RESOLUTION 16-07

A RESOLUTION AUTHORIZING THE CITY OF SPRING HILL TO PARTICIPATE IN THE TDEC CLEAN TENNESSEE ENERGY MATCHING GRANT PROGRAM

WHEREAS, the City of Spring Hill has the opportunity to reduce electrical and HVAC consumption through cost and usage reduction techniques at City Hall, the Public Library and the Water Treatment Plant; and

WHEREAS, TDEC is offering a 50/50 Matching Grant Program to implement the proposed energy reduction techniques; and

WHEREAS, the City of Spring Hill now seeks to participate in this important program.

NOW, THEREFORE, BE IT RESOLVED, by the Board of Mayor and Aldermen of the City of Spring Hill, Tennessee, the following:

SECTION 1. That the City of Spring Hill is hereby authorized to submit application for the Clean Tennessee Energy Matching Grant Program through TDEC.

SECTION 2. That the City of Spring Hill is further authorized to provide a matching sum not to exceed $26,409.78 to serve as a match for any monies provided by this grant. Obligated funding will be included in the 2016-2017 budget.

Passed and adopted this 19th day of January, 2016.

Rick Graham, Mayor

ATTEST:

April Goad, City Recorder

LEGAL FORM APPROVED:

Patrick Carter, City Attorney

DATE: Dec. 30, 2015

TO: BOMA

FROM: Jeremy Polk, MS4 Coordinator

RE: Authorization to participate in TDEC Clean Tennessee Energy matching grant program

---

OVERVIEW: Authorization to participate in a matching grant program through TDEC.

HIGHLIGHTS:

- This request is to authorize participation in a grant program that would reduce electrical and HVAC consumption thereby saving the City money

PROJECT/CONTRACT UPDATES:

- This request is not a budgeted item in this year's budget.
- Total Cost is $52,819.55; City will be required to pay funds as work is done and then receive 50% reimbursement from TDEC.
- City's 50% cost will not exceed $26,409.78.
- The cost and usage reduction techniques will be implemented at City Hall, the public library and the Water Treatment plant

ACTION ITEMS:

- Request that this authorization be approved.

CONCERNS/ISSUES/PROBLEMS:

- None

Respectfully,

Jeremy Polk, MS4 Coordinator

CITY OF SPRING HILL ENERGY EFFICIENT UPGRADES

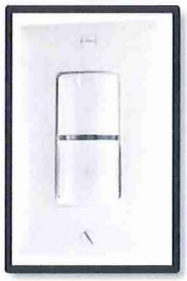
Background Information:

The City of Spring Hill seeks to use Clean Tennessee Energy grant funds to reduce electrical and HVAC consumption at the following municipal facilities: City Hall, Spring Hill Water Plant, & Spring Hill Library. The City believes this can be accomplished by the following:

SPRING HILL CITY HALL

City Hall will retrofit the existing basic thermostats with 7-day multi-time setting thermostats and replace existing on/off light switches with passive infrared wall switch occupancy sensor or lighting controlled passive infrared ceiling sensors. The individual area determines the wall or ceiling option. Upgraded thermostats will create set back temperatures during unoccupied hours. Lighting controls will prevent any area not authorized to remain on all hours are turned off after work hours and will reduce any areas when on-site personnel are absent the area after a designated time.

The City seeks to install a single room Energy Efficient Ductless Mini-Split HVAC unit into a server/electronics room for controlled temperature and remove the room from the existing HVAC unit supplying additional offices. The existing unit operates continuously to satisfy the server/electronics required temperatures, causing the additional offices ineffective & uncomfortable working temperatures. The City Hall building is owned and maintained by the City.



Installation of IR sensors will reduce lighting when occupants are out of office during the work day and ensure they are off during non-working hours.

The current thermostats call for heat or cool only. The set temperature remains until changed. Retrofit to a multi-day, multi-time setting will instantly reduce operating cost/usage during non-work hours.

SPRING HILL WATER PLANT

The City of Spring Hill Water Plant seeks to retrofit the existing 400 watt metal halide ceiling fixtures with 150 watt LED High Bay Base with lamp. The 33 interior fixtures never shut off and are continually on due to 24 hour employees on-site and is required for this building type.

The Water Plant also seeks to retrofit 8 outdoor wall-mounted lights. The existing lamps are 175 watt metal halide and will be retrofit to 42 watt LED fixtures. These fixtures operate during non-daylight hours. The water plant is owned and maintained by the City and will reduce maintenance cost, material cost, and decrease usage and cost over the 8-10 year lifespan of the fixtures.

The current 250 watt lamps (Left) last from 6-8 months. The 42 watt LED (Right) is expected to last 8-10 years.

The 400 watt metal halide (Left) typically last 6-8 months. The 150 watt LED base w/ lamp (Right) is expected to last 8-10 years!

