BEFORE THE NORTH CAROLINA UTILITIES COMMISSION
DOCKET NO. E-100, SUB 113

In the Matter of: Requests for Declaratory Ruling and, if Necessary and Appropriate, a Rulemaking by the North Carolina Sustainable Energy Association	**REQUESTS FOR DECLARATORY RULING ON MEANING OF N.C.G.S. § 62-133.9 AND NCUC RULE R8-67 AND, IF NECESSARY AND APPROPRIATE, A RULEMAKING TO CLARIFY NCUC RULE R8-67**

NCSEA'S REQUESTS FOR DECLARATORY RULING AND, IF NECESSARY AND APPROPRIATE, A RULEMAKING

Pursuant to N.C. Gen. Stat. §§ 1-253 and 62-60 and Rule R1-5 of the Rules of the North Carolina Utilities Commission ("Commission"), the North Carolina Sustainable Energy Association ("NCSEA") respectfully requests that the Commission issue a declaratory ruling, affirmative in form, that:

> A new topping cycle combined heat and power ("CHP") system – including such a system that uses nonrenewable energy resources – that both (a) produces electricity or useful, measureable thermal or mechanical energy at a retail electric customer's facility and (b) results in less energy being used to perform the same function or provide the same level of service at the retail electric customer's facility constitutes an "energy efficiency measure" for purposes of N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-67.

Moreover, if deemed necessary or helpful, NCSEA also respectfully requests that the Commission issue a complementary declaratory ruling, negative in form, that:

> It is inconsistent with the clear and unambiguous language of N.C. Gen. Stat. §§ 62-133.8 and 62-133.9 to recognize *only* the heat recovery component of a new topping cycle CHP system as an "energy efficiency measure."

Finally, in the event one or both of the foregoing declaratory rulings are issued, NCSEA respectfully requests the Commission to initiate a rulemaking, if necessary and appropriate, to make clarifying changes to Commission Rule R8-67.

In support of the foregoing requests, NCSEA shows the Commission as follows:

CONTACT INFORMATION

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JURISDICTION

3. The North Carolina Declaratory Judgment Act, N.C. Gen. Stat. § 1-253, empowers courts of record to declare rights, status, and other legal relations, whether or not further relief is or could be claimed. Such declarations shall have the force and effect of a final judgment or decree. Pursuant to N.C. Gen. Stat. § 62-60, the Commission may exercise this power under the Declaratory Judgment Act with respect to all subjects over which the Commission has jurisdiction.

4. N.C. Gen. Stat. § 62-31 vests the Commission with "full power and authority to administer and enforce the provisions of [Chapter 62], and to make and enforce reasonable and necessary rules and regulations to that end."

FACTS - *PART I*

Combined Heat and Power – General Background

5. The State and Local Energy Efficiency Action Network ("SEEAction") is a state and local effort facilitated by the federal government that is designed to help states, utilities, and other local stakeholders take energy efficiency to scale and achieve all cost-effective energy efficiency by 2020. In March 2013, SEEAction published a *Guide to the Successful Implementation of State Combined Heat and Power Policies* ("SEEAction Guide").[1] The first chapter of the SEEAction Guide contains a general, non-statutory definition of combined heat and power ("CHP") as well as a general overview of CHP's market potential. These portions of the first chapter of the SEEAction Guide are excerpted here to provide necessary context for the statutory interpretation question being presented to the Commission for resolution:[2]

> The average generation efficiency of grid-supplied power in the United States has remained at 34% since the 1960s—the energy lost in wasted heat-from-power generation in the United States is greater than the total energy use of Japan. **CHP systems typically achieve total system efficiencies of 60%–80% compared to only about 45%–50% for conventional separate heat and power generation** by avoiding line losses and capturing much of the heat energy normally wasted in power generation to provide heating and cooling to factories and businesses. By efficiently providing electricity and thermal energy from the same fuel source at the point of use, CHP significantly reduces the total primary fuel needed to supply energy services to a business or industrial plant, saving them money and reducing air emissions.

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[1] The official citation is as follows: State and Local Energy Efficiency Network. 2013. *Guide to the Successful Implementation of State Combined Heat and Power Policies.* Prepared by B. Hedman, A. Hampson, J. Rackley, E. Wong, ICF International; L. Schwartz and D. Lamont, Regulatory Assistance Project; T. Woolf, Synapse Energy Economics; J. Selecky, Brubaker & Associates. The SEEAction Guide is accessible electronically at https://www4.eere.energy.gov/seeaction/publication/guide-successful-implementation-state-combined-heat-and-power-policies (accessed on 9 April 2015).

[2] For the Commission's review, the first chapter of the SEEAction Guide is attached hereto in its entirety as **Exhibit A**.

. . .

CHP is already an important resource for the United States—the existing 82 GW of CHP capacity at more than 4,100 industrial and commercial facilities represents approximately 8% of current U.S. generating capacity and more than 12% of total megawatt-hours (MWh) generated annually. Compared to the average fossil-based electricity generation, the existing base of CHP saves 1.8 quads of energy annually and eliminates 240 million metric tons of $CO2$ emissions each year (equivalent to the emissions of more than 40 million cars).

While investment in CHP declined in the early 2000s due to changes in the wholesale market for electricity and increasingly volatile natural gas prices, CHP's potential role as a clean energy source for the future is much greater than recent market trends would indicate. Efficient on-site CHP represents a largely untapped resource that exists in a variety of energy-intensive industries and businesses . . . [(see Figure 1 below)]. Recent estimates indicate the technical potential for additional CHP at existing industrial facilities is slightly less than 65 GW, with the corresponding technical potential for CHP at commercial and institutional facilities at slightly more than 65 GW, for a total of about 130 GW. A 2009 study by McKinsey and Company estimated that 50 GW of CHP in industrial and large commercial/institutional applications could be deployable at reasonable returns with then current equipment and energy prices. These estimates of both technical and economic potential are likely greater today given the improving outlook in natural gas supply and prices.

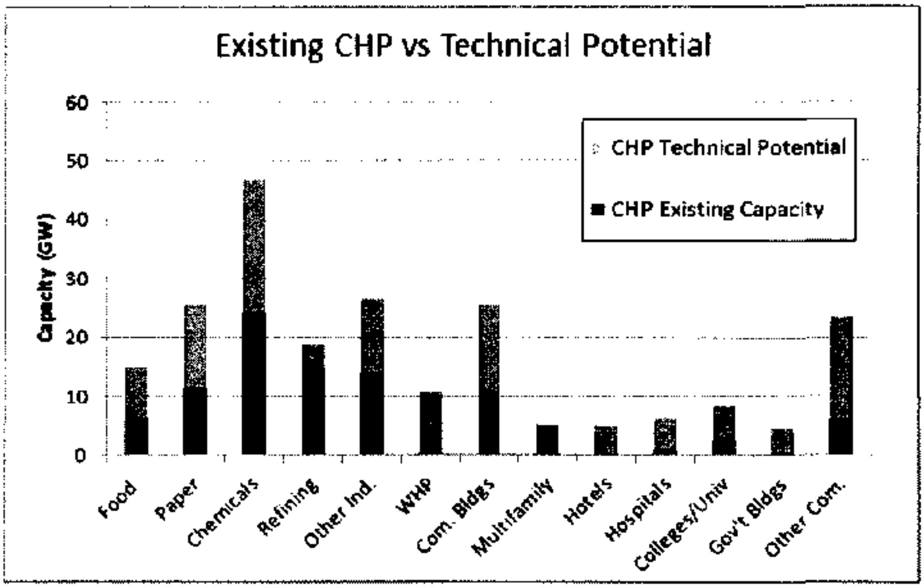
The outlook for increased use of CHP is improving. Policymakers at the federal and state level are beginning to recognize the potential benefits of CHP and the role it could play in providing clean, reliable, cost-effective energy services to industry and businesses. A number of states have developed innovative approaches to increase the deployment of CHP to the benefit of users as well as ratepayers. CHP is being looked at as a productive investment by some companies facing significant costs to upgrade old coal- and oil-fired boilers. In addition, CHP can provide a cost-effective source of new generating capacity in many areas confronting retirement of older power plants. Finally, the economics of CHP are improving as a result of the changing outlook in the long-term supply and price of North American natural gas—a preferred fuel for many CHP applications.

Key to capturing this potential is the market structure for CHP at the state level. **Markets with unnecessary barriers to the development of CHP will see less than the economically and environmentally desirable development of the resource, resulting potentially in higher cost**

resources or resources with greater environmental impacts incorporated into the nation's electricity system.

SEEAction Guide, pp. 3-5 (emphasis added) (footnotes omitted).

Figure 1



Source: Internal estimates by ICF International and CHP Installation Database developed by ICF International for Oak Ridge National Laboratory and DOE, 2012. www.eea-inc.com/chpdata/index.html.

Combined Heat and Power – Topping Cycle and Bottoming Cycle

6. In addition to the already-excerpted general, non-statutory definition of CHP and the general overview of CHP's market potential, the SEEAction Guide provides working definitions of "topping cycle CHP" and "bottoming cycle CHP." *Understanding topping cycle CHP and bottoming cycle CHP is critical to resolution of the statutory interpretation question at issue.* The SEEAction Guide provides the following working definitions:

> There are two types of CHP—topping and bottoming cycle. In a **topping cycle CHP system** [(see Figure 2 below)], fuel is first used in a prime mover such as a gas turbine or reciprocating engine, generating electricity or mechanical power. Energy normally lost in the prime mover's hot exhaust or cooling systems is recovered to provide process heat, hot water,

> or space heating/cooling for the site. Optimally efficient topping CHP systems are typically designed and sized to meet a facility's baseload thermal demand. In a **bottoming cycle CHP system** [(see Figure 3 below)], also referred to as waste heat to power, fuel is first used to provide thermal input to a furnace or other high temperature industrial process, and a portion of the heat rejected from the process is then recovered and used for power production, typically in a waste heat boiler/steam turbine system. Waste heat to power systems are a particularly beneficial form of CHP in that they utilize heat that would otherwise be wasted from an existing thermal process to produce electricity without directly consuming additional fuel.

