Proposed Legislation for Combined Heat and Power: Introduction and Legislative Language

UNITED STATES COMBINED
HEAT & POWER ASSOCIATION

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INTRODUCTION: PROPOSED NATIONAL COMBINED HEAT & POWER LEGISLATION

Goal

Create a level playing field for combined heat and power (CHP) systems to secure the national benefits of significant improvements in energy efficiency and electric power reliability in US markets.

Strategy

To develop model legislative language that can be used both federally and at the state level to address regulatory and market imperfections that discourage CHP. This language and supporting documentation will be made available to advocates and legislative staff for incorporation in other legislative vehicles. We will also attempt to have the language introduced at the federal level as several stand-alone bills to get the language in play.

Key Topic Areas

Depreciation of CHP assets (See Section 1)

Background:
The goal of this language is to address current inequities in IRS depreciation schedules that impose widely different depreciation schedules for CHP equipment under different ownership situations. This language will establish a single depreciation schedule for common CHP assets, such as turbine and engines, for all stationary applications, irrespective of ownership.

Tax credits for new or expanded CHP assets (See Section 2)

1) Investment tax credits
2) Production credits
3) Displaced grid consumption credits (i.e., all power used on-site, so project can be treated as a demand side measure)

Background:
The goal of this language is to provide an incentive for the installation of new CHP capacity, or for the modification of existing equipment to increase the CHP capacity of the asset. This capacity should be clean and efficient, representing leadership in both categories.

Utility interconnection (See Section 3)

1. Technical standard
    a) Operation in parallel
    b) Switched operation
    c) Size issues
2. Timeliness considerations

Background:
The goal of this language is to provide an interconnect standard or standards for existing electricity grids that provides for worker safety and is synchronous with current and future utility generators. Interconnection standards can be regarded as particularly long-term barriers due to the fact that individual utilities currently have the authority to approve or deny the design of an interconnect with their grid. Currently, no method exists to govern the technical design and interconnect requirements in any consistent fashion even within one utilities=territory. At present, the utilities usually demand individual, expensive, and time consuming studies and modifications to proposed designs. This can actually prevent the installation of a CHP project where time and added expenses can eliminate a reasonable return on investment for the new energy efficient technology.

Environmental permitting (See Section xx)

1. Mandate issuance of state CHP permitting guides
2. Mandate a move to output-based standards
3. Equal valuation of thermal and power output
4. EPA develops expedited permitting procedure guidelines
5. Certification by EPA/DOE of package CHP systems
6. Consistent treatment independent of ownership

Background:
The goal of this language is to recognize that combined heat and power (CHP) systems achieve significant reductions in environmental emissions due to their much higher efficiencies of fuel conversion relative to conventional separate heat and power systems. Most current environmental regulations do not recognize the true magnitude of this benefit because they focus on concentrations of pollutants in exhaust streams, end of the pipe measurements, rather than emissions per unit of usable energy input. This situation can be remedied by a move to using output-based standards for measuring emissions. These standards must value electric and non-electric output equally, and should be independent of fuel source. These standards must also not discriminate against different ownership situations.

Consideration should also be given to the establishment of process for the certification of the emissions form package CHP equipment and systems for which the emissions do not vary substantially unit to unit. Systems using certified equipment should be eligible for expedited permitting.

States and local regulatory authorities should be encouraged to put similar language in effect at the local level.

Supporting Definitions (See Section 4)

1. Common definition of terms
2. Efficiency criteria for qualifying CHP facilities
3. Environmental criteria for qualifying CHP facilities

Issues

These represent issues that directly or indirectly impact the viability of legislative language, and must be considered:

- Fuel neutrality, and the impact of output based environmental strategies on coal
- Environmental opposition to MSW and waste-to-energy
- Other DG interest versus CHP interest in interconnect
- Other DG interest versus CHP interest in environmental permitting
- Other DG interest versus CHP interest in siting
- Dealing with environmental leakage
- Ownership
- Grandfathering in states that already have various CHP incentives, like interconnection in Texas; what happens to correlated state level initiatives like net metering that would affect and/or look like double dipping for some of the financial incentives
- Electric centric perspective: thermal output not valued

LEGISLATIVE LANGUAGE

Section 1: SEC. 104. RECOVERY PERIOD FOR COMBINED HEAT AND POWER EQUIPMENT.

