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January 14, 2019

VIA E-PORTAL FILING

Ms. Carlotta S. Stauffer
Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Docket No. 20180186-GU- Petition for approval of demand side management goals and residential customer assisted and commercial walk-through energy audit programs, by Peoples Gas System

Dear Ms. Stauffer:

Attached for electronic filing in the above docket on behalf of Peoples Gas System, please find its Response to Staff's First Data Request (Nos. 1-19). By separate cover, a CD is being mailed to Mr. Wright which contains the referenced excel charts.

Your assistance in this matter is greatly appreciated.

Sincerely,

Andrew M. Brown

AB/plb
Attachment
cc:

Douglas Wright, Engineering Specialist, Florida Public Service Commission
Mr. Mark R. Roche
Ansley Watson, Jr., Esq.

**PEOPLES GAS SYSTEM
DOCKET NO. 20180186-GU
STAFF'S FIRST DATA REQUEST
REQUEST NO. 1
BATES STAMPED PAGE: 1
FILED: JANUARY 14, 2019**

- 1.** Please refer to Bates Stamp Page (BSP) 1 of the petition. Please rectify the discrepancy between the phrase "the company's tariff sheets for these programs attached" and the availability of the tariff sheets.
 - A.** The company's use of the term "tariff sheets" was in error. The proposed Demand Side Management ("DSM") goals, Residential Customer Assisted (Online) and Commercial Walk-Through Energy Audit DSM programs are not shown in tariff sheets other than the Energy Conservation Cost Recovery Clause which does not need to be amended by this filing. The details of these programs are seen in the Exhibits to the Petition.

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Please refer to Exhibit "A" of the petition when answering the following questions.

- 2.** Please refer to BSP 12. Please provide a yearly and per-sector breakdown of projected site energy consumption for the years 2019-2028 in Microsoft Excel format with formulas intact.

- A.** The yearly and per-sector breakdown of projected site energy consumption for the years 2019-2028 that is referenced in Bates Stamped Page ("BSP") 12 is provided on the accompanying CD in Microsoft Excel format with formulas intact. On the Microsoft Excel sheet please see tab titled, "Customer Count Projection".

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- 3.** Please refer to BSP 17. PGS indicates that "[t]he numerical DSM goals proposed for the ten-year period (20 19-2028) are based upon PGS's most recent load and customer forecast planning process."
- a. Did PGS use these load and customer forecasts in developing its projection of customer site energy consumption presented on BSP 12? If not, please explain.
 - b. Did PGS use these load and customer forecasts in developing its Technical Potential presented on BSP 14? If not, please explain.
 - c. Did PGS use these load and customer forecasts in developing its Achievable Potential presented on BSP 16? If not, please explain.
- A.**
- a. Yes, Peoples Gas System used these load and customer forecasts in developing its projection of customer site energy consumption presented on BSP 12.
 - b. Yes, Peoples Gas System used these load and customer forecasts in developing its Technical Potential presented on BSP 14.
 - c. Yes, Peoples Gas System used the customer forecast in developing its Achievable Potential presented on BSP 16. The load forecast was not used in developing the Achievable Potential. The Achievable Potential is based upon the incremental energy in therm savings from each projected measure that is installed from the projected participants.

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4. If the responses to Question Nos. 3(a) and 3(b) are affirmative, please answer the following questions:
- a. Please describe, in detail, how the load and customer forecasts used in both the projection of customer site energy consumption and the derivation of the Technical Potential are developed. Please also discuss the selection of independent variables and function forms, as well as any underlying assumptions used.
 - b. Please describe the sensitivity analyses, if any, performed on the above-discussed forecasts and provide the relevant results.
 - c. Please identify all the Commission dockets in which the same/similar load and customer forecasts have been used.
 - d. Please specify the change/improvement, if any, made to the forecasts since their last use in a Commission docket(s).
 - e. Please provide a detailed description of how the above-discussed forecasts were used in the projection of customer site energy consumption, presented on BSP 12, and the development of the Technical Potential, presented on BSP 14.

- A. a. The load and customer forecasts used in both the projection of customer site energy consumption and the derivation of the Technical Potential are developed at the division level of the company. Peoples Gas System has 14 divisions. Customer and therms-per-customer forecasts for the residential and small commercial sectors are based on 56 separate equations. These equations are developed using Itron's MetrixND forecasting tool which is regression based.

The customer model is a 28 equation model made up of 14 divisional models for the residential sector and 14 models for the small commercial sector. Typically, the past ten years' number of customers are the dependent variable. The primary independent variables, also known as explanatory variables, used in the customer models are population growth, and/or trend variables. In addition, binary variables are used to adjust for anomalies or seasonality. Assumptions and result are reviewed for reasonableness and consistency with recent trends.

The therms-per-customer model is also a 28 equation model made up of 14 divisional residential and 14 small commercial equations. These average use equations are developed similarly to the customers models with the primary explanatory variable being cooling and/or heating degree-days which explains the historical monthly weather variability. Since future weather is unknown, a normal weather pattern (20 year average) is assumed and used over the forecast horizon.

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Each assumption and result are reviewed for reasonableness and consistency with recent trends.

To derive the residential and small commercial total therm forecasts for each of the 14 divisions, the 28 customer model results and the 28 therms-per-customer model results are multiplied, resulting in total therms.

The customer and therm forecasts for large commercial and industrial customers are conducted exogenously from the company's regression model tools. Each of these customers are forecasted individually based on historical trends and known changes in their operations. Additional new growth is added through the company's subject matter experts based on known or expected future developments and pipeline expansions.

b. Sensitivities were not conducted on the above-discussed forecasts.

c. Below is a list of all the Commission dockets in which the same/similar load and customer forecasts have been used:

- Annual "03" Purchased Gas Adjustment ("PGA") true-up
- Annual "04" Natural Gas Conservation Cost Recovery
- 20180044 Consideration of the Tax Impacts Associated with Tax Cuts and Jobs Act of 2017 for Peoples Gas System
- 20180173 Petition for approval of true-up, projected 2018 true-up, and 2019 revenue requirements and surcharges with cast iron/bare steel pipe replacement rider, by Peoples Gas System
- 20170192 Petition for approval of true-up, projected 2017 true-up, and 2018 revenue requirements and surcharges with cast iron/bare steel pipe replacement rider, by Peoples Gas System
- 20160201 Petition for approval of true-up, projected 2016 true-up, and 2017 revenue requirements and surcharges with cast iron/bare steel pipe replacement rider, by Peoples Gas System
- 20150203 Petition for approval of true-up, projected 2015 true-up, and 2016 revenue requirements and surcharges with cast iron/bare steel pipe replacement rider, by Peoples Gas System
- 20140183 Petition for approval of Cast Iron/Bare Steel Pipe Replacement Rider (Rider CI/BSR), by Peoples Gas System
- 20110320 Petition for approval of Cast Iron/Bare Steel Pipe Replacement Rider (Rider CI/BSR), by Peoples Gas System
- 20080318 Petition for rate increase by Peoples Gas System

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d. As part of the annual forecast process, the company updates all models with the most recent historical customer and therm data, as well as the newest assumptions. Models are calibrated as needed by adding or removing binary variables.

e. The overall forecast was utilized in conjunction with the forecasted customer count in each segment to determine the per customer site energy consumption. This process is performed by taking the projected therms used in that individual customer segment and dividing it by the projected customer count to develop the projected customer site energy consumption. The forecasted customer count is used to assist in projecting the number of measures that could be physically installed or implemented without regard to the achievability or cost.

