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Reply Comments on Proposed Rule Review of:

- **Ohio Energy Efficiency Programs (Case No. 13-651-EL-ORD)**
- **Ohio Alternative Energy Portfolio Standard (Case No. 13-652-EL-ORD)**
- **Ohio Implement Am. SUB. S.B. 315 (Case No. 12-2156-EL-ORD)**

Thank you for the opportunity to submit reply comments regarding initial comments submitted on the above cases. The Energy Resources Center (ERC) would like to reiterate its recommendations submitted in its March 3rd, 2014 E-Filing **with some additional points**, in response to other comments submitted on these cases. The original filing is Official PDF File 92de3de7-b78d-4425-95bb-dea2fe363a65_Official_Energy Resources Center33201411712PM_ERC Comments Ohio Docket Proposed CHP Rukes Feb 28 2014Secure.pdf.

Combined Heat and Power (CHP) Systems:

The ERC included in its initial comments the following recommendations:

- The PUCO should make it clear that they are recommending a production incentive for CHP systems based on the total kWh produced by a qualified CHP system
- The PUCO should consider a tiered approach be added to the production incentive to encourage and reward both CHP developers and operators to strive for maximum efficiency levels.
 - Allow 100% of the total generated kWhs for systems with **measured** efficiencies above 70% (LHV)
 - Allow 90% of the total generated kWhs for systems with **measured** efficiencies between the minimum 60% (LHV) and the enhanced 70% (LHV).
- The PUCO should make it clear that the electrical energy savings will match the kWhs generated and utilized in the production incentive.
- The PUCO should make it clear that the production incentive is performance based (based on measuring the efficiency of the CHP unit in the field over time) with the performance reported in the annual report.
- The PUCO should remove the \$0.005 per kWh generated as a maximum incentive level and better define the period of time the production incentive will be issued. The level of incentive and timing of the incentive is critical for the participation of the industrial user in this program. Receiving incentive payments at the rate of \$0.005 per kWh over a 10 to 15 year time period will result in CHP developers avoiding the Ohio market.
- The PUCO should better define the term "Useful Thermal Energy" to ensure that all applications provide correct and consistent information. **Useful thermal energy is defined as the thermal energy output of the CHP system that is actually recovered and utilized in the facility/process.**

In response to other stakeholders' comments on CHP systems, the ERC offers these responses:

- Several commenters stated there is ambiguity in how energy savings will be determined. The ERC agrees that the PUCO should make it very clear that their intention is to tie the energy savings to the **Useful Electric Energy (kWhs)** produced by the CHP system (not the total electric energy produced). **Useful Electric Energy (kWhs) is defined as the electric energy output of the CHP system that is actually utilized to replace the electricity required to meet the requirements of the facility/process.** Useful electric energy (kWhs) = Total electric energy (kWhs) produced by the CHP system (minus) parasitic power (kWhs required to operate the CHP system). Example of parasitic power would include electricity required to operate a gas compressor required for a CHP gas turbine, or the electricity required to operate externally installed pumps, controls, or monitoring equipment required to operate the CHP system. The Useful Electric Energy (kWhs) produced by the CHP system is easily measured by ensuring that the kWh meter required by the PUCO in the Application to Commit is properly placed to measure the actual energy being provided to the facility. The potential confusion in the case documents is that the term Useful Electric Energy (kWhs) is not utilized or defined (only total electric energy produced by the CHP system is used).
- Similar to the comments submitted by the Ohio Power Company (AEP-Ohio), the ERC recommends that the PUCO provide clear guidance on how to measure the annual energy efficiency of a CHP system (definition of terms and placement of meters). Leaving it to each applicant and utility to decide will result in great variance of results. The ERC recommends: **CHP System Energy Efficiency (HHV) = (Useful Electric Energy (kwh X 3412 Btu/kWh) + Useful Thermal Energy (Btus)) ÷ Total Fuel Input to CHP System (Btus). To convert the efficiency in HHV to LHV (if required) simply multiply the HHV % times 1.105 (example 70% HHV = .70 X 1.105 = 77% LHV).** The useful electric energy can be measured by correct placement of a kWh meter; useful thermal energy can be measured by correct placement of a Btu meter; and total fuel input to the CHP system can be measured by correct placement of a gas meter.
- In response to the comments submitted by the Midwest Cogeneration Association in which they make a recommendation to allow for a higher incentive paid within a shorter timeframe, the ERC recommends that the PUCO consider the applicant eligible for a partial incentive payment at the time of application acceptance to reduce the cost of detail system design, a partial incentive payment at the time of commissioning of the CHP system to provide some relief from the high first cost of the system, and the remainder of the incentive issued after twelve months of measured performance of the system (measuring the annual operating efficiency of the unit). An example of the levels utilized in other states (Maryland and Illinois) are:
 - \$75/kW at the conclusion of the detailed design phase

