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CONTRACT REPORT

Appliance and Equipment Efficiency Standards for Florida

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Appliance and Equipment Efficiency Standards for Florida

Executive Summary

This report identifies efficiency improvements that could be anticipated by implementation of new appliance and equipment efficiency standards consistent with Governor Crist’s Executive Order 07-127.

In cases where a national standard exists, states can only enforce a tougher standard by first petitioning the U.S. DOE for a waiver. As a result, the focus of this study is on non-currently regulated products, and opportunities for greater saturation of efficient appliances or requirements not covered for that appliance. This report identifies and summarizes 17 standard recommendations. These recommendations include:

- ❖ Bottle-type water dispensers
- ❖ Commercial boilers
- ❖ Commercial hot food holding cabinets
- ❖ Compact audio products
- ❖ DVD players and recorders
- ❖ Televisions
- ❖ Metal halide lamp fixtures
- ❖ Residential pool heaters
- ❖ Portable electric spas
- ❖ Residential furnaces and boilers
- ❖ Residential pool pumping
- ❖ Single-voltage power supplies
- ❖ State-regulated reflector lamps
- ❖ Walk-in refrigerators and freezers
- ❖ Ceiling Fans
- ❖ Residential Lighting
- ❖ Residential Water Heating

Figure 1 shows the estimated 2020 savings from each of the proposed standards (all savings are in site million Btus, and standards are ordered from highest to lowest savings). Total combined 2020 savings for both electricity and gas benefits is estimated at 113,741,528 million Btus. Total combined 2020 electrical savings from the standards is estimated at 31,465 GWh, or 14.1% of Florida’s 2006 net electricity generation of 223,751.6 GWh. These proposed gas and electric standards will yield reductions in state greenhouse gas emissions equivalent to 15% to 18% of those produced through electric-generation.

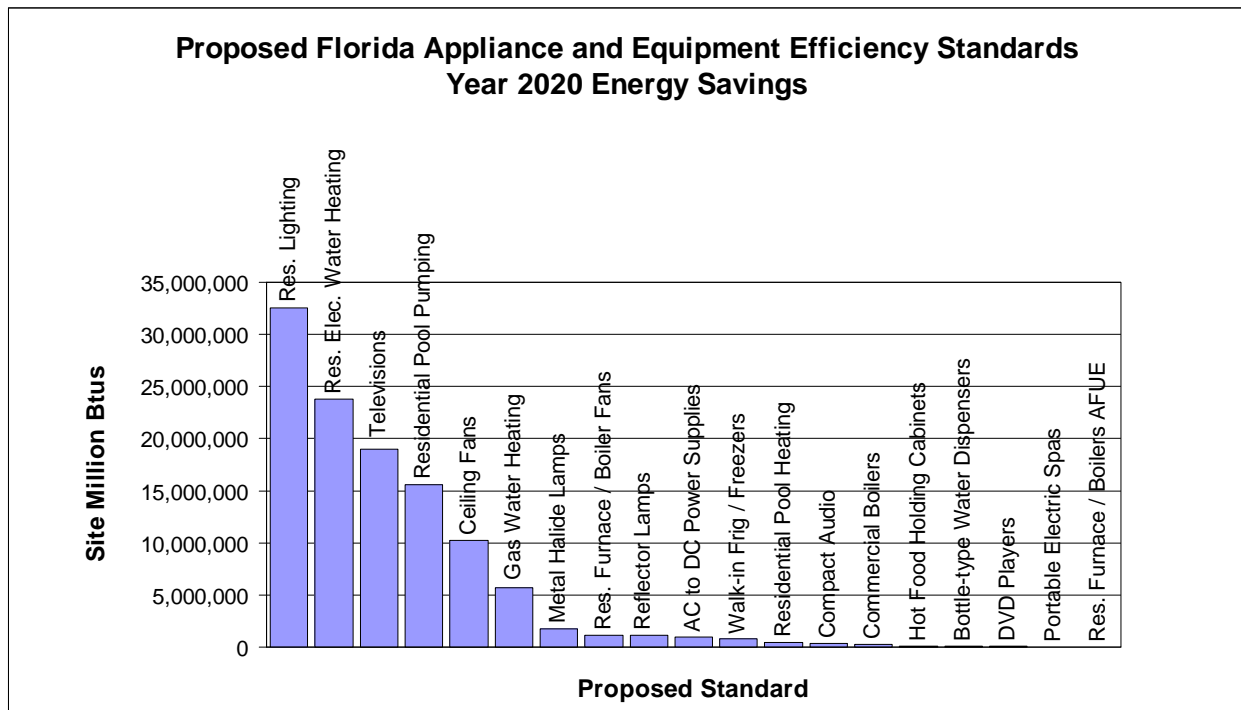


Figure 1. Proposed Florida appliance and equipment efficiency standards ordered by estimated 2020 savings.

