

**State of Illinois**  
**Energy Efficiency**  
**Technical Reference Manual**

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**Combined Heat and Power**  
**New Measure**

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**1/13/2015**

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**Table 1 Work Paper Revision History**

#	MM/DD/YY	Author, Company	Summary of Changes
1	10/08/2014	John Cuttica, Stefano Galiasso, Shraddha Raikar, Energy Resources Center	Include new measure in the TRM
2	11/21/2014		Reflects resolved comments and open issues from 11/18/2014 SAG Meeting
3	12/5/2014		Reflects resolved comments and new comments post 12/2 SAG Meeting
4	1/7/2014		Reflects resolved issues from 12/16/2014 SAG meeting

## 1 Overview

The Combined Heat and Power (CHP) measure **can** provide electric and natural gas savings within the state of Illinois **through** the development and operation of CHP projects. This measure is applicable for Conventional CHP (Topping Cycle) systems as well as Waste Heat-to-Power (WHP) CHP (Bottoming Cycle) systems.

It is recognized that CHP system design and configuration may be complex, and as such the calculation of energy savings may not be reducible to the equations within this measure. In such cases a more comprehensive engineering and financial analysis may be developed that more accurately incorporates the attributes of complex CHP configurations such as variable-capacity systems, and partial combined-cycle CHP systems. Where noted, the use of values that are determined through an external engineering analysis may be substituted by agreement between the participant, the program administrator and independent evaluator.

**Comment [EC1]:** Added per R.Baker email on 12/5/2014

**Comment [ASB2]:** Chris: Keep language on exceptional cases. Move language.

**Comment [CN3]:** This was in the section on measure costs, which didn't seem the right place. This seems a more relevant place.

## 2 New Measure Characterizations

### DESCRIPTION

The Combined Heat and Power (CHP) measure **can** provide electric and natural gas savings within the State of Illinois **through** the development and operation of CHP projects. This measure is applicable for Conventional or Topping Cycle CHP systems, as well as Waste Heat-to-Power (WHP) or Bottoming Cycle CHP systems. The measure will reduce the total Btu's of **energy** required to meet the end use needs of the facility. Depending on the application, the saved Btu's can be converted into a combination of kWh and therms saved. In all cases **estimates of** the saved energy will account for any additional natural gas utilized at the site **in order** to operate the CHP system.

This measure was developed to be applicable to the following program types: Retrofit (RF), New Construction (NC). If applied to other program types, the measure savings should be verified.

### DEFINITION OF EFFICIENT EQUIPMENT

Conventional or Topping Cycle CHP is defined as an integrated system that is located at or near the building or facility (on-site, on the customer side of the meter) that utilizes a prime mover (reciprocating engine, gas turbine, micro-turbine, fuel cell, boiler/steam turbine combination) for the purpose of generating electricity and useful thermal energy (such as steam, hot water, or chilled water) where the primary function of the facility where the CHP is located is not to generate electricity for use on the grid. An eligible system must demonstrate a minimum total system efficiency of 60% (HHV)<sup>1</sup> with at least 20% of the system's total useful energy output in the form of useful thermal energy on an annual basis.

*Measuring and Calculating Conventional CHP Total System Efficiency:*

CHP efficiency is calculated using the following equation:

$$CHP_{Efficiency(HHV)} = \frac{\left[ CHP_{thermal} \left( \frac{kBtu}{yr} \right) + E_{CHP} \left( \frac{kWh}{yr} \right) * 3.412 \left( \frac{kBtu}{kWh} \right) \right]}{F_{totalCHP} \left( \frac{kBtu}{yr} \right)}$$

Where:

CHP<sub>thermal</sub> = Useful annual thermal energy output from the CHP system, defined as the annual thermal energy output of the CHP system that is actually recovered and utilized in the facility/process.

