Non-Utility Energy Efficiency Programs

Barriers and Solutions: Strategies for Effectively Leveraging Energy Efficiency as an Environmental Compliance Tool

SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

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About This Resource Paper Series

Energy efficiency is widely recognized as a cost-effective, rapidly-deployable resource for air pollution reductions from the electric sector. However, with the release of the U.S. Environmental Protection Agency's (EPA) proposed Clean Power Plan (CPP) in June 2014, southeastern states and utilities have voiced concerns regarding a number of barriers and challenges to using energy efficiency as a pollution control strategy within state compliance plans, both under existing air programs and forthcoming regulations, such as the CPP, once finalized (expected in August 2015). This SEEA Resource Paper Series identifies resources, strategies and solutions to help states and utilities address these barriers and effectively utilize energy efficiency as a compliance strategy, where appropriate and cost-effective.

Disclaimer

SEEA recognizes that the EPA is still finalizing the CPP, and that there are many unknowns until the final guidelines are released. The materials provided on the SEEA 111(d) web portal, along with the resources and discussion contained in this Resource Paper are provided for informational purposes only, and do not constitute legal advice. Contact your attorney for advice with respect to any particular legal issue.

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I. EXECUTIVE SUMMARY

In its proposed Clean Power Plan (CPP), the U.S. Environmental Protection Agency (EPA) establishes energy efficiency as one of a portfolio of strategies that states may use in complying with the rule.

State, local and private sector energy efficiency measures that are delivered outside the scope of regulated utility energy efficiency programs have an important role to play in facilitating environmental compliance at least cost and promoting the growth of new markets and economic resources.

Each non-utility program or measure type brings with it a unique set of both advantages and challenges to its implementation within the context of a compliance plan. For each non-utility energy efficiency program opportunity considered, states will have to assess how they fit within the compliance framework that EPA has defined for its proposed CPP. This paper begins to explore some of these issues for each program type highlighted.

A. Methodology

This paper surveys a number of energy efficiency emissions-reducing programs or measure types that have not typically operated within the bounds of utility programs in the Southeast, although there are notable exceptions for specific states and utilities. It provides an analysis of the benefits and drawbacks of including each program type within state compliance plans, in addition to a high-level assessment of the magnitude of the savings opportunity from each non-utility program area. These values are calculated using the American Council for an Energy-Efficient Economy's (ACEEE) State and Utility Pollution Reduction (SUPR) Calculator.

B. Energy Savings Performance Contracting

Research suggests that energy savings performance contracting (ESPC) has the potential to deliver a comparable level of savings to ratepayer-funded energy efficiency programs. According to ACEEE's SUPR calculator, performance contracting can contribute an average of 10.5% toward the achievement of CPP goals across SEEA's eleven southeastern states.

ESPC may be advantageous as a compliance strategy based on the extensive EM&V framework that surrounds it and the inherent contractual guarantee that projected savings will be achieved. In order for ESPC to effectively operate as a compliance strategy, in the case of state performance contracting programs, a lead agency may be needed to collect data from projects and determine avoided emissions, as well as ensure that projects are appropriately tracked to avoid double-counting. States may also need some sort of tool to effectively aggregate and leverage ESPC impacts within their compliance plans, particularly in the case of those that occur in the private sector or state programs.

C. Building Energy Codes

Building energy codes set a floor for the energy performance of new buildings and major renovations. According to ACEEE's SUPR Calculator, building codes can contribute an average of 14% toward the achievement of CPP goals across the eleven southeastern states.

Because they impact a defined subset of the building stock, building energy codes represent a significant savings opportunity. The methodology for quantifying reductions in energy use attributable to code adoption and compliance activities is still evolving; however, with each year that passes, the established methodology improves as an increased number of jurisdictions begin using it.

D. Combined Heat and Power

Combined heat and power (CHP) refers to a suite of technologies and approaches that concurrently generate electric power and useful thermal energy, producing a combined efficiency of more than 80%, relative to the current electric generation fleet, which is only about 35% efficient. According to ACEEE's SUPR Calculator, CHP can contribute an average of 8% toward the achievement of CPP goals across the eleven southeastern states.

Evaluation, measurement and verification for CHP projects is fairly well-established; there are existing, accepted methods for calculating the net CO_2 emission reductions from CHP systems through both direct measurement and other approaches. In addition, CHP serves as a distributed resource that supports overall grid resiliency–an important co-benefit in areas of the Southeast susceptible to weather extremes. As with ESPC, if CHP programs are used as a compliance strategy, some entity at the state level may need to oversee programmatic and data collection procedures.

E. Other Considerations

Energy efficiency savings that occur outside of regulated utility programs are generally not subject to the same public review of those that occur through regulated utility programs. While EM&V of program savings may follow best practice protocols, often the data for tracking them is not publicly available. Energy efficiency registries could provide a consistent framework for tracking and verifying savings from energy efficiency measures, and constitute a critical component of the market infrastructure needed to fully maximize the low-cost and job creation benefits of energy efficiency.