- \$175/kW at commissioning
- \$0.07/kWh produced during the first 12 months of operation based on the measured annual efficiency of the unit

Each of these can be capped so the total incentive for any one CHP project will not exceed \$2,000,000 or 50% of the cost of the project (whichever is less).

- Additionally, as the Midwest Cogeneration Association and Ohio Coalition for Combined Heat and Power point out in their initial comments, the PUCO should not consider CHP as a behavioral measure. The industrial customer that invests in a CHP system is paying over \$1,400 per kW of installed CHP capacity (in most system installations). The payback period for most CHP investments is between 4 years and 8 years (the reason incentives are necessary to move the market). The level of investment by the industrial customer is much larger than the incentive level received through the utility/state program. In order for the industrial customer to recoup his/her investment within the 4 to 8 years, the CHP system must be operating for the longest number of hours at the highest efficiency possible. If the industrial customer decides to operate the system in any other mode (shorter hours of operation or longer hours of operation at lower efficiency), their payback period will drastically increase and their return on investment will greatly suffer. In addition, properly installed, operated and maintained CHP systems have demonstrated operating availability factors above 95%.

Waste Energy Recovery Systems

ERC included in its initial comments the following recommendations:

- The production incentive method (\$/kWh generated) is appropriate and since the minimum efficiency requirements defined for CHP systems do not pertain to WER systems, no tiered approach is appropriate. All kWhs generated should receive the incentive.
- The total kWhs produced or generated by the WER system should be counted as saved energy.
- Remove the Maximum \$0.005 per kWh generated for the same reasons discussed in the CHP section.
- Give clear directions that the incentives should be performance based with the performance reported in the annual report required.
- Provide clear guidance that allows the applicant to receive agreed to incentives in a timely manner that allows the incentive to impact their upfront procurement costs.
- Provide clear guidance that applicants provide in their application: how the incentive level and payout schedule reduces risk for the applicant and how the incentive level and payout schedule impacts the risk level for the Utility (savings versus incentive level).

Adding CHP/WER to Utility Custom Programs

- In addition to the mercantile self-direct process for including CHP/WER, the PUCO should consider requiring utilities to include CHP/WER under their existing energy efficiency custom programs. The CHP/WER technologies should be considered and

treated like any other energy efficiency measure that is not included in the prescriptive program. Industrial customers and energy efficiency developers are very familiar with utility custom programs and the application process. I would recommend that PUCO consider requiring Ohio utilities to include CHP/WER in their custom programs (in addition to the mercantile self-direct process) immediately and require the utilities to design a CHP/WER specific program in their next portfolio plan..

Once again, the ERC appreciates the opportunity to submit these reply comments on the Commission's proposed regulations.

Respectfully submitted on behalf of the Energy Resources Center, located at the University of Illinois at Chicago



John J. Cuttica
Director, Energy Resources Center
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Summary: Reply Reply Comments on Proposed Rule Review of (REVISED):

- Ohio Energy Efficiency Programs (Case No. 13-651-EL-ORD)
- Ohio Alternative Energy Portfolio Standard (Case No. 13-652-EL-ORD)
- Ohio Implement Am. SUB. S.B. 315 (Case No. 12-2156-EL-ORD) electronically filed by Mr. Clifford Haefke on behalf of Cuttica, John Mr.