

January 17, 2017

A Board meeting of the Electric and Water Plant Board of the City of Frankfort, Kentucky, was held at Farmers Bank and Capital Trust, located at 125 W. Main Street, Frankfort, Kentucky, on Tuesday, January 17, 2017 at 5:00 p.m.

ATTENDANCE:

Ralph Ludwig, Board Chair
Dr. Scott Green, Secretary/Treasurer
Walt Baldwin, Vice Chair
Anna Marie Pavlik Rosen, Board Member
John Cubine, Board Member
James Liebman, Board Attorney
Herbbie Bannister, General Manager
David Billings, Water Engineer
Harvey Couch, Marketing and Video Coordinator
Katrina Cummins, Asst. Finance Director
David Denton, Finance Director
Sharmista Dutta, Water Engineer
Monique Gilliam, Customer Service Director
Dana Goodlett, Cable Installation Supervisor
Gary Grider, Media Services Manager
Adam Hellard, Broadband/Security Manager
Ryan Henry, Asst. IT Director
John Higginbotham, Asst. GM Cable/Telecommunications
Scott Hudson, Electric Superintendent
Travis McCullar, Electric Engineer
Kathy Poe, Executive Assistant
Kim Phillips, Safety Director
Hance Price, Staff Attorney/Asst. GM Administration
Mark Redmon, Support Services Director
Julie Roney, WTP Superintendent
Dianne Schneider, HR Director
Alan Smith, Water Dist. Superintendent
Will Triplett, IT Technician
Zach Hubbard, Cable 10 Videographer
Rosalind Essig, State Journal
John Painter, nFront Consulting
Charlie Hamilton, Powell Walton Milward
Stanley Marcinec, Powell Walton Milward
Blair Johanson, Johanson Group

AGENDA

The Agenda for the Board Meeting was received and entered into the Minute Book as follows:

JANUARY 17, 2017 BOARD MEETING AGENDA

1. **Action Item:** Consider Approving Minutes for the December 20, 2016 Board Meeting.
2. **Action Item:** Consider Approving Renewal of FPB's Insurance Policies in the Amount of \$755,897.
3. **Action Item:** Accept Electric, Water and Cable Financial & Statistical Data for December 2016.
4. **Informational Item:** Public Comment Period.

5. **Informational Item:** Departmental Reports:
 - Website Customer Comments
 - Cable Dept.
 - Customer Service
 - Tanglewood
 - Electric Dept.
 - SEPA
 - KyMEA
 - Safety
 - Water Distribution
 - Water Treatment Plant
 - Administration Building
6. **Information Item:** Update on KyMEA's Assessment of Renewable Resource Options.
7. **Action Item:** Consider Accepting Johanson Group Report on Compensation and Benefits Study for Electric Department and Cable Construction Positions.
8. **Action Item:** Consider Award of RFQ 16-09 for Engineering Services for FPB Electric and Water AMI Business Case.
9. **Action Item:** Approval of Contractor Agreements for Storm Response with Davis H Elliot, Groves Construction, and Bowlin Companies.
10. **Action Item:** Consider Approval of Change Order No. 6 for the Administration Building for an addition of \$23,470.65.
11. **Action Item:** Consider renewal for direct agreements for Fox Sports Ohio, BTN, YES and Fox Broadcast VOD/TVE.
12. **Action Item:** Consider Approving Public Hearing Notice covering: (1) Increasing rate for Classic Cable service, (2) Increasing rate for Bulk cable I and Bulk cable II; (3) Reducing rate for HBO, (4) Changing names and speeds for High Speed Internet Offerings.
13. **Action Item:** Consider Awarding Cable-Telecom Infrastructure RFP to Finley Engineering-CCG Consultants (\$63,000).
14. **Old & New Business:**
15. **Informational Item:** General Manager's Comments.
16. **Request Permission to have Chair call for a Closed Session** pursuant to KRS 61.810(1)(c) for the discussion of proposed or pending litigation against or on behalf of FPB.
17. **Closed Door Session:**

BOARD ACTION

Mr. Ludwig called the meeting to order. Ms. Poe called the roll. She noted five (5) Board members in attendance.

1. **Action Item: Consider Approving Minutes for the December 20, 2016 Board Meeting.**

Mr. Cubine moved to approve the minutes for the December 20, 2016 board meeting. Ms. Rosen seconded. Mr. Ludwig called for the vote and the motion passed unanimously.

2. **Action Item: Consider Approving Renewal of FPB's Insurance Policies in the Amount of \$755,897.**

FPB's current insurance coverages expire February 5, 2017. Staff has completed renewal forms and worked with Charlie Hamilton at Powell Walton Milward to obtain the best coverage and prices available. Staff is prepared to renew the coverages shown in the detail section upon the Board's approval.

FPB has several different types of policies that cover a variety of risks. These policies are with several different companies. The overall premium to renew is \$755,897. This price does not include our pollution policy, which renewed last year for a three (3) year term and the Workers' Compensation policy which renews on July 1, 2017.

The total annual premium increased by 1.3% over last year with the most significant increase being with the Automobile policy premium. That increase is due to the mix of vehicles being higher for the larger heavier trucks. Although FPB has one less vehicle in the fleet this year, the fleet includes two more medium trucks and two more extra heavy duty vehicles. The insurance information as well as the ten (10) year policy premium comparison is included in the detail section of your board package.

The coverages are reasonably priced. More importantly, the companies pay our claims. Unlike some carriers in the past that have denied our claims, FPB currently receives payment for most claims. Powell Walton Milward has surveyed the marketplace and found that these policies offer the broadest coverages at the most competitive prices. Staff recommends renewal of FPB's insurance policies in the amount of \$755,897.

Mr. Price stated that the total cost included the renewal of all policies except the workers' compensation and pollution coverages. He noted a 1.3% increase from last year due to business income which increased by 2.7% and the change in the types of vehicles in the FPB fleet. He advised that the workers' compensation coverage would be brought back to the Board for consideration in July.

In response to Mr. Cubine, Mr. Hamilton stated that the package included both property insurance as well as general liability. He stated that the increase in property values and the increase in payroll were the main drivers for the cost changes of the package. He further explained insurance coverage under the property and general liability packages.

In response to Ms. Rosen, Mr. Hamilton explained the coverage for terrorism. He noted that the coverage was required and re-insured by the federal government.

Mr. Cubine moved to accept the proposal. Ms. Rosen seconded. Mr. Ludwig called for the vote and the motion passed unanimously.

7. **Action Item: Consider Accepting Johanson Group Report on Compensation and Benefits Study for Electric Department and Cable Construction Positions.**

At the October 2016 Board meeting, the Board approved engaging the Johanson Group to conduct a market study and to re-evaluate the classifications of the Electric Department and Cable Construction positions, as necessary. Blair Johanson will attend the meeting to review the results and recommendations with the Board.

If acceptable, Staff will proceed to develop an implementation plan and request specific changes with budget implications at a future Board meeting.

Ms. Schneider explained the history of the current compensation plan. Mr. Johanson explained the results of the study for compensation and benefits. He explained the number of positions reviewed and the number of responses received for comparison in the market. He stated that the study reviewed actual pay as well as the pay ranges.

Mr. Johanson advised that many of the lineworker positions and system technician positions show an average negative variance for actual pay. He further advised that the pay range structure for FPB was closer to the market average for these positions. He stated that actual pay was on average approximately 20% behind the market and that the range schedule was approximately 5-7% behind the market. He noted that Staff would come back to the Board later with recommendations for pay adjustments as well as minor pay range adjustments.

In response to Mr. Cubine, Mr. Johanson explained comparative information in the study results, which included utility companies competing with the FPB workforce. He further explained that actual pay as well as the pay ranges for these positions would need to be increased in order for FPB to remain competitive in the market. He discussed the evaluation process, which would need to take place in order to address and correct these issues. Mr. Johanson stated that power positions, line workers and system technicians were competitive in the market today.

In response to Mr. Ludwig, Mr. Johanson stated that this study was more heavily weighted on actual utility companies. Mr. Johanson further noted that competition in the market was likely the most prevalent driver in the difference

In response to Mr. Cubine, Mr. Bannister advised that the implementation of changes would come with the new fiscal year budget.

Mr. Cubine moved to accept the report on compensation and benefits study and that staff would develop a plan to bring back to the Board for approval and implementation. Mr. Baldwin seconded. Mr. Ludwig called for the vote and the motion passed unanimously.

3. Action Item: Accept Electric, Water and Cable Financial & Statistical Data for December 2016.

Mr. Denton discussed the statement of net position for the period ending December 30, 2016. He discussed assets, debt, liabilities, capital assets, cash and investments, and expenses and revenues. He further discussed bonds, leases and loans payable, and the financial performance companywide.

Mr. Cubine moved to accept the financial and statistical data. Dr. Green seconded. Mr. Ludwig called for the vote and the motion passed.

4. Informational Item: Public Comment Period

Mr. Ludwig opened the floor for public comment.

Andy McDonald:

In response to Dr. Green, Mr. McDonald stated that he worked for Earth Tools, he worked with sustainable energy consulting regarding solar energy projects and green building, and that he and his wife operate a farm together. He further stated that he had spoken to the FPB Board 5 or 6 times dating back 10 years.

Mr. McDonald requested the status of hiring an independent consultant and legal counsel regarding the review of the KyMEA All Requirements contract. He stated that members of Envision Franklin County were concerned that there had been little movement and urged the Board to expedite the process. He discussed concerns

raised in the Synapse report. Mr. McDonald further requested the status of the response to specific questions asked at the November meeting and if there was a timeline regarding these answers.

In response to Mr. Cubine, Mr. Ludwig advised that an update regarding the Reservoir would be discussed during departmental reports.

5. **Informational Item: Departmental Reports:**

Website Customer Comments: There were no website customer comments.

Cable: Mr. Goodlett explained graphs and numbers provided to the Board. He discussed trouble call numbers and issues, outage numbers, customer penetration numbers and VOD views.

Tanglewood: Mr. Higginbotham discussed status of work at the Headend location in connection with mitigation efforts. He explained the status of questions and answers, the removal of lighting and progress with final equipment removal from the old building to prepare for the demolition of that building. He further stated that additional clarification questions had been received from the Tanglewood Neighborhood Association and that FPB was working to obtain answers to those questions. Mr. Higginbotham stated that FPB Staff met with GRW prior to the meeting and that Staff was making progress. He advised that the goal was to bring bid documents to the Board in February

Customer Service: Ms. Gilliam discussed the customer service transaction survey. She stated that overall the results were trending high in billing services as well as starting and stopping services. She stated that the lowest survey areas referenced payment arrangements and reporting problems. She advised that Ms. Comer would provide the Board with a full and in-depth report at the conclusion of the survey in approximately three (3) months.

Ms. Gilliam explained communications regarding cycle billing. She stated that specific calls had diminished immensely. She explained that Staff was continuing communications through various media outlets to communicate specifics regarding budget billing, bank drafts, pool bills and other various customer questions.

Electric Dept.: Mr. Hudson explained graphs for the electric department and noted 36 outages for the month of December. He discussed the SAIDI numbers and outage numbers as well as causes for outages.

SEPA: Mr. Bannister explained SEPA graphs. He noted a loss in November of \$31,588 and stated that the kilowatt hours (kWh) were low due to taking the minimum allotment since the power is less profitable during this time.

In response to Mr. Cubine, Mr. Bannister stated that SEPA futures would likely be no better until the completion of repairs at Center Hill Dam in 2018 when SEPA will be more schedulable which would improve profitability.

In response to Mr. Cubine, Mr. Bannister stated that a loss in SEPA was budgeted.

KyMEA: Mr. Bannister stated that this item would be covered under Mr. Painter's presentation in item 6.

SAFETY: Ms. Phillips noted one (1) OSHA recordable accident for a strain and no (0) vehicle accidents.

Water Distribution: Mr. Smith noted three (3) main breaks and three (3) outages for the month of December. He stated that meetings were scheduled with the County Parks Board and with the City Commission to discuss potential commitments from each entity in connection with the community water fountain project.