Enforceability is one of the criteria that EPA will evaluate when reviewing state plans, and many southeastern states have expressed concerns regarding the potential federal enforceability of energy efficiency measures. The use of non-utility programs within a compliance plan may raise these concerns based on the potential to have a number of actors involved in fulfilling compliance obligations.

One option that has been brought forth regarding this concern is known as the "state commitment approach," wherein states can shield implementing parties from federal enforceability by agreeing to

meet any shortfall in anticipated emissions reductions through other energy efficiency policies or measures as part of a larger portfolio.

These issues and others relating to the role of non-utility energy efficiency programs continue to evolve, and may become clearer upon the release of the final rule.

F. Conclusion

Non-utility energy efficiency programs represent a viable, often market-based opportunity to facilitate compliance with EPA's proposed Clean Power Plan at least cost. Measures such as energy savings performance contracting, building energy code adoption and compliance activities and combined heat and power present market-driven opportunities that can promote economic and market growth, in addition to meeting compliance obligations under the EPA's proposed Clean Power Plan at least cost.

II. Introduction

A. EPA's Proposed Clean Power Plan Suggests That Non-Utility Programs Will Be a Potential Compliance Option

Energy efficiency is widely recognized as a cost-effective, rapidly-deployable resource for air pollution reductions from the electric sector. In its proposed Clean Power Plan (CPP), the U.S. Environmental Protection Agency (EPA) establishes energy efficiency as one of a portfolio of strategies that states may use in complying with the rule. While ratepayer-funded energy efficiency programs represent the foundation of the framework EPA has laid out for energy efficiency, the agency also suggests a role for energy-saving measures that are typically implemented outside of ratepayer-funded utility energy efficiency programs, or "non-utility programs."

State, local and private sector energy efficiency measures that are delivered outside the scope of regulated utility energy efficiency programs have an important role to play in facilitating environmental compliance at least cost and promoting the growth of new markets and economic resources. While utility programs have demonstrated their effectiveness in deploying substantial amounts of energy efficiency into the marketplace, research suggests that an equal if not greater amount is being delivered outside the boundaries of ratepayer-funded energy efficiency programs, as described in this paper. These include, but are not limited to, the following:

- Energy savings performance contracting;
- Building energy codes;
- State policies or programs to foster adoption of CHP systems;
- Private sector-delivered industrial energy efficiency;
- State programs to improve industrial or agricultural efficiency;
- Tax incentives;
- Financing programs;
- State-based appliance efficiency standards; and
- Lead-by-example programs.

Some of these programs may be incorporated into utility-administered energy efficiency programs to some degree in specific jurisdictions; for example, some utilities administer codes and standards programs. The same type of energy savings may be considered as a utility program in one state and a non-utility energy efficiency program in another state. For purposes of simplicity, this paper specifically focuses on programs that have typically not been a part of utility portfolios in the Southeast.

B. Non-Utility Energy Efficiency Programs Are a Source of Significant Savings Potential

Importantly, a significant amount of the energy efficiency activity in the Southeast occurs outside of utility programs. In fact, states with modest utility energy efficiency programs, such as Alabama and Virginia, may have the potential to achieve robust savings through non-utility program efforts.

Much of the activity in the non-utility program space occurs in the private sector. The private sector plays an essential role in achieving higher efficiency standards through the innovation and market development of technology and new products, also serving as a significant platform for economic development and job creation.

C. Non-Utility Programs Will Likely Have a Place in the Clean Power Plan Final Rule

In its calculation of Building Block 4, which drives the amount of energy efficiency incorporated into its state-by-state goal setting, EPA utilizes data reported to the Energy Information Agency (EIA), which is restricted to utilities' self- reported demand-side management program savings. In effect, the current level of performance used in setting state goals does not include efforts taking place outside of ratepayer-funded programs, and as such, presents an additional and complementary set of tools to help states achieve their efficiency goals.

Although the proposed CPP does not explicitly indicate that states may include non-ratepayer funded programs in their compliance plan, general consensus based on the language of the draft rule is that EPA will allow for non-utility energy efficiency measures as a compliance strategy.[1] Confirmation of this is expected to come with the release of the final rule in August 2015. Importantly, the EPA continues to reiterate the flexibility that states have to design compliance plans. Initial EPA guidance on mechanisms for incorporating non-utility programs into a compliance approach has been sparse; however, continued reference to and emphasis on the flexibility of the CPP points to these measures as a viable component of compliance strategies.

D. Non-Utility Programs Present Both Advantages and Disadvantages as a Compliance Strategy

Each non-utility program or measure type brings with it a defined set of both advantages and challenges to its implementation within the context of a compliance plan. At a high level, non-utility programs may be more rapidly deployable than utility programs since they are not subject to the same regulatory processes and review that utilities must follow in program development and administration. However, one potential challenge in deploying a non-utility program as part of a CPP

compliance strategy, may be that in the case of specific energy efficiency measures, evaluation, measurement and verification (EM&V) may be less standardized or well-defined, or there may simply be less experience applying them. In other cases, there may be less of a track record or publicly available data to determine savings potential and overall viability.

