

Hopping Green & Sams

Attorneys and Counselors

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BY E-FILING

Carlotta Stauffer,
Commission Clerk
2540 Shumard Oak Boulevard,
Tallahassee, Florida, 32399-0850

Re: Docket No. 150087-EG
JEA's Responses to Staff's Second Data Request

Dear Ms. Stauffer:

Enclosed for filing in the above docket are JEA's Responses to Staff's Second Data Request in the above docket.

If you have any questions, please give me a call.

Very truly yours,

HOPPING GREEN & SAMS, PA.



By: _____
Gary V. Perko

Attorneys for JEA

Enclosures

cc: Leslie Ames, Esq (by email)

- For each of the company's audit programs (residential and commercial), please state the per-customer kWh reduction assigned to each of the promoted measures listed below. If a kWh reduction is not assigned by these measures, please describe how the kWh reduction per audit participant was calculated.

Response:

	Residential Audit Behavioral Measures	original estimate kWh	adjusted kWh
1.	Set water heater temperature 10°F cooler where applicable.	171.2	41.8
2.	Wash in cold water	160.5	39.1
3.	Set cooling space temperature setpoint warmer where applicable.	52.2	12.7
4.	Set heating space temperature cooler where applicable.	20.1	4.9
5.	Set back HVAC temperature when no one is home	91.5	22.3
6.	Clean HVAC filter & coils if practical	103.0	25.1
7.	Clean refrigerator condenser coil	39.1	9.5
8.	Use manual dry settings on dishwasher	5.3	1.3
9.	Set freezer temperature setpoint 1°F warmer where applicable	16.3	4.0
10.	Unplug phantom loads	29.3	7.1
11.	Turn-off lights & ceiling fans when not in use.	7.7	1.9
12.	Turn-off computers, printers & monitors when not in use.	64.8	15.8
13.	Dry clothes outside on clothes line when possible	18.1	4.4
14.	Use curtains & shades to reduce cooling loads	40.8	10.0
Note: All energy values are at the meter		820	200

	Commercial Audit Behavioral Measures	original estimate kWh	adjusted kWh
1.	Set water heater temperature 10°F cooler where applicable.	214.4	67.7
2.	Set cooling space temperature warmer where applicable.	297.6	94.0
3.	Set heating space temperature cooler where applicable.	32.0	10.1
4.	Set back HVAC temperature when unoccupied	313.1	98.9
5.	Clean HVAC filter & coils if practical	704.4	222.6
6.	Turn-off lights & ceiling fans when not in use.	128.5	40.6
7.	Turn-off computers, printers & monitors when not in use.	19.2	6.1
Note: All energy values are at the meter		1,709	540

2. How does JEA estimate the kWh reduction by customer class from each promoted measure?

Response: Please see Attachment 1 (Commercial calculations) and Attachment 2 (Residential calculations).

ATTACHMENT 1
COMMERICAL CALCULATIONS

Behaviorial measures promoted during JEA commercial energy audit

1. Set water heater temperature 10°F cooler where applicable.
2. Set cooling space temperature warmer where applicable.
3. Set heating space temperature cooler where applicable.
4. Set back HVAC temperature when unoccupied
5. Clean HVAC filter & coils if practical
6. Turn-off lights & ceiling fans when not in use.
7. Turn-off computers, printers & monitors when not in use.

1. Set water heater temperature 10°F cooler where applicable

From End Use Load Shapes, JEA Commercial Customers average
5,890 kWh of electric hot water use per year
Use a 18% savings factor for reducing HW supply temperature

Baseline Energy Use = 5,890 kWh/year

Calculated Savings = 1,072 kWh/year

Percent Savings	
Before (Baseline)	
T _{input} =	70 °F
T _{output} =	125 °F
Delta T =	55 °F
After	
T _{input} =	70 °F
T _{output} =	115 °F
Delta T =	45 °F
Percent Savings =	18%

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.88	0.16
Summer Peak kW =	0.88	0.16

Persistence Rate = 20.0%

Average Annual Energy Savings @ Meter =	214.4 kWh
Average Annual Winter Peak Savings @ Meter =	0.032 kW
Average Annual Summer Peak Savings @ Meter =	0.032 kW

2. Set cooling temperature setpoint warmer where applicable

Use a 5% savings for calculating cooling savings

Average Annual Cooling Energy JEA Customer = 29,757 kWh

Calculated Energy Savings 1,488 kWh

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	1.0	0.05
Summer Peak kW =	15.7	0.79