Appliance and Equipment Efficiency Standards for Florida

Cost Effective Energy Conservation Project Background

The 2007 Florida Legislature authorized the Florida Building Commission and Department of Community Affairs to evaluate cost effectiveness of energy conservation measures including appliance efficiencies that could be implemented through the Florida Energy Code for certain buildings. It also authorized the Florida Building Commission to develop model ordinances for local governments to provide incentives for energy efficiency and to develop and implement a public awareness campaign to promote energy efficiency and the benefits of green building practices in consultation with stakeholders. Spending authority specific to these initiatives was provided through the appropriations act.

The purpose of the Cost Effective Energy Conservation project is to provide technical, administrative and logistical support to the Florida Building Commission and the Department of Community Affairs for energy conservation related tasks authorized by the 2007 Florida Legislature and directed by the Governor in Executive Order 07-127.

The four project tasks are: (1) develop model ordinance(s) for local governments to promote builder and home owner participation in “Green Building” programs; (2) evaluate the standard for energy efficiency of the Florida Energy Code and national model codes and standards, including but not limited to, economic analyses applicable to housing first cost and owning operating costs and determine enhanced energy efficiency measures for commercial buildings; (3) develop and implement a public awareness Green Buildings Campaign website that promotes energy efficiency and promotes the benefits of building green, and; (4) identify and review new or updated energy conservation standards for products that consume electricity as they relate to the appliance efficiency law.

Specifically, Task 4 includes identifying efficiency improvements that could be anticipated by implementation of new standards consistent with Governor Crist’s Executive Order 07-127 and the anticipated costs of implementing and enforcing the standards and consideration of methods and processes for the regular review of new standards and implementation, if warranted. Potential energy efficiency standards are then to be identified for products and systems components that use electricity pursuant to the Governor’s Executive Order 07-127, and for energy using products including, but not limited to, residential pool pumps, pool heaters, spas and commercial and residential appliances=.

This report summarizes Task 4 activities to date, including a review of energy consuming product standards and proposed product standards for Florida.

Federal and State Standards Background

There is a history of effective and successful state appliance and equipment efficiency standards starting in the 1970s (e.g. refrigerators). These state standards led to support for and enactment of national standards in 1987, 1988, 1992, 2005 and now 2007. The overall savings to consumers and businesses from these existing standards (through 2005) will approach \$250 billion by 2020¹.

¹ “Leading the Way: Continued Opportunities for New State Appliance and Equipment Efficiency Standards”, American Council for an Energy-Efficient Economy and Appliance Standards Awareness Project, March 2006.

If a national standard exists, states can only enforce a tougher standard by first petitioning the U.S. DOE for a waiver. As a result, the focus of this study is on non-currently regulated products, and opportunities for greater saturation of efficient appliances or requirements not covered for that appliance.

Energy Use of Appliances

Buildings accounted for 35.4% of the primary energy use in the U.S. overall in 1999, but they accounted for 47.5% of Florida's primary energy use. Florida also ranks 2nd of all states in net generation and 3rd in capability, and 3rd in carbon dioxide and nitrogen oxide emissions². A 1999 monitored study showed that for a typical Florida residence, 34% of the total average electrical loads were "other" than HVAC, water heating, dryer, range and pool use, accounting for approximately 5,800 kWh per year (Figure 2)³.