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<sup>1</sup> Higher Heating Value (HHV): refers to the heating value of the fuel and is defined as the total thermal energy available, including the heat of condensation of water vapors, resulting from complete combustion of the fuel versus the Lower Heating Value (LHV) which assumes the heat of condensation is not available

$E_{CHP}$  = Useful annual electricity output produced by the CHP system, defined as the annual electric energy output of the CHP system that is actually utilized to replace purchased electricity requires to meet the requirements of the facility/process.

$F_{totalCHP}$  = Total annual fuel consumed by the CHP system

For further definition of the terms, please see “Calculation of Energy Savings” Section below.

Waste Heat-to-Power or Bottoming Cycle CHP is defined as an integrated system that is located at or near the building or facility (on-site, on the customer side of the meter) that **does one of the following**:

- Utilizes exhaust heat from an industrial/commercial process to generate electricity (except for exhaust heat from a facility whose primary purpose is the generation of electricity for use on the grid); **or**
- Utilizes the pressure drop in an industrial/commercial facility to generate electricity through a backpressure steam turbine where the facility normally uses a pressure reducing valve (PRV) to reduce the pressure in their facility; **or**
- Utilizes the pressure reduction in natural gas pipelines (located at natural gas compressor stations) before the gas is distributed through the pipeline to generate electricity, provided that the conversion of energy to electricity is achieved without using additional fossil fuels.

Since these type of systems utilize waste heat as their fuel, they do not have to meet any specific total system efficiency level (assuming they use no additional fossil fuel in their operation – **if** additional natural gas is used onsite, it should be properly accounted for). These systems may export power to the grid.

**DEFINITION OF BASELINE EQUIPMENT**

Electric Baseline: The baseline facility would be a facility that purchases its electric power from the grid.

Heating Baseline (for CHP applications that displace onsite heat): The baseline equipment would be the boiler/furnace operating onsite, **or a boiler/furnace** meeting the minimum standard defined in the boiler/furnace measures of the this TRM.

Cooling Baseline (for CHP applications that displace onsite cooling demands): The baseline equipment would be the chiller (or chillers) operating onsite, or a chiller (or chillers) meeting the minimum standard defined in the chiller measures of the this TRM

Facilities that use biogas or waste gas: facilities that use (but are not purchasing) biogas or waste gas that is not otherwise marketable, whether they are using biogas or waste gas only or a combination of biogas or waste gas and natural gas to meet their energy demands are also eligible for this measure. If additional natural gas is purchased to fuel the CHP system, then the additional natural gas should be taken into account in the fuel savings calculations. Consumption of any biogas or waste gas that would not otherwise being wasted (e.g., flared) will be accounted for in the overall net BTU savings calculations the same as for purchased natural gas.

**DEEMED LIFETIME OF EFFICIENT EQUIPMENT**

Measure life is **a custom assumption**, dependent on the technology selected and the system installation.

**Comment [RH4]**: How this value is arrived at is not discussed in the workpaper. Guidance or rules should be given.

Among customers and utilities there is often a desire to discount down-time during the early period of operation. However, there is not guarant that early problems will not persist. I suggest a measurement scheme based on “date of commercial operation” similar to what is used in PA.

The customer and utility decide on the DCO, preferably after the system has been tested and commissioned and the early bugs worked out with some steady state operation – perhaps several hundred hours until the first service shut-down is finished. The DCO starts the test clock for the program. ALL data from the DCO until the verification visit is used for the incentive calculation – minimum 2 weeks. Furthermore, ALL data from the DCO until the EM&V date is used for the evaluated savings – minimum 2 months. No exceptions, no data tossed. Downtime for anytype of service or failure must be assumed to represent future operation.

If distinct daytypes are observed (say weekend operation different from weekday) data are extrapolated to yearly based on the number of annual days of each daytype. For example if Sundays operate at 75% capacity but the other days consistently show 97% capacity on average, savings is

$$\text{Capacity} \times [(52 \times 6 \times 0.97) + (52 \times 1 \times 0.75)]$$

**Comment [ASB5]**: Chris Response: Electric savings defined by useful electric output. Conceptually makes sense, but need to define further. Navigant’s suggested language to further define is fine. Stefano: Useful electric: output of system minus paralytics. Program design decision on how to calculate.

