The Alliance for Industrial Efficiency

SUBMISSION TO THE U.S. SENATE SUBCOMMITTEE ON ENERGY AND NATURAL RESOURCES

RESPONSE TO THE COMMITTEE'S WHITE PAPER ON A CLEAN ENERGY STANDARD

May 2011

David Gardiner & Associates, LLC

Coordinated and staffed by David Gardiner & Associates, LLC, the **Alliance for Industrial Efficiency** is a coalition of business, labor, and non-profit organizations who advocate for policies to increase US manufacturing competitiveness through industrial energy efficiency, especially the use of Combined Heat and Power (CHP) and Waste Heat Recovery (WHR).

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Submitted on behalf of the following organizations/companies:

Mechanical Contractors Association of America (MCAA)
National Electrical Contractors Association (NECA)
Ohio Business Council for a Clean Economy
Ormat Technologies Inc.
Pew Environment Group
Pharmaceutical Industry Labor-Management Association (PIL-MA)
Recycled Energy Development (RED)
Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)
Sheet Metal Workers' International Association (SMWIA)
Solar Turbines
TAS Energy
The Association of Union Constructors (TAUC)
United States Clean Heat and Power Association (USCHPA)
Voith Turbo

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EXECUTIVE SUMMARY

We are grateful for the opportunity to comment on your Clean Energy Standard (CES) White Paper and commend you for your leadership on this issue. The Alliance for Industrial Efficiency is a diverse coalition that includes representatives from the business, environmental, labor and contractor communities. We are committed to enhancing America's manufacturing competitiveness, creating manufacturing and construction jobs, and reducing emissions through industrial energy efficiency. Loss of US manufacturing is among voters' top concerns and 86 percent of voters support government efforts to revitalize the manufacturing sector, according to a recent poll by The Alliance for American Manufacturing. We urge the Committee to make enhancing America's manufacturing competitiveness a primary focus of the CES. Our comments identify several elements to accomplish this. In particular, we believe:

- Combined Heat and Power (CHP) and Waste Heat Recovery (WHR), which can produce 20 percent of America's electricity and do so cleanly, should be included in any CES.
- Production and efficiency should compete evenly in any standard.
- Energy efficiency is a critical component of a CES because it provides the cheapest, cleanest energy source, especially for industrial electricity consumers.

CHP and WHR are key sources of clean power that are already making sizable contributions to the US clean energy economy. A seminal 2008 study by the U.S. Department of Energy's (DOE) Oak Ridge National Laboratory (ORNL) reported that CHP and WHR already provide nine percent of U.S. electric capacity and projected this figure to more than double in the next twenty years. These projections are on par with DOE's projections for wind and current nuclear power production. And CHP and WHR should be an even greater part of our nation's energy mix as we look to a future of increased energy demand and grid constraints. A CES that explicitly includes CHP and WHR would help these technologies reach their full potential, thereby reducing our dependence on conventional power, creating jobs, increasing US manufacturing competitiveness, protecting public health and reducing emissions.

Again, we commend you for raising, and seeking input on, this important policy matter. We provide more detailed comments in response to Questions 2, 3 and 6 in the attached. We are eager to continue working with you as you craft a CES and hope that our comments help inform that process.

Sincerely,

David Gardiner – Executive Director, Alliance for Industrial Efficiency

Question 2. What resources should qualify as "clean energy"?

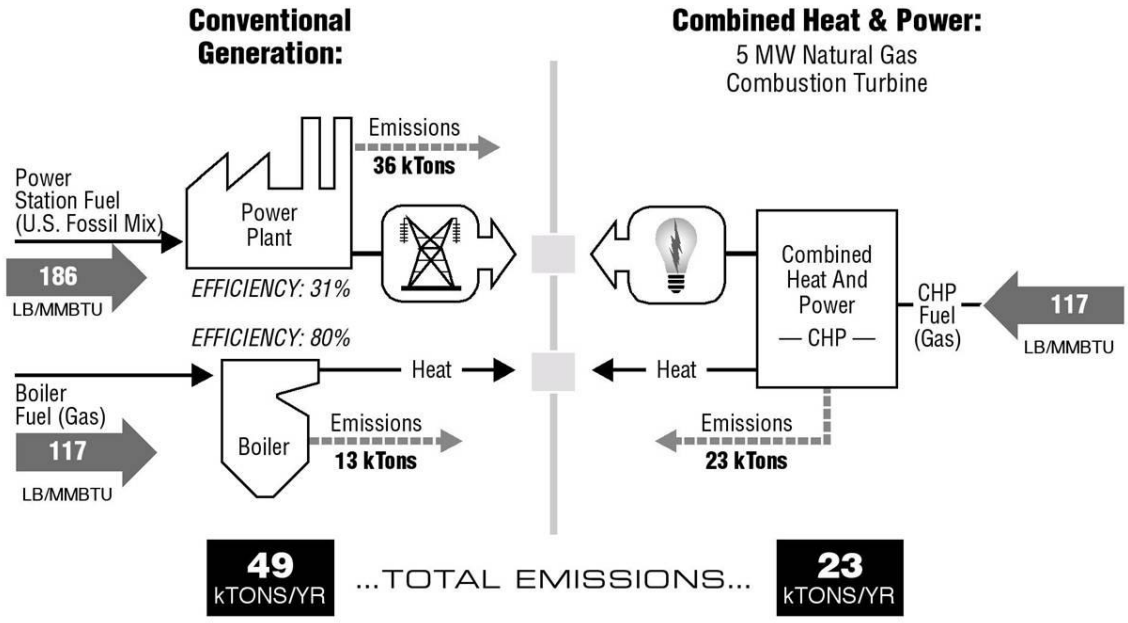
On what basis should qualifying "clean energy" resources be defined? Should the definition of "clean energy" account only for the greenhouse gas emissions of electric generation, or should other environmental issues be accounted for (e.g. particulate matter from biomass combustion, spent fuel from nuclear power, or land use changes for solar panels or wind, etc.)?