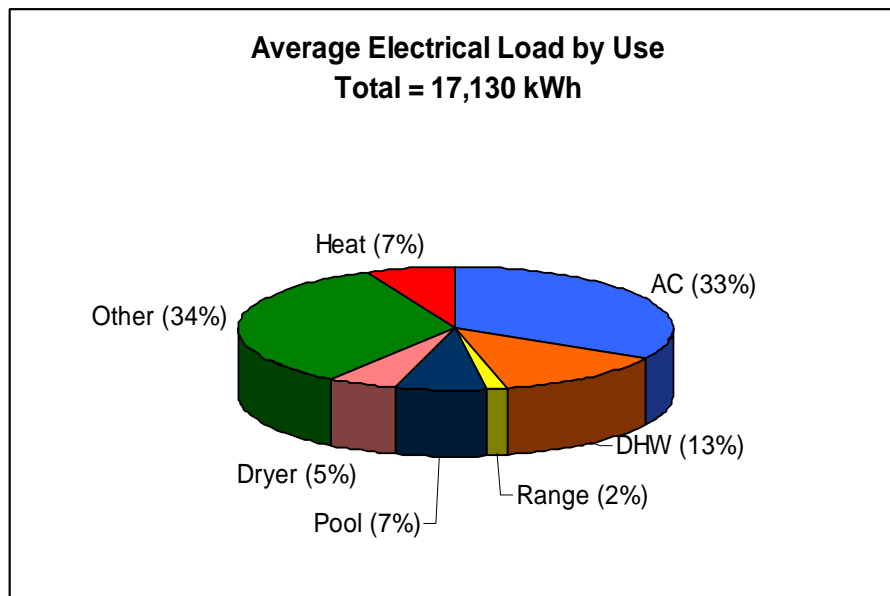


Figure 2. Breakdown of typical Florida single family residential electrical use, showing 34% of the total, annual use to be other than HVAC, water heating, clothes dryer, range and pool.

A recent Florida Energy Code study comparing the 1979 and proposed 2007 codes showed that while HVAC energy use has decreased significantly, use other than HVAC and hot water has increased (see Figure 3). On a percentage basis, "other" use has increased from 28% in 1979 to 52% in 2007⁴

² http://www.eia.doe.gov/cneaf/electricity/st_profiles/florida.html, viewed February 13, 2008.

³ Parker, D., "Research Highlights from a Large Scale Residential Monitoring Study in a Hot Climate" Florida Solar Energy Center, FSEC-pf-369-02, Jan. 01, 2002

⁴ Fairey, P., J. Sonne, "Effectiveness of Florida's Residential Energy Code: 1979 - 2007" Florida Solar Energy Center, FSEC-CR-1717-07, May. 15, 2007

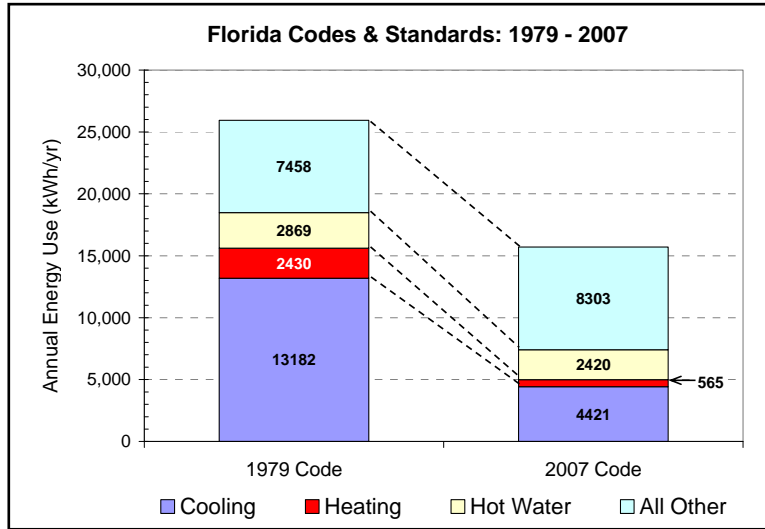


Figure 3. Comparison of 1979 Code and 2007 Code annual residential energy uses in Florida.

The same 1999 study noted above found 24% of homes had pools with an average use of 4,200 kWh/yr, and 7% had electrically heated hot tubs with an average use of 2,150 kWh/yr. As illustrated in Figure 4, the study also found lighting, refrigerator and plug loads use increased by an average of 8.2 Wh/day or about 17% over the 1999 monitoring period.