**Comment [RH6]**: Fuel consumption based on metered data concurrent with the timeframe used for determining Echp.

**Comment [ASB7]**: Response: Address later.

### **DEEMED MEASURE COST**

Custom installation and equipment cost will be used. These costs should include the cost of the equipment and the cost of installing the equipment. Equipment costs include, but are not limited to: prime mover, heat recovery system(s), exhaust gas treatment system(s), controls, and any interconnection/electrical connection costs.

The installations costs include labor and material costs such as, but not limited to: labor costs, materials such as ductwork, piping, and wiring, project and construction management, engineering costs, commissioning costs, and other fees.

Measure costs will also include the present value of expected maintenance costs over the life of the CHP system.

### **LOADSHAPE**

Use Custom Loadshape. The loadshape should be obtained from the actual CHP operation strategy, based on the On-Peak and Off-Peak Energy definitions specified in Table 3.3 of “Section 3.5 Electrical Loadshapes” of the TRM.

### **COINCIDENCE FACTOR**

Custom coincidence factor will be used. Actual value based on the CHP operation strategy will be used.

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### **Algorithm**

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### **CALCULATION OF ENERGY SAVINGS**

#### **i) Conventional or Topping Cycle CHP Systems:**

##### **Step 1: (Calculating total annual source fuel savings in Btu)**

The first step is to calculate the total annual source fuel savings associated with the CHP installation, in order to demonstrate that CHP applications meet the statutory definition of efficiency necessary to be included in the Illinois EEPS programs:

$S_{\text{FuelCHP}}$  = Annual fuel savings (Btu) associated with the use of a Conventional CHP system to generate the useful electricity output (kWh, converted to Btu) and useful thermal energy output (Btu) versus the use of the equivalent electricity generated and delivered by the local grid and the equivalent thermal energy provided by the onsite boiler.

$$= (F_{\text{grid}} + F_{\text{thermalCHP}}) - F_{\text{total CHP}}$$

Where

$F_{\text{grid}}$  = Annual fuel in Btu that would have been used to generate the useful electricity output of the CHP system if that useful electricity output was provided by the local utility grid.

$$= E_{\text{CHP}} * H_{\text{grid}}$$

Where

$E_{CHP}$  = Useful annual electricity output produced by the CHP system, defined as the annual electric energy output of the CHP system that is actually utilized to replace purchased electricity required to meet the requirements of the facility/process.<sup>2</sup>

**Comment [EC8]:** Added per R.Baker email 12/5/2014

$$= ( CHP_{capacity} * Hours ) - E_{Parasitic}$$

$CHP_{capacity}$  = CHP nameplate capacity

= Custom input

Hours = Annual operating hours of the system

= Custom input

$E_{parasitic}$  = The electricity required to operate the CHP system that would otherwise not be required by the facility/process

= Custom input

$H_{grid}$  = Heat rate of the grid in btu/kWh, based on the average fossil heat rate for the EPA eGRID subregion and includes a factor that takes into account T&D losses.

For systems operating less than 6,500 hrs per year:

Use the Non-baseload heat rate provided by EPA eGRID for RFC West region for ComEd territory, and SERC Midwest region for Ameren territory. Also include any line losses.

For systems operating more than 6,500 hrs per year:

Use the All Fossil Average heat rate provided by EPA eGRID for RFC West region for ComEd territory, and SERC Midwest region for Ameren territory. Also include any line losses.

$F_{thermalCHP}$  = Annual fuel in Btu that would have been used on-site by a boiler or heater to provide the useful thermal energy output of the CHP system.<sup>3</sup>

**Comment [EC9]:** Added per R.Baker email 12/5/2014

$$= CHP_{thermal} \div Boiler_{eff}$$

$CHP_{thermal}$  = Useful annual thermal energy output from the CHP system, defined as the annual thermal energy output of the CHP system that is actually recovered and utilized in the facility/process.