Persistence Rate = 20.0%

Average Annual Energy Savings @ Meter =	297.6 kWh
Average Annual Winter Peak Savings @ Meter =	0.010 kW
Average Annual Summer Peak Savings @ Meter =	0.157 kW

4. Set back HVAC temperature during unoccupied periods

HVAC Temperature set-back will yield about 10% savings during u

Average Annual HVAC Energy JEA Customer = 31,306 kWh

Calculated Energy Savings 3,131 kWh

The reduction in peak is difficult since most businesses are open during peak hours. A conservative 25% estimate of businesses are capable of shedding peak by switching off loads during peak periods.

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	1.6	0.16
Summer Peak kW =	3.7	0.37

Persistence Rate = 10.0%

Average Annual Energy Savings @ Meter =	313.1 kWh
Average Annual Winter Peak Savings @ Meter =	0.016 kW
Average Annual Summer Peak Savings @ Meter =	0.037 kW

6. Turn-off lights & ceiling fans when not in use

Turning off lights & ceilings fans when no one is around will yield about 2% savings

Average Annual Lighting Energy JEA Customer = 32,118 kWh

Calculated Energy Savings 642 kWh

The reduction in peak is difficult since most businesses are open during peak hours. A conservative 25% estimate of businesses are capable of shedding peak by switching off loads during peak periods.

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	1.33	0.027
Summer Peak kW =	1.33	0.027

Persistence Rate = 20.0%

Average Annual Energy Savings @ Meter =	128.5 kWh
Average Annual Winter Peak Savings @ Meter =	0.005 kW
Average Annual Summer Peak Savings @ Meter =	0.005 kW

JEA's engineering estimates (initial values no EM&V) for energy audits are:

Annual Energy Saved (kWh)	1,709
Annual Winter Peak Saved (kW)	0.287
Annual Summer Peak Saved (kW)	0.605

Based on other mature energy audit/education programs in the State of Florida which have undergone EM&V analysis (see file titled: "Benchmark of State FEECA Programs") JEA is more comfortable using the following "@ meter" values:

Annual Energy Saved (kWh)	540
Annual Winter Peak Saved (kW)	0.120
Annual Summer Peak Saved (kW)	0.120

As part of JEA's ongoing EM&V work values will be adjusted appropriately

ATTACHMENT 2
RESIDENTIAL CALCULATIONS

Behavioral measures promoted during JEA residential energy audit

1. Set water heater temperature 10°F cooler where applicable.
2. Wash in cold water
3. Set cooling space temperature setpoint warmer where applicable.
4. Set heating space temperature cooler where applicable.
5. Set back HVAC temperature when no one is home
6. Clean HVAC filter & coils if practical
7. Clean refrigerator condenser coil
8. Use manual dry settings on dishwasher
9. Set freezer temperature setpoint 1°F warmer where applicable (refrigerator setting not to exceed 40°F).
10. Unplug phantom loads
11. Turn-off lights & ceiling fans when not in use.
12. Turn-off computers, printers & monitors when not in use.
13. Dry clothes outside on clothes line when possible
14. Use curtains & shades to reduce cooling loads

1. Set water heater temperature 10°F cooler where applicable.

A family of four on average uses 96 gallons of hot water per day
 A 10 degree reduction in supply temperature will yield the following savings.

Daily hot water use =	96 gallons
T _{input} =	70 °F
T _{output} =	125 °F
Delta T =	55 °F

Baseline Energy Use = 44,035 BTU/day

Daily hot water use =	96 gallons
T _{input} =	70 °F
T _{output} =	115 °F
Delta T =	45 °F

Calculated ECM Energy Use = 36,029 BTU/day

Calculated Savings = 8,006 BTU/day

Table 2: Average domestic water use in the United States (Data Source Adapted from Hager, et al. Residential end uses of water: 1999. American Water Works Association Research Foundation.)