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- 5.** If the response to Question No. 3(c) is affirmative, please answer the following questions:
- a. Please describe, in detail, how the load and customer forecasts used are developed. Please also discuss the selection of independent variables and functional forms, as well as any underlying assumptions used.
 - b. Please describe the sensitivity analyses, if any, performed on the above-discussed forecasts and provide the relevant results.
 - c. Please identify all the Commission dockets in which the same/similar load and customer forecasts have been used.
 - d. Please specify the change/improvement, if any, made to the forecasts since their last use in a Commission docket(s).
 - e. Please provide a detailed description of how the above-discussed forecasts were used in the development of the Available Potential, presented on BSP 16.
- A.**
- a. Please see Response No. 4a this set.
 - b. Please see Response No. 4b this set.
 - c. Please see Response No. 4c this set.
 - d. Please see Response No. 4d this set.
 - e. The load forecast was not used in the development of the Achievable Potential because the Achievable Potential is based upon the company's current programs and is based upon the incremental reduction of natural gas usage from a customer installing a specific measure. The forecasted customer count was utilized in the development of the Achievable Potential. The forecasted customer count was used to develop growth rates from year to year which was used to escalate the number of projected program (measure) participants in each year. This escalation calculation can be found on the accompanying CD in Microsoft Excel format with formulas intact. On the Microsoft Excel sheet please see tab titled, "Customer Count Projection".

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- 6.** Please provide all worksheets showing the development of the load and customer forecasts discussed in Question Nos. 4-5 above in Microsoft Excel format with links and formulas intact.

- A.** The worksheets showing the development of the load and customer forecasts discussed in Question Nos. 4-5 above in Microsoft Excel format with links and formulas intact. On the Microsoft Excel sheet please see tab titled, "2019 Load and Cust forecast".

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7. Please refer to BSP 24-25.
- a. Please explain why residential customer consumption is expected to remain fairly constant over the 2019-2028 period.
 - b. Please explain why commercial customer consumption is expected to decline over the 2019-2028 period.
 - c. Please explain why industrial customer consumption is expected to increase over the 2019-2028 period.
 - d. Please identify and describe the industries to which each of PGS's 62 industrial customers belong.
- A.**
- a. Trends in average therm consumption for the residential sector has been relatively stable over the past decade, with most of the volatility being weather driven. This relatively stable trend, which excludes weather variability, is continued into the forecast horizon.
 - b. Peoples Gas System is projecting that site energy usage per commercial customer is declining due to the faster growth projection of smaller commercial customers (2.5 percent growth rate) versus larger commercial customers (2.2 percent growth rate).
 - c. The company is projecting to serve larger liquefied natural gas ("LNG") customers. These larger LNG customers are the primary driver for an increase in industrial average use.
 - d. The composition of the 62 industrial customers is made up of the following industries:
 - Aluminum processing
 - Asphalt manufacturer
 - Brewery
 - Building materials manufacturer
 - Chemical manufacturer
 - Electric utilities
 - Entertainment
 - Fertilizer manufacturer
 - Food manufacturer
 - Glass manufacturer
 - Hospital/healthcare
 - Juice manufacturer
 - Steel processing
 - Wood processing

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- Universities
- US Government
- US Navy

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8. Please refer to BSP 20-22.
- a. Please discuss how these measures were identified for inclusion in the Technical Potential.
- b. Please provide a description of each of these measures and identify how each yield therm savings over their respective baselines.
- A.**
- a.** Peoples Gas System identified the measures for inclusion in the Technical potential through the following methods:
- Documented technologies the company is aware of that are commercially available in Florida in which customers can install to reduce the incremental use of natural gas either in homes or commercial/industrial facilities.
 - Researched other utility/state Technical Potential studies and Technical Reference Manuals to compare technologies on those measure lists. Evaluated any missing measures to ensure the technology is commercially available in Florida in which customers can install to reduce the incremental use of natural gas either in homes or commercial/industrial facilities.
 - Examined studies performed through the United States Department of Energy and the Energy Information Administration to compare technologies utilized in these studies. Evaluated any missing measures to ensure the technology is commercially available in Florida in which customers can install to reduce the incremental use of natural gas either in homes or commercial/industrial facilities.
- b.** A description of each of these measures is further below. The savings over the respective baseline is shown on the worksheets in the Microsoft Excel sheet with formulas intact on the accompanying CD. The methodology to develop how each measure yields therm savings, on a per site basis, over their respective baselines is shown in Column "I" on each of the tabs below under each measure. The inputs for each measure that support the development of the incremental savings in therms is shown on the applicable row with labels of inputs. On the Microsoft Excel sheet please see tabs titled:
- Res – WH
 - Res – Pool Heating
 - Res – Cooking
 - Res – Laundry
 - Res – HVAC
 - Comm – WH
 - Comm – Cooking
 - Comm – Laundry

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- Comm - HVAC
- Ind - WH
- Ind - HVAC
- Ind - Process

Residential Low Flow Showerhead

Measure Description:

A low flow showerhead reduces the flow of water to save both water and energy.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Population	328,686

Baseline Efficiency (GPM)	2.2
New Efficiency (GPM)	1.5
Average Shower Time (Mins)	7.8
Average Number of People	2.58
Average Showers per Person per Day	1.3
Delta T (Degrees)	32
Savings per Premise (Therms)	21.211

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Residential Low Flow Faucet Aerator

Measure Description:

A low flow faucet aerator reduces the flow of water to save both water and energy.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Population	328,686

Baseline Efficiency (GPM)	2.2
New Efficiency (GPM)	1.0
Wash Time (Mins)	0.5
Average Number of People	2.58
Average Handwashes per Person per Day	8
Delta T (Degrees)	32
Savings per Premise (Therms)	9.563

Residential Water Heater Temperature Check Card

Measure Description:

A temperature card that illustrates the temperature heating setting of the water heater that enables the occupants to downturn/set back the heating set point.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	5
Applicable Population	311,387

Base Gallons per Day (Gallons)	34.15
Average Number of People	2.58
Temperature Downturn (Degrees)	10
Savings per Premise (Therms)	42.521

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Residential Hot Water Pipe Insulation

Measure Description:

Insulating uninsulated hot water pipes that carry hot water through unconditioned spaces.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	13
Applicable Population	34,599

Water Heater Base Efficiency	0.63
Base R-Value	1.0
New R -Value	3.0
Length of Pipe (Feet)	6
Diameter of Pipe (Inches)	0.75
Water Heater Temperature (Degrees)	130
Average Temperature in Garage (Degrees)	90
Savings per Premise (Therms)	2.655