(a) 7-YEAR RECOVERY PERIOD.— Subparagraph (C) of section 168(e)(3) of the Internal Revenue Code of 1986 (relating to 7-year property) is amended by striking the period at the end of clause (ii) and inserting ‘‘, and’’ and by inserting after clause (ii) the following new clause:

‘‘(iii) any qualified CHP system.’’.

(b) QUALIFIED CHP SYSTEM.— Section 168(e) of such Code is amended by adding at the end the following new paragraph:

‘‘(6) QUALIFIED CHP SYSTEM.— For purposes of paragraph (3)(C)(iii), the term ‘qualified CHP system’ shall include equipment and related facilities used to provide used energy products through combined heat and power (CHP), excluding assets used to transport fuel to the generating facility. CHP property may include property owned by a third party for primary use by one or more customers located in close proximity to the CHP property. CHP property shall include all equipment necessary to provide usable energy products through CHP, including, but not limited to, prime movers such as engines and turbines, boilers, air and water filtration, pollution and noise control, pumps, pipes and electrical switchgear. Further, the term “qualified CHP system” refers to applications of technologies that achieve an actual average, annual, fuel-conversion efficiency, as asserted by a registered and licensed engineer utilizing standard engineering practices, that meets or exceeds the following levels:

(A) For systems with a total used energy output of less than 10 MW_{t+e} , an efficiency

of 55%,

(B) For systems with a total used energy output of 10 MW_{t+e}, but less than 100 MW_{t+e}, an efficiency of 60%, and

(C) For systems with a total used energy output of 100 MW_{t+e} or greater, an efficiency of 65%,

where MWt+e is the sum of the thermal and electrical/mechanical capacity of the system in common units with the thermal power converted to MW using the conversion of 3,412,000 Btu/hr per MW. These shall be delivered power ratings measured at the bus bar for electrical, the output shaft for mechanical, and at the distribution header for thermal
In addition, a "qualifying CHP system" must meet the following performance criteria:

(D) Sum of all used thermal energy products must constitute at least 20 percent of the technology's total used energy output, and

(E) Sum of all used electric or mechanical energy must constitute at least 20 percent of the technology's total used energy output.

However, the following technologies do not need to meet the minimum, fuel-conversion efficiency requirement above:

(F) Retrofit technologies that generate electricity using back-pressure steam turbines in place of existing pressure-reducing valves, or

(G) Technologies that make use of waste heat from industrial process.

(We will have Legislative Counsel's office put in language to insure that no one who takes advantage of this depreciation schedule can claim credit or deductions again for the

same technology under any other legislation.)

(d) EFFECTIVE DATE.— The amendments made by this section shall apply to property placed in service after December 31, 2000.

Section 2: INVESTMENT TAX CREDIT FOR COMBINED HEAT AND POWER (CHP) SYSTEMS

Current law

No tax credits are available for combined heat & power systems. There are, or have been, tax credits issued for technologies related to renewable power sources, such as solar and wind, and for certain hybrid vehicle technologies. Tax credits are effective in spurring the increased use and innovation of these new sources of energy and technologies for the future.

Reasons for change

Combined heat and power systems utilize thermal energy that is otherwise wasted in producing electricity by more conventional methods. CHP systems achieve a greater level of overall energy efficiency (they are as much as 65% efficient as compared to conventional means of power generation and transmission which typically is only 30% efficient), thereby, lessening the consumption of primary fuels, lowering total energy costs, and reducing carbon emissions. An investment tax credit for CHP assets is expected to encourage increased energy efficiency by accelerating planned investments and inducing additional investments in such systems.

