Testimony of James A. Dickenson,
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on behalf of JEA and its customers

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Energy and Natural Resources
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My name is James A. Dickenson. I serve as Managing Director & CEO of JEA, a municipally owned electric, water and sewer utility located in Jacksonville, Florida. JEA is a not-for-profit, community-owned utility with an electric system that serves more than 400,000 northeast Florida customers in Duval and three adjacent counties. Thank you for allowing me to testify today on behalf of JEA and its customers. JEA is also a member of the Large Public Power Council ("LPPC"), an association of 23 of the nation's largest municipal and state-owned utilities, American Public Power Association ("APPA"), a service association for the nation's more than 2,000 community-owned electric utilities, and Florida Municipal Electric Association ("FMEA"), an association of 34 public power communities in the state of Florida. Our commitment is to provide highly reliable, reasonably priced and environmentally responsible electric service to our citizen-customers.

We are concerned that any national clean energy standard will create substantial competitive impacts between regions, favoring those that are situated to take advantage of geographic assets that more readily support development of solar, wind and hydropower. Using national average cost impacts can disguise significant electric rate differences among regions. While applauding the inclusion of nuclear energy and the partial credits for natural gas technologies in the Clean Energy Standard Act of 2012 ("CES"), the move away from existing coal generation, including JEA's, will strand not only large capital investments but the nation's abundant supply of a secure domestic fuel that will be exported to other countries.

We are also concerned that the proposed CES requiring large-scale phasing in over a short 20-year time frame is too aggressive. Most large-scale electric generation projects take years to design, finance, permit and construct and utilities throughout the country will likely be vying for the same resources in materials, manpower, financing and regulatory review time.

National energy policy should balance multiple goals including energy security, economic growth, electric rate/cost considerations and the environment. These factors should all be considered with no one goal being weighted too heavily, thereby creating an imbalance for energy production to U.S. consumers.

As background, JEA's existing non-renewable generation capacity totals over 3700 megawatts (MW) with 38% coal or coal/petcoke units, 16% combined-cycle natural gas turbines, 32% simple-cycle natural gas turbines and 14% natural gas/diesel turbines. JEA's resource mix is constantly evolving. JEA was heavily reliant on residual oil generation until the 1980s when it diversified its fuel mix to include natural gas and coal in order to reduce both energy costs and fuel supply risks for our customers. JEA has continued to diversify and move to cleaner generation technologies by adding natural gas simple- and combined-cycle turbines and small-scale renewables. We have constructed seven modern natural gas turbines since 2000. In the early 2000s, JEA was the recipient of a Department of Energy grant of over $70 million dollars to build two innovative 300 MW circulating fluidized bed ("CFB") coal/petcoke units, the leading clean-coal, fuel-efficient technology just a decade ago. Those CFB units now represent 15% of JEA's generation fleet and we have been able to use them with coal, petcoke and biomass fuels. JEA has made significant capital investments to modernize environmental controls at its existing coal plants. JEA carefully balances the generation and dispatch of electricity based on the most cost-effective use of fuels while meeting environmental standards.

JEA has reviewed and developed an initial analysis of the impact of the CES on JEA's generation sources and on the electricity cost implications for JEA customers. JEA continues to model the CES and its impact on generation dispatch and associated costs.

My testimony today addresses our initial analysis of the effects of the CES on JEA and ultimately on our customers. I will focus on five areas: 1) CES qualifying clean energy resources that are practical options for northeast Florida, 2) modifications to JEA's generation mix and energy sources to meet the CES over time, 3) projected electricity cost impacts to JEA customers, 4) Alternative Compliance Payments ("ACP") and return to contributing utilities for designated construction of further CES qualifying resources, and 5) CES credit for energy efficiency programs. JEA supports clean energy generation that protects and enhances the environment while remaining cost effective on our consumers' monthly energy bills.