In section VIII Part C of the Clean Power Plan, EPA outlines four general criteria it will use to evaluate state plans and emissions reduction measures:[2]

1. The measures contained in the plan are enforceable.
2. The plan as a whole is projected to achieve the emissions standard.
3. The emissions reductions from measures are quantifiable and verifiable.
4. Each measure has a clear process of reporting on implementation.

As it considers non-utility energy efficiency programs, states will need to assess how they fulfill these criteria. This paper begins to explore some of these issues for each measure highlighted.

E. Methodology

This paper surveys a number of energy efficiency emissions-reducing measures that have not typically operated within the bounds of utility programs in the Southeast, although there are notable exceptions for specific states and utilities. It provides an analysis of the benefits and drawbacks of including each measure type within state compliance plans, in addition to a high-level assessment of the magnitude of the savings opportunity from each non-utility program type. These values are calculated for using the American Council for an Energy-Efficient Economy's (ACEEE) State and Utility Pollution Reduction (SUPR) Calculator. More information on this tool, as well as specific assumptions used in developing it, are available on ACEEE's website.[3] Data inputs for each measure are described below, and full results are included in the appendices.

Table 1. SUPR Input Values Utilized

Non-utility Program Category	Input Value
Energy Savings Performance Contracting	ESCO Programs
Building Energy Codes	Building Energy Codes (Low)
Combined Heat and Power	Combined Heat and Power (CHP) (High)

SEEA selected these input values based on the following logic:

- ESCO Programs: Only one value is available for energy savings performance contracting.
- Building Energy Codes (Low): Building energy code adoption in the Southeast has historically lagged behind the development of national model building codes.
- Combined Heat and Power (CHP) (High): ACEEE's quantification of CHP potential is conservative, based on the scope of its analysis (new, small- and medium-sized systems).

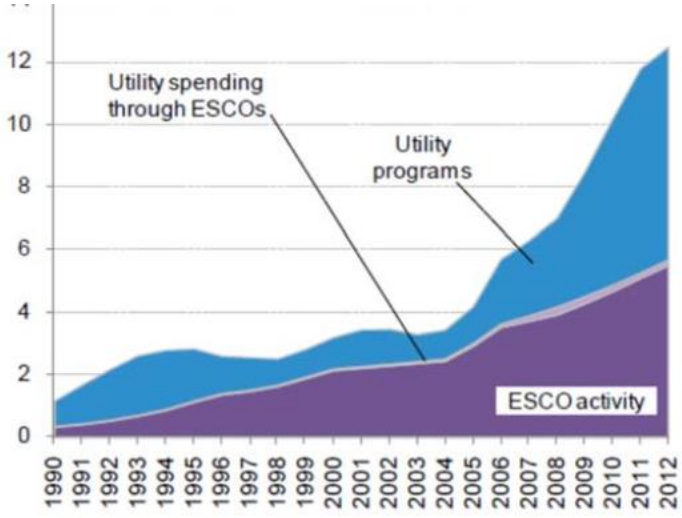
III. Energy Savings Performance Contracting

A. Overview and Characterization

Energy-savings performance contracting (ESPC) is a turnkey service for financing and implementing energy-saving upgrades. A firm or energy services company (ESCO) identifies, finances and implements these upgrades, and receives payments via the resulting savings on customers' utility bill.

A 2014 study by Lawrence Berkeley National Laboratory estimates that "the remaining investment potential in facilities typically addressed by the ESCO industry ranges from ~$71 to $133 billion," and that the achievable energy savings potential ranges from approximately 103,800 GWh to 152,000 GWh.[4] According to Bloomberg New Energy Finance, investment in energy efficiency through performance contracting projects and ratepayer funded programs was nearly equal to investment in ratepayer-funded energy efficiency programs in 2009-2012, as seen below.

Figure 1. Investment in Energy Efficiency Through ESCOs and Utility Programs, Categorized by Program, 1993-2012 (Billion $)



[5]

According to ACEEE's SUPR calculator, performance contracting can contribute an average of 10.5% toward the achievement of CPP goals across the eleven southeastern states. See **Appendix A** for a state-by-state breakdown.

Much of the performance activity in the U.S. occurs inside the public sector. States can authorize ESPC for state agencies, counties, municipalities, school districts, institutions of higher learning and public agencies.[6]

B. Performance Contracting as a Compliance Strategy

In the past, ESPCs have been widely deployed in the Southeast, and public sector performance contracting is currently authorized in all of SEEA's 11 states, as seen below.

