



TGS Conservation Program Quarterly Report

July 20, 2010

Teri Green, Conservation Program Manager



Residential Programs

As of June 30, 2010

Program	# of Participants	Spent to Date	Budget
Free Heater/Weatherization*	1	\$2,730	\$110,000
Weatherization/Attic/Duct Sealing	2,983	\$481,960	\$350,000
Water Heater/Tankless	318	\$87,080	\$150,000
Furnace Incentive	756	\$56,700	\$ 40,000
Hydronic Heating*	0	0	\$145,000
WashWise	2,510	\$125,090	\$105,000
Natural Gas Vehicle	2	\$9,000	\$ 10,000
Green Saver Tariff	349	\$8,376	\$ 60,000

*10 free heater and 5 stove applications are pending installation. \$18,000 hydronic heating application pending payment.

Multi-Stop
Hydro-Heat



Commercial Programs

<u>Program</u>	<u># of Participants</u>	<u>Spent to Date</u>	<u>Budget</u>
Misc. Gas Equipment*	0	0	\$32,150
Commercial WashWise	14	\$1,100	
Natural Gas Vehicle	0	0	\$30,000

*Several applications for high-efficiency water heating equipment totaling \$9,103 are pending approval and payment.

NO compressed
gas
natural

NO compressed
gas
natural



Energy/Carbon Savings Report

BUDGET VS. ACTUALS - FY 2009, PROGRAM BUDGET - FY 2010

PROGRAM	PARTICIPANTS	BUDGET	ACTUALS	VARIANCE	FY 2010 BUDGET	MCF	KWH	MCF Carbon Emissions	KWH Carbon Emissions	Reduction of Carbon Emissions
Free Heater and Weatherization	0	\$110,000	\$2,730	(\$109,610)				0	0	0
Furnace Incentive	756	\$40,000	\$56,700	(\$8,275)		661	199,357	79,754	237,551	157,797
Residential Weatherization		\$350,000		(\$98,343)				0	0	0
Duct Sealing	1,825		\$ 280,607			2,838	855,560	342,272	1,019,473	677,201
Attic Insulation	1,158		\$ 201,353			1,376	475,012	190,031	566,017	375,986
Natural Gas Water Heater		\$150,000		(\$107,800)				0	0	0
High-efficiency Tankless	32		\$1,280			39	11,720	4,689	13,965	9,277
Residential Hydronic Heating	0	\$145,000	\$0	(\$145,000)		347	104,748	41,905	124,816	82,911
WashWise	2,510	\$105,000	\$125,900	(\$47,900)		1,913	576,577	230,663	637,941	456,378
Natural Gas Vehicle Program								0	0	0
Residential	2	\$10,000	\$9,000	(\$1,000)				0	0	0
Commercial	0	\$30,000	\$0	(\$30,000)				0	0	0
Commercial Equipment and Weatherization	0	\$42,150	\$0	(\$42,150)				0	0	0
TOTAL INCENTIVE EXPENSES	6569	\$982,150	\$763,370	(\$570,578)				0	0	0

Total Rebates	\$763,370
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Estimated ANNUAL Carbon Reduction (lbs CO2)	1,759,550
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Carbon Reduction-Oct-Jun (lbs CO2)	1,601,754
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Highlights

Most programs are on track.

--Working closely with Austin Energy on the Free Gas Equipment Program

--New rebates being considered for next fiscal year

--Gas Dryer w/ Moisture Sensor (\$75)

--Residential Solar Water Heater w/ Gas Back-up (\$750)

--Customer Commercial Solar Water Heater w/ Gas Back-up

Questions



BUDGET VS. ACTUALS - FY 2009, PROGRAM BUDGET - FY 2010

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Residential Weatherization		\$350,000		(\$78,843)				0	0	0
Duct Sealing	1,825	\$ 280,607				2,838	855,560	342,272	1,019,473	677,201
Attic Insulation	1,158	\$ 201,353				1,576	475,012	190,031	566,017	375,986
Natural Gas Water Heater		\$150,000		(\$107,800)				0	0	0
High-efficiency Tankless	32 286	\$1,280 \$85,800				39 347	11,720 104,748	4,689 41,905	13,965 124,816	9,277 82,911
Residential Hydronic Heating	0	\$145,000	\$0	(\$145,000)		0	0	0	0	0
WashWise	2,510	\$105,000	\$125,900	(\$47,900)		1,913	576,577	230,663	687,041	456,378
Natural Gas Vehicle Program								0	0	0
Residential	2	\$10,000	\$9,000	(\$1,000)				0	0	0
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Frontier Associates LCC was contracted by Texas Gas Services to develop the annual report using TGS monthly reports and TGS's completed energy applications forms. MCF, KWH, and carbon emissions were calculated using the following methodology, formulas and assumptions.