1) CES Qualifying Clean Energy Resource Options for JEA

We commend the basic framework of the proposed CES that would allow utilities to meet the requirement through the best possible combination of energy sources for each utility in each region of the country. However, we have concerns that because of the limited resources in our particular region, the costs to meet the CES are higher for JEA and other Southeast utilities. As I stated in written testimony in March 2009 to this Committee, when considering renewable energy from Florida's standpoint, as well as the entire Southeast, the available options depend very much on geography. In the Southeast, unlike the West, Pacific Northwest and Midwest, we are not blessed with substantial wind resources, elevation changes for hydropower options, or intense sun and expansive open lands for high-intensity solar installations. For example, the

Department of Energy's ("DOE") nationwide study of wind resources shows that there are no significant on-shore wind resources in the Southeast, and only limited off-shore capability.[1]

What we do have in Northeast Florida are limited biomass, solar and landfill gas capabilities, the potential for nuclear development and the opportunity to consume energy more efficiently. JEA has cautiously approached adding renewables to its generation fleet out of concern for the comparatively high cost, small production amounts and low capacity factors of the available options. JEA has had 10 MW of purchased power wind energy in Nebraska since 2005. That facility runs at a capacity factor of about 38%. JEA sells the energy on the grid and retains the renewable credits. JEA also purchases all of the output from a 15 MW (direct current) solar installation built in 2010 on 100 acres of JEA-owned land in Jacksonville. This modern solar farm operates at a capacity factor of 17%. JEA has a net metering policy to purchase excess power from certain customer-owned solar installations and has small-scale photovoltaic solar applications scattered throughout Duval County. JEA also produces or purchases 16 MW of landfill gas from Jacksonville's three local landfills and biogas from a JEA-owned wastewater treatment facility. Combined, these renewable energy resources represent roughly one percent of JEA's retail sales. As mentioned, JEA has been co-firing our CFB units with biomass material from tree trimming. JEA also continues to evaluate biomass ownership or purchase power options considering the availability of biomass fuel supplies, yet-to-be-determined carbon classification impacts and relative cost comparisons.

JEA has a contractual commitment with the Municipal Electric Association of Georgia ("MEAG") for 200 MW of purchase power in the new Plant Vogtle nuclear units 3 and 4 that

[1] *See* *http://www.windpoweringamerica.gov/windmaps/offshore.asp*

should be available in 2017. JEA also has an option for an ownership interest of between 5% and 20% in the proposed Duke Energy William States Lee III Nuclear Station currently scheduled to be available in 2021-2022. JEA continues to evaluate other nuclear options.

2) Modifications to JEA's generation mix and energy sources to meet the CES

JEA has continued to transition its resource mix toward natural gas baseload generation, to expand its access to intermittent renewable resources, and to diversify with new nuclear options. However, we anticipate that the combination of the CES proposed targets and our customer demand for energy would require significant additional nuclear and renewable generation resources above what is projected in our current long-range plans.

We have prepared a comparison between a base case projection to meet JEA's energy demands over the proposed time frame (without CES) with a modified case to meet the CES (shown in Exhibit A). The results of this analysis were produced by a preliminary study and not by a full-blown integrated resource planning study ("IRP"). However, the results are a reasonable analysis of the choices we would likely make to meet the proposed CES.

Substantial additional nuclear generation would be the primary means to meet the CES. JEA would also add additional solar installations in 15 MW increments over an eight-year period early in the 20-year time frame and would build or purchase additional solar, wind and biomass energy. Even with an aggressive program of renewable and nuclear generation development, JEA would be unable to meet the requirements of the CES beginning in 2015 through its own resources and would have to rely on a combination of clean energy credit purchases and Alternative Capacity Payments while working to replace the majority of our current generation capacity with other sources.

Because of the large-scale output and high capital development costs of current nuclear design technology, JEA finds its only economic option for nuclear is to purchase power or to acquire partial ownership interest in nuclear projects. We remain interested in the ongoing development of Small Modular Reactor ("SMR") designs and believe the commercial demonstration of SMR might make a local nuclear option more viable for JEA in the future. The SMR design is being incentivized by DOE at present through proposed funding agreements. Because nuclear plants would comprise a great percent of total capacity under the CES, new large-scale nuclear plant design and the developing SMR designs must allow for flexibility to lower the energy output of nuclear units during off-peak demand periods in order to avoid energy dumping.

JEA has not included new coal capacity with carbon capture and sequestration ("CCS") in either our base case or the CES case. Although it has not yet been adequately demonstrated on a utility scale, we believe the technical and engineering obstacles to CCS may be solved with enough investment in research and development. Of course, the high costs and substantial energy penalties of CCS will continue to discourage investment by electric utilities. However, solving the engineering issues will not be enough.