= Custom input

<sup>2</sup> For complex systems this value may be obtained from a CHP System design/financial analysis study.

<sup>3</sup> Ibid

- Boiler<sub>eff</sub> = Efficiency of the on-site boiler OR heater that is displaced by the CHP system or if unknown, the value stated in the boiler measure TRM.  
 = Custom input
- F<sub>total CHP</sub> = Total fuel in Btus consumed by the CHP system  
 = Custom input

**Step 2: (Savings allocation to Program Administrators)**

Savings claims are a function of the electric output of the CHP system ( $E_{CHP}$ ), the used thermal output of the CHP system ( $F_{thermalCHP}$ ), and the CHP system efficiency ( $CHP_{efficiencyHHV}$ ). The percentages of electric output and used thermal output that can be claimed also differ slightly depending on whether the project was included in both electric and gas EEPS efficiency programs, only an electric EEPS program or only a gas EEPS program. The tables below provide the specific percentages of electric and/or thermal output that can be claimed under each of those three scenarios.

1) For systems participating in both electric EEPS and gas EEPs programs:

CHP Annual System Efficiency (HHV)	Allocated Electric Savings	Allocated Gas Savings
60%	65% of $E_{CHP}$ (kWh)	No gas savings
>60% to 65%	65% of $E_{CHP}$ (kWh) + one percentage point increase for every one percentage point increase in CHP system efficiency (max 70% of $E_{CHP}$ in kWh)	No gas Savings
>65%	70% of $E_{chp}$ (kWh)	2.5% of $F_{thermal}$ (useful thermal output of the CHP system) for every one percentage point increase in CHP system efficiency above 65%.

Example: System with measured annual fuel use efficiency of 70%: Electric savings (kWh) = 70% of  $E_{CHP}$  measured over 12 months, and Gas savings (therms) = 12.5% of  $F_{thermal}$  measured over 12 months (70% - 65% = 5 X 2.5% = 12.5%)

2) For systems participating in only an electric EEPS program:

CHP Annual System Efficiency (HHV)	Allocated Electric Savings	Allocated Gas Savings
60%	65% of $E_{CHP}$ (useful electric output of CHP system in kWh)	No gas Savings
Greater than 60%	65% + one percentage point increase for every one percentage point increase in CHP	No gas Savings



system efficiency (no max)

Example: System with measured annual fuel use efficiency of 75%: Electric savings (kWh) = 65% + 15% = 80% of  $E_{CHP}$  measured over 12 months (15% = 1% for every 1% increase in system efficiency). No gas savings (therms).

3) For systems participating in only a gas EEPS program:

CHP Annual System Efficiency (HHV)	Allocated Electric Savings	Allocated Gas Savings
60% or greater	No electric savings	2.5% of $F_{thermal}$ (useful thermal output of the CHP system) for every one percentage point increase in CHP system efficiency above 60%.

Conventional or topping cycle CHP systems virtually always require an increase in the use of natural gas on-site in order to produce electricity. Different jurisdictions and experts across the country have employed and/or put forward a variety of approaches to addressing how increased on-site gas consumption should be reflected in the attribution of electric savings to CHP systems. Those approaches range from ignoring the increased gas use (i.e. no “penalty”) to roughly 40-60% “penalties”, depending on the CHP efficiency, based on the number of kWh that could have been produced had the increased gas Btu’s been used on the grid (a grid “Btu equivalency”). Several other approaches produce results in between those two extremes. The approach reflected in the tables above is generally consistent with approaches recently put forward by the Southwest Energy Efficiency Project (SWEEP), Insitutue for Industrial Productivity (IIP) and others which essentially establish an electric savings “penalty” that is equal to the amount of kWh that could be produced by the electric grid with a “carbon emissions budget” that is equal to the emissions associated with the increased on-site gas consumption. The result of this “carbon equivalency” approach is a savings penalty that will typically range from 20% to 35%.<sup>4</sup> That result is also solidly in the middle of the two extremes discussed above.

