ESIG Webinar: Market Design Concepts for Evolving Power Systems	
Question	**Answer**
Do you have an opinion on European energy market reforms, such as proposed by Greece recently? The proposal included separation the market of RES from thermal.	We have not done a specific analysis on this proposed market reform, and so we cannot provide an quantified insights on this reform.
Is the EMIS tool combining both capacity expansion & production cost modeling analysis in one?	Yes, via an agent-based modeling approach, but not in a fully co-optimized manner. The investor agents make investment/retirement decisions based on price and resoruce utilization predictions from a suite of simple capacity expansion model scenarios, but any exogenous forward price predictions could also be used. The "actual" market clearing process then plays out using a production cost model. As the model moves to the next investment period, the agents then make recourse decisions and update their beliefs about the future through learning with Kalman Filters.
Does this work also examine &evaluate market designs that "level the field" among options that vary substantially in degree of variabilty and dispatchability?	We are exploring different eligibility rules across multiple technologies (primarily IBR resources), which includes cases that allow full participation to effectively help to "level the field."
What is the data source for correlated thermal outages? Is it from FERC forms?	We plan to use the correlated thermal outages from this paper: Murphy, S., Sowell, F., & Apt, J. (2019). A time-dependent model of generator failures and recoveries captures correlated events and quantifies temperature dependence. Applied Energy, 253, 113513.
was Gas w/ CCS (e.g. Allam Cycle) modeled in the 17 scenarios? why/why not?	No, it was not a technology option in our test system, but we plan to include more technologies in the future.
In the climate provisions of the new IRA, Congress clearly signalled that it wants a level playing field among the various zero-C generation options.	NREL is actively looking into the IRA language.

How are CETs modelled in these studies ? (edited)	In the EMIS analysis (the second study presented), we included three clean energy targets (CETs) by 2035: 45% (low), 75% (mid), and 100% (high). In each case, we assume a 30% CET in our starting year of 2021 and a linear increase in the annual CET to achieve the desired 2035 target (i.e., 1%/year to reach 45%, 3%/year to reach 75%, and 4.67%/year to reach 100% by 2035). The 30% CET starting point was arbitrarily chosen to be slightly larger than the clean energy level of the starting system. We assume clean energy includes generation from wind, solar, hydropower, nuclear, and RE-CTs. EMIS enforces these CET requirements on a capacity basis via the forward Clean Energy Credit (CEC) market. This CEC market was modeled in the same way as the renewable energy certificate (REC) market in our earlier publication, but with additional technology eligibility in the CEC case: https://doi.org/10.1016/j.apenergy.2021.117908
Are you consider some markets for grid forming inverters? For example are you consider GFM for inertia market?	No, not specifically for GFM. We only included a very stylized generic IBR elibility case were wind, solar, and batteries can supply FFR. We make the simplifying assumption that FFR from these resources (regardless of inverter type) can tradeoff equally with traditional rotating-mass inertial response because both ultimately contribute to the high-level system need of maintaining frequency at very short timescales
was there any consideration on demand side management?	No, but this is high on our wish list for future work.