

# ***Successful Market Design: What Should a State Want?***

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# What Should A State Want?

This panel's topic assumes that a market design is imminent and asks "what should a state want from a successful market design?"

The question could be framed more broadly, to apply to all regions, including those not supporting RTOs.

Irrespective of FERC, SMD, LMP, FTRs and ICAPs, . . .

*What should a state want to ensure its consumers (1) are served reliably at lowest cost and (2) capture the benefits of regional trading for its consumers and producers, while (3) minimizing the risks?*

It would be fortunate if the answers to these two questions have a lot in common.

# What Should A State Want?

We can safely assume that States want at least an equal, or even exclusive voice in critical policy decisions affecting their citizens:

- Whether to allow competition at the retail level
- How to reflect wholesale costs/prices in retail rates
- When/where to invest in transmission expansions
- How to allocate transmission expansion costs,
- And so on . . .

# What Should A State Want? Some Clear Answers Would Help.

States should want much clearer answers to key questions (e.g.):

- Do we have enough “successful” market experience to be assured of net benefits? What’s the measure of “successful”?
- Was California an exception, or harbinger? Is there a “right” SMD?
- Does FERC have the right analytical definitions to recognize, and tools to mitigate, market power? “Gaming” vs “good” arbitrage?
- Where is FERC going with scarcity pricing/price caps/ICAP?
- Who will/should bear the costs of transmission expansion?

We can also assume that states do not want to be told that their efforts to get answers to these questions are not “designed to protect public health, safety, or welfare” of their citizens.

# How Would We Keep the Lights on?

Whether system operations were done on a utility-by-utility control area level or through an RTO/ISO, we'd want the system operators to have all of the dispatch functions and capabilities needed to monitor/control transmission and assure reliable operations.

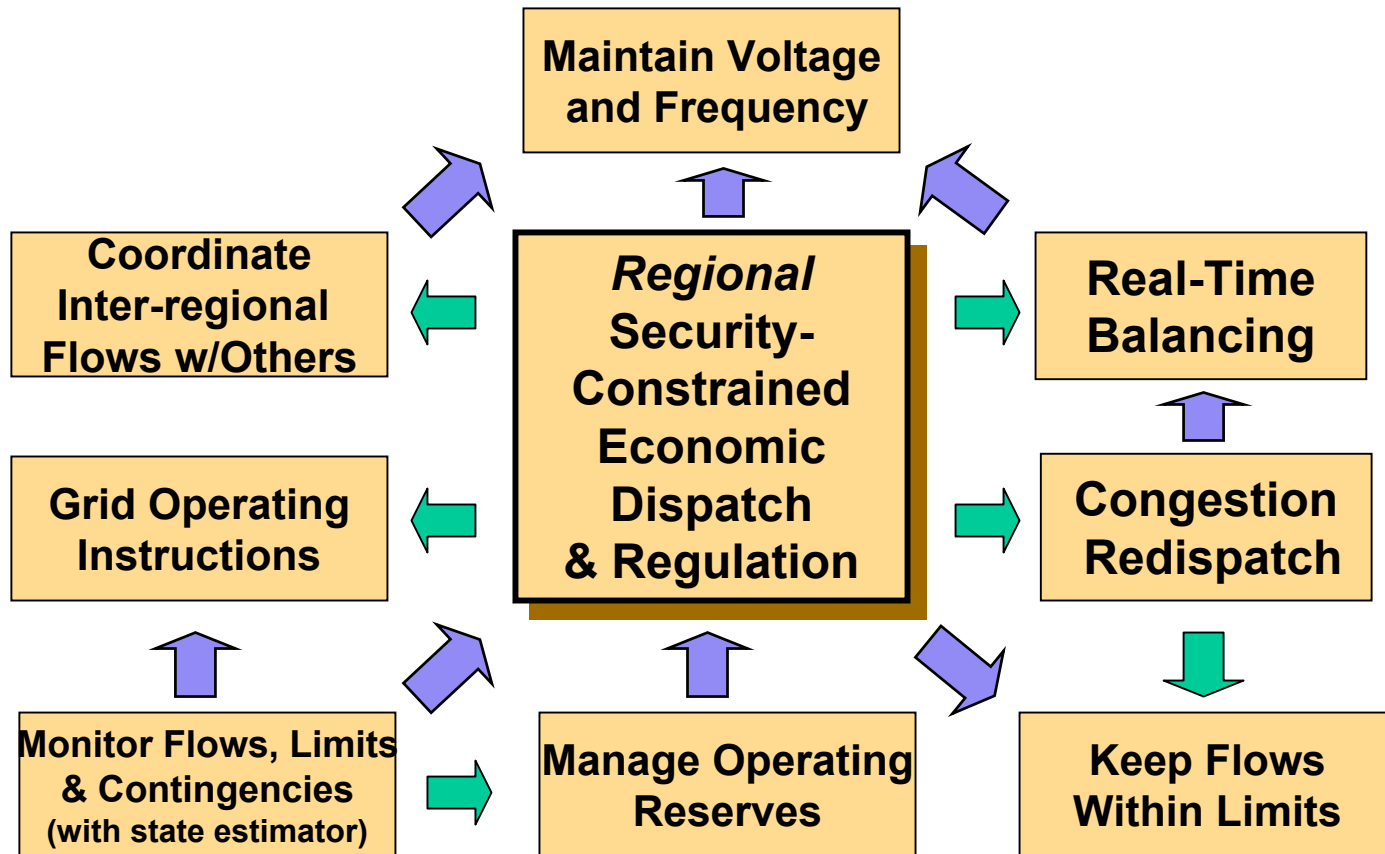
If these functions were done utility by utility . . .