A Clean Energy Standard should explicitly include Combined Heat and Power (CHP) and Waste Heat Recovery (WHR). As elaborated below, these production technologies have significant emission benefits as compared to conventional power generation.

The Alliance believes that greenhouse gases provide a simple and reasonable proxy for defining clean energy sources. We note that by reducing total fuel inputs or converting traditionally waste heat into emissions free power for onsite use or sell to the electric grid, CHP and WHR will simultaneously reduce emissions of GHGs along with other pollutants of concern, such as particulate matter and hazardous air pollutants, like mercury.

Because CHP replaces the separate generation of heat and power from an offsite source, local carbon emissions may increase, despite significant reductions throughout the airshed. Because CHP is so efficient, however, overall greenhouse gas emissions associated with CHP are less than half what they would otherwise be under conventional power generation (see figure):

FIGURE 1: CHP EFFICIENCY LOWERS CARBON EMISSIONS[1]



[1] US EPA, Combined Heat and Power Partnership: "Environmental Benefits" (http://www.epa.gov/chp/basic/environmental.html) .

Question 2. What resources should qualify as "clean energy"?

The above-referenced emissions benefits and the energy savings for industrial energy consumers should be recognized by including CHP and WHR in the CES.

Question 2. What resources should qualify as "clean energy"?

Should qualifying clean energy resources be expressly listed or based on a general emissions threshold? If it is determined that a list of clean energy resources is preferable, what is the optimal definition for "clean energy" that will deploy a diverse set of clean generation technologies at least cost? Should there be an avenue to qualify additional clean energy resources in the future, based on technological advancements?

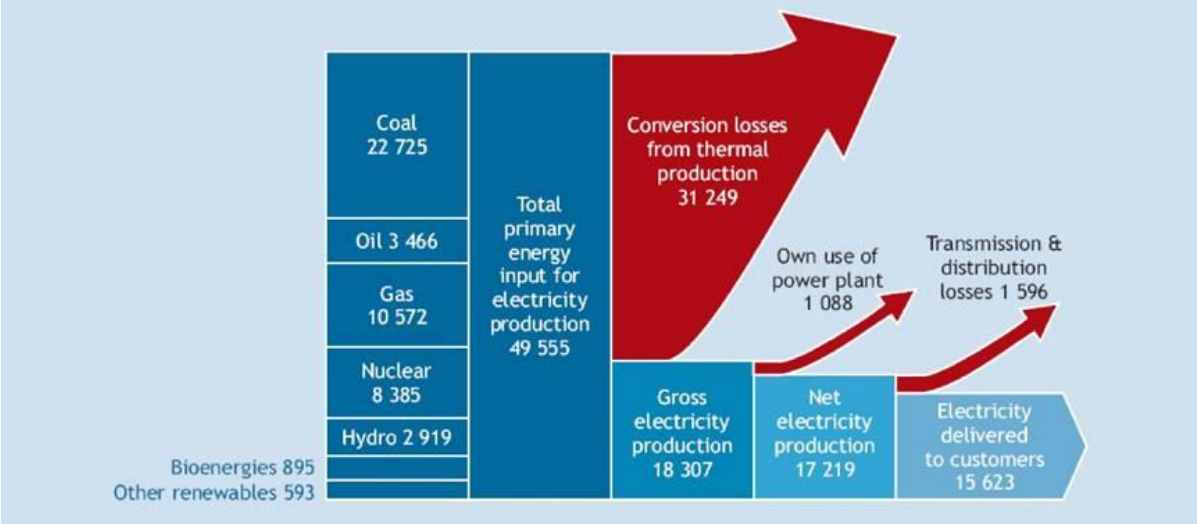
The Alliance believes that it is preferable to list qualifying energy resources to provide certainty to states and project developers. We further believe that Combined Heat and Power (CHP) and Waste Heat Recovery (WHR) should be explicitly listed as qualifying clean energy resource. CHP and WHR are readily available and cost-effective clean energy options and should be explicitly identified in any CES. Indeed, as the Department of Energy has recognized, CHP "represent[s] a proven and effective near-term energy option to help the United States enhance energy efficiency, ensure environmental quality, promote economic growth, and foster a robust energy infrastructure."[2] WHR is a "well developed and technically proven" [3] approach that "provides an attractive opportunity for an emission-free and less-costly energy resource." [4]

As you are aware, U.S. power generation is woefully inefficient – and has not improved since Dwight Eisenhower occupied the White House. In fact, as Figure 1 (below) illustrates, roughly two-thirds of energy inputs (68 percent) are simply emitted into the air, with a mere 32 percent actually delivered to customers. The unfortunate results are lost competitiveness and jobs, as well as increased emissions.

