Memorandum

TO: ANDY MCDONALD, APOGEE – CLIMATE & ENERGY TRANSITIONS

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DATE: SEPTEMBER 24, 2020

RE: COMMENTS REGARDING KYMEA'S 2020 IRP

Synapse was retained by Apogee – Climate & Energy Transitions to review public IRP communications made through September 2, 2020 by the Kentucky Municipal Energy Agency (KYMEA). The purpose of this review was two-fold: review KYMEA's integrated resource planning (IRP) process, KYMEA's current positioning, some critical IRP inputs, and appropriate actions and considerations over the coming months, years, and decades; and make suggestions on how to improve the process to allow for safer, more reliable, and lower cost outcomes for electric ratepayers ultimately served by KYMEA.

IRP Process

KYMEA has embarked on its first IRP. This is a promising action, demonstrating a focused interest on prudent decision-making that is in the best interest of its members and of ratepayers. This decision-making process should seek to best achieve KYMEA's objectives, balancing risk and reward in the near- and longer term. There are several points on the process that warrant emphasis:

1. A successful IRP process requires that KYMEA set clear goals and priorities focused on customers' needs and interests. These explicit goals and priorities should describe KYMEA's appetite for and concern with a variety of considerations including short-term bill impact, long-term bill impact, the risks associated with lower-than-forecasted or higher-than-forecasted customer bills, local economic impact, and support for the most vulnerable customers. While all of these are worthy, tradeoffs between improving one criterion at the expense of another are inherent in an IRP process. Clarifying goals and priorities now can be critical to guide rational decision-making later in the IRP process.

2. Good planning is free from irrelevant anecdotes that don't reflect KYMEA'S 2020 reality. The specifics about utilities serving customers across America vary widely, and KYMEA should ensure its examples are applicable to its own reality. For example, KYMEA serves a 300 MW load and is surrounded by PJM, MISO, and TVA, whose resources outnumber KYMEA's by a 1000:1 ratio. Comparisons to California's 50,000 MW system adjacent to lesser resourced balancing authorities is simply not instructive.

3. It is critical that KYMEA collect accurate data and keep it up to date. KYMEA should identify which inputs and forecasts result in stable IRP outcomes and for which inputs and forecasts small changes generate widely varied IRP results.

4. When building scenarios representing different futures, KYMEA should recognize that they aren't equally likely and therefore shouldn't be given equal weight.

5. In making an action plan, prioritize actions that appear in many or all of the resource portfolios the IRP process produces, especially if the downside risk is low or zero. Even if proposed actions won't *solve* future challenges, they can help to mitigate those challenges and make future decision-making more effective.

6. Had Mark Twain been a modern-day energy planning expert, he might have popularized the phrase "lies, damned lies, statistics, and scorecards." Scorecards provide the illusion of an unbiased, comprehensive decision that includes all of the factors known and unknown. In practice, it is trivial to slightly adjust the weights of the considerations and generate different preferred plans. Instead of choosing a "winning" portfolio based on information that won't be known for five or ten years to come, KYMEA will be better served focusing on immediate and near-term actions that are common across a variety of portfolio plans, particularly those with low risks. As will be explained later, this is especially true for KYMEA in 2020 because it has stable, low-cost options in the Midcontinent Independent System Operator (MISO) marketplace.

7. Transparency with the public and the media is important, including publishing all documents related to the IRP widely and as soon as available whenever confidentiality requirements allow. Relevant documents include but are not limited to inputs, parameters, forecasts, memos, contracts, interim reports, meeting minutes, slide decks, or other print, audio, or video material.

KYMEA Today

KYMEA finds itself surrounded by opportunity. Although it may hold several overpriced contracts, its exposure to longer-term, riskier contracts appears to be limited to those with Big Rivers Electric Corporation (BREC) and Paducah Power System (PPS). The Agency has contracts that roll off at the end of 2026 and 2028, and appears to have the option to reduce contractual obligations by 60 MW of peaking capacity as soon as 2022.[1] KYMEA's proximity to MISO is a significant advantage with respect to capacity, energy, diversity, and more. Its proximity to TVA, non-RTO investor-owned utilities within Kentucky—and to a lesser extent PJM—also provide additional optionality.

Given its relatively small size, KYMEA has a reasonable diversity of capacity and energy resources under contract. It is currently over-reliant on coal but has the ability to reduce that obligation relatively soon.

[1] KYMEA, "Board Packet," June 25, 2020. Page 71.

KYMEA's load shape is typical, with a needle peak that could be reduced with a targeted effort, potentially saving on capacity costs, transmission obligations and, to a lesser extent, energy costs.