SEEAction Guide, p. 3 (emphasis added) (footnotes omitted).

As becomes more evident upon review of the figures below, system configuration is a key distinction between topping cycle CHP and bottoming cycle CHP. Specifically, the heat recovery component's "location" within a CHP system distinguishes a topping cycle CHP system from a bottoming cycle CHP system. In a topping cycle CHP system, the heat recovery component is located "behind" the prime mover component in order to process the prime mover component's waste heat; in contrast, in a bottoming cycle CHP system, the heat recovery component is located "in front of" the prime mover component to process waste heat for use in the prime mover component itself.

Figure 2[3]

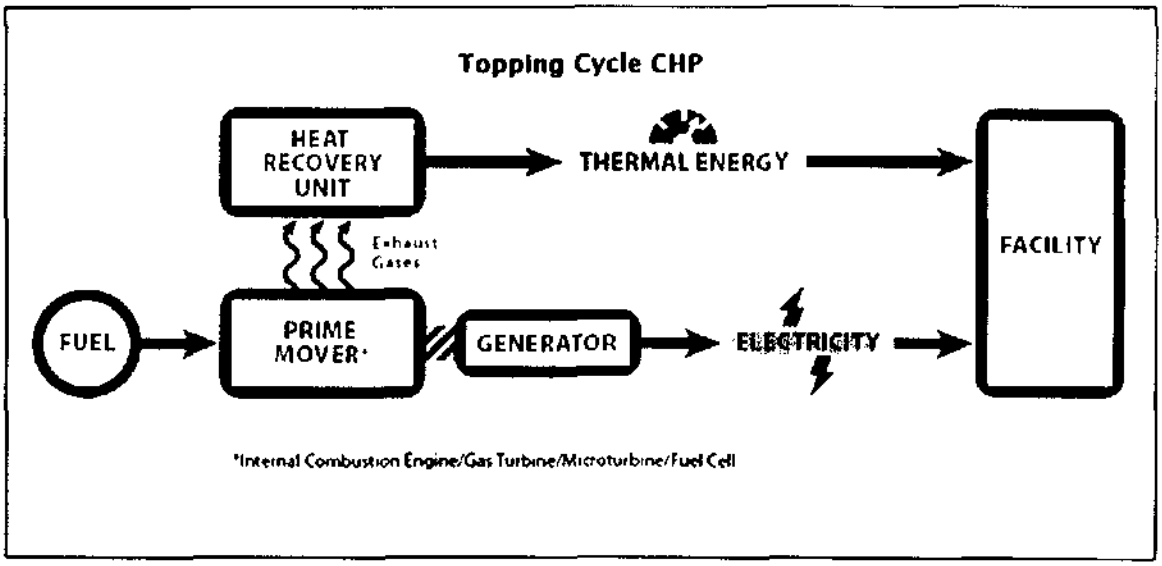
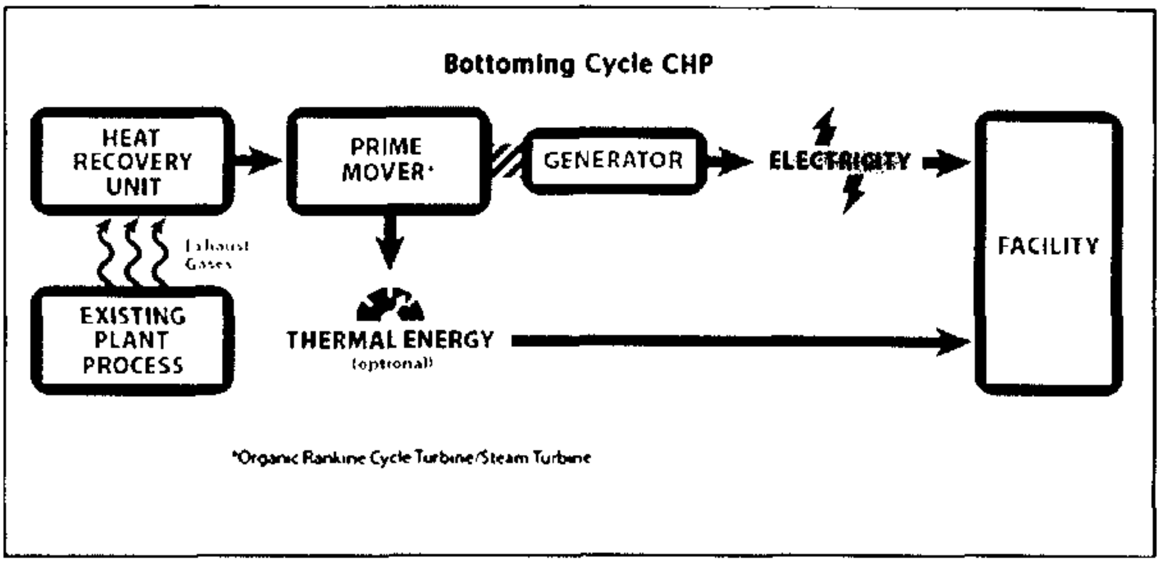


Figure 3[3]



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[3] Figures 2 and 3 were prepared by the Center for Sustainable Energy and are accessible electronically at http://energycenter.org/self-generation-incentive-program/business/technologies/chp (accessed on 9 April 2015).

Topping Cycle CHP in North Carolina – Installed and Potential

7. As of 7 August 2013, there were 66 CHP systems installed in North Carolina, totaling 1,540 MW of electric generation nameplate capacity. Of the 66 installed CHP systems, 62 were topping cycle CHP systems and only 4 were bottoming cycle CHP systems. *Pre-filed Testimony of Isaac Panzarella on Behalf of NCSEA and EDF*, p. 5, Commission Docket No. E-7, Sub 1032 (7 August 2013).[4] In other words, the overwhelming majority of installed CHP systems in North Carolina are topping cycle CHP systems.

8. As of 7 August 2013, there was approximately 6,428 MW of new topping cycle CHP technical potential in North Carolina, of which roughly 4,667 MW resided in the industrial sector and 1,761 MW resided in the commercial sector. *Id.* at p. 6 (based on research conducted by the U.S. Department of Energy's Southeast Clean Energy Application Center and ICF International). "Technical potential is defined by ICF [International] as the total electric generating capacity potential from existing and new facilities that are likely to have the appropriate physical electric and thermal load characteristics that would support a CHP system." *Id.*

9. There is no reason to believe the technical potential of new topping cycle CHP systems in North Carolina has diminished significantly since 7 August 2013.

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[4] Isaac Panzarella's pre-filed testimony was stipulated into the record in the E-7, Sub 1032 proceeding. A complete copy of Mr. Panzarella's 14-page pre-filed testimony is attached hereto as **Exhibit B**. Mr. Panzarella's testimony in the 2013 proceeding is relevant to this proceeding because it highlights the parties' differing statutory interpretations and presaged the need for this proceeding. Mr. Panzarella's pre-filed testimony is also accessible via the internet at http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=6e50df84-5c22-4618-a5ac-f95f67ef77d7 (accessed on 12 April 2015).

CHP as an Energy Efficiency Measure under State Law

10. As part of what has become known as "Senate Bill 3," the General Assembly enacted N.C. Gen. Stat. § 62-133.9 in 2007. *See* N.C. Sess. Law 2007-397, § 4(a). N.C. Gen. Stat. § 62-133.9(b) provides that "[e]ach electric power supplier shall implement . . . **energy efficiency measures** . . . [as part of an effort] to establish the least cost mix of demand reduction and generation measures that meet the electricity needs of its customers." (Emphasis added).

11. For purposes of N.C. Gen. Stat. § 62-133.9, "energy efficiency measure" means, in relevant part,

> an equipment, physical, or program change implemented after January 1, 2007, that results in less energy used to perform the same function. **"Energy efficiency measure" includes, but is not limited to, energy produced from a combined heat and power system that uses nonrenewable energy resources.**

N.C. Gen. Stat. § 62-133.8(a)(4) (emphasis added). The phrase "combined heat and power system," as used in the foregoing statutory definition, is itself statutorily defined to mean

> a **system** that uses waste heat to produce electricity or useful, measurable thermal or mechanical energy at a retail electric customer's facility.

N.C. Gen. Stat. § 62-133.8(a)(1) (emphasis added).

<u>FACTS - *PART II*</u>

Duke Energy Carolinas, LLC's Nonresidential Smart Saver Program's "Component Approach" to Topping Cycle CHP Systems

12. Several years ago, in accordance with Senate Bill 3's directive that electric power suppliers implement cost-effective energy efficiency measures as part of a least cost portfolio, Duke Energy Carolinas, LLC ("DEC") proposed and secured Commission authorization to offer a Nonresidential Smart Saver Energy Efficient Products and Assessment Program ("Smart Saver Program"). In 2013, the Commission issued an order in Commission Docket No. E-7, Sub 1032 that revised the Smart Saver Program. *Order Approving DSM/EE Programs and Stipulation of Settlement*, p. 32, Commission Docket No. E-7, Sub 1032 (29 October 2013).