[2] Oak Ridge National Laboratory (ORNL), Dec. 1, 2008, *Combined Heat and Power: Effective Energy Solutions for a Sustainable Future*, at 3 (http://www1.eere.energy.gov/industry/distributedenergy/pdfs/chp_report_12-08.pdf).; *see also* International Energy Agency, 2007, "Combined Heat and Power: Evaluating the benefits of greater global investment," at 4 ("Combined heat and power (CHP) represents a series of proven, reliable and cost-effective technologies that are already making an important contribution to meeting global heat and electricity demand").
[3] U.S. Department of Energy, Industrial Technologies Program, Mar. 2008, "Waste Heat Recovery: Technology and Opportunities in U.S. Industry," at 1 (http://www1.eere.energy.gov/industry/intensiveprocesses/pdfs/waste_heat_recovery.pdf) .
[4] *Id.* at v.

Question 2. What resources should qualify as "clean energy"?

FIGURE 2: Losses from Conventional Power Generation[5] (TWh)



Fortunately, cost-effective alternatives already exist in the form of Waste Heat Recovery and Combined Heat and Power. CHP uses a single source for electric generation to create both thermal energy (heat) and electricity. WHR uses industrial waste heat (or other energy-laden waste streams) that is typically released into the atmosphere and, instead, captures that energy to generate emission free electricity and useful thermal heat. Thus, instead of purchasing electricity from a distant electric utility and burning fuel in an on-site boiler to produce heat, an industrial, commercial or residential facility can use CHP or WHR to provide emission free electricity, efficiently provide both electricity and heat. By providing both power and heat, a CHP facility can be twice as efficient as traditional power generation,[6] while WHR can produce emission free power from heat otherwise vented into the air. Thus, rather than emitting two-thirds of potential power from our smokestacks and factories, facilities using CHP and WHR convert that waste to clean power. This, in turn, lowers energy use and associated costs and makes American manufacturers both cleaner and more competitive.

DOE's ORNL projects that CHP could provide 20 percent of U.S. electric capacity by 2030. The following figure shows the growth in clean CHP and WHR needed to realize such economic benefits. A CES that explicitly includes CHP and WHR – critical sources of America's power production – and allows them to compete on a level playing field with other clean energy sources would help propel this growth.

[5] International Energy Agency, 2008, "*Combined Heat and Power: Evaluating the benefits of greater global investment*," at 6 (Figure 3) (http://www.iea.org/papers/2008/chp_report.pdf).

[6] Oak Ridge National Laboratory (ORNL), Dec. 1, 2008, *Combined Heat and Power: Effective Energy Solutions for a Sustainable Future*, at 6 (http://www1.eere.energy.gov/industry/distributedenergy/pdfs/chp_report_12-08.pdf).

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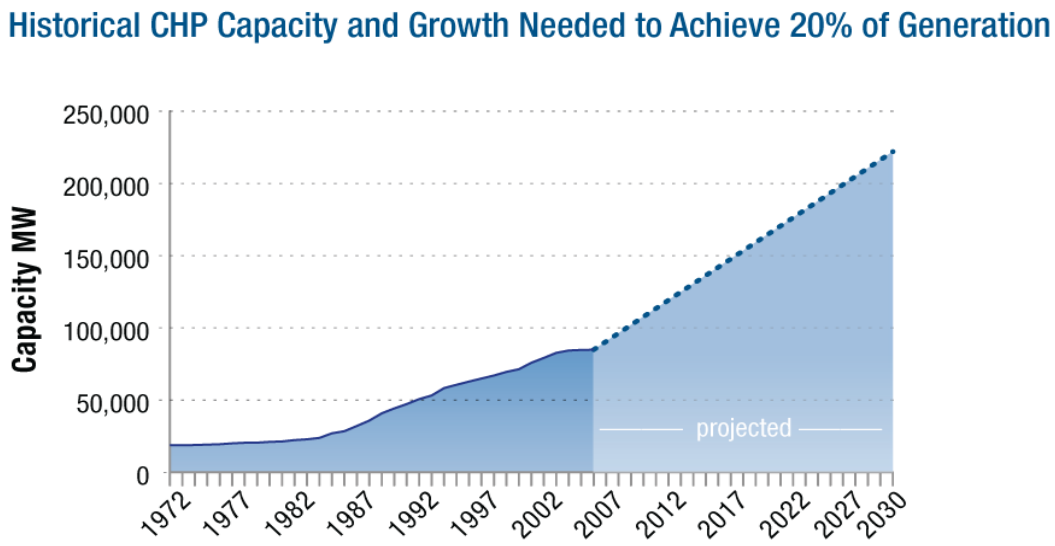

SOURCE: ORNL 2008, at 21.