There are also a variety of ways one could treat the potential for gas utilities to claim savings from CHP projects in their EEPS portfolios. For projects in which a gas utility EEPS program is involved, the tables above treat savings from CHP installations in two steps: (1) a fuel-switch from electricity to gas (i.e.

<sup>4</sup> Consider, for example, a hypothetical CHP system that produces 5 million kWh annually, consumes 50 million kBtu of gas annual to generate that electricity (i.e. electric efficiency of approximately 34.8% HHV), reduces on-site gas use for space heating by 26 million kBtu of gas (i.e. equivalent to approximately 81.5% CHP thermal output utilization displacing gas used in a 70% efficient space heating boiler) and has a total annual CHP efficiency of 70.6% HHV. In this example, the net increase in on-site gas use is 24 million kBtu. At a carbon dioxide emission rate of 53.06 kg/MMBtu for burning natural gas, that translates to an increase in on-site carbon dioxide emissions of 1404 tons per year. At an estimated marginal emission rate of 1.098 tons of carbon dioxide per MWh in Illinois, that is equivalent to electric grid production of approximately 1.28 million kWh, or penalty of about 25.6% of the CHP system’s electrical output.

using more gas to eliminate the need to generate as much electricity on the grid); and (2) possible increases in CHP efficiency above a “benchmark” level. When both electric EEPS and gas EEPS programs are involved in a project, the electric utility claims all the savings associated with a fuel-switch up to a “benchmark” 65% efficient CHP system. The gas utility then claims all the savings associated with increasing CHP efficiencies above that benchmark level (e.g. if the CHP efficiency is 75%, the gas utility claims the gas savings associated with an increase in CHP efficiency from 65% to 75%). That is consistent with the notion that CHP efficiency typically increases primarily by increasing use of the thermal output of the system (increasing the displacement of baseline gas use). For projects that involve only a gas utility EEPS program, the “benchmark” above which the gas utility can claim savings is lowered to 60%.

ii) **Waste-Heat-to-Power CHP Systems :**

**ELECTRIC ENERGY SAVINGS:**

$$\Delta kWh = E_{CHP}$$

Where

$E_{CHP}$  = Useful annual electricity output produced by the CHP system, defined as the annual electric energy output of the CHP system that is actually utilized to replace purchased electricity required to meet the requirements of the facility/process.  
 = Custom input

**NATURAL GAS ENERGY SAVINGS:**

$$\Delta Therms = F_{thermalCHP} \div 100,000$$

Where

$F_{thermalCHP}$  = Net savings in annual purchased fuel in Btu, if any, that would have been used on-site by a boiler or heater to provide some or all of the useful thermal energy output of the CHP system<sup>5</sup>.  
 100,000 = Conversion factor for Btu/hr to therms

**SUMMER COINCIDENT PEAK DEMAND SAVINGS**

$$\Delta kW = CF * CHP_{capacity}$$

Where

CF = Summer Coincidence factor. This factor should also consider any displaced Chiller capacity<sup>6</sup>  
 = Custom input  
 $CHP_{Capacity}$  = CHP nameplate capacity

<sup>5</sup> In most cases, it is expected that waste to energy systems will not provide any new net useful thermal energy output, since the CHP system will be driven by thermal energy that was otherwise being wasted. If additional natural gas or other purchased energy is used onsite, it should be properly accounted for.

<sup>6</sup> If additional natural gas is used onsite, it should be properly accounted for.

