

BGS Support for Heating System Efficiency and Emissions Reductions

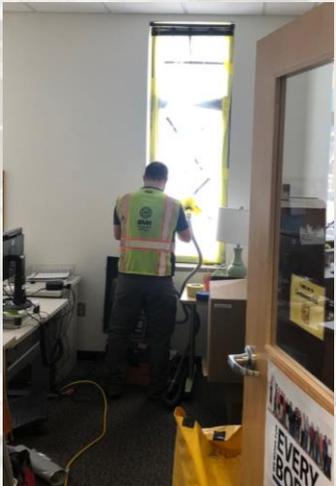
H.600 Testimony 2/17/22



BGS Process

SEMP

1. Energy Use Tracking
2. Investment Grade Energy Audit
3. Project Scope Development and Funding



Design & Construction

1. Major Maintenance Project List
2. Energy Analysis
3. Project Scope Development and Funding



BGS Project Overview

Current Systems

- Montpelier Campus - Chips
- Waterbury State Office Complex – Chips
- Middlebury Mahady Court House – Chips
- Pittsford Fire and Police Academy – Chips
- Newport Hebert State Office Building – Chips
- NSCF – Chunk wood
- St. Johnsbury Correctional Facility – Chunk Wood
- Middlesex Central Services – Pellets
- Hartford Rest Area- Pellets
- Westminster Public Safety Facility – Pellets
- St. Albans Public Safety Facility – Pellets
- Barre Washington District Courthouse – Pellets
- Bennington Bennco – Closed Loop
- Bennington Courthouse – Open Loop
- Sharon Welcome Center – Closed Loop

Systems Planned & Under Study

- Williston Police Barracks – Closed Loop
- Essex PSSF – Ground Source Heat Pump
- Randolph Lab (VAEL) – Too expensive, never implemented
- NSCF-upgrade
- SSCF
- Vt. Veterans Home



Project Highlight: Middlesex Central Services

Energy Tracking

Building	Site EUI kBtu/ft ² /yr	Source EUI Btu/ft ² /yr	Energy Star Rating (1-100)
Middlesex Central Services	65.7	161.3	29

Investment Grade Energy Audit

CSM-1 Replace Oil Fired Steam Boilers and Steam Distribution Systems with wood Pellet fueled Hot Water Boilers and a Hot Water Distribution System

Budgetary Cost	Annual Utility Savings					Payback (without incentive)
	Electricity		Fuel Oil #2	Wood Pellets	Total	
\$	kW	Gal	Gal	Ton	\$	Years
568,118	0	0	11,997	(98)	24,470	-



SRMRF Application Project Funding

C. ESTIMATED ANNUAL SAVINGS		
Please provide additional documentation to verify methodology and calculations.	Estimated Annual Savings (Units)	Estimated Financial Savings (\$)
Electrical Savings – Associated annual electrical usage reduction (kWh) and avoided cost at current rates.	7,852 kWh	\$ 2,000.00
Heating Fuel Savings – Associated annual heating fuel (oil, natural gas, wood, etc.) usage reduction and avoided cost at current rates.	6568 Gallons	\$ 31,449.00
Emissions Reduction – The equivalent amount of greenhouse gas reductions this project will achieve. (This information is not required. If left blank, BGS will calculate this for you).	151.8	(MTCO ₂ e)
Total:	N/A	\$ 33,449.00



Project Highlight: Williston Public Safety

Williston PS Building Energy Analysis Process

2. Energy Modeling of HVAC Systems

HVAC System	Tons of CO2/year	Equivalent Cost/year
Baseline Fan Coil Unit System with Gas Fired Garage Heating	151.03	\$15,102.71
Air to Water Heat Pump System with Gas Fired Garage Heating	94.98	\$9,498.33
Air to Water Heat Pump System with Hot Water Garage Heating	80.13	\$8,013.10
Water to Water Heat Pump System with Gas Fired Garage Heating	89.41	\$8,941.05
Water to Water Heat Pump System with Hot Water Garage Heating	57.23	\$5,723.22
Water to Water Heat Pump System with Hot Water Garage Heating	\$20,203.65	Main: \$0.00 Garage: \$0.00



a) 134,691kWh / Main 0 CCF/ Garage 0 CCF

Project Highlight: SOV Secure Recovery Residence

SRR Building Energy Analysis Process

3. Carbon Analysis of HVAC Systems

1: Energy Modeling
Recommended Water to Water geothermal heat pumps

HVAC System	Metric Tons of CO2/year	Equivalent Cost/year
Baseline Air Handling System	46.43	\$4,643.00
Geothermal System	38.42	\$3,842.00
VT Gas Geothermal System	38.42	\$3,842.00
VT Gas Geothermal System	\$13,562.10	\$0.00

