

Green Energy Projects for the City of Smyrna

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Topics of Discussion

- Georgia Power MSA
- HVAC Equipment Replacement
- Facility Evaluation Example
- Importance of Implementing Program Now
- Program Summary
- Financial Proforma
- Funding Term Options
- Decarbonization
- Call to Action



Georgia Power MSA (Master Services Agreement)

Great News

City of Smyrna Qualifies for Georgia Power's MSA Program

- Reduce Risk, Avoid Emergency Costs, Save by Implementing Now
- No CapEX Needed, GPC Provides Upfront Capital
- Off-Book Funding with No Balance Sheet Financing
- Use OpEX Budget with On-Bill Monthly Services Fee
- Generate Savings while Improving the Environment
- Decarbonize with CO2 Reductions

Excellent Partnership



- ✓ Coauthor Solutions
- ✓ Single Source Responsibility
- ✓ No Upfront Capital Needed
- ✓ Reduce Cost by Eliminating Risk
- ✓ Savings Help Pay for Upgrades
- ✓ Implement Program Now
- ✓ Decarbonization CO2 Reduction
- ✓ Environmental Stewardship



Together We're Improving the Environment for Citizens, Stakeholders and Staff

HVAC Equipment Replacement and Scope of Work

Facility Location	High Level Summary of HVAC Scope of Work, Equipment Replacements, GPS Ionization, Duct Cleaning, Commissioning, TAB, and Controls
1 City Hall	Provide variable speed pumping for hot water heating, replace 5-HW control valves, replace HW pump, flush hot water system, add VFD for pump motor, install DP switch for variable speed controls, install GPS ionization for 5-AHUs, clean ductwork, provide system commissioning, provide final TAB of HVAC systems and updated controls drawings.
2 Community Center	Replace 10-WSHPs, 9-Pumps, 2-Boilers, 3-Split systems and 12-Exhaust fans. Replace valve hose kits with 11-new PIC (Pressure Independent Control) valves for each of 11-WSHPs, install VFDs for 3-loop pumps, install VFD for Cooling Tower fans, provide controls for variable speed pumping, install DP switch for variable speed pumping controls, install DP for variable speed fan controls, install GPS ionization for 11-WSHPs, clean ductwork, provide system commissioning, provide final TAB of HVAC systems and update controls drawings.
3 Public Library	Replace 6-WSHPs, and 8-Exhaust fans. Replace valve hose kits with 8-new PIC (Pressure Independent Control) valves for each of 8-WSHPs, provide controls for variable speed pumping, install DP switch for controls, install GPS ionization for 8-WSHPs, clean ductwork, provide system commissioning, final TAB and update controls drawings.
4 Brawner Hall	Replace 1-Chiller, 2-chilled water pumps, add VFDs for 2-chilled water pumps, provide DP switch for variable speed pumping, replace 6-chilled water control valves, replace 1-boiler, replace 6-hot water control valves, 2-exhaust fans, 13-PIUs, clean hot water and chilled water coils, flush hot water and chiller water piping, adjust fan VFDs and pulleys, reconnect manual volume dampers at each of 7-AHUs, install GPS ionization for 7-AHUs, clean ductwork, provide system commissioning, provide final TAB of HVAC systems and update controls drawings.
5 Police Station/Jail	Replace 4-RTUs, replace 2-ERUs, replace 1-Split System, provide steel modifications for roof mounted equipment, install GPS ionization for 10-RTUs and 2-Split Systems, clean ductwork, provide system commissioning, provide final TAB for HVAC systems and update controls drawings.
6 Public Works	Replace 5-Split Systems, install GPS ionization for 1-RTU and 8-Split Systems, provide new wireless thermostats connected to central Distech system, clean ductwork, provide HVAC system commissioning, provide final TAB for HVAC systems and furnish new controls drawings.
7 Wolfe Center	Replace 6-Split Systems, install GPS ionization for 6-Split Systems, clean ductwork, provide final TAB for HVAC systems and furnish new controls drawings.
8 Fire Station #1	Modify RA ductwork to ensure proper air flow, replace hot water heater with tankless heater, add GPS ionization for 2-AHUs, clean ductwork for 2-AHUs and 7-PIUs restore economizer controls, provide final TAB for HVAC systems and furnish new controls drawings.
9 Fire Station #2	Add GPS ionization for 2-AHUs and 1-RTU, clean ductwork for 2-AHUs and 1-RTU, and provide final TAB for HVAC systems.
10 Fire Station #3	Replace 3-Split Systems, add GPS ionization for 3-FCUs, clean ductwork for 3-FCUs, and provide final TAB for HVAC systems.
11 Fire Station #4	Replace 1-Split System, add GPS ionization for 2-FCUs, clean ductwork for 2-FCUs, and provide final TAB for HVAC systems.
12 Fire Station #5	Replace 4-Split Systems, add GPS ionization for 4-FCUs, clean ductwork for 4-FCUs, and provide final TAB for HVAC systems.
13 Recycling Center	Replace 1-Split System with thermostat and replace unit heaters with IR tube type heaters.
14 Brinkley Park	Replace 6-Split Systems and thermostats.
15 Chuck Camp Park	Replace 2-Split Systems and thermostats.
16 Cobb Park	Replace 4-Split Systems and thermostats.
17 Jonquil Park	Replace 1-Split Systems and thermostat.
18 Tolleson Park	Replace 1-Twin Split System with furnaces and thermostats, provide 3-Split New Systems with 1-for Press Box, 1-for Men's Restroom and 1-for Woman's Restroom complete with refrigerant piping and electrical work pour new concrete pad for new condensers, provide coring for piping and electrical work and add new fencing around new condensing units. Replace domestic water heater, replace pool heater to match exiting pool heater and replace pool pump including electrical work.
19 Ward Park	Replace 1-Wall Pack and thermostat.