13. The revised Smart Saver Program leaf, a copy of which is attached hereto as **Exhibit C**,[5] provides, in relevant part, that the program is intended to encourage the installation of new high efficiency equipment in new and existing nonresidential establishments and, to this end, the program will provide incentive payments to offset a portion of the higher cost of new energy efficient equipment, including custom incentives for custom projects.

14. Of importance to this proceeding, the revised Smart Saver Program leaf includes a paragraph related to custom CHP systems that appears to reflect DEC's current understanding of the extent of "energy efficiency measure" as that term is used in N.C. Gen. Stat. § 62-133.9.

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[5] The revised Smart Saver Program leaf is also accessible electronically at Duke Energy's website at <u>https://wwwqa.duke-energy.com/pdfs/NCEENonResSS.pdf</u> (accessed 9 April 2015).

15. Specifically, the revised Smart Saver Program leaf contains the following language that appears to reflect a DEC understanding that only the heat waste recovery components of new topping cycle CHP systems qualify as "energy efficiency measures" under the statute:

> Electric generation, from either non-renewable or renewable sources, is not considered an energy efficiency measure and therefore does not qualify for payments; however, bottoming-cycle Combined Heat and Power ("CHP") systems or the waste heat recovery components of topping-cycle CHP may be eligible for payments.

Exhibit C, p. 2.

NCSEA's Decision to Submit the Question to the Commission

16. Pursuant to recent Commission orders, NCSEA, DEC, the Public Staff, and several other stakeholders have met to discuss CHP. *See, e.g., Order Approving DSM/EE Rider and Requiring Filing of Proposed Customer Notice*, p. 35, Commission Docket No. E-7, Sub 1050 (29 October 2014) (ordering "[t]hat discussion of CHP at the Collaborative shall continue, and that the Collaborative shall consider whether a stakeholder meeting dedicated solely to discussing CHP in North Carolina as proposed by witness Panzarella is merited and should be scheduled prior to DEC filing its next DSM/EE rider application.").

17. During said discussions, it has become apparent that NCSEA, DEC, and the Public Staff differ in their current understandings of "energy efficiency measure" as the phrase applies to new topping cycle CHP systems.

18. Given the current differing understandings, NCSEA believes it is appropriate at this time to present the statutory interpretation question to the Commission for resolution.

19. Neither DEC nor the Public Staff objects to NCSEA's presentation of the question to the Commission for resolution.

20. Furthermore, while DEC's, NCSEA's, and the Public Staff's current understandings differ, DEC has indicated that, in the event the Commission clarifies that new topping cycle CHP systems qualify as "energy efficiency measures," DEC will – after participating in any necessary and appropriate rulemaking to establish eligibility standards (see below at ¶¶ 37-38) – perform the necessary analytics to determine if it is cost effective and appropriate and, if so, will seek to modify the language of its Smart Saver Program leaf to include new topping cycle CHP systems.

ARGUMENT

21. The present dispute involves a question of statutory interpretation, focusing on the meaning of "energy efficiency measure" in the context of N.C. Gen. Stat. § 62-133.9, particularly as it relates to new topping cycle CHP systems and the extent of their eligibility for participation in an incentive program.

22. As already stated, for purposes of N.C. Gen. Stat. § 62-133.9, "energy efficiency measure" means, in relevant part,

> an equipment, physical, or program change implemented after January 1, 2007, that results in less energy used to perform the same function. **"Energy efficiency measure" includes, but is not limited to, energy produced from a combined heat and power system that uses nonrenewable energy resources.**

N.C. Gen. Stat. § 62-133.8(a)(4) (emphasis added).[6] The phrase "combined heat and power system," as used in the foregoing statutory definition, is itself statutorily defined to mean

> a **system** that uses waste heat to produce electricity or useful, measurable thermal or mechanical energy at a retail electric customer's facility.

N.C. Gen. Stat. § 62-133.8(a)(1) (emphasis added).

A "System Approach" is Appropriate, and a "Component Approach" is Inappropriate

23. The two statutory definitions cited in ¶ 22, read together, yield the following composite definition: "Energy efficiency measure" includes, but is not limited to, energy produced from a system, including a system that uses nonrenewable energy resources, that uses waste heat to produce electricity or useful, measureable thermal or mechanical energy at a retail electric customer's facility.

[6] Per N.C. Gen. Stat. § 62-133.9(a), the definitions set out in N.C. Gen. Stat. § 62-133.8 apply to N.C. Gen. Stat. § 62-133.9.

24. The definitions, regardless of whether they are read separately or together, clearly and unambiguously focus on a CHP "system" and not on individual components within a CHP system. Similarly, neither definition draws a distinction between bottoming cycle CHP and topping cycle CHP or otherwise distinguishes between systems based on system configuration.

25. Put another way, the statutes clearly and unambiguously state that "energy produced from a combined heat and power *system* that uses nonrenewable energy resources" is an energy efficiency measure.

26. Put yet another way, the relevant statutes do *not* state that energy produced from *only the waste heat recovery component* of a combined heat and power system that uses nonrenewable energy resources is an energy efficiency measure. Nor do the relevant statutes state that a waste heat recovery component, standing alone and apart from a prime mover and a generator, shall constitute an entire CHP system. Instead, the relevant statutes refer to a "system," clearly meaning all the components of the system, including not only the waste heat recovery component but also the prime mover and generator components.[7] Under the clear and unambiguous statutes, all that is required for a new CHP "system" – comprised of the waste heat recovery component *and* the prime mover and generator components – to qualify as an energy efficiency measure is that the

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[7] The Internal Revenue Code and North Carolina's Revenue Act appear to have adopted the "system" approach being advocated for by NCSEA. Thus, for example, in construing the term "combined heat and power system property" for purposes of federal and State tax credits, both taxing authorities consider "system" property to include all of the components of the system except for the input and output property. *See* 26 U.S.C. § 48(c)(3)(C)(iii) ("Input and output property not included. The term 'combined heat and power system property' does not include property used to transport the energy source to the facility or to distribute energy produced by the facility."); *see also* N.C. Gen. Stat. § 105-129.15(7)b. (incorporating the federal definition by reference).

components, working together and regardless of configuration, "use[] waste heat to produce electricity **or** useful, measurable thermal **or** mechanical energy at a retail electric customer's facility" and that the new CHP system results in less energy being used to perform the same function. (Emphasis added).

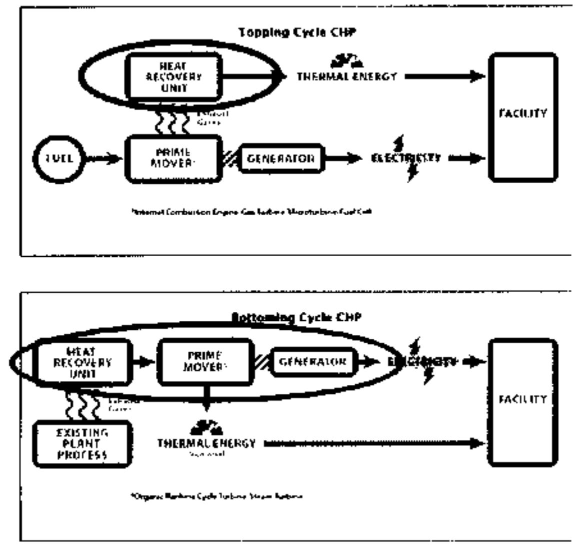
The Statutory Language is Clear and Unambiguous and Should Control

27. As North Carolina appellate courts have opined, "The general rule in statutory construction is that a statute must be construed as written." *In re Town of Smithfield*, 749 S.E.2d 293, 296 (N.C. Ct. App. 2013). Furthermore, "Where the language of a statute is clear and unambiguous, there is no room for judicial construction and the courts must give it its plain and definite meaning, and are without power to interpolate, or superimpose, provisions and limitations not contained therein." *Id.*

28. If the Smart Saver Program leaf sets out DEC's current understanding of what constitutes an energy efficiency measure under N.C. Gen. Stat. § 62-133.9 (as asserted above in ¶¶ 14-15), then NCSEA disagrees with DEC's (and possibly the Public Staff's) current understanding because such an understanding does not appear to be giving full weight to the relevant statutes' use of the word "system." Instead of taking a "system" approach, DEC's apparent understanding takes a "component" approach in interpreting the statutory definitions, leading DEC to construe the statutes to permit (a) DEC's disaggregation of new topping cycle CHP systems into their component parts and then (b) DEC's exclusion of the new topping cycle CHP system's prime mover and generator components from coverage under the definition.

29. The extent to which DEC's apparent interpretation conflicts with the clear and unambiguous statutory language is best illustrated by returning to Figures 2 and 3 set out above. Building on Figures 2 and 3, Figure 4 below illustrates DEC's apparent understanding of the statutory language, including the exclusion of the prime mover and generator components from coverage when they serve as part of a topping cycle CHP system (but not when they serve as part of a bottoming cycle CHP system). There is no statutory basis for drawing such a distinction or for so narrowly and counter-intuitively interpreting what constitutes a "system" in the topping cycle CHP context but not in the bottoming cycle CHP context. Figure 5 below illustrates NCSEA's understanding.

