

Carbon Pricing Policies & Implications

KIUC

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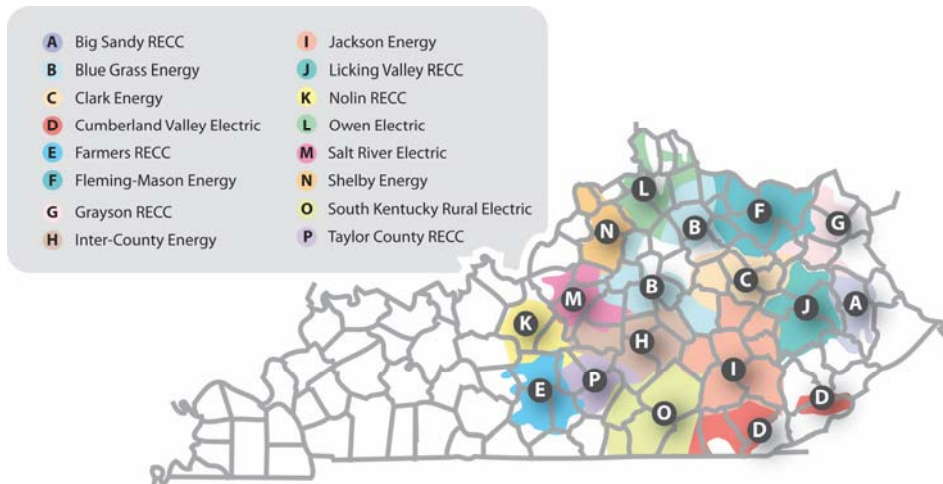
East Kentucky Power Cooperative



East Kentucky Power Cooperative

Member co-ops provide electricity to more than 1.2 million Kentuckians in 87 counties

- Not-for-profit, member-owned generation and transmission cooperative
- Provides wholesale power to 16 member-owner distribution cooperatives serving rural Kentucky
- Over \$860 million in operating revenue; \$3.8 billion in assets
- 3,500 WW of winter generating capacity
- 13.5 million MWh delivered to member-owners in 2019



* Hydropower via contract with SEPA

Federal Decarbonization Policies

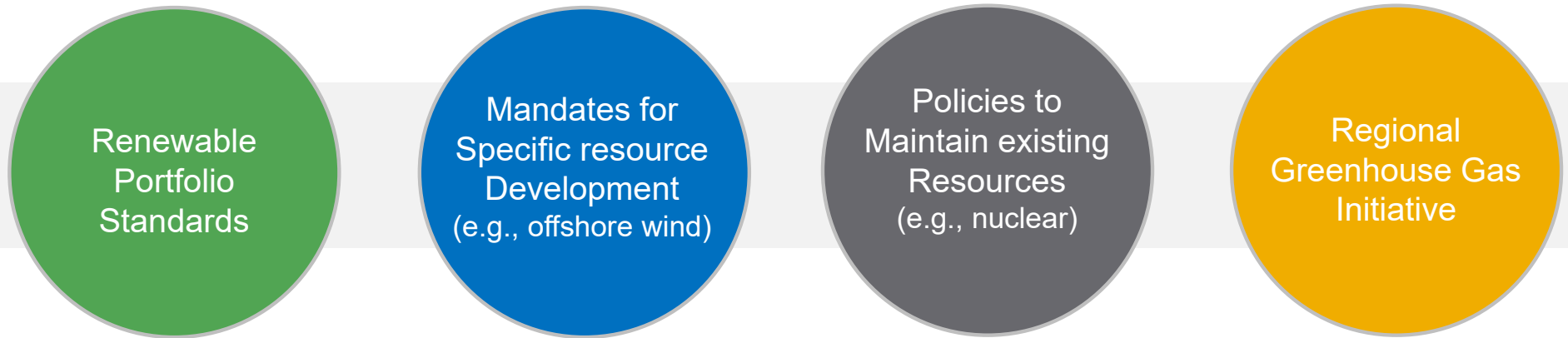


- President Biden’s climate goals include a “**carbon free**” electric power sector **by 2035** and a “**carbon neutral**” economy **by 2050**
- Executive Order – **Social Cost of Carbon (SCC)**
 - How will the FERC factor SCC into its decision making?
 - How will the EPA factor SCC into its decision making?
 - Other agencies?



- Will any **Clean Energy Standard** or **Carbon Pricing** legislation pass this year?

