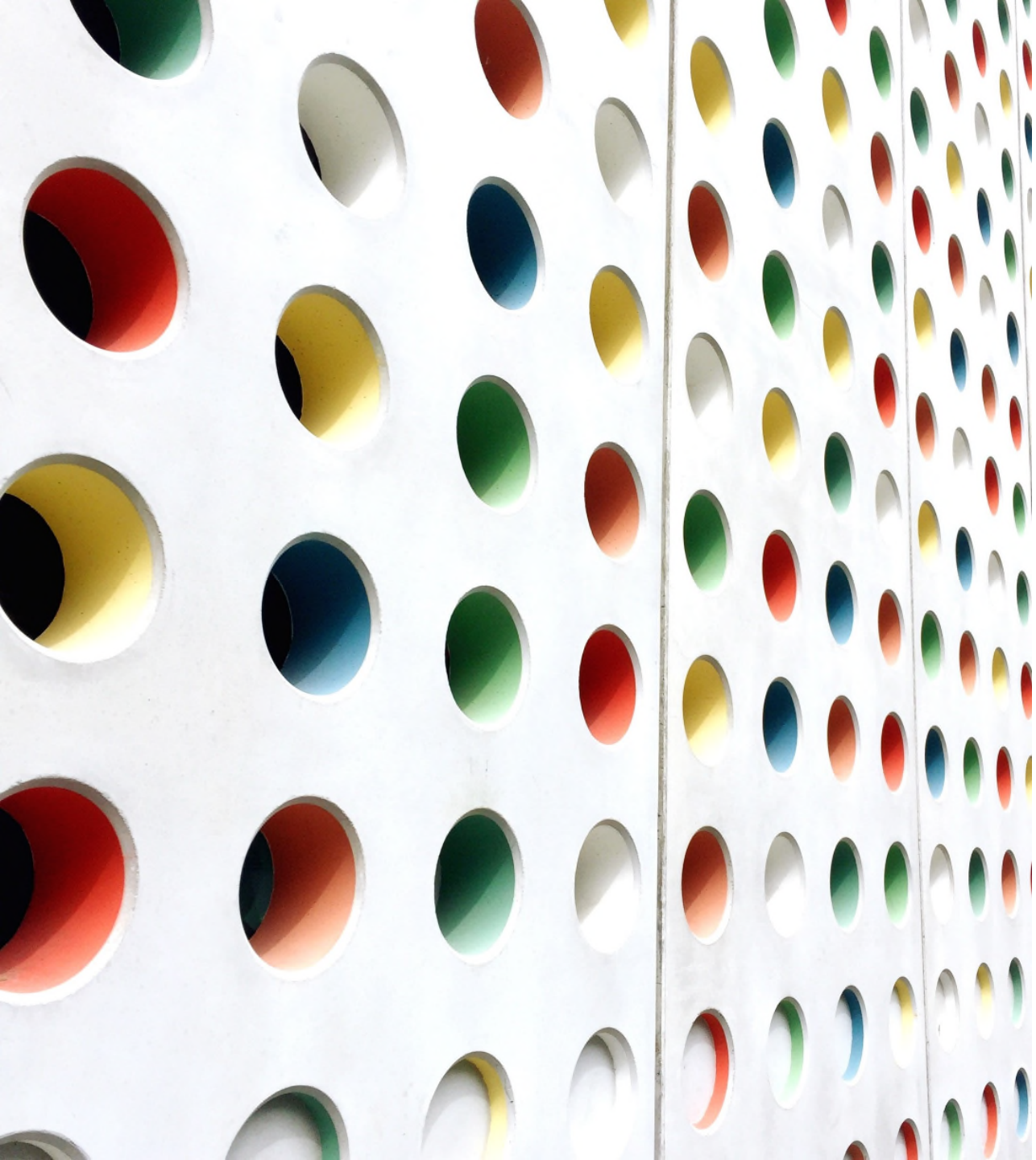

Resource Adequacy

DIMENSIONS & OPTIONS

Steven Corneli
9/3/2020

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Generation T&D Solar Storage Demand Response Distributed Energ

California regulators plan post-mortem to examine cause of rolling blackouts

gtm: Solar Grid Edge Storage Wind Trending Podcasts White Papers Webinars

ENERGY

Global Power Sector Embracing Renewables but Ditching Fossil Fuels Too Slowly

A new study of 3,000 power companies around the world shows even those leading on renewables are still locking in more carbon.