= Custom input

**WATER IMPACT DESCRIPTIONS AND CALCULATION**

N/A

**DEEMED O&M COST ADJUSTMENT CALCULATION**

Custom leveled Maintenance costs that will be incurred for the life of the measure will be used. Maintenance costs vary with type and size of the prime mover. These costs include, but are not limited to:

- Maintenance labor
- Engine parts and materials such as oil filters, air filters, spark plugs, gaskets, valves, piston rings, electronic components, etc. and consumables such as oil
- Minor and major overhauls

For screening purposes, the US EPA has published resource guides that provide average maintenance costs based on CHP technology and system size<sup>7</sup>.

**COST-EFFECTIVENESS SCREENING**

For the purposes of screening a CHP measure application for cost-effectiveness, changes in site energy use – reduced consumption of utility provided electricity and the net change in consumption of natural gas – should be used. Where

Benefits:  $E_{CHP} + \Delta kW + F_{thermal\_CHP}$

Costs:  $F_{total\_CHP} + CHP_{COSTS} + O\&M_{COSTS}$

$CHP_{COSTS}$  = CHP equipment and installation costs as defined in the “Deemed Measure Costs” section

$O\&M_{COSTS}$  = CHP operations and maintenance costs as defined in the “Deemed O&M Cost Adjustment Calculation” section

**3 Proposed Changes to Existing Measures**

N/A

<sup>7</sup> “EPA Combined Heat and Power Partnership Resources” Oct 07, 2014, <http://www.epa.gov/chp/resources.html>

**Comment [CN10]:** NRDC/DCEO edited this language to be clearer and simpler (hopefully!)

**Comment [SG11]:** I think we can use the previously defined Delta(kW)= CF \* CHP\_capacity OR we could use a definition with hours of use, such as Delta(kW)=CF/Hours\*E\_CHP. The two could be different depending on how the system is operated. Also, it doesn't include Chiller offset kW / kWh --- wouldn't those be savings too?

**Comment [EC12]:** Regarding part one – kw definition – SAG to discuss and decide – both are technical correct

**Comment [EC13]:** Regarding part 2- chiller offset, the only time you need to add the chiller benefit is when you have added a new absorption chiller . If you keep electric chillers, you catch the savings in the existing kw calc, if you displace the thermal generation for an existing absorption chiller you catch the savings in the Fthermal. If you add a brand new absorption chiller that you did not have before and retire the existing electric chiller and you use all the CHP electric out put as well, than, the kw savings would be: TONS \* ((IPLVbase) – (IPLVee)) \* EFLH wher eIPLVbase would be the displaced electric chiller and IPLVee would be the new absorption chiller. (this is from the commerical chiller TRM).

**Comment [EC14]:** There are already listed above (page 10 so not needed here)

## 4 References

Please refer to the Chicago style for variances on format citations. Please upload any new references or calculation sheets to the Tracker item.

[http://www.chicagomanualofstyle.org/tools\\_citationguide.html](http://www.chicagomanualofstyle.org/tools_citationguide.html)

EXAMPLES:

### **Paper presented at a meeting or conference (Including internal work papers)**

Author Name, "Paper title" (paper presented at the annual meeting for the Organization Name, City, State, Month Day, Year).

### **Website**

"Title," last modified Month Day, Year, URL

### **E-mail**

Author Name, e-mail message to author, Month Day, Year.

### **Item in a commercial database**

Author Name. "Source Title" Publisher, Year. Database Name

### **Book: Chapter or other part of a book**

Author Name, "Chapter," in Title, City: Publisher, Year, page range

### **Book: Published electronically**

Author Name, "Chapter," in Title, City: Publisher, Year, Accessed Month Day, Year. URL.

### **Journal Article in a print journal (Use this for program evaluations.)**

Author Name, "Article Title," Journal Name edition (Year): page

Author Name, "Evaluation Title," Utility Name, Program or Measure Name (Date): page

### **Journal Article in an online journal**

Author Name, "Article Title," Journal Name edition (Year): page, accessed Month Day, Year, dio:xx.xxxx/xxxxxx.