Mr. Billings explained comments regarding the reservoir. He stated that Staff had contacted Parks and Recreation Department as well as Historic Properties in connection with relocating the reservoir at Juniper Hills Park or at Berry Hill. He advised that the Parks and Recreation Board voted unanimously against relocation at Juniper Hills Park. He stated that the meeting at the Optimist Club went well and that Staff would make the same presentation at the Kiwanis Club on Thursday.

Mr. Cubine discussed ongoing presentations and meetings regarding the reservoir project as well as the commitment to the community to answer questions and appropriately vet community concerns. He advised that he would like to have the item ready to be voted on in March. Mr. Ludwig stated that he felt like things were on track at this point and the Board wanted to keep things moving.

Water Treatment Plant: Ms. Roney stated that the water treatment plant produced 249 million gallons of potable water with an average daily production of 8 million gallons per day. She discussed a summary of water production for 2016 stating that more than 3 billion gallons of water were treated for the year with an average daily production of 8.26 gallons per day. She advised that this marked the fourth consecutive year in which water production increased.

Administration Building: Ms. Dutta discussed the overview of the site work and interior work to finalize the building. She noted that work on the ground floor was nearly complete and that furniture installation had begun. She discussed coordination with the IT and security departments in preparing for the move.

In response to Mr. Cubine, Ms. Dutta stated that coordination for the move was ongoing but the goal would be to move over a weekend in order to reduce disruptions for customers as much as possible. She further discussed communicating with the public regarding the upcoming move.

10. **Action Item: Consider Approval of Change Order No. 6 for the Administration Building for an addition of \$23,470.65.**

Change Order No. 6 was originally presented at the December 2016 board meeting. It consisted of 11 items and an addition of \$24,795.65. The board voted to approve all items except for Item #3. Item #3 consisted of four line items, two of which related to the shades in the board/community room. The revised Change Order 6 being presented tonight reflects the deduction to remove the electrical controls for the blackout shades and replace with manual shades. Additional items requiring a change order since the last board meeting have also been included.

The revised change order consists of 16 items for an addition of \$23,470.65.

A summary of the change orders is listed below:

Summary:

Original Construction Contract	\$15,730,293.00
Change Order #1 (addition):	\$ 23,306.00
Change Order #2 (deduction):	\$ (94,775.42)
Change Order #3 (deduction):	\$ (50,753.00)
Change Order #4 (addition):	\$ 9,397.00
Change Order #5 (deduction):	\$ (12,967.90)
<u>Change Order #6 (addition):</u>	<u>\$ 23,470.65</u>

New Contract Amount: \$15,627,970.33

Staff recommends the Board approve Change Order #6 with Marrillia Design and Construction.

Ms. Dutta reiterated discussions from last month's meeting and the revisions requested by the board. She reviewed and discussed the revised change order as well as new items added to the change order. She stated that items 1-11 were the same as presented in the December meeting and further explained details of each item added to the revised change order.

Ms. Dutta explained the revisions to item number 3 as requested by the board for a reduction in cost of the blinds in the board/community room.

Mr. Cubine moved to approve the change order as presented. Dr. Green seconded. Mr. Ludwig called for the vote and the motion passed unanimously.

6. **Information Item: Update on KyMEA's Assessment of Renewable Resource Options.**

At the December 14 KyMEA Board meeting the consultants presented the Assessment of Renewable Options that the KyMEA Board had ask them to study to determine how best to proceed as to renewable options.

- The goals of this assessment of renewables were to:

Identify the types of renewable energy resources that might be considered further for incorporation into KyMEA's Portfolio as soon as May 1, 2019;

Develop high level estimates of the magnitude of the impact on the Members' costs of all requirements power supply of those renewable resources; and

Identify appropriate next steps based on the results of the study.

- Remember:

The analyses presented in this Assessment of Renewable Resource Options are intended to be used by KyMEA to screen potential options, narrow the list for further consideration, and provide a greater understanding of the key issues that will need to be considered in structuring procurement processes and evaluating proposals received from prospective suppliers.

The analyses are not intended to be a basis for a final decision to proceed (or not proceed) with any particular resource or to provide a definitive assessment of the projected increase or decrease in costs that may be incurred by KyMEA and its Members by implementing any particular resource.

- The following was recommended:

- KyMEA should Give Further Consideration to Purchasing or Otherwise Obtaining Capacity and Energy from Renewable Resources

- Solicit Proposals through a formal competitive procurement process
- Consider both utility scale and smaller community solar projects
- Consider resource integration costs
- Consider energy from projects connected to MISO, the LGE/KU transmission system, and one or more Member Systems

- Work with any KyMEA Member or Group of Members that Decide to Consider Renewables Independently

- Would allow consideration of that Member's unique priorities
- Options include:
 - Member-Owned Resources
 - Customer-Owned Resources

At the December 14 KyMEA Board meeting the KyMEA Board directed the consultants to:

To finalize its Assessment of Renewable Resource Options and to develop a plan for an RFP that would solicit proposals to provide capacity and energy from renewable resources and to present a draft of that plan at the KyMEA Board's January meeting.

Further, the RFP should solicit proposals to sell energy from wind and solar resources under PPAs providing preference to resources located in KY and additional preference to resources connected to the LGE/KU transmission. The RFP should also solicit proposals that would involve construction of new solar facilities connected to systems of one or more KyMEA Members.

Mr. Bannister introduced John Painter of nFront.

Mr. Painter reviewed a presentation regarding KyMEA's assessment of renewable resource options. He stated that the assessment was to look at the broad view of renewables to enable KyMEA to take the next step to narrow down the options. He advised that the options researched included wind, solar photovoltaic, hydro energy, and alternative fuel resources including biomass and landfill gas. He stated that the group went out into the market and requested indicative pricing and indicative proposals. He advised that he had included information received from other clients into this study. He further advised that past experience dictated that pricing, promises and details were usually better once the actual request for proposals were completed and sent out into the market.

Mr. Painter explained cost differences with wind resources compared to the cost of conventional resources. He advised that it was most likely that a competitive bid would come from the zones of MISO for wind energy.

Mr. Painter stated that the consultants looked at three (3) different types of solar projects. He discussed buying solar from an established project under a Power Purchase Agreement, building a solar project large enough to enjoy economies of scale or building a smaller community solar project. The differences being primarily the ability to take advantage of current tax incentives. He advised that the most attractive options would likely be buying solar from a large project connected to the bulk transmission system or building a solar project that is large enough to enjoy economies of scale but handle the ownership of it in a way so that the tax incentives could be beneficial.

Mr. Painter advised that consultants recommended that the KyMEA Board give further consideration to purchasing or otherwise obtaining capacity from renewable resources particularly solar and wind, and that KyMEA should undertake an RFP process to determine what options were available in the market, then make decisions based upon the proposals received. He advised that the consultants also recommended that KyMEA work with individual municipalities to develop a project which would be cost effective if the proposals from the market did not produce pricing favorable to the overall portfolio

Mr. Painter advised that the KyMEA Board instructed the consultants to create a plan to proceed with the RFP process. He further advised that the consultants are working on that plan for presentation to the KyMEA Board next week. He stated that if the plan was approved that it was expected that they would be ready in February or March to move forward with the RFP for renewable resources, which would likely be published in March or April.

In response to Mr. Cubine, Mr. Painter stated that the RFP would ask for proposals for three (3) categories: 1) proposals from developers or owners of renewable resources connected to the bulk transmission system which range in size from 25 megawatts up to 50 megawatts; 2) proposals for building a project between 1 megawatt and 10 megawatts that could either be connected to a members distribution system or to the bulk transmission system; and 3) build a small project connected to a member's distribution system that is less than 1 megawatt (likely a

community solar effort). Mr. Painter further stated that there were tremendous advantages in private sector initiatives as opposed to being contracted for and built by a municipal. Mr. Painter stated that five (5) builders were currently following this initiative and were interested in the agency's path with renewable resources.

In response to Mr. Cubine, Mr. Painter explained three (3) possible decisions that could come from the review of proposals. He stated that 1) there are no proposals that make sense to move forward; 2) a viable option is found and efforts continue to incorporate that option into the KyMEA portfolio via contract; or 3) an option may not fit in the portfolio but may fit the needs of a KyMEA member. Mr. Painter stated that a great deal of data would be generated within the results of RFPs.

In response to Mr. Ludwig, Mr. Painter stated that the term of these renewable contracts would typically be longer. He further explained how renewable energy pricing could change in the coming years. He discussed potential contract terms and risks, the manner in which FPB could be effected by energy costs, and the necessity to remain competitive.

In response to Mr. Baldwin, Mr. Painter further explained the scale of pricing and the reason for requesting proposals for certain capacity amounts.

In response to Mr. Baldwin, Mr. Painter discussed demand side management and energy efficiency programs. He stated that most customers are currently working on efficiency programs. He further stated that some utilities are finding it beneficial to help, particularly residential customers, with various educational programs, rebate programs and other programs to promote energy efficiency. He advised that FPB could evaluate all the efficiency and demand side management programs available and decide which ones make sense for Frankfort. He stated that demand side management and energy efficiency programs would not be included in the RFPs for renewable energy resources.

In response to Mr. Baldwin, Mr. Painter stated that the indicative price points received from the example PPAs were protected by non-disclosure agreements and could not be publicly disclosed. He advised that a summary of that information was included in the presentation provided. Mr. Baldwin requested to see the hard numbers if possible. Mr. Painter stated that the consulting group would assemble information on indicative pricing and provide it to the Board in a way that is consistent with the non-disclosure agreement.

In response to Mr. Ludwig, Mr. Painter further discussed information regarding the wind projects in Indiana. He explained that the resources included large wind turbines intended to be utilized for power generation.

In response to Ms. Rosen, Mr. Painter stated that the KyMEA Board was making every effort to have the lowest cost power supply that is likely to remain competitive with Kentucky Utilities. He further stated that since one-third (1/3) of the capacity in the portfolio past the year 2022 was coal, the group was of the belief that the portfolio did not contain too much coal since Kentucky Utilities, KyMEA's principal competitor, was utilizing much more coal. He further explained potential changes and the manner in which KyMEA's portfolio is designed so that its energy prices can remain competitive.

In response to Mr. Baldwin, Mr. Painter reiterated that one-third of the capacity in 2022 would be from coal and further explained that KyMEA was currently negotiating a contract for additional natural gas resources. He reiterated that the portfolio was well balanced and would allow KyMEA rates to remain competitive. He stated that the 100 megawatts from Dynegy would not be renewed past the year 2022.

8. **Action Item: Consider Award of RFQ 16-09 for Engineering Services for FPB Electric and Water AMI Business Case.**

As part of our ongoing efforts to improve service to our customers, staff has started a formal investigation into the benefits of an advanced metering infrastructure (AMI) deployment. To better understand the costs, benefits, and the potential technological solutions available with AMI systems, staff issued a request for qualifications to perform an AMI business case. RFQs were sent to five firms who have previously demonstrated expertise in smart grid development. Three responses were received. A selection team of employees from management, electric, water and IT reviewed the submitted proposals and ranked them as follows:

- 1) VASS Solutions
- 2) Valutech Solutions

Patterson and Dewar Engineers also submitted a proposal, but the selection team did not feel they qualified for ranking based on the information provided.

VASS Solutions was selected as the top ranked firm based on the exceptional qualifications of the project manager and the firm as a whole, as well as extensive experience performing AMI and other smart grid business case studies for utilities. As a small, but highly experienced consulting firm, Vass is well suited to dedicate the resources necessary to ensure a successful study. Mr. Mark Michaels, who has been selected as the project manager for this engagement has over 34 years of utility and telecommunications experience.

The AMI business case will be performed in alignment of key areas of focus for FPB, including:

- Better serving our customers with better information regarding their energy and water consumption.
- Controlling costs through increased operational efficiency.
- Improving system reliability and safety.
- And continually improving our ability to operate in an environmentally and socially responsible manner.

Staff has negotiated a contract with VASS Solutions for an amount not to exceed \$52,750 plus travel expenses. The scope of services include assessing AMI costs and benefits, identify available AMI solutions, provide a cost benefit model, and develop an AMI implementation strategy. FPB staff and VASS have agreed upon a 120 day schedule for this project. After the project is completed, the findings of the AMI business case will be presented to the Board, so that the members may consider deployment and budgeting of an AMI system based on findings of a complete evaluation of the implications for FPB and our customers.