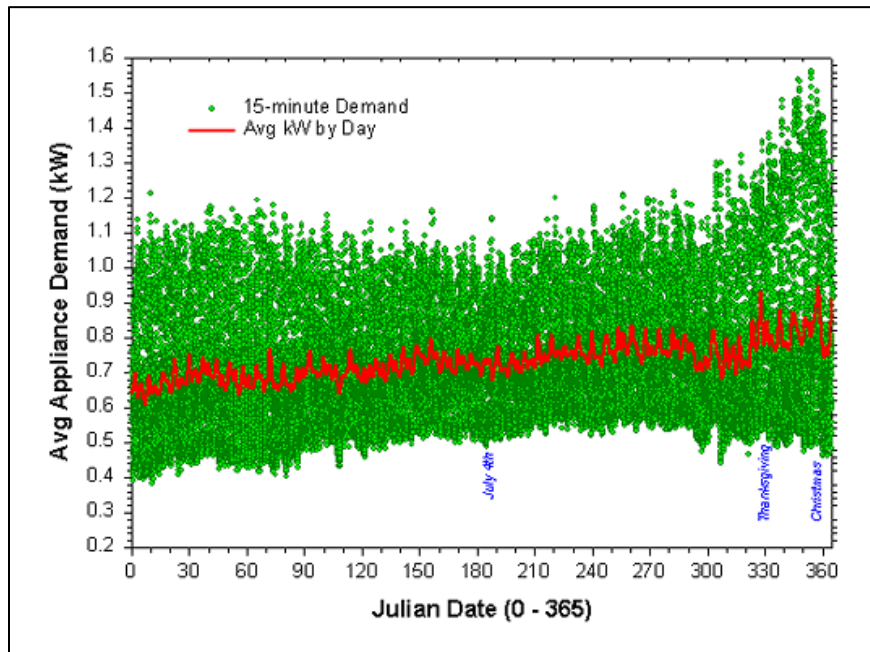


Figure 4. Plot showing trend of increased lighting, refrigerator and plug load energy use over a 1999 study period.

Sample Standards for Consideration

Florida Statutes 553 Part VI Energy Conservation Standards provides the pertinent guidelines for standards that may be considered for other covered products:

STANDARDS FOR OTHER COVERED PRODUCTS

(a) The department may prescribe an energy conservation standard for any type or class of covered products of a type specified in s. [553.957](#), except where precluded by federal law, if the department determines that:

1. The average per occupancy energy use within this state resulting from performance of products of such type or class exceeded 80 kilowatt hours or its Btu equivalent for any 12 calendar-month period ending before such determination; and
2. Substantial improvement in the energy efficiency of products of such type or class is technologically feasible.

(b) The department may prescribe an energy conservation testing and rating standard for any type or class of covered products of a type specified in s. [553.957](#) if the department determines that the certifications to the state and uniform product labeling required by this part will improve the enforceability of the code.

(c) Any new or amended standard for covered products of a type specified in s. [553.957](#)(1)(d) shall not apply to products manufactured within 2 years after the publication of a final rule establishing such standard.

The 2006 ACEEE standards report referred to above also provided criteria for standard recommendations including:

- ❖ The standard must provide significant and very cost-effective energy savings for purchasers/users
- ❖ There must be readily available products that meet the standard
- ❖ The standard must be able to be easily developed and implemented at low cost to the state (either another state or national voluntary standard is already in use elsewhere).

Based on these criteria, the report goes on to recommend fifteen standards for adoption. Two of the standards concerning distribution transformers are no longer being considered because DOE has since issued a Federal standard for them.

The product standards recommended in this report for adoption in Florida are based on the remaining ACEEE standards recommendations plus four additional standards identified by FSEC for televisions, ceiling fans, residential lighting and residential water heating. Each of the 17 standards is summarized below and in Appendix A, Table A-1.

Bottle-Type Water Dispensers Standard (ACEEE)

This standard stipulates that “hot and cold” bottle-type water dispensers meet Energy Star standby energy specification of 1.2 kWh/day.

- ❖ Incremental cost: \$12 / 0.6 year payback
- ❖ 2020 energy savings: 15.0 GWh
- ❖ 2020 emissions reductions
 - CO₂: 9,117 metric tons
 - NO_x: 15.9 metric tons
 - SO₂: 27.0 metric tons
- ❖ Currently adopted in 5 states / pending in 3 states

Commercial Boilers Standard (ACEEE)

This standard stipulates minimum *thermal* efficiencies of 80% and 82% for commercial gas and oil-fire burners respectively.