Plumbing Fixture or Appliance	Gals (Gal) per person per day
Toilet	13.5
Clothes washer	15.0
Shower	11.8
Faucets	10.9
Leak	9.5
Other	1.6
Bath	1.2
Dishwasher	1.0
Total	69.5

Hot Water Use per Person	
Fixture	gal/person/day
Clothes Washer	5
Shower	15
Faucets	3
Dishwasher	1
TOTAL	24

$$Q_{\text{reduction}} = \text{Daily use} \times \text{Temp. Dif.} \times C_p \text{ of H}_2\text{O} \times \text{density of H}_2\text{O} = 96 \text{ gallons/day} \times 10 \text{ }^\circ\text{F} \times 1.0 \text{ Btu/lb/}^\circ\text{F} \times 8.34 \text{ lb/gallon} = 8,006 \text{ Btu/day}$$

2.3 kWh/day	@ 0.13 \$/kWh	= \$0.30
71.4 kWh/month	@ 0.13 \$/kWh	= \$9.28
856.2 kWh/year	@ 0.13 \$/kWh	= \$111.31

The reduction in peak is based on percentage reduction of the temperature difference, therefore, 10/55 or a 18.2% reduction in the electric hot water end use load shape

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.5	0.09
Summer Peak kW =	0.3	0.05

Persistence Rate = 20.0%

Average Annual Energy Savings @ Meter =	171.2 kWh
Average Annual Winter Peak Savings @ Meter =	0.0182 kW
Average Annual Summer Peak Savings @ Meter =	0.0109 kW

2. Wash in cold water

A family of four on average uses 20 gallons of hot water per day
 A 10 degree reduction in supply temperature will yield the following savings:

Daily hot water use =	20 gallons
T_{input} =	70 °F
T_{output} =	115 °F
Delta T =	45 °F

Baseline Energy Use = 7,506 BTU/day

Daily hot water use =	0 gallons
T_{input} =	70 °F
T_{output} =	115 °F
Delta T =	45 °F

Calculated ECM Energy Use = 0 BTU/day

Calculated Savings = 7,506 BTU/day

Table 2: Average domestic water use in the United States (Data Source Adapted from Hayes, et al. Residential end uses of water: 1996. American Water Works Association Research Foundation.)

Plumbing fixture or appliance	Use (gal per person per day)
Toilet	13.5
Clothes washer	15.0
Shower	11.8
Faucets	10.0
Leak	9.5
Other	1.6
Sink	1.2
Dishwasher	1.0
Total	65.1

Hot Water Use per Person	
Fixture	gal/person/day
Clothes Washer	5
TOTAL	5

$$Q_{day} = \text{Daily use} \times \text{Temp. Dif.} \times C_p \text{ of H}_2\text{O} \times \text{density of H}_2\text{O} = 7,506 \text{ Btu/day}$$

20 gallons/day	x 45 °F	x 1.0 Btu/lb./°F	x 8.34 lb./gallon	= 7,506 Btu/day		
					2.2 kWh/day	@ 0.13 \$/kWh = \$0.29
					66.9 kWh/month	@ 0.13 \$/kWh = \$8.70
					802.7 kWh/year	@ 0.13 \$/kWh = \$104.35

The reduction in peak is based on percentage reduction of the hw use; therefore, 10/96 or a 10.4% reduction in the electric hot water end use load shape

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.5	0.05
Summer Peak kW =	0.3	0.03

Persistence Rate = 20.0%

Average Annual Energy Savings @ Meter =	160.5 kWh
Average Annual Winter Peak Savings @ Meter =	0.0104 kW
Average Annual Summer Peak Savings @ Meter =	0.0062 kW

3. Set cooling temperature setpoint warmer where applicable.

A 1 degree temperature increase from 78°F to 79°F will yield approx. 8% savings

Average Annual Cooling Energy JEA Customer = 3,260 kWh

Calculated Energy Savings 261 kWh

The reduction in cooling peak is based on the same 8% percent reduction of energy

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.0	0.00
Summer Peak kW =	1.6	0.13

Persistence Rate = 20.0%

Average Annual Energy Savings @ Meter =	52.2 kWh
Average Annual Winter Peak Savings @ Meter =	0.0000 kW
Average Annual Summer Peak Savings @ Meter =	0.0256 kW

4. Set heating temperature setpoint cooler where applicable.

A 1 degree temperature decrease from 70°F to 69°F will yield approx. 6% savings

Average Annual Heating Energy JEA Customer = 1,677 kWh

Calculated Energy Savings 101 kWh

The reduction in heating peak is based on the same 6% percent reduction of energy

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	2.9	0.17
Summer Peak kW =	0.0	0.00

