



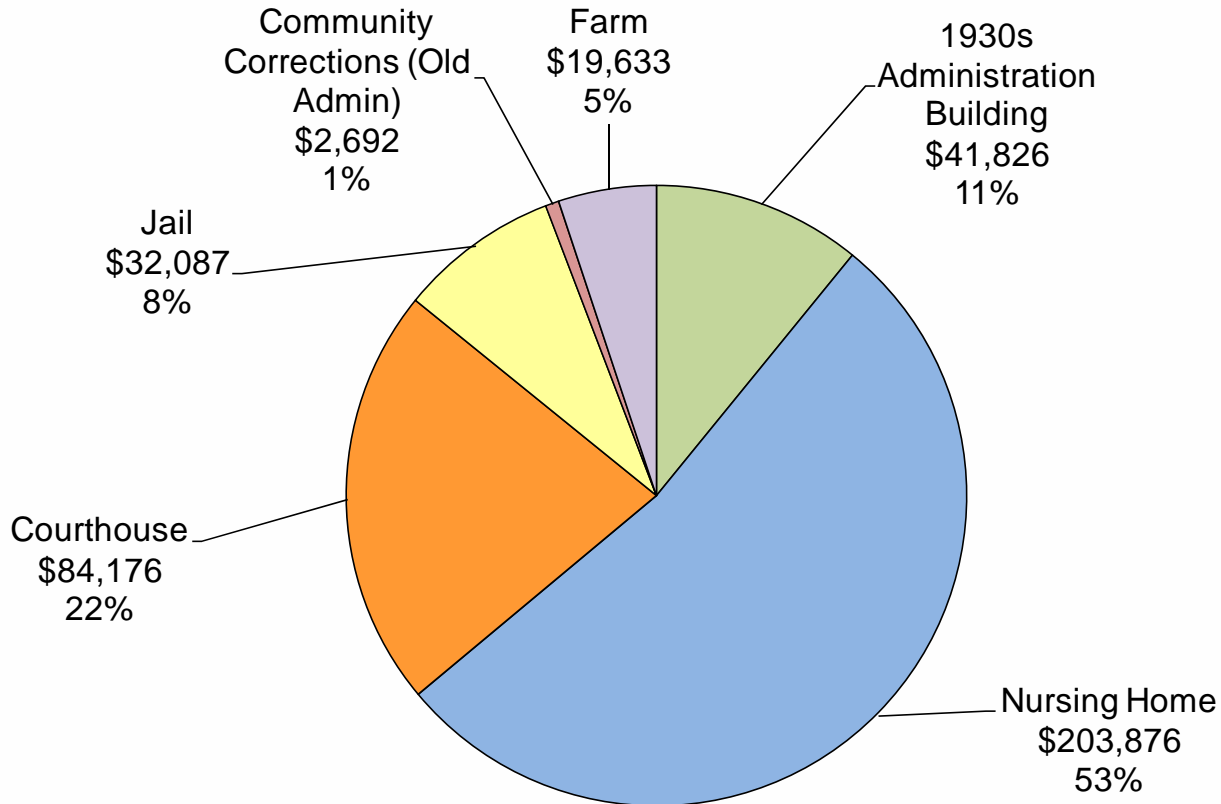
Comprehensive Energy Audit

Prepared by ERS
for
Grafton County Complex

Objectives

- Current Facility Consumption
- Energy Reduction Opportunities
 - Energy Efficiency Measures
 - Informational Measures

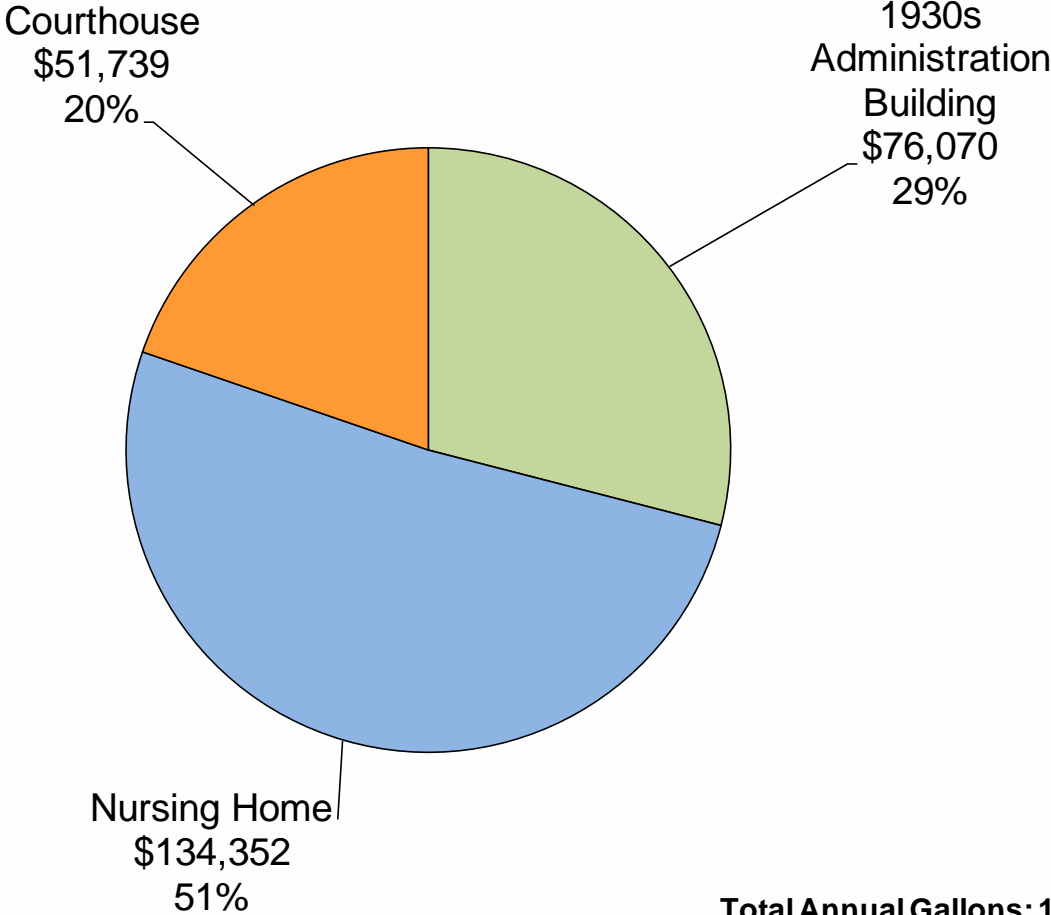
Current Facility Electricity Consumption Summary