- ❖ Incremental cost: \$2,968 / 4.6 year payback
- ❖ 2020 energy savings: 224.4 Million CF
- ❖ 2020 emissions reductions
 - CO₂: 10,643 metric tons
 - NO_x: 3.5 metric tons
 - SO₂: 0.1 metric tons
- ❖ Current federal standard update seen as overdue (requires waiver)

Commercial Hot Food Holding Cabinets Standard (ACEEE)

This standard stipulates that hot food holding cabinets will meet the Energy Star maximum idle energy rate of 40 W/cubic foot of measured interior volume.

- ❖ Incremental cost: \$453 / 3.1 year payback
- ❖ 2020 energy savings: 21.3 GWh
- ❖ 2020 emissions reductions
 - CO₂: 12,946 metric tons
 - NO_x: 22.5 metric tons
 - SO₂: 38.4 metric tons
- ❖ Currently adopted in 5 states / pending in 3 states

Compact Audio Products Standard (ACEEE)

This standard stipulates that all compact audio products will meet the Energy Star maximum standby power level of 2 W (or 4 W if permanently illuminated clock display).

- ❖ Incremental cost: \$1 / 0.2 year payback
- ❖ 2020 energy savings: 98.7 GWh
- ❖ 2020 emissions reductions
 - CO₂: 59,991 metric tons
 - NO_x: 104.3 metric tons
 - SO₂: 177.7 metric tons
- ❖ Currently adopted in 3 states / pending in 2 states

DVD Players and Recorders Standard (ACEEE)

This standard stipulates that all DVD players and recorders will meet Energy Star maximum standby mode power level of 3 Watts.

- ❖ Incremental cost: \$1 / 1.0 year payback
- ❖ 2020 energy savings: 14.3 GWh
- ❖ 2020 emissions reductions
 - CO₂: 8,692 metric tons
 - NO_x: 15.1 metric tons
 - SO₂: 25.8 metric tons
- ❖ Currently adopted in 3 states / pending in 2 states

Televisions (FSEC)

This standard stipulates a maximum standby power of three Watts and a maximum active power state based on TV size.

- ❖ Incremental cost and simple payback pending.
- ❖ 2020 energy savings: 5,565 GWh
- ❖ 2020 emissions reductions
 - CO₂: 3,382,483 metric tons
 - NO_x: 5,881.5 metric tons
 - SO₂: 10,021.2 metric tons
- ❖ Currently pending in 1 state

Metal Halide Lamp Fixtures Standard (ACEEE)

This standard stipulates the ban of new probe start ballasts in metal halide light fixtures (for all lamp positions).

- ❖ Incremental cost: \$30 / 1.2 year payback
- ❖ 2020 energy savings: 510.1 GWh
- ❖ 2020 emissions reductions
 - CO₂: 310,046 metric tons
 - NO_x: 539.1 metric tons
 - SO₂: 918.6 metric tons
- ❖ Currently adopted in 10 states / pending in 4 states

Gas-Fired Pool Heater Standard (ACEEE)

This two-part standard disallows constant burning pilot lights and requires a minimum 80% thermal efficiency for gas-fired pool heaters.

- ❖ Incremental cost: \$295 / 2.5 year payback
- ❖ 2020 energy savings: 453.8 Million CF
- ❖ 2020 emissions reductions
 - CO₂: 21,286 metric tons
 - NO_x: 7.1 metric tons
 - SO₂: 0.1 metric tons
- ❖ National standard thermal efficiency minimum is 78% (requires waiver); California prohibits constant burning pilot lights

Portable Electric Spas Standard (ACEEE)

This standard stipulates a maximum portable electric spa standby energy consumption of $5 * (V/3)$ Watts where “V” is spa volume in gallons.

- ❖ Incremental cost: \$100 / 4.2 year payback
- ❖ 2020 energy savings: 6.8 GWh
- ❖ 2020 emissions reductions
 - CO₂: 4,133 metric tons
 - NO_x: 7.2 metric tons
 - SO₂: 12.2 metric tons
- ❖ Currently adopted in 3 states / pending in 1 state

Residential Furnaces, Boilers, and Furnace Fans Standard (ACEEE)

This standard stipulates that residential furnace electricity use no more than 2% of total appliance energy use and increased furnace and boiler AFUEs.