There appear to be a notable lack of customer-sited initiatives within the KYMEA service territory when compared to other utilities. Energy efficiency (EE) opportunities likely abound, as programs and policies within Kentucky promoting EE are ranked a low 38th by the American Council for an Energy-Efficiency Economy.[2] Similarly, in June 2020 there was less output by distributed generation solar photovoltaic (DG PV) from Kentucky rooftops than from those in 37 other states.[3] That KYMEA isn't more actively promoting customer-sited resources is a bit perplexing. While investor-owned utilities often seek to profit from increased sales, "KYMEA exists to serve its members."[4] The good news is that there is great opportunity to use customer-sited resources such as energy efficiency and solar PV to reduce capacity and energy costs facing KYMEA.

Key IRP Inputs

Although some of inputs were available in public documents, and others made available, the complete set of inputs for KYMEA's IRP process are not wholly available at this time. Nevertheless, it is possible to compare some available inputs to other data sources available to the public, including the Energy Information Administration's 2020 Annual Energy Outlook (AEO 2020). Several key inputs are reviewed below.

Load Forecast

A load forecast is essential for an IRP, as it provides a reasonable expectation for the load profile in future years, including peak load, minimum load, and the shape of the load across all 8,760 hours of each year. Predicting the weather in future years is impossible, so the load forecast doesn't predict the load for a specific hour in a future year. Instead, incorporating climate information as well as economic, demographic, and other forecasts, it characterizes load information necessary for good planning.

As recently as a few years ago, utilities forecasted load growth on the order of 3 percent per year; several decades ago, it may have been 5-7 percent per year. In almost every single case, actual load growth has been less than forecasted load growth, often resulting in utilities procuring too much capacity as the anticipated growth never materialized.[5]

KYMEA's base case load forecast grows by approximately 0.5 percent per year, in what appears to be a considerably more reasonable growth rate. On the other hand, the future load should be compared to

[2] American Council for an Energy-Efficient Economy, "The State Energy Efficiency Scorecard," October 1, 2019.

[3] Energy Information Administration, "Table 1.17.A. Net Generation from Solar Photovoltaic," August 25, 2020.

[4] KYMEA, "Development of KYMEA," https://www.kymea.org/about/. Sep. 18, 2019.

[5] Charles R. Nelson and Stephen C. Peck (1985). The NERC Fan: A Retrospective Analysis of the NERC Summary Forecasts. *Journal of Business & Economic Statistics*, 3(3), 179-187.

historical load – has load been increasing or declining over the past 10-15 years, and if it hasn't been steadily growing, what justification does KYMEA have for a projection that doesn't align with the region's history. Furthermore, the Agency's inclusion of approximately 38 MW of load from Berea and Benham may be premature, and the IRP should certainly plan for futures with and without that obligation.

Many jurisdictions have experienced flat load over several years now and are forecasting no load growth in the coming decade despite growing populations and increasing GDP per capita metrics. This is because economic growth has decoupled from energy use; energy efficiency improvements for existing energy uses are reducing use, as are economic transitions from energy-intensive industries to activities that require less energy per useful economic output. Although KYMEA includes a Low Demand scenario, the load growth for that scenario was unobtainable at the time of this publication. Given the frequency of no-load-growth forecasts across the industry and given the broad availability of EE and PV opportunities within KYMEA, it is reasonable that the Agency both include a no-load-growth scenario and, when analyzing the appropriate portfolios for that scenario, consider how actively ensuring that no load growth occurs may result in lower bills for its customers. Conversely, KYMEA should consider significant growth in the latter years of its analysis due to substantial customer adoption of electric vehicles (EVs) and air source heat pumps (ASHPs).

Capacity

Capacity is the ability to serve load, and KYMEA is obligated to ensure enough firm capacity to meet customer demands on the hottest summer day, the coldest winter morning, and every hour in between, incorporating the reality that no resource is always available or always turns on when called to do so. The load forecast is, therefore, a critical input to capacity requirements.

Time Intervals

Within the IRP, the Agency must consider capacity options in four separate time intervals.

- **Now-term (2020).** KYMEA has a Paducah capacity contract option to reduce capacity obligation from 90 MW to 30 MW effective in 2023. This option should be explicit in IRP documents even if the option to exercise date falls before the final IRP publication. Furthermore, this option should be actively considered immediately, in tandem with the IRP process, to ensure that a limited-time opportunity to provide cost or risk reductions isn't lost due to inaction.

