ESIG May Webinar - Market Design for the Clean Electricity Transition	
Question	**Answer**
what is the role of DSM in these market proposals/models?	Demand side resources would primarily either contribute passively (i.e., in response to spot energy market prices) or bid actively into the day-ahead and real time energy
Why not allow bids in the RTM to reflect opportunity cost and scarcity so the natural volatility incentivises both generators and LSEs to contract long term?	Arguably, this is occurring to some extent in today's real-time markets. The question is whether the prices emanating from current real-time and day-ahead market designs are capable of guiding the investments needed in the coming decades that will result in affordable, reliable, low-carbon grids. The authors of these four papers, along with many other experts, argue that the answer is no, hence the need for an OLTM. However, opinions differ and other experts argue that there is no need for an OLTM. Both Joskow and Schmalensee note the need for some kind of OLTM. See their presentations at https://www.wri.org/events/2020/12/market-design-clean-energy-transition-advancing-long-term. For an in-depth treatment, see Joskow's paper: "Challenges for wholesale electricity markets with intermittent generation at scale: the US experience." Oxford Review of Economic Policy, Volume 35, Number 2, 2019, pp. 291-331.
What are the challenges and opportunities to integrating these new OLTM frameworks with the transmission planning that is needed to underpin new resource mixes?	Three authors offer some thoughts on transmission integration. See p. 17 of Workshop "Matrix" document: at https://www.wri.org/events/2020/12/market-design-clean-energy-transition-advancing-long-term.
Can you foresee a time when electricity would become a service and customers would pay a monthly subscription fee?	Opinions differ, but it seems likely that, over time, LSEs will need to recover more of their total costs through fixed charges rather than per MWh charges
How would LT markets address market-ready vs emerging techs? Even if tech isn't viable yet, how it is (not) considered influences timing & scale of other tech.	Three authors offer some thoughts on promoting technology innovation. See p. 9 of Workshop "Matrix" document: at https://www.wri.org/events/2020/12/market-design-clean-energy-transition-advancing-long-term.
Storage is the resource that can (and does already) bid at opportunity cost (in some mkts) that moves real time prices smoothly from abundance to scarcity.	Storage has many useful roles to play in affordable, reliable, low-carbon grids.
Why do we keep seeing this bizarre depiction of the supply-demand curve in a high-RES system? It ignores the cost of scarcity that grows incrementally.	The figure is not meant to be taken literally, but is rather a heuristic illustration of the impacts on moving from a grid with mostly positive-variable-cost generators to a grid with mostly zero-variable-cost generators.

Non-profit public power company customers pay 10% less than IOUs. Will municipalization help with deep decarbonization?	The challenges of deep decarbonization will likely be similar across various types of utilities.
Interesting that the OLTM administrator assembling the bid packages is not the RTO. In this fashion, it would be easier to promote cross-border RFPs. Correct?	The four authors offer various options for what entity administers the OLTM. An RFP would typically be "cross-border" in a multi-state RTO.
Can you speak to how these different OLTMs will help foster deployment of stand-alone storage?	The OLTM design in all four papers would allow stand-alone storage to participate.
How much attention should be given to the ambulance at the bottom of the cliff (ie demand rationing system) so it is safe and effective during extreme events?	A couple of the market designs (Corneli and Tierney) focus on trying to elicit a collection of investments that will support a very low probability of involuntary load shedding on a substantially decarbonized grid. More customer exposure to time varying prices could help to limit the likelihood of such events as well, by substituting voluntary demand rationing for involuntary load shedding. Emergency measures to maintain frequency during extreme events will still need to be developed and utilized when needed.
Is Tierney's flexible RA product similar to what California has, or is it entirely different?	Tierney's flexible RA product is more generic than what California currently has but it is intended to serve a similar purpose, which is to enable sufficient resource flexibility in response to varying and intermittent availability of renewable resources.
What is the argumentation for not considering carbon pricing?	Most experts agree that carbon pricing is foundational to climate policy, while acknowledging the political obstacles. All four papers offer an OLTM design that could operate with or without carbon pricing.
Steve has just decided what the market outcome should be - is that a market ?	All authors offer a market design, not a market outcome.
Would participants have an opportunity to reset their position based on a significant movement in the forward price curve projection? It's a question frequency	The Tierney and Corneli market designs are not built around forward energy prices (short-run marginal costs), but around the least-cost (long-run marginal costs) tranches of resources incrementally needed to meet system balancing and GHG emission requirements. The Gimon and Pierpont designs are built around forward projections or expectations of energy prices, and retrading of the contracts is intended to allow participants to adjust their positions over time.
Do you see a need in stronger harmonizing different states market designs? Do you see stronger needs for unbundling?	Several of the authors recognize that there are economies of scale and diversity, especially in renewable energy, that can best be realized with a large, regional market footprint. All propose at least an unbundling of transmission and distribution costs from energy costs.

Who would administer these auctions? Sue = RTO. The others? f	All four authors offer thoughts on market administrator. See p. 3 of Workshop "Matrix" document: at https://www.wri.org/events/2020/12/market-design-clean-energy-transition-advancing-long-term.
Are their any studies with an eye for an over abundance of energy?	Most studies suggest that, with sufficiently cheap solar and wind, it will be economic to overbuild to a degree, so that power is curtailed during some periods if it cannot be otherwise used or stored.
Do you think that hybrid power plants (wind+solar+storage) will be necessary to ensure the performance in the RT market?	A mix of all these resources will be needed, along with some firm, flexible and dispatchable clean resources. Whether these mixes are integrated in a single project (as "hybrids") or developed separately by specialists, will depend on the relative costs of such integration vs. specialization.
Aren't utilities sort of rushing to build out large-scale solar with an assumption that rate payers will get on board, when smaller solar is truly competitive.	The comparative economics of large vs small scale solar are very grid- and location-specific. And expert opinion can vary.
At Google IO they announced work with Fervo geothermal – something missing in models. Google's involvement suggests scale beyond NV - is this a key answer?	Geothermal technology that is competitive and available in a wide range of locations would be a welcome addition to the suite of "clean firm" generation options.