Question 2. What resources should qualify as "clean energy"?

What is the role for energy efficiency in the standard? If energy efficiency qualifies, should it be limited to the supply side, the demand side, or both? How should measurement and verification issues be handled?

The Alliance for Industrial Efficiency believes that a guiding principle behind the Clean Energy Standard should be to keep energy costs low for U.S. manufacturers. To accomplish this, AIE believes it is essential that energy efficiency be included in a CES. As noted elsewhere in our comments, we also believe that including Combined Heat and Power (CHP) and Waste Heat Recovery (WHR) as production technologies will provide valuable opportunities for industry to make it more efficient and competitive while also producing low-cost, clean energy for the American public.

Far from limiting consideration to efficiency on one side of the meter or the other, we urge Congress to adopt a standard that places no limits on the role energy efficiency can play in achieving the standard. Thus, energy efficiency should not be limited to a set percentage of the clean energy target. Limiting energy efficiency – in any form – eliminates the lowest cost energy resource, thereby increasing compliance costs. Regulated entities should be allowed to determine the optimal resource mix to satisfy the CES. This can only happen when *all* clean energy sources (both production and efficiency) are on the table and allowed to compete on a level playing field.

As McKinsey and Company has recognized: "Energy efficiency offers a vast, low-cost energy resource for the U.S. economy – but only if the nation can craft a comprehensive and innovative approach to unlock it."[7] By including energy efficiency, a CES would create opportunities for the largest factories and power plants to identify ways to become more efficient – and save money over their operating lifetimes. These resources, in turn, could be invested in increasing production, thereby enhancing America's manufacturing competitiveness. In short, by including energy efficiency in a CES, Congress will ensure that the nation achieves clean energy at the lowest possible cost.

Energy efficiency is the lowest cost energy resource. A 2009 study by the American Council for an Energy-Efficient Economy (ACEEE) found that utility-run energy efficiency programs cost one-third less than satisfying demand through new power generation of any type.[8] The study found that the cost of energy efficiency programs in 14 states ranged from 1.6 to 3.3 cents per kWh, with an average cost of 2.5 cents per kWh – one-fourth to one-half the reported cost new power generation from either pulverized coal (7.14 cents per kWh) or natural gas (7.10 cents per kWh).[9] Similarly, the Energy Information Administration projects that energy efficiency will

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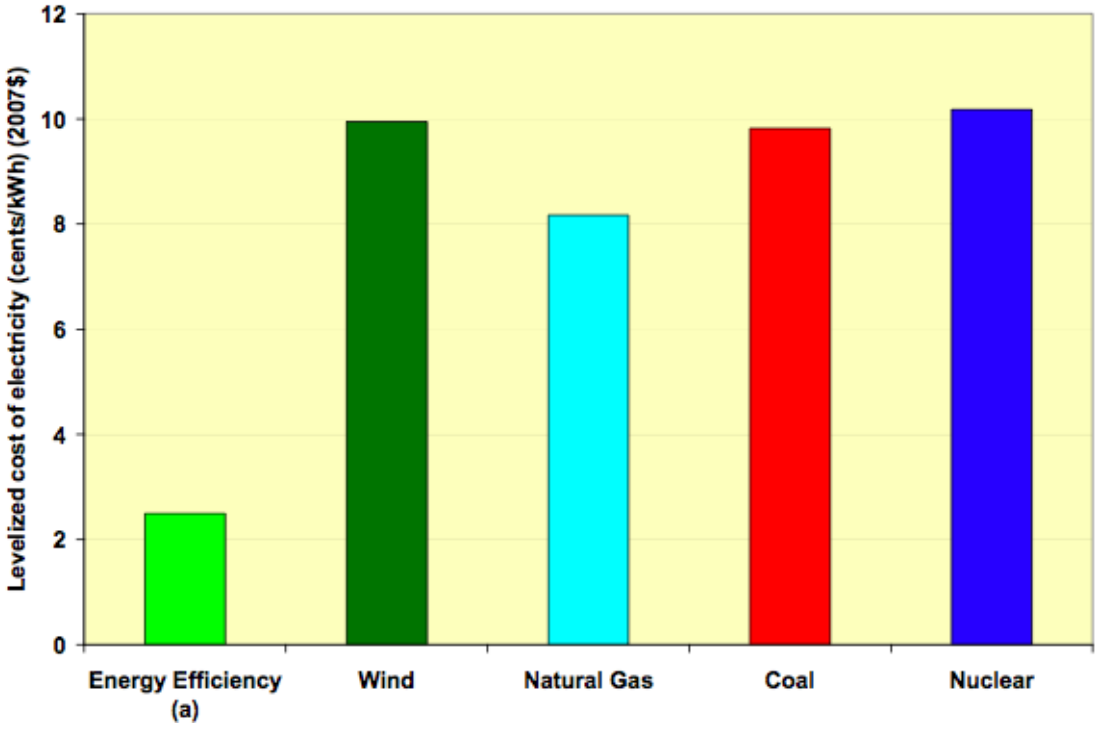
[7] McKinsey & Company, July 2009, "Unlocking Energy Efficiency in the U.S. Economy," at 1 (http://www.mckinsey.com/clientservice/electricpowernaturalgas/downloads/us_energy_efficiency_full_report.pdf).