Furnance, Attic Insulation, and Infiltration Savings

A sample size of 345 applications was used to determine the average resident size and furnace capacity from a population of 941 applications and thus provide a cost effective estimate of each measure. The data extracted from the applications was used to derive the following averages:

Average Size of Residence: 1550 square feet

Average Furnace Capacity: 75.5 KBtu/hr

Furnace AFUE: 78%

Savings attributed to improved furnace efficiency and weatherization measures were derived using EnergyGauge simulation software and a baseline 1550 square foot single floor residence. 8760 hour data was evaluated using TYM3 data for the Austin, Texas weather zone.

The following baseline and change case data was used to arrive at the savings:

	Baseline	Change case	Remarks
Furnace AFUE	69%	78%	Based on removed AFUE
Attic Insulation	R19	R38	Average Delta = R20
Infiltration	0.415 ACH	0.249 ACH	16 therm savings/house

Tankless Water Heating Savings

In a similar approach, a sample size 83 applications was used to determine the average tankless water heater capacity. The data extracted from the applications was used to derive the following:

Average Input Capacity: 199,000 btu/hr

Average Flow rate: 6 gpm @ 35 psi operating pressure

EF: .82

Replaced Water Heater Efficiency: 0.5 (plus 7 year old water heater)

DOE, WHAM program was used to determine water heater savings. 0.5 EF used was for the removed water heater and 0.86 was used to provide a conservative estimate of the energy saved.

Hydronic Savings

A hydronic systems consists of a fan coil unit (fan, hot water coil and cabinet) and a tankless water heater including a pump and accessories. The hydronic unit replaces the conventional gas furnace or electric heater. The efficiency of the hydronic system is assumed equal to the efficiency of the tankless water heater.

Savings attributed to the hydronic system were derived using EnergyGauge simulation software and a baseline 1550 square foot single floor residence. 8760 hour data was evaluated using TYM3 data for the Austin, Texas weather zone.

The following baseline and change case data was used to arrive at the savings:

	Baseline	Change case	Remarks
Furnace AFUE	69%	86%	Hydronic Efficiency = tankless efficiency
Water EF	0.50	0.86	Tankless water heater EF

Washer Savings

The savings attributed to washing machines was derived from TGS change out of 3045 washers with Energy Star Rated Washers. The average Energy Star rated washer uses 17 gallons less water than a non rated washer per the following link:

(http://www.energystar.gov/index.cfm?c=clotheswash.clothes_washers_save_money)

The energy consumption for the Energy Star rated washer was estimated using the following link:

(http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers) and the Energy Star residential calculator: *CalculatorConsumerClotheswasherBulk.xls*

The value for therms saving was derived using a gas water heater. The KWH column was derived using both an electric water heater

Vehicle Carbon Emissions

Car emissions are calculated by dividing the miles driven by the fuel efficiency of the vehicle. This number is then multiplied by the CO₂ emissions coefficient, 19.36 lbs CO₂/gallon¹ of gasoline, and then divide by 2204.6 lbs/metric ton to obtain tonnes of CO₂ emitted . To convert vehicle emissions:

$$\frac{\text{Miles driven}}{\text{Fuel efficiency}} \times 19.36 \frac{\text{lbs CO}_2}{\text{gallon}} \div 2204.6 = \text{CO}_2 \text{ Emissions (tons)}$$

Natural Gas Carbon Emissions

120.593 pounds CO₂ per mcf was used as per Energy Information Agency's Voluntary Reporting of Greenhouse Gases Program: Fuel and Energy Source Codes and Emission Coefficients

(<http://www.eia.doe.gov/oiaf/1605/coefficients.html>)

Electricity Carbon Emissions

1.11886 pounds of CO₂ per kWh was used as provided by EPA in "Total, Non-baseload, eGRID Subregion, State? = Guidance on the Use of eGRID Emission Rates." See page 7, eGRID subregion name 'ERCOT All' for non-baseload (<http://www.epa.gov/ttn/chief/conference/ei18/session5/rothschild.pdf>). Non-baseload values were used to reflect the fuel mix that will be reduced when load is reduced as per suggestion in this document. An average overall transmission and distribution loss of 6.5% was used, as per 'Integrated Assessment of Using Photovoltaic Technology in the United States Electricity Sector' by Deepak Sivaraman, page 67 (http://deepblue.lib.umich.edu/bitstream/2027.42/64604/1/lcalca_2.pdf).