Proposal

The proposal would establish a 10-percent investment credit for qualified CHP systems with an electrical capacity in excess of 50 kilowatts or with a capacity to produce mechanical power in excess of 67 horsepower (or an equivalent combination of electrical and mechanical energy capacities). CHP property would be defined as property comprising a system that uses the same energy source for the simultaneous or sequential generation of (1) electricity or mechanical shaft power (or both) and (2) steam or other forms of useful thermal energy (including heating and cooling applications). A qualified CHP system would be required to produce at least 20 percent of its total useful energy in the form of thermal energy and at least 20 percent of its total useful energy in the form of electrical or mechanical power (or a combination thereof) and would also be required to satisfy an energy-efficiency standard. For CHP systems with an electrical capacity in excess of 50 megawatts (or a mechanical energy capacity in excess of 67,000 horsepower), the total energy efficiency of the system would have to exceed 70 percent.

For smaller systems, the total energy efficiency would have to exceed 60 percent. For this purpose, total energy efficiency would be calculated as the sum of the useful electrical, thermal, and mechanical power produced by the system at normal operating rates, measured on a Btu basis, divided by the lower heating value of the primary fuel source for the system supplied. The credit would be allowed with respect to qualified CHP property only if its eligibility is verified under regulations prescribed by the Secretary of the Treasury.

The regulations would require taxpayers claiming the credit to obtain proper certification by qualified engineers that the system meets the energy-efficiency and percentage-of-energy tests.

The credit would be treated as energy property under the investment credit component of the section 38 general business credit, and would be subject to the rules and limitations governing such property. Thus, only property placed in service in the United States would be eligible for the credit, and the basis of qualified property would be reduced by the amount of the credit. Regulated public utilities claiming the credit would be required to use a normalization method of accounting with respect to the credit. Taxpayers using the credit for CHP equipment would not be entitled to any other tax credit for the same equipment.

The credit would apply to investments in CHP equipment placed in service after December 31, 2001, but before January 1, 2005.

Section 3: SEC. __ INTERCONNECTION

(a) INTERCONNECTION TO DISTRIBUTION FACILITIES. – Section 210 of the Federal Power Act is amended by adding the following at the end thereof:

"(f) SPECIAL RULE FOR INTERCONNECTION TO DISTRIBUTION FACILITIES. -

"(1) INTERCONNECTION. – A local distribution utility shall interconnect a generating facility with the distribution facilities of such utility if the generating facility owner complies with the final rule promulgated under paragraph (2) and pays the costs of such interconnection. The costs for such interconnection shall be just and reasonable, and not unduly discriminatory, as determined by the appropriate regulatory authority, and shall be comparable to the costs charged by such local distribution utility for interconnection by any other similarly situated generating facility to the distribution facilities of such utility. The right to interconnect does not relieve the generating facility or the local distribution utility of other federal, State, or local requirements nor does it provide the generating facility with transmission or distribution service.

"(2) RULES. – Within one year from the date of enactment of this subsection, the Commission shall promulgate a final rule to establish reasonable and appropriate technical standards for the interconnection of any generating facility with the distribution facilities of any local distribution utility. To the extent feasible, the Commission shall develop the standards through a process involving interested parties. For purposes of developing such standards, the Commission shall establish an advisory committee composed of qualified experts to make recommendations to

the Commission. Where appropriate, a State regulatory authority may administer and enforce the rule. To the extent a State regulatory authority does not administer and enforce the rule, the Commission shall administer and enforce the rule with respect to interconnection in that State.

"(3) RIGHT TO BACK-UP POWER. – To the extent the local distribution utility is not subject to an order of a State regulatory authority to provide open access to its distribution facilities or has not offered to provide open access to its distribution facilities or does not allow a generating facility to purchase back-up power from another entity using the local distribution utility's distribution facilities, the local distribution utility shall offer to sell back-up power to a generating facility which has interconnected with that utility and to do so at rates, terms, and conditions that are just and reasonable and not unduly discriminatory or preferential, taking into account the actual incremental cost whenever incurred by the local distribution utility to supply back-up power service during the period it was provided, as determined by the appropriate regulatory authority, provided that a local distribution utility shall not be required to offer back-up power for resale to anyone other than the entity for which the backup power is being purchased. To the extent back-up power is being used to serve new or expanded load, the generating facility shall pay any reasonable costs associated with transmission, distribution or generation upgrades required to provide such service.