[8] American Council for an Energy-Efficient Economy, *Saving Energy Cost-Effectively: A National Review of the Cost of Energy Saved Through Utility-Sector Energy Efficiency Programs*, September 2009.

[9] American Council for an Energy-Efficient Economy, *Saving Energy Cost-Effectively: A National Review of the Cost of Energy Saved Through Utility-Sector Energy Efficiency Programs*, September 2009 (evaluating California, Connecticut, Iowa, Massachusetts, Minnesota, Nevada, New Mexico, New Jersey, New York, Oregon, Rhode Island, Texas, Vermont, and Wisconsin).

cost one-third to one-fourth the cost of supply-side resources in 2020 (see figure below). These findings are reaffirmed in a report by Synapse Energy Economics (a research and consulting firm, specializing in energy, environmental and economic topics), which found that among utilities leading in energy efficiency, the cost per kWh of electricity saved through energy efficiency never exceeded 3 cents, compared to the national average price of 9 cents per kWh of delivered electricity.[10]

FIGURE 3: LEVELIZED RESOURCE COST ESTIMATES FOR 2020[11]



What's more, energy efficiency investments can dramatically reduce electricity demand, reducing the need for conventional power generation. For instance, the Synapse Report found that some leading utilities and states reduced their energy needs by 1 to 3 percent through implementation of cost-effective energy efficiency measures.[12]

Twenty six states and regional electricity markets in New England and the mid-Atlantic have already adopted electric utility energy efficiency programs and requirements that have addressed questions of defining and determining energy savings, measurement and verification, additionality, and other issues. Their experience might prove useful, as you explore development of these

[10] Synapse Energy Economics, Inc, *No Need to Wait: Using Energy Efficiency and Offsets to Meet Early Electric Sector Greenhouse Gas Targets*, May 2009.
[11] American Council for an Energy-Efficient Economy, Sept. 2009, *Saving Energy Cost-Effectively: A National Review of the Cost of Energy Saved Through Utility-Sector Energy Efficiency Programs*, Fig. 3.
[12] Synapse Energy Economics, Inc, *No Need to Wait: Using Energy Efficiency and Offsets to Meet Early Electric Sector Greenhouse Gas Targets*, May 2009.

elements of a Clean Energy Standard. These programs serve as models for addressing potential issues with measurement and verification, and also indicate the significant focus that state and regional policy makers have placed on energy efficiency. Your Committee should follow the lead of these state and regional policy makers and put energy efficiency at the forefront of national energy policy.

Question 3. How should the crediting system and timetables be designed?

Should partial credits be given for certain technologies, like efficient natural gas and clean coal, as the President has proposed? If partial credits are used, on what basis should the percentage of credit be awarded? Should this be made modifiable over the life of the program?

The CES should encourage the efficient use of natural gas or any other fuel. For example, the Alliance recommends that highly efficient natural gas generation using CHP should be given full credit, while less efficient electricity production should receive less credit.

Provisions to drive greater deployment of CHP and natural gas together can expand growth in America's manufacturing industries. In its most recent Annual Energy Outlook, for instance, the Energy Information Administration projects an increase in natural gas use for CHP corresponding to faster growth of industrial production in small, non-energy-intensive industries (such as metal-based durable goods manufacturing).[13]

[13] U.S. Energy Information Administration, 2011. *Annual Energy Outlook 2011 Early Release Overview.* p. 5. http://www.eia.doe.gov/forecasts/aeo/

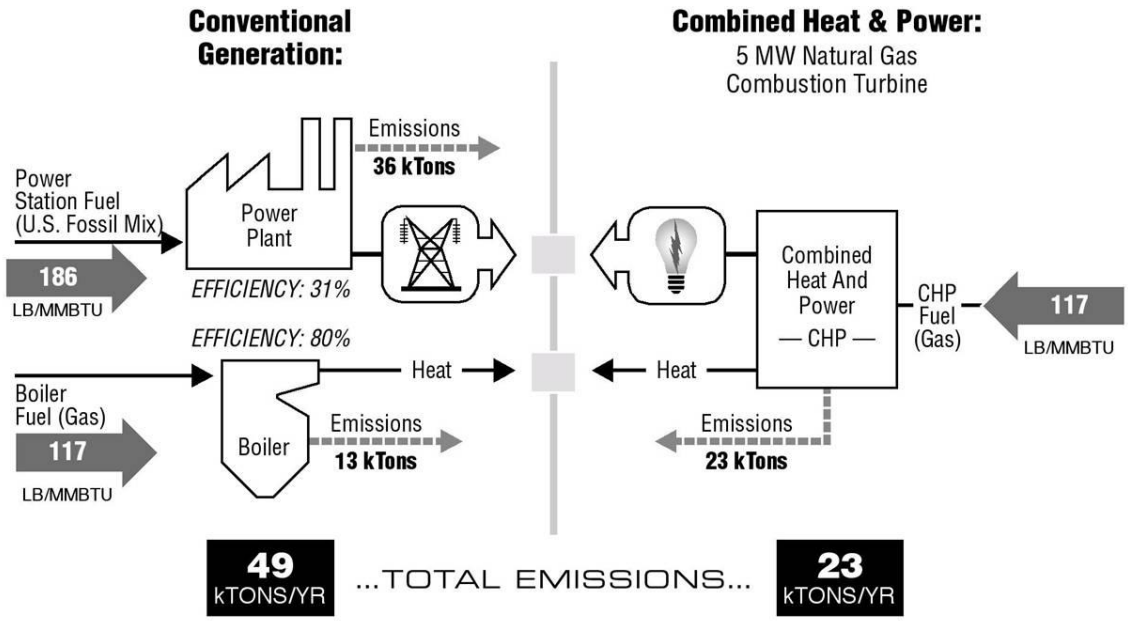
Question 6. Are there policies that should be considered to complement a CES?