Persistence Rate = 20.0%

Average Annual Energy Savings @ Meter =	20.1 kWh
Average Annual Winter Peak Savings @ Meter =	0.0348 kW
Average Annual Summer Peak Savings @ Meter =	0.0000 kW

5. Set back HVAC temperature during unoccupied periods

HVAC Temperature set-back will yield about 10% savings

Average Annual HVAC Energy JEA Customer = 4,576 kWh

Calculated Energy Savings 458 kWh

The reduction in peak is based on the same 10% percent reduction of energy use

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	2.7	0.27
Summer Peak kW =	1.5	0.15

Persistence Rate = 20.0%

Average Annual Energy Savings @ Meter =	91.5 kWh
Average Annual Winter Peak Savings @ Meter =	0.0545 kW
Average Annual Summer Peak Savings @ Meter =	0.0294 kW

6. Clean/Replace Air Filter

Cleaning/Replace air filter will yield approx. 10% savings

Average Annual A/C Energy JEA Customer = 4,118 kWh

Calculated Energy Savings 412 kWh

The reduction in peaks is based on 10% percent reduction of energy use

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	2.45	0.25
Summer Peak kW =	1.32	0.13

Persistence Rate = 25.0%

Average Annual Energy Savings @ Meter =	103.0 kWh
Average Annual Winter Peak Savings @ Meter =	0.0613 kW
Average Annual Summer Peak Savings @ Meter =	0.0331 kW

7. Clean refrigerator condenser coil

Cleaning refrigerator coils will yield approx. 6% savings

Average Annual Refrigerator Energy JEA Customer = 1,304 kWh

Calculated Energy Savings 78 kWh

The reduction in peaks is based on the same 6% percent reduction of energy use

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.14	0.01
Summer Peak kW =	0.18	0.01

Persistence Rate = 50.0%

Average Annual Energy Savings @ Meter =	39.1 kWh
Average Annual Winter Peak Savings @ Meter =	0.0042 kW
Average Annual Summer Peak Savings @ Meter =	0.0054 kW

Sustainable Choices

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Home > In the Home > Refrigerator Coils

Clean Refrigerator Condenser Coils Twice a Year

Explore:

Carbon Impact:

Money Savings:

Health Helper:

Overview

This is one of the less intuitive and lesser known opportunities for energy savings: refrigerator coils. For starters, where and what are refrigerator coils? Condenser coils in your refrigerator cool a refrigerant liquid, which is then used to cool the air inside the fridge. They are markedly less efficient at doing their job when they are covered with lint, dust, and other kitchen floor crud. While it may sound like a hassle to pull your fridge out from the wall to clean the coils, it's really not such a big deal if you only do it once or twice a year. And hey—it could cut 6% off your fridge's energy use.

Tip & Tricks

Make a friend. It's a good idea to ask someone to help you with your fridge, since it is probably big and heavy. Set up a trade with a friend—start by cleaning one fridge and then move on to the other. The work will get done quicker, and you'll have fun doing it!

Web & Print Resources

How to clean refrigerator coils:
www.hometips.com/home_problems/tips0309_refrig/tips_refrig04.html

General information about efficient refrigerators:
www.energystar.gov/index.cfm?c=refrig_pr_refrigerators

Fun Facts

Cleaning your refrigerator coils can result in an energy savings of about 6% **annually**.

Condenser coils cool refrigerant liquid, which is used to cool the air inside the fridge.

Overview

- Get Started
- Computer Sleep Mode
- Unplugging Appliances
- Fluorescent Lights
- Wash Heating/Cooling
- Wash Water Temperature
- Thermostat Setting
- Dishwasher & Washing Machine
- Running Water
- Mowing Irrigation
- Short Showers
- Games Like
- Stop & Go
- Green Power
- Carbon Offsets
- Weather Stripping
- Insulation
- Refrigerator Coils
- Furnace Filter
- Programmable Thermostat
- Energy Audits

7. Use natural dry settings on dishwasher

Using "natural dry" setting on dishwasher will yield about 5% savings

Average Annual Dishwasher Energy JEA Customer = 212 kWh

Calculated Energy Savings 11 kWh

The reduction in peaks is based on the same 5% percent reduction of energy use

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.03	0.002
Summer Peak kW =	0.04	0.002

Persistence Rate = 50.0%

Average Annual Energy Savings @ Meter =	5.3 kWh
Average Annual Winter Peak Savings @ Meter =	0.0008 kW
Average Annual Summer Peak Savings @ Meter =	0.0010 kW