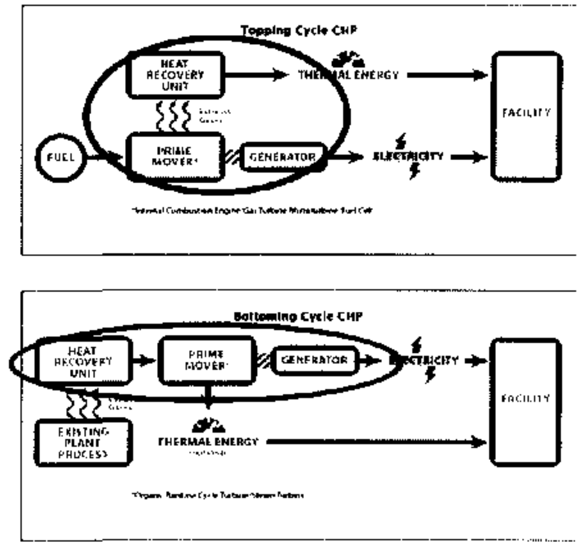
Figure 4



DEC's Apparent Understanding

The red circles in Figure 4 circumscribe the "systems" that DEC apparently asserts qualify as energy efficiency measures. The red circles illustrate that DEC is taking a "component approach" rather than the "system approach" clearly called for by the statutory language. DEC's approach yields an unreasonable result: Despite an absence of any statutory distinction between topping cycle CHP and bottoming cycle CHP systems and despite the fact that topping cycle CHP systems can significantly enhance energy efficiency, DEC's apparent interpretation disqualifies a CHP system's prime mover and generator components as part of the CHP system when they are located "in front of" the heat recovery unit.

Figure 5



NCSEA's Understanding

The red circles in Figure 5 circumscribe the systems, including all their component parts, NCSEA asserts qualify as energy efficiency measures. The red circles illustrate that NCSEA is supporting the "system" approach clearly called for by the statutory language. NCSEA's approach yields a reasonable result: the statutory language expressly states that an "energy efficiency measure" includes "energy produced from a combined heat and power system that uses nonrenewable energy resources." NCSEA's interpretation of what constitutes a topping cycle CHP system is the only interpretation that can yield a "system" that uses nonrenewable energy resources (note the fuel feeds directly into the circumscribed system). Under DEC's apparent interpretation, there would never be a qualifying CHP "system" that uses nonrenewable energy resources; there would only be non-qualifying components – prime movers in topping cycle CHP systems – that use nonrenewable energy resources.

30. The General Assembly's decision to take a "system" approach (and its concomitant decision not to take a "component" approach) is particularly reasonable in light of the fact that *a CHP system, regardless of whether it is topping cycle or bottoming cycle, achieves efficiencies of 60-80% through the concurrent operation of the heat recovery, prime mover, and generator components*, resulting in less energy being used to perform the same function as compared to conventional separate heat and power generation, which achieves efficiencies of only around 45-50%.

31. Based on communications made during NCSEA's, DEC's, and the Public Staff's recent collaborative CHP discussions, NCSEA understands that DEC's (and possibly the Public Staff's) current understanding(s) may be the result of a strict reading of a three-word phrase in the Commission's definition of "energy efficiency measure" in Commission Rule R8-67(a)(3).

32. Subsequent to enactment of the definitional language quoted above in ¶ 22, the Commission promulgated Commission Rule R8-67,[8] which contains the following administrative definition of "energy efficiency measure," in relevant part:

> "Energy efficiency measure" . . . includes energy produced from a combined heat and power system that uses nonrenewable resources **to the extent** the system:
> (i) Uses waste heat to produce electricity or useful, measureable thermal or mechanical energy at a retail electric customer's facility; and
> (ii) Results in less energy used to perform the same function or provide the same level of service at a retail electric customer's facility.

Commission Rule R8-67(a)(3) (emphasis added).

[8] N.C. Gen. Stat. § 62-133.9(h) provides that the "Commission shall adopt rules to implement this section."

33. DEC (and possibly the Public Staff) may be interpreting the "to the extent" phrase included in the Commission's definition to require an electric utility to recognize only the heat recovery component of a new topping cycle CHP system as an "energy efficiency measure" eligible for participation in an incentive program.

34. NCSEA believes the "to the extent" phrase included in the Commission's definition was merely intended to introduce the Commission's restatement of the two legislative prerequisites for a new CHP system to qualify as an energy efficiency measure: (1) the new system, somewhere in its configuration, must make use of waste heat to produce electricity or useful, measureable thermal or mechanical energy *and* (2) an otherwise qualifying new CHP system must actually result in less energy being used to perform the same function or provide the same level of service at the customer's facility. Accordingly, NCSEA believes the "to the extent" phrase in the Commission's definition was intended to be read as "so long as."

35. In the event the Commission intended the "to the extent" phrase to limit an electric utility's ability to recognize more than the heat recovery component of a new topping cycle CHP system as an "energy efficiency measure," NCSEA believes the Commission exceeded its delegated authority by effectively re-writing a clear and unambiguous statute to include a limitation that does not exist in the statute. *See, e.g., State ex rel. Commissioner of Ins. v. Integon Life Ins. Co.*, 28 N.C. App. 7, 11, 220 S.E.2d 409, 412 (1975) ("An administrative agency has no power to promulgate rules and regulations which alter or add to the law it was set up to administer or which have the effect of substantive law."); *see also, In re Town of Smithfield*, 749 S.E.2d 293, 296 (N.C. Ct. App. 2013) (Where a party's interpretation would "giv[e] to the statutory phraseology

a distorted meaning at complete variance with the language used[,]" a court is "powerless to construe away [or create a] limitation just because [the court] feel[s] that the legislative purpose behind the requirement can be more fully achieved in its absence [or presence]."). In such an event, NCSEA also believes that the Commission should revisit, pursuant to N.C. Gen. Stat. §§ 62-31 and 62-80, and revise its earlier ruling promulgating the administrative definition.

NCSEA's Current Interpretation is Consistent With Sound Regulatory Policy

36. NCSEA believes that its current interpretation is not only consistent with sound and time-honored principles of statutory interpretation but also yields a result that is sound from a policy perspective. For example,

- By concluding that new topping cycle CHP systems that use nonrenewable energy resources are energy efficiency measures eligible to participate in incentive programs, the Commission would further enable use of low cost natural gas to advance the systemic efficiency of the electric suppliers' grids at shared cost between ratepayers and individual customers.[9]
- Recognizing that the opt-out rate by industrial and large commercial customers merits attention, the Commission has ordered that "DEC shall continue to use its Collaborative to work with stakeholders to find ways of increasing DSM and EE program impacts and participation, including programs designed to decrease opt outs." *Order Approving DSM/EE Rider and Requiring Filing of Proposed*

[9] As the Commission contemplates, amidst considerable uncertainty, how best to position the State for compliance with the Environmental Protection Agency's "Clean Power Plan," it should not be lost on the Commission that confirming that NCSEA's interpretation of the statute is correct will also confirm that the State has an additional tool for achieving compliance with any final rule.

Customer Notice, p. 35, Commission Docket No. E-7, Sub 1050 (29 October 2014). By concluding that new topping cycle CHP systems, including all of their components, are energy efficiency measures eligible to participate in incentive programs, the Commission would confirm that electric suppliers have a powerful tool for use in attracting opt-out eligible customers to opt in.

- Finally, by concluding that new topping cycle CHP systems, including all their components, are energy efficiency measures eligible to participate in incentive programs, the Commission would further enable such systems to be strategically deployed to enhance the reliability and resiliency of the grid. Moreover, new topping cycle CHP systems installed as a result of such a Commission ruling could be integrated into islandable microgrids at military installations and at critical government and business facilities. Confirming the existence of a tool that can be used both to advance strategic locational deployment of grid supporting resources *and* to advance the development of islandable microgrids is a positive step toward making the grid more resilient and realizing the so-called "utility of the future" or "Utility 2.0" here in North Carolina.

The Likely Value of a Rulemaking

37. To the extent the Commission is concerned that recognizing that all of the components of a new topping cycle CHP system are eligible for participation in incentive programs will spawn the installation of customer-sited combined-cycle combustion turbines or some other kind of gaming of the incentive program process, NCSEA respectfully submits that there are alternative means for dealing with this concern that are within the Commission's authority and not *ultra vires*.

38. For example, in order to ensure that new topping cycle CHP systems are truly significant energy efficiency measures, the Commission could initiate a rulemaking to set operating and efficiency standards as well as a fundamental use test, similar to the operating and efficiency standards and fundamental use test set out in 18 C.F.R. § 292.205, promulgated under the Public Utility Regulatory Policies Act of 1978, as amended. Subsection (a) of the federal regulation provides as follows:

> (a) *Operating and efficiency standards for topping-cycle facilities*—(1) *Operating standard.* For any topping-cycle cogeneration facility, the useful thermal energy output of the facility must be no less than 5 percent of the total energy output during the 12-month period beginning with the date the facility first produces electric energy, and any calendar year subsequent to the year in which the facility first produces electric energy.
>
> (2) *Efficiency standard.* (i) For any topping-cycle cogeneration facility for which any of the energy input is natural gas or oil, and the installation of which began on or after March 13, 1980, the useful power output of the facility plus one-half the useful thermal energy output, during the 12-month period beginning with the date the facility first produces electric energy, and any calendar year subsequent to the year in which the facility first produces electric energy, must:
>
> (A) Subject to paragraph (a)(2)(i)(B) of this section be no less than 42.5 percent of the total energy input of natural gas and oil to the facility; or
>
> (B) If the useful thermal energy output is less than 15 percent of the total energy output of the facility, be no less than 45 percent of the total energy input of natural gas and oil to the facility.
>
> (ii) For any topping-cycle cogeneration facility not subject to paragraph (a)(2)(i) of this section there is no efficiency standard.