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Residential Condensing Water Heater

Measure Description:

A water heater that allows for the additional capturing of the latent heat of condensation to a storage tank of hot water.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	13
Applicable Population	120,801

Baseline Efficiency of Tank	0.63
New Efficiency of Tank	0.95
Baseline Efficiency of Tankless	0.81
New Efficiency of Tankless	0.95
Base Gallons per Day (Gallons)	34.15
Average Number of People	2.58
Delta T (Degrees)	32
Savings per Premise from Tank (Therms)	28.875
Savings per Premise from Tankless (Therms)	4.512

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Residential Tankless Water Heater

Measure Description:

An on-demand type water heater that heats water directly without the use of a storage tank.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	20
Applicable Population	44,290

Baseline Efficiency of Tank	0.63
New Efficiency of Tank	0.90
Baseline Efficiency of Tankless	0.81
New Efficiency of Tankless	0.90
Base Gallons per Day (Gallons)	34.15
Average Number of People	2.58
Delta T (Degrees)	32
Savings per Premise from Tank (Therms)	25.717
Savings per Premise from Tankless (Therms)	8.572

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Residential Energy Star Water Heater

Measure Description:

An ENERGY STAR certified water heater with a storage tank of hot water.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	13
Applicable Population	132,616

Baseline Efficiency	0.63
New Efficiency	0.66
Base Gallons per Day (Gallons)	34.15
Average Number of People	2.58
Delta T (Degrees)	32
Savings per Premise (Therms)	3.897

Residential Solar Water Heater

Measure Description:

A water heater that uses a solar collector to heat water to a storage tank of hot water.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	15
Applicable Population	31,642

Baseline Efficiency from Tank	0.63
Baseline Efficiency from Tankless	0.81
Base Gallons per Day (Gallons)	34.15
Average Number of People	2.58
Delta T (Degrees)	32
Savings per Premise from Tank (Therms)	136.069
Savings per Premise from Tankless Therms)	105.831

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Residential Energy Star Dishwasher

Measure Description:

An ENERGY STAR certified dishwasher that uses less water and energy.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	13
Applicable Population	176,504

Baseline Gallons per Cycle (GPC)	5.0
New Gallons per Cycle (GPC)	3.5
Average Loads per Day	0.28
Average Number of People	2.58
Delta T (Degrees)	58
Savings per Premise (Therms)	0.741

Residential Energy Star Washer

Measure Description:

An ENERGY STAR certified washer that uses less water and energy.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Population	336,298

Baseline IWF (GPC/CF)	6.5
New IWF (GPC/CF)	4.3
Average Loads per Year	300
Washer Size (Cubic Feet)	4.5
Delta T (Degrees)	58
Savings per Premise (Therms)	22.777

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Residential Front-Loading Washer

Measure Description:

A high-efficient clothes washer that uses less water and energy than a top-loading washer.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Population	336,298

Baseline IWF (GPC/CF)	6.5
New IWF (GPC/CF)	3.2
Average Loads per Year	300
Washer Size (Cubic Feet)	4.5
Delta T (Degrees)	58
Savings per Premise (Therms)	34.165

Residential Gas Pool Heater

Measure Description:

A gas fired pool heating system that heats water for a swimming pool.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Population	6,641

Baseline Efficiency	0.55
New Efficiency	0.95
Hours per Year (Hours)	700
Heater Rating (Btu/hr.)	250,000
Savings per Premise (Therms)	737

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Residential Solar Water Pool Heater

Measure Description:

A pool heating system that uses a solar collector to heat water for a swimming pool.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	20
Applicable Population	2,530

Baseline Efficiency	0.55
Hours per Year (Hours)	700
Displaced Heater Rating (Btu/hr.)	250,000
Savings per Premise (Therms)	1,750

Residential Insulating Pool Cover

Measure Description:

A pool cover that reduces the ambient heat loss from swimming pools.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Population	15,811

Baseline Efficiency	0.55
Hours per Year (Hours)	700
Heater Rating (Btu/hr.)	250,000
Savings per Premise (Therms)	107

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Residential Range/Cooktop

Measure Description:

A cooktop in which the combustion of natural gas is used as the source of heat.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	15
Applicable Population	273,805

Baseline Efficiency	0.385
New Efficiency	0.42
Cook Time per Day (Mins)	30
Cooktop Rating (Btu/hr.)	9,000
Savings per Premise (Therms)	1.369

Residential Oven

Measure Description:

An oven heated by natural gas.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	12
Applicable Population	273,805

Baseline Efficiency	0.385
New Efficiency	0.42
Cook Time per Day (Mins)	30
Cooktop Rating (Btu/hr.)	20,000
Savings per Premise (Therms)	3.042

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Residential Furnace

Measure Description:

A natural gas heating system used to heat a home.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	21
Applicable Population	135,361

Baseline Efficiency	0.80
New Efficiency	0.95
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	45
Savings per Premise (Therms)	49.737

Residential Hydronic Heating

Measure Description:

A home heating system that uses radiant water heating to heat a home.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	6,750

Baseline Efficiency	0.80
New Efficiency	0.95
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	45
Savings per Premise (Therms)	49.737

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Residential Gas Heat Pump

Measure Description:

An air-source heat pump that uses natural gas as a heat source.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Population	28,778

Baseline Efficiency	0.80
New Efficiency	1.0
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	45
Savings per Premise (Therms)	63.000

Residential Programmable Thermostat

Measure Description:

A thermostat that can be programmed to adjust cooling and heating set points at different times of the day.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Population	108,743

Baseline Efficiency	0.80
Average Premise Size (Square Feet)	1,938
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	45
Delta T Adjust (Degrees)	5
Savings per Premise (Therms)	0.010

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Residential Duct Repair

Measure Description:

Sealing the joints throughout the air duct system in unconditioned spaces to improve the HVAC system's efficiency.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	18
Applicable Population	93,432

Baseline Efficiency	0.78
New Efficiency	0.80
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	45
Savings per Premise (Therms)	7.875

Residential Attic Insulation

Measure Description:

Insulation that is used to reduce heat loss or gain by providing a barrier between the inside of a home and the outside climate.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	52,398

Baseline Efficiency (R-Value)	10 & 19
New Efficiency (R-Value)	30
Average Premise Size (Square Feet)	1,938
Heating Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	45
Delta T (Degrees)	7.4
Savings per Premise (Flat to Low Pitch) (Therms)	4.755
Savings per Premise (Regular Pitch) (Therms)	6.693

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Residential Ceiling Insulation

Measure Description:

Insulation that is used to reduce heat loss or gain by providing a barrier between the inside of a home and the outside climate.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	52,398

Baseline Efficiency (R-Value)	10 & 19
New Efficiency (R- Value)	30
Average Premise Size (Square Feet)	1,938
Hours per Year (Hours)	700
Delta T (Degrees)	1.8
Savings per Premise with 19 R-Value (Therms)	1.157
Savings per Premise with 30 R-Value (Therms)	1.628