The legal and regulatory barriers to sequestration of hundreds of millions of tons of CO_2 effectively forestall any serious consideration of CCS on a widespread basis by electric utilities. Although there may be adequate geological formations capable of accepting CO_2, we see no credible path to licensing large scale CO_2 sequestration. In Florida, there are no significant formations capable of sequestering utility CO_2. This means that an interstate network of CO_2 pipelines would need to be sited, licensed, financed and built. The siting alone would offer hundreds of miles of opportunities for obstruction. Those obstructions would likely include

additional environmental concerns, permitting difficulties, and lack of confidence in protective, effective technologies.

JEA is also concerned that the CES, as written, will further drive our nation away from the economic use of our abundant coal resources. Today coal powers more than 40% of all electric generation in the United States. If coal is removed from our energy mix, the U.S. energy position will be both higher cost and less secure.

3) Projected electricity cost impacts to JEA customers

JEA customers, like those across the country, are concerned about their utility costs. These concerns are amplified by the current economic environment. JEA has had a series of rate increases over a seven year period to pay for capital construction financing and high coal and natural gas fuel costs. Due to the recent drop in natural gas prices, we plan to reduce our pass through fuel cost to customers in July 2012 for the first significant decrease in overall rates since 2004. While our overall rates remain about average for Florida utilities, our customers express concern about the absolute cost of energy and are often not understanding of the relative comparisons.

Renewable and nuclear energy options are expensive, especially compared with the alternatives available today. As discussed earlier, renewables in Northeast Florida are limited in terms of output and availability and are far from sufficient to meet our customers' electric demands even with the addition of new projects.

Based on the CES case projected in Exhibit A, JEA would be able to meet the CES through a combination of resource development, credit purchasing and alternative compliance payments with an average annual energy cost increase of 4.6% above our base case over the first six years of the mandate. The cost premium is so low primarily because JEA has already

committed to the new Plant Vogtle nuclear units. While a 4.6% cost differential seems relatively reasonable, our customers already protest any increases in costs. Neither our residential nor our commercial customers will readily accept the CES mandate as a good reason to raise rates. Even more troubling are the significant annual cost differentials (20% to over 100%) JEA customers will be asked to endure to meet the CES beginning in 2021. The total cost to JEA customers to meet the CES over the 20 years to 2035 is an estimated additional $14 billion in combined energy replacement and alternative compliance payments, an increase over base case costs of about 64%.

4) Alternative Compliance Payments ("ACP") and return to contributing utilities

The cumulative alternative compliance payments necessary to meet the CES would be an additional cost burden on JEA customers who will be funding the development or purchase of replacement energy sources to meet the CES while also making the compliance payments. JEA is concerned that the ACP structure contained in the proposed CES would keep 25% of the payments in Washington, D.C. and return 75% of the ACPs to the states for distribution restricted to energy efficiency projects as the language is currently worded. This plan would likely penalize public power customers unless there was a formula directing the payments back to the contributing communities. The rationale for keeping 25% of the ACPs at the federal level appears intended to have the program remain revenue neutral to the federal government. However, JEA and other municipal utilities do not pay corporate income tax, and would receive no benefit from an expense deduction for ACPs. Thus the federal budget would not be harmed if 100% of ACPs paid by public power utilities were returned to the public power utilities.

Additionally, the ACPs may result in substantial sums of dollars directed solely to energy efficiency projects when for some utilities the development of additional clean or renewable

resources might provide a greater benefit toward achieving the CES's stated goal of reducing carbon emissions. Flexibility to direct the dollars to qualified clean energy projects or energy efficiency upgrades would be a great improvement.

Rather than pay the ACP to the federal government, JEA proposes that each affected public power utility make this significant investment in qualified CES resources that directly benefit their communities. This would allow our customers, who are making the investment as a portion of their electric rate, to directly benefit from the payments. Thus, public power utilities would be provided the flexibility to develop more clean or renewable energy projects and energy efficiency upgrades, based on cost-benefit analyses. This method would result in a large investment in qualified clean energy and energy efficiency projects. In Florida, where renewable energy at reasonable costs is severely limited, such projects could include rebates for customer-owned energy efficiency and photovoltaic energy, as well as development of biomass projects.

We urge reconsideration of the method of distribution of ACPs to return them directly to any contributing utility, regardless of ownership structure, or in the alternative, return the payments to the contributing community-owned utilities, for restricted investment in qualifying clean energy or energy efficiency projects. We underscore the recommendation to allow the returned payments to be used with flexibility by the utilities and communities making the payments and to send the full amounts back to public power utilities or allow them to track the payments and qualifying expenditures, rather than remitting them to the government.