18 C.F.R. § 292.205(a). Subsections (d)(2) and (3) of the federal regulation provides as follows:

> (2) The electrical, thermal, chemical and mechanical output of the cogeneration facility is used fundamentally for industrial, commercial, residential or institutional purposes and is not intended fundamentality for sale to an electric utility, taking into account technological, efficiency, economic, and variable thermal energy requirements, as well as state laws

> applicable to sales of electric energy from a qualifying facility to its host facility.
> (3) Fundamental use test. For the purpose of satisfying paragraph (d)(2) of this section, the electrical, thermal, chemical and mechanical output of the cogeneration facility will be considered used fundamentally for industrial, commercial, or institutional purposes, and not intended fundamentally for sale to an electric utility if at least 50 percent of the aggregate of such output, on an annual basis, is used for industrial, commercial, residential or institutional purposes. In addition, applicants for facilities that do not meet this safe harbor standard may present evidence to the Commission that the facilities should nevertheless be certified given state laws applicable to sales of electric energy or unique technological, efficiency, economic, and variable thermal energy requirements.

18 C.F.R. § 292.205(d).

CONCLUSION

39. For the foregoing reasons, NCSEA respectfully requests that the Commission issue a declaratory ruling, affirmative in form, that:

> A new topping cycle combined heat and power ("CHP") system – including such a system that uses nonrenewable energy resources – that both (a) produces electricity or useful, measureable thermal or mechanical energy at a retail electric customer's facility and (b) results in less energy being used to perform the same function or provide the same level of service at the retail electric customer's facility constitutes an "energy efficiency measure" for purposes of N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-67.

40. Moreover, if deemed necessary or helpful, NCSEA also respectfully requests that the Commission issue a complementary declaratory ruling, negative in form, that:

> It is inconsistent with the clear and unambiguous language of N.C. Gen. Stat. §§ 62-133.8 and 62-133.9 to recognize *only* the heat recovery component of a new topping cycle CHP system as an "energy efficiency measure."

41. Finally, in the event one or both of the foregoing declaratory rulings are issued, NCSEA respectfully requests the Commission to initiate a rulemaking, if necessary and appropriate, to make clarifying changes to Commission Rule R8-67.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that all persons on the docket service list have been served true and accurate copies of the foregoing filing, together with any exhibits attached thereto, by hand delivery, first class mail deposited in the U.S. mail, postage pre-paid, or by email transmission with the party's consent.

This the 1st day of June, 2015.

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EXHIBIT A

DOE/EE-0838

SEE Action

STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

Guide to the Successful Implementation of State Combined Heat and Power Policies

Industrial Energy Efficiency and Combined Heat and Power Working Group

Driving Ratepayer-Funded Efficiency through Regulatory Policies Working Group

March 2013

The State and Local Energy Efficiency Action Network is a state and local effort facilitated by the federal government that helps states, utilities, and other local stakeholders take energy efficiency to scale and achieve all cost-effective energy efficiency by 2020.

Learn more at www.seeaction.energy.gov

Letter from the Co-Chairs of the SEE Action Industrial Energy Efficiency and Combined Heat and Power Working Group

To all,

This *Guide to Successful Implementation of State Combined Heat and Power Policies* is designed to inform state regulators, facility operators, utilities, and other key stakeholders about the benefits, costs, and implications of greater use of combined heat and power (CHP). Achieving greater use of CHP is consistent with President Obama's Executive Order 13626-Accelerating Investment in Industrial Energy Efficiency, which calls for 40 gigawatts (GW) of new, cost-effective CHP by 2020.

CHP can provide significant energy, energy system, and environmental benefits. CHP is inherently more efficient than obtaining electricity from a utility and generating heat or steam from an on-site boiler. By being more efficient, less fuel is consumed and greenhouse gases (GHGs) and other emissions are reduced. Properly designed CHP can bolster the grid, provide security benefits, and potentially support intermittent renewable energy sources.

An assumption of this guide is that CHP must have the potential to be economically viable. Chapter 2 describes the design of standby rates charged by utilities to a customer with CHP, a potential impediment to the implementation of CHP.

Economical CHP may encourage large energy users to reduce purchased electricity or leave the grid entirely by self-generating. This impacts regulators and utilities because large customers leaving the grid may shift costs to other customers, requiring these remaining customers to carry the costs of the departing CHP user. Therefore, the challenge for all affected parties is to identify the most equitable arrangement that encourages adoption of CHP while ensuring that costs are not inequitably transferred to those not participating in CHP. Among the policy considerations that must be evaluated are the following: (1) Can CHP be directed to provide system benefits for all customers? (2) How can standby rates be designed to avoid cross-subsidization?

Whether a CHP system exports excess electricity or not can create additional issues that must be considered. As noted in Chapters 3 and 4, CHP that is designed only to supply a facility's energy needs will require an interconnection agreement between the CHP facility and the local utility. However, a CHP project that generates excess electricity may compete with a utility or other generators, and merits different regulatory and contractual considerations.

Finally, Chapter 5 discusses the use of CHP as a clean energy resource, and identifies states where CHP qualifies for the clean energy portfolio standard. While advocates of renewable energy would agree that waste heat to power (also known as waste heat recovery or bottoming cycle CHP) is a clean energy source, others have expressed skepticism that CHP can truly be considered clean energy because it often fundamentally uses a fossil fuel, namely natural gas, albeit efficiently and with lower environmental impact. Considering if and/or how to credit the thermal outputs of CHP that use biomass or biogas can be an important clean energy portfolio standard discussion.

The working groups, authors, and contributors hope that this guide clearly and accurately describes the policy issues all parties must address when evaluating CHP. To ensure the process is transparent, members were given the option to include a statement of alternative perspectives; see Appendix F.

Joshua B Epel

Joshua Epel
Chairman
Colorado Public Utilities Commission

Todd Currier
Assistant Director
Washington State University Extension Energy Program

Guide to the Successful Implementation of State Combined Heat and Power Policies was developed as a product of the State and Local Energy Efficiency Action Network (SEE Action), facilitated by the U.S. Department of Energy and the U.S. Environmental Protection Agency. Content does not imply an endorsement by the individuals or organizations that are part of SEE Action working groups, or reflect the views, policies, or otherwise of the federal government.

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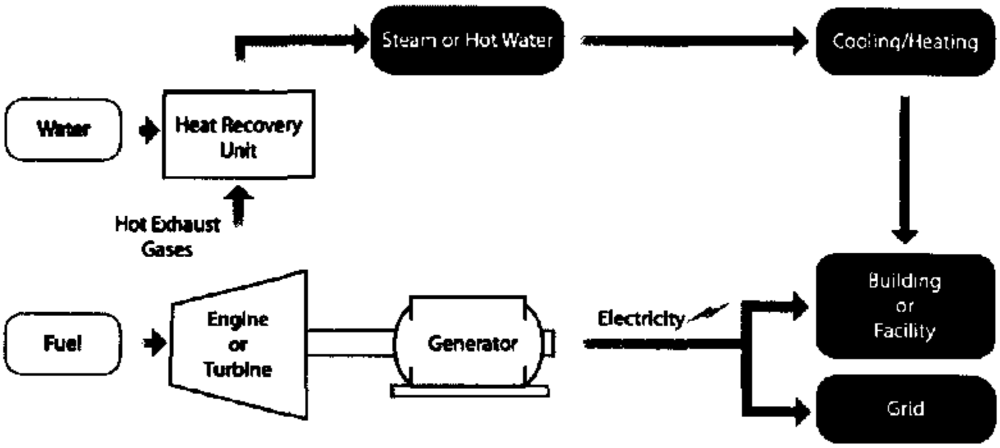
Chapter 1. CHP Defined

1.1 CHP Defined: Topping and Bottoming Cycle CHP

The average generation efficiency of grid-supplied power in the United States has remained at 34% since the 1960s—the energy lost in wasted heat-from-power generation in the United States is greater than the total energy use of Japan.[25] CHP systems typically achieve total system efficiencies of 60%–80% compared to only about 45%–50% for conventional separate heat and power generation[26] by avoiding line losses and capturing much of the heat energy normally wasted in power generation to provide heating and cooling to factories and businesses.[27] By efficiently providing electricity and thermal energy from the same fuel source at the point of use, CHP significantly reduces the total primary fuel needed to supply energy services to a business or industrial plant, saving them money and reducing air emissions.[28]

There are two types of CHP—topping and bottoming cycle. In a topping cycle CHP system (Figure 2), fuel is first used in a prime mover such as a gas turbine or reciprocating engine, generating electricity or mechanical power. Energy normally lost in the prime mover's hot exhaust or cooling systems is recovered to provide process heat, hot water, or space heating/cooling for the site.[29] Optimally efficient topping CHP systems are typically designed and sized to meet a facility's baseload thermal demand.

In a bottoming cycle CHP system (Figure 3), also referred to as waste heat to power, fuel is first used to provide thermal input to a furnace or other high temperature industrial process, and a portion of the heat rejected from the process is then recovered and used for power production, typically in a waste heat boiler/steam turbine system. Waste heat to power systems are a particularly beneficial form of CHP in that they utilize heat that would otherwise be wasted from an existing thermal process to produce electricity without directly consuming additional fuel.