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Residential Wall Insulation

Measure Description:

Insulating exterior walls to reduce heat loss or gain by providing a barrier between the inside of your home and the outside temperature.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	52,398

Baseline Efficiency (R-Value)	5
New Efficiency (R-Value)	16
Average Premise Size (Square Feet)	1,938
Average Wall Size (Square Feet)	352
Hours per Year (Hours)	700
Delta T (Degrees)	7.4
Savings per Premise (Therms)	2.507

Residential HVAC Tune Up

Measure Description:

HVAC maintenance on existing HVAC systems to return the system to its original unit efficiency.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Population	82,999

Baseline Efficiency	0.78
New Efficiency	0.80
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	45
Savings per Premise (Therms)	7.875

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Residential Weather Stripping

Measure Description:

Weather stripping on doors, operable windows, and other movable building components to reduce heat loss or gain by providing a barrier between the inside of a home and the outside climate.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	5
Applicable Population	27,305

Baseline Efficiency	0.80
Energy Savings (Percent)	2.0
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	45
Savings per Premise (Therms)	6.300

Residential Energy Star Windows

Measure Description:

ENERGY STAR certified windows that reduce heat loss or gain in addition to reducing solar radiation heat gain by providing a barrier between the inside of a home and the outside climate.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	123,569

Baseline Efficiency	0.80
Energy Savings (Percent)	0.20
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	45
Savings per Premise (Therms)	63.000

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Residential Fireplace Ignition Control

Measure Description:

An automatic ignition control for natural gas fireplace.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Population	15,252

Operating Hours (Hours)	8,760
New Operating Hours (Hours)	700
Unit Size (Btu/hr.)	83.3
Savings per Premise (Therms)	6.714

Residential Fireplace Pilotless Ignition

Measure Description:

An automatic electronic ignition to light a natural gas fireplace.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Population	15,252

Operating Hours (Hours)	8,760
New Operating Hours (Hours)	700
Unit Size (Btu/hr.)	83.3
Savings per Premise (Therms)	6.714

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Residential Dryer

Measure Description:

A clothes dryer which has a heating source provided by natural gas.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Population	73,009

Baseline Efficiency (Lbs./kWh)	3.30
New Efficiency (Lbs./kWh)	5.70
Loads per Year	300
Pounds per Load (Lbs.)	6.36
Savings per Premise (Therms)	8.306

Residential Energy Star Dryer

Measure Description:

An ENERGY STAR certified clothes dryer which has a heating source provided by natural gas.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11 Years
Applicable Population	73,009

Baseline Efficiency (Lbs./kWh)	3.30
New Efficiency (Lbs./kWh)	3.48
Loads per Year	300
Pounds per Load (Lbs.)	6.36
Savings per Premise (Therms)	1.020

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Commercial Low Flow Showerhead

Measure Description:

A low flow showerhead that reduces the flow of water to save both water and energy.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Segments	Church, Educational, Healthcare, Safety
Applicable Population	2,934

Baseline Efficiency (GPM)	2.2
New Efficiency (GPM)	1.5
Shower Time (Mins)	11
Average Number of People	354
Average Showers per Person per Day per Premise (Therms)	1
Days in Year	305
Delta T (Degrees)	58
Savings per Premise (Therms)	5,020.845

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Commercial Low Flow Faucet Aerator

Measure Description:

A low flow faucet aerator that reduces the flow of water to save both water and energy.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Segments	All Commercial Segments
Applicable Population	38,226

Baseline Efficiency (GPM)	2.2
New Efficiency (GPM)	1.0
Wash Time (Mins)	1
How Water Faucets	524
Hand Washes per Person per Day per Faucet	1
Water Heater Temperature (Degrees)	130
Incoming Water Temperature (Degrees)	72
Days in Year	305
Delta T (Degrees)	58
Savings per Premise (Therms)	1,158.232

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Commercial Water Heater Temperature Check Card

Measure Description:

A temperature card that illustrates the temperature heating setting of the water heater that enables the facility to downturn/set back the heating set point of the temperature of the water heater.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	5
Applicable Segments	Church, Educational, Lodging, Office, Other, Service
Applicable Population	12,855

Baseline Gallons per Day (Gallons)	524
Water Heater Temperature (Degrees)	130
Incoming Water Temperature (Degrees)	72
Temperature Turndown (Degrees)	10
Days in Year	305
Savings per Premise (Therms)	166.413

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Commercial Hot Water Pipe Insulation

Measure Description:

Insulating uninsulated pipes that carry hot water through conditioned or non-conditioned spaces.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	13
Applicable Segments	All Commercial Segments
Applicable Population	3,823

Baseline Efficiency (R-Value)	1.0
New Efficiency (R-Value)	3.0
Length of Pipe (Feet)	15
Diameter (Inches)	0.75
Times in Year	660
Delta T (Degrees)	40
Savings per Premise (Therms)	15.543

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Commercial Condensing Water Heater

Measure description:

A commercial water heater that allows for the additional capturing of the latent heat of condensation to a storage tank of hot water.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	15
Applicable Segments	All Commercial Segments
Applicable Population	37,330

Baseline Efficiency (Tank)	0.80
New Efficiency (Tank)	0.95
Baseline Efficiency (Tankless)	0.90
New Efficiency (Tankless)	0.90
Baseline Gallons per Day (Gallons)	2,500
Days in Year	305
Delta T (Degrees)	68
Savings per Premise (Tank) (Therms)	681.964
Savings per Premise (Tankless) (Therms)	227.321

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Commercial Tankless Water Heater

Measure Description:

A commercial on-demand type water heater that heats water directly without the use of a storage tank.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	20
Applicable Segments	All Commercial Segments
Applicable Population (Tankless)	37,330

Baseline Efficiency (Tank)	0.80
New Efficiency (Tank)	0.95
Baseline Efficiency (Tankless)	0.81
New Efficiency (Tankless)	0.90
Baseline Gallons per Day (Gallons)	2,500
Days in Year	305
Delta T (Degrees)	68
Savings per Premise (Tank) (Therms)	479.901
Savings per Premise (Tankless) (Therms)	431.911

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Commercial Energy Star Water Heater

Measure Description:

An ENERGY STAR certified commercial water heater with a storage tank of hot water.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	15
Applicable Segments	All Commercial Segments
Applicable Population	37,031

Baseline Efficiency	0.80
New Efficiency	0.93
Baseline Gallons per Day (Gallons)	2,500
Days in Year	305
Delta T (Degrees)	68
Savings per Premise (Therms)	603.746

Commercial Energy Star Dishwasher

Measure Description:

An ENERGY STAR certified commercial dishwasher that uses less water and energy.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Segments	Church, Educational, Restaurants, Grocery, Healthcare, Lodging, Office, Safety
Applicable Population	9,240

Baseline Gallons per Rack (Gallons)	1.32
New Gallons per Rack (Gallons)	0.65
Average Racks per Day	280
Days in Year	305
Savings per Premise (Therms)	405.132

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Commercial Drain Water Recovery

Measure Description:

A heat recovery heat exchanger that recovers heat from the drain water.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Segments	Church, Educational, Restaurants, Grocery, Healthcare, Lodging, Office, Safety
Applicable Population	9,240

Savings Factor (Percent)	11.5
Gallons per Year (Gallons)	112,728
Delta T (Degrees)	68
Savings per Premise (Therms)	91.790

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Commercial Energy Star Front Loading Washer

Measure Description:

An ENERGY STAR certified commercial clothes washer that uses less water and energy than a top-loading washer.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Segments	Church, Educational Restaurants, Healthcare, Lodging, Safety
Applicable Population	7,163

Baseline IWF (GPC/CF)	4.7
New IWF (GPC/CF)	4.0
Loads per Year	1,646
Size of Washer (Cubic Feet)	3.0
Delta T (Degrees)	68
Savings per Premise (Therms)	24.474

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Commercial Combined Heat and Power (Thermal)

Measure Description:

A technology that performs the simultaneous production of mechanical and thermal energy. The thermal portion is the heat recovery of exhaust gas or other hot fluids from the technology to support displacing existing thermal needs provided by natural gas.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Segments	Educational, Grocery, Healthcare, Lodging, Restaurants, Safety
Applicable Population	7,473

Operating Hours per Year (Hours)	4,270
Available Thermal Rating (Btu/hr.)	126,400
Useable Heat (Percent)	75.0
Savings per Premise (Therms)	5,059.950

Commercial Range/Cooktop

Measure Description:

A commercial cooktop which uses the combustion of natural gas as the source of heat.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	12
Applicable Segments	Church, Educational, Restaurants, Grocery, Healthcare, Lodging, Safety
Applicable Population	5,521

Baseline Efficiency	0.30
New Efficiency	0.40
Cook Time per Day (Hours)	8.55
Cooktop Rating (Btu/hr.)	88,000
Savings per Premise (Therms)	686.565

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Commercial Convection Oven

Measure Description:

A commercial cooking oven which is equipped with a fan to evenly distribute heat for cooking.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	12
Applicable Segments	Educational, Restaurants, Grocery, Healthcare, Lodging
Applicable Population	4,838

Baseline Efficiency	0.35
New Efficiency	0.50
Cook Time per Day (Hours)	8.55
Oven Rating (Btu/hr.)	45,000
Savings per Premise (Therms)	421.301

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Commercial Energy Star Convection Oven

Measure Description:

An ENERGY STAR certified commercial cooking oven which is equipped with a fan to evenly distribute heat for cooking.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	12
Applicable Segments	Educational, Restaurants, Grocery, Healthcare, Lodging
Applicable Population	4,838

Baseline Efficiency	0.35
New Efficiency	0.46
Cook Time per Day (Hours)	8.55
Oven Rating (Btu/hr.)	12,000
Savings per Premise (Therms)	89.552

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Commercial Fryer

Measure Description:

A commercial fryer which uses natural gas as the heating source used to heat cooking oils.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	12
Applicable Segments	Church, Educational, Restaurants, Grocery, Healthcare, Lodging
Applicable Population	5,148

Baseline Efficiency	0.35
New Efficiency	0.68
Cook Time per Day (Hours)	8.55
Fryer Rating (Btu/hr.)	120,000
Savings per Premise (Therms)	636.082

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Commercial Energy Star Fryer

Measure Description:

An ENERGY STAR certified commercial fryer which uses natural gas as the heating source used to heat cooking oils.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	12
Applicable Segments	Church, Educational, Restaurants, Grocery, Healthcare, Lodging
Applicable Population	5,148

Baseline Efficiency	0.35
New Efficiency	0.58
Cook Time per Day (Hours)	8.55
Fryer Rating (Btu/hr.)	120,000
Savings per Premise (Therms)	519.766

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Commercial Griddle

Measure Description:

A commercial cooking appliance which uses natural gas as the heating source to heat a flat surface for cooking.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	12
Applicable Segments	Church, Educational, Restaurant, Grocery, Healthcare, Lodging, Safety
Applicable Population	5,521

Baseline Efficiency	0.35
New Efficiency	0.52
Cook Time per Day (Hours)	8.55
Oven Rating (Btu/hr.)	25,000
Savings per Premise (Therms)	330.079

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Commercial Energy Star Griddle

Measure Description:

An ENERGY STAR certified commercial cooking appliance which uses natural gas as the heating source to heat a flat surface for cooking.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	12
Applicable Segments	Church, Educational, Restaurant, Grocery, Healthcare, Lodging, Safety
Applicable Population	5,521

Baseline Efficiency	0.30
New Efficiency	0.49
Cook Time per Day (Hours)	8.55
Oven Rating (Btu/hr.)	25,000
Savings per Premise (Therms)	164.250

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Commercial Steam Cooker

Measure Description:

A commercial food steamer which uses natural gas as the heating source to make steam for cooking.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	12
Applicable Segments	Church, Educational, Restaurant, Grocery, Healthcare, Lodging, Safety
Applicable Population	5,521

Baseline Efficiency	0.16
New Efficiency	0.49
Cook Time per Day (Hours)	8.55
Cooker Rating (Btu/hr.)	5,740
Savings per Premise (Therms)	120.639

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Commercial Energy Star Steam Cooker

Measure Description:

An ENERGY STAR certified commercial food steamer which uses natural gas as the heating source to make steam for cooking.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	12
Applicable Segments	Church, Educational, Restaurant, Grocery, Healthcare, Lodging, Safety
Applicable Population	5,521

Baseline Efficiency	0.16
New Efficiency	0.38
Cook Time per Day (Hours)	8.55
Cooker Rating (Btu/hr.)	5,740
Savings per Premise (Therms)	103.707

Commercial Furnace

Measure Description:

A natural gas fired heating system used to supply heat to a facility.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	23
Applicable Segments	Assembly, Church, Educational, Healthcare, Lodging, Office, Service
Applicable Population	6,558

Baseline Efficiency	0.80
New Efficiency	0.95
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	205
Savings per Premise (Therms)	283.224

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Commercial Gas Heat Pump

Measure Description:

An air-source heat pump that transfers heat energy and uses natural gas as a heat source.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Segments	Assembly, Church, Educational, Healthcare, Lodging, Office, Service
Applicable Population	6,558

Baseline Efficiency	0.80
New Efficiency	1.65
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	205
Savings per Premise (Therms)	924.053

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Commercial Programmable Thermostat

Measure Description:

A thermostat that can be programmed to adjust cooling and heating set points at different times of the day.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Segments	Assembly, Church, Educational, Healthcare, Lodging, Office, Service
Applicable Population	6,558

Baseline Efficiency	0.80
Average Premise Size (Square Feet)	12,000
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	205
Delta T (Degrees)	5
Savings per Premise (Therms)	0.060

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Commercial Duct Repair

Measure Description:

Sealing the joints throughout the air duct system in unconditioned space to improve the HVAC system's efficiency.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	18
Applicable Segments	Assembly, Church, Educational, Healthcare, Lodging, Office, Service
Applicable Population	1,640