- **Near-term (2021-2022).** KYMEA has no near-term capacity needs unless a contract option to reduce capacity currently under contract is exercised. Potential sources of capacity that can be procured in the near-term include EE, DG PV, utility scale PV, bilateral contract PPA, and MISO transactions, although the quantity of EE and DG PV available over the next few years is rather limited, as these resources tend to develop steadily over several years. Similarly, the time to develop a utility-scale PV project is at least a year, typically several; on the other hand, a project in already in development may have some capacity available. Two- or three-year contracts for fossil-fueled capacity may be prudent if at a low enough cost ($/MW-day), but long-term fossil-

fuel contracts for capacity or for energy are almost certainly too risky given fuel price and environmental/regulatory uncertainty and KYMEA's satisfactory capacity position through 2026.

Although the Dynegy contract for 100 MW expires in 2022, the capacity charts provided by KYMEA[6] demonstrate a much smaller gap, perhaps 30 MW, consistent from 2022 – 2027, and only if Benham and Berea join the all requirements group.

- **Mid-term (2023-2028).** The Agency's mid-term options are similar to near-term, but with more time to understand how the capacity markets and capacity resources' capital costs are evolving. KYMEA will have to procure approximately 100 MW of capacity to serve by January 1, 2027. Given that constructing nuclear or coal-fired generation is not part of KYMEA's capacity considerations, it is too soon to take any action to specifically meet the 2027 capacity need at this time.

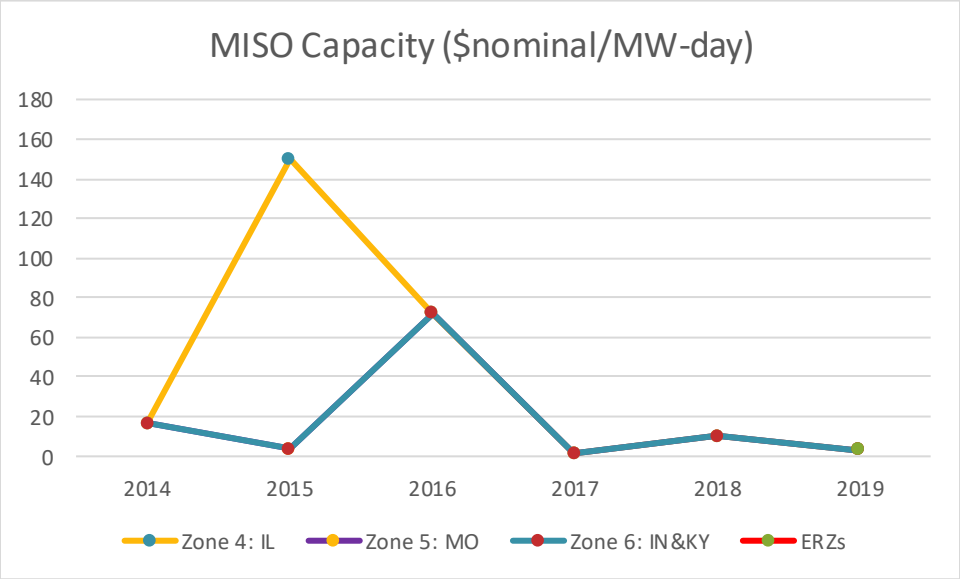
- **Long-term (2029-).** KYMEA will likely need even more capacity by 2029, though the long lead time obviates the need for any immediate action. On the other hand, it is reasonable to forecast the cost of capacity options this far into the future because there may be opportunities to procure long-term capacity options to meet mid-term needs that could have contracts extending this long. While fossil-fueled contracts would likely be too risky even for capacity, customer-sited resources could have lifetimes that extend to 2029 and beyond, as could utility-scale PV PPAs.

Capacity in MISO

Capacity in the MISO Planning Resource Auction (PRA) is available at a very low cost, and has been for five of the past six years (and only moderately priced in 2016). As shown in Figure 1 below, the most recent auction price is $2.99/MW-day in all zones near KYMEA, roughly one-tenth of the market price necessary to support the cost to build a new capacity resource, known as the cost of new entry (CONE). There is a surplus of generating capacity north of the Ohio River.

[6] KYMEA, "Integrated Resource Planning Community Focus Group," September 2, 2020. Page 65.