- ❖ Incremental cost: \$100 / 3.3 year payback for electricity use
- ❖ 2020 energy savings: 333.4 GWh for electricity
- ❖ 2020 emissions reductions for electricity
 - CO₂: 202,645 metric tons
 - NO_x: 352.4 metric tons
 - SO₂: 600.4 metric tons
- ❖ Incremental cost: \$6 / 2.0 year payback for increased AFUEs
- ❖ 2020 energy savings: 0.3 Million CF for gas
- ❖ 2020 emissions reductions for gas
 - CO₂: 16.4 metric tons
 - NO_x: 0 metric tons
 - SO₂: 0 metric tons
- ❖ Currently adopted in 4 states / pending in 2 state (requires waivers)

Residential Pool Pumping Standard (ACEEE and FSEC)

- ❖ This multi-part standard bans split-phase and capacitor start-induction run motors, requires two-speed pumps/controls for residential pool pumps, and requires 2” piping with motor sizing calculations that consider pipe friction loss and that motors not be sized more than 25% over the calculated size.
- ❖ Incremental cost: \$724 / 2.4 year payback
- ❖ 2020 energy savings: 4,556 GWh
- ❖ 2020 emissions reductions
 - CO₂ 2,769,199 metric tons
 - NO_x: 4,815.1 metric tons
 - SO₂: 8,204.3 metric tons
- ❖ Split-phase and capacitor start induction run motors and two-speed pumps/controls currently adopted in 2 states / pending in 1 state; piping and sizing requirements not adopted or pending in any other states.

Single-Voltage External AC to DC Power Supply Standard (ACEEE)

This standard stipulates minimum active mode efficiency and maximum no-load mode energy consumption for single-voltage external AC to DC power supplies based on output Wattage.

- ❖ Incremental cost: \$0.5 / 1.2 year payback
- ❖ 2020 energy savings: 279.4 GWh
- ❖ 2020 emissions reductions
 - CO₂: 169,823 metric tons
 - NO_x: 295.3 metric tons
 - SO₂: 503.1 metric tons

- ❖ Currently adopted in 10 states / pending in 3 states

State-Regulated Incandescent Reflector Lamps Standard (ACEEE)

This standard stipulates that most BR, BPAR, ER and R20 lamps meet the same efficacy requirements as R lamps (with some exceptions).

- ❖ Incremental cost: \$1.0 / 0.1 year payback
- ❖ 2020 energy savings: 327.5 GWh
- ❖ 2020 emissions reductions
 - CO₂: 199,059 metric tons
 - NO_x: 346.1 metric tons
 - SO₂: 589.7 metric tons
- ❖ Currently adopted in 9 states / pending in 4 states

Walk-In Refrigerators and Freezers Standard (ACEEE)

This standard stipulates a prescriptive standard for walk-in refrigerators and freezers based on a CEC standard with insulation and lighting efficacy modifications.

- ❖ Incremental cost: \$957 / 1.4 year payback
- ❖ 2020 energy savings: 235.2 GWh
- ❖ 2020 emissions reductions
 - CO₂: 142,958 metric tons
 - NO_x: 248.6 metric tons
 - SO₂: 423.5 metric tons
- ❖ Currently adopted in 5 states / pending in 4 states

Ceiling Fan Standard (FSEC)

This standard stipulates minimum efficiencies for ceiling fans with and without light kits; airflow efficiency minimums are set for low, medium and high speeds and lighting lumen per watt and other criteria are set.

- ❖ Incremental cost: \$60 / 3.5 year payback
- ❖ 2020 energy savings: 3,000 GWh
- ❖ 2020 emissions reductions
 - CO₂: 1,823,441 metric tons
 - NO_x: 3,170.6 metric tons
 - SO₂: 5,402.3 metric tons
- ❖ Currently not adopted or pending any states

Phase Out of Inefficient Incandescent Lighting (FSEC)

This standard would phase out incandescent lighting.