Total Annual kWh: 2,680,010
Total Annual Electricity Bill: \$384,290



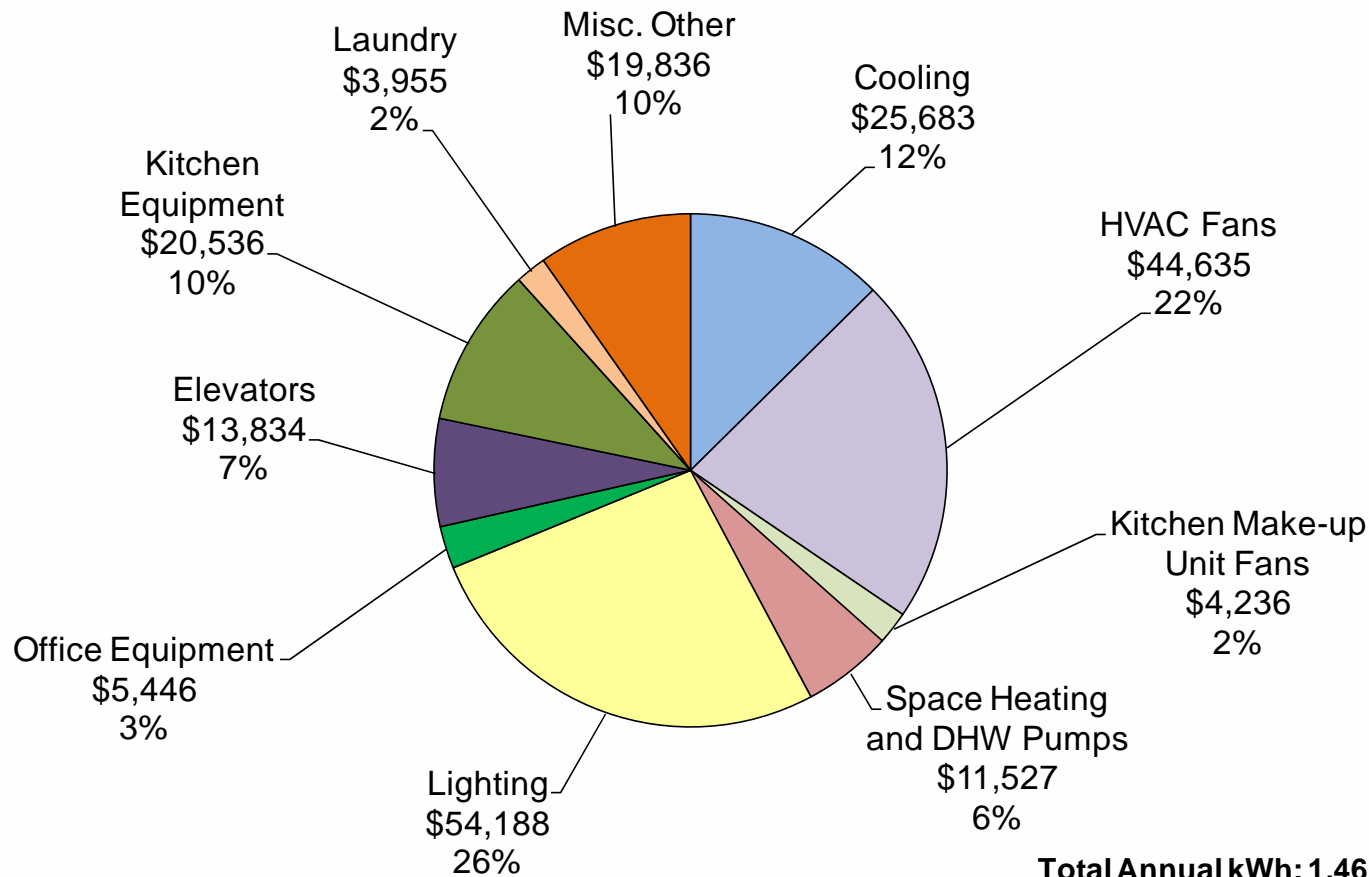
Current Facility Fuel Oil Consumption Summary