(b) INTERCONNECTION TO TRANSMISSION FACILITIES. – Section 210 of the Federal Power Act is amended as follows:

"(g) SPECIAL RULE FOR INTERCONNECTION TO TRANSMISSION

FACILITIES.–

"(1) INTERCONNECTION. – Notwithstanding subsections (a) and (c), above, a transmitting utility shall interconnect a generating facility with the transmission facilities of such utility if the generating facility owner complies with the final rule promulgated under paragraph (2) and pays the costs of such interconnection. The costs for such interconnection shall be just and reasonable, and not unduly discriminatory, and shall be comparable to the costs charged by such transmitting utility for interconnection by any other similarly situated generating facility to the transmitting facilities of such utility [If "FERC lite" provision is adopted, add the following language: , provided, however, that where appropriate, the procedures of {FERC "lite" reference for non-public utilities} shall apply to the determination of the costs for interconnection with a transmitting utility subject to {FERC "lite" reference for non-public utilities}]. The right to interconnect does not relieve the generating facility of other federal, State, or local requirements nor does it provide the generating facility with transmission or distribution service.

"(2) RULES. – Within one year of the date of enactment of this subsection, the Commission shall promulgate a final rule to establish reasonable and appropriate technical standards for the interconnection of any generating facility with the transmission facilities of any transmitting utility. To the extent feasible, the Commission shall develop the standards through a process involving interested parties. For purposes of developing such standards, the Commission shall establish an advisory committee composed of qualified experts to make recommendations to the Commission.

"(3) RIGHT TO BACK-UP POWER. – Unless federal or state law or regulation allows a generating facility to purchase back-up power from an entity other than the transmitting utility or unless a transmitting utility allows a generating facility to purchase back-up power from an entity other than the transmitting utility using the transmitting utility's transmission facilities and those of any other transmitting utility, the transmitting utility shall offer to sell back-up power to a generating facility which has interconnected with that utility and to do so at rates, terms, and conditions that are just and reasonable and not unduly discriminatory or preferential, taking into account the actual incremental cost whenever incurred by the local distribution utility to supply such back-up power service during the period it was provided, as determined by the appropriate regulatory authority, provided that a transmitting utility shall not be required to offer back-up power for resale to anyone other than the entity for which the backup power is being purchased. To the extent back-up power is being used to serve new or expanded load, the generating facility shall pay any reasonable costs associated with transmission, distribution, or generation upgrades required to provide such service.

(c) Conforming Amendments. --

(1) Section 3(23) of the FPA is amended to read as follows:

"(23) 'transmitting utility' means any entity that owns, controls, or operates electric power transmission facilities that are used for the sale of electric energy, notwithstanding section 201(f) of this Act;"

(2) Section 210 of the Federal Power Act is amended as follows:

(A) In subsection (a)(1) (16 U.S.C. 824i(a)(1)) –

(i) by inserting “transmitting utility, local distribution companies” after “electric utility,”; and

(ii) by inserting “any transmitting utility,” after “small power production facility,” in subparagraph (A).

(B) In subsection (b)(2) (16 U.S.C. 842I(b)(2)) by striking “an evidentiary hearing” and inserting “a hearing”.

(C) In subsection (c)(2) by striking “or” at the end of subparagraph (B), by striking “and” the end of subparagraph (C) and inserting “or”, and adding the following at the end thereof:

“(D) promote competition in electricity markets, and”.

(D) In subsection (d) by deleting the last sentence.

(d) DEFINITIONS. – Section 3 of the Federal Power Act is amended by adding the following new paragraphs at the end:

(25) The term “generating facility” means any facility which generates electric energy.