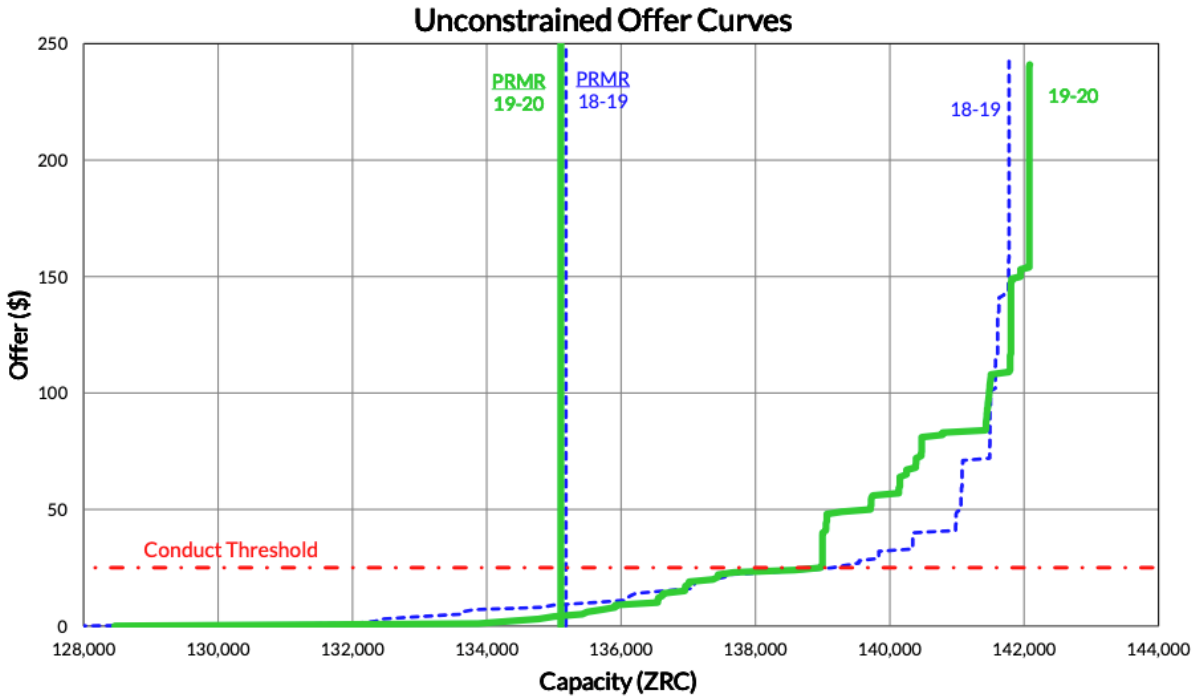
Figure 1: MISO Planning Resource Auction Clearing Prices in Zones 4, 5, 6, and in ERZs



Source: 2019/2020 Planning Resource Auction (PRA) Results, April 12, 2019.

While it can be challenging for a non-member to acquire capacity from MISO at the market price, the price provides a clear market signal of the market value of capacity in the entire region. Furthermore, not every resource bid into the MISO PRA clears; several thousand MW of capacity doesn't receive capacity payments, with bids just above the clearing price. These resources are therefore available for bilateral transactions, and while they may not be geographically or electrically proximate to KYMEA's load, multiple-party contracts may give KYMEA the opportunity to procure capacity from a just-out-of-market generator for slightly more than the MISO capacity clearing price. The supply curve for the past two MISO capacity auctions, shown in Figure 2 below, demonstrates the availability of low-cost capacity options, including approximately 3,000 MW priced between $3/MW-day and $25/MW-day.

Figure 2: MISO Planning Resource Auction Offer Curve, 2018/2019 and 2019/2020, $/MW-day



Source: 2019/2020 Planning Resource Auction (PRA) Results, April 12, 2019.

Near-term and mid-term capacity purchases should be weighed against the low cost of MISO capacity.