SPRING HILL LIBRARY

The City of Spring Hill Library seeks to install an automated Energy Management System for HVAC efficiency reduction. The retrofit will create scheduled settings for daily usage, monitor the facilities HVAC capabilities, and report issues to designated personnel. In addition, we seek to replace twelve (12) 175 watt metal halide outdoor wall packs with 42 watt LED. This retrofit is like the Water Plant stated above. This will reduce maintenance cost, daily usage and cost, and prevent early unit life cycle span. The library is owned and maintained by the City.

Energy Efficiency & Cost Savings:

This project makes a strong business case for energy efficiency.

City of Spring Hill City Hall

- The City anticipates a 35-40% energy reduction for the installation of programmable thermostats – From 146,520 kwh/year to 87,912 kwh/year.
- The City anticipates a 10-15% energy reduction for the installation of passive infrared wall light switches and passive IR ceiling sensors – 73260 kwh/year to 62271 kwh/year.
- The Energy Efficient Ductless Mini-Split HVAC unit install will accomplish two items:
    - The existing three ton unit supporting the server/electronics room will run at a decreased rate, reduce maintenance cost, and support the additional offices with a proper work environment.
    - The server/electronics room will run at a set temperature to ensure decreased usage and provide the required temperature to prevent computer equipment damage.
- This project will save the City approximately $68,427.80 over the next 10 years and does not factor the savings from reduced maintenance and labor hours.
- Estimated Return On Investment is 2 years, 5 months. Payback schedule is displayed below.

City of Spring Hill Water Plant

- The City anticipates a 20-25% energy reduction for the retrofit of 33 metal halide hi-bay fixtures and 8 metal halide wall pack fixtures to LED – From 1,580,700 kwh/year to 1,501,749 kwh/year.
- This project will save approximately $78,951.00 over 10 years. These fixtures have an expected life span of 8-10 years.
- The savings do not factor cost of current materials replacements or maintenance labor hours.
- Estimated Return On Investment is 2 years, 8 months. Payback schedule is displayed below.

City of Spring Hill Library

- The City anticipates a 30-35% energy reduction for the installation of an Energy Management System for HVAC control and retrofit of twelve (12) 175 watt metal halide wall packs. From – 239,280 kwh/year to 189,803 kwh/year.
- This project will save approximately $51,357.60 over 10 years. The savings do not factor the cost of existing materials and maintenance labor hours and potentially expand the life of existing HVAC units.
- Estimated Return On Investment is 2 years, 10 months.

GENERAL PUBLIC BENEFIT:

The LED lights give off a strong white light that provides better illumination than what is currently installed, thus improving public safety and city employee work areas, and improved security lighting from the new wall packs. The current lights only last 6 months, making it difficult and cost inefficient to replace. The long life cycle of the LEDs will ensure a well-lit Water Plant and Library.
The Programmable Thermostats will provide instant savings and continue thru the life of the facility. The existing thermostats do not support set back temperatures or schedules to maximize savings.
The Passive IR ceiling & wall mounted sensors will decrease work time usage when personnel are not occupying areas, ensure all lighting is off during non-work hours, and extend the life of the current lights, reducing replacement cost and labor to install.
The Energy Management System (EMS) will ensure the Public Library receive a comfortable relaxing environment while reducing the cost and usage of non-work hours in setback mode. The electronic schedule will eliminate on-site personnel making adjustments daily as well as providing automatic notification of any maintenance issues monitored by the EMS.

CREATIVE/NEW TECHNOLOGY:

In the last 10 years, LEDs have surged in the marketplace and costs have decreased for an improved ROI/Payback period. They have become an increasingly reliable, aesthetic, proven, and cost effective option. Retrofitting thermostats to decrease HVAC cost/usage are becoming the standard of everyday office space. Motion Sensor Technology have drastically improved over the last 5 years. These installations ensure maximum electrical savings in lighting. Energy Management Systems have been integrated into civilian and government facilities for several years. Facilities with weekly set hours of operation can maximize HVAC efficiency thru programmed schedules as well as decrease response time to maintenance issues.

QUALIFICATIONS, EXPERIENCE, CAPABILITIES, AND SCHEDULING:

If awarded, the City will follow its procurement policy for projects in each range. Based on the average cost of materials for municipalities, the materials will be purchased by the City. Installation of materials will be awarded to qualified contractors. The Energy Management System will be provided within the awarded contractors bid.
The project can be completed within six (6) months after entering into a contract with TDEC and the Facilities Directors, Director of Public Works, and Principal Planner will administer the grant and oversee the project.

PUBLIC AWARENESS/EXPOSURE:

If awarded, the City will devote $2,500 towards "in-kind" staff time to inform the public about this project. The City will issue a press release, include information on our website, and create a video that informs the public on the current conditions, the retrofit process, and the results.