(26) The term “local distribution utility” means any entity that owns, controls, or operates electric power distribution facilities that are used for the sale of electric energy.

Section 4: Definitions for CHP legislation:

As used in this act -

The term **"technology"** includes, but is not limited to, equipment, hardware, software, information management systems, business practices, and system changes.

The term **"power"** refers to electric or mechanical energy generated by a technology that has the potential to do work. These energy forms include, but are not limited to, electricity, shaft power, and compressed air.

The term **"thermal energy"** refers to any media generated by a technology that transports energy in the form of a difference between its temperature and that of the surrounds. Thermal energy media include, but not limited to, hot gases, steam, hot water, chilled water, and refrigerant.

The term **"usable energy products"** refers to any power or thermal energy that can be transferred to an application where it can provide utility. These products shall be measured at their point of generation. For example, for heated gases, steam, hot or chilled water, or compressed air, the product shall be measured at the point at which it is discharged into the pipe or duct system. For electricity, the product shall be measured at the generator buss. For mechanical power, the product shall be measured at the point of power transfer.

The term **"total usable energy"** refers to sum of all usable energy products generated by a technology, converted into common units of British Thermal Units (BTU) or kilowatt-hours (kW), using accepted conversion factors as specified by the National Institute of Standards and Technology.

The phrase **"measured at its higher heating value"** means that the latent heat of condensation of the moisture formed by combustion of the hydrogen in the fuel is included in measuring the fuel's energy output.

The term **"fuel conversion efficiency"** refers to the ratio expressed as a percentage of the total usable energy produced by a technology to the sum of all fuel or other energy inputs to the technology measured at its higher heating value. For purpose of qualifying technologies, these values should be for the average annual efficiency calculated by using aggregate, annual fuel consumption and energy production totals.

Combined Heat and Power (CHP) is defined as the production of two or more usable energy products from a single fuel or energy source. To be considered CHP for purposes of this act, the technology must meet the performance criteria listed below for "efficient CHP."

The term **"CHP property"** shall include equipment and related facilities used to produce usable energy products through CHP, excluding assets used to transport fuel to the generating facility.

Qualifying property shall include all equipment necessary to generate usable energy products through CHP, including, but not limited to, prime movers such as engines and turbines, boilers, air and water filtration, pollution and noise control, pumps, pipes and electrical switchgear.

The term **"package system"** refers to technologies of less than 50 megawatts electric that are available on a ready-to-install production basis.

The term **"output-based"** refers to any measure that is based on the total usable output from a technology. Specifically, in the context of the measurement of environmental emissions, output-based refers to the rate at which emissions are discharged by the technology to the environment per unit of total usable energy produced by the technology, as opposed to emissions per unit of fuel consumed.

The term **"efficient CHP"** refers to applications of technologies that achieve an average, annual, fuel-conversion efficiency meeting or exceeding the following levels:

(H) For systems with a total usable energy output of less than 1 MW_{t+e} per hour, an efficiency of 60%,

(I) For systems with a total usable energy output of 1 MW_{t+e}, but less than 100 MW_{t+e}, an efficiency of 63%, and

(J) For systems with a total usable energy output of 100 MW_{t+e} or greater, an efficiency of 66%.

In addition, "efficient CHP" must meet the following performance criteria:

(A) Sum of all usable thermal energy products must constitute at least 20 percent of the technology's total usable energy output, and

(B) Sum of all usable power must constitute at least 20 percent of the technology's total usable energy output.

However, the following technologies do not need to meet the minimum, fuel-conversion efficiency requirement above:

(K) Retrofit technologies that generate electricity using back-pressure steam turbines in place of existing pressure-reducing valves, , and

(L) Technologies that make use of waste heat from industrial process.

The term **"clean CHP"** refers to any technology in which:

(A) The fuel conversion efficiency exceeds 60%

(B) NO_x emissions are 0.5 lb/MWh $_{output}$ or less; and

(C) SO_2 emissions are 2.5 lb./MWh $_{output}$ or less.