Table 2. Public Sector Performance Contracting Authorization in the Southeast

State	ESPC Authorization	Lead Management Agency
Alabama	Yes	Alabama Department of Economic and Community Affairs
Arkansas	Yes	Arkansas Economic Development Commission
Florida	Yes	Florida Department of Management Services
Georgia	Yes	Georgia Environmental Finance Authority
Kentucky	Yes	Office of Energy Policy
Louisiana	Yes	Louisiana Department of Natural Resources
Mississippi	Yes	Mississippi Development Authority
North Carolina	Yes	Department of Environment and Natural Resources
South Carolina	Yes	South Carolina Energy Office (Budget and Control Board)
Tennessee	Yes	Department of General Services
Virginia	Yes	Department of General Services

Source: AJW et al. Appendix B

Performance contracting projects in the Southeast have a track record of inclusion within the Clean Air Act Section 110 State Implementation Plans (SIPs), which are anticipated to be more restrictive than the requirements for compliance plans under Section 111 of the Clean Air Act.[7] For example, in 2005, EPA approved a 20-year performance contract in Shreveport, Louisiana as a voluntary control measure in an 8-hour ozone early-action compact SIP revision.[8] The same type of energy savings may be considered as a utility program in one state and a non-utility energy efficiency program in another state.

ESPCs could be included in a state compliance plan by the provision of additional state incentives for ESPC activities, or through requirements for state or municipal buildings in Executive Orders, legislation or regulations. In addition, private sector ESPCs could be sold into a marketplace, assuming the appropriate infrastructure is in place.

1. Advantages

In general, evaluation, measurement and verification of performance contracting programs is fairly robust, and projects are generally evaluated based on nationally recognized protocols, such as the International Performance Measurement and Verification Protocol or the Federal Energy Management Program. In addition, EM&V is performed by the ESPC contractor, lessening the burden on states.

Federal and state performance contracting laws require ESCOs to guarantee that improvements will generate sufficient savings to pay for the project.[9] As such, ESPC projects contain inherent corrective measures that can ensure the fulfillment of compliance obligations.

Finally, ESPC serves a number of market segments that conventional utility programs typically do not target, including municipal and state governments, universities and colleges, K-12 schools and hospitals. ESPC provides an opportunity to tap into these savings, which might otherwise be lost for compliance purposes.

2. Disadvantages

For state performance contracting programs, a lead agency may be needed to collect data from projects and determine avoided emissions, as well as ensure that projects are appropriately tracked to avoid double-counting. States may also need some sort of tool to effectively aggregate and leverage ESPC impacts within their compliance plans, particularly in the case of those that occur in the private sector or state programs. The use of a national energy efficiency registry, such as that underway by The Climate Registry and APX, would likely prove to be an efficient and effective vehicle for taking advantage of ESPC. Finally, administrative costs are a factor to consider; however, costs could be minimized by working within existing performance contracting program structures through state energy offices and other agencies.

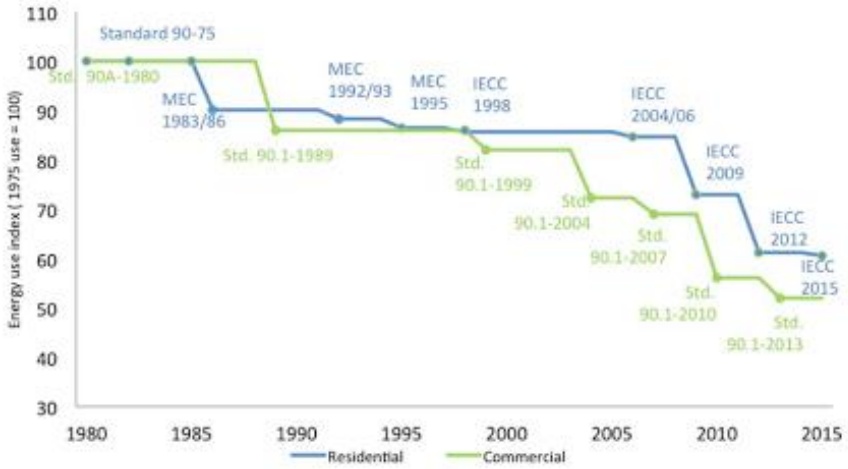
IV. Building Energy Codes

A. Overview and Characterization

Building energy codes establish minimum requirements for the construction of new and renovated buildings. Building codes are typically established at the state and local level, guided by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1 and the International Energy Conservation Code (IECC), both are widely recognized standards for design and construction of residential and commercial buildings.

The past decade has seen a remarkable increase in the energy savings achieved through each consecutive version of both commercial and residential codes. The most recent 2012 and 2015 versions of the International Energy Conservation Codes (IECC) have boosted the efficiency of new home and commercial building construction by 38% and 28%, respectively, over 2006 requirements.[10] The chart below illustrates the relative decrease in energy usage with each new addition of the code from 1975 to today.

Figure 2. Historical Trajectory of Energy Code Efficiency Improvements



Source: ACEEE

With the exception of Tennessee, all states in SEEA's territory have adopted the 2009 IECC and/or ASHRAE 90.1-2007 or better, and a majority of this adoption activity occurred between 2011 and 2013. A majority of U.S. states have also adopted ASHRAE 90.1-2007 or greater.[11]

Currently, many southeastern states have adopted or are in their first years of implementing the 2009 IECC, as seen on the following page.