The RFQ and response from both VASS and ValuTech are included in the detail section.

Mr. McCullar explained that the project was to evaluate the feasibility of AMI for FPB. He explained qualifications of the firms responding to the RFQ. He stated that Staff recommended the approval of Vass Solutions and further explained the specifics of the statement of work and master service agreement as well as the cost.

In response to Mr. Cubine, Mr. McCullar stated that the goal was to have the results of the study back to the Board so that the implementation could be budgeted for the 17-18 budget cycle. He further noted that the technology had improved and the cost of the technology drastically decreased.

In response to Ms. Rosen, Mr. McCullar advised that the metering would be for both electric and water. He further explained that the water meter would talk to the electric meter and the electric meter would send all information back to FPB.

Mr. Baldwin moved to award RFQ 16-09 for Engineering Services for FPB Electric and Water AMI Business Case. Mr. Ludwig seconded. Mr. Ludwig called for the vote and the motion passed unanimously.

9. **Action Item: Approval of Contractor Agreements for Storm Response with Davis H Elliot, Groves Construction, and Bowlin Companies.**

Staff ask that the board approve agreements with Davis H Elliot, Groves Construction, and Bowlin Companies for storm response. In order for FPB to be eligible for FEMA reimbursements we must have on file agreements with contractors that can provide services to FPB in an outage restoration.

These three (3) companies have provided pricing and would charge these amounts to FPB for work performed in an outage restoration after an emergency such as a storm. These companies are located in Kentucky and perform quality work. Staff ask that the board move to approve the agreements and rate sheets with Davis H Elliot, Groves Construction, and Bowlin Companies.

Mr. Hudson discussed the contracts for storm response companies. He advised that these services would only be utilized if there were to be a major storm event or natural disaster. He further advised that FPB was required to have these contracts on hand by FEMA to receive reimbursement.

In response to Mr. Ludwig, Mr. Hudson stated that this was similar to mutual aid agreement except that if a storm was to hit the state, neighboring communities may not be available to help because they may have their own outages/clean up to address.

Mr. Cubine moved to approve. Dr. Green seconded. Mr. Ludwig called for the vote and the motion passed unanimously.

11. **Action Item: Consider renewal for direct agreements for Fox Sports Ohio, BTN, YES and Fox Broadcast VOD/TVE.**

The Cable Advisory Committee and Staff recommend the approval of the following direct agreements: (1) Fox Sports Ohio on Classic Cable; (2) Big 10 Network (BTN) on Preferred Cable; YES Network on the Sports Plus tier; and (4) Fox Broadcasting Network for the rights to Fox Broadcast VOD and TVE. As a reminder to the Board, these agreements expired on December 31, 2016 and the Board approved a 30-day extension last month to complete these agreements. The term of these agreements will be retroactive to January 1, 2017 and extend until December 31, 2019. The increases in license fees were anticipated in the FY17 budget and the outstanding technical issues within the agreements have been resolved. No additional launches or carriage changes are required with this renewal. The Assistant GM-Administration has reviewed the agreements and they meet with his approval.

Mr. Couch stated that Staff and the Cable Advisory Committee recommended approval and explained the direct agreement. He explained the terms and conditions as well as the channels included. In response to Mr. Cubine, Mr. Couch stated that there was no direct rate increase for this agreement as the pricing was anticipated and budgeted.

Mr. Cubine moved to approve. Dr. Green seconded.

In response to Ms. Rosen, Mr. Couch explained that the increased costs were included in the cost increase to be discussed in the next item.

Mr. Ludwig called for the vote and the motion passed unanimously.

12. **Action Item: Consider Approving Public Hearing Notice covering: (1) Increasing rate for Classic Cable service, (2) Increasing rate for Bulk cable I and Bulk cable II; (3) Reducing rate for HBO, (4) Changing names and speeds for High Speed Internet Offerings.**

Staff recommends the Board approve the Public Notice for the purpose of conducting a public hearing at a special meeting of the Frankfort Plant Board on February 7, 2017 at 5 pm at the Farmers Bank Community Room.

1) Increase rate for the Classic Cable tier:

The public notice proposes to increase the Classic Cable tier (channels 2-95) rate from \$60.15 per month to \$63.50 per month effective March 1, 2017. The increase is needed to keep pace with increases in the wholesale license fees FPB must pay to programmers.

2) Increase rate for Bulk Cable I and Bulk Cable II

The public notice proposes to increase the Bulk Cable I from \$11.10 per outlet per month to \$12.00 per outlet per month effective March 1, 2017. Bulk Cable I, as defined in the FPB Tariff, typically includes hotels and KSU dormitories. The increase is needed to keep pace with increases in the wholesale license fees FPB must pay to programmers. Staff proposes to increase Bulk Cable II from \$19.35 per outlet per month to \$20.39 per outlet per month effective January 1, 2016. Bulk Cable II, as defined in the FPB Tariff, typically includes office complexes with more than 8 outlets. This increase is needed to keep pace with increases in the wholesale license fees FPB must pay to programmers.

3) Reduce rate for HBO:

The public notice proposes to decrease the rate for HBO (channels 300-307) from \$20.00 to \$18.50. The decrease is a result of a new agreement executed by NCTC for carriage of HBO.

4) Changing names and speeds for High Speed Internet Offerings:

The public notice would not change any High Speed Internet Offerings, but FPB would make the following changes to speeds and names of Internet tiers. Additionally, the public notice proposes to establish a new tier and price for 100Mbps.

Existing Max Download	Existing Max Upload	Existing Res / Biz Pricing	Proposed Name	Proposed Max Download	Proposed Max Upload	Proposed Res / Biz Pricing
1 Mbps	128 Kbps	34 / 52	Lite	1 Mbps	128 Kbps	34 / 52
10 Mbps	1 Mbps	44 / 82	Standard	10 Mbps	1 Mbps	44 / 82
20 Mbps	2 Mbps	56 / 112	Premium	25 Mbps	3 Mbps	56 / 112
30 Mbps	3 Mbps	68 / 142	Ultra	50 Mbps	5 Mbps	68 / 142
N/A	N/A	N/A	Elite	100 Mbps	10 Mbps	80 / 172

Mr. Higginbotham explained the necessity of a public hearing as well as the requested date, time and location of the public hearing. He further explained specifics of the changes noted above for which FPB was soliciting comments. Mr. Couch explained corrections for Bulk Cable changes. Mr. Higginbotham continued with the explanation for the HBO reduction and Mr. Couch explained changes for broadband offerings and name changes for the broadband tiers.

In response to Mr. Baldwin, Mr. Couch stated that the changes would be effective March 1, 2017. He advised that testing on the 100 meg speed had been ongoing with positive feedback and that the IT department felt comfortable rolling out the new speeds. Mr. Henry explained capacity planning, upgrades at the new headend and results of testing to avoid congestion at the increased speeds.

In response to Ms. Rosen, Mr. Couch stated that the industry was trending toward using words to describe tiers in place of numbers to help alleviate confusion.

In response to Mr. Rosen, Mr. Couch stated that due to carriage agreements already in place, there were no channels that could be removed from the lineup in order to reduce or eliminate a rate increase. He further advised that the networks that could offset the increase were the most watched and most desired networks on the lineup.

Mr. Higginbotham explained that the Limited Tier had not been increased in several years. He further explained increases for the retransmission consent agreements for local channels and advised that retransmission consent would be in front of the board for consideration by the end of 2017. He stated that the expectation was for the retransmission costs to nearly double to around \$22 to \$24 dollars if FPB continued to carry all Lexington and Louisville channels. He further discussed the possibility of utilizing survey tools to involve the customers in the discussion of whether to maintain all the local channels or dropping some to control costs.

Mr. Higginbotham further explained federal law, which requires FPB to carry local channels and does not allow the customer to opt out of the purchase. He explained FPB's competitive advantage due to the ability to carry all local channels since satellite companies cannot.

In response to Mr. Cubine, Mr. Higginbotham reiterated that this rate increase was a strict pass through of programming increases in place with current approved agreements and that none of the revenue received from the price increase would be utilized for administrative or operating costs. He further explained that the vast majority of the increase was for sports programming.

In response to Mr. Baldwin, Mr. Higginbotham stated that IT would email data regarding the network saturation and impact that the new speeds would have on the existing services. Mr. Henry stated that equipment would bond channels.

Mr. Ludwig stated that the Board was being asked to approve a public hearing to be held on Tuesday, February 7, 2017 at 5:00 p.m. at the 4th floor community room at Farmers Bank. Mr. Cubine moved to conduct the public hearing. Mr. Baldwin seconded. Mr. Ludwig called for the vote and the motion passed unanimously.

13. Action Item: Consider Awarding Cable-Telecom Infrastructure RFP to Finley Engineering-CCG Consultants (\$63,000).

Staff recommends the award of the Cable-Telecom Infrastructure Study to Finley Engineering/CCG Consulting. As part of the FY17 budget, staff issued an RFP to identify and hire an outside consultant to provide:

- * Assessment of FPB's existing outside plant and alternatives for improving the infrastructure in order to meet current and future wholesale and retail demands by subscribers in the offering of voice, video and data products.
- * Capital and operating costs of alternate infrastructure design versus costs associated with improving the existing plant and design.
- * As applicable, a business case and deployment plan that allows FPB to provide services during a transition and/or maintain existing services long term while migrating services to a new infrastructure.

Additionally – this proposal includes an optional evaluation of current business in order to look for efficiencies and opportunities to reduce operating expenses. Staff believes this a good value (\$7,500 which is included in the \$63,000) and seeks adding this option to the agreement.

The RFP was sent to nine companies on October 3, 2016 and the responses were due on November 4, 2016. Five of the initial nine firms submitted a response to the RFP and one additional company submitted a response by the deadline. Eight staff members scored and then ranked the submittals and based on the factors included

in the RFP, Finley/CCG scored the second best score – but had the lower cost and the added financial analysis. Staff negotiated the agreement and the Assistant GM-Administration has review the agreement and it meets with his approval.

If approved, the evaluation would begin later this month with the project competition set for 120 days.

Mr. Higginbotham explained discussions, re-evaluation and negotiations based on board instructions from the December board meeting. He stated that Finley met all the main goals plus added additional services for an operational evaluation. He explained that this evaluation would offer FPB ideas which could reduce overhead and operational expenses. He explained costs associated with the additional work as well as the overall cost. He stated that Staff recommended approval of the Finley proposal and to include the addition of the operational evaluation. He advised that Staff would like to get approval so that the study results could be used in the upcoming budget process.

In response to Mr. Baldwin, Mr. Higginbotham explained the market research goals and the request to scale back in an effort to reduce costs. He advised that his decision was based on information received from other municipals that have completed this type of research. At the request of Mr. Baldwin, Mr. Higginbotham explained the rating process, cost specifics and customer references. Mr. Higginbotham further explained the manner in which contact information was collected for distribution of the RFP.

In response to Mr. Baldwin, Mr. Price stated that this was a professional service and that the Board could choose whichever firm it felt was best suited for the work. Mr. Cubine explained the State's rule for procurement of professional services.

In response to Ms. Rosen, Mr. Higginbotham explained the location of Finely Engineering and Engineering Associates. He further discussed infrastructure projects for other Kentucky municipals.

Mr. Baldwin stated that he would like to see Staff spend some time thinking about their recommendation if the price difference was off the table and whether or not that affect their choice. Mr. Baldwin also requested to review the customer reference data and stated he would like Staff to reach out to CTC Technologies regarding this project as well.

14. Old & New Business:

- Mr. Baldwin requested information regarding the progress of investigating participation in samsknows. Mr. Higginbotham explained information received from samsknows regarding the ability to participate in the program. He discussed the cost of participation, recurring fees, license fees and equipment costs. Mr. Baldwin requested that Staff research options for participation through the FCC/Broadband USA and to reach out to CenturyLink or other participants to discuss.
- In response to Mr. Baldwin, Mr. McCullar discussed the color of the light emissions for the LED lighting projects. He explained that FPB based the decision on the AMA standards regarding light emissions. He further discussed general improvements of HVS fixtures and stated that those would be replaced with a new LED fixture as they stopped working. Mr. McCullar advised that if the HVS was working but there was a customer complaint, then FPB would install a shield. He further advised that the City wanted to replace a sample of approximately 300 of its 400-watt fixtures that consisted of all the City's mercury vapor fixtures. He advised that the payback period was significantly shorter with this scenario.

