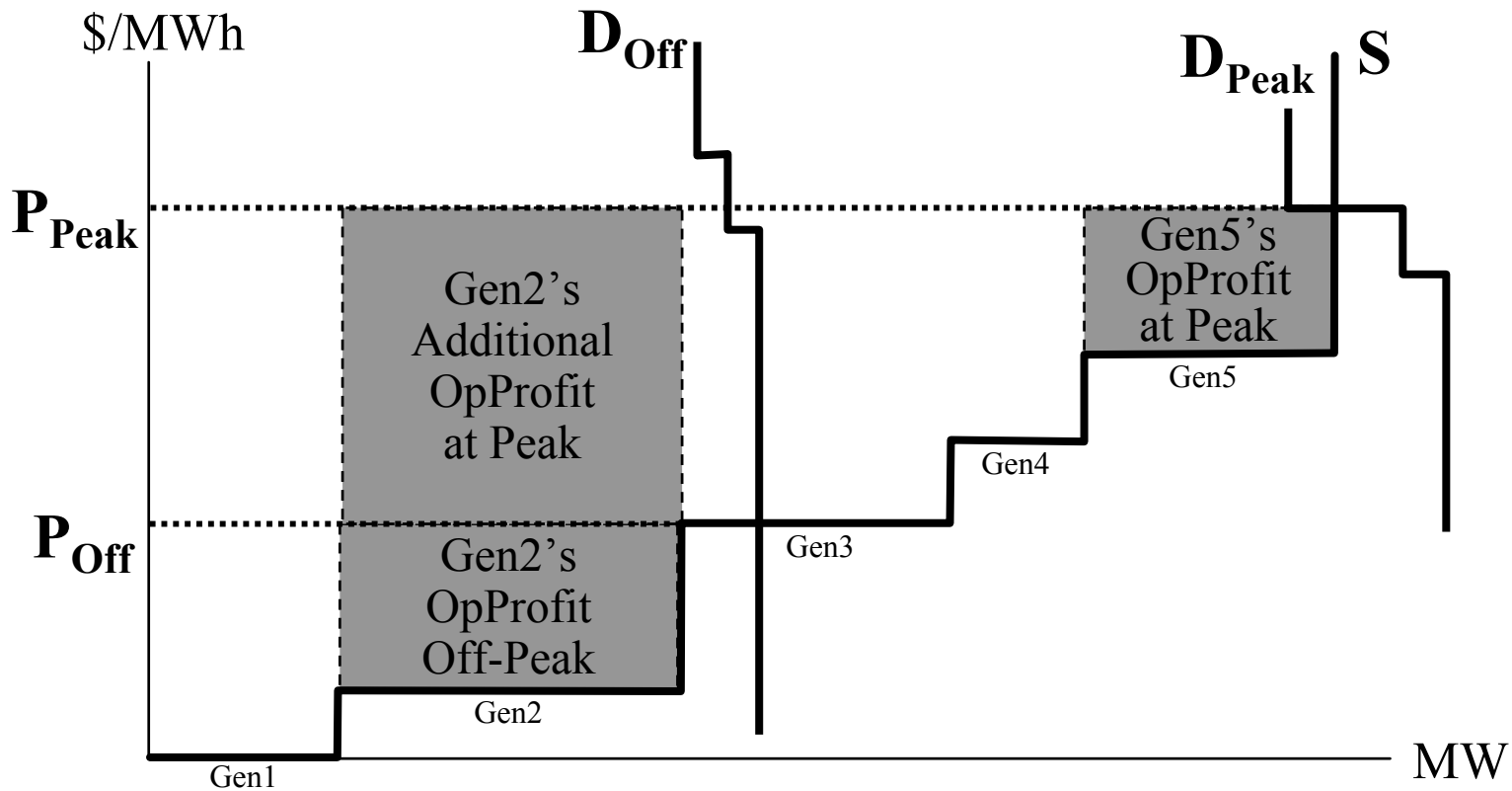
In principle, spot prices for energy, reserves and ancillary service (E&AS) should:

- Increase as needed to clear the markets
- Adequately compensate generation/DR
- Stimulate timely investment in generation/DR

In practice, it is difficult to:

- Design E&AS markets that always clear
- Convince anyone to trust them even if they do
- Find alternatives that work well

How Capacity Gets Paid in Simple Theory



What gets prices up to peaks? What if they don't/are not allowed to go high enough?

