TAMPA BAY WATER
Supplying Water To The Region

AGENDA ITEM C4

DATE: February 17, 2020

TO: Matt Jordan, General Manager

FROM: Charles H. Carden, Chief Operating Officer

SUBJECT: Energy Management Program – *Status Report*

SUMMARY

The attached report details the on-going activities being implemented within the agency's Energy Management Program.

RECOMMENDATION

Receive Status Report

COST/FUNDING SOURCE

Not Applicable.

DISCUSSION

A programmatic approach to improve energy efficiency through implementation of emerging technology and other opportunities is a top priority for the Agency.

The attached Status Report provides a summary of the two critical projects and other current activities and projects related to the Agency's Energy Management Program.

BACKGROUND

Significant energy is consumed by Tampa Bay Water in providing water to its customers over its 2,000-square-mile service area. Water provided by the Agency is on-demand; that is, Tampa Bay Water does not control demand, but rather responds to its Member Governments' demand for water. Commercial power is purchased from three commercial entities under multiple rates. The vast majority of Tampa Bay Water's energy costs are related to pumping, treating, and distributing drinking water from three different types of water sources.

Attachment

Energy Management Program Status Report

February 3, 2020

Energy Management Program Roadmap

Staff has developed a Roadmap to implement the Agency's Energy Management Program. The Roadmap was received by the Board October 17, 2011. The Roadmap:

- Aligns with the Agency's Strategic Plan;
- Identifies elements of technology and energy infrastructure to enhance financial stability and sustainability of Tampa Bay Water's operations; and
- Identifies gap/key projects necessary to bridge or connect on-going and planned capital projects with the steps and goals of the Energy Management Program Roadmap prepared in September 2011.

Activities and Accomplishments

- An ISO 50001 Energy Management Systems (EnMS) Policy was approved by the Board in October 2016.
- An in-house Energy team has been established to evaluate and implement energy savings projects. The team meets every two months and considers, evaluates and recommends new energy savings ideas.
- As-needed Energy Program consultant contracts are in place to assist staff to evaluate energy-related projects.
- Completed Energy Audits at the following Facilities:
  - Cypress Creek Water Treatment Plant and Pump Station,
  - Morris Bridge Pumping Station, and
  - Tampa Bay Desalination Facility
- Authorized an as-needed energy program consultant (Black and Veatch) to conduct an energy audit at the High Service Pump Station; the Surface Water Treatment Plant, and the Hillsborough Alkalinity Adjustment Facility. Expecting completion by the Fall of 2020.
- Completed implementation of the EnergyCap energy billing software. The software serves as a repository of energy billing data, energy consumption reporting engine, and performs billing audits to identify potential billing errors.
- Completed evaluation of Hydropower technologies at the South Pasco Water Treatment Plant January 2017. Recommendation to add a hydropower energy recovery unit was added to Capital Improvements Program Project 07055-South Paco Wellfield and Treatment Improvements.
- At the June 2018 Board meeting the Board requested staff to evaluate the feasibility of a solar installation at the C.W. Bill Young Reservoir site. An as-needed energy program consultant (Hatch) completed the evaluation and report. Presentation was provided at the October 2018 Board meeting and the Project was added to the FY 2020 Capital Improvements Program. The project includes either a ground-mounted solar installation or a floating solar installation at a stormwater pond adjacent to the Reservoir. Staff has started the execution of the project. Since October 2018 Tampa Bay Water staff has met with interested parties including: TECo, contractors, and consultants to provide an overview of the Solar Project. Additionally, staff have researched on how best to procure services for design and installation activities. The reservoir solar project schedule includes the following major activities/milestones identified in the CIP:

- Evaluate Property/ Conservation Easements Requirements: January - August 2020
- Develop Design Criteria Package: February - August 2020
- Request for Proposals for Design-Build Contractors: September-December 2020
- Design-Build: January 2021-June 2023

Rebates & Incentive Programs

TECO's Commercial Demand Response Program

In December 2007, the Board authorized Tampa Bay Water to enter into an agreement with Tampa Electric's (TECO) Commercial Demand Response Program provider Enel X. The Program helps manage peak demand to reduce summer and winter electricity demand peaks. Tampa Bay Water earns revenue on a quarterly basis by agreeing to reduce TECO-based electricity consumption when TECO calls for a demand response event, i.e. the reduction of energy usage to lower peak demand. Revenues thus earned, are deposited into a new Energy Fund. The means used to accomplish energy reductions in this program are through emergency backup generation by Tampa Bay Water. The general program rules for emergency backup generation are:

- 100 kw or more of demand reduction available
- Thirty-minute notification prior to reduction
- Reduction events may occur on non-holiday business days between 7:00 AM and 7:00 PM
- Reduction events may last from one to eight hours
- Reduction events are limited to 88 hours per site during a calendar year
- Enel X assumes all risk for non-performance
- Capacity payments are $5.35/kw-month

Table 1 Provides a summary of revenue generated and received through the TECO program by Calendar Year and the total funds received to date.

Table 1: Commercial Demand Response Program	
Calendar Year	**Revenue ($)**
2008 - 2012	$728,896
2013 - 2017	$720,995
2018	$156,908
2019	$155,071
TOTAL (To Date)	$1,761,870

Notes:

- Funds collected from TECO's program are used to fund energy projects within the Capital Improvements Program.