Total Annual Gallons: 119,818
Total Annual #2 Fuel Oil Bill: \$262,017



Current Electricity Consumption Nursing Home

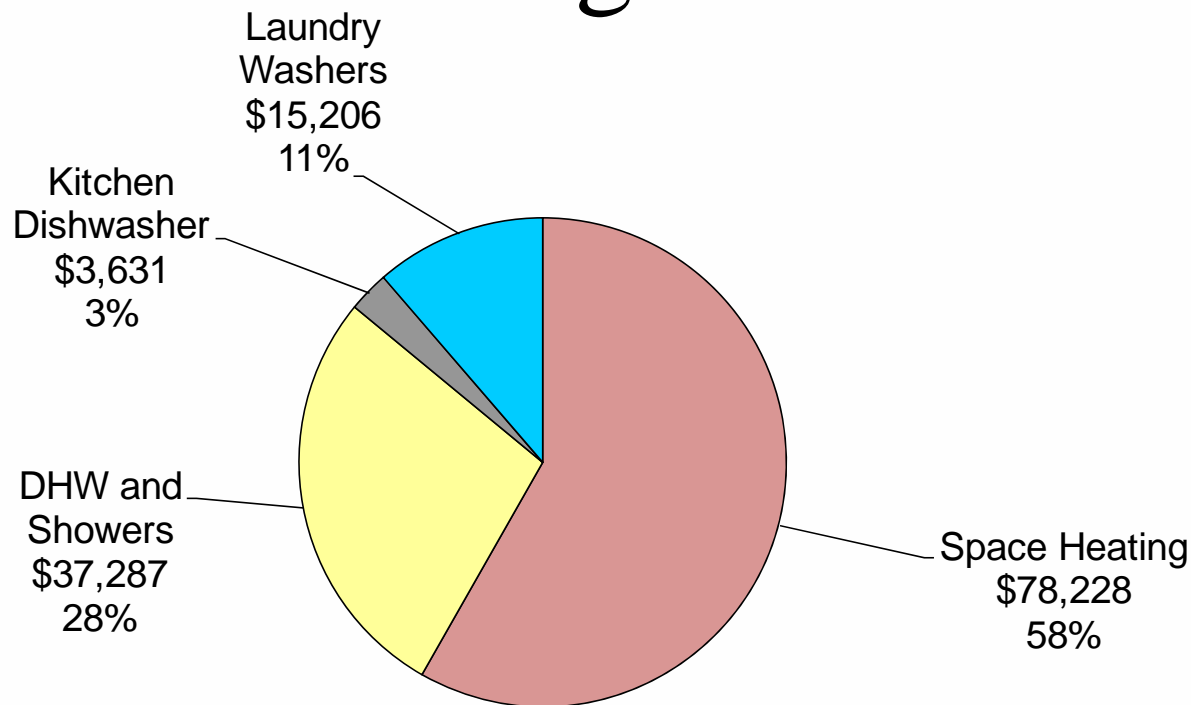


Total Annual kWh: 1,460,646
Total Annual Electricity Bill: \$203,876



Current Fuel Oil Consumption

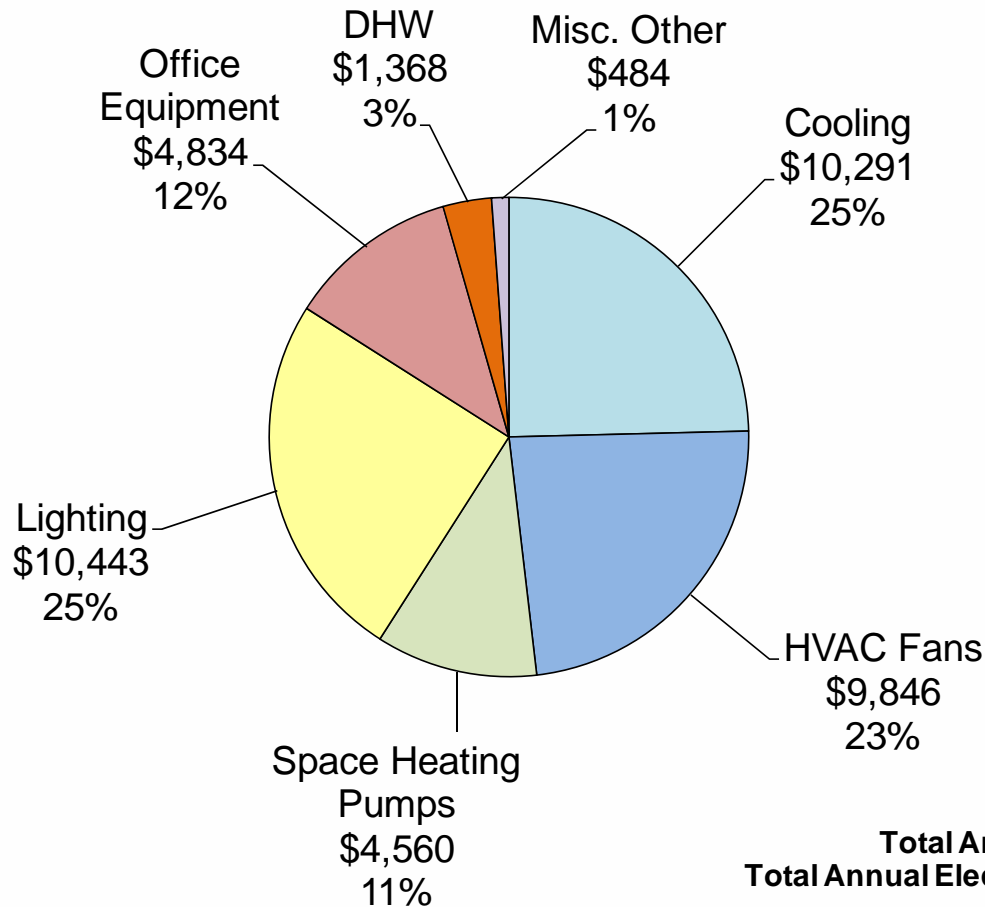
Nursing Home



Total Annual Fuel Oil Use (Gallons): 66,450
Total Annual Fuel Oil Bill: \$134,452



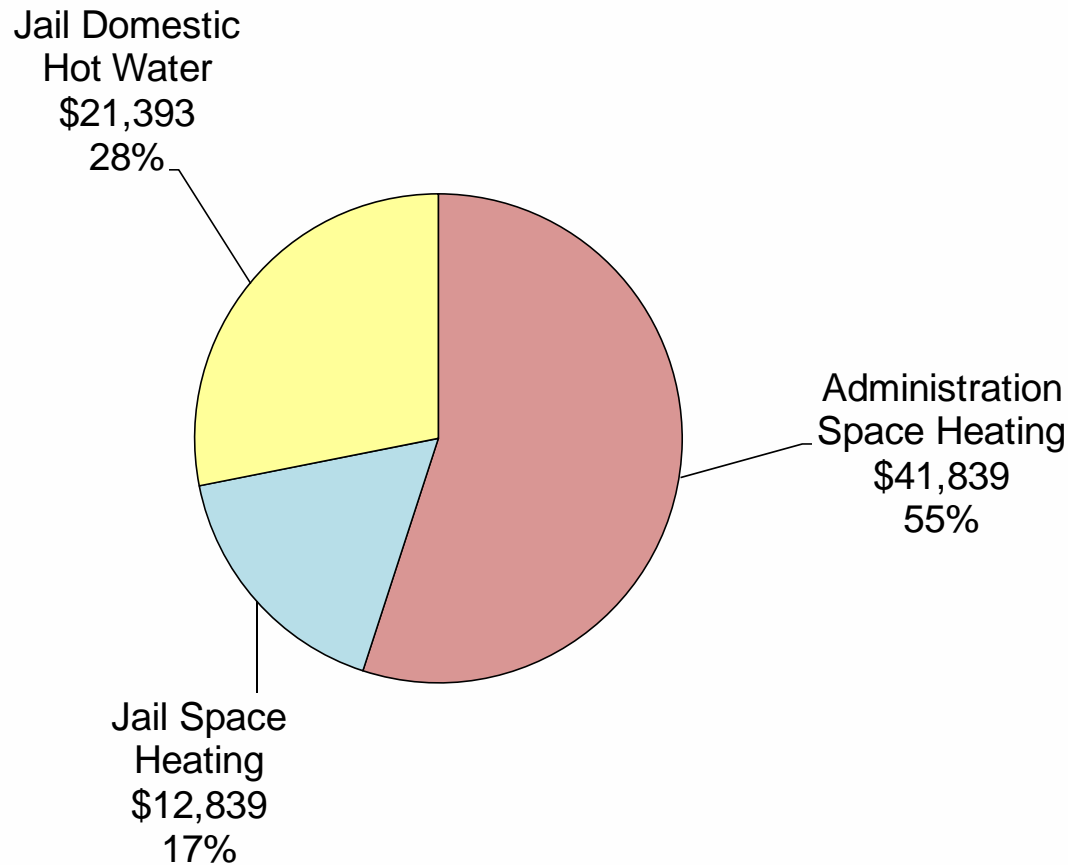
Current Electricity Consumption Administration Building