The Basic Options for Paying Resources

Rely on short-term E&AS markets to clear

- Suppliers “bid up” in scarcity periods
- Demand-side bids/responses set prices
- ITP uses SRMC of system-cost/risks

Impose a “long-term” resource requirement

- LSEs need contract MW > own demand
- Enforced with a deficiency penalty
- ITP may operate CAP market to help traders

If “long-term” → “one hour” & short-term trading is efficient, these options converge

**(How) Can Short-Term Markets Be
Cleared Reliably and Efficiently?**

Demand-Side Bids/Actions Affect Prices

Explicit D-side bids in dispatch are/should be:

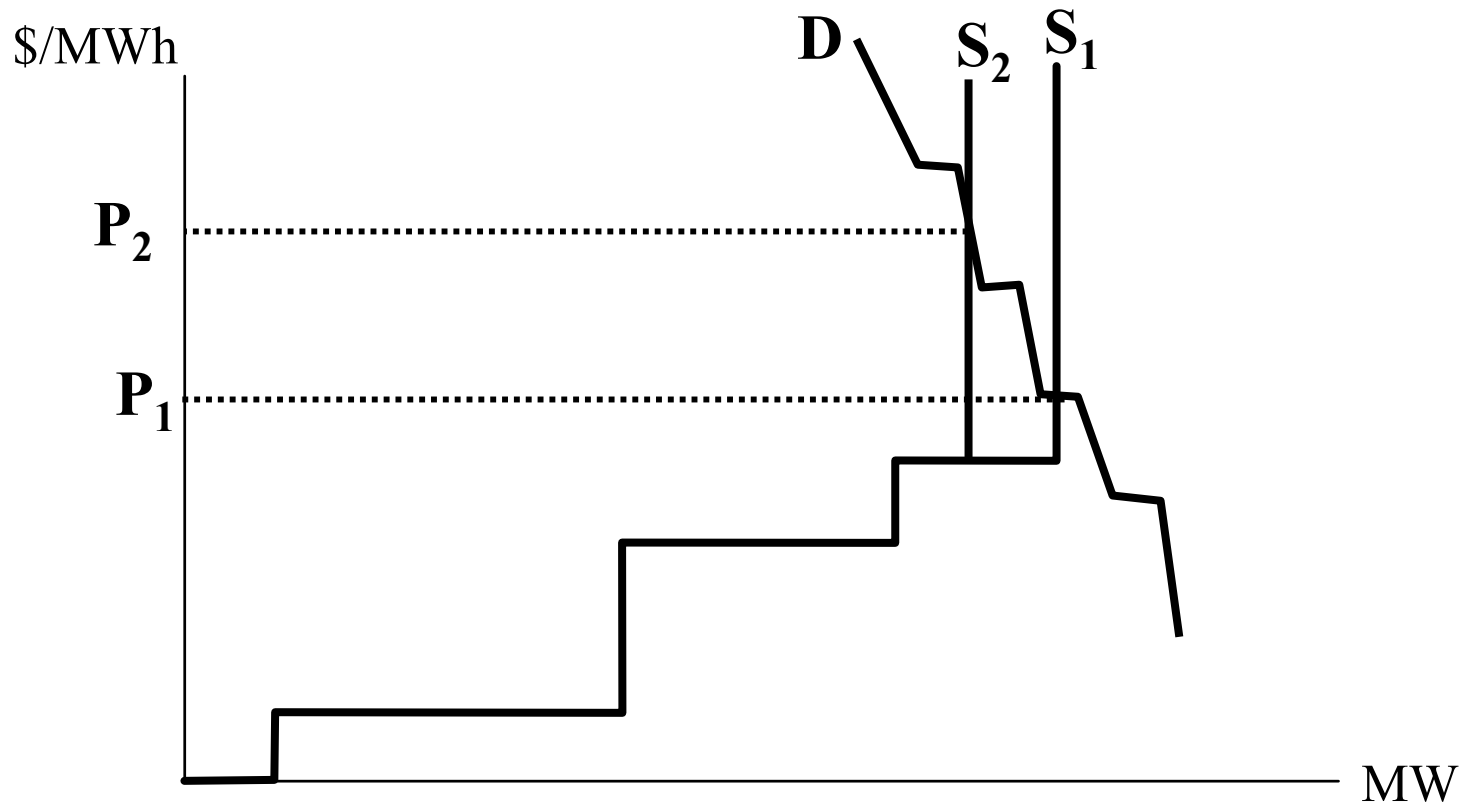
- Prices at which buyers will stop buying
- Not ***paid to*** loads (ex. sale of contract MWh)
- Never complete and not really necessary

ITP can/should use price elasticities in:

- Forecasting demand to be met
- Scheduling supplies for operations

Demanders need not “bid” to affect prices; they need only respond to (expected) prices.