15. Informational Item: General Manager's Comments.

None

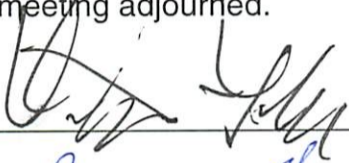
16. **Request Permission to have Chair call for a Closed Session** pursuant to KRS 61.810(1)(c) for the discussion of proposed or pending litigation against or on behalf of FPB.

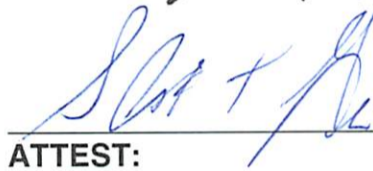
Mr. Cubine moved to go into closed session. Dr. Green seconded. Mr. Ludwig called the vote and the motion passed unanimously.

17. **Closed Door Session:**

The Board adjourned from closed session and returned to open session. Mr. Baldwin moved to release the response from Tom Trauger to EnvisionFranklin County. Ms. Rosen seconded. Mr. Ludwig called for the vote and the motion passed unanimously.

With no further business to discuss, the meeting adjourned.





ATTEST:

The projections herein are preliminary and will change based on further investigation. See Slide 3 for more information.

Kentucky Municipal Energy Agency

Assessment of Renewable Resource Options (Screening Level Analyses)



December 14, 2016

Revised 12/19/2016

Public Information



Status Report – Renewable Resource Assessment

The objectives of this presentation are:

- Review initial results of comparative analyses;
- Review input received during Frankfort stakeholder meeting; and
- Provide our conclusions based on the analyses prepared.

To accomplish the above objective, the following topics will be discussed

1. Goals of current assessment;
2. Alternatives and key assumptions;
3. Results of the Comparative Analyses; and
4. Preliminary conclusions.

Goals: Assessment of Renewable Energy Resources

The goals of this assessment of renewables were to:

1. Identify the types of renewable energy resources that might be considered further for incorporation into KyMEA's Portfolio as soon as May 1, 2019;
2. Develop high level estimates of the magnitude of the impact on the Members' costs of all requirements power supply of those renewable resources; and
3. Identify appropriate next steps based on the results of the study.

Note:

The analyses presented in this Assessment of Renewable Resource Options are intended to be used to screen potential options, narrow the list for further consideration, and provide a greater understanding of the key issues that will need to be considered in structuring procurement processes and evaluating proposals received from prospective suppliers.

The analyses are not intended to be a basis for a final decision to proceed (or not proceed) with any particular resource or to provide a definitive assessment of the projected increase or decrease in costs that may be incurred by KyMEA and its Members by implementing any particular resource.

Renewable Energy Options

The following 4 categories of renewable resources were investigated.

Wind

- TX and OK resources via Clean Line DC transmission project
- MSIO Zone 6 resources (IN/KY)

Solar PV

- Utility-scale solar project constructed in one or more Members' systems
- Small Scale solar projects connected to Members' systems

Hydro Energy

- New projects under development in MISO

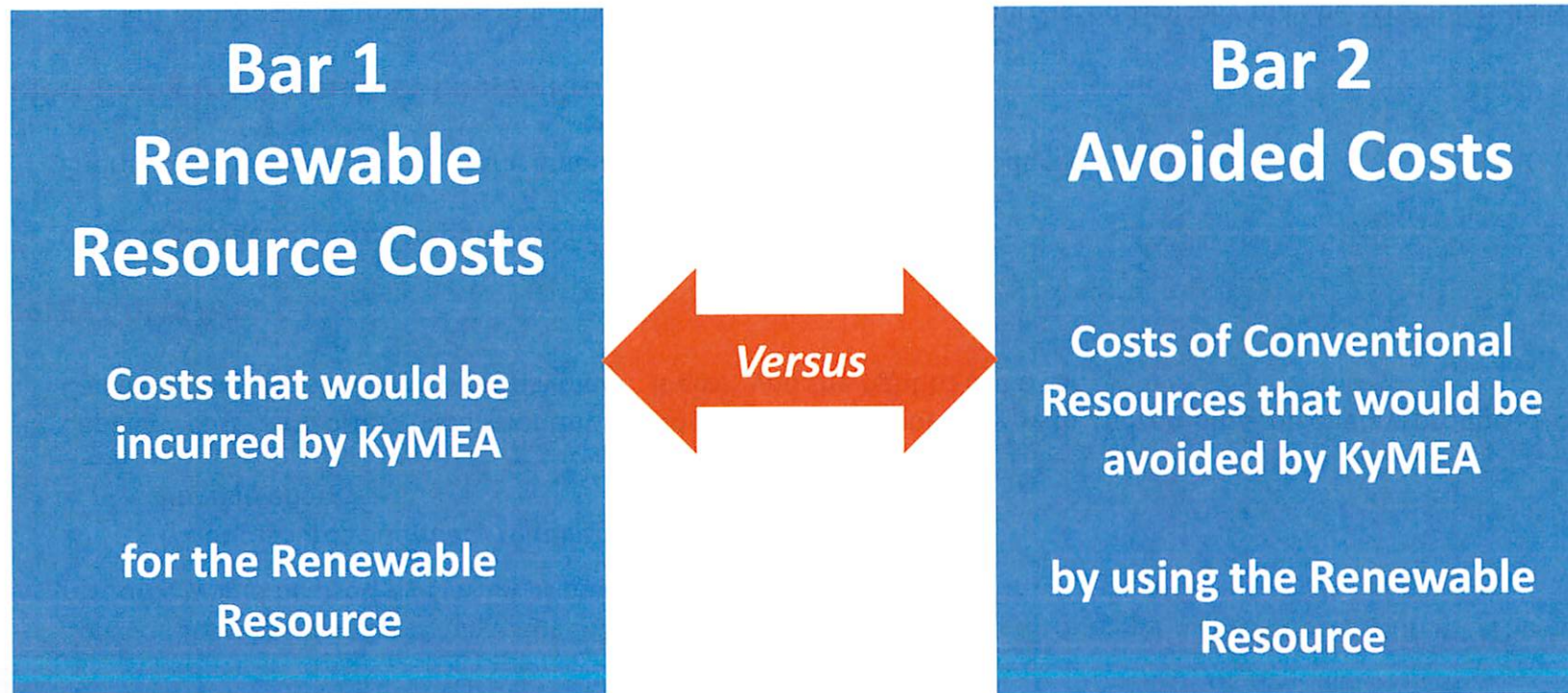
Alternative Fuel Sources

- Landfill gas (LFG) internal combustion engine
- Biomass-fired steam generators

Comparative Quantitative Analysis

The following comparison was made for each type of Renewable Resource

To determine the potential impact on KyMEA's costs of each renewable resource, we compared:



For a renewable resource type to lower the costs of KyMEA's AR Members, the bars representing the renewable resource costs would need to be shorter than the bars representing the costs of conventional resources that could be avoided on Slides 19 - 22.

Comparative Quantitative Analysis

We considered both Capacity and Energy Costs

Capacity Costs Are:

Costs or charges incurred to have rights to the capacity of a generation resource or a system of resources. The capacity of the resource would be used by KyMEA primarily to:

1. Meet resource adequacy requirements, and
2. Provide energy.

Capacity costs are often fixed monthly or annually and do not vary with the amount of energy produced or purchased. Capacity costs are similar to a car payment. It gives you the right to use a car.

Energy Costs Are:

Costs or charges incurred to purchase or produce energy.

Energy costs typically vary with the amount of energy purchased or produced in a period.

Determining the Amount of Energy Produced or Purchased

- For conventional resources, the amount of energy produced or purchased typically may be scheduled daily or hourly by the Buyer. Sellers typically make a separate charge for capacity and energy.
- For wind and solar resources, the amount of energy produced or purchased depends on the extent to which the wind or sun is available to make energy production possible. For these resources, Sellers typically specify that Buyers must take all energy produced and Buyers are charged an energy price that covers the Seller's capacity and energy production costs. Buyers have to use a different source of energy if the renewable energy is not available.

Components of Resource Cost and Avoided Cost Computations

Cost Component	Renewable Resource Costs include	Avoided Conventional Resource Costs include
Costs of Capacity	<p>For owned options, debt service on capital costs and fixed O&M</p> <p>For solar and wind PPAs, typically N/A</p> <p>For hydro PPAs, capacity charges</p>	<p>Avoided costs of purchasing peaking capacity</p> <ul style="list-style-type: none"> ➤ In the amount of the resource's Accredited Capacity ➤ Times an avoided cost rate based on the Paducah contract capacity rate
Cost of Energy	<p>For owned options, fuel and variable O&M, if any</p> <p>For PPAs, assumed charges determined based on a specified energy rate.</p> <ul style="list-style-type: none"> ➤ Expect must-take provisions for wind and solar 	<p>Avoided costs of purchasing energy from the MISO market</p> <ul style="list-style-type: none"> ➤ For projected pattern of output of the resource. ➤ At the interface between MISO and LGE/KU
Delivery Costs	<p>Assumed costs of transmission service and losses and congestion charges to the LGE/KU interface</p>	<p>For resources located on Member systems, any avoided costs of transmission on LGE/KU system</p>
Replacement Capacity and Energy Costs	<p>For owned options, the assumed cost of replacing capacity and energy lost due to resource degradation over time</p>	<p>N/A</p>

Key Assumptions Concerning Renewable Resource Options

See next slide for explanation of key terms.

Description	Purchased ("PPA") or Owned ("Resource") by KyMEA	Accredited Capacity as % of Installed Capacity	Modeled Annual Capacity Factor %	Example Project Installed Capacity MW	% of AR Energy (Assuming Example Project Size)	Installed Facility Cost (2016 \$ Million per MW of Installed Capacity)	Resource Life/ Potential PPA Term (Yrs.)
Wind OK	PPA	15%	55%	50.0	17.19%	-	20
Wind IN	PPA	10%	33%	50.0	10.25%	-	20
Solar PPA	PPA	59%	16%	5.0	0.51%	-	20
Solar Large	Resource	59%	16%	5.0	0.51%	\$2.1 M	20
Solar Small	Resource	59%	16%	0.1	0.01%	\$2.6 M	20
Hydro - Exist Dam	PPA	57%	56%	10.0	3.53%	\$4.8 M	40
Hydro - New Dam	PPA	57%	56%	10.0	3.53%	\$6.2 M	40
LFG - Exist Sys	Resource	100%	88%	2.0	1.10%	\$1.9 M	15
LFG - New Sys	Resource	100%	88%	2.0	1.10%	\$2.6 M	15
Biomass – Boiler	Resource	100%	88%	50.0	27.44%	\$3.6 M	25

Explanations of Special Terms on the Key Assumptions Slide

1. Installed Capacity

- The pace at which energy can be produced during peak load hours in the summer (i.e., MWh's per hour)
- For instance, a conventional resource with a capacity of 10 MW could produce 10 MWhs (which is the same as 10,000 kWhs) in each hour it runs during typical summer conditions.
- The installed capacity would drive the costs to KyMEA of the capacity.

2. Accredited Capacity

- The amount of the installed capacity of a renewable resource that a regulatory agency allows a load serving entity to count toward meeting the entity's capacity requirements.
- For solar and wind resources, the accredited capacity is much lower than the installed capacity.
- For conventional resources, the accredited and installed capacity ratings are typically the same.
- The accredited capacity would determine the reduction in other capacity resources achievable by KyMEA.

Explanations of Special Terms on the Key Assumptions Slide (Continued)

3. Annual Capacity Factor

- The amount of energy assumed produced as a percentage of the amount that could be produced if the resource operated at its summer installed capacity rating in each and every hour of a year.

4. % of AR Energy

- The percentage of the total energy needed by all of KyMEA's members in a year that could be provided by one resource of the size shown in the column headed "Example Project Installed Capacity MW"

Overview of Data Sources

We obtained data for this study from the following types of sources.