Utility Scale PV

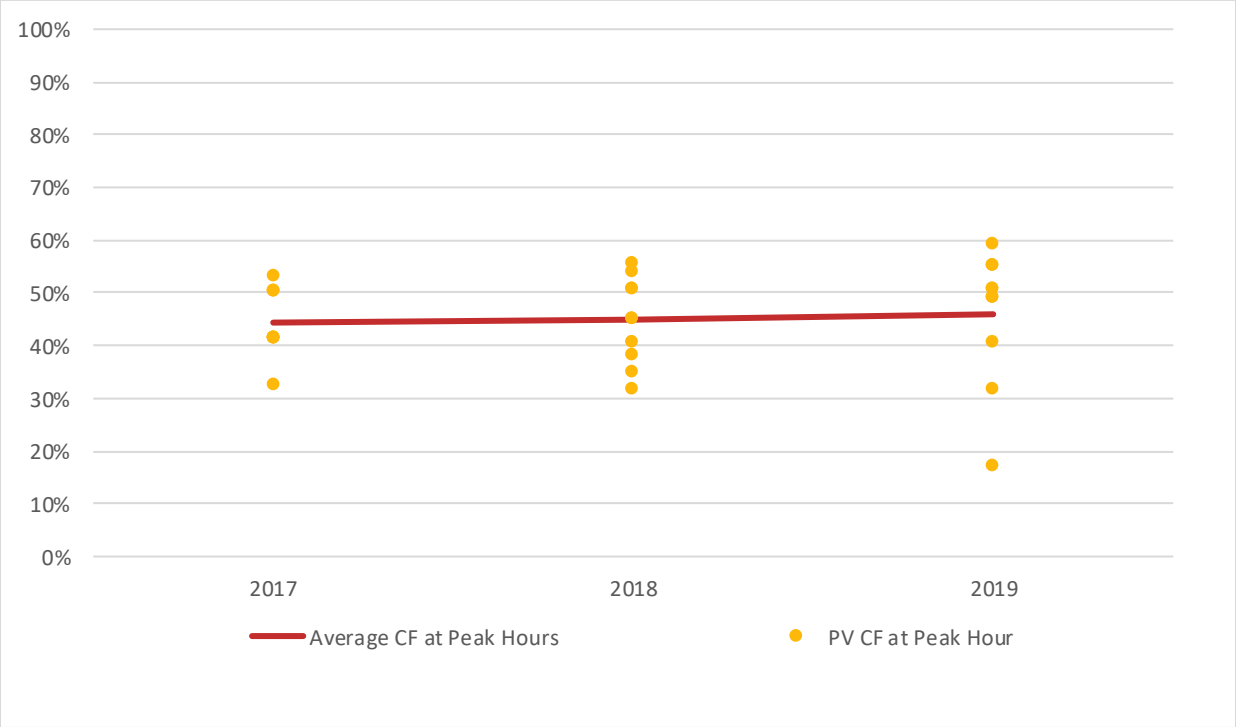
In addition to energy, utility scale PV provides capacity—though not its nameplate value. The capacity value of PV is associated with the installation's expected output at times of peak load. If a region's peak load is during nighttime hours, the capacity value of PV is zero. If, on the other hand, peak loads occur on sunny days, a solar PV installation will contribute to the utility's ability to provide adequate power during those moments, and therefore has a positive capacity value.

To approximate the capacity value of solar PV within KYMEA's territory, one can model solar PV output during the hours of the year with the largest load. Fortunately, the ten hours of highest load for each of 2017, 2018, and 2019 was available. To determine how much power a solar installation would provide during those hours, default inputs for the National Renewable Energy Laboratory's PVWatts[7] tool were used, and the power output for the relevant hour across every day of the month was used. In other words, to determine the solar output for July 21, 2017 hour end 16 (the largest load seen in 2017), the output for all 31 days of July hour end 16 were averaged, an average output of 41 percent of nameplate. A scatterplot demonstrating the solar output associated with the ten peak hours for each of the past three years can be seen in Figure 3, as can the line connecting the average across all ten points within

[7] National Renewable Energy Laboratory, "PVWatts Calculator," https://pvwatts.nrel.gov/.

each year, which has climbed from 44 percent in 2017 to 46 percent in 2019. In other words, an additional 2 MW of solar PV will provide nearly 1 MW of capacity during KYMEA's peak.

Figure 3 Solar PV Output During KYMEA Peak Hours



Source: KYMEA, PVWatts, Synapse analysis

It is important to recognize that this analysis is for a KYMEA system with 0 MW of solar. Of course, the Ashwood Solar I resource is scheduled to come online in several years. When it does, KYMEA's peak load hours *net of the Ashwood resource* will be different, and will likely occur slightly later in the day. This will have the effect of reducing the capacity value of additional solar, probably by a few percent. A detailed analysis should be performed before any solar resource is procured, to ensure the correct capacity credit is considered when making the decision.

Batteries

Electric batteries are a promising resource, as they can provide a long list of useful benefits including capacity, reserves, ancillary services, and help avoid the need for transmission or distribution acquisitions or upgrades. The price (per MW and MWh) is declining very quickly. This implies that (a) KYMEA should avoid purchasing batteries in the short-term unless they can be used to avoid a substantial alternative cost (such as a transmission upgrade), but also that (b) KYMEA should use appropriate declining cost curves when considering the role that batteries could play in its system in the mid-2020s and beyond. It is entirely possible that battery storage will become so cheap that pure capacity resources like CTs no longer make much sense, and that non-dispatchable resources like PV or wind grow useful across many more hours of the year.

Recommendations

KYMEA should be currently engaged in exploring options in its contracts – if it has the opportunity to make a decision in 2020 about contractual obligations for capacity (or energy), it should be actively considering the ramifications of that decision now. To the extent that it has a contract to procure capacity at a price well above $2.99/MW-day, it is a very good bet that it could procure replacement capacity at a lower price by 2022. Exercising an option to reduce a contractual obligation will also have implications on IRP decisions.

Even if KYMEA doesn't have capacity need until 2026, procuring additional resources that provide both capacity and energy might make sense if they offer long term (10 or more years) stable pricing in the neighborhood of $3/MW-day, and have appropriate energy pricing.