Demand Response Can Set Scarcity Prices

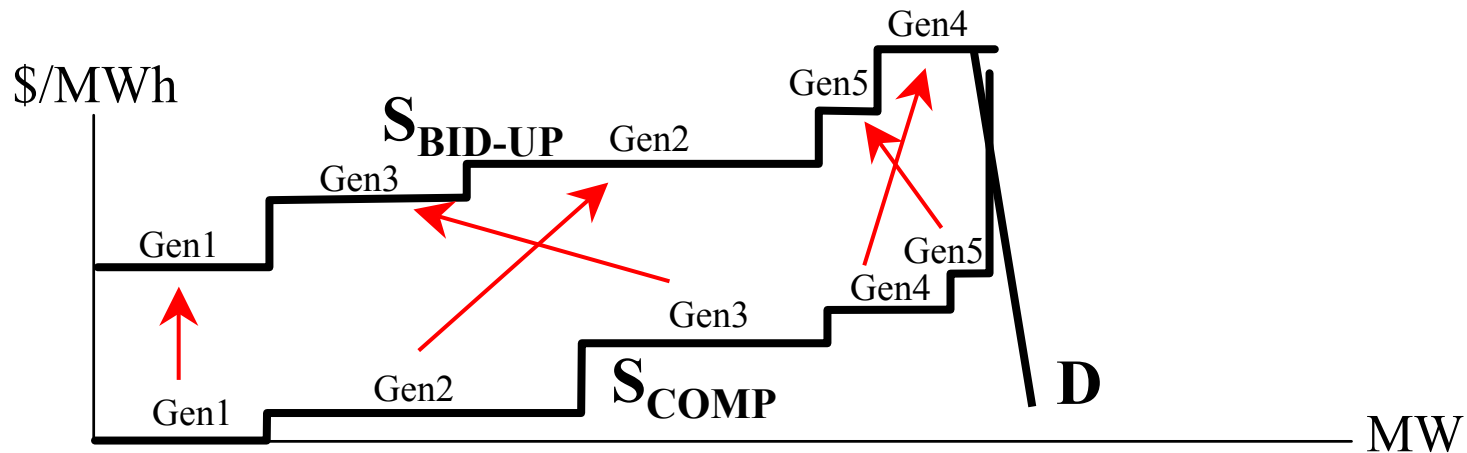


DR – bid and/or projected – can/should affect operations and prices at all times

Suppliers “Bid Up” in Scarcity Hours

Suppliers bidding up all MW to increase prices:

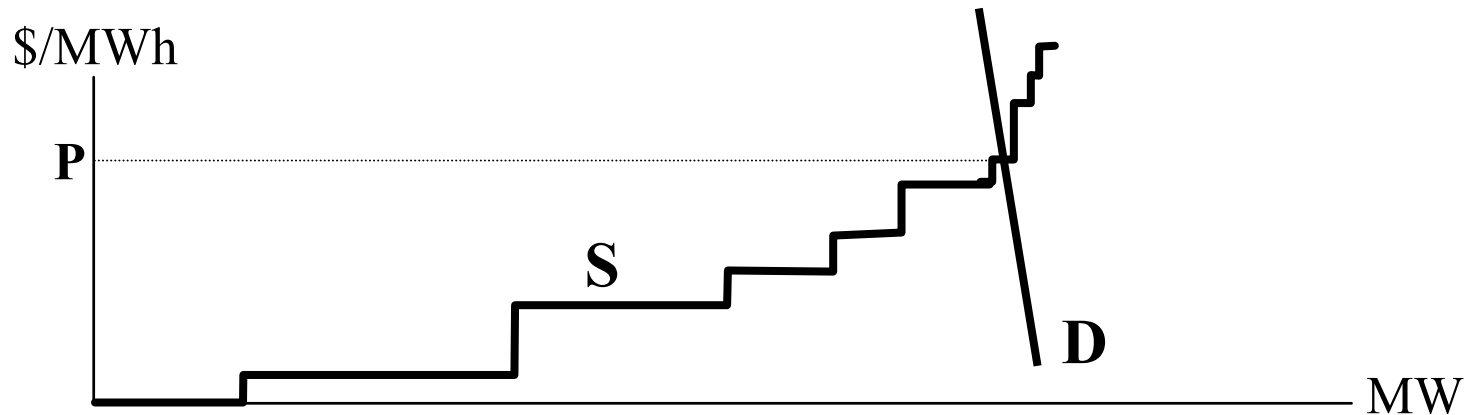
- Is, by definition, using market power (even if necessary to get competitive scarcity prices) and hence is often banned or “mitigated”
- Is inefficient, even if allowed: Suppliers cannot predict scarcity or MCPs