1. Indicative wind prices in OK/TX were provided from multiple sources.
2. Indicative pricing of the Clean Line DC Project was provided by the developer.
3. Indicative pricing of energy from wind resources located in Indiana was provided by a prospective owner/operator.
4. Indicative pricing of energy from solar resources was provided by a developer/owner/operator.
5. Data was used from recent solar projects undertaken by other clients.
6. Information was obtained from National Renewable Energy Laboratory (NREL) publications.

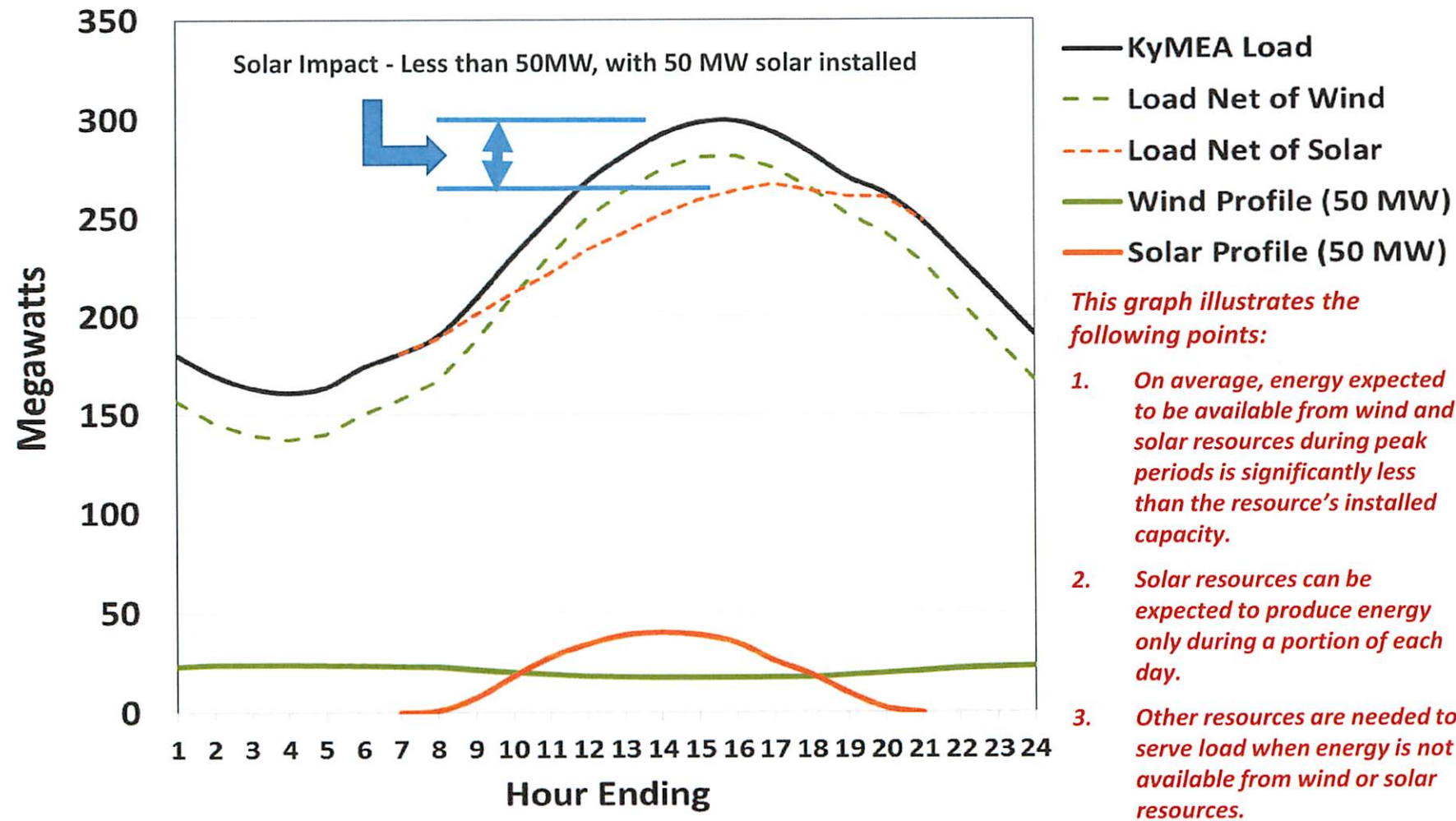
Availability of Energy from Solar and Wind Resources

The following four Slides illustrate important characteristics of the production of energy by solar and wind resources that impact the use of renewable resources in physically serving the loads of KyMEA's Members.

These characteristics must be taken into account when determining the feasibility of using renewable resources.

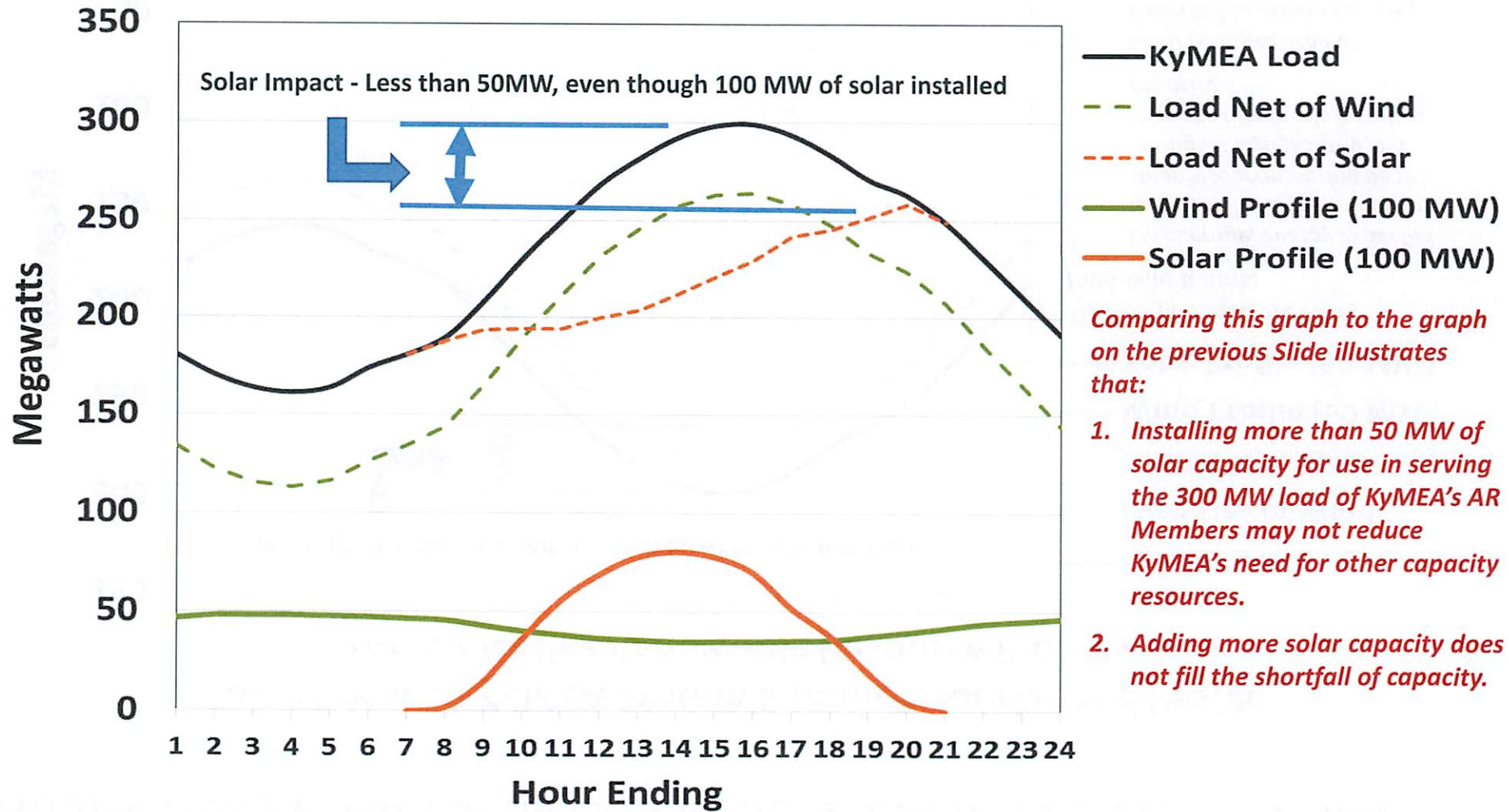
Hourly Energy from Solar and MISO Wind Resources – 50 MW

Comparison of KyMEA System Summer Hourly Load Profile and Indicative Renewable Resource Profiles



Hourly Energy from Solar and MISO Wind Resources – 100 MW

Comparison of KyMEA System Summer Hourly Load Profile and Indicative Renewable Resource Profiles

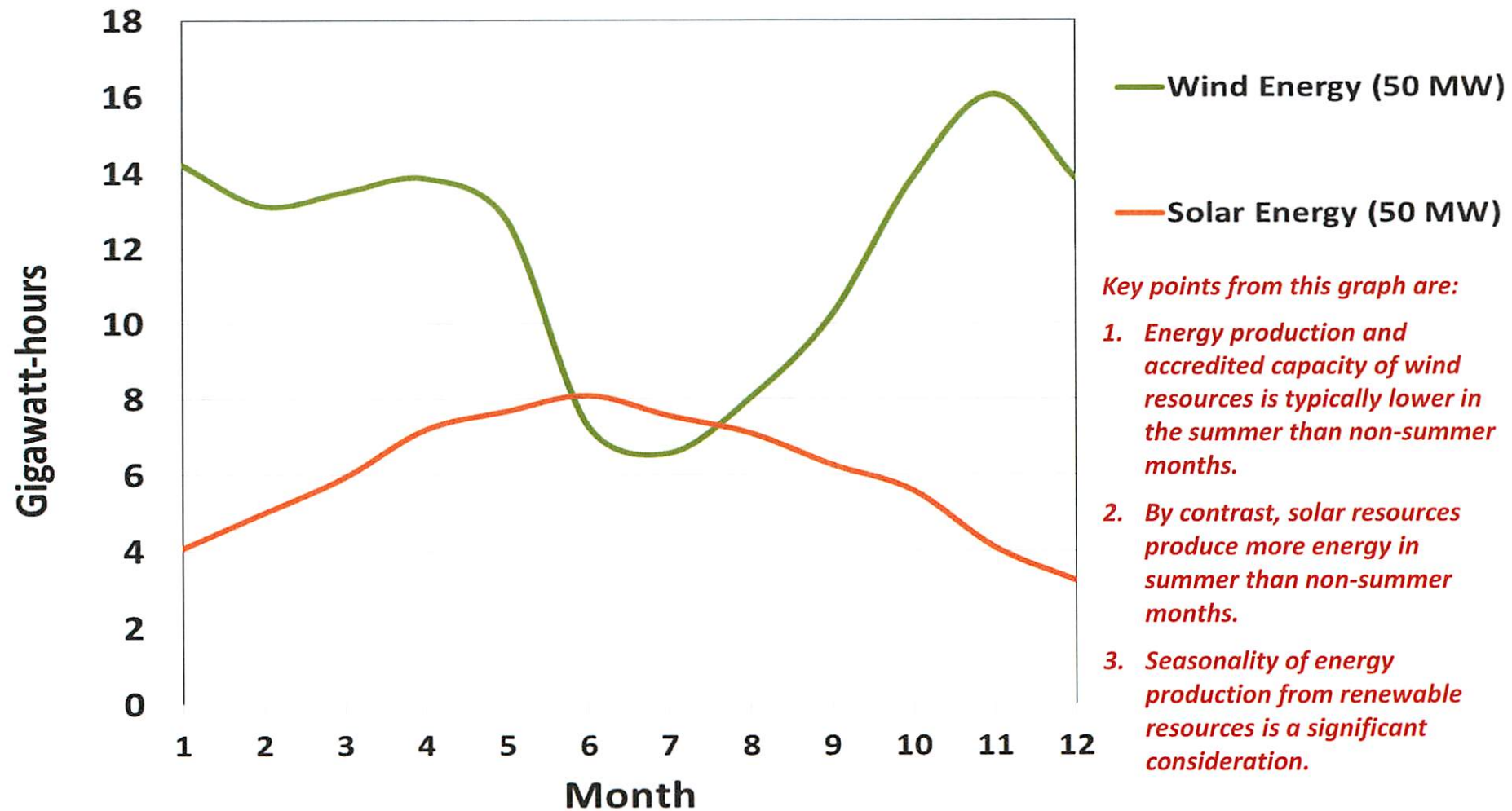


Comparing this graph to the graph on the previous Slide illustrates that:

1. Installing more than 50 MW of solar capacity for use in serving the 300 MW load of KyMEA's AR Members may not reduce KyMEA's need for other capacity resources.
2. Adding more solar capacity does not fill the shortfall of capacity.