Baseline Efficiency	0.75
Efficiency Restored	0.80
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	205
Savings per Premise (Therms)	119.583

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Commercial Ceiling Insulation

Measure Description:

Insulation that is used to reduce heat loss or gain by providing a barrier between the inside of a facility and the outside climate.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	20
Applicable Segments	Assembly, Church, Educational, Healthcare, Lodging, Office, Service
Applicable Population	1,640

Baseline Efficiency (R-Value)	10
New Efficiency (R-Value)	19 & 30
Average Building Size (Square Feet)	12,000
Heating Hours (Hours)	700
Delta T (Degrees)	1.8
Savings per Premise for 19 R-Value (Therms)	7.162
Savings per Premise for 30 R-Value (Therms)	10.080

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Commercial Wall Insulation

Measure Description:

Insulating exterior walls to reduce heat loss or gain by providing a barrier between the inside of a facility and the outside climate.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	20
Applicable Segments	Assembly, Church, Educational, Healthcare, Lodging, Office, Service
Applicable Population	1,640

Baseline Efficiency (R-Value)	5
New Efficiency (R-Value)	16
Average Building Size (Square Feet)	12,000
Average Wall Size (Square Feet)	1,159
Heating Hours (Hours)	700
Delta T (Degrees)	7.4
Savings per Premise (Therms)	8.255

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Commercial BAS Controller

Measure Description:

Control of a building's heating, ventilation, air conditioning, lighting and other systems through a building management system.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Year)	11
Applicable Segments	Assembly, Church, Educational, Healthcare, Lodging, Office, Service
Applicable Population	6,558

Baseline Efficiency	0.80
Energy Savings (Percent)	5
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	205
Savings per Premise (Therms)	89.688

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Commercial Demand Control Ventilation

Measure Description:

Automatic adjustment of the amount of outdoor air being delivered to a conditioned space based upon the current occupancy.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Segments	Assembly, Church, Educational, Healthcare, Lodging, Office, Service
Applicable Population	5,247

Baseline Efficiency	0.80
Energy Savings (Percent)	2
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	205
Savings per Premise (Therms)	35.875

Commercial Dryer

Measure Description:

A commercial clothes dryer which has a heating source provided by natural gas.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Segments	Church, Educational, Healthcare, Lodging, Other, Service
Applicable Population	4,087

Baseline Efficiency (Lbs./kWh)	2.30
New Efficiency (Lbs./kWh)	3.49
Load per Year	1,646
Pounds per Load (Lbs.)	14.27
Savings per Premise (Therms)	118.811 Therms

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Industrial Condensing Boiler/Water Heater

Measure Description:

Industrial boilers/water heaters that allows for the additional capturing of the latent heat of condensation to make steam or to a storage tank of hot water.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Population	29

Baseline Efficiency (Tank)	0.80
New Efficiency (Tank)	0.90
Baseline Efficiency (Tankless)	0.90
New Efficiency (Tankless)	0.95
Baseline Gallons per Day (Gallons)	74,000
Delta T (Degrees)	140
Savings per Premise with Tank (Therms)	49,735
Savings per Premise with Tankless (Therms)	16,578

Industrial Tankless Water Heater

Measure Description:

An on-demand type industrial water heater that heats water directly without the use of a storage tank.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	20
Applicable Population	28

Baseline Efficiency	0.80
New Efficiency	0.95
Baseline Gallons per Day (Gallons)	74,000
Delta T (Degrees)	68
Savings per Premise (Therms)	16,999

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Industrial Energy Star Water Heater

Measure Description:

An ENERGY STAR certified industrial water heater with a storage tank of hot water.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	15
Applicable Population	28

Baseline Efficiency	0.80
New Efficiency	0.95
Baseline Gallons per Day (Gallons)	74,000
Delta T (Degrees)	68
Savings per Premise (Therms)	24,157

Industrial Boiler Advanced Controls

Measure Description:

A control technology that replaces the existing mechanical linkages to direct digital control for controlling the amount of excess air being delivered to a boiler which optimizes the boilers combustion efficiency.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Population	28

Baseline Combined Efficiency	0.78
New Combined Efficiency	0.81
Baseline Gallons per Day (Gallons)	74,000
Baseline Stack Temperature Rise (Degrees)	500
Savings per Premise (Therms)	14,777

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Industrial Boiler Blowdown Recovery

Measure Description:

Recovering heat from a boiler's surface blowdown either for flash steam production or some other facility thermal needs.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	28

Heat Recovery Efficiency (Percent)	11.5
Flash Steam Recovery Efficiency (Percent)	6.0
Baseline Gallons per Day (Gallons)	74,000
Savings per Premise Heat Recovery (Therms)	22,769
Savings per Premise Flash Steam (Therms)	11,880

Industrial Boiler Combustion Air Preheat

Measure Description:

Recovering waste heat from a boilers exhaust to preheat the combustion air being delivered to the boiler.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	28

Baseline Combustion Efficiency	0.77
New Combined Efficiency	0.84
Baseline Gallons per Day (Gallons)	74,000
Baseline Stack Temperature Rise (Degrees)	500
Savings per Premise (Therms)	12,385

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Industrial Boiler Feedwater Economizer

Measure Description:

Recovering waste heat from a boilers exhaust to preheat the incoming feedwater to the boiler.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	28

Heat Recovery Efficiency (Percent)	11.5
Baseline Gallons per Day (Gallons)	74,000
Savings per Premise (Therms)	22,769

Industrial High Efficiency Burner

Measure Description:

A natural gas high temperature industrial burner.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	28

Energy Improvement Reduction (Percent)	4.0
Baseline Gallons per Day (Gallons)	74,000
Savings per Premise (Therms)	9,450

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Industrial Boiler Tune-Up

Measure Description:

Maintenance on the boiler to return the system to its original unit efficiency.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Population	28

Energy Improvement Reduction (Percent)	4.0
Baseline Gallons per Day (Gallons)	74,000
Savings per Premise (Therms)	12,600

Industrial Condensate Return

Measure Description:

The installation of a system to collect the hot condensate from an industrial steam process and return this water to the boiler.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	28

Heat Recovery Efficiency (Percent)	11.5
Baseline Gallons Per Day (Gallons)	74,000
Savings per Premise (Therms)	22,769

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Industrial Furnace

Measure Description:

A natural gas heating system used to heat the office areas of an industrial plant or portions of the facility that requiring tempering.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	23
Applicable Population	2

Baseline Efficiency	0.80
New Efficiency	0.95
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	300
Savings per Premise (Therms)	414.474

Industrial Gas Heat Pump

Measure Description:

An industrial air-source heat pump that uses natural gas as a heat source.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	10
Applicable Population	0

Baseline Efficiency	0.80
New Efficiency	1.65
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	300
Savings per Premise (Therms)	1,352.273

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Industrial Programmable Thermostat

Measure Description:

A thermostat that can be programmed to adjust cooling and heating set points at different times of the day.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Population	2

Baseline Efficiency	0.80
Average Premise Size (Square Feet)	17,500
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	300
Delta T (Degrees)	5
Savings per Premise (Therms)	0.087