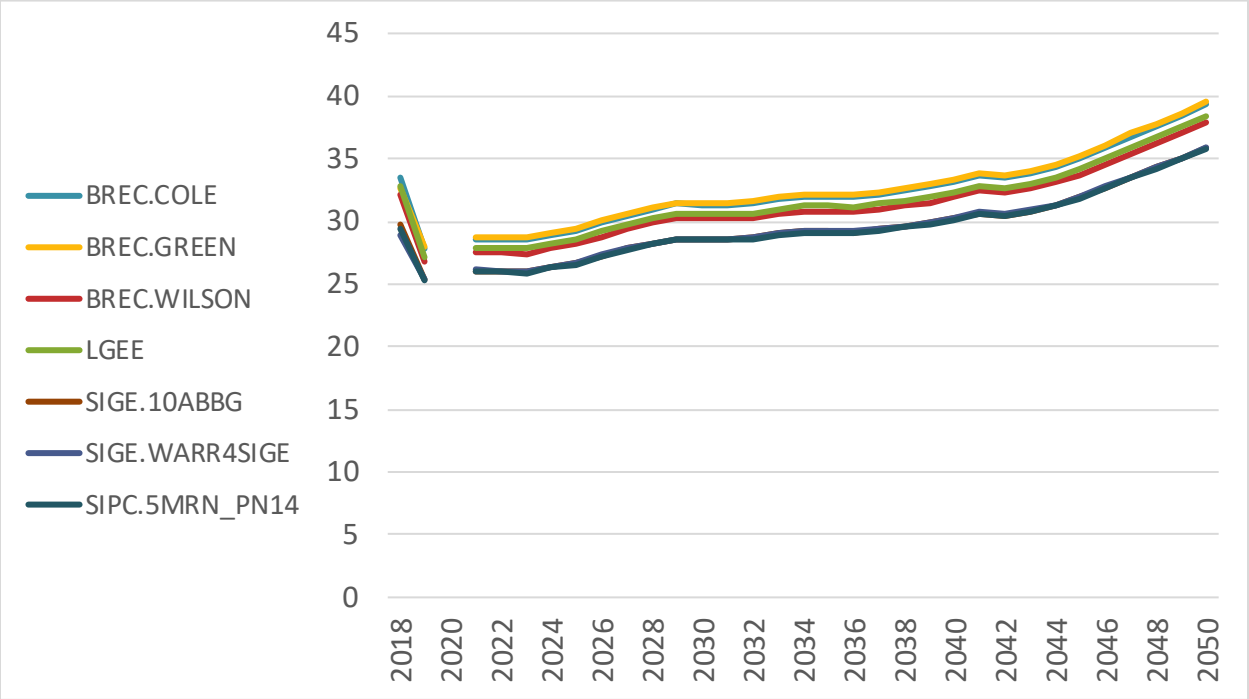
The Agency should also be actively negotiating with its counterparties regarding any contracts that are clearly out-of-the-money. Given the economic malaise that will certainly last well into 2021 and beyond, it is likely that demand will remain depressed, and hence capacity prices will remain low. KYMEA may find near-term savings by being aggressive with counterparties such as BREC, PPS, and Ashwood before the IRP is complete.

Energy

Energy available in MISO Central is inexpensive. The very low prices in 2020, may continue for a year or two before restabilizing; for long term planning the 2019 prices serve as a more reliable reference point. The load-weighted average locational marginal price (LMP) of energy in 2019 at the Louisville Gas and Electric Company node (LGEE) was $27.14/MWh, more than $5/MWh lower than the year prior. There is substantial downward pressure on prices, the result of low natural gas prices, new combined cycle gas turbine generating capacity, and increasing capacities of wind generation on the MISO grid. While coal-fired units could provide upward pressure, their declining capacity factors indicate that they're not participating in setting the market price in an increasing number of hours.

To project future prices of energy at nodes near to KYMEA, Synapse used AEO 2020's Table 54.16, the Electric Power Projection for the MISO Central region of the country, and escalated each node's load-weighted 2019 LMP by the increase in nominal cost of electric generation end-use price, which increases in nominal dollars by roughly 1.1 percent per year. Multiple adjacent nodes (e.g. BREC.COLE1, BREC.COLE2, BREC.COLE3) are consolidated by presenting the arithmetic average. Figure 4 presents the projection, with the aberrational 2020 LMPs omitted.

Figure 4: Projected Annual Load-weighted LMP at Select MISO Nodes ($/MWh)



Source: AEO 2020 Reference Case Table 54.16, historical MISO Day Ahead LMPs, Synapse analysis.