Source: U.S. Environmental Protection Agency (EPA) CHP Partnership www.epa.gov/chp/basic/index.html

Figure 2. Topping cycle CHP: gas turbine or reciprocating engine with heat recovery

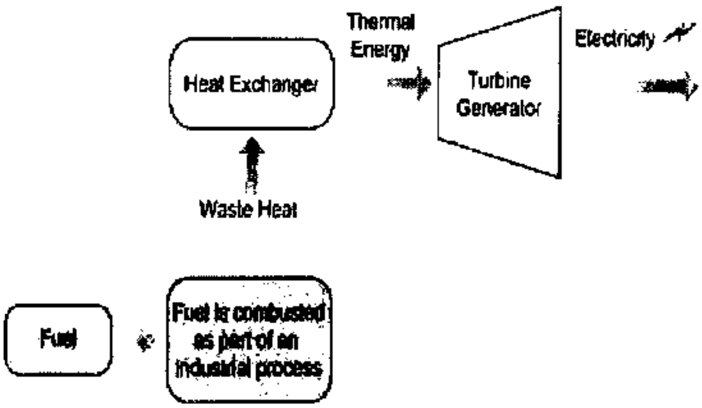
[25] Oak Ridge National Laboratory. *Combined Heat and Power, Effective Energy Solutions for a Sustainable Future*. 2008.

[26] Total system efficiency is equal to the power and useful thermal energy divided by the total fuel consumed to generate both energy services.

[27] U.S. DOE, U.S. EPA. *Combined Heat and Power: A Clean Energy Solution*. August 2012. www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_clean_energy_solution.pdf.

[28] U.S. EPA. *Fuel and Carbon Dioxide Emissions Savings Calculation Methodology for Combined Heat and Power System*. August 2012. www.epa.gov/chp/documents/fuel_and_co2_savings.pdf.

[29] In another version of a topping cycle CHP system, fuel is burned in a boiler to produce high pressure steam. That steam is fed to a steam turbine, generating mechanical power or electricity, before exiting the turbine at lower pressure and temperature and used for process or heating applications at the site.



Source: U.S. EPA CHP Partnership www.epa.gov/chp/documents/waste_heat_power.pdf

Figure 3. Bottoming cycle CHP: waste heat to power

1.2 Market Status and Potential

CHP is already an important resource for the United States—the existing 82 GW of CHP capacity at more than 4,100 industrial and commercial facilities represents approximately 8% of current U.S. generating capacity and more than 12% of total megawatt-hours (MWh) generated annually.[30] Compared to the average fossil-based electricity generation, the existing base of CHP saves 1.8 quads of energy annually and eliminates 240 million metric tons of CO_2 emissions each year (equivalent to the emissions of more than 40 million cars).[31]

While investment in CHP declined in the early 2000s due to changes in the wholesale market for electricity and increasingly volatile natural gas prices, CHP's potential role as a clean energy source for the future is much greater than recent market trends would indicate. Efficient on-site CHP represents a largely untapped resource that exists in a variety of energy-intensive industries and businesses (Figure 4). Recent estimates indicate the technical potential[32] for additional CHP at existing industrial facilities is slightly less than 65 GW, with the corresponding technical potential for CHP at commercial and institutional facilities at slightly more than 65 GW,[33] for a total of about 130 GW. A 2009 study by McKinsey and Company estimated that 50 GW of CHP in industrial and large commercial/institutional applications could be deployable at reasonable returns with then current equipment and energy prices.[34] These estimates of both technical and economic potential are likely greater today given the improving outlook in natural gas supply and prices.

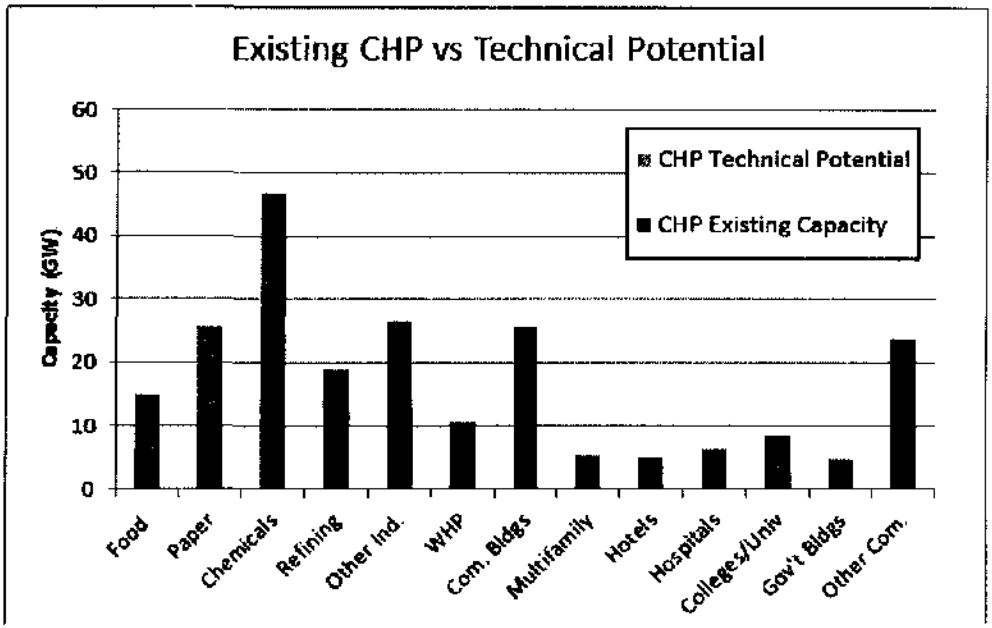
[30] CHP Installation Database developed by ICF International for Oak Ridge National Laboratory and the U.S DOE. 2012. Available at www.eea-inc.com/chpdata/index.html.

[31] www.epa.gov/chp/basic/environmental.html.

[32] The technical market potential is an estimation of market size constrained only by technological limits—the ability of CHP technologies to fit existing customer energy needs. The technical potential includes sites that have the energy consumption characteristics that could apply CHP. The technical market potential does not consider screening for other factors such as ability to retrofit, owner interest in applying CHP, capital availability, fuel availability, and variation of energy consumption within customer application/size classes. All of these factors affect the feasibility, cost, and ultimate acceptance of CHP at a site and are critical in the actual economic implementation of CHP.

[33] Based on ICF International internal estimates as detailed in the report *Effect of a 30 Percent Investment Tax Credit on the Economic Market Potential for Combined Heat and Power*, prepared for WADE and USCHPA, October 2010. These estimates are on the same order as recent estimates developed by McKinsey and Company (see below).

[34] McKinsey Global Energy and Materials. (2009). Unlocking Energy Efficiency in the U.S. Economy. www.mckinsey.com/Client_Service/Electric_Power_and_Natural_Gas/Latest_thinking/Unlocking_energy_efficiency_in_the_US_economy.



Source: Internal estimates by ICF International and CHP Installation Database developed by ICF International for Oak Ridge National Laboratory and DOE. 2012. www.eea-inc.com/chpdata/index.html.

Figure 4. Technical potential for CHP at industrial and commercial facilities

The outlook for increased use of CHP is improving. Policymakers at the federal and state level are beginning to recognize the potential benefits of CHP and the role it could play in providing clean, reliable, cost-effective energy services to industry and businesses. A number of states have developed innovative approaches to increase the deployment of CHP to the benefit of users as well as ratepayers. CHP is being looked at as a productive investment by some companies facing significant costs to upgrade old coal- and oil-fired boilers. In addition, CHP can provide a cost-effective source of new generating capacity in many areas confronting retirement of older power plants. Finally, the economics of CHP are improving as a result of the changing outlook in the long-term supply and price of North American natural gas—a preferred fuel for many CHP applications.[35]

Key to capturing this potential is the market structure for CHP at the state level. Markets with unnecessary barriers to the development of CHP will see less than the economically and environmentally desirable development of the resource, resulting potentially in higher cost resources or resources with greater environmental impacts incorporated into the nation's electricity system.

The chapters that follow provide state utility regulators and other state policymakers with actionable information to assist them in implementing key state policies that address barriers to, and promote opportunities for, CHP development. They discuss five policy categories and highlight successful state CHP policy implementation approaches within each category:

- Design of standby rates
- Interconnection standards for CHP with no electricity export
- Excess power sales
- Clean energy portfolio standards (CEPS)

Emerging market opportunities—CHP in critical infrastructure and utility participation in CHP markets.

[35] U.S. DOE. *Combined Heat and Power: A Clean Energy Solution*. August 2012. www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_clean_energy_solution.pdf. Note that the existing fleet of CHP uses a wide variety of fuels in addition to natural gas including coal, oil, landfill gas, waste heat, process wastes, wood, and other forms of biomass.

EXHIBIT B

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION
DOCKET E-7, SUB 1032

Testimony of Isaac Panzarella
On Behalf of the North Carolina
Sustainable Energy Association and Environmental Defense Fund

August 7, 2013

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS FOR THE RECORD.

A. My name is Isaac Panzarella. My business address is 1575 Varsity Drive, Raleigh, NC 27695.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by the North Carolina Solar Center at North Carolina State University ("NC State"), where I serve as Director of the U.S. Department of Energy's Southeast Clean Energy Application Center ("SE-CEAC").

Q. WOULD YOU BRIEFLY DISCUSS YOUR EDUCATION AND EXPERIENCE?

A. I graduated from NC State with a Bachelors of Science in Mechanical Engineering. After graduating from NC State, I worked as an engineering consultant from 1998 to 2010, and for six years of those years I operated my own practice, providing engineering consulting services on high performance commercial, industrial and institutional projects, including a number of grid connected distributed generation systems. I have been licensed as a Professional Engineer in the State of North Carolina for the past ten years.