- ❖ Virtually all 7+ million Florida households are predominately electric incandescent / halogen lighting
- ❖ Add ~ 1,600 kWh/year of electric load
 - 0.25 kW on morning winter peak
 - 0.25 kW on summer afternoon peak
- ❖ CFL and LED substitutes available
- ❖ Incremental cost: \$1.50 / 0.4 year payback for CFLs
- ❖ 2020 energy savings: 9,528 GWh
- ❖ 2020 emissions reductions
 - CO₂: 5,791,249 metric tons
 - NO_x: 10,069.9 metric tons
 - SO₂: 17,157.7 metric tons
- ❖ Statewide Impacts by 2014
 - Energy: 3.3% reduction in total electricity use

- Demand: 3% reduction in summer peak demand (1350 MW); 740 MW or 1.4% in winter
- CO2 emissions: reduction of 4.3 million metric tons (3%)
- ❖ CFLs can reduce energy use by 2/3 and lower AC load
- ❖ Significant Demand reductions: Winter: 130 W / household; Summer: 230 W
- ❖ 2009: Default in energy compliance software assumes all interior hard-wired lighting (50% of fixtures) is compact fluorescent
- ❖ 2009: State tax of \$1 per incandescent/halogen bulbs greater than 25W
 - Funds used to establish state-wide CFL recycling programs
- ❖ 2012: Incandescent and halogen lighting lamps over 25 W can no longer be sold or imported into Florida. Lamps must have an efficacy rating > 25 lumens/Watt.
- ❖ Life of electric incandescent bulbs: 1-2 years
- ❖ Natural retirement of inefficient stock will result in rapid statewide efficiency improvements
- ❖ Faster than building new power plants
 - Costs: \$780 million annually saved by Florida consumers; \$108/per household
- ❖ California, Connecticut and NJ plan similar action on same time line

Phase Out of Electric Resistance Water Heating and Increase Minimum Gas Water Heater Energy Factors (FSEC)

This standard would phase-out electric resistance water heaters in Florida (except as backup to solar systems) and increase the minimum energy factor of gas water heaters. Standard would include low income assistance.

- ❖ Approx. 89% of Florida homes have electric resistance water heaters
- ❖ Add ~ 2,300 kWh/year of electric load
 - 0.75 kW on morning winter peak
 - 0.20 kW on summer afternoon peak
- ❖ Ready substitutes available:
 - Solar hot water with small resistance back-up element
 - Heat pump water heaters
- ❖ Incremental cost for solar hot water systems: \$2,050 / 7.4 year payback⁵
- ❖ Incremental cost for heat pump water heaters: \$950 / 6.0 year payback
- ❖ Solar & HP water heaters can easily cut energy use in half
- ❖ Demand reductions are even greater: Winter: 40-60%; Summer: 80%
- ❖ 2020 energy savings: 6,974GWh for electric resistance phase-out
- ❖ 2020 emissions reductions for electric resistance phase-out
 - CO2: 4,238,893 metric tons
 - NOx: 7,370.6 metric tons
 - SO2: 12,558.5 metric tons
- ❖ Incremental cost: \$1,250 / 12.5 year payback for increased gas water heater energy factors
- ❖ 2020 energy savings: 5,483Million CF for increased gas water heater energy factors
- ❖ 2020 emissions reductions for increased gas water heater energy factors
 - CO2: 298,892 metric tons
 - NOx: 233.3 metric tons
 - SO2: 0 metric tons
- ❖ 2010: Default water heating in energy compliance software becomes solar water heater with downsized 3500 W electric resistance element
- ❖ 2012: Electric resistance water heaters no longer sold in Florida unless installed with solar water heating system with downsized element and minimum EF of 2.0
- ❖ 2012: Heat pump water heaters become the minimum appliance standard stand-alone electric type sold in Florida
- ❖ 2012: All gas water heaters sold in Florida must have a minimum EF of 0.8
- ❖ Life of electric resistance tanks ~15 years

⁵ Cost includes current federal, state and utility incentives.

- ❖ Natural retirement of inefficient stock substitutes solar hot water and heat pump water heaters
- ❖ Statewide Impacts by 2025 to existing housing stock
 - Energy: 3.3% reduction in total electricity use
 - Demand: 2.4% reduction (1300 MW) in summer peak demand; 4.6% in winter (2400 MW).
 - CO2 emissions: reduction of 5 million tons (4%)
 - Costs: \$900 million annually saved by Florida consumers; \$125/per household
- ❖ Technologies are cost effective and conversion will benefit Florida firms and companies.