Table 3. Current Codes Effective in Southeastern States

State	Residential Code	When Adopted	Commercial Code	When Adopted
Alabama	2009 IRC with Amendments[12]	10/1/12	2009 IECC/ASHRAE 90.1-2007	10/1/12
Arkansas	2009 IECC with Amendments	1/1/2015	ASHRAE 90.1-2007	1/1/2013
Florida	State Specific - Equivalent to 2009 IECC	3/15/2012	2010 Florida Energy code (ASHRAE 90.1-2007 equivalent)	3/15/12
Georgia	2009 IECC with Amendments	1/1/2011	2009 IECC/ASHRAE 90.1-2007	1/1/12
Kentucky	2009 IECC with Amendments	10/1/2014	2007 Kentucky Energy code (2009 IECC equivalent)	6/1/2011
Louisiana	2009 IRC	1/1/2015	2009 IECC/ASHRAE 90.1-2007	7/20/2011
Mississippi	None Statewide		ASHRAE 90.1-2010	7/1/2013
North Carolina	State Specific - 2012 North Carolina Energy Conservation Code	1/1/2012	ASHRAE 90.1-2010	1/1/2012

South Carolina	2009 IECC	1/1/2013	2009 IECC	1/1/2013
Tennessee	2006 IECC	7/1/2011	2006 IECC	7/1/2011
Virginia	2012 IECC with Amendments	7/1/2015	2009 IECC	3/1/2011

Source: http://www.seealliance.org/policy-initiatives/initiatives/energy-codes/codesreports/

Codes and standards programs can save energy by both promoting adoption of more advanced codes and facilitating compliance. Although a certain code may be "on the books," both anecdotal and quantitative evidence points to shortfalls in compliance. There are several regionally-specific factors that serve as barrier to compliance with the energy code. In general, the Southeast is characterized by a lack of awareness and demand for energy code compliance, along with a lack of funding, training opportunities and real-world informational resources available to the construction industry and code inspectors. Much of the region is rural, and in many cases, trained and experienced personnel are simply not available to carry out enforcement activities.

According to ACEEE's SUPR calculator, building codes can contribute an average of 14% toward the achievement of CPP goals across the eleven southeastern states. See **Appendix B** for a state-by-state breakdown.

B. Energy Codes as a Compliance Strategy

As described above, the adoption of newer codes can lead to significant savings. Code compliance activities also represent a viable source of savings. Even though codes are "on the books," full compliance may not always be achieved in the field. Training and other innovative solutions that enhance the capacity and resources available for meeting code can also serve as a source of savings.

Both adoption and compliance activities could be included as measures within a state plan; however, states and utilities in the Southeast may choose to focus on one or the other depending on their specific needs and preferences.

1. Advantages

While energy codes have advanced substantially in the Southeast, particularly within the last five years, most states have not yet reached current national standards. In effect, there is still a significant amount of savings available to the Southeast simply from code adoption.

The cost-effectiveness of building energy codes is also a potential advantage in maintaining low compliance costs. Because energy codes provide a standard to which all new homes and buildings are constructed, they impact a jurisdiction's entire new building stock and major renovations, where other energy efficiency measures are often done on a project-by-project basis. Energy codes lock in savings for the lifetime of the structure, and "getting it right the first time" can avoid more expensive retrofits down the road.

In addition, building codes have already been used as measures in State Implementation Plans under Clean Air Act Section 110, which sets a much more stringent standard of review. Just west of SEEA's footprint, in 2008, the State of Texas included building energy code adoption in a plan to achieve NOx emissions goals. [13]

Finally, the extensive documentation process undergone in the context of code implementation and enforcement should offer ready-made infrastructure to facilitate reporting.

2. Disadvantages

The methodology for quantifying reductions in energy use attributable to code adoption and compliance activities is still evolving; however, with each year that passes, the established methodology improves as an increased number of jurisdictions begin using it.[14]

V. Combined Heat and Power

A. Overview and Characterization

Combined heat and power (CHP) is a suite of technologies and approaches that concurrently generate electric power and useful thermal energy, producing a combined efficiency of more than 80%, relative to the current electric generation fleet, which is only about 35% efficient.[15] These systems may be used across virtually all sectors, but are often discussed in the context of industrial or institutional users. CHP encourages emissions reductions by reducing demand for higher-emitting EGUs covered under EPA's proposed CPP.

CHP is an important electric generating resource in the United States; about 83 gigawatts (GW) of existing CHP generation capacity at over 4,300 facilities represents over 8% of total U.S. power generation capacity, with the potential to represent a much larger share.[3] While CHP is a technology supported by utility programs nationwide, it is generally not a part of utility program portfolios in the Southeast. [16]

According to ACEEE's SUPR Calculator, CHP can contribute an average of 8% toward the achievement of CPP goals across the eleven southeastern states. See **Appendix C** for a state-by-state breakdown.