For the last three years, I have managed the Clean Power and Industrial Efficiency Project team at the North Carolina Solar Center. Under this project, I work with industrial and commercial energy end-users, utilities, state energy offices, state legislators and state regulators in a nine state Southeast region that includes North Carolina. During this time, my chief responsibility has been to serve as Director of the Southeast Clean Energy Application Center ("SE-CEAC"), which provides targeted education, unbiased information and project technical assistance in the areas of combined heat and power ("CHP"), waste heat to power and district energy.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to (1) provide a brief overview of combined heat and power ("CHP"), including its potential in North Carolina; (2) explain how development and incorporation of a CHP incentive program in Duke Energy Carolinas, LLC's ("Duke" or the "Company") portfolio could yield capacity and energy savings; (3) highlight how Duke's apparent exclusion of a type of CHP – topping-cycle CHP – from eligibility for its programs is not appropriate; and (4) request that the Commission strongly encourage Duke to introduce CHP as a topic for discussion in the Duke Collaborative and direct Duke to report back to the Commission on the Duke Collaborative's initial conclusions regarding the feasibility of a CHP incentive program.

Q. WHAT IS COMBINED HEAT AND POWER?

A. Combined heat and power ("CHP"), also known as cogeneration, is an energy efficient approach to generating electricity and useful thermal energy from a single fuel source at the point of use. An industrial or commercial facility can utilize an on-site CHP system to provide both their thermal and electricity requirements from a single fuel source, instead of utilizing electricity produced at a central station power plant and burning fuel in an on-site furnace or boiler to produce the required thermal energy. An on-site CHP system sized properly for the thermal load of the industrial or commercial facility can provide both electricity and thermal energy at an efficiency of 75% versus the combined efficiency of the conventional method which is approximately 45%. As a result of this efficiency, CHP systems can provide significant emission advantages over the conventional method of providing electricity and thermal requirements via separate systems.

Q. WHAT ARE THE BENEFITS OF COMBINED HEAT AND POWER?

A. As an energy efficient technology, CHP can provide benefits to both businesses and utilities in North Carolina. For businesses, properly sized and installed CHP systems can:

• Make them more competitive by reducing their overall energy costs;

• Reduce the risk of electric grid disruptions by enhancing electricity reliability;

• Provide stability in the face of uncertain electricity prices; and

• Reduce overall emissions of greenhouse gases and hazardous air pollutants.

For utilities, CHP systems can:

• Offer a low-cost approach to new electricity generation capacity;

• Lessen the need for new transmission and distribution infrastructure;

• Enhance power grid security; and

• Contribute to meeting energy efficiency targets.

Q. ARE THERE DIFFERENT TYPES OF CHP?

A. Yes. There are basically two types of CHP: Topping-cycle CHP and bottoming-cycle CHP.

Q. CAN YOU BRIEFLY DESCRIBE EACH TYPE?

A. Yes. In a *topping-cycle* CHP system, sometimes referred to as "conventional" CHP, fuel is combusted in a prime mover such as a gas turbine, micro-turbine, reciprocating engine, or fuel cell for the purpose of generating both electricity and thermal energy. The thermal energy, which comes from using the heat that would otherwise be lost in the prime mover's hot exhaust or cooling systems is recovered to provide process or space heating, cooling, and/or dehumidification. Optimally-efficient topping-cycle CHP systems are typically designed and sized to meet a facility's baseload thermal demand. In a *bottoming-cycle* CHP system, also referred to as waste-heat-to-power ("WHP"), the CHP system takes advantage of heat that is generated as part of an industrial process and would normally be vented to the atmosphere. In the WHP process, a portion of the waste heat from the industrial process is recovered and typically used to produce high-grade steam through a heat recovery steam generator, and then a steam turbine utilizes the steam to generate electricity. Under ideal circumstances, WHP systems are a particularly beneficial form of CHP in that they utilize heat that would otherwise be wasted from an existing thermal process to produce electricity with a minimal amount of additional fuel.

Q. WHAT IS THE EXISTING CHP CAPACITY IN NORTH CAROLINA?

A. In North Carolina today, there are 66 CHP systems in operation totaling 1,540 MW of electric nameplate capacity. Most of these CHP systems are located at large industrial and manufacturing sites, with some CHP at agribusiness sites and institutional sites, including military installations and university campuses. Of the 66 CHP systems, 62 are topping-cycle and four are bottoming-cycle.

Q. IS THERE POTENTIAL FOR ADDITIONAL CHP DEVELOPMENT IN NORTH CAROLINA?

A. Yes, there is a large amount of potential for new CHP in North Carolina. Since 2006, an estimated 3.5 GW of new CHP capacity has been installed in the United States. The markets with the greatest CHP growth during this time have been paper manufacturing, colleges/universities, food processing plants, chemical plants, refining operations, utilities and hospitals. Many of these markets are present in North Carolina, and represent stable and some growing industry and institutional sectors. Working with ICF International ("ICF"), SE-CEAC recently investigated the technical potential for new topping-cycle CHP in North Carolina. Technical potential is defined by ICF as the total electric generating capacity potential from existing and new facilities that are likely to have the appropriate physical electric and thermal load characteristics that would support a CHP system with high levels of thermal utilization. ICF and SE-CEAC estimated that there is approximately 6,428 MW of new topping-cycle technical potential in North Carolina of which roughly 4,667 MW resides in the industrial sector and 1,761 MW resides in the commercial sector.

Q. DOES CHP MEET THE DEFINITION OF ENERGY EFFICIENCY IN NORTH CAROLINA?

A. Yes. North Carolina General Statute §62-133.8(a)(4) states that an "energy efficiency measure" means *"an equipment, physical, or program change* implemented after January 1, 2007, that results in less energy used to perform the same function" and "includes, but is not limited to, energy produced from a combined heat and power system that uses nonrenewable energy resources." North Carolina General Statute § 62-133.9(a) makes the definition I just recited applicable in the DSM/EE cost recovery context at the heart of this proceeding.

Q. DOES DUKE ENERGY'S PROPOSED DSM/EE PORTFOLIO INCLUDE A CHP INCENTIVE PROGRAM?

A. Duke's proposed portfolio for 2014-2017 does not include a CHP incentive program. Moreover, Duke's proposed new Non-Residential Smart Saver Custom Program, Attachment G Tariff, has a statement under Incentives for Custom Projects that appears to make CHP ineligible: "Electric generation, from either non-renewable or renewable sources, are not considered energy efficiency measures and therefore do not qualify for these payments." The tariff for the 2009-2013 Non-Residential Smart Saver Custom Program did not have this specific exclusion.

Q. HOW WOULD A CHP INCENTIVE PROGRAM FIT INTO A UTILITY PORTFOLIO?

A. When deciding whether CHP should be an allowable technology in a utility incentive program, there are several considerations and an opportunity to learn from what other utilities and states have done. Operating at 65% to 80% efficiency, CHP systems are effective energy efficiency measures and can provide cost-effective efficiency savings for both customer and the utility while also boosting the competitiveness of manufacturing and other energy intensive industries. CHP has been included by several states in their state energy efficiency programs and electric utilities have successfully integrated these programs into their multi-year plans.

Though there is no universal method for including CHP in an incentive program, the states of Maryland, Massachusetts, Connecticut and Ohio provide examples of different ways that CHP benefits can be quantified. In Maryland, on April 13, 2012, the Potomac Electric Power Company ("Pepco"), Delmarva Power & Light Company ("Delmarva") and Baltimore Gas and Electric Company ("BGE") jointly filed a request for approval to provide a CHP incentive program for their commercial and industrial customers. In Maryland, PSC Commission Order 84955, dated June 5, 2012, the Commission approved the companies' proposed CHP incentive program as filed. The program terms stipulate that CHP systems must meet a minimum efficiency of 65% and pass a modified Total Resource Cost (TRC), with separate valuations for the on-peak and off-peak operation of the CHP system, placing a higher weight on on-peak energy savings. A total combined budget of $20,000,000 was approved for the CHP incentives under the companies' programs. The incentive structure includes an up-front payment of $250/kW of capacity, and an incentive of $0.07/kWh the system saves for the first 18 months of operation. In the first solicitation for participants, which closed on December 21, 2012, BGE received 16 proposals from a variety of commercial and industrial customers, for a total of 13 MW of CHP and 102,000 MWh savings. Information on the number or scale of proposals received by Pepco and Delmarva is not available at this time.

The state of Massachusetts uses a performance-based incentive program in which efficiency credits are allocated on the basis of one credit per MWh of net fuel source savings. Fuel source savings are determined by metering the CHP generated electrical and useful thermal energy as well as the fuel energy consumed and comparing the CHP fuel energy consumed with what would have been needed to generate an equal amount of electricity by the grid and thermal energy from a boiler or furnace. An empirical formula is used to quantify the net source fuel reduction.

The state of Connecticut credits all electricity produced (kWh) by qualified CHP systems that meet or exceed the minimum efficiency threshold of 50%. In Washington State, CHP systems must have a useful thermal output of at least 33% to qualify. In Ohio, recently passed legislation (SB 14 315) allows CHP systems to participate in the state's efficiency program if they have an overall efficiency of at least 60%, with at least 20% of total energy output as thermal energy. The details on calculating CHP savings are currently being finalized by the Public Utility Commission of Ohio.