Facility Evaluation Example - Brawner Hall



Items to bring Facility back to Best Design Conditions

- 1 Clean AHU CW/HW Coils, adjust pulleys/belts, RCx VFDs & AHUs
- 2 Adjust manual balance dampers (RA/OA) & Final TAB SA/RA/OA
- 3 Replace (13) PIUs, Cx new PIUs and RCx (10) remaining PIUs
- 4 Repair SA duct leaks at each PIU like the leaks found at PIU10
- 5 Replace AC1 chiller and CW pumps (primary/standby)
- 6 Replace B1 boiler, HW pumps and inline circulating pumps
- 7 Replace (2) Exhaust Fans (EF1 & EF3)
- 8 Perform RCx of each system with final TAB of airside and waterside
- 9 Flush chilled and hot water systems to clean interior of piping
- 10 Clean Ductwork for Entire Facility
- 11 Install GPS (Global Plasma System) Ionization for all (7) AHUs

Equipment Replacements and Recommendations

Equipment Replacements

Replace (1) Chiller, (2) CHW Pumps, (1) Boiler & (2) HW Pumps

Replace (2) In-line pumps, (13) PIUs and (2) Exhaust Fans

General Recommendations

Clean AHU1 through AHU7 chilled water and hot water coils

Adjust/TAB AHU1 to 7 SA/RA/OA manual balance dampers

Final TAB of all air distribution systems after work is complete

Clean Interior of Ductwork

For AHU1

Replace filter with correct filter (grease type filter installed causing dirty coils impacting air flow), clean heating and cooling coils, adjust manual volume balance dampers, Cx VFD, TAB airflow & water flow, & final TAB floor registers

For AHU2, AHU3, AHU4, AHU5, AHU6, & AHU7

Clean heating and cooling coils, check pulley & belt, adjust AHU manual volume RA/OA dampers, RCx VFD, final TAB airside & waterside systems and TAB AHUs.