Energy Audit Program

Energy audits are one of the first activities in an energy program to identify energy saving measures. Typical audit activities last 6 to 8 months and usually include:

- Step 1- Baseline Energy Data Collection

- Step 2- Field Testing and Analysis of Energy Data
- Step 3- Identify Energy Savings Measures
- Step 4- Economic Analyses and Report

Tampa Bay Water is conducting energy audits and pump testing on high energy consuming facilities that may provide the greatest payback for the costs of the audits, **Table 2** lists these facilities, the expected audit costs, and the energy audit fiscal year.

Table 2: Energy Audits Facilities

Facility	Audit Costs ($)	Audit Fiscal Year	Status
Cypress Creek WTP/PS	$50,000 (actual)	2012	Completed
Morris Bridge Booster Station	$50,000 (actual)	2016	Completed
Tampa Bay Desalination Facility	$217,944 (actual)	2017-2018	Completed
Group 1 Drinking Water System: • Regional HSPS • Regional Alkalinity Adjustment Facility • Surface Water Treatment Plant	$187,547 (Estimated)	2020	On-Going
Group 2 Raw Surface Water system: • Regional Repump Station • Tampa Bypass Canal (Structure-162) Pump Station • South-Central Hillsborough Booster Station • Alafia River Pump Station	$175,000-$250,000	2020-2021	Future
Reservoir Off-stream Pump Station	$ 50,000-$60,000	2022	Future

Capital Improvements Program and Operational Optimization Projects

Operational Optimization Projects

Energy audits and pump testing provide opportunities for efficiency improvements through operational changes and pump maintenance activities as well as capital expenditures. Changes are identified in the investment grade energy audits conducted by third party experts. These audits identify both capital projects and operational optimization projects.

Cypress Creek Pump Station

An audit for the Cypress Creek Water Treatment Plant was completed in FY 2012, and energy savings of approximately 18% were realized in FY's 2013 - 2014 compared to the FY 2012 baseline year achieving a payback on the investment in 6 months. In FY 2015 Tampa Bay Water continued to save 6% compared to the baseline year. In FY 2016 even though effluent pressure at the Cypress Creek Pump Station increased from 55 psi to a new operating range of 65- 75 psi to meet Exhibit C of the Master Water Supply contract requirements. This increase in pumping pressures has resulted in additional energy consumption at the facility with a decrease in energy savings compared to the baseline FY 2012. However, the increased cost would have been greater had the optimization not been completed. To better project future cost savings, FY 2016 will serve as the new baseline year to reflect the new operating conditions. FY 2018 and FY 2018 experienced a 21 % and 13 % energy savings compared to the new FY 2016 Baseline.

Capital Projects

Staff continues planning, design, and construction of energy savings-related capital projects. Staff has identified baseline energy use and costs for some of the Tampa Bay Water's facilities and is collecting data in others.

Clearwater Administration Building

At the Clearwater Administration Building, an energy savings project in the air conditioning system was completed in 2011. Energy savings of 25% - 40% were realized in **FY's 2012 – 2019** compared to the FY 2009 baseline year. This averages to a yearly savings of about $44,300. Payback for this project was achieved in five and a half years. To date Tampa Bay Water has saved about **$354,410** in energy costs at the Clearwater Administration building.

South-Central Hillsborough Wellfield

The pumps at the South-Central Hillsborough Regional Wellfield were replaced in 2012. Energy savings between 7% to 24% were realized in **FY's 2013 - 2019** compared to the FY 2009 baseline year. This averages to a yearly savings of about $160,000; at this rate the expected payback will be achieved in about eight years. To date Tampa Bay Water has saved about **$1,089,332** in energy costs at the South-Central Hillsborough Wellfield.

Cross Bar Wellfield

The pumps and motors at the Cross Bar Wellfield were replaced in 2015. Energy savings between 13% to 32% were realized in **FY's 2016 through 2019** compared to the FY's 2009 baseline year. This averages to a yearly savings of about $220,000 at this rate the expected payback will be achieved in about 15.5 years. To date Tampa Bay Water has saved about **$661,640** in energy costs at the Cross Bar Wellfield.

US 41 Pump Station

The pumps and motors at the US 41 Pump Station were replaced in 2016. Energy savings between 27% and of 38 % were realized in **FY's 2017 and 2019** compared to the FY's 2009 baseline year. Total energy cost savings to date is **$106,800** at the US 41 Pump Station.

Table 4 identifies on-going and future projects listed in the Capital Improvement Program.

On-going & Future Energy Saving Capital Projects

Table 4: Capital Improvement Program Projects	
Project	**Status**
Complete	
Cross Bar Ranch WF Pumps & Motors Replacement	on-going collection of energy consumption data
Regional HSPS Pumps & Motors Repairs	
US-41 Pump Station Pumps and Motors Replacement	
Odessa WTP Pumps and Motors Replacement	
Alafia River Pump Station Pumps Replacement & Motors Repairs	
Cypress Creek WTP/PS Pumps & Motors Repairs	
Future/Planning	
Eldridge-Wilde WF Pumps and Motors Replacement	Design on going
Starkey Wellfield Improvements	Design on-going
Northwest Hillsborough Wellfield Improvements	Design Starts FY 2020
Morris Bridge WF Improvements	Design Starts FY 2021
Cypress Bridge Wellfield Improvements	Design Starts FY 2020
South Pasco WF and Treatments Improvements	Design Starts FY 2022