Q. HAS SE-CEAC WORKED WITH DUKE TO EXPLORE CHP OPPORTUNITIES IN NORTH CAROLINA?

A. SE-CEAC has been part of a working group convened by Duke in January 2012 to investigate CHP opportunities in North Carolina. The group was formed after a conference in November 2011 on CHP in North Carolina. At this conference, which had over 70 attendees including large energy-users, SE-CEAC's data on CHP technical potential in North Carolina was presented. The CHP working group was started and managed by Karim Ly, Senior Marketing Manager with Duke Energy, with the intention of realizing a profitable and viable CHP incentive program for the Company. This working group has advised Duke on examples of CHP programs in other states and on aspects of the design for a potential CHP incentive program for Duke. Part of my role as Director of SE-CEAC was to help Duke identify potential pilot sites in North Carolina from among the sites we provide CHP technical assistance to. If our site assessments showed a viable CHP opportunity and interest in a utility incentive program, we obtained their permission to share their contact information with Duke. From there, Duke and the sites worked together directly to evaluate whether the CHP opportunity met Duke's criteria for a pilot site.

Q. WHAT IS THE STATUS OF THE DUKE CHP WORKING GROUP YOU JUST REFERRED TO?

A. Duke's CHP working group has been inactive for the past 9 months due to the departure of Senior Marketing Manager Karim Ly in September of 2012. My understanding is that Duke staff were reassigned to work on the project in early 2013 but the Duke CHP working group has not been re-convened.

Q. PLEASE COMMENT ON DUKE'S RESPONSE TO NCSEA'S DISCOVERY REQUEST RELATED TO CHP?

A. Duke's response to NCSEA's Data Request No. 3-23 is attached to my testimony as Exhibit 1. In the response, Duke responds to the question, "Have you considered or investigated the feasibility of offering a combined heat and power (CHP) program? If so, please provide a summary of the results of your consideration/investigation." Duke's response, in part, reads as follows: "[T]he Company has collaborated with external stakeholders with the hope of identifying one or more customers that are considering a CHP investment and are willing to act as a test case for the incentive design. Unfortunately, to date, no suitable candidates have been identified, however the Company remains interested in exploring a CHP incentive program if one or more test cases emerge." The stakeholder group Duke refers to in its response is the same working group that SE-CEAC was participating in. Although SE-CEAC and the other stakeholders provided Duke with a number of customer contacts that were interested in a CHP project investment, Duke states that no suitable candidates had been identified.

Q. CAN YOU EXPLAIN WHY DUKE WAS UNABLE TO IDENTIFY ANY SUITABLE CANDIDATES?

A. SE-CEAC followed-up with several of the industrial, commercial and institutional customers that were put in touch with Duke's CHP team. Based on follow-ups with representatives of two of these customers, it is my impression that Duke considers only sites with bottoming-cycle CHP applications to be eligible for incentives in North Carolina and that customer applications for topping-cycle CHP systems are not eligible for an incentive because they generate electricity using a nonrenewable fuel. As I stated in an earlier answer, North Carolina law allows for CHP as an energy efficiency *measure under a utility cost recovery program even if the CHP uses a* nonrenewable energy resource.

Q. DO YOU BELIEVE THAT A CHP INCENTIVE CAN DECREASE OPT-OUT OF LARGE ENERGY-USERS FROM A UTILITY'S PORTFOLIO OF PROGRAMS?

A. Yes. SE-CEAC provides technical services to potential CHP candidates, including large industrial and institutional energy-users who typically opt-out of utility energy efficiency programs. During the period starting October 1, 2011 and ending September 30, 2012, SE-CEAC performed technical evaluations for four potential CHP projects in North Carolina. Two of these projects were at industrial sites, with potential natural gas-fired CHP capacities of 10 MW and 4.7 MW, having estimated payback periods between three and five years. The current prevailing practice among industrial companies that we have spoken to is to pursue projects that have less than a two-year payback due to limited internal capital. If an incentive program were offered for CHP projects that could help produce payback periods of approximately two years or less, I believe that could lead industrials to opt-in to the program to pursue projects eligible for the CHP incentive. The level of increased participation achieved would depend on the level of incentive offered and terms of the program.

Q. WHAT IS YOUR RECOMMENDATION TO THE COMMISSION?

A. I have two recommendations. First, I recommend that the Commission strongly encourage Duke to introduce CHP as a topic for discussion in the Duke Collaborative and direct Duke to report back to the Commission on the Duke Collaborative's initial conclusions regarding the feasibility of a CHP incentive program. Second, I recommend that the Commission reinforce that both topping-cycle CHP and bottoming-cycle CHP qualify as energy efficiency measures per North Carolina law.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

DUKE ENERGY CAROLINAS

Request:

Have you considered or investigated the feasibility of offering a combined heat and power (CHP) program? If so, please provide a summary of the results of your consideration/investigation.

Response:

Duke Energy has investigated the viability of an energy efficiency incentive program to promote commercial and industrial customer adoption of combined heat and power (CHP) systems. Similar to Duke Energy Carolinas' Smart$aver custom incentive program, the concept that the Company has explored involves the payment of incentives to customers that install and own a CHP system based on the verified energy and demand savings that result from the increased electric efficiency of the CHP system. Because it is not possible to produce a theoretical analysis model that accurately represents the wide range of customers' unique financial, electric and thermal needs, the Company has collaborated with external stakeholders with the hope of identifying one or more customers that are considering a CHP investment and are willing to act as a test case for the incentive deign. Unfortunately, to date, no suitable candidates have been identified, however the Company remains interested in exploring a CHP incentive program if one or more test cases emerge.

PANZARELLA
EXHIBIT
1

EXHIBIT C

NONRESIDENTIAL SMART SAVER ®
ENERGY EFFICIENT PRODUCTS AND ASSESSMENT PROGRAM (NC)

PURPOSE

The purpose of this program is to encourage the installation of new high efficiency equipment in new and existing nonresidential establishments as well as efficiency-related repair activities designed to maintain or enhance efficiency levels in currently installed equipment. The program will provide incentive payments for energy assessment and to offset a portion of the higher cost of new energy efficient equipment or the efficiency-related repair activities.

PROGRAM

Payments are available to owners of, or customers occupying, new or existing nonresidential establishments served on Duke Energy Carolinas' general service rate and industrial rate schedules from Duke Energy Carolinas' retail distribution system.

Payments are available for a percentage of qualifying energy assessments, a percentage of the cost difference between standard equipment and qualifying new higher efficiency equipment, or a percentage of the cost of qualifying efficiency-related repair activities as further described below.

Prescriptive Incentives for Specific Equipment

The following types of equipment are eligible for incentives.

High efficiency lighting
High efficiency heating, ventilation and air conditioning equipment
High efficiency pumps and variable frequency drives
High efficiency food service equipment
High efficiency process equipment
High efficiency information technology equipment

The Company may vary the percentage incentive by type of equipment, differences in efficiency and type of efficiency-related repair activity either to provide the minimum incentive needed to drive customers to install higher efficiency equipment or to encourage maintaining or enhancing efficiency levels in currently installed equipment.

The Company reserves the right to adjust the incentive and equipment requirements on a periodic basis, as equipment efficiency standards change and as customers naturally move to install higher efficiency equipment.

The amount of the incentive payment for various standard types of equipment will be filed with the Commission annually, for information, and posted to the Company's website at www.duke-energy.com.

Incentives for Custom Projects

Energy Assessments

Optional energy assessments are available to identify and/or evaluate energy efficiency projects and energy efficient measures. The scope of an energy assessment may include but is not limited to facility energy audit, new construction/renovation energy performance simulation, system energy study and retro-commissioning service. Payments are available to offset a portion of the costs of a qualifying energy assessment.

The Company may vary the percentage of energy assessment payment based on the facility size, age, equipment, and other criteria that may affect the amount of energy efficiency opportunities, and the expectation of the customer implementing recommendations identified. All, or a portion of, the energy assessment payment may be contingent on the customer implementing a minimum amount of cost effective energy efficiency measures within a set timeframe.

Custom Incentives

Custom incentives are available with or without an energy assessment provided by the Company.
The Company shall determine what projects meet the criteria for higher efficiency equipment or efficiency-related maintenance activities, including but not limited to the types of equipment shown above under Prescriptive Incentives. To qualify for efficiency related incentives for HVAC or process equipment, such equipment must have a remaining use life greater than 2 years.

Electric generation, from either non-renewable or renewable sources, is not considered an energy efficiency measure and therefore does not qualify for payments; however, bottoming-cycle Combined Heat and Power ("CHP") systems or the waste heat recovery components of topping-cycle CHP may be eligible for payments.

The Company may vary the percentage incentive based on project conditions, including differences in efficiency, operating conditions, measure life, free ridership, and other factors that affect projected energy savings, and based on measure cost effectiveness in order to provide the minimum incentive needed to drive customers to install higher efficiency equipment.

In order to receive payment under this program the following requirements must be met.

- For new high efficiency equipment in an existing establishment, the customer must submit a request for incentive payment either before or within ninety (90) days of installation, along with the required documentation and verification that the installed efficiency measures meet the requirements of this program.
- For efficiency-related activity, the customer must submit a request for incentive payment either before or within 90 days of the completing the efficiency-related activity, along with the required documentation and verification that the efficiency-related activity meet the requirements of the program.
- For new high efficiency equipment in a new establishment the customers must submit a request for incentive payment either before or within 90 days after the customer takes initial permanent service for the Company.

The Company reserves the right to inspect the premises of the customer both before and after implementation of the measure or completion of the efficiency-related activity for which an incentive payment is requested. Incentive payments will be made only after the equipment has been installed and is operable or the efficiency-related activity has been completed, as verified by the Company.

Multiple incentive payments may be requested for each establishment; however, the Company reserves the right to limit the payments per establishment per year.

PAYMENT

- The payment to the customer or owner will be an amount up to 75% of the installed cost difference between new standard equipment and new higher efficiency equipment or up to 75% of the cost of the efficiency-related activity.
- With Company approval, the customer or owner may designate that payment be made to the vendor or other third-party.