5) CES credit for energy efficiency programs

The ACP structure favors energy efficiency programs as currently proposed. JEA recommends allowing utility-sponsored customer energy efficiency programs and improvements to count toward qualified clean energy credits. An exception or deduction could be made for

those energy efficiency programs that are funded with returned ACPs as suggested in item 4 above.

Conclusion

In summary, JEA is very concerned that the Clean Energy Standard, as described in S. 2146, is too aggressive and too costly to electric consumers across the country, especially in our service area. The CES further isolates our country's abundant coal resources from being a viable source of energy production. It would require that large capital assets not only be scaled in over a mere 20-year period but would also require existing capital assets to be retired or abandoned before the end of their useful economic lives. All this cost would be borne by electric consumers - our customers, your constituents - in uncertain economic times. The ever-changing focus of environmental concerns and the long-term uncertainty of fuel availability and pricing impact a basic life resource that in part defines our quality standard of living.

Base Case Capacity Additions and Retirements						
Year	Capacity Additions		Energy-Only Additions		Retirement / Conversion	
	(MW)	Type/Fuel	(MW)	Type/Fuel	(MW)	Type/Fuel
2015						
2016						
2017						
2018						
2019						
2020						
2021	50	Nuclear (AP1000)				
2022	50	Nuclear (AP1000)			524	Gas/Oil
	600	Combined Cycle Conversion			372	Converted to CC
2023						
2024						
2025	186	Simple Cycle Gas				
2026						
2027						
2028	186	Simple Cycle Gas				
2029						
2030	600	Combined Cycle Conversion			372	Converted to CC
2031						
2032	600	Combined Cycle Gas				
2033						
2034						
2035						

CESA Case Capacity Additions and Retirements						
Year	Capacity Additions		Energy-Only Additions		Retirement / Conversion	
	(MW)	Type/Fuel	(MW)	Type/Fuel	(MW)	Type/Fuel
2015			50 15	Wind Solar PV		
2016			15	Solar PV		
2017			15	Solar PV		
2018	50	Biomass	15	Solar PV		
2019			15	Solar PV		
2020			15	Solar PV		
2021	220	Nuclear (AP1000)	15	Solar PV		
2022	220	Nuclear (AP1000)	15	Solar PV	524	Gas/Oil
2023			50	Wind		
2024	220	Nuclear (AP1000)				
2025					293	Coal/Coke
2026	220	Nuclear (AP1000)				
2027	600	Combined Cycle Gas			293	Coal/Coke
2028	220	Nuclear (SMR)			194	Coal
2029						
2030	220	Nuclear (SMR)				
2031						
2032	600	Combined Cycle Gas			510	Coal
2033	220	Nuclear (SMR)				
2034	220	Nuclear (SMR)			510	Coal
2035	110	Nuclear (SMR)				

Notes:
Time constraints did not allow Base Case or CESA Case capacity expansion and retirement plans to be fully optimized according to Integrated Resource Plan best practices.
Energy-Only resources do not contribute capacity
Southeastern on-shore wind capacity is limited, and Western wind is not expected to be available in quantity in the Southeast
Southeastern off-shore wind is considered impractical due to permitting issues demonstrated in Northeast, hurricanes, and poor economics due to lower wind velocities
Biomass energy contribution to CESA is undetermined, and likely to be extremely limited
Supplies of Biomass and biomass based Waste-to-Energy fuels are limited by region specific issues, competition, and transportation costs
Recently proposed ClSWI and Industrial Boiler MACT rules render biomass onerous to permit and operate, and Waste-to-energy fuels virtually impossible to permit and operate
Utililty-Scale solar PV is an energy-only resource requiring approximately 6 acres of land per MW of DC rating, with a capacity factor of approximately 17% in North Florida
The cost of PV energy does not compare favorably with the cost of Nuclear energy, and nuclear also provides capacity, while solar is energy-only.
Solar Thermal generation in Florida is a higher cost than solar PV
CESA goals cannot be met with gas and practical renewable energy alone
Without large quantities of nuclear capacity and energy it is not possible to meet CESA goals while still preserving system reliability and minimizing the cost to the customer
To make system operation practical, nuclear capacity must be able to turn down to approximately 50% load as current coal-fired base load generation does.
Nuclear turndown is an expected design feature of both Gen III reactors like the AP1000, and Small Modular Reactors (SMR)
Though nuclear turndown is technically feasible, it represents a departure from typical US nuclear fleet operating practices and contractual arrangements
Due to reliability concerns associated with replacing native base-load capacity with high levels of non-native capacity, it is probable that as baseload coal is retired in later years, replacement nuclear capacity would need to be constructed locally