Recommendations

With nominal energy prices in MISO forecasted to grow more slowly than inflation, energy in the future is forecasted to be cheaper than energy today in real dollars. This forecast certainly isn't a guarantee, and KYMEA should weigh potential contracts for energy against this MISO future carefully. A long-term contract with exposure to fuel price increases should be avoided; a long-term contract within Kentucky with energy prices on the order of $30/MWh will provide reduced energy price risk, may provide transmission and line loss savings, and can lock in stable, relatively low bills for ratepayers.

Now-term Actions (2020)

There are several actions KYMEA can and should be taking right now in order to maximize its ability to lock in lower prices in the 2020s and beyond.

1. Avoid new long-term contracts with variable pricing before the IRP is completed. Prices will almost certainly remain low and stable for the next six months or more; rushing to enter a new obligation immediately before finalizing a resource plan is almost certainly imprudent.

2. The Agency should aggressively seek to renegotiate out-of-the-money contracts, while being very careful to not simply trade a slight price reduction for a more months or years of obligation to a contract that is still out-of-the-money.

3. KYMEA should review its contracts for opportunities to *reduce* its contractual obligations for capacity or energy that are well above the MISO prices of $3/MW-day or $28/MWh, starting with the opportunity to reduce the PPS capacity obligation by 60 MW. As prices in 2022 are likely to remain as low as they are in 2020 in real terms, reducing the length of out-of-the-money positions will prove to be a real cost-saver; achieving this rebalancing before completing the IRP will allow for better planning as well.

4. KYMEA should expand its energy and capacity options under study to include two resource options that allow for cooperation and cost-sharing.

    a. Consider KYMEA, municipal utility, or third party owned and operated resources within the municipal utility's service territory. This can provide additional transmission savings, increased reliability, and local economic benefits, and if solar PV, allows for a more geographically diverse set of panels, thereby reducing operational challenges associated with mixed cloud cover.

    b. Consider customer-sited, owned, and operated resources, namely increased EE and rooftop PV. EE should be cost-effective using a thorough Total Resource Cost (TRC) test that includes and properly values Other Program Impacts (OPIs), applied to the entire portfolio.[8] The portfolio could initially emphasize measures that provide demand reduction during the municipal or system peak. Solar PV should generally face south or southwest and be appropriately sized for the distribution circuit.

Short-term Positioning (2021-2022)

Short-term positioning entails research, planning, and preparation so that a decision made in the next year or two is prudent, appropriately balancing near- and long-term costs and risks. These items should be a natural outcome of the IRP, determined once the IRP analysis is complete.

1. KYMEA should prioritize actions that occur in many or all resource plans under most scenarios, especially if the downside risk is low. If the action occurs early in some portfolios but later in others, it may be prudent to accelerate the timing. Even if the short-term actions don't *solve* an energy, capacity, or other need, these actions will likely reduce a future challenge and capture value in the immediate years.

2. The Agency should opportunistically seek PV PPAs. KYMEA could become a junior tenant in a utility-scale PV installation, allowing the Agency to procure a few more megawatts of capacity and to lock in a low price for energy. This would also provide additional layers to the long-term contract portfolio, reducing exposure of significant future bill impacts in a single year. Diversity

[8] Tim Woolf et. al., "National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources," August 2020. https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-DERs_08-24-2020.pdf

of location and contract expiration reduces several different kinds of risks. Of course, the energy price must be nearly equal to or better than the energy it is replacing, or alternatively, allow for "wheeling" into MISO at neutral or better financial terms.

3. Locking in long-term decisions with significant downside risks such as those associated with regulatory changes, financial solvency of counterparty, or fuel cost eliminates the ability to engage in a better deal later. Instead, KYMEA should actively ensure that it has the flexibility to adapt to changing circumstances and secure low-priced resources in the future. With prices low and stable, the only long-term contracts KYMEA enters should be for fixed, low prices.

Mid-term Planning (2023-2028)

To the extent that exercising contract options or changing circumstances with counterparties results in a capacity need or an opportunity to save energy costs before 2026, KYMEA should consider the following framework:

1. MISO market prices are the standard against which others should be judged; the MISO marketplace is low-cost, stable, diverse, and liquid.

2. New coal-fired or nuclear-powered energy supply is not pragmatic. No new coal units are expected to be built in the United States, and no new nuclear units could be available in this time frame. Contracts with existing coal- or nuclear-powered units are conceivable, but should be avoided because the regulatory, capital expenditure requirement, and financial solvency risks are significant.

3. Incorporating more natural gas resources is a plausible action. However, natural gas resources simply cannot provide stable prices for both energy and capacity, as natural gas supply contracts or futures that extend four or five years or more into the future are simply not available at competitive prices, if at all. Scenarios where the price of natural gas declines considerably are difficult to imagine; scenarios where the price increases considerably due to fracking regulation, carbon pricing, or changes in export policies are far easier to envision. For that reason, any natural gas contractual obligation should be limited to two or three years in length.

