Agenda Item #4.1
For Subcommittee Meeting of: October 13, 2021

CITY OF SANTA ROSA
CLIMATE ACTION SUBCOMMITTEE

TO: MAYOR AND COUNCIL MEMBERS
FROM: DOUGLAS WILLIAMS, FACILITIES MAINTENANCE AND OPERATIONS COORDINATOR
TRANSPORTATION & PUBLIC WORKS
SUBJECT: INTRODUCTION TO CITY-WIDE ENERGY EFFICIENCY, RENEWABLES, AND MICROGRID FEASIBILITY STUDY

AGENDA ACTION: FOR INFORMATION ONLY

RECOMMENDATION

It is recommended by the Transportation and Public Works Department that the Climate Action Subcommittee receive information, ask any questions of staff regarding the recent City-Wide Energy Efficiency, Renewables, and Microgrid Feasibility Study, and report findings to the City Council.

EXECUTIVE SUMMARY

As California moves towards complete grid decarbonization and elimination of fossils fuels for both stationary and non-stationary sources, state agencies and cities are developing, finalizing, and deploying strategic implementation plans to meet the state mandated goals. In addition to focusing on deferred maintenance opportunities and renewable energy sources, these entities are also very much focused on improving the resiliency of their operations in light of the ever-increasing frequency of natural disasters and catastrophic climate events. The City of Santa Rosa (Santa Rosa), in the past 10 years, has endured a continuously lengthening wildfire season and has suffered significant losses in multiple wildfires (e.g., Tubbs, Kincade, and Glass). These fires along with the Covid-19 pandemic, have impacted Santa Rosa's short- and long-term goals as documented in the Municipal Operations Climate Action Plan. This detailed feasibility study for which Santa Rosa selected AECOM through a competitive process, will help the City identify cost-effective opportunities for reducing Greenhouse Gas (GHG) emissions and improving the resiliency of the City's operations. Under this scope, AECOM has performed a detailed investigation and study to analyze the feasibility of deploying microgrids at two City building clusters as well as identify opportunities for installation solar photovoltaics and energy efficiency measures at all City facilities and parks. A total of 47 city facilities and 63 parks are included in the

scope of which nine buildings have also been investigated for microgrid deployment. Utilizing the data obtained during our detailed site visits and the information provided by Santa Rosa the AECOM team has been able to develop a comprehensive suite of solutions across the three main aspects of the scope:

Energy Efficiency

- Based on the site visit and data collected, AECOM completed detailed utility bill analysis to understand the current performance of all the facilities.
- Santa Rosa is also in the process of updating its utility rates with PG&E. AECOM obtained that information and used the new rates for finalizing the baseline and calculating the current utility spend.
- In terms of energy conservation measures (ECMs), AECOM recommended similar measures for multiple buildings as well as developed site-specific measures.
- For most of the buildings AECOM utilized a calibrated hourly simulation tool (eQUEST) to model the impact of multiple ECMs and their interactive effects.
- The identified ECMs can be categorized within three main areas: lighting, HVAC and controls. HVAC recommendations include both packaged units and central cooling/heating systems as deemed feasible.
- AECOM has included options for electrification of building HVAC systems and have calculated comparative ROIs with higher efficiency natural gas system. This will assist Santa Rosa to make an informed decision either on financial metrics or the City's vision of carbon-free operations

Solar Photovoltaics Systems

- A total of 107 sites were included in the initial scope.
- In order to determine the feasibility of deploying solar PV, AECOM started their analysis with a desktop study which reviewed available space, shade, electrical infrastructure among additional requirements.
- This initial study was also informed by drive-by and detailed site visits depending on the size and complexity of the site.
- Based on this study, a scoring system from 1 to 10 was created to determine the relative feasibility of solar PV installation. There were multiple sites which were scored as "0" because of different factors and criteria which resulted in the sites not being feasible for solar PV at all.
- This scoring methodology helped us group sites into three different tiers where Tier 1 is a straight recommendation for solar PV installation, Tier 2 requires additional investigation due to lack of details related to electrical infrastructure and Tier 3 sites are not recommended.
- Based on this methodology a total of 11 sites are recommended for PV installations and 6 additional sites are recommended for additional investigation.