To what extent does a CES contribute to the overall climate change policy of the United States, and would enactment of a CES warrant changes to other, relevant statutes?

A primary focus of a CES should be to enhance the competitiveness of America's manufacturing sector while expanding the development and use of clean-energy resources in this country. Inclusion of Combined Heat and Power (CHP) and Waste Heat Recovery (WHR) as eligible production technologies capable of providing 20 percent of U.S. electricity capacity by 2030 is a key tool to accomplish that objective. In addition, full inclusion of energy efficiency within a CES will ensure the lowest cost power for industrial electricity consumers. A secondary benefit of such a CES would be to lower greenhouse gas emissions and other air pollutants. In fact, according to DOE's Oak Ridge National Laboratory, a large-scale expansion of CHP could reduce carbon emissions by more than 800 million metric tons per year, the equivalent of taking more than half the current U.S. passenger vehicles off the road.[14] A doubling of CHP would provide 156 GW of clean, efficient power – the equivalent of the electricity generated by more than 300 conventional power plants.[15]

CHP and WHR should be a part of this clean-energy mix because they use power for dual purposes (i.e., electricity and heat) and/or capture a "resource" that otherwise would be wasted and instead turn it into useful electricity and/or heat. (see Figure below)

FIGURE 1: CONVENTIONAL GENERATION VS. CHP: CO2 EMISSIONS



SOURCE: US EPA, Combined Heat and Power Partnership: "Environmental Benefits" (http://www.epa.gov/chp/basic/environmental.html)

[14] Oak Ridge National Laboratory (ORNL), Dec. 1, 2008, *Combined Heat and Power: Effective Energy Solutions for a Sustainable Future*, at 4 (http://www1.eere.energy.gov/industry/distributedenergy/pdfs/chp_report_12-08.pdf).
[15] Assuming a typical coal-fired power plant generates 500 MW of electricity.

Question 6. Are there policies that should be considered to complement a CES?

Are there specific supporting policy options that should be considered for coal, nuclear, natural gas, renewable energy, and efficiency?

While a CES provides an important policy to advance "clean energy", the Alliance for Industrial Efficiency believes that complementary policies are needed to further enhance the competitiveness of American manufacturing while providing clean energy.
Specifically:

First, Congress should support policies that help incentivize investments in Combined Heat and Power (CHP) and Waste Heat Recovery (WHR). In particular, the Alliance for Industrial Efficiency supports the following changes to the existing Investment Tax Credit for CHP that would make the credit more usable by relevant entities:

- Support previously-introduced, bi-partisan legislation that would allow WHR projects to qualify for the existing 10 percent Investment Tax Credit; increase the capacity limitation of the existing credit to a project's first 25 Megawatts, rather than the first 15 megawatts, as is currently the case; and remove the current 50-Megawatt size limitation.
- Provide a 30 percent investment tax credit for WHR and highly-efficient CHP projects.

Second, the Alliance also supports EPA's continued recognition of CHP and WHR as effective compliance options under the Clean Air Act. EPA's new Clean Air Act rules provide important incentives for American manufacturers to gain credit for the use of CHP and WHR and we would urge Congress to provide support for those rules.

We are happy to discuss these proposed policies further with staff and Committee Members, although we recognize that these recommendations extend beyond the jurisdictional purview of the Senate Energy and Natural Resources (ENR) Committee.

Question 6. Are there policies that should be considered to complement a CES?

What is the current status of clean energy technology manufacturing, and is it reasonable to expect domestic economic growth in that sector as a result of a CES?

A recent poll by The Alliance for American Manufacturing reveals that loss of U.S. manufacturing is among voters' top concerns and that the vast majority (86 percent) of voters support government efforts to revitalize the manufacturing sector.[16] By dramatically reducing electric power demand (and related energy costs) from industrial sources, Combined Heat and Power (CHP) and Waste Heat Recovery (WHR) can create jobs, enhance economic growth, and make America's manufacturers more competitive, thus helping to address this concern. Moreover, because CHP and WHR are existing technologies with equipment already manufactured widely in the United States, expanding their use will not only help their industrial customers by lowering energy costs, but it will also create jobs and markets for U.S. CHP/ WHR manufacturers.