4. In-state PV remains an excellent option for KYMEA if the pricing is favorable. KYMEA's procurement of PV is not limited to 105 MW;[9] surplus power can be sold, storage or load control can increase KYMEA's ability to absorb power during shoulder months, and output can be shaped. With a fixed price long-term contract for the output of an in-state utility scale PV resource there is no price risk, the energy is long-term hedged, there is little or no regulatory risk, and the exposure to congestion, transmission challenges, and MISO movement is reduced. Pricing must come in at or under $30/MWh (3 cents per kWh) to be competitive, and each

[9] KYMEA, "Integrated Resource Planning Community Focus Group Portfolios," September 2, 2020.

option should be weighed carefully to determine the full value of its capacity, energy, avoided transmission and distribution costs and challenges, and so forth. If in-state wind came in at these prices it too would be very attractive. However, current technology and policy doesn't appear to support prices nearly that low.

For capacity need beginning in 2027, or for energy cost savings in the 2027-2028 window, the approaches remain the same.

Long-term Vision (2029-)

The 2030s

What do the 2030s look like? If they look like the 2010s, a good plan for the 2020s will continue to serve KYMEA well. Simply keep looking for low risk opportunities to sign for capacity and energy. If, however, the 2030s see accelerated beneficial electrification, customer-sited load control, and increased environmental regulations, then KYMEA has ten years to be well-positioned for an IRP process in the late 2020s that will consider dramatically different resources and requirements. In a future with increased reliance on electricity, distributed flexibility in load, and reduced carbon emissions, KYMEA will be best positioned if it can produce timely, accurate pricing signals. This will likely incorporate

1. advanced metering infrastructure (AMI),
2. advanced ratemaking to provide the price signals,
3. customer-sited PV and battery storage, and
4. substantial increases in dispatchable load, such as EV charging and ASHPs for both space and water heating.

Such a future would also likely result in notably higher prices for fossil-fuel generation, resulting in

1. no coal-fired generation and a shift from natural gas combined cycle generators to more renewable resources,
2. batteries to time-shift energy and to provide capacity rather than fossil-fuel fired combustion turbines, and
3. increasingly complex real time operating, balancing, and planning.

What will KYMEA and its neighbors look like in the 2030s? What will the MISO and PJM footprints be, and what will their market rules require? Will a Southeastern RTO be formed by 2029? Will utilities within Kentucky have joined an RTO? Furthermore, what will the needs of KYMEA's members be in the 2030s? How about the individual customers?

Portfolios

There are several questions regarding the portfolios analyzed by the IRP that warrant careful consideration.

1. Is the "Balanced" portfolio tenable in a future where policy or technology relegates fossil-fired generation to the history books? Will KYMEA have entered into one or more long-term contracts for assets that will never be in-the-money again or are destined to be stranded?

2. Can KYMEA call a portfolio "net zero" without guaranteeing retirement of the renewable energy certificates (RECs) associated with the renewable generation? If KYMEA only procures the energy and capacity output of a renewable resource, or re-sells the RECs, it has no legal claim to the renewable nature of the generation. How has KYMEA modeled the REC value? What is the status of RECs or other environmental attribute certificates associated with the Ashwood Solar I project or the SEPA hydroelectric resources?

3. Perhaps most importantly, can KYMEA continue to take now-term actions and have near-term positioning guided by mid-term planning to track preferred portfolios while avoiding costly long-term mistakes?

Conclusion

KYMEA has tremendous opportunity to provide safe, reliable, low-cost power in the 2020s and beyond in a portfolio that minimizes downside risk. These actions almost certainly include significant utilization of MISO's low market prices, increased quantities of renewable generation for energy and capacity, and gradually increasing utilization of utility-sited and customer-sited generating and load resources, all while steadily reducing carbon emissions and the regulatory and price risk that accompanies pollution. While this outcome is clearly within the grasp of KYMEA, it is not a given. An insistence on doing business as its always been done, a refusal to be honest about the risks of long-term contracts for fossil-fired resources, and a disinterest in embracing the increasing complex real-time operations and near-term decision making associated with wind and solar generation, dispatchable load, and batteries will all result in prices higher than necessary and, quite possibly, KYMEA members leaving for greener pastures.

A commitment to openness and data sharing will improve KYMEA's chances of success, as will a more complete and enthusiastic engagement with stakeholders and the media. Finally, KYMEA must recognize that the opportunities of the future will be clean, and low-cost, and it must therefore avoid long-term commitments that don't align with both of those qualities.