For PIU1 through PIU23

Replace (13) PIUs (1,2,4,6,7,8,9,11,12,16,20,21 & 23)

Commission (10) PIUs (3,5,10,13,14,15,17,19, & 22)

Final TAB for all air distribution devices associated with PIUs

Pictures of Issues Discovered



New HVAC Equipment, LED Lighting, & Electrical Systems



Importance of Implementing Program Now

- Critical Systems at Risk of Failure with High Cost of Emergency Replacement
- Safety Risk to Employees because Data & Call Centers are not on Backup Generator
- Maintenance Cost Continue to Rise due to Old Inefficient Equipment
- HVAC Systems are Beyond Useful Life (some >26 years)
- R22 Refrigerant not Manufactured and is very Expensive
- Equipment has long lead time of 24-to-66 weeks for HVAC, Generators, Etc.
- Cost Increase due to Need for Temporary Heating, Cooling and Power
- Downtime could be Extended due to Supply Chain Issues
- Lost Savings Every month Systems are not Replaced
- Replacing Equipment on an Add Hock Basis Causes Disparate Systems

Program Summary Energy Conservation Measure (ECM)

ECM1, ECM2, ECM3, ECM4, and ECM5 Totals	Investment Budget	Estimated Energy kWh/yr	Estimated Energy therms/yr	Estimated Savings \$/yr	Estimated CO2 Reduced lbs./yr
ECM1 HVAC Systems Upgrades	\$ 4,403,290	260,339	1,418	\$ 32,266	227,454
ECM2 Duct Cleaning, Commissioning, and Final TAB	\$ 735,960	84,935	1,756	\$ 12,671	877,488
ECM3 Interior Lighting LED Upgrades	\$ 696,359	444,151	-	\$ 89,321	-
ECM4 Switchgear, Transformers, Generators, Automatic Transfer Switches	\$ 2,583,337	-	-	-	-
ECM5 LED Lighting for all Park Ball Fields, Batting Cages, Pool	\$ 2,316,297	-	-	-	-
ECM1, ECM2, ECM3, ECM4, and ECM5 Totals	\$ 10,735,245	789,425	3,174	\$134,258	1,104,942

Investment to Implement Program Now

\$10,735,245.00

Estimated Annual Electricity Savings

789,425 kWh/year

Estimated Annual Natural Gas Savings

3,174 therms/year

Estimated Annual Dollar Savings

\$134,258/year

Estimated Annual Carbon Reduction

1,104,942 lbs/year

Financial Proforma

<u>Energy Conservation Measure (ECM)</u>	<u>Investment</u>
ECM 1 HVAC Systems Upgrades	\$ 4,403,290
ECM 2 Duct Cleaning, Commissioning, & Final TAB	\$ 735,960
ECM 3 Interior Lighting LED Upgrades	\$ 696,359
ECM 4 Switchgear, Transformers, Generators, ATSS	\$ 2,583,337
ECM 5 LED Retrofit for Sports Fields all Parks	<u>\$ 2,316,297</u>
 Total Investment to Implement Now	 \$10,735,245
Estimated Annual Dollar Savings	\$ 134,258
On-Bill Monthly Fee (15-year Term)	\$ 97,394
Savings Over 15-year Time Horizon	\$ 2,013,870

Savings Help to Offset Upgrades by 18.7% Over Time

Funding Term Options (7, 10, and 15-years) Estimated Fees

Option #1 Monthly Fee for 7-years

- Program Total Investment \$10,735,245
- GPC Provides Funds to Implement Program Now \$0 dollars out-of-pocket
- On-Power Bill Monthly Fee **\$ 161,709**

Option #2 Monthly Fee for 10-years

- Program Total Investment \$10,735,245
- GPC Provides Funds to Implement Program Now \$0 dollars out-of-pocket
- On-Power Bill Monthly Fee **\$ 124,867**

Option #3 Monthly Fee for 15-years

- Program Total Investment \$10,735,245
- GPC Provides Funds to Implement Program Now \$0 dollars out-of-pocket
- On-Power Bill Monthly Fee **\$ 97,394**

Funding does not Impact Credit Worthiness since Off-Book Service Fee

Carbon Reduction Equivalents CO2e

Decarbonization Reduction by 1,104,942 Pounds



Carbon Sequestered
by 9,251 tree
seedlings grown for
10 years



CO2 emissions from
626,672 pounds of
coal burned



CO2 emissions from
68,053,181 number of
smartphones charged



GHG emission from 124
passenger vehicles
driven for one year or
CO2 emissions from
62,952 gallons of
gasoline consumed

Call to Action