  For the 17 sites (a combination of tier 1 and tier 2 sites), AECOM is recommending a total installed solar PV capacity of approximately 7.4 MW.

CITY-WIDE ENERGY EFFICIENCY, RENEWABLES, AND MICROGRID FEASIBILITY STUDY 3 OF 5

Microgrid Solutions

- Santa Rosa identified a total of 10 buildings in two clusters as candidates for the deployment of microgrids.
- These sites have been chosen because they support critical City operations. In order to make the city operation more resilient, the aim is to invest in infrastructure for these sites which will result in uninterrupted vital city services during a catastrophic event and a potential grid failure.
- As with the other two areas, the microgrid feasibility utilized data from site visits, as well as utility representatives and submitted information for each site.
- For some sites, detailed historical information such as electrical single-line diagrams were not available. For those sites, new line diagrams were created from inputs provided by Santa Rosa electrical engineering department.

After analyzing the gathered data, Staff is recommending a total of seven (7) different microgrids across the buildings identified in the RFP:

- Maintenance Service Center North (MSCN)
- Maintenance Service Center South (MSCS)
- City Hall
- City Hall Annex
- Public Safety Building
- Finley Park Community Center
- Finley Park Senior Center

This recommendation is informed by a multitude of factors including but not limited to facility connection, suitability of current switchgears and switchboards for microgrid operation, installed equipment specification and age. A detailed documentation of all these factors along with AECOM's assumptions that are documented and discussed in final report included as Attachment 1 to this Staff Report. This entire scope is intended to give Santa Rosa a full suite of solutions ranging from much needed infrastructure upgrades for deferred maintenance to reducing the GHG footprint of City operations and increasing the overall resiliency of City facilities.

If the City decides to move forward with implementation, the next step for most of these recommendations would be to conduct more in-depth analyses such as conceptual design and due diligence for solar PV and microgrids and investment grade audits for energy efficiency measures. The final report contains detailed documentation of all activities which were undertaken to develop the recommendations for energy efficiency, renewable energy and microgrids.

BACKGROUND

In February 2019, the Council recognized implementation of the Climate Action Plan as a Tier One priority and recommended formation of the Climate Action Subcommittee (Subcommittee). The Subcommittee was created to provide guidance and oversight of the implementation of the City's Municipal Climate Action Plan and the Community

Climate Action Plan with a goal of reducing the local greenhouse gas emissions and ensuring long-term sustainability and resilience from climate change and its effects.

On July 10, 2019, following a Staff presentation to the Subcommittee, it was recommended that the Evergreen power source option be presented to the full Council for information and staff direction.

On January 28, 2020, City Council directed the Facilities section of the Transportation and Public Works Department to pursue a City-Wide Energy Efficiency, Renewables, and Microgrid Feasibility Study.

PRIOR CITY COUNCIL REVIEW

On December 1, 2020, the City Council, through Resolution, approved the agreement with AECOM to provide a City-Wide Energy Efficiency, Renewables, and Microgrid Feasibility Study.

FISCAL IMPACT

There are a number of variables which make costing any potential Capital Projects difficult including size, scope, and potential payback on energy savings.

In January of 2018, the City received the final report for a city-wide facilities assessment. Using the facilities assessment data and the energy audit report, the Facilities section recommends that funds from the general fund reserves be utilized to update several of the City's mechanical assets. These assets are beyond or near the end of their useful lifespan. Replacing these assets would help the city by:

- Using less electricity due to more energy efficient models
- Reducing GHG
- Removing assets that utilize the ozone polluting R-22 freon gas
- Reducing the cost of maintenance

As of January 1, 2020, production and import of R-22 refrigerant is illegal in the United States. As a result of this law, the cost of R-22 exponentially increases.

The estimated project cost to address emergent mechanical issues is $12,807,039.00.

ENVIRONMENTAL IMPACT

This action is exempt from the requirements of the California Environmental Quality Act (CEQA) in accordance with Section 15308 of the CEQA Guidelines as action taken by a regulatory agency as authorized by state or local ordinance to assure the maintenance,

restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment.

BOARD/COMMISSION/COMMITTEE REVIEW AND RECOMMENDATIONS

Not applicable

NOTIFICATION

Not applicable.

ATTACHMENTS

- Attachment 1 - Facilities Assessment Mechanical Report
- Presentation

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