Monthly Energy from Solar and MISO Wind Resources – 50 MW

Comparison of KyMEA Monthly Load and Indicative Renewable Resource Monthly Energy

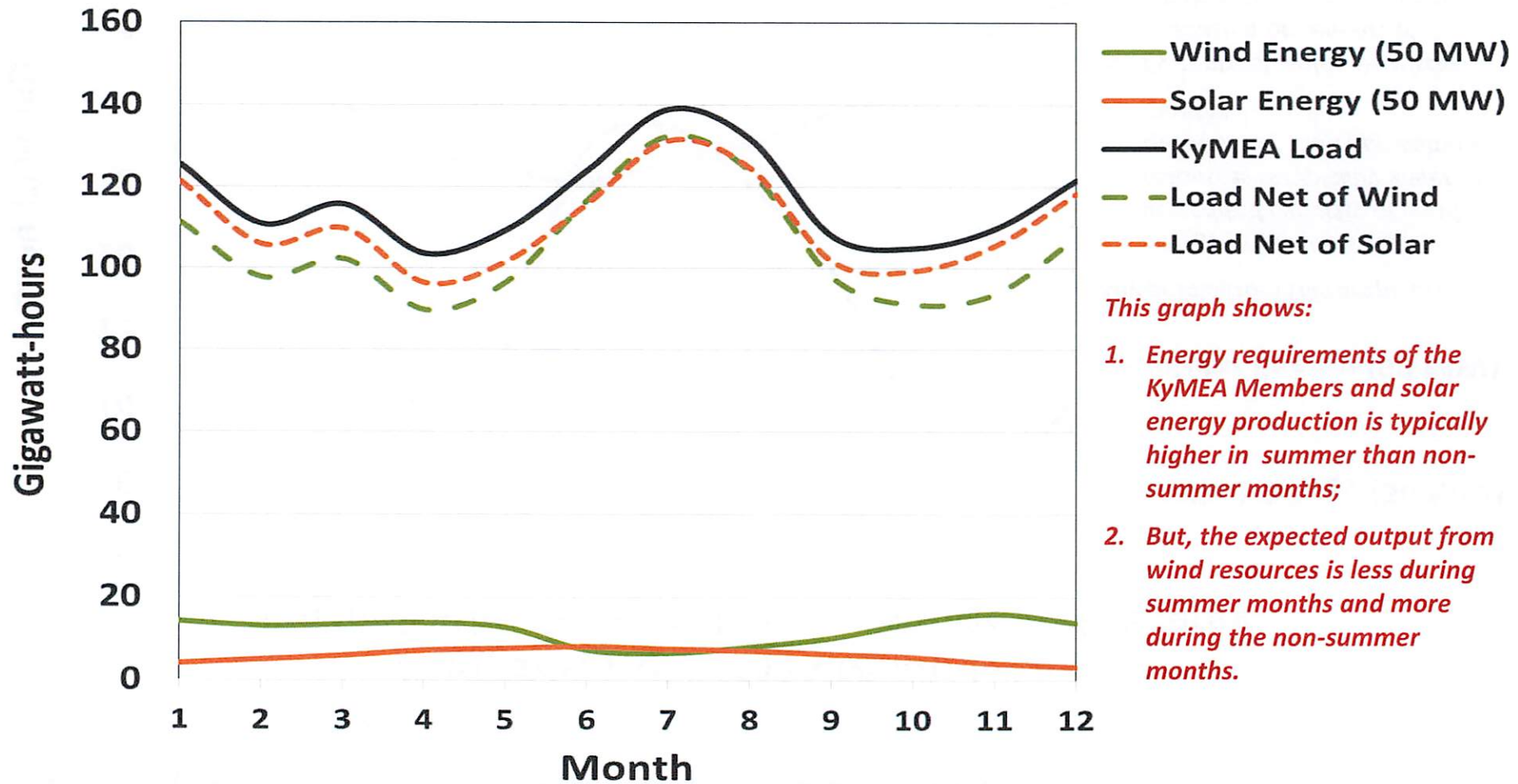


Key points from this graph are:

- 1. Energy production and accredited capacity of wind resources is typically lower in the summer than non-summer months.*
- 2. By contrast, solar resources produce more energy in summer than non-summer months.*
- 3. Seasonality of energy production from renewable resources is a significant consideration.*

Monthly Energy from Solar and MISO Wind Resources – 50 MW

Comparison of KyMEA Monthly Load and Indicative Renewable Resource Monthly Energy



This graph shows:

- 1. Energy requirements of the KyMEA Members and solar energy production is typically higher in summer than non-summer months;*
- 2. But, the expected output from wind resources is less during summer months and more during the non-summer months.*

Initial Understandings regarding Customer Priorities

1. Interest in Renewables Varies Among the AR Members' Customers

- a. Industrial and commercial customers tend to be most interested in lowest price of electricity.
- b. Some residential customers are very interested in renewables, but only a portion of those interested will participate if there is much impact on their cost of electricity or a capital outlay required.
- c. Some stakeholders would see renewables as adverse to the interests of KY coal businesses and jobs.

2. KyMEA should continue to place a high priority on affordability and adequacy of its AR power supply portfolio

KyMEA should seek to Identify renewables that:

- a. Are attractive in terms of total costs;
- b. When integrated into KyMEA's portfolio, are consistent with KyMEA's goal of remaining competitive with KU under a wide range of circumstances; and
- c. When integrated into KyMEA's power supply portfolio, do not:
 - a. reduce the assurance that adequate power supply resources will be available during peak demand periods;
 - b. increase the chance of power curtailments; or
 - c. expose KyMEA's Members to spikes in costs during periods in which the renewable resource is not available to meet the energy requirements of the Members' customers

3. KyMEA may also consider implementing renewable resources on a subscription basis

- a. Such that the resource is used and paid for only by those AR Members that choose to participate in the resource
- b. This strategy is likely to be most applicable to very small renewable projects

Comparative Analyses Results

The following 4 Slides show comparisons of the cost of renewable resources to the cost of conventional resources that would be avoided by KyMEA by using that type of renewable resource. Results are shown for the following type of resources:

Slide 19 – Wind

Slide 20 – Solar

Slide 21 – Hydroelectric (“Hydro”)

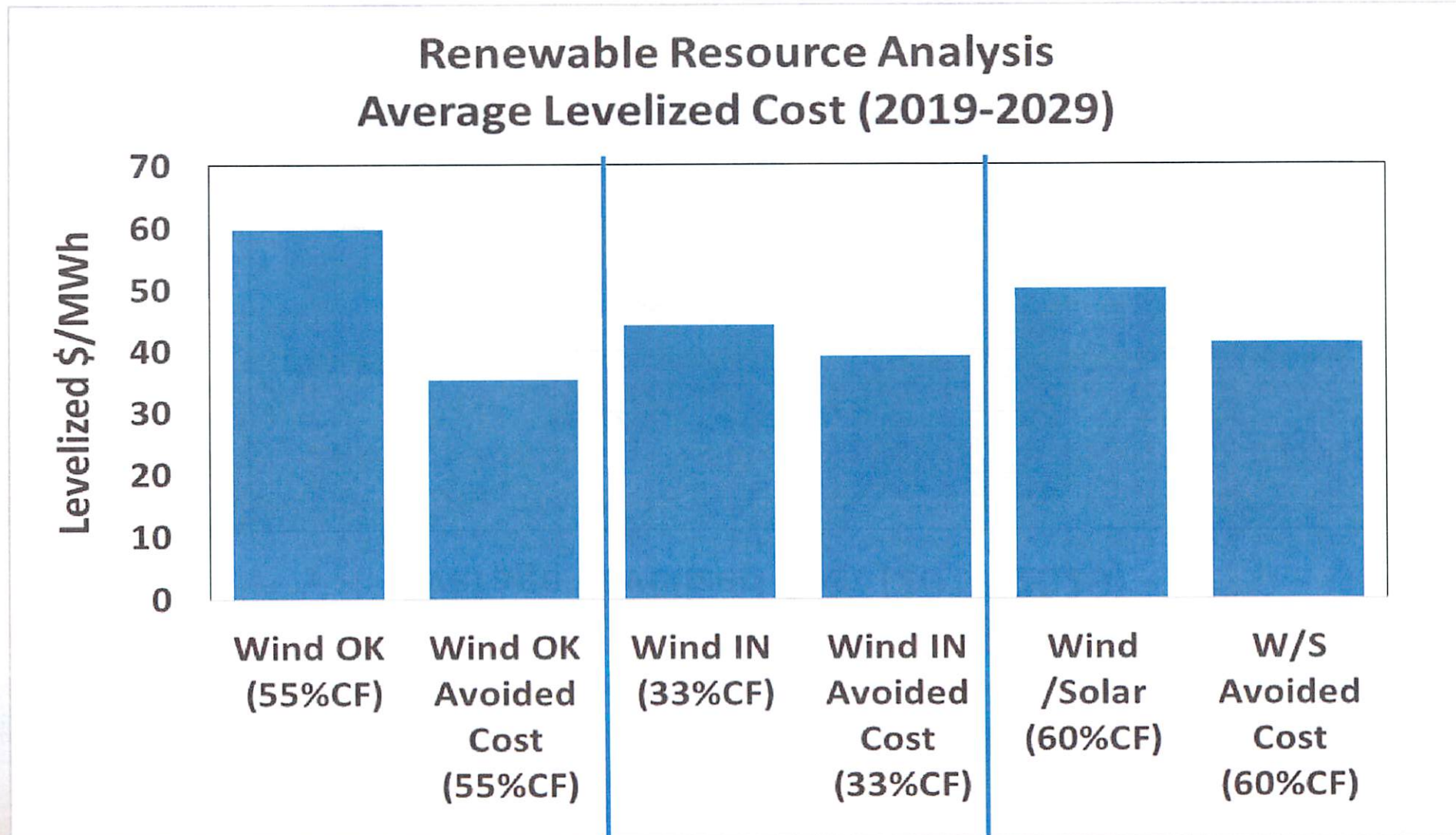
**Slide 22 – Land Fill Gas (“LFG”) and
Biomass (Boilers that would burn biomass products such as wood)**

For each resource type shown on each Slide, the bar or bars to the left represent the projected total cost to KyMEA of the renewable resource and the bar to the right represents the projected avoided cost of conventional resources.

If the height of the renewable resource cost bar is higher than the avoided cost bar, implementing the renewable would increase KyMEA’s costs.