JOHN PARNELL | AUGUST 31, 2020

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GRID EDGE

California's Shift From Natural Gas to Solar Is Playing a Role in Rolling Blackouts

California's grid operator warns that the state has become overly reliant on power imports: "The rest of the West is hot too."

JEFF ST. JOHN | AUGUST 17, 2020

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Generation T&D Solar Storage Demand Response Distributed Energy Regs

Pacific Northwest looks to avoid California-style blackouts through more regional coordination

Climate change, load growth and the replacement of fossil fuels with renewables are pushing the region to take big steps toward a new model.

Three key dimensions of RA :

1. What
2. Who
3. How

First dimension: What?

a. **Sufficient resources for an electric system to avoid an excessive need for load-shedding to preserve system operating integrity.**[1]

b. **A target loss of load metric which, if met, implies sufficient resources.**

c. **A methodology for determining that loss of load metric.**

1. The electric system associated with this aspect of RA is *usually bigger than a single state*. States in such a system need a way to allocate system-wide RA among themselves for state-level RA approaches to be effective.

Second dimension: Who?

a. **Who establishes the target levels?**
b. **Who allocates it amongst power system members?**
c. **Who among these members face consequences for failure to meet target levels?**
d. **Who decides on the consequences and designs the mechanism to create them?**

Third dimension: How?

a. How are responsible members exposed to consequences and motivated to meet standard?
   i. Vertically integrated utility regulatory requirement
   ii. Capacity market (with or without self-supply option)
   iii. Exposure to scarcity prices in spot energy market
b. The specific policy designs intended to effectively motivate meeting the standard

	PJM	MISO	ERCOT
What? • Target LOLE /reserve margin • UCAP for VRE	• Mandatory reserve margin • On-peak CF	• Mandatory reserve margin • ELCC for wind, with UCAP allocated by location	• Non-mandatory targets • Energy market prices & bilaterals
Who? 1. Sets target & margins 2. Allocates 3. Sees consequence 4. Designs mechanisms 5. Approves “	1. RFC 2. PJM 3. Capacity market participants 4. PJM 5. FERC	1. MISO (states can also) 2. MISO 3. Load-serving entities, owners of excess capacity 4. MISO 5. FERC	1. ERCOT 2. NA 3. Energy-market participants 4. ERCOT 5. PUCT
How? • Financial incentives • Key policy details	LSE choice of self-supply (via FRR) or capacity market “Demand curve” & 3-year forward capacity market	LSE choice of bilateral/self supply, prompt capacity auction, or deficiency charge. Vertical demand curve & most investments paid for through regulated rates	Scarcity revenue (resource owners) or charges (buyers) ORDC to support effective scarcity price levels

One more important issue:

Will RTO Tariff provisions (e.g., MOPR) continue to be used in ways that increase the costs for states to achieve their clean energy policy goals?

- **If *yes*, states will increasingly look to ways to meet RA needs *without* using federally-regulated markets. (FRR, FRAP)**

- **If *no*, then states have a broader set of RA options, including clean energy deployment approaches that work alongside today's capacity markets or evolving versions of them.**

Examples

"MOPR-land"	"Sustainable markets land"
• **FRR / FRAP (minimal change in What and Who dimension)** **Adds a self-supply "How" option to the RTO tariff** **Requires development of UCAP procurement and market power mitigation policies at the state level** **Could be combined with several sustainable state-level policies from RH column.**	• **CES** • **Carbon price (where leakage isn't a problem)** • **Collaborative multi-state planning to develop incentive policies for evolving least-cost, best-fit (& perhaps adequate) clean energy resource portfolios.** • **Early retirement incentives and limited operation options for existing fossil resources** **These incentives would co-exist with a regional RA construct and a FERC RA-relevant market.**

The bigger picture is changing, too

In both worlds, new approaches will be needed to key “what,” “who” and “how” issues as clean energy technologies gain market share:

- What counts toward RA, and how much?
- What if it takes a specific mix of clean technologies to provide the equivalent of a fossil MW in terms of balancing generation and consumption?
- What if only some of these specific mixes result in much lower total costs for reliable & clean electricity?