- **Every utility control area would need to have these core functions.**
- **Every control area would have to communicate/coordinate frequently with all neighboring control areas, using well-defined protocols.**
- **We'd probably need common, mandatory protocols with at least effective regional oversight.**

If these functions were done by a large regional ISO (RTO) . . .

- **Much of this coordination/oversight could be internalized.**
- **The RTO/ISO would need most/all of the C/A functions/capabilities.**
- **Each RTO/ISO would still need to communicate/coordinate with its neighboring RTOs/ISOs and utility Control Area operators.**
- **A hybrid RTO with many utility CAs might be difficult to coordinate.**
- **A Swiss cheese approach would be risky. We want all grids "in."**

# A Utility's Real-Time Reliability Functions Center Around the System Operators' Dispatch



Utility (and RTO) System Operators Maintain Security and Reliability Through a Set of Closely Integrated Dispatch Functions

# How Does a State Ensure Its Consumers Get the Benefit of Its Utilities' Low-cost Power?

Today, each utility uses economic dispatch to ensure that the lowest cost mix of plants is used to meet demand at each moment. We should keep this tool.

We can think of this as an implicit contract (or regulatory compact):

- The utility will build/contract for and use the least-cost mix of resources available to it to serve its native loads at all times;
- The regulator will set retail rates at levels sufficient to cover the costs of this resource mix over time, both fixed/capital costs and variable/operating costs.

The Dispatch appears to be critical. How the dispatch is arranged, conducted and priced would affect how many other state interests would be furthered.

# How Might a State Ensure Its Consumers Get Access to the Lowest Cost Supplies?

Each state would want its utilities to be able to purchase power from IPPs or other utilities whenever it was cheaper to do so than running our own utilities' generation.

At each hour (or dispatch interval) of the day, the utility would need:

- An unbiased way to compare the costs of using non-utility generation to its own marginal costs. A useful approach might be common supply offers showing quantities and prices -- \$/MWh.
- The utility would then pick the least cost mix of offers to dispatch.
- We'd want the system operators to make unbiased, least-cost choices. So it would be important that the system operators behaved in an unbiased, independent fashion – (just like an iso).

# How Could a State Ensure Its Utilities Took Advantage of Sales Into Other Markets?

If our local utility had “extra” generation to sell to others in any hour, we’d want them to take advantage of economic opportunities.

- Every state should favor policies that allow its products to be sold in other states/regions – trades can contribute to both economies.
- The extra revenues our utilities received could be used to offset the revenue requirements imposed on our own rate payers.

To facilitate these sales, our utilities would need:

- Non-discriminatory access to other utilities’ transmission.
- Fair rates for the use of that transmission.
- Fair procedures for what happens when the grid is congested, like the ability to buy through congestion by paying for redispatch, rather than just be curtailed, as occurs today under TLR rules.
- An open dispatch/spot market for selling extra power, to complement and support any bilateral deals.