Industrial Duct Repair

Measure Description:

Sealing the joints throughout the air duct system in unconditioned space to improve the HVAC system's efficiency.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	18
Applicable Population	1

Baseline Efficiency	0.75
Efficiency Restored	0.80
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	300
Savings per Premise (Therms)	175.000

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Industrial Ceiling Insulation

Measure Description:

Insulation that is used to reduce heat loss or gain by providing a barrier between the inside of a facility and the outside climate.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	1

Baseline Efficiency (R-Value)	10
New Efficiency (R-Value)	19 & 30
Average Office Size (Square Feet)	17,500
Hours per Year (Hours)	700
Delta T (Degrees)	1.8
Savings per Premise for 19 R-Value (Therms)	10.445
Savings per Premise for 30 R-Value (Therms)	14.700

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Industrial Wall Insulation

Measure Description:

Insulating exterior walls to reduce heat loss or heat gain by providing a barrier between the inside of a facility and the outside climate.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	1

Baseline Efficiency (R-Value)	5
New Efficiency (R-Value)	16
Average Office Size (Square Feet)	17,500
Average Wall Size (Square Feet)	1,058
Hours per Year (Hours)	700
Delta T (Degrees)	7.4
Savings per Premise (Therms)	7.536

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Industrial BAS Controller

Measure Description:

Control of a building's heating, ventilation, air conditioning, lighting and other systems through a building management system.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	11
Applicable Population	2

Baseline Efficiency	0.80
Energy Savings (Percent)	5.0
Hours per Year (Hours)	700
Unit Size (MBtu/hr.)	300
Savings per Premise (Therms)	393.750

Industrial Infrared Heating Process

Measure Description:

Infrared heating through the process of conduction, radiant heat to reach desired temperatures.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	5

Energy Improvement Reduction (Percent)	7.5
Heat Rating (MMBtu/hr.)	0.2
Operating Hours per Year (Hours)	8,000
Savings per Premise (Therms)	1,200 Therms

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Industrial Dryers

Measure Description:

An industrial dryer which heating source is provided by natural gas.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	21

Energy Improvement Reduction (Percent)	12.0
Heat Rating (MMBtu/hr.)	282
Operating Hours per Year (Hours)	8,000
Savings per Premise (Therms)	2,707,200

Industrial Direct Heating Process

Measure Description:

Heat that is produced by the combustion of natural gas and is then transferred to material directly.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	21

Energy Improvement Reduction (Percent)	10.0
Heat Rating (MMBtu/hr.)	282
Operating Hours per Year (Hours)	8,000
Savings per Premise (Therms)	2,256,000

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Industrial Combined Heat and Power (Thermal)

Measure Description:

A technology that performs the simultaneous production of mechanical and thermal energy. The thermal portion is the heat recovery of exhaust gas or other hot fluids from the technology to support displacing existing thermal needs provided by natural gas.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	34

Operating Hours per Year (Hours)	8,000
Available Thermal Rating (MMBtu/hr.)	410
Useable Heat (Percent)	25.0
Savings per Premise (Therms)	4,592,000

Industrial Exhaust Gas Heat Recovery

Measure Description:

A heat exchanger that recovers the waste heat from the exhaust gas for thermal needs in an industrial site.

Measure Data:

Date Performed	August, September 2018
Equipment Life (Years)	25
Applicable Population	21

Heat Recovery Efficiency (Percent)	11.5
Heat Rating (MMBtu/hr.)	282
Operating Hours per Year (Hours)	8,000
Savings per Premise (Therms)	2,594,400

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9. Please refer to BSP 26-66 and 69-77. Please provide the calculations supporting the measure savings determinations in Microsoft Excel format with formulas intact
- A. The savings over the respective baseline is shown on the worksheets in the Microsoft Excel sheet with formulas intact on the accompanying CD. The methodology to develop how each measure yields therm savings, on a per site basis, over their respective baselines is shown in Column "I" on each of the tabs below under each measure. The inputs for each measure that support the development of the incremental savings in therms is shown on the applicable row with labels of inputs. On the Microsoft Excel sheet please see tabs titled:
- Res – WH
 - Res – Pool Heating
 - Res – Cooking
 - Res – Laundry
 - Res – HVAC
 - Comm – WH
 - Comm – Cooking
 - Comm – Laundry
 - Comm – HVAC
 - Ind – WH
 - Ind - HVAC
 - Ind – Process

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- 10.** Please discuss how measure development and therm savings analysis account for measure implementation in different dwellings (e.g. single-family, multi-family, and mobile home). Please provide any supporting technical analysis in Microsoft Excel format with formulas intact.
 - A.** Peoples Gas System analyzed the effects of measure implementation and their resulting different energy savings in Single Homes, Multi-Family Homes and Manufactured Homes for water heating by adjusting the number of people to a typical home population based upon the latest US Census data for Florida. This adjustment methodology to develop how each measure yields therm savings, on a per site basis, over their respective baselines is shown on the accompanying CD in Microsoft Excel format with formulas intact. These adjustments are made in Column "E" on the "Res – WH" tab worksheet.

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11. Please discuss and provide an example of how PGS accounted for measure interaction and overlapping effects. Please provide any supporting technical analysis in Microsoft Excel format with formulas intact.

A. a. Measure Interactions: Peoples Gas System accounted for measure interactions in the development of the Technical Potential by assuming the Technical Potential would be maximized. This was done by assuming that the measure interaction combination or input assumptions regarding the measure that provided the maximum Technical Potential would be used. The methodology to develop how each measure yields therm savings, on a per site basis, over their respective baselines is shown in Column "I" on each of the tabs below under each measure. The inputs for each measure that support the development of the incremental savings in therms is shown on the applicable row with labels of inputs. On the Microsoft Excel sheet on the accompanying CD please see tabs titled:

- Res – WH
- Res – Pool Heating
- Res – Cooking
- Res – Laundry
- Res – HVAC
- Comm – WH
- Comm – Cooking
- Comm – Laundry
- Comm – HVAC
- Ind – WH
- Ind – HVAC
- Ind – Process

b. Overlapping effects: Peoples Gas System accounted for overlapping effects (mutually exclusive) in the development of the Technical Potential by utilizing the measure that provided the maximum technical potential. The accounting for overlapping effects can be seen by the omission of certain cells in the totaling of the Technical Potential for each of the measure categories "cell I3" in the Microsoft Excel format with formulas intact on the tabs below. The measures that were omitted from the Technical Potential due to overlapping are also labeled in Column H or J on the accompanying CD on the following tabs:

- Res – WH
- Res – Pool Heating
- Res – Laundry
- Res – HVAC

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- Comm – WH
- Comm – Cooking
- Ind – WH

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- 12.** Please discuss and provide an example of how PGS accounted for potential rebound effects. Please provide any supporting technical analysis in Microsoft Excel format with formulas intact.
 - A.** Peoples Gas System examined for potential rebound effects in the analysis for the development of the Technical Potential but did not find any supporting evidence that after customers install a more energy efficient gas appliance that rebound effect occurs.