Suppliers Bid “Sculpted SRMCs”

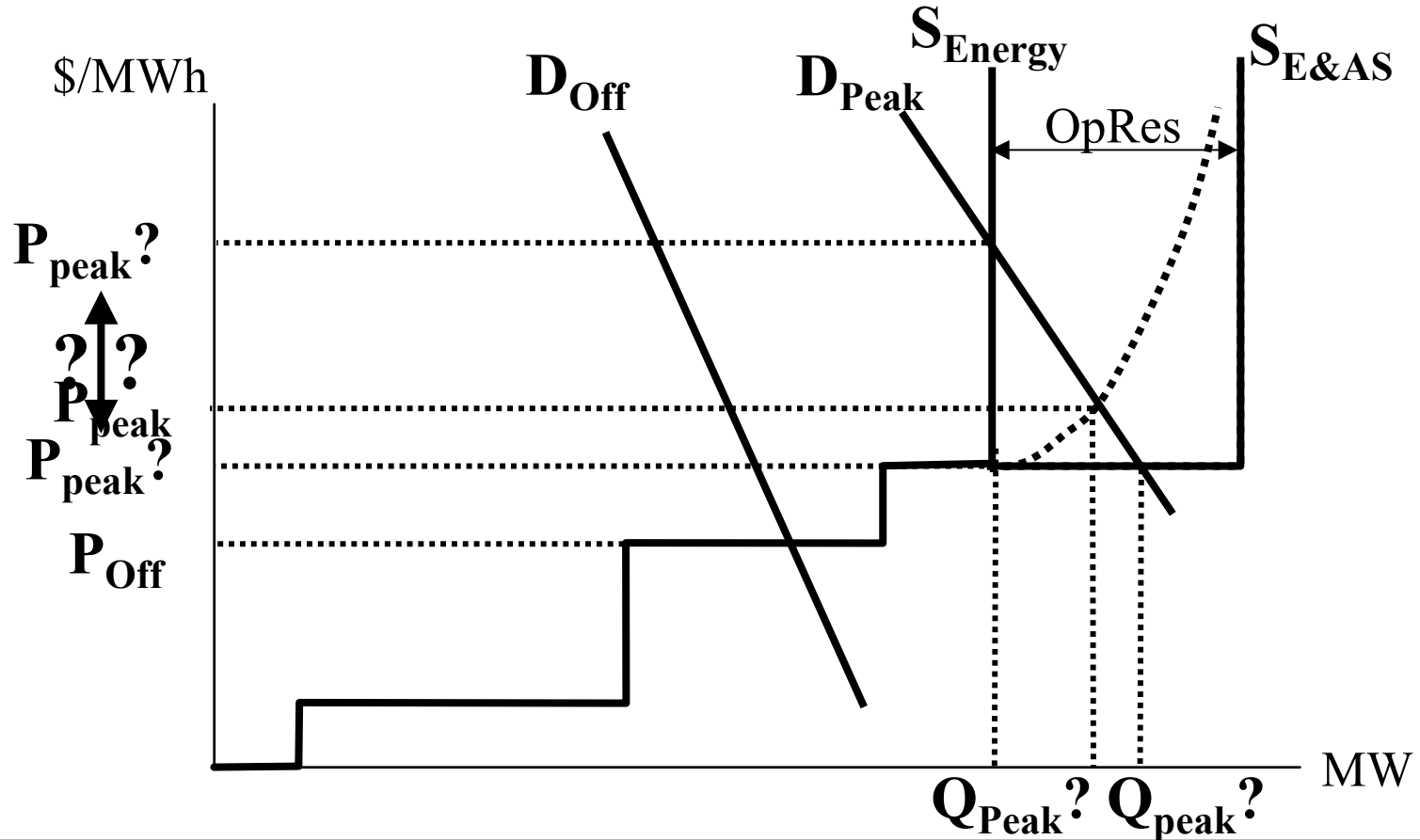
In a “perfectly” competitive market:

- Suppliers will bid (offer) E&AS at SRMCs
- SRMCs/Bids increase rapidly near MaxGen
- Scarcity prices occur w/o demand bidding



Sculpted SRMC bidding is usually banned or mitigated, but should not be

A Capacity Adder to Energy Price



P_{Peak} should reflect the risk of low OpRes – as the penalty in the SMD's RAR would do

All Three Methods Should Be Used

Price-responsive demand should be:

- Encouraged (but not subsidized)
- Used in determining operations and prices

Suppliers should use sculpted bids to:

- Reflect reality of generator SRMCs
- Produce scarcity prices at critical times

Prices should reflect system costs/risks

- Low OpRes, high LOLP → High prices
- SMD suggests similar concept in RAR

Short-term markets MUST clear

The Paranoia About Price Spikes

MCPs will/should/must sometimes be very high, to:

- Call forth costly DR and supplies in short run
- Stimulate long-run investment and contracting

Short-run price spikes, even if “too high” :

- Have little effect on consumers, are easy to hedge
- Mostly pay the rent for competitive generators

Reducing price spikes will require:

- Largely-offsetting increases in other prices
- Heavy-handed intervention in the market

The best advice for price spikes? Get used to it.

