

**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 comments and recommendations regarding the above cases. The Energy Resources Center (ERC), located at the University of Illinois at Chicago has been very active over the past several years in Ohio, participating in many of the workshops, meetings and hearings relating to Combined Heat and Power (CHP) and Waste Energy Recovery (WER) issues in Ohio. The ERC perceives its role as providing technical assistance and education on the subject matter. These ERC comments and recommendations regarding the cited cases are focused solely on the elements relating to CHP and WER.

**General Comment:** Combined Heat and Power (CHP) is defined in the cited cases as "the co-production of electricity and useful thermal energy from the same fuel source designed to achieve thermal-efficiency levels of at least sixty percent, with at least twenty percent of the system's total useful energy in the form of thermal energy". For the definition of Waste Energy Recovery (WER), the cited cases refer to division (A) (38) of section 4928.01 of the Revised Code. That definition includes a facility that generates electricity through the conversion of energy from either of the following:

- (i) Exhaust heat from engines or manufacturing, industrial, commercial, or institutional sites, except for exhaust heat from a facility whose primary purpose is the generation of electricity;
- (ii) Reduction of pressure in gas pipelines before gas is distributed through the pipeline, provided that the conversion of energy to electricity is achieved without using additional fossil fuels.

The ERC believes it is important to keep in mind, as one reviews the cited cases, that incentives issued under an energy efficiency program are meant to assist the implementation of cost effective projects that, without the incentive, would not otherwise move forward. Therefore a well-designed program allows for balancing the business and financial risks and rewards of both the "Incentor" (i.e. utility program) and the "Incentee" (i.e. the ratepayer investing in the CHP/WER system). Since both of these technologies (CHP and WER) require significant investments by the applicant but also have the opportunity to provide substantial savings potential for the utilities, the ERC believes **the utilization of the mercantile self-direct program and its ability to develop reasonable arrangements between the parties is a good first approach/mechanism to bring the two parties together, with the PUCO responsible for reviewing and approving the applications.**

### Comments Regarding CHP:

- **Production Incentive:** It appears that the Commission is recommending a production incentive (\$/kWh generated) under Option 1: Request for Cash Payment Reasonable Arrangement (page 3 Application to Commit – CHP). This approach is one that is simple to implement and one that can be utilized to encourage the proper design and operation of a CHP system (operating for the maximum hours at the highest system efficiencies technically and financially dictated by individual site characteristics). The minimum efficiency requirements for CHP systems to qualify for an incentive (60% with at least 20% of the system's total useful energy output in the form of useful thermal energy on an annual basis) ensure that significant energy savings will be realized in any application. Some applications (facilities), depending on the size and shape of the thermal and electric loads and the type of CHP technology required to meet those loads, can reach efficiencies significantly higher than the minimum required 60%. A concern pointed out at previous workshops by some stakeholders is that there is the possibility that CHP operators may choose to operate their system more hours (still maintaining the 60% minimum efficiency but sacrificing some potential efficiency gains) for the purpose of receiving higher incentives. Although we do not believe this to be the case, adding a single tier to the production incentive would address this concern as well as provide the following:
  - Incentivize all energy efficient CHP prime mover technologies while not picking specific technology winners
  - Encourage project developers to design highest-efficiency installations, regardless of the energy efficient prime mover technology required by the application
  - Encourage the installed CHP system to be operated at the highest efficiency possible for the longest operating hours rather than solely be operated for the longest operating hours at a minimum allowable efficiency.
  - Would not add significant complexity to the proposed production incentive approach

A suggested single tiered approach could be to allow 100% of the total generated kWhs for systems with measured efficiencies above 70% and allow 90% of the total generated kWhs for systems with measured efficiencies between the minimum required 60% and the enhanced 70%.

- **Recommendation:** Consider a tiered approach be added to the recommended production incentive to encourage and reward the proper design and operation of the CHP system.
- **Energy Savings:** The Commission is unclear on what or how electrical savings will be determined for CHP systems. One might conclude from the application that the Commission intends to allow the total kWhs generated by the CHP system or the total kWhs utilized for calculating the production incentive (tiered approach) as the allowed annual savings. Again this is the simplest approach since the total kWhs generated by the CHP system can easily be

measured with an appropriate electric meter and is an accurate measure of the kWhs that would otherwise be generated and delivered by the utility. Also, with the meters required in the application guide (fuel meter, BTU meter, Steam meter, and electric meter), the annual efficiency of the CHP system can easily be measured to ensure that the required annual efficiency of the CHP system is met. This approach is utilized in Maryland under their energy efficiency program.

