
IEA/ESAP Workshop: What is Next for Our Electricity Markets?

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Summary recommendations:

- Fast, reliable, affordable decarbonization: Markets must access and adequately compensate the lowest cost sources of flexibility
- Centrally administered fwd procurement excludes most low-cost distributed flexibility, mis-prices flexibility, over-procures capacity
- Flexible demand (active and passive) is often the lowest cost source of flexibility services
- Energy market provides near-universal access and pays for what customers actually need and use (energy plus services)
- Administrative valuation of reliability services still needed, but through energy market, not around it
- Energy price formation (LMP) must reflect combined demand for energy & services, opportunity cost of reserve shortages
1 Reliability matters – so let’s be clear what we’re talking about

Resource “adequacy” by the numbers
It’s all about the consumer

Resource adequacy, objectively

Imputed Average Value of Lost Load

Average value of lost load ($/MWh)

Annual duration of firm load curtailment (hours/year)

One event in ten years

24 hours in ten years

Optimal?

Price cap

Source: W. Hogan, Harvard University, Kennedy School of Government.
Is there a different way to look at this?

We’re talking about a fundamental change in the nature of the supply mix

Can we really afford to continue to build a power system and charge customers based on the assumption that they are happy to pay €35,000-€250,000/MWh for the luxury of not shifting their flexible loads by a few hours?
We need a new paradigm – VoSL (“Value of Shiftable Load”)

**VoSL:** The price at which customers will happily shift flexible loads to save money

The VoSL for a given end use is often far less than what it costs to ensure (and far more than the price we’re charging to ensure it)
Fast, reliable and affordable means one thing: Flexible

Flexibility, not capacity, is the new coin of the realm
“How much?” depends on “What kind?”

Considering only generation flexibility…the legacy resource portfolio can require up to 40% more investment in grid and generation capacity than the transformed portfolio.

Source: Adapted from The Power of Transformation (IEA, 2014)
System flexibility: Where can we get what we need at least cost?

New role for responsive demand

Moving from a world where we forecast load and schedule generation, to a world where we forecast generation and schedule load will now need to shape, not just shave, demand

[Graph showing demand response and energy sources]
Innovation: 3rd party access is essential
Priority # 1 (and #2 and #3): Get the energy price right

Marginal-cost energy pricing isn’t necessarily what you’ve been told it is
Capital-intensive yes, but value will come from demand for operational capabilities, *not* capacity

...so market model should reflect this
Rapid growth in range of needed services
The real supply curve:

![Supply Curve Diagram]

- **Marginal cost (€/MWh)**
- **Value of load**
- **Price cap**
- **Generation merit order**
- **Emergency gen & other**
- **Drawdown of required reserves**

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Administrative measures (e.g., reserve shortage function) ensure demand for reliability is priced…

...creating volume & price risks that drive bilateral contracting (e.g., ~95% of energy consumed in ERCOT is under bilateral contracts)

10 years of investment in leading markets

**ERCOT**

No forward capacity market, but administrative shortage pricing in the energy market, 20% wind share of market in 2018.

**PJM**

Forward capacity market, but with only 1-year rolling "contracts" for existing & new capacity, scarcity pricing, 36% reserve margin in 2018.

- Source: ERCOT and PJM published data.
When surplus baseload is retired, energy prices reflect true value & consumers are empowered:
About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

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