Total Annual kWh: 301,253
Total Annual Electricity Bill: \$41,826



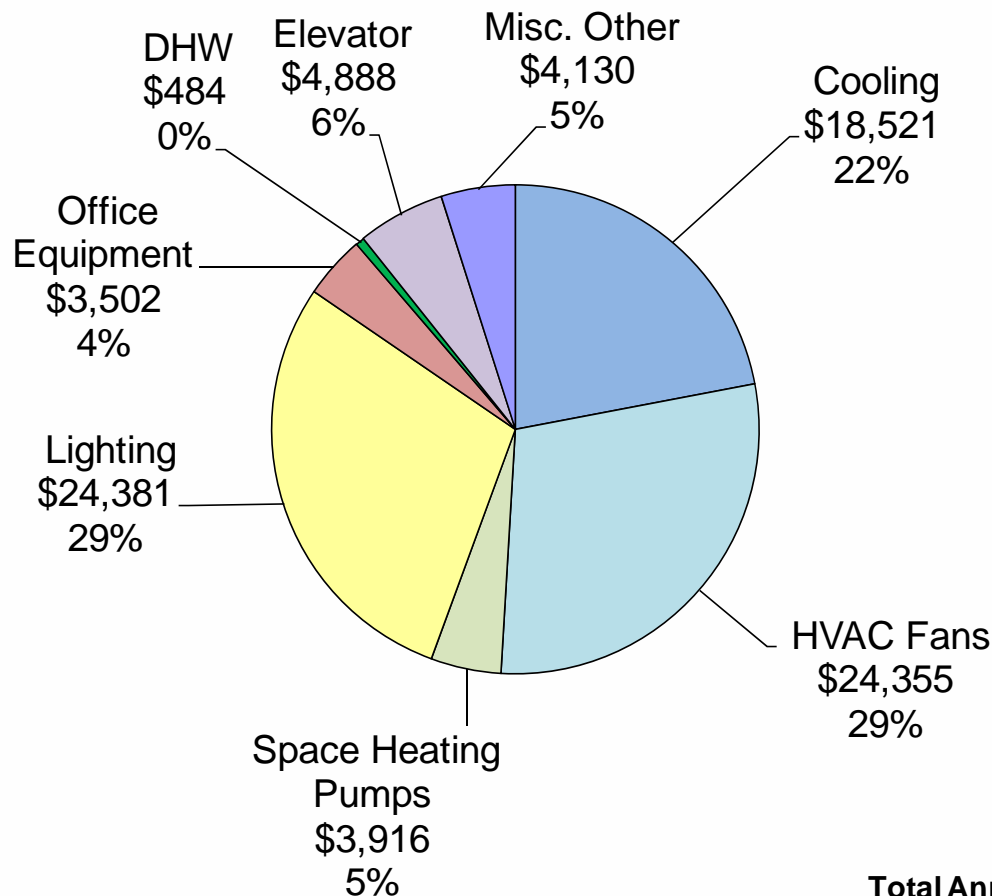
Current Fuel Oil Consumption Administration Building



Total Annual Fuel Oil Use (Gallons): 31,736
Total Annual Fuel Oil Bill: \$76,060



Current Electricity Consumption Courthouse



*All fuel oil consumed in the courthouse is for heating

Total Annual kWh: 534,480
Total Annual Electricity Bill: \$84,176



Energy Efficiency Measures

Energy Efficiency Measures	Energy Savings (kWh/yr)	Demand Reduction (kW)	#2 Fuel Oil Savings (MMBtu/yr)	Propane Savings (MMBtu/yr)	Total Cost Savings	Installed Cost	Simple Payback (Years)	CO ₂ Reduction (lbs/year)#
EEM-1: Optimize Boiler Combustion Controls On a Semi Annual Basis			322		\$1,957	\$0	0.0	51,878
EEM-2: Implement Night Temperature Setback in the Administration Building	3,468		139		\$2,900	\$800	0.3	26,293
EEM-3: Reduce Outside Air Intake in Designated AHUs	58,023	19.5	1,128		\$27,599	\$19,600	0.7	245,890
EEM-4: Shutdown Designated AHUs During Unoccupied Hours	44,057		4,852		\$17,812	\$12,400	0.7	829,921
EEM-5: Install Kitchen Hood Ventilation Control System	17,687			157	\$5,617	\$8,380	1.5	41,415



Energy Efficiency Measures

Energy Efficiency Measures	Energy Savings (kWh/yr)	Demand Reduction (kW)	#2 Fuel Oil Savings (MMBtu/yr)	Propane Savings (MMBtu/yr)	Total Cost Savings	Installed Cost	Simple Payback (Years)	CO ₂ Reduction (lbs/year)#
EEM-6: Replace Standard Efficiency Motors with NEMA Premium Efficiency Motors as They Fail	10,652	2.5			\$1,616	\$2,821	1.7	11,802
EEM-7: Install Lighting Controls in Designated Areas	60,137	0.6			\$8,627	\$19,275	2.2	66,632
EEM-8: Program Computers and Monitors to Go into "Standby" When Not in Use	8,045				\$1,154	\$3,200	2.8	8,914
EEM-9: Upgrade From T12 to High Performance T8 Lighting	49,649	14.8			\$7,122	\$27,911	3.9	55,012
EEM-10: Optimize Walk-In Refrigeration Units	13,990				\$2,007	\$12,880	6.4	15,501
EEM-11: Replace Kitchen Electric Booster Heater with a Propane Heater	25,097	8.6		-105	\$1,389	\$9,550	6.9	13,181
Total *	290,805	45.9	6,441	52	\$77,799	\$116,816	1.5	1,366,438

* These totals are based on a summation of the measures treated independently.

* Should all measures be implemented, interactive effects may alter total energy and cost savings.

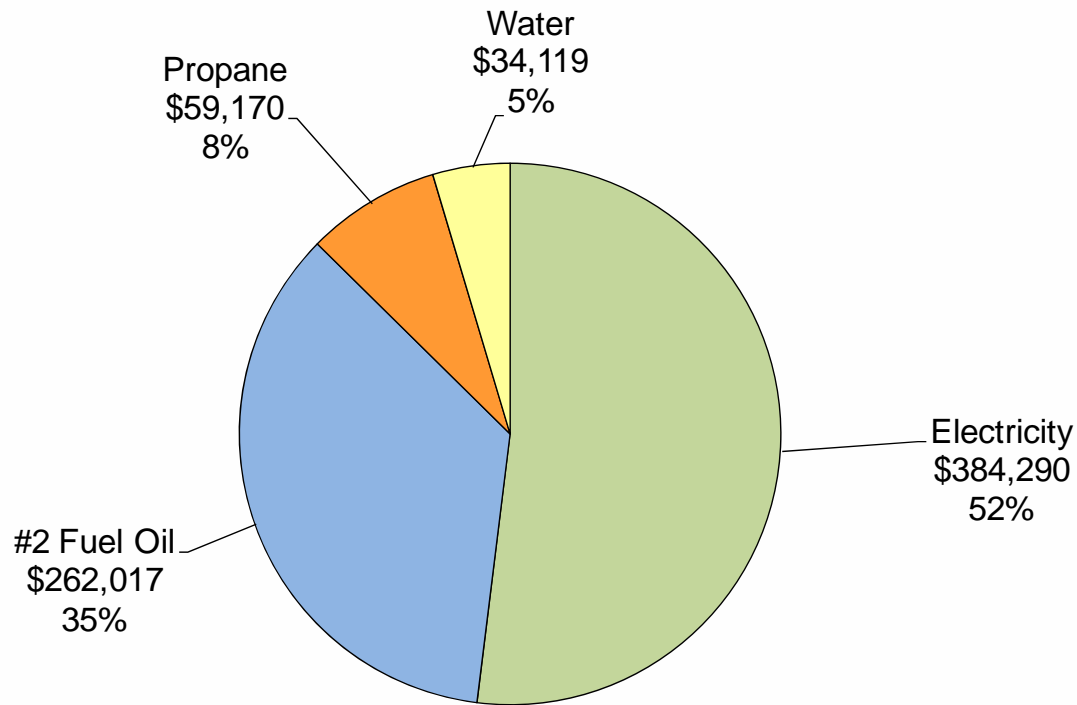
No.2 Fuel Oil: 161 lbs of CO₂ per MMBtu saved, Propane: 139 lbs of CO₂ per MMBtu saved, Electricity: 1.108 lbs of CO₂ per kWh saved