Full-scale deployment of CHP and WHR has profound implications: that is, DOE's Oak Ridge National Laboratory that a robust investment in CHP could create nearly 1 million new, highly-skilled technical jobs across the country.[17] Applying the same jobs multiplier to a recent report by ICF International, a global consulting firm with a substantial energy focus and practice, examining the technical potential for CHP, indicates that full deployment in the commercial and industrial sectors would support nearly 800,000 new jobs nationwide, with substantial job creation in every state in the nation. (see Table 1, next page)

These workers would be responsible for the construction, installation and maintenance of CHP equipment. Many of these jobs cannot be exported, as they must occur on site. Moreover, as Attachment 1 illustrates, energy recycling equipment is already manufactured right here in the United States. Thus, the infrastructure is in place, and can be readily expanded to accommodate increased demand stimulated by a CES.

CHP and WHR also create economic opportunities at the facilities where they are used. In today's global economy, American manufacturing must be as productive and efficient as possible. A CES that truly recognizes all clean energy sources would spur investments in manufacturing competitiveness within the steel, aluminum, chemical, glass, and other energy-intensive industries. It would encourage near-term, shovel-ready projects that create and maintain thousands of jobs within those industries as well as in the manufacture, installation, and operation of CHP and WHR equipment.

The significant economic benefits of WHR are evident at ArcelorMittal's East Chicago facility. By producing 220 MW of energy on site,[18] the project allows ArcelorMittal to save $100 million

[16] The Mellman Group, "Presentation to the Alliance for American Manufacturing: Findings From A Nationwide Survey Of 1000 Likely 2010 General Election Voters," June 2010, at 5 & 24. http://www.americanmanufacturing.org/wordpress/wp-content/uploads/2010/06/10pre607-aam-f2-short.pdf.

[18] Primary Energy Recycling Corp (PERC) website (reporting a combined 220 megawatts of installed capacity; calculation of thermal energy based on energy content of reported steam capacity) (http://www.primaryenergyrecycling.com/projects.htm).

in electricity costs each year.[19] This was the only ArcelorMittal facility in North America to remain in full operation throughout the recession.

Electricity savings, in turn, can be reinvested to increase jobs and competitiveness. For more than 75 years, West Virginia Alloys has melted quartz rock, converting it into silicon metal, while venting waste heat into the atmosphere. Their new project will capture this heat and bring it back into the facility to create 65 megawatts of emission-free power, saving the company millions of dollars each year. West Virginia Alloys plans to use the savings to open a new furnace, increase production and thereby create more jobs. The project developers report that this will make West Virginia Alloys the lowest-cost silicon manufacturer in the world – thus taking a key step to help bring silicon manufacturing back to the U.S. from overseas.[20]

Including CHP and WHR in a CES would encourage this investment, reducing energy costs and creating employment opportunities for America's industrial and manufacturing sectors.

[19] Chris Steiner, "Gray is the New Green," *Forbes*, Sept. 15, 2008 (http://www.forbes.com/forbes/2008/0915/054_2.html).
[20] Recycled Energy Development, "Recycled Energy Project Fact Sheet: West Virginia Alloys" (http://www.recycled-energy.com/_documents/projects/fact-sheet-globe.pdf).

Question 6. Are there policies that should be considered to complement a CES?

TABLE 1: POTENTIAL JOBS FROM FULL DEPLOYMENT OF CHP (CIRCA 2010)[21]

	Commercial CHP Potential (MW)	Industrial CHP Potential (MW)	Total CHP Potential (MW)	Capital Investment[22] (millions)	Jobs[23]
Total U.S.	**68,056**	**63,823**	**131,879**	**197,819**	**791,274**
Alabama	973	1,106	2,079	3,119	12,474
Alaska	125	101	226	339	1,356
Arizona	1,421	525	1,946	2,919	11,676
Arkansas	625	733	1,358	2,037	8,148
California	5,850	4,157	10,007	15,011	60,042
Colorado	1,030	432	1,462	2,193	8,772
Connecticut	966	587	1,553	2,330	9,318
Delaware	184	596	780	1,170	4,680
Florida	4,284	1,252	5,536	8,304	33,216
Georgia	1,921	2,253	4,174	6,261	25,044
Hawaii	383	54	437	656	2,622
Idaho	248	263	511	767	3,066
Illinois	3,379	4,139	7,518	11,277	45,108
Indiana	1,593	1,480	3,073	4,610	18,438
Iowa	738	937	1,675	2,513	10,050
Kansas	709	789	1,498	2,247	8,988
Kentucky	806	1,806	2,612	3,918	15,672
Louisiana	960	1,733	2,693	4,040	16,158
Maine	324	603	927	1,391	5,562
Maryland	1,214	658	1,872	2,808	11,232
Massachusetts	1,872	1,065	2,937	4,406	17,622
Michigan	2,434	2,314	4,748	7,122	28,488
Minnesota	1,434	1,075	2,509	3,764	15,054
Mississippi	600	913	1,513	2,270	9,078
Missouri	1,533	1,073	2,606	3,909	15,636
Montana	162	146	308	462	1,848
Nebraska	494	266	760	1,140	4,560
Nevada	824	248	1,072	1,608	6,432

[21] ICF, Oct. 2010, "Effect of a 30 Percent Investment Tax Credit on the Economic Market Potential for Combined Heat and Power," Tables 3 and Table 4, on p. 11 and p. 12 respectively, http://www.uschpa.org/files/public/USCHPA%20WADE_ITC_Report_FINAL%20v4.pdf. N.B.: "The estimates of CHP technical potential are based on thermally loaded CHP systems sized to serve on-site electrical demands at target facilities and do not include export capacity", so the potential would be even higher if that were factored in.