B. CHP as a Compliance Strategy

The addition or uprating of non-covered CHP[17] reduces emissions by decreasing demand for electricity produced by affected generating units, and meeting demand at a facility that uses the energy potential of fuel inputs for other purposes. For this reason, CHP is mentioned specifically in the proposed Clean Power Plan, and EPA has requested comment on its role as a compliance strategy.[18] Depending on how states structure their compliance plans, CHP could fit into a compliance framework in a number of ways; for example, through incentive programs or legislation that encourages the installation of CHP systems.

In the Southeast, CHP has not been extensively deployed to date. Of SEEA's 11 southeastern states, Louisiana has the most installed CHP capacity, although much of it was installed in the 1980s or earlier. North Carolina currently has the most robust policy framework to encourage CHP, including state incentives for CHP projects, and interconnection and net metering policies. North Carolina also includes some types of CHP as an eligible measure under the state's renewable portfolio standard (RPS).

Table 4. Current Installed CHP Capacity and Recent Installations

State	Installed Capacity (kW)	2011 Installations	2012 Installations	2013 Installations
Alabama	3,401,115	3	1	0
Arkansas	560,500	0	0	0
Florida	3,249,205	1	2	1
Georgia	1,319,968	3	1	1
Kentucky	117,920	0	0	0
Louisiana	6,106,290	3	2	0
Mississippi	528,721	2	0	0
North Carolina	1,539,476	2	8	2
South Carolina	1,392,377	3	2	3
Tennessee	591,823	0	0	0
Virginia	1,717,808	2	0	4

Source: DOE CHP Database

1. Advantages

According to ICF International, a total of 125 GW of technical potential for CHP still remains at existing industrial, commercial and institutional facilities in the U.S.[19] Evaluation, measurement and verification for CHP projects is fairly well-established; there are existing, accepted methods for calculating the net CO_2 emission reductions from CHP systems through both direct measurement and other approaches. For instance, EPA's CHP Partnership has developed an online tool that states may use to estimate emissions impacts from CHP projects.[20]

Additionally, because CHP technology is relatively mature, it is rapidly deployable at existing facilities, suggesting a potential role in replacing commercial and industrial boilers that reach retirement.

Finally, in addition to reducing energy consumption from high-emitting sources, CHP also serves as a distributed resource that can promote grid reliability and improve the resiliency of critical infrastructure– an important policy goal in much of the Southeast, which is subject to climate extremes.

2. Disadvantages

In order to meet EPA's established criteria for meeting compliance obligations, as with ESPC, some entity at the state level may need to be responsible for regular oversight of CHP installations, including facility metering equipment, calibration and data collection procedures.

Uncertainty may also be a significant drawback to the use of CHP in the context of compliance plans. As noted in the comments of the CHP Association filed with EPA, "the Proposed Rule contains only a handful of references to CHP, including some that introduce uncertainty as to whether CHP will be an approvable emission reduction tool in state compliance plans."[21]

VI. Additional Considerations

A. Energy Efficiency Registries

Energy efficiency registries could provide a consistent framework for tracking and verifying savings from energy efficiency measures, and constitute a critical component of the market infrastructure needed to fully maximize the low-cost and job creation benefits of energy efficiency. Under the leadership of the Climate Registry (TCR) and APX, efforts are currently underway to develop a national energy efficiency registry. Leveraging this effort will afford southeastern states a simpler approach to tracking and managing their gains through energy efficiency programs across the state, streamline various program- and policy-related administrative processes, and unleash private sector investment in energy efficiency. In addition, engagement in the development and rollout of a registry will provide states a foundational tool that may be used in future energy planning processes or other market developments.

B. Enforceability

Enforceability is one of the criteria that EPA will evaluate when reviewing state plans. It is an issue that EPA has sought comment on, and as such, its exact meaning in the context of CPP compliance is still uncertain. In general, enforceability involves having a responsible party that will face penalties or find additional emissions reductions to compensate for any shortfall. As noted in the introduction of this paper, many southeastern states have expressed concern regarding the enforceability of energy efficiency measures.

One option that has been brought forth regarding this concern is known as the "state commitment approach," wherein states can shield implementing parties from federal enforceability by agreeing to meet any shortfall in anticipated emissions reductions through other energy efficiency policies or measures as part of a larger portfolio.

A more extensive discussion of enforceability is available in the first resource paper in this series, *Southeastern State Agency Authority and Enforcement Structures*.[22]

These issues and others relating to the role of non-utility energy efficiency programs continue to evolve, and may become clearer upon the release of the final rule.

VII. Conclusion

Non-utility energy efficiency programs represent a viable, often market-based opportunity to facilitate compliance with EPA's proposed Clean Power Plan at least cost. Measures such as energy savings performance contracting (ESPC), building energy code adoption and compliance activities, combined heat and power systems and industrial energy efficiency measures that fall outside of utility-administered programs present market-driven opportunities that can promote economic and market growth, in addition to meeting compliance obligations under the EPA's proposed Clean Power Plan, at least cost.