# How Could Each State Accommodate Other Grid Users?

Ideally, we'd want parties other than our local utility who wanted to use our utilities' grid to pay their own way – to pay for any costs.

- We wouldn't want these “outside” traders to lean on “our” rate payers/utilities.
- We wouldn't expect them to subsidize our rate payers/utilities either.

Charging grid users the marginal cost of using the grid would seem to cover the basic idea.

- Charging anything less would subsidize those transactions, creating an incentive for them to use more of “our” grid at subsidized rates.
- Charging anything more would force them to subsidize our utility, (they won't); if others did the same, our utilities would pay more.

# How Could a State Protect Its Grid From Other Grid Users' “Imbalances”?

There would be times when other users scheduling trades on “our” grid failed to follow their scheduled transactions exactly.

- The user might inject/generate more or less than scheduled.
- The user might withdraw/consume more or less than scheduled.

We'd need a fair way to charge/pay for such imbalances.

- We could heavily penalize these imbalances, trying to force balanced schedules – but that would just drive up their costs (*and ours when used against us for our trades*). All native loads would pay more.

Alternatively, we could charge/pay for imbalances at marginal cost, reflecting the changes in the dispatch that the imbalance caused.

- That would be efficient, and fair to everyone . . .

# How Would a State Encourage All Grid Users to Support Reliable Operations?

Pricing the dispatch at marginal costs would support reliability.

- Pricing energy bought and sold through the dispatch at marginal costs would create incentives for parties to follow the system operator's dispatch instructions.

Remember, the security-constrained dispatch keeps the lights on

- The system operators issue dispatch instructions to generators to produce more or less to keep the system in balance . . .
- And to manage congestion (“redispatch”). Every SO must do this.

But if prices were inconsistent with the dispatch signals, generators would have incentives not to follow dispatch instructions.

# What If Others' Use of Our Grid Caused Congestion?

To keep grid users from “overusing” our grids, we’d want them to pay the marginal costs of redispatching generation to relieve any congestion they caused or to which they contributed.

- Each system operator’s redispatch would be the “least-cost,” given the dispatch offers, while relieving the congestion.
  - This is called “security-constrained economic dispatch.”

The marginal cost of that redispatch could be charged to the users.

- Users willing to pay this charge could “buy through congestion.”
- Users unwilling to pay this charge to “buy through congestion” would be curtailed before our system operators were required to incur redispatch costs to support them.