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- 13.** Please refer to BSP 14-15.
- a.** Please provide a breakdown of Technical Potential contribution by energy usage category and customer segment, in a similar format to those seen on BSP 14, following the removal of those natural gas fired cogeneration and interruptible customers which were removed from the applicable population toward the Achievable Potential.
 - b.** Please list those natural gas fired cogeneration and interruptible customers which were removed from the applicable population toward the Achievable Potential and identify the respective Technical Potential savings attributed to each customer.
- A. a.** Below are the modified Technical Potential contributions by energy usage category and customer segment, in a similar format to those seen on BSP No. 14, following the removal of those natural gas fired cogeneration and interruptible customers which were removed from the applicable population toward the Achievable Potential. The portion of the Commercial segment that contains wholesale and wholesale transportation which was excluded from the Technical Potential has been removed as a percentage (0.695 Percent) as it relates to those customers projected energy consumption as a portion to the entire population of commercial customers. These charts are included in the Microsoft Excel sheet with formulas intact on the accompanying CD under the tab titled "TPS DR #13a".

Peoples Gas System 2019 Base Year Technical Potential in Therms	
Residential	58,560,018
Commercial	142,744,289
Total	201,304,306

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Peoples Gas System Technical Potential (Residential)	
Cooking	1,207,594
HVAC	16,868,459
Laundry	606,440
Pool Heating	7,456,278
Water Heating	32,421,247
Total	58,560,018

Peoples Gas System Technical Potential (Commercial)	
Cooking	11,941,119
HVAC	8,858,540
Laundry	482,178
Water Heating	121,462,452
Total	142,744,289

b. The composition of these natural gas fired cogeneration and interruptible customers which were removed from the applicable population toward the Achievable Potential is included in Response No 7. D this set. The projected energy usage this group of customers separated by rate class is included in the Microsoft Excel sheet with formulas intact on the accompanying CD under the tab titled "2019 Load and Cust forecast". The Technical Potential performed does not look at each customer as a separate customer, it looks at the customer segment as a collective group of customers. The Technical Potential for that portion of energy savings that was removed, due to their ineligibility to participate in the company's DSM programs could be divided by the total customers that are in that segment to obtain an average Technical Potential savings. Performing this calculation yields a result of 3,980,789 Therms per customer.

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14. Please refer to the table found on BSP 16 titled "Peoples Gas System 2019-2028 Achievable Potential." Please provide a table in a similar format with residential, commercial, industrial, and combined potential savings reported separately.

A. Below are the tables in a similar format with residential, commercial, industrial, and combined Achievable Potential savings reported separately.

Peoples Gas System 2019-2028 Achievable Potential	
	Energy (Therms)
Residential	2,479,682

Peoples Gas System 2019-2028 Achievable Potential	
	Energy (Therms)
Commercial	2,205,988

Peoples Gas System 2019-2028 Achievable Potential	
	Energy (Therms)
Industrial	0

Peoples Gas System 2019-2028 Achievable Potential	
	Energy (Therms)
Combined	4,685,670

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- 15.** Please refer to BSP 31-32. Please explain what accounts for the differences in applicable populations between the "Residential Gas Pool Heater," "Residential Solar Water Pool Heater," and "Residential Insulating Pool Cover" measures.
- A.** The population difference between Residential Gas Pool Heater and Residential Solar Water Heater and Residential Insulating Pool Covers measures stem from the technical ability of certain homes being unable to install a solar water pool heater either due to the age or construction (unable to support the weight of the collector on the roof) of the home, size of the actual roof (inadequate space for the collector), the orientation or pitch of the home (roof is not oriented to enable the collector to effectively and efficiently collect solar radiation) or too much tree or canopy coverage (would shade the collector from effective and efficient operation). Because the Residential Solar Water Heater is the most efficient and provides the largest Technical Potential, all of the Technical Potential from the Residential Solar Water Heater went into the final Technical Potential. The estimated customer count from the Residential Solar Water Heater was subtracted from the Residential Gas Pool Heater customer count before the amount of Technical Potential was added to the final Technical Potential for residential pool heating. This formula can be seen in cell "I3" on the tab "Res – Pool Heating" on the accompanying CD in in Microsoft Excel format with formulas intact.

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Please refer to Exhibit "B" of the petition when answering the following questions.

- 16.** Please refer. to BSP 79. Please discuss the assumptions and calculations supporting the projected \$10 per audit administrative costs for the Residential Customer Assisted Energy Audit. Please provide any supporting technical analysis in Microsoft Excel format with formulas intact.
- A.** Peoples Gas System projected the \$10 per audit administrative costs for the Residential Customer Assisted Energy Audit (Online) by taking the estimated annual subscription fee for the online audit service and dividing it by the projected annual number of program participants.

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17. Will this program be directly marketed to residential customers? If so, please describe how.
- A. Yes, Peoples Gas System would market the Residential Customer Assisted Energy Audit (online) program to educate customers on the availability and benefits of participating in the online audit. At this time, the company will market the online audit in the following methods:
- 1) Inclusion of the program on the company's website.
 - 2) Promotion of the program via the company's social media such as Facebook and twitter.
 - 3) Send a program announcement to all eligible customers at least every six months in accordance with Florida Administrative Code 25-17.003 (11)(a).
 - 4) Inclusion of the Residential Customer Assisted Energy Audit (online) program into the current advertising performed to educate customers on the portfolio of conservation programs offered by Peoples Gas System.

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Please refer to Exhibit "C" of the petition when answering the following questions.

- 18.** Please refer to BSP 83. Please discuss the assumptions and calculations supporting the projected \$180 per audit administrative costs for the Commercial Walk-Through Energy Audit. Please provide any supporting technical analysis in Microsoft Excel format with formulas intact.

- A.** Peoples Gas System projected the \$180 per audit administrative costs for the Commercial Walk-Through Energy Audit by projecting that the energy audit would typically take four to six hours to perform depending on the size of the facility. This cost includes mileage and travel time to and from the facility, time discussing with the owner/manager of the facility, time to walk the facility and inspect for energy savings opportunities and time and materials to complete a written report. The company used an hourly cost of \$30 per hour for this projection.

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- 19.** Will this program be directly marketed to commercial customers? If so, please describe how.
- A.** Yes, Peoples Gas System will market the Commercial Walk-Through Energy Audit program to educate customers on the availability and benefits of participating in the audit. At this time, the company will market the Commercial Walk-Through Energy Audit in the following methods:
- 1) Inclusion of the program on the company's website.
 - 2) Promotion of the program via the company's social media such as Facebook and twitter.
 - 3) Send a program announcement to all eligible customers at least every six months in accordance with Florida Administrative Code 25-17.003 (11)(a)
 - 4) Promotion of the program through trade journals or business trade publications through print advertising.
 - 5) Utilize the company's internal representatives to market the audit that currently assist commercial customers throughout the state with their accounts and all of the currently existing portfolio of commercial conservation programs offered by Peoples Gas System.