Informational Measures

- IM-1: Retrofit the HVAC Distribution System in the Courthouse from CAV to VAV
- IM-2: Upgrade Exterior Light Systems To LEDs
- IM-3: Install Insulation on Boilers and Pipes
- IM-4: Use Outside Air for Free Cooling of Dry Goods Storage
- IM-5: Install Domestic Hot Water heater in Jail
- IM-6: Install a Heat Recovery System on the Clothes Dryer Exhaust

Questions

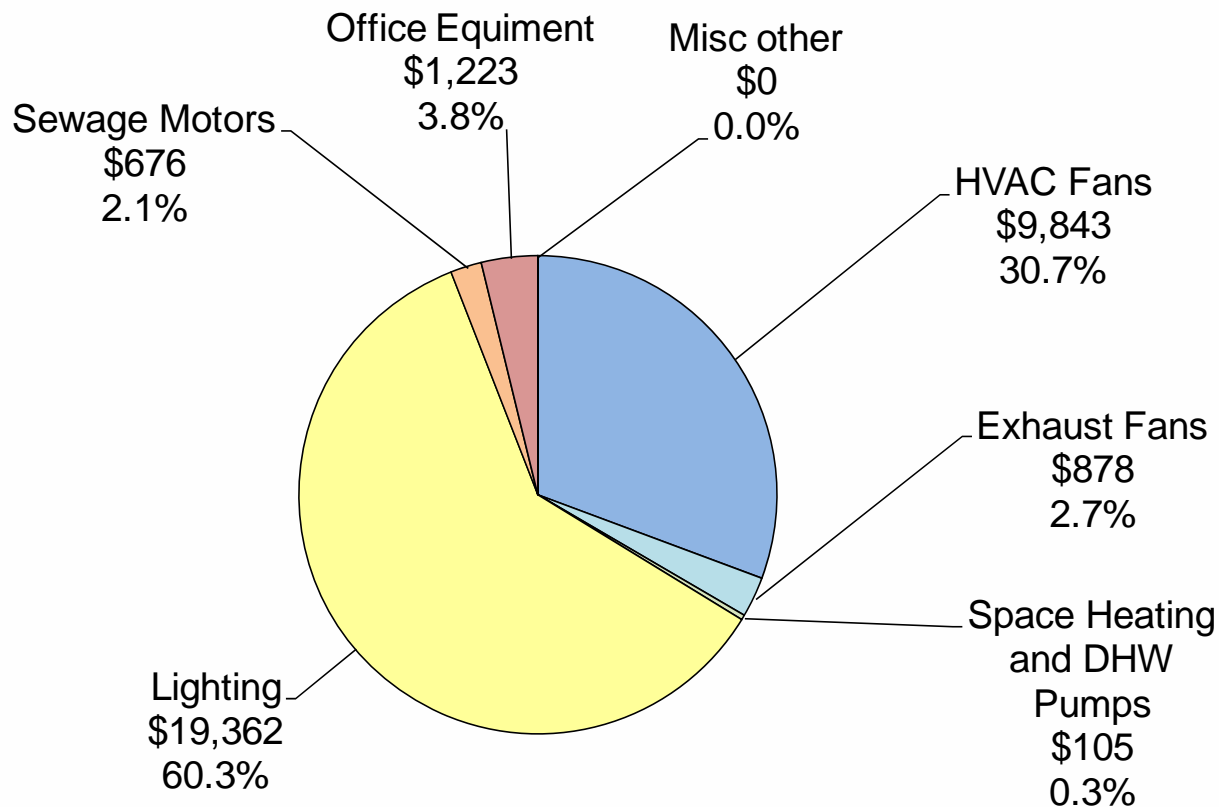
Complex Annual Utility Bill Breakdown



Total Annual Utility Bill: \$739,595