Some critics of this approach would argue that one is not necessarily measuring the total energy savings. To do that, there is an approach that can be implemented (e.g. being implemented in Illinois where the state energy program requires that energy efficiency targets be met on both the electric and natural gas side). That approach uses a formula to calculate the Btu savings [takes into account the energy (Btus) that would have been used to generate the annual kWhs generated by the CHP system if those kWhs were generated by the local grid + the energy (Btus) that are being displaced by the useful thermal recovered by the CHP system - the total energy (Btus) consumed annually by the CHP system]. The Btus saved are then converted to appropriate kWhs saved. Although this is more complicated, it can be implemented by taking measured data with the same set of meters described above. This approach can result in savings numbers quite different than the total generation approach.

- **Recommendation:** Provide clear directions that the energy savings will match the kWhs generated and utilized in the production incentive approach. Should the Commission decide to require a savings approach where the Btus are measured and then converted to equivalent kWhs, It is recommended that the Commission clearly define the method to be utilized (examples are the methods utilized in Massachusetts or Illinois).
- **Level and Timing of Incentive:** The mercantile self-direct approach allows for a cash payment reasonable arrangement (Section 3 A Option 1 of Application to Commit - CHP). There are at least four inputs that should be determined in order to construct a reasonable and effective cash rebate (see application for Jay Plastics CHP system under mercantile self-direct Case No. 13-2440-EL-EEC):
  - The percentage of kWhs output from the CHP system that will be counted towards fulfilling the Energy Efficiency Resource Standard (EERS)
  - The price paid per kWh allowed or counted.
  - The time period to claim the savings (negotiable up to life of the system and /or sunset of the EERS)
  - The schedule of incentive payments

The Commission has limited the price to be paid per kWh allowed to a maximum of \$0.005 per kWh. Placing this maximum incentive level is unrealistic to “move the market.” The incentive level is only one of four variables that go into establishing a “reasonable arrangement”. The time period that is allowed to claim the savings will greatly affect the level of incentive that is justified. For example, the suggested \$0.005 per kWh utilized for savings over 10 years equates to roughly \$0.05 per kWh if the savings were taken all in one year (not factoring in cost of money

relative to time). CHP systems installed past 2015 would not even qualify for 10 years of savings since the sunset for the energy efficiency program is set for 2025. If the equivalent of \$0.05 per kWh based on claiming all the savings in the first 12 months were considered reasonable, one could not get the equivalent incentive (if the max. level was set at \$0.005 per kWh) for any system installed after 2015.

CHP investors require the incentive be issued in as short a period as possible after the system is commissioned to help off-set the large investment risk associated with CHP systems. The Utilities are inclined to want to stretch out the incentives over a much longer period of time to reduce their financial risk (ensure that the system continues to operate and save kWhs over time). The Commission should address this in the proposed rules. Maryland and Illinois programs are designed to provide the equivalent of approximately 40% to 50% (on average) of the total cost of a CHP system (equivalent incentive of \$750/kW capacity). These programs allow for a portion of the incentive to be collected at the time the CHP system is commissioned and the remainder of the incentive (approximately 2/3) is collected after 12 to 18 months of operation at a rate of between \$0.06 and \$0.09 per kWh generated, with the savings claimed over that time period. The Maryland program has been in effect for over a year and has been considered very successful by the utilities, CHP owners, and the Commission. The Illinois pilot is to be launched this summer (2014).

- **Recommendation:**

- Remove the Maximum of \$0.005 per kWh generated since it will greatly limit any systems installed after 2015 and also limits the reasonable arrangements that the applicants can negotiate.
- Give clear direction that the incentives should be performance based (based on measuring the efficiency of the unit in the field over time) with the performance reported in the annual report
- Provide clear guidance that allows the applicant to receive agreed to incentives in a timely fashion 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).

- **Definitions:**

**Useful Thermal Energy** (page 5 Section 5 Criteria 2 Amount of Useful Thermal Energy) should be better defined to ensure that the applications provide the 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.** Without this definition, the applicant might consider useful thermal energy as the total amount of thermal energy that could be used rather than the total amount of thermal energy that is actually used. Not clearly defining this term can lead to significant variation in the calculated efficiency of the CHP system.

**Waste Energy Recovery:**

The following are the ERC comments/ recommendations regarding WER systems as addressed in the cited cases (page 3 Section 3 B Option 1):

- 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).

**Additional Final Comments:**

The proposed rule only proposes that CHP/WER projects apply for incentives under the mercantile self-direct program. Although this is a good and viable method of applying for a CHP/WER incentive, the ERC believes the Commission should encourage the Utilities to:

- Consider both CHP and WER under their existing EE Programs utilizing their Custom Program.
- Consider developing targeted CHP/WER programs for submission under their three year program plans.

Once again, the ERC appreciates the opportunity to comment on the Commission's proposed regulations and looks forward to continuing participating in the process.

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: Comments John Cuttica Director, Energy Resources Center. Comments on Public Utilities Commission of Ohio Case Nos. 13-651-EL-ORD, 13-652-EL-ORD, 12-2156-EL-ORD.

electronically filed by Mr. Clifford Haefke on behalf of Energy Resources Center and Mr. John Cuttica