Comparative Analysis – Wind Resources

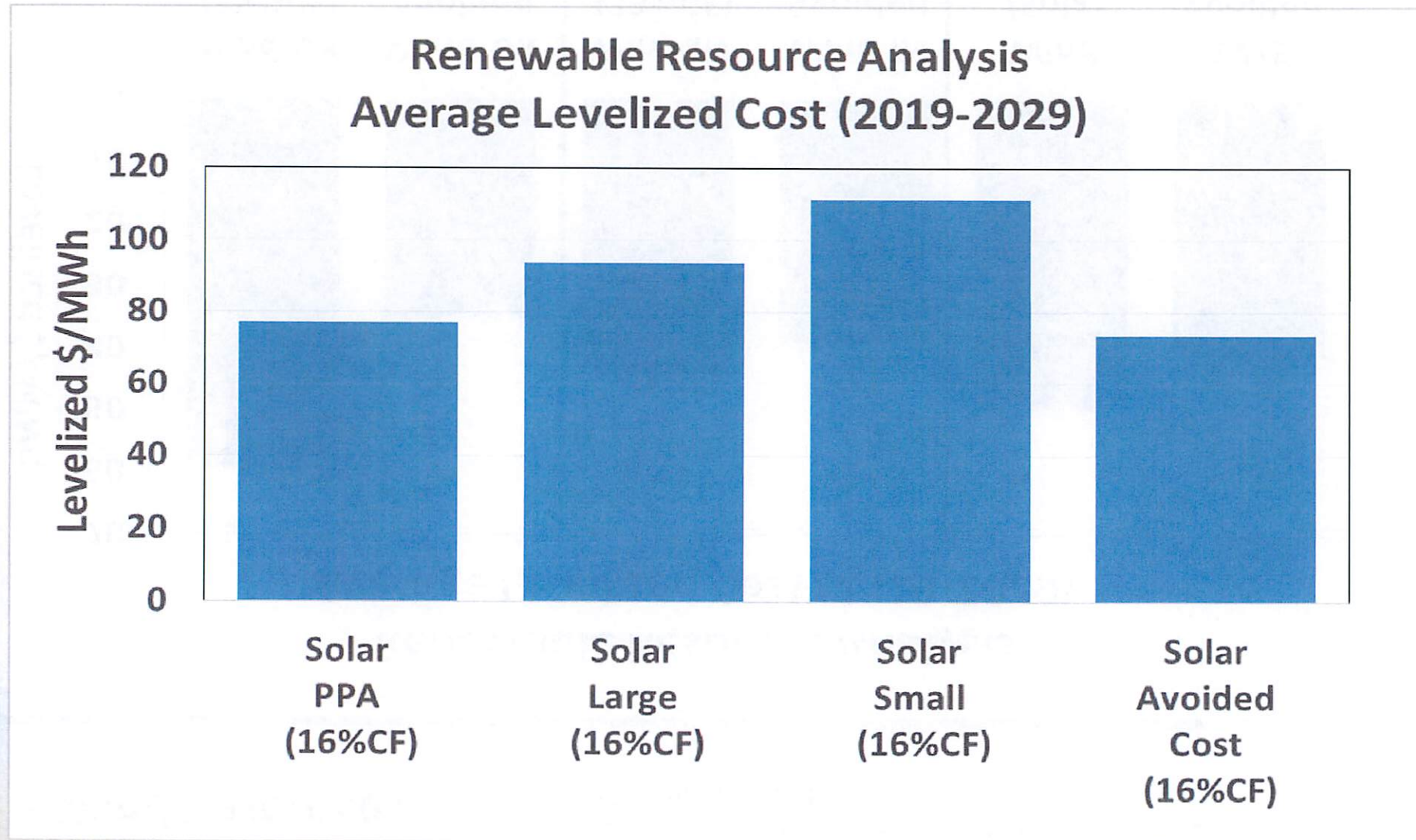
The projected cost of purchasing wind from resources in Indiana is the most competitive of the wind resources considered.
(See middle two bars.)



Comparative Analysis – Solar Resources

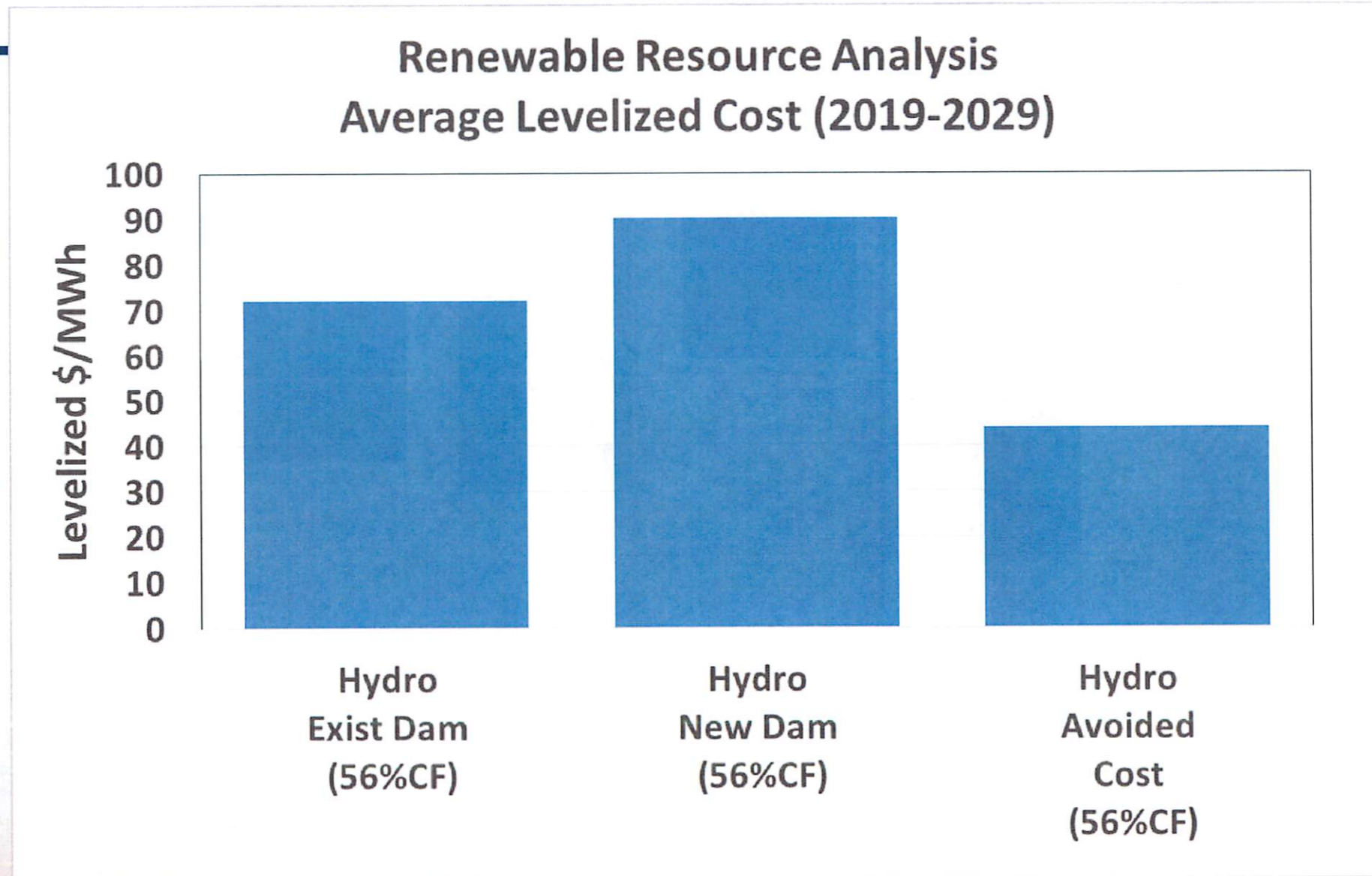
The data available indicates that purchases from utility scale solar plants developed by others may be most cost competitive.

There are significant economies of scale in developing solar resources.



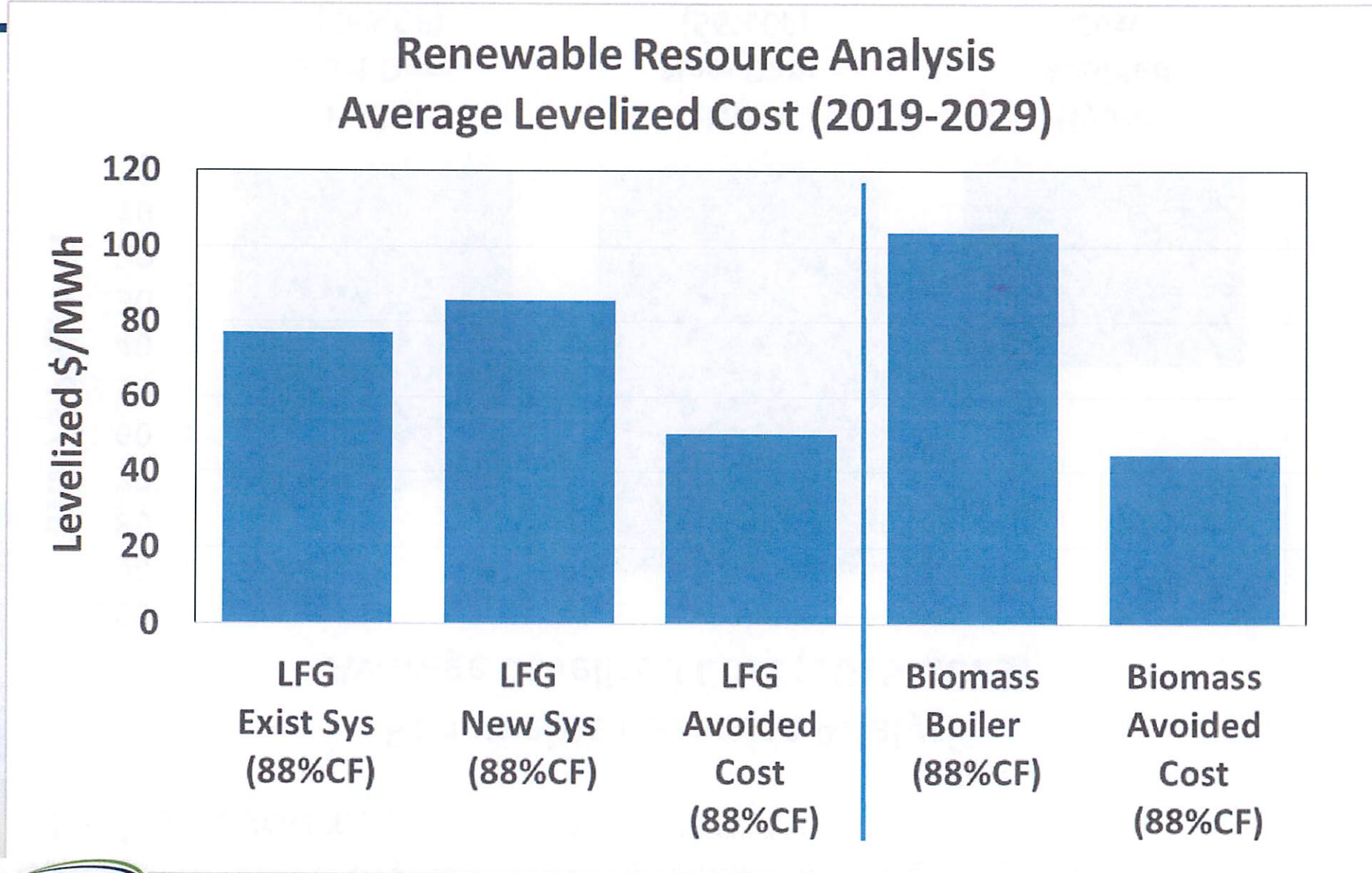
Comparative Analysis – Hydro Resources

The cost of hydro resources in the area appears to be high relative to conventional resources.



Comparative Analysis - Alternative Fueled Resources

Landfill gas (LFG) is more cost effective if gas can be used from the landfill without charge (which would lower the bar to the far left by 20% to 25%) and there is an adequate existing collection system in the landfill.



Results of the Comparative Analyses

Of the options assessed, the annual costs of the following Renewable Resources would compare most favorably with KyMEA's avoided costs over the 10-year period May 2019 through May 2029. Other renewable options considered appear to be much higher in cost relative to comparable KyMEA avoided costs. None of the options assessed are projected to result in lower costs for KyMEA.

1. Purchase of wind capacity and energy

- a. A purchase of wind energy from a project within MISO – Indiana appears to be the lower cost option for wind available to KyMEA at this time.
- b. Seller's expectations regarding the minimum transaction capacity may impact the decision – sellers seem most interested in 50 MW or more, which may be a larger commitment than KyMEA should make at this time.
- c. More investigation of congestion, losses, curtailment exposure, pricing, project size, and output patterns would be needed to confirm or modify our initial assessment.