Base Case Capacity Balance As of 2035				
Type	Capacity Additions	Retirements or Conversions	System Total	% of Total
Simple Cycle Gas	372	744	558	9.2%
Combined Cycle Gas	1,800	0	2,400	48.8%
Nuclear	100	200	100	8.2%
Biomass	0	0	0	0.0%
Gas/Oil	0	524	0	4.1%
Solid Fuel	0	0	1,800	29.7%
Total	2,272	1,468	4,858	100.0%

CESA Case Capacity Balance As of 2035				
Type	Capacity Additions	Retirements or Conversions	System Total	% of Total
Simple Cycle Gas	0	0	930	9.2%
Combined Cycle Gas	1,200	0	1,800	48.8%
Nuclear	1,870	200	1,870	8.2%
Biomass	50	0	50	0.0%
Gas/Oil	0	524	0	4.1%
Solid Fuel	0	1,800	0	29.7%
Total	3,120	2,524	4,650	100.0%

Capacity Mix by Fuel in 2035		
Fuel	Base	CESA
	%	%
Simple Cycle Gas	11.5%	20.0%
Combined Cycle Gas	49.4%	38.7%
Nuclear	2.1%	40.2%
Solid Fuel	37.1%	0.0%
Other	11.5%	21.1%

Percent CESA			
Year	Base Case	CESA Case	Required
2015	19.0%	19.5%	24.0%
2016	24.3%	24.8%	27.0%
2017	30.2%	27.0%	30.0%
2018	30.5%	27.1%	33.0%
2019	27.7%	29.2%	36.0%
2020	27.4%	28.5%	39.0%
2021	31.3%	37.0%	42.0%
2022	28.1%	40.7%	45.0%
2023	26.5%	39.9%	48.0%
2024	25.8%	48.4%	51.0%
2025	25.8%	51.0%	54.0%
2026	26.2%	57.9%	57.0%
2027	25.2%	61.2%	60.0%
2028	26.3%	66.2%	63.0%
2029	25.0%	65.9%	66.0%
2030	28.8%	68.7%	69.0%
2031	28.7%	67.6%	72.0%
2032	27.9%	74.4%	75.0%
2033	28.6%	77.3%	78.0%
2034	27.8%	87.3%	81.0%
2035	28.7%	87.8%	84.0%

Note:
CESA % is Red If ACPs were purchased

Cost of Energy ($/MWh)				
Year	Base Case	CESA Case	% Increase Over Base Each Year	Cumulative Increase (NPV) over Base
2015	54.89	56.64	3%	3%
2016	57.33	60.15	5%	4%
2017	61.19	63.63	4%	4%
2018	62.70	65.10	4%	4%
2019	63.50	67.24	6%	4%
2020	64.89	68.97	6%	5%
2021	67.33	80.14	19%	7%
2022	66.17	88.12	33%	10%
2023	66.65	89.35	34%	13%
2024	66.97	104.35	56%	17%
2025	67.43	104.20	55%	21%
2026	68.84	118.84	73%	25%
2027	68.70	123.43	80%	29%
2028	69.49	133.70	92%	34%
2029	69.73	132.82	90%	38%
2030	74.15	145.92	97%	42%
2031	74.94	145.61	94%	45%
2032	80.79	153.34	90%	48%
2033	81.52	166.80	105%	51%
2034	81.41	175.21	115%	54%
2035	82.33	180.86	120%	58%

Notes:
NPV represents Net Present Value in $2015 calculated at 2.5% inflation rate.
NPV of CESA Case cost increase over Base case is $10.3 Billion
Nominal cost of CESA Case cost increase over Base $14.8 Billion

ACP Cost	
Year	Cost ($/MWh)
2015	3.00
2016	3.23
2017	3.47
2018	3.73
2019	4.01
2020	4.31
2021	4.63
2022	4.98
2023	5.35
2024	5.75
2025	6.18
2026	6.65
2027	7.15
2028	7.68
2029	8.26
2030	8.88
2031	9.54
2032	10.26
2033	11.03
2034	11.85
2035	12.74

ACP Escalates at 5% above the assumed 2.5% inflation rate