PROTECTION OF ENVIRONMENTAL RESOURCES:

This project is a low-impact improvement that will reduce the City's energy usage and operational expenses. The long lifespan will reduce material waste to the landfill and reduction of vehicle emissions (decreased travel time & fuel for maintenance vehicles). It is estimated the LED products will last twenty (20) times longer than the existing metal halides.

ABILITY TO MATCH GRANT FUNDS:

The City commits to a 50% monetary match as well as in-kind time for the public awareness effort.

AIR QUALITY AND ESTIMATE OF REDUCTIONS:

Spring Hill is located in an 8-hour ozone nonattainment area and the 1-hour Ozone Maintenance Area. The combined facilities annual kwh usage is approximately 2,064,180. The combined facilities annual kwh reduction is approximately 198,025. Based on the EPA emissions calculator at http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator, this amounts to 151 metric tons of CO2 equivalent.

CONCLUSION

After considering many improvements and analyzing various ROIs, we are proposing the upgrades above only because of the dramatic payback period and determined ROI for each. The significant improvement to the City Hall complex, Library, and Water Plant will benefit the community and city staff by providing safer lighting, improved HVAC capabilities, and reduce our budgeted cost.

Total 7 year consumption cost and usage without project retrofit - $1,329,076.42 / 14,449,260kwh
Total 7 year consumption cost and usage with project retrofit - $1,189,960.94 / 13,063,085kwh
7 year Cost & Usage Savings - $139,115.48 / 1,386,175kwh!!

PAYBACK SHEDULE:

CITY OF SPRING HILL CITY HALL

Materials	Labor	Material Type	Individual Project Cost		Total Project Cost
$ 1,980.00	$ 2,600.00	Pgrm. T'Stats (11)	$ 4,580.00		$ 16,349.55
$ 1,509.55	$ 1,200.00	IR Wall Sensors (35)	$ 2,709.55	1st year Payback	$ 6,842.78
$ 1,360.00	$ 1,700.00	IR Ceiling Sens. (16)	$ 3,060.00		$ 9,506.77
$ 6,000.00	(included)	HVAC retrofit (1)	$ 6,000.00	2nd year Payback	$ 6,842.78
					$ 2,663.99
$ 10,849.55	$ 5,500.00		$ 16,349.55	5 months	$ 2,851.15
					$ 187.16

PROJECT PAYBACK PERIOD - 2 YEARS 5 MONTHS
CITY OF SPRING HILL PAYBACK - 1 YEAR 2.5 MONTHS

CITY OF SPRING HILL LIBRARY

Materials	Labor	Material Type	Individual Project Cost		Total Project Cost
$ 5,900.00	$ 3,800.00	EMS HVAC (1)	$ 9,700.00		$ 14,550.00
$ 2,850.00	$ 2,000.00	LED Wall pack (12)	$ 4,850.00	1st year Payback	$ 5,135.76
					$ 9,414.24
$ 8,750.00	$ 5,800.00		$ 14,550.00	2nd year Payback	$ 5,135.76
					$ 4,278.48
				10 months	$ 4,279.80
					$ 1.32

PAYBACK PERIOD - 2 YEARS 10 MONTHS
CITY OF SPRING HILL PAYBACK - 1 YEAR 5 MONTHS

CITY OF SPRING HILL WATER PLANT

Materials	Labor	Materials Type	Individual Project Cost		Total Project Cost
$ 9,570.00	$ 8,000.00	LED Hi-Bay (33)	$ 17,570.00		$ 20,670.00
$ 1,900.00	(included)	LED Wall pack(8)	$ 1,900.00	1st year Payback	$ 7,895.10
$ 1,200.00		Lift Rental	$ 1,200.00		$ 12,774.90
				2nd year Payback	$ 7,895.10
$ 12,670.00	$ 8,000.00		$ 20,670.00		$ 4,879.80
				8 months	$ 5,263.40
					$ 383.60

PAYBACK PERIOD - 2 YEARS, 8 MONTHS
CITY OF SPRING HILL PAYBACK - 1 YEAR, 4 MONTHS

BUDGET JUSTIFICATION:

The City anticipates purchasing the following materials (Est.): 33 LED Hi-bay fixtures ($9,570.00), 20 LED wall packs ($4750.00), 11 Programmable thermostats ($1,980.00), 35 Wall sensors ($1,509.55), 16 Ceiling Sensors ($1,360.00), 1 HVAC ductless mini-split system w/labor ($6,000.00), 1 multi day lift rental ($1,200.00), and 1 Energy Management System w/ components ($5,900.00), and labor hours to complete multiple installations ($19,300). All values have been budgeted for possible rate hikes from proposal creation to project execution.

Lastly, the City $2,500 has been dedicated as "in-kind" match. City staff will devote time to writing a press release, administering the grant, update the website to include project details, and create a video that documents the current conditions, retrofit, and completed project results.