# Would Marginal Costs Be the Same Everywhere on the Grid?

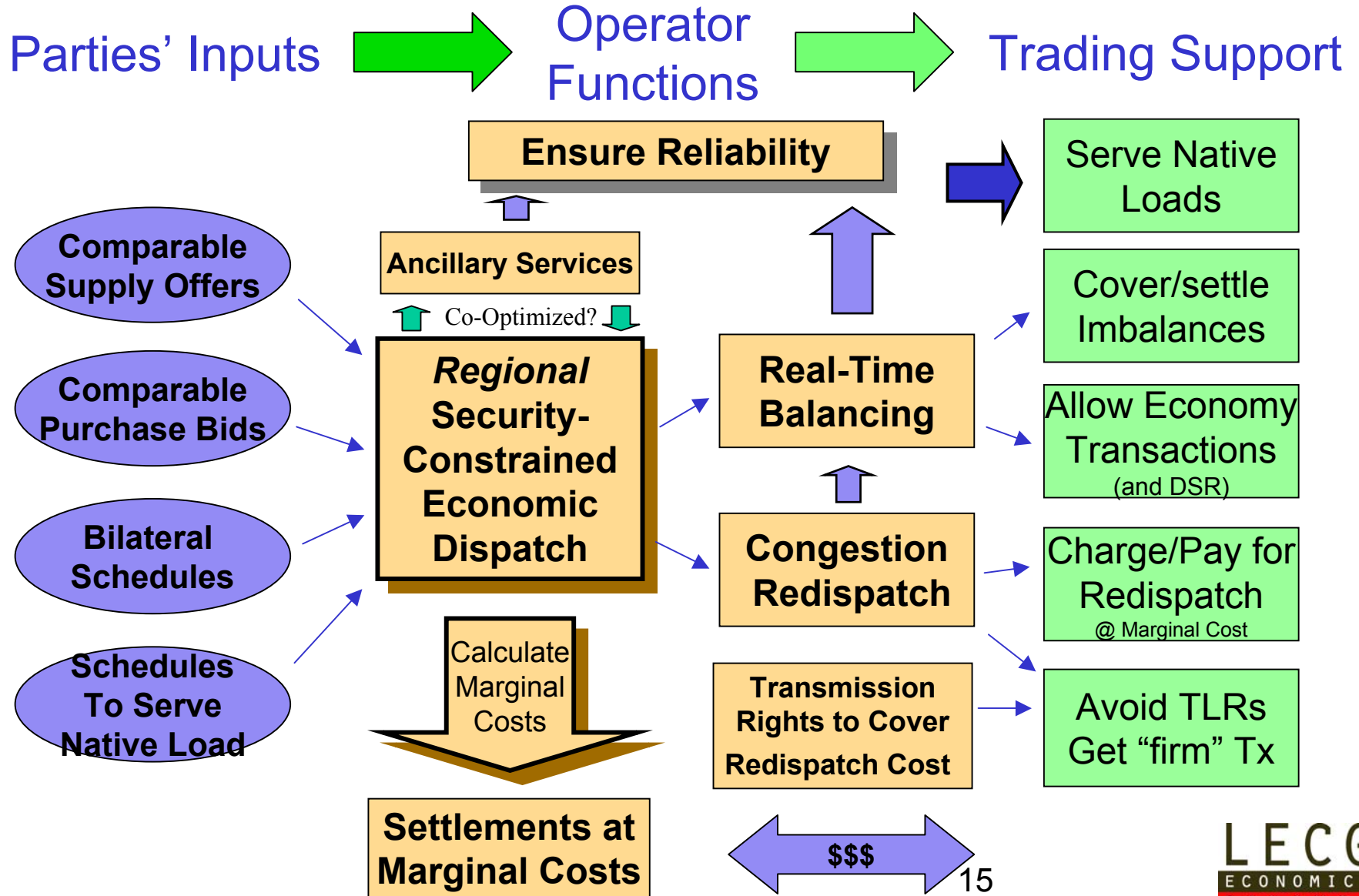
If the grid became congested, our system operators would need to redispatch generation to relieve the congestion. This would mean:

- Generators at some locations would need to be constrained off/down by the system operators to relieve the congestion. This would tend to lower the marginal costs at those locations.
- Generators at other locations would need to be constrained on/up by the system operators to rebalance the system. This would tend to raise the marginal costs at those locations.
- An average/uniform price would not work without side payments.

Locationally different marginal costs would avoid cross subsidies and encourage users to use the grid efficiently and follow dispatch instructions to relieve congestion. System operators would use locational marginal costs to charge/pay:

- All generators (and dispatchable loads) following the dispatch.
- Any party buying/selling economy/spot energy through the dispatch.
- Any grid user with imbalances that were made up by the dispatch.

# Each System Operator Uses Integrated Dispatch Functions To Support Regional Trading



# Suppose These Same Arrangements Were Structured As Market Transactions

How would the utility serve its customers at the lowest cost?

- The utility could offer or “self-schedule” its low-cost resources with the regional system/market operator
- The regional system/market operator would accommodate these schedules through its regional dispatch, and . . .
- The system/market operator would dispatch other lower-cost resources if they could serve the region’s loads at lower costs.