7. Set freezer temperature setpoint warmer where applicable (refrigerator setting not to exceed 40°F).

Setting freezer from 0 degrees to 5 degrees will yield about 5% savings

Average Annual Refrigerator Energy JEA Customer = 1,304 kWh

Calculated Energy Savings 65 kWh

The reduction in peaks is based on the same 5% percent reduction of energy use

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.03	0.002
Summer Peak kW =	0.04	0.002

Persistence Rate = 25.0%

Average Annual Energy Savings @ Meter =	16.3 kWh
Average Annual Winter Peak Savings @ Meter =	0.0004 kW
Average Annual Summer Peak Savings @ Meter =	0.0005 kW

§. Unplug Phantom Loads

Unplugging phantom loads will yield about 5% savings

Average Annual Phantom Loads JEA Customer = 2,344 kWh

Calculated Energy Savings 117 kWh

The reduction in peaks is based on the same 5% percent reduction of energy use

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.28	0.014
Summer Peak kW =	0.29	0.015

Persistence Rate = 25.0%

Average Annual Energy Savings @ Meter =	29.3 kWh
Average Annual Winter Peak Savings @ Meter =	0.0035 kW
Average Annual Summer Peak Savings @ Meter =	0.0036 kW

9. Turn-off lights & ceiling fans when not in use

Turning off lights & ceilings fans when no one is around will yield about 2% savings

Average Annual Lighting Energy JEA Customer = 1,530 kWh

Calculated Energy Savings 31 kWh

The reduction in peaks is based on the same 2% percent reduction of energy use

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.15	0.003
Summer Peak kW =	0.25	0.005

Persistence Rate = 25.0%

Average Annual Energy Savings @ Meter =	7.7 kWh
Average Annual Winter Peak Savings @ Meter =	0.0008 kW
Average Annual Summer Peak Savings @ Meter =	0.0013 kW

9. Turn-off computers, printers & monitors when not in use

Turning off computers & printers when no one is around will yield about 259 kWh savings/year

Average Annual Lighting Energy JEA Customer = 1,530 kWh

Estimated Annual Energy Savings 259 kWh

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.44	0.022
Summer Peak kW =	0.44	0.022

Persistence Rate = 25.0%

Average Annual Energy Savings @ Meter =	64.8 kWh
Average Annual Winter Peak Savings @ Meter =	0.0055 kW
Average Annual Summer Peak Savings @ Meter =	0.0055 kW

11. Dry clothes outside on clothes line when possible

Using a clothesline weather permitting will yield about 10% savings

Average Annual Dryer Energy JEA Customer = 722 kWh

Calculated Energy Savings 72 kWh

The reduction in peaks is based on the same 10% percent reduction of energy use

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.09	0.009
Summer Peak kW =	0.12	0.012

Persistence Rate = 25.0%

Average Annual Energy Savings @ Meter =	18.1 kWh
Average Annual Winter Peak Savings @ Meter =	0.0023 kW
Average Annual Summer Peak Savings @ Meter =	0.0030 kW

14. Use curtains & shades to reduce cooling loads

Use curtains & shades to block direct sunlight will yield approx. 5% savings

Average Annual Cooling Energy JEA Customer = 3,260 kWh

Calculated Energy Savings 163 kWh

The reduction in cooling peak is based on the same 5% percent reduction of energy

	Average Peak (kW)	Average Peak Reduction (kW)
Winter Peak kW =	0.0	0.00
Summer Peak kW =	1.6	0.08

Persistence Rate = 25.0%

Average Annual Energy Savings @ Meter =	40.8 kWh
Average Annual Winter Peak Savings @ Meter =	0.0000 kW
Average Annual Summer Peak Savings @ Meter =	0.0200 kW

JEA's engineering estimates (initial values no EM&V) for energy audits are:

Annual Energy Saved (kWh)	820
Annual Winter Peak Saved (kW)	0.197
Annual Summer Peak Saved (kW)	0.146

Based on other mature energy audit/education programs in the State of Florida which have undergone EM&V analysis (see file titled: "Benchmark of State FEECA Programs") JEA is more comfortable using the following "@ meter" values:

Annual Energy Saved (kWh)	200
Annual Winter Peak Saved (kW)	0.100
Annual Summer Peak Saved (kW)	0.100

As part of JEA's ongoing EM&V work values will be adjusted appropriately