**(How) Can Long-Term Measures Assure
that Short-Term Markets Always Clear?**

The Theory/Hope of Resource Requirements

If a resource is paid just for existing:

- It will need less from spot prices to cover its costs
- It will offer its services at (approximately) SRMC
- Spot MCPs will be lower and less peaky

Even in theory, this works only if/because:

- There is more, and hence “excess,” capacity
- The ITP’s hand is very visible in the market

A resource/contracting requirement is ITP-mandated insurance that creates “moral hazard”

Making Long-Term Requirements Work

The ITP (or somebody) must define:

- System requirements (MW) and each LSE's share
- How many MW each resource can provide, with trade-offs among resource types, locations, etc.

Enforcement must be either:

- *Ex ante* based on forecasts: requires giving the ITP a lot of essentially arbitrary power
- *Ex post* based on outcomes: is basically inconsistent with the “long-term” objective

Choices must be made – and acknowledged

The Logic of *Ex Ante* Enforcement

Ex ante enforcement requires the ITP to:

- Define how many and which MW each LSE must buy years in advance
- (Try to) use heavy penalties to ensure compliance before ITP's judgments can be tested/validated

If this results in lower, less peaky spot prices:

- Short-term DR and supply incentives are reduced
- More capacity is needed to clear the spot market

This can “work” – if LSEs buy too much, ITP-mandated/approved capacity years in advance

The Logic of *Ex Post* Enforcement

With *ex post* enforcement, the ITP:

- May set targets years in advance – but why bother?
- Penalizes LSEs who have insufficient capacity relative to load in real time (or a day-ahead, or...)

This voids the long-term requirement and its effects

- LSEs can avoid penalties with short-term buys
- Spot/short-term prices will be high and volatile
- Long-term contracts only hedge short-term prices

Such a “long-term” resource requirement is at best a way to help short-term markets clear

**So Where Does the SMD's Resource
Adequacy Requirement Fit into This?**

The SMD's Resource Adequacy Requirement

The SMD's RAR uses short-term, *ex post* enforcement

- The ITP takes names of LSEs who do not have “enough” contracts (say) 3 years ahead
- If a listed LSE buys in the spot market(s) 3 years later, it pays the spot price + a penalty
- A listed LSE can avoid penalties by contracting any time in those 3 years, up to 1 or 2 days ahead
- 3-year contracts do nothing but hedge later prices

The RAR proposal as it stands is unclear and may be harmless (except for the confusion it causes), but it is not a “long-term” requirement

The RAR's Penalty on Spot Purchases

Does the MWh penalized depend on the listed LSE's:

- Size (MW) of contract shortage 3 years ago?
- Contracts and/or loads 3 months/weeks/days ago?
- Imbalances (Δ s) on individual or total contracts?
(If individual, RAR = contract-driven dispatch)
(If total, strong incentives for portfolios/mergers)

A penalty on only listed LSEs reduces incentive for:

- Unlisted LSEs to implement DR
- Uncontracted generators to produce more

The scarcity-dependent penalty should become a price adder applied to all spot buys and sells

Where Will/Can FERC Go with the RAR?

With further definition, the RAR must become either:

- A real long-term, ICAP-like requirement; or
- A way to get scarcity-level spot MCPs

But the SMD NOPR has charred FERC's bridges in both directions, by saying:

- ICAP works poorly and requires a strong ISO; and
- Spot prices must be capped and mitigated, and (hence?) cannot stimulate enough investment

The best solution is to assure that spot markets clear, but it is unclear what FERC will do

Summary and Conclusions

Resource adequacy can be achieved either by letting:

- Prices be high/volatile enough to clear markets
- ITPs mandate excess capacity as price insurance

In my view, best approach is an efficient spot market

- Use DR, sculpted bidding and system-status pricing
- Spot price variations can be hedged and/or ignored

The FERC/SMD Resource Adequacy Requirement:

- Is unclear, probably unworkable as it stands
- Promises long-term effects it cannot deliver
- Must become either ICAP or spot pricing tool