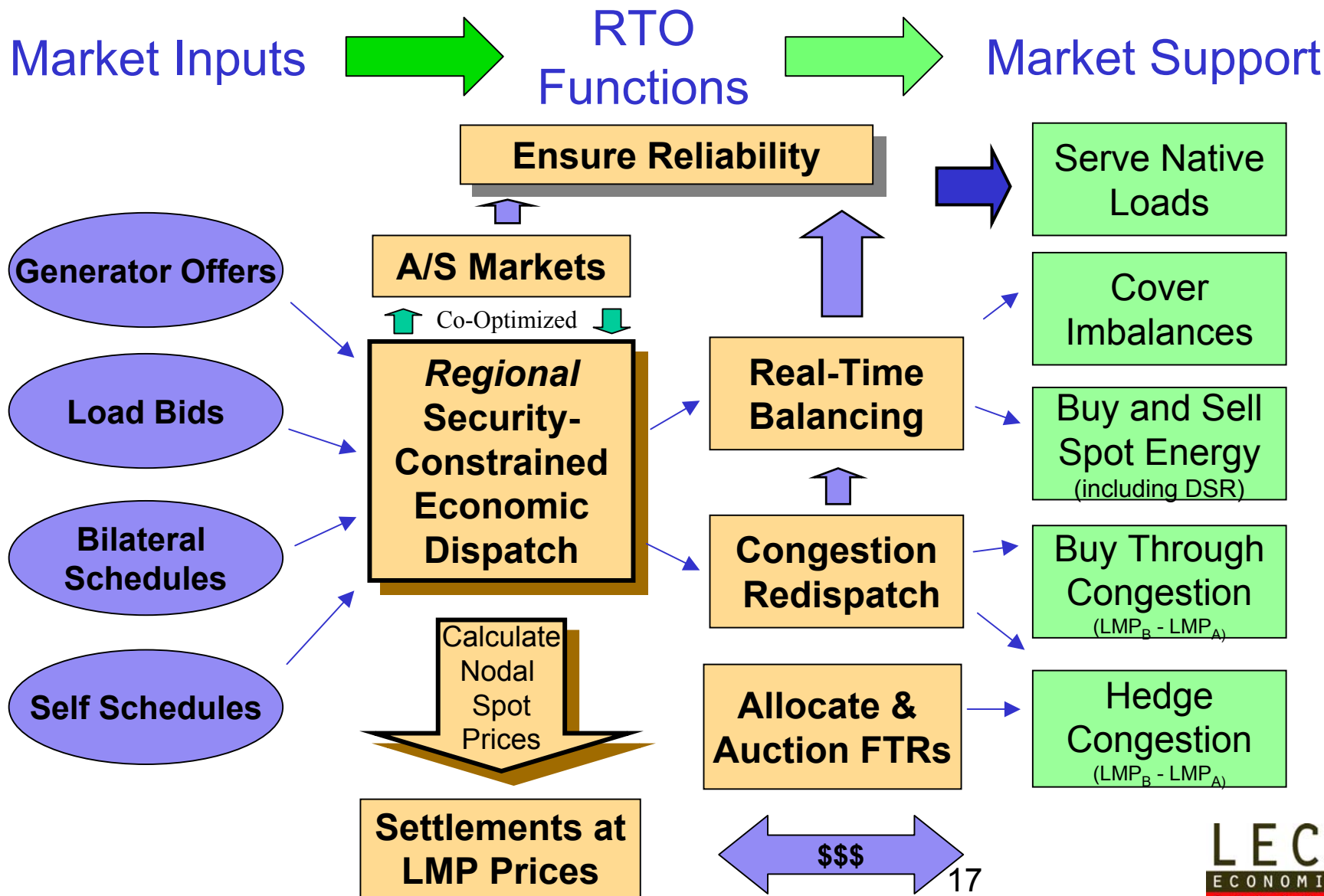
How would the state regulator define retail rates?

- The regulator could initially define retail rates at the same “cost-of-service” levels it would have used before. A transition period.
- More sophisticated retail pricing that tracked wholesale prices in some manner could follow later, if/as markets developed and matured.

In general, retail rates should reflect wholesale prices, over time.

- Default supply for low-volume consumers can reflect average prices.
- Prices from the real-time dispatch would support real-time pricing for those larger, price-sensitive customers able to participate in markets.

# RTO Uses the Same Integrated Dispatch Functions To Support a Regional Market



# What Should FERC Want?

FERC should want what our hypothetical State wants:

- . . . to ensure its consumers (1) are served reliably at lowest cost and (2) capture the benefits of regional trading for its consumers and producers, while (3) minimizing the risks.
- To have clear answers to the key questions.
- Agreement that getting good answers is in everyone's interest.

FERC and States are presently at odds over what each wants.

- The disagreements are sharp, troubling, but are they irreconcilable?

The two pictures share a lot in common. Some might say, *they're the same picture*, with different names for the same concepts.