A core element of the conversation around energy efficiency as a compliance strategy is the diversity of energy efficiency measures that are available to states. Illustrative of this spectrum, each type of energy efficiency measure described in this paper reflects a set of unique characteristics that must be considered in determining whether they are appropriate for inclusion in a compliance strategy. States will need to carefully think through and prioritize an appropriately balanced portfolio of compliance tools in order to suit their own unique needs and circumstances.

Appendix A

ESCO Programs: CO_2 and Energy Savings, Costs and Percent of Overall EPA Target Achievable

State	Cumulative CO_2 Reductions (tons)			Cumulative Net Cost (Million 2011 $)			Cumulative Energy Saved (MWh)			Percent of EPA Goal Achieved
	2020	2025	2030	2020	2025	2030	2020	2025	2030	
Alabama	3,748,000	9,324,000	17,631,000	465	1,142	2,132	4,701,400	11,695,600	22,115,900	8%
Arkansas	2,312,000	5,750,000	10,873,000	209	528	1,020	2,556,300	6,359,200	12,025,000	6%
Florida	7,824,000	19,464,000	36,806,000	1092	2,696	5,122	2,803,000	4,174,000	6,219,000	8%
Georgia	5,996,000	14,915,000	28,204,000	663	1,629	3,039	7,145,100	17,774,800	33,611,400	9%
Kentucky	5,525,000	13,744,000	25,989,000	437	1,110	2,131	4,857,700	12,084,500	22,851,400	16%
Louisiana	3,720,000	9,253,000	17,498,000	422	1,063	2,050	4,622,200	11,498,600	21,743,400	9%
Mississippi	1,642,000	4,085,000	7,725,000	268	675	1,300	2,639,600	6,566,600	12,417,100	7%
North Carolina	6,499,000	16,167,000	30,571,000	590	1,440	2,674	6,987,200	17,382,000	32,868,800	12%
South Carolina	3,989,000	9,924,000	18,766,000	408	998	1,857	4,243,100	10,555,400	19,959,900	9%
Tennessee	5,563,000	13,839,000	26,170,000	463	1,129	2,103	5,257,700	13,079,700	24,733,100	15%
Virginia	4,439,000	11,044,000	20,883,000	486	1,186	2,200	5,880,400	14,628,600	27,662,000	17%

Appendix B

Codes (Low): CO_2 and Energy Savings, Costs and Percent of Overall EPA Target Achievable

State	Cumulative CO_2 Reductions (Tons)			Cumulative Net Cost (Million 2011 $)			Cumulative Energy Saved (MWh)			Percent of EPA Goal Achieved
	2020	2025	2030	2020	2025	2030	2020	2025	2030	
Alabama	1,153,000	5,798,000	14,005,000	302	179	-491	1,446,500	7,273,000	17,567,600	8%
Arkansas	659,000	3,326,000	8,056,000	148	81	-285	728,400	3,678,400	8,909,000	5%
Florida	4,924,000	24,929,000	60,351,000	1,854	1,907	-623	7,576,700	38,355,700	92,854,400	16%
Georgia	3,392,000	17,160,000	41,550,000	793	503	-1,191	4,042,400	20,450,200	49,517,000	17%
Kentucky	1,396,000	7,017,000	16,948,000	202	26	-641	1,227,500	6,169,900	14,901,900	13%
Louisiana	1,013,000	5,125,000	12,407,000	296	253	-277	1,259,300	6,368,000	15,417,500	8%
Mississippi	505,000	2,544,000	6,146,000	157	66	-361	812,400	4,089,100	9,879,500	7%
North Carolina	4,160,000	20,946,000	50,789,000	960	714	-1,091	4,473,100	22,520,600	54,607,100	23%
South Carolina	2,101,000	10,583,000	25,659,000	420	197	-824	2,235,000	11,256,700	27,291,600	15%
Tennessee	2,133,000	10,718,000	25,888,000	375	241	-560	2,015,500	10,130,100	24,466,700	18%
Virginia	2,516,000	12,680,000	30,735,000	524	62	-1,612	3,332,000	16,795,500	40,710,900	29%

Appendix C

CHP (High) CO_2 and Energy Savings, Costs and Percent of Overall EPA Target Achievable