2. Purchase of solar capacity and energy

- a. Our initial assessment indicates that purchasing the output of a solar project may be lower in cost than the self build option.
- b. More investigation of PPA terms and new project costs would be needed to confirm or modify our initial assessment.

3. Develop landfill gas project(s)

- May be cost effective if landfill gas can be obtained without charge and/or we can verify a substantially lower O&M allowance.
- Economics are very dependent on the specifics of the landfill design and fixed O&M allowances deserve more investigation.

For each option, the longer term comparative cost analysis typically will be more attractive than the comparison for the first 10 years.

Qualitative Considerations

Consideration	Wind 25 to 50 MW	Solar 1 to 5 MW	LFG 1 to 3 MW
Practical for Member Locations?	No	Possibly, 5-6 acres per MW	Depends on Locating an Existing Site(s) with Certain Characteristics
PPA or New Build?	PPA	PPA or New Build	New Build
Could be Available by 2019?	Indiana – potentially OK/TX – not until early 2020's	Probably but dependent on planning and construction schedule	Probably but dependent on planning and construction schedule
Minimum size usable by KyMEA?	50 MW normal minimum needs more careful analysis, 20-25 MW expected to be useable	1 to 5 MW would allow reasonable economies of scale and be usable by KyMEA	Likely useable, normally will be 1-3 MW
Requires financing by KyMEA?	No	For a PPA, no. For a small scale project located on a Member's system, potentially.	Expected

Qualitative Considerations -- Timing

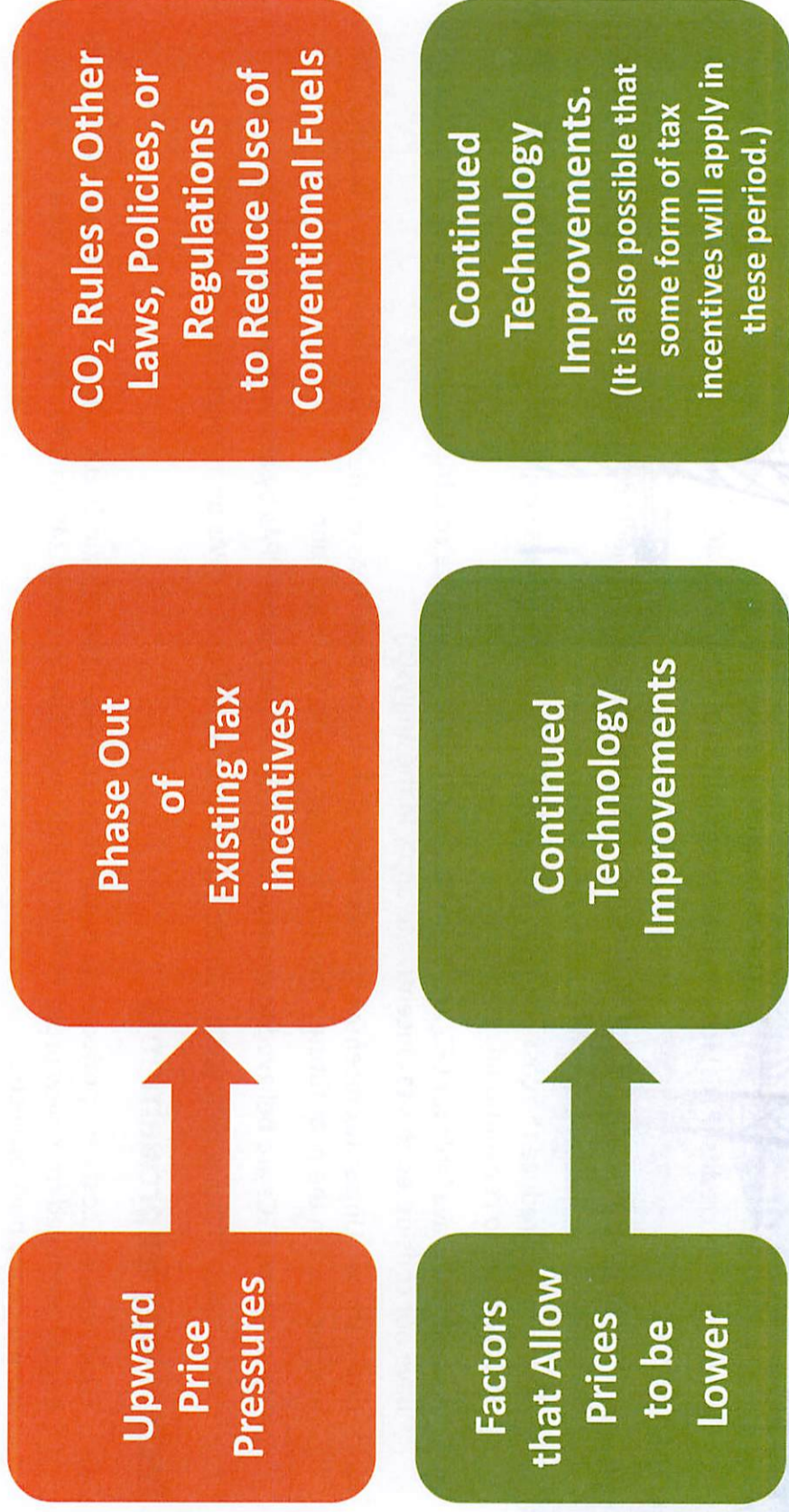
1. Tax incentives under Current Law

- a. Production tax credits (PTCs) for wind resources will decline by 20%, 40% and 60% for projects commenced in 2017-2019, respectively.
- b. An investment tax credit (ITC) of 30% remains applicable to solar projects commenced through 2019, and declines thereafter.
- c. Tax incentives reduce the cost of energy from wind and solar resources significantly, but do not fully offset differences in costs relative to conventional resources.
- d. A small PTC is available for LFG and Biomass projects that commence construction by the end of 2016. (Given timing, we have not considered this tax incentive to apply in the analysis.)
- e. Implications: Unless tax incentives are extended, the cost under PPAs of energy produced from wind and solar resources may increase in the near future. This will also depend on CO₂ legislation.
 - a. Wind PTCs are believed to reduce current prices paid under PPAs by as much as 40% to 50%.
 - b. Solar ITCs are believed to reduce current prices paid under PPAs by as much as 25% to 30%

2. Technology Improvements

- a. Wind resource costs are projected to continue to decrease through the 2020s. One study indicates wind costs/MWh of energy produced from new projects built in 2030 would be lower by 24% to 30% than costs/MWh of energy produced from recently built projects.
- b. In the most recent 2 years, PPA prices for solar energy appear to have decreased at a somewhat slower pace than in the immediately prior two years. This may have resulted from multiple factors.
- c. Construction of proposed DC high voltage transmission projects to transmit wind and solar energy from Oklahoma and Texas may be completed in the early 2020's.

Factors Expected to Influence Prices for Renewable Energy over the Planning Period



**Early 2020s thru
Early 2030s**

**2017 thru
Early 2020s**

Discussion of Primary Conclusions

Attractiveness of Potential Renewable Resources

1. None of the options assessed are projected to result in lower costs for KyMEA under our base case set of assumptions regarding the projected cost of the renewable resource types considered and the cost to KyMEA of capacity and energy from conventional resources during the 2019-2029 period.
2. Of the renewable resource types studied, purchases of energy produced from wind resources in Indiana or from a solar project in MISO owned by a taxable entity are the closest to being competitive with conventional resources.
3. A landfill gas project under very favorable conditions (i.e., no charge for gas and suitable gas collection system already in place - see part 3 of Slide 23) may also be competitive. Determining if such a situation exists would require KyMEA and its Members to review nearby landfills to assess whether the favorable circumstances may be present. Additional effort to make a project specific O&M estimate also would be required.
4. There are significant economies of scale involved in solar resources. Solar resources can be implemented on a very small scale (~1,000 kW or less) that may be appropriate for a community solar project or on a utility scale level (~1,000 kW or more) that can be expected to provide significantly lower costs per unit of energy produced as compared to small scale projects.

Discussion of Primary Conclusions (Continued)

Renewables will Impact KyMEA's Risk Profile – Relative to KU's

Adding a renewable resource to KyMEA's portfolio can be expected to affect KyMEA's risk profile.

- All of the renewable resources studied are anticipated to involve commitments of 15 years or longer. So far, KyMEA has contracted for conventional resources for periods of 3 and 10 years.
- Relying in part on renewable energy would reduce the risks to KyMEA of higher natural gas or coal prices and the potential for higher costs that could result from CO₂ or other new environmental legislation. New environmental legislation is expected to impact KyMEA's costs of conventional resources to a similar or lesser degree than KU's costs.
- Significant reliance on renewable resources may also increase the risks to KyMEA of becoming less competitive with KU in the event that fuel and market prices are lower in the 2020s than assumed at this time.
- The as-available, must-take nature of the energy provided from wind and solar resources requires effective integration with a portfolio of conventional resources to manage the potential impact of the resource on assurance of adequate power supply and volatility of energy costs.

Discussion of Primary Conclusions (Continued)

Recommend Proceeding to Further Consider Renewable Resources

Considering the results of this initial assessment, it would be reasonable to give further consideration to certain renewable resources as discussed below.

- The KyMEA Board has placed a very high priority on assembling a portfolio that provides a favorable cost of power to the KyMEA AR Members and is structured to remain competitive with KU under a wide range of future conditions. This initial assessment indicates that additional and continuing consideration of renewable resources is important to KyMEA's efforts to achieve this goal.
- This Assessment has been based on indicative prices received from certain renewable energy providers and publicly available data. Actual data provided through a competitive procurement process would provide a more accurate basis for further efforts to identify the most cost effective renewable resources actually available to the KyMEA Members and may identify cost effective resources not identified in this Assessment.
- KyMEA's AR Contract and PPAs provide flexibility to:
 - Integrate into KyMEA's portfolio some level of renewable resources with as-available, non-dispatchable energy availability characteristics; and
 - Implement a renewable resource only for individual, or groups of, Members that choose to use and pay for that resource.

Recommended KyMEA Directions

Based on the conclusions summarized on the preceding slide and the results of the assessment summarized in this presentation, we recommend the following course.

1. KyMEA should Give Further Consideration to Purchasing or Otherwise Obtaining Capacity and Energy from Renewable Resources

- Solicit Proposals through a formal competitive procurement process
- Consider both utility scale and smaller community solar projects
- Consider resource integration costs
- Consider energy from projects connected to MISO, the LGE/KU transmission system, and one or more Member Systems

2. Work with any KyMEA Member or Group of Members that Decide to Consider Renewables Independently

- Would allow consideration of that Member's unique priorities
- Options include:
 - Member-Owned Resources
 - Customer-Owned Resources

Recommended KyMEA Directions (Continued)

Recommended Process for Further Consideration of Renewable Energy Resources

We recommend the following steps to obtain the information KyMEA and its Members should have to support their collective and individual decision processes.

1. Using a formal RFP process, obtain specific proposals from potential sellers of energy from renewable resources including:
 - Large utility-size renewable projects (10,000 kW to 50,000 kW of KyMEA installed capacity entitlement) connected to the MISO or LGE/KU Transmission Systems, and
 - Community Solar Project-size (~100-1,000 kW Class) or Small Utility Project-size (~1,000 kW to ~10,000 kW Class) solar projects connected to one of more of the KyMEA Members' systems.
2. Prepare appropriate analyses to identify any proposal(s) most likely to be deemed susceptible of award, based on key proposed terms and conditions of applicable Power Purchase or Other Agreements (PPAs) and reasonable initial allowances for other cost impacts.
3. Assuming potentially attractive proposals are identified:
 - Further assess potential transmission congestion costs, other transmission costs, and any other potential impacts on KyMEA and its Members of sellers' proposals to deliver the energy to MISO or the LGE/KU transmission system;
 - Project the net benefits from or net costs of the particular resource(s) upon integration into KyMEA's power supply portfolio for use in meeting the load serving obligations of KyMEA's Members, specifically addressing the impact on other resource costs of any applicable as-available, non-dispatchable characteristics of the proposed renewable energy resources;
 - Assess the impacts of the proposed renewable energy resources on KyMEA's risk profile relative to KU's; and
 - Finalize PPA Terms and conditions and update pertinent analyses.