[22] Assumed cost of $1,500 per kilowatt-hour installed cost (MW is 1,000 x kW).

[23] Jobs Multiplier: Based on four jobs created for every $1 million in capital investment, Oak Ridge National Laboratory. "Combined Heat and Power: Effective Energy Solutions for a Sustainable Future." December 2008.

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New Hampshire	322	255	577	866	3,462
New Jersey	2,457	1,713	4,170	6,255	25,020
New Mexico	345	217	562	843	3,372
New York	6,600	2,445	9,045	13,568	54,270
North Carolina	1,761	4,667	6,428	9,642	38,568
North Dakota	196	136	332	498	1,992
Ohio	2,231	3,384	5,615	8,423	33,690
Oklahoma	741	863	1,604	2,406	9,624
Oregon	681	887	1,568	2,352	9,408
Pennsylvania	3,461	3,924	7,385	11,078	44,310
Rhode Island	298	190	488	732	2,928
South Carolina	810	1,652	2,462	3,693	14,772
South Dakota	199	136	335	503	2,010
Tennessee	1,280	1,606	2,886	4,329	17,316
Texas	3,863	3,793	7,656	11,484	45,936
Utah	467	458	925	1,388	5,550
Vermont	166	118	284	426	1,704
Virginia	1,822	1,466	3,288	4,932	19,728
Washington	1,284	1,197	2,481	3,722	14,886
West Virginia	351	527	878	1,317	5,268
Wisconsin	1,535	2,352	3,887	5,831	23,322
Wyoming	98	533	631	947	3,786

Question 6. Are there policies that should be considered to complement a CES?

ATTACHMENT 1
REPRESENTATIVE CHP AND WHR SYSTEM VENDORS IN THE UNITED STATES

Turbines /Generators

- GE, New York
- Dresser Rand, Massachusetts
- Ormat Technologies Inc., Nevada
- Siemens, Illinois, New Jersey
- Solar Turbines Incorporated, California
- Turbosteam, Massachusetts
- TurboCare, Massachusetts

HRSG/ Boiler

- Tulsa Heaters, Oklahoma
- Deltek, Minnesota
- Nebraska Boiler
- McBurney, Florida
- Detroit Stokers, Michigan
- Riley Stoker, Massachusetts
- Babcock & Wilcox, Ohio

Reciprocating Engines

- Caterpillar, Illinois
- Cummings Engines, Maine
- Waukesha, Wisconsin

Condensers/Flue Gas Heat Recovery Systems

- Graham, New York
- Direct Contact, Washington
- Condex, Illinois
- Steam Plant Systems, New York

Instrumentation and Controls

- ABB, California
- Foxborough, Massachusetts
- Endressn + Hauser, Indiana

Engineering

- ESI of Tennessee, Georgia
- ATSI, New York
- Ambitech, Illinois

Question 6. Are there policies that should be considered to complement a CES?

- Ford, Bacon and Davis, Louisiana
- Harris Group, Oregon
- Middough, Oak Brook
- Abener, Missouri
- MPR, Washington DC
- Weaver Boos Consultants, Illinois
- Penta Engineering, Missouri

Cooling Towers

- Nebraska Boilers
- Marley Cooling Towers, Kansas and New Jersey
- Cooling Tower Technologies, Louisiana
- Cooling Towers Depot, Colorado

WHR Equipment/ Product Manufacturers

- Alphabet Energy, California
- Calenetix, California
- Echogen, Ohio
- Electratherm, Nevada
- GE Heat Recovery Solutions, Florida
- Ormat, National
- TAS Energy, Texas

Water Treatment

- Nalco, Illinois
- GE Betz, New York

Construction

- The Industrial Company (TIC), Colorado
- Kiewit, Texas
- Holm, West Virginia
- Graycor, West Virginia
- CH2M Hill, Pennsylvania
- HOHL, New York
- Nitro, West Virginia

Environmental Consultants

- ERM, Chicago
- WSP, Virginia
- Podesta, West Virginia

Question 6. Are there policies that should be considered to complement a CES?

Project Developers

- GE Heat Recovery Solutions, California & Florida
- Gulf Coast Green Energy, Texas
- KGRA Energy Corporation, Illinois
- Ormat Technologies Inc., Nevada
- Primary Energy, Illinois
- Recycled Energy Development, Illinois
- Robust Energy, Texas
- Turbo Thermal, Texas
- Veolia Energy, Massachusetts