State Decarbonization Policies



State energy and environmental policies are intended to reduce emission of harmful pollutants, which include CO₂ directly or indirectly

Energy vs. Capacity vs. Ancillary Services



Capacity

a generator's total capability to produce power or a load responders total capability to reduce load



Energy

is the commodity that generators produce in real-time



Ancillary Services

support the continuous flow of electricity to maintain grid stability and security -- address imbalances between supply and demand, and help the system recover after a power system event

Tension: State Decarbonization Policies & PJM's Capacity Market



- **Federal Energy Regulatory Commission (FERC)** determined that certain resources, and resources offered by certain entities, could suppress prices in PJM's capacity market; required them to offer at or above a **"Minimum Price"**
 1. Pay for capacity own/bilaterally contract that does not clear in the market; and
 2. Pay to purchase capacity from the market to meet load requirements



Tension is not sustainable

Workshops to drive change

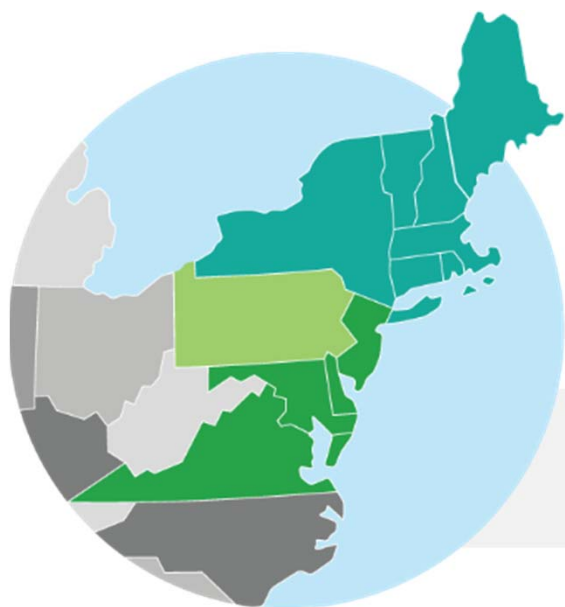


Composition of FERC changed

Tech. conferences to drive change

Tension: State Carbon Pricing Policies & PJM's Energy Market

- **Regional Greenhouse Gas Initiative (RGGI)** – sets cap on carbon emissions and generators must purchase allowances to emit CO₂; price of allowance is set by auction



- 4 PJM states are in RGGI
- 1 state will be joining in 2022
- 55% of PJM's load will be in RGGI; 45% will not

Generators who purchase allowances are able to recover their cost via their PJM energy market offers

How does CO2 Compliance Cost Impact PJM Generation Dispatch?

- In PJM, generators include the cost of emission regulation compliance (SOx, NOx, CO2) in their energy market offers
- PJM dispatches generation across the PJM region based on economics, selecting the **least cost mix of resources to meet the aggregate load** on the system
- If the cost adder in the generator's market offer makes it more costly than the marginal unit, the generator will not run, and hence, will not produce emissions
- Technically CO2 pricing is currently in effect in the PJM region through RGGI
 - Low RGGI allowance prices (~ \$7/MWh) have not materially impacted PJM's dispatch

Tension: State Carbon Pricing Policies & PJM's Energy Market



Pennsylvania Coal does not clear
Emissions **reduce**

Kentucky Coal clears
Emissions **produced**

**Oversimplified example*

- **Carbon Pricing** - a cost assigned to energy based on the CO2 emission of the generator that produced the energy.
 - Assigning a carbon price to energy will change the dispatch of the generation fleet, which, in turn, will:
 - (1) push high carbon emitters into retirement, and
 - (2) raise the price of electricity
- **Leakage** - the change in CO2 emissions outside the state jurisdiction that adopted carbon pricing
 - Leakage relocates emissions rather than eliminating them
 - The higher the carbon price, the greater the potential emissions leakage

Why is Carbon Pricing a Strategic Issue for EKPC?

- Federally mandated carbon pricing or controlling for leakage to accommodate PJM state RGGI program goals would negatively impact EKPC and our owner members:
 - Would **increase the cost of the energy** EKPC purchases from PJM and threaten the economic efficiency gains obtained by joining PJM
 - Would increase the dispatch cost of EKPC's fossil generation units and **reduce the hedge effectiveness** of our environmentally compliant coal fleet
 - Would **hasten the retirement** of coal and combined cycle generators in PJM, raising reliability concerns

FERC Proposed Carbon Pricing Policy Statement

(Oct. 2020) FERC issued a proposed **Policy Statement** clarifying it has jurisdiction to approve regional market operator (e.g., PJM) carbon pricing proposals and encouraged them to make such filings



- **EKPC submitted comments:**

- **Unneeded** – generators are able to recover costs to comply with state carbon pricing programs under current market rules
- Does not fully consider all the **potential costs and reliability** concerns that could arise
- Should **require all states to agree** on any mechanism to address leakage

Ensuring Electric Grid Reliability & Affordability in Transition to Grid of the Future

- Transitioning to the Grid of the Future requires consideration of capacity, energy and ancillary services as well as transmission planning.
- We must ensure that **reliability** can be maintained in all hours of the day, in peak and non-peak seasons
- Any market changes – near term of long term – must consider the portfolio of generation resources we will have in the future.
 - PJM interconnection queue – wind, solar, hybrid
 - Market design must address the challenges of operating an evolving resource mix
 - System operator needs dispatchable (controllable) resources & resources that can ramp up and down
 - Generation retirement decisions may not be able to be unwound
 - Should avoid market rule changes that drive disorderly exit that may undermine reliability and add cost
 - “Hope is not a Plan” -- technology aspiration is not sufficient for grid operators to ensure reliability
 - Need to ensure power may be delivered from where it is produced to where it needed
 - Will take time to site and build transmission; will add cost