Summary

Total combined 2020 electrical savings from the proposed standards is estimated at 31,465 GWh, or 14.1% of Florida's 2006 net electricity generation of 223,751.6 GWh. Total combined 2020 savings for both electricity and gas benefits is estimated at 113,741,528 million Btus. Resulting 2020 electric generation emission savings are estimated to be 19,658 thousand metric tons of CO₂, or 15.5% of the 2006 total Florida CO₂ emissions of 126,529 thousand metric tons. Total NO_x and SO₂ savings are estimated at 33,900 metric tons (16.0% of the total 2006 Florida emissions) and 57,300 metric tons (17.4% of the total 2006 Florida emissions) respectively.

Appendix A

Table A-1 Summary of Recommended Product Standards for Florida

Product	Annual Average Baseline Energy per Product	Baseline Energy Units	Annual Operating Cost	Recommended Standard	Basis for Standard	Annual Average Energy Savings per Product	Savings Energy Units
Bottle-type water dispensers	854	kWh/yr	\$97.36	Max. 1.2 kWh/day standby energy	Energy Star and CEC Title 20	266	kWh/yr
Commercial boilers	9,246	therms/yr	\$19,877.83	Min 0.81 thermal efficiency	Proposal to ASHRAE	481	therms/yr
Commercial hot food holding cabinets	2,402	kWh/yr	\$273.83	Max. idle energy rate 40 W/ft ³	Energy Star and CEC Title 20	1,815	kWh/yr
Compact audio products	64	kWh/yr	\$7.34	Max. 2.0 W standby energy	Energy Star and CEC Title 20	53	kWh/yr
DVD players and recorders	26	kWh/yr	\$3.02	Max 3.0 W standby energy	Energy Star and CEC Title 20	11	kWh/yr
Televisions (added by FSEC)* **	442	kWh/yr	\$50.39	Max 3.0 W standby, Calif. prop. Title 20	Energy Star and CEC Title 20	215	kWh/yr
Metal halide lamp fixtures	2,015	kWh/yr	\$229.69	Pulse-start ballast	Pulse-start ballast	307	kWh/yr
Residential pool heaters*	1125	therms/yr	\$2,418.75	Min. 80% thermal effic. & electric ignition	DOE 2004	213.75	therms/yr
Portable electric spas (hot tubs)	2,500	kWh/yr	\$285.00	Max. 5 V ² (2/3) standby energy	CEC Title 20	250	kWh/yr
	110	fan kWh	\$12.54	2% electricity ratio	GAMA/CEE specification	28	fan kWh
Residential furnaces and residential boilers* (baseline AFUE=80)	165	therms/yr	\$354.75	Boilers min. 84 AFUE; Furnaces / nat. gas. Tier 1 min. 80 AFUE, Tier 2 min. 90 AFUE / oil min. 83 AFUE	For boilers, significant current sales; for Tier 1 nat. gas. furnaces, non-condensing max; for Teir 2 nat. gas. furnaces, condensing; for oil furnaces, significant current sales.	1.98	therms/yr
Residential pool pumping*	4,200	kWh/yr	\$478.80	No split-phase or capacitor start-- induction run types; 2-speeds; 2" pipe and motor sizing	2-speed pump; friction losses	2,688	kWh/yr
Single-voltage external AC to DC power supplies	38	kWh/yr	\$4.36	Varies with size	CEC Title 20 (Tier 1) and other states' standards	4.1	kWh/yr
State-regulated incandescent reflector lamps	209	kWh/yr	\$23.88	Varies with size	EPAAct 1992 standard with MA exemptions	61	kWh/yr
Walk-in refrigerators and freezers	18,859	kWh/yr	\$2,149.94	Typical installation from CEC case study	CEC Title 20 with a few modifications	8,220	kWh/yr
Ceiling fans (added by FSEC)	317	kWh/yr	\$36.14	Airflow and lighting efficiency minimums	Energy Star	142	kWh/yr
Incandescent lighting (added by FSEC)	55	kWh/yr	\$6.27	Phase out of incandescent lighting	Three states have similar plan/time line	37	kWh/yr
Res. water heaters (added by FSEC)	2,300	kWh/yr	\$262.20	Electric EF > 2 (phased in over time)	Technology is available	1,150	kWh/yr
	133	therms/yr	\$285.95	Gas EF minimum EF 0.80 (2012)		46	therms/yr

* Original ACEEE data modified based on FSEC experience and judgement.

** For televisions, average energy savings / unit includes 15% energy savings from interaction with I

Note: All data supplied by ACEEE except televisions, part of residential pool pumps, ceiling fans, incandescent lighting and electric water heaters supplied by FSEC.