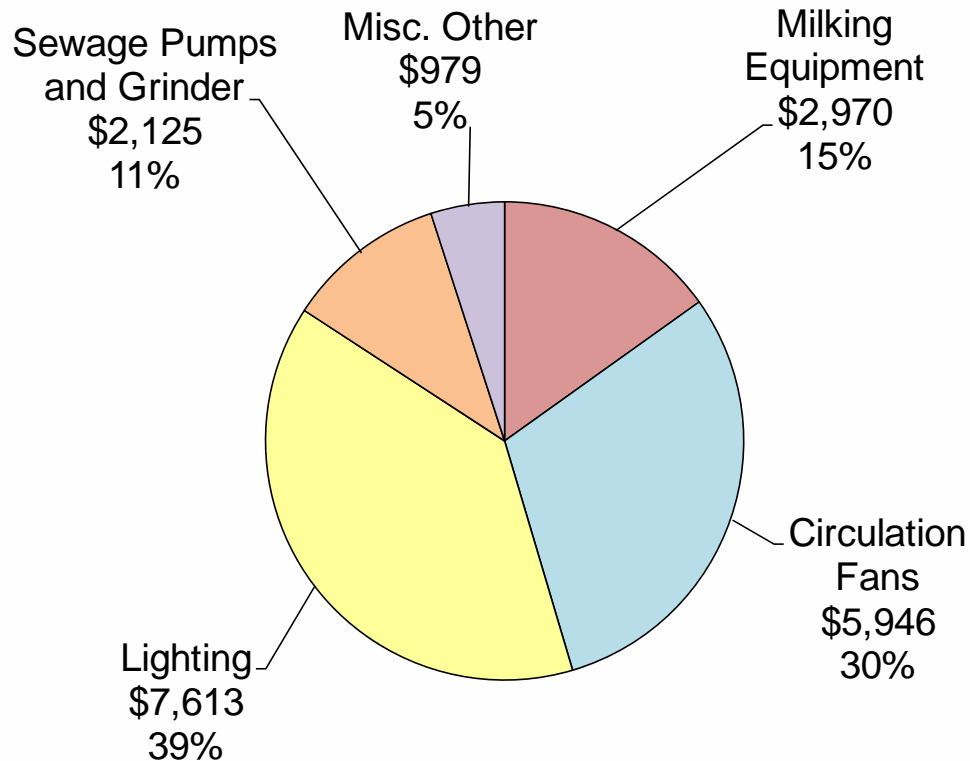
Current Electricity Consumption Jail



Total Annual kWh: 229,933
Total Annual Electricity Bill: \$32,087



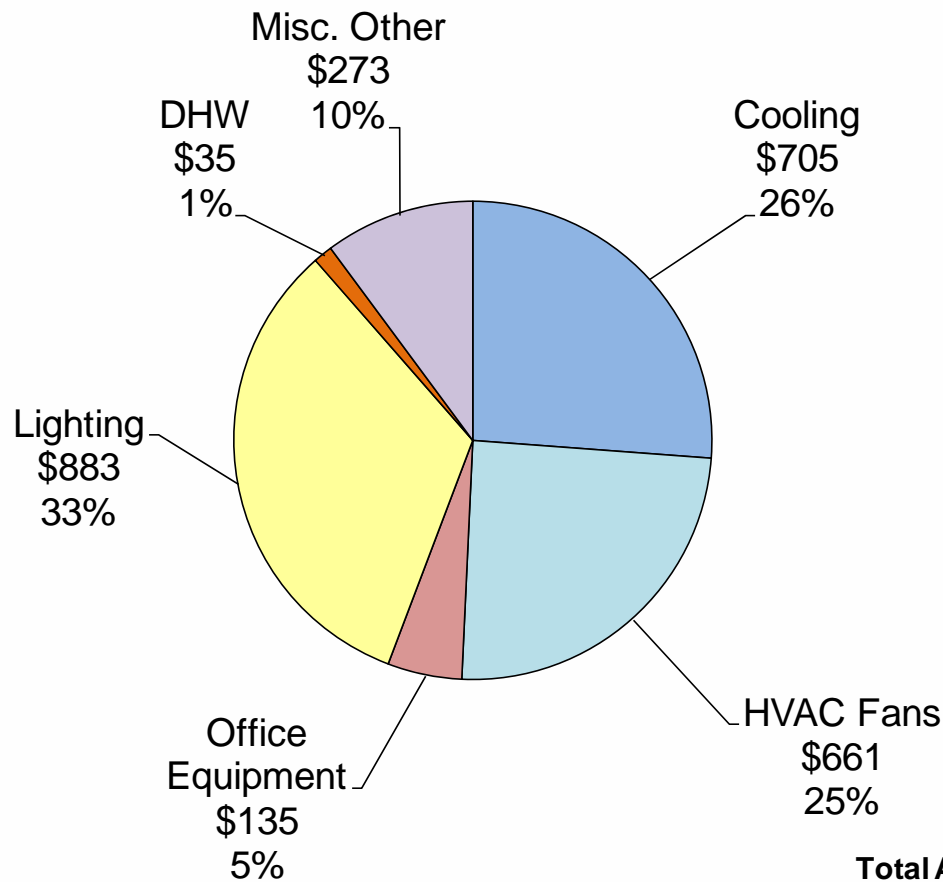
Current Electricity Consumption Farm



Total Annual kWh: 140,867
Total Annual Electricity Bill: \$19,633



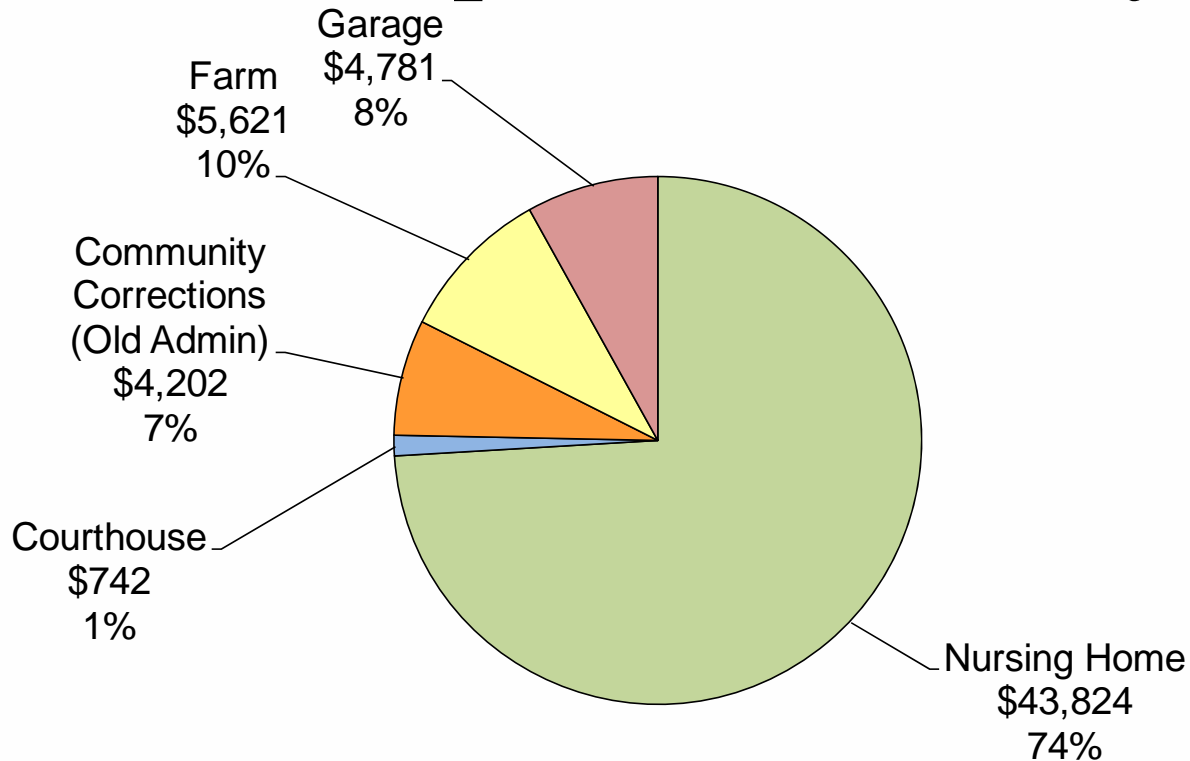
Current Electricity Consumption Community Corrections



Total Annual kWh: 12,830
Total Annual Electricity Bill: \$2,692



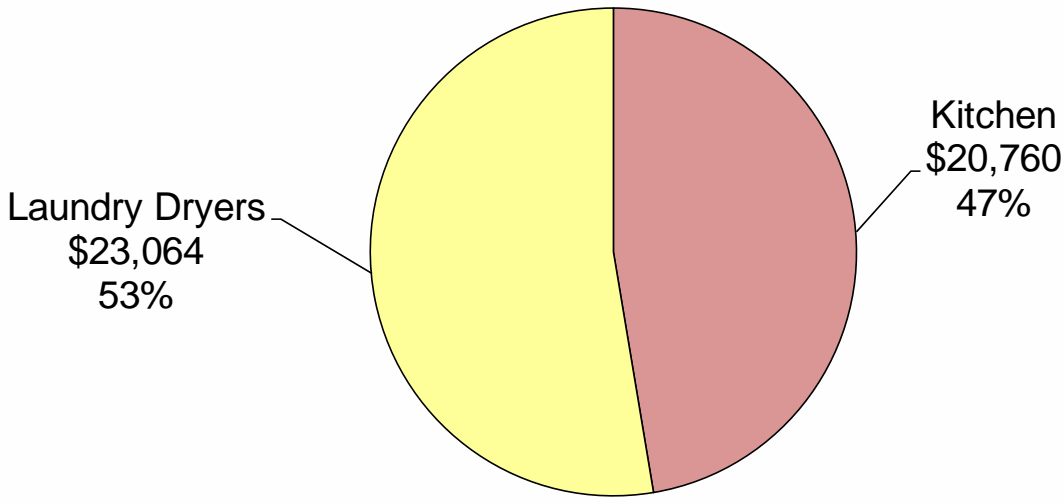
Current Facility Propane Consumption Summary