## 5 Stakeholder Comments

If adding comments to an existing work paper, add note in “Progress Notes” section of the tracker item stating “(Author, Company) added comments to workpaper, (date)”. This will send an alert to VEIC and others that a new comment has been added.

Stakeholder Comments to Revision 1 Author, Company and Date: Philip Mosenthal, Optimal Energy on behalf of the Eric Robertson and Ali Al-Jabir, Illinois Attorney General’s Office, 10/30/Industrial Energy Consumers (IIEC), October 24, 2014.

Comment:

See above redline and comments.

**General Comment:** The AG continues to oppose crediting a utility with savings that count toward meeting goals if the actual utility system sales will increase. We agree generally with the math, the issue is really one of allocation.

Also, we believe that some circumstances are not fully or properly covered regarding when either the thermal output is offsetting a different fuel than Natural Gas or the CHP system is fired by a different fuel. It appears even if a CHP system was oil fired and offsetting oil thermal load that the above proposal would still provide savings credit to the gas utility. We acknowledge with today’s economics we may not see any oil fired systems, but it is possible and should be addressed.

IIEC’s revisions to Section 2 of the proposed CHP measure are designed to recognize that large industrial customers are sophisticated users of electricity who possess the economic incentive, resources and expertise to adequately assess and analyze CHP opportunities at their sites. While the use of generic inputs and the formulas specified in the proposed CHP measure may be appropriate for smaller customers, such inputs and formulas may not be appropriate for large customer facilities with peak loads of 3 MW or more at an individual site or peak loads of 5 MW or more at the aggregate company level within a utility’s service territory. Such large customers should be afforded maximum flexibility to customize all of the measure formulas and the variable inputs that are used to evaluate CHP opportunities at their sites, as long as the customers can adequately document the engineering studies and cost-benefit analyses conducted to justify the implementation of a CHP project at their sites.

Large industrial customers operate in very competitive business environments and are actively pursuing energy savings opportunities where such opportunities are cost-effective. As a matter of good business practice, such customers will not pursue a CHP project unless it is thoroughly analyzed through engineering and cost-benefit studies and unless the project can clear the internal return on investment hurdles that the customer has established within its company. Consequently, the requirement of using a more rigid, formulaic approach to the evaluation of CHP projects for such customers, as set forth in the proposed CHP measure, is inappropriate, unnecessary and may inhibit the implementation of many cost-effective CHP projects.

IIEC's other revision to Section 2 is to include within the scope of the CHP measure generation from process gases that may not otherwise fit into the category of "biogas," but similarly constitute lower BTU content gas that otherwise has no marketable value and may be disposed of onsite, i.e. flared.

Also, the CHP measure should provide examples of the application of the proposed efficiency algorithm to prime movers to provide TRM users with a better understanding of the algorithm and to provide a means of testing the algorithm.

Stakeholder Comments to Revision 2

Stakeholder Comments to Revision 2

Authors: Eric Robertson and Ali Al-Jabir on behalf of the Illinois Industrial Energy Consumers (IIEC)

IIEC has modified its previously submitted comments regarding the applicability of the CHP measure to clarify that IIEC is not requesting a blanket exemption from all aspects of the CHP workpaper for large customers. Rather, IIEC simply seeks to clarify that large customers should be able to substantiate the costs and energy savings associated with their CHP projects using the data and analysis they prepare in-house, with the understanding that this data and analysis would be subject to review by the local electric or natural gas utility for sufficiency. The purpose of IIEC's proposed language is to ensure that large customers will not be required to prepare two separate sets of analyses to support a CHP project (one analysis to meet the customer's internal corporate requirements and a separate analysis to conform to the requirements of the CHP workpaper). IIEC's suggested approach would be equivalent to approval of a customized measurement for an energy efficiency measure. IIEC's revised proposed language can be found under the heading "Deemed Measure Cost."

**Comment [CN15]:** Note that DCEO/NRDC have moved this to the intro section instead, as this wasn't really a measure cost issue.