State	Cumulative CO_2 Reductions (tons)			Cumulative Net Cost (Million 2011 $)			Cumulative Energy Saved (MWh)			Percent of EPA Goal Achieved
	2020	2025	2030	2020	2025	2030	2020	2025	2030	
Alabama	8,359,000	16,719,000	25,078,000	138	5	-367	1,754,400	6,978,400	14,214,100	5%
Arkansas	9,706,000	19,413,000	29,119,000	141	30	-347	1,850,500	7,401,900	16,488,100	9%
Florida	6,831,000	13,661,000	20,492,000	156	73	-253	1,606,700	6,426,700	14,316,000	2%
Georgia	9,089,000	18,178,000	27,267,000	146	0	-338	1,762,100	6,775,900	13,759,800	4%
Kentucky	13,874,000	27,747,000	41,621,000	146	-7	-313	1,857,800	7,431,300	16,552,100	13%
Louisiana	7,966,000	15,932,000	23,899,000	138	5	(411)	1,841,100	7,364,200	16,403,300	7%
Mississippi	4,655,000	9,310,000	13,965,000	120	-63	-561	1,832,800	7,331,400	16,333,300	11%
North Carolina	10,444,000	20,888,000	31,332,000	155	53	-292	1,818,100	7,231,700	14,736,700	5%
South Carolina	10,636,000	21,271,000	31,907,000	145	38	-356	1,816,600	7,266,500	15,901,300	8%
Tennessee	12,441,000	24,882,000	37,323,000	142	39	-295	1,861,400	7,445,600	16,585,500	11%
Virginia	7,393,000	14,785,000	22,178,000	146	-7	-313	1,796,700	6,824,300	13,430,400	8%

End Notes

[1] Regulatory Assistance Project, "It's Not a SIP: Opportunities and Implications for State 111(d) Compliance Planning" (February 2015) available at http://www.raponline.org/document/download/id/7491.

[2] The text of the proposed Clean Power Plan was published in Volume 79 of the Federal Register on June 18, 2014. The Code of Federal Regulations (CFR) presents the official and complete text of federal agency regulations and the CFR is updated by amendments appearing in the daily Federal Register. Our reference to Section VIII Part C can be found on page 34909 of Volume 79 of the Federal Register and cite this as "70 FR 34909." Readers can access the complete text here: http://www.gpo.gov/fdsys/pkg/FR-2014-06-18/pdf/2014-13726.pdf.

[3] American Council for an Energy-Efficient Economy. "The State and Utility Pollution Reduction Calculator" (April 2015) available at http://aceee.org/state-and-utility-pollution-reduction-supr.

[4]Elizabeth Stuart et al., "A Method to Estimate the Size and Remaining Market Potential of the U.S. ESCO Industry" (December 2014) available at http://www.sciencedirect.com/science/article/pii/S0360544214010585#.

[5] AJW et al., "Greenhouse Gas Reductions Through Performance Contracting Under EPA's Clean Power Plan" (November 2014) available at http://ajw-inc.com/pc/.

[6] *Ibid.*

[7] U.S. Department of Energy, "States Address Air Pollution from Energy through Energy Efficiency and Renewable Energy Programs" (December 2007) available at http://www.nrel.gov/docs/fy08osti/42168.pdf.

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[9] *Ibid.*

[10] Building Codes Assistance Project, "New Calculator Tool Empowers States to Use Building Energy Codes to Comply with the Clean Power Plan" (May 2015) available at http://energycodesocean.org/news/2015/may/14/new-calculator-tool-empowers-states-use-building-energy-codes-comply-clean-power-pl.

[11] Southeast Energy Efficiency Alliance," Construction, Codes and Commerce" (2015) available at http://www.seealliance.org/wp-content/uploads/SEEA_EnergyCode_Report_Online.pdf.

[12] Many southeastern states have adopted amendments in order to tailor model codes to locally specific characteristics and considerations.

[13] Harvard Law School Environmental Law Program, "Efficiency Rules" (March 2014) available at https://hlsenvironmentallaw.files.wordpress.com/2014/11/the-role-of-energy-efficiency-in-the-111d-rule.pdf.

[14] Northeast Energy Efficiency Partnerships, "Attributing Building Energy Code Savings to Energy Efficiency Programs" (February 2013) available at http://www.neep.org/attributing-building-energy-code-savings-energy-efficiency-programs.

[15] American Council for an Energy-Efficient Economy, "Change Is in the Air: How States Can Harness Energy Efficiency to Strengthen the Economy and Reduce Pollution" (April 2014) available at http://aceee.org/sites/default/files/publications/researchreports/e1401.pdf.

[16] CHP is also sometimes considered a renewable energy technology.

[17] Some large CHP units may be affected sources under the Clean Power Plan.

[18] Clean Power Plan 34924.

[19] National Association of Clean Air Agencies, "Implementing EPA's Clean Power Plan: A Menu of Options" (May

2015) available at http://www.4cleanair.org/sites/default/files/Documents/NACAA_Menu_of_Options_LR.pdf.

[20] U.S. Environmental Protection Agency, "CHP Emissions Calculator" available at http://www.epa.gov/chp/basic/calculator.html.

[21] CHP Association, "Comments of CHP Association on Proposed Rule, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" (December 2014) available at http://chpassociation.org/wp-content/uploads/2014/12/Comments-of-CHP-Association-to-Clean-Power-Plan-1.pdf.

[22] Southeast Energy Efficiency Alliance, "Southeastern State Air Agency Authority and Enforcement Structures" (April 2015) available at www.seealliance.org/wp-content/uploads/ResourcePaper1Authority-FINAL.pdf.