Total Annual Gallons: 30,488
Total Annual Water Bill: \$55,920



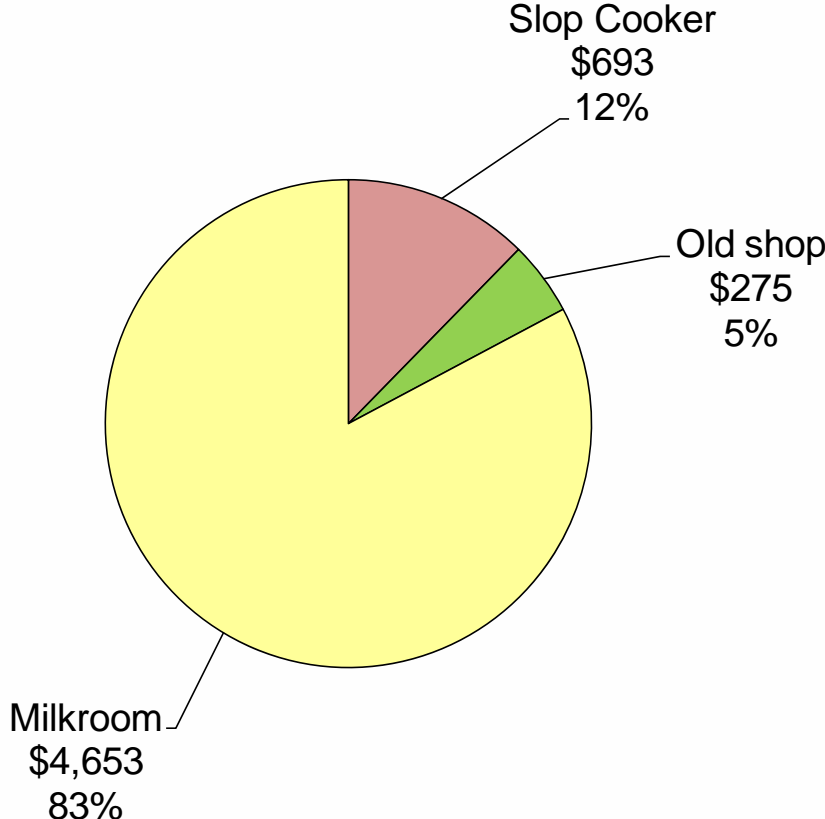
Current Propane Consumption Nursing Home



Total Annual Propane Use (Gallons): 22,308
Total Annual Fuel Oil Bill: \$39,349



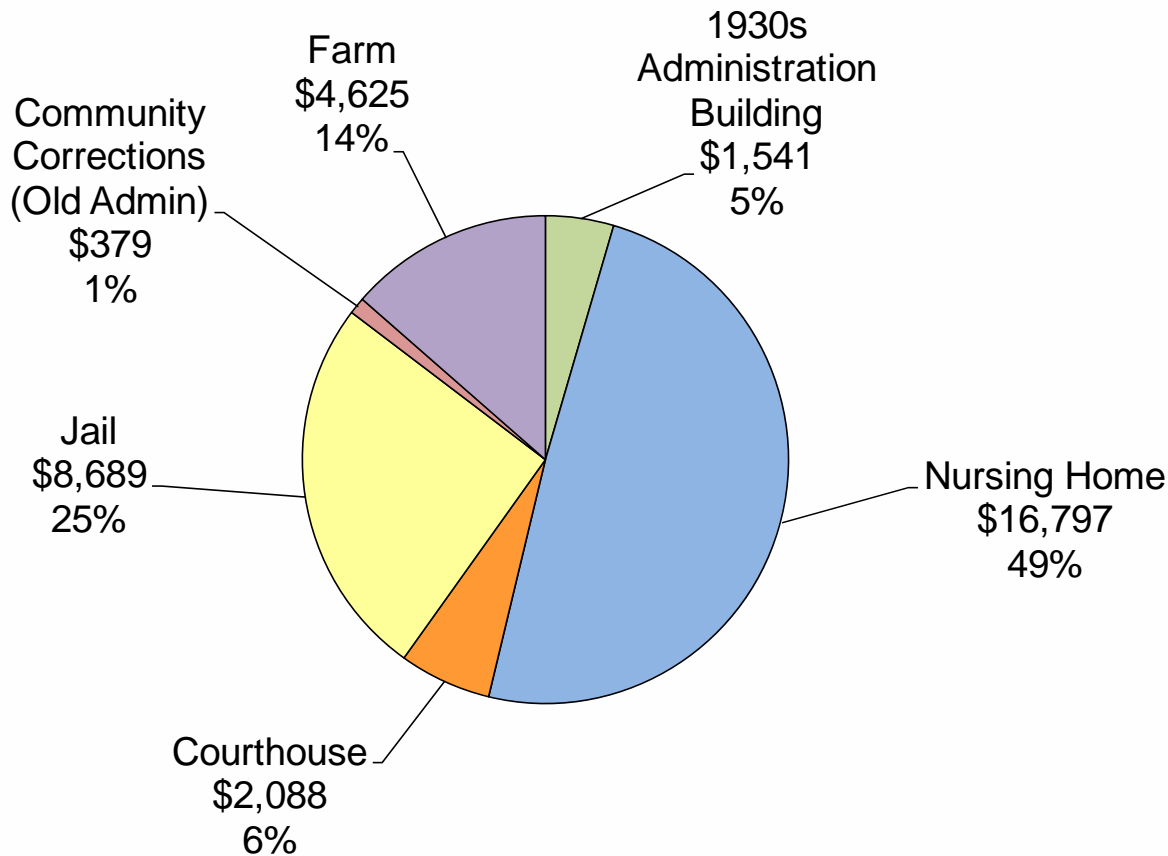
Current Propane Consumption Farm



Total Annual Propane Use (Gallons): 2,261
Total Annual Fuel Oil Bill: \$4,156



Current Facility Resource Consumption Water

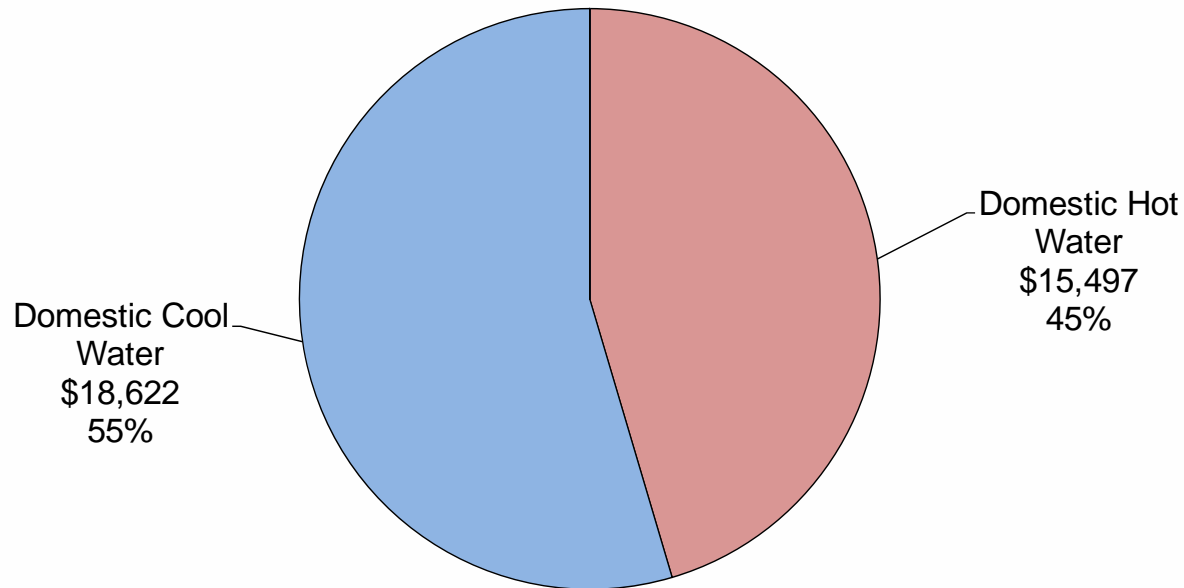


Total Annual Gallons: 8,318,000
Total Annual Water Bill: \$34,119



Current Resource Consumption

Water

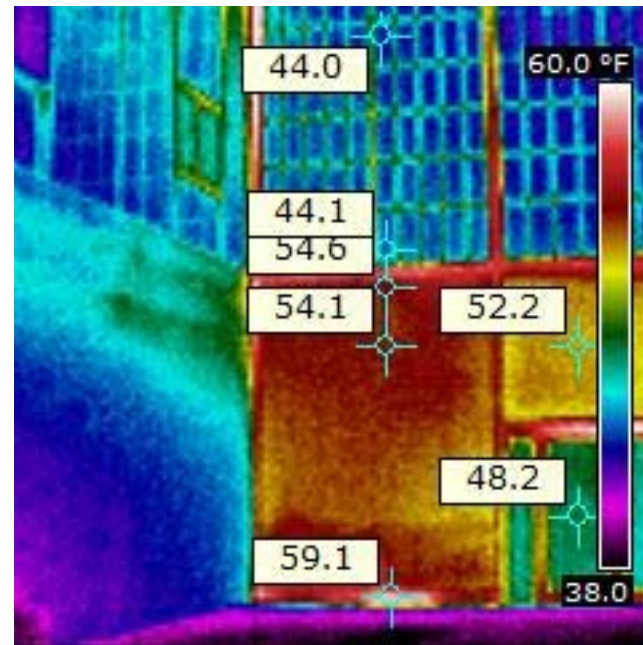
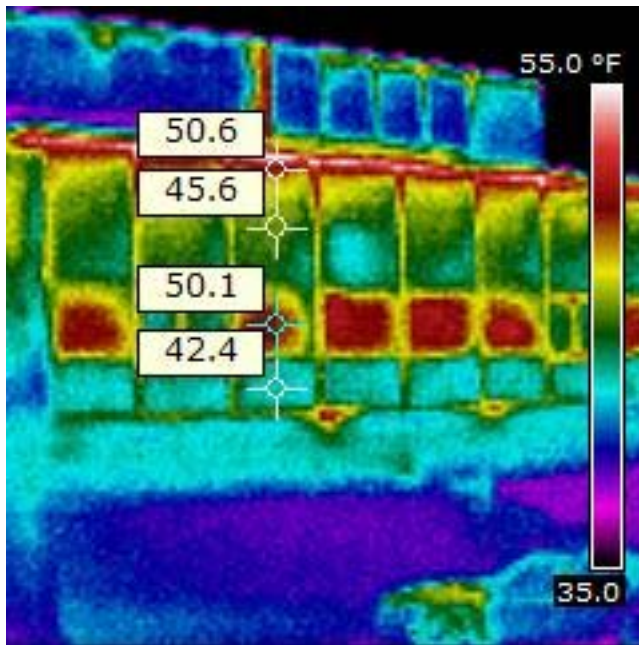


Total Annual Water Bill: \$34,119
Total Annual Gallons: 8,318,000



IR Imaging

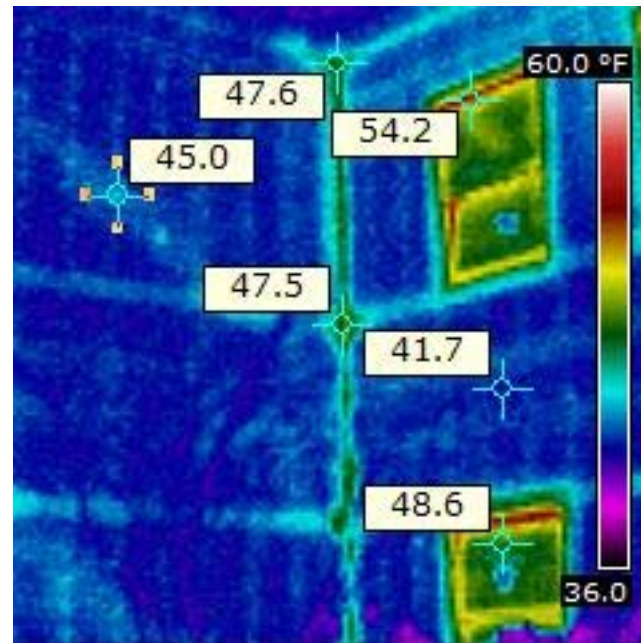
Courthouse Windows



energy & resource
solutions

IR Imaging

Nursing Home Windows



Facility Benchmarking

Building Description	Offices	Inpatient Health Care	Public Order and Safety
	kBtu/sq.ft.	kBtu/sq.ft.	kBtu/sq.ft.
National	75	109	63
Northeast	101	**	**
Midwest	109	272	**
Administrative Building	138	-	-
Nursing Home	-	181	-
Courthouse	-	-	117
Community Corrections	16	-	-
Jail	-	-	36