



DATE: November 10, 2020

CATEGORY: Public Hearing

DEPT.: Public Works

TITLE: **Adopt a Resolution Awarding a Construction Contract to Syserco Energy Solutions for HVAC Replacement at City Hall/CPA and Fire Station No. 1**

RECOMMENDATION

1. Adopt a Resolution of the City Council of the City of Mountain View Awarding a Contract to Syserco Energy Solutions for the HVAC Replacement at City Hall/CPA and Fire Station No. 1 for a Cost Not to Exceed \$3,808,028, Including a \$340,000 Contingency, to be read in title only, further reading waived (Attachment 1 to the Council report).
2. Appropriate and transfer \$245,000 from the Construction/Conveyance Tax Fund to Project 20-1802, Planned and Emergency Facilities Projects-Fire Station No. 1 HVAC, and \$1,328,000 from the Construction/Conveyance Tax Fund to Project 20-54, Civic Center Infrastructure, Phase I. (Five votes required)
3. Direct staff to seek offsets for 200 percent of the greenhouse gas generation associated with natural gas use from the City Hall/Center for the Performing Arts heating, ventilation, and air conditioning system and return to the City Council as part of the 2021-22 Operating Budget for funding.

BACKGROUND

Fire Station No. 1 opened in 1995, and the heating, ventilation, and air conditioning (HVAC) system has been failing for a number of years. Several repairs have been made to major components, but replacement of the system is now warranted. Since September 2020, the City has been renting a portable chiller as the existing chiller began failing this summer.

City Hall and the Center for the Performing Arts (CPA) were constructed approximately 30 years ago, and major mechanical systems began to fail approximately 10 years ago. Several projects have been completed, including replacement of the air conditioning chillers in 2008. Components of the electronic controls and air handling system have also

been replaced as needed and during remodels of portions of the buildings. The current project includes replacement of major remaining components of the HVAC system, including the boilers, cooling tower, air handlers, and electronic control systems.

The existing systems at both facilities are energy-inefficient compared with current technologies. New electric motors use considerably less electricity than older models, and modern control systems allow the entire system to be operated much more efficiently.

Best Value Contracting Process

The City contracted with Syserco Energy Solutions (Syserco) in 2017 to replace the HVAC system at Fire Station No. 4 using a streamlined process inclusive of both design and construction (Best Value Contracting), allowed by Government Code Sections 4217.10 through 4217.18 (collectively, Section 4217). Best Value Contracting was created by the State to encourage energy efficiency within existing public facilities by allowing public agencies to use the ensuing energy savings as an alternative funding source to finance infrastructure upgrades that were deemed a net benefit and cost-effective. Syserco is a qualified energy services contractor, and Section 4217 allows a public agency to select a qualified energy services contractor to design and deliver energy efficiency projects so long as the City makes the following findings at a public hearing:

1. The energy services contract with Syserco is in the best interests of the City; and
2. The anticipated cost to the City for the conservation services provided by Syserco under the contract will be less than the anticipated marginal cost to the City of thermal, electrical, or other energy that would have been consumed by the City in the absence of those purchases.

The City was able to make these findings for the Fire Station No. 4 project, and the project proceeded very efficiently and was completed successfully.

Staff worked with Syserco to perform evaluations of Fire Station No. 1 and City Hall/CPA with the goal of using a similar Best Value Contracting process. To utilize this process and make the required findings, the energy savings from the improvements must at least equal the cost of the improvements. This consideration is addressed further with discussion of alternatives.

The alternative to the recommended method is a traditional design-bid-build process. While successfully used for most Public Works projects, design-bid-build is more demanding of staff resources and requires a longer time frame to complete the process.

ANALYSIS

Green Building Policy and Codes

Staff was prepared to recommend that the City Council award contracts for replacement of the HVAC systems at Fire Station No. 1 and City Hall/CPA in January 2020, but delayed the process to evaluate all-electric options pursuant to the Sustainability Action Plan-4 (SAP-4). SAP-4, adopted by Council on October 22, 2019, requires that the City evaluate electrification of buildings during renovations or when major systems are upgraded. This objective was further defined in the Municipal Green Building Policy, which was adopted by Council on June 9, 2020. This policy states that for new City-owned facilities, all-electric building design shall be used whenever feasible and for renovations, opportunities for electrification shall be analyzed when major building systems are upgraded or equipment is replaced. The policy does not specify criteria for selection of an alternative.

Under the California and Mountain View Building Codes, including the Green Building Codes, replacing HVAC equipment with in-kind, but updated modern equipment, is not a building alteration; this work is considered a repair or maintenance activity. Repair and maintenance activities are not subject to the Green Building Code requirements to eliminate natural gas usage that regulates private development in Mountain View.

In accordance with the Municipal Green Building Policy and Council's interest in greenhouse gas (GHG) reductions, both sites have been analyzed for conversion to all-electric HVAC systems. Information about replacement-in-kind and all-electric options are provided below along with staff's recommendations.

Fire Station No. 1

Three options were evaluated for Fire Station No. 1: one replacement-in-kind option with a natural gas-fired boiler and two all-electric options. Each option includes replacement of the existing electric chiller, natural gas-fired boiler, and other end-of-life equipment. Each option, described below and in Table 2, also includes improved air handling systems and electronic controls for more efficient operation of the system.

Option 1: Replacement in Kind

Option 1 includes replacement of the existing electric chiller and natural gas boiler with more efficient units that would require less maintenance.

Option 2: Air-to-Water Heat Pump

Option 2 includes replacement of the existing chiller and natural gas boiler with an electric air-to-water heat pump. The heat pump provides both heating and cooling without the use of natural gas. The proposed equipment would occupy the same spaces as the existing equipment.

Option 3: Ground Source Heat Exchange

Option 3 replaces the existing equipment with a ground source heat exchange (GSEx) system. This system uses buried pipe conducting fluid that exchanges heat with the ground. The pipes would be installed in six 300' deep holes drilled in the adjacent Dana Park property (see Figure 1). The equipment in the park would be buried, and the park would be restored to its current condition. All other equipment would be located on the Fire station property.



Figure 1: Fire Station No. 1 Heat Exchange Field

Table 1 provides a comparison of key aspects of each option.

Table 1: Fire Station No. 1 Options

Fire Station No. 1	Estimated Construction Cost	Current Annual Utility Costs	Annual Utility Cost Savings	<u>After Project</u> New Annual GHG Generation (Annual Reduction)
Option 1 (Replace in Kind)	\$692,610	\$46,469	\$5,882	87,656 lbs./39.8 Metric Tons (9,278 lbs./4.2 Metric Tons)
Option 2 (Air-to-Water)	\$913,486	\$46,469	\$5,453	40,659 lbs./18.4 Metric Tons (56,272 lbs./25.5 Metric Tons)
Option 3 (GSHx)	\$1,048,797	\$46,469	\$7,520	40,659 lbs./18.4 Metric Tons (56,272 lbs./25.5 Metric Tons)

Because the City uses renewable energy from Silicon Valley Clean Energy (SVCE), conversion of natural gas to electric serves to eliminate GHG emissions from the standpoint of building operations. The two all-electric options include leaving several natural gas-fired appliances in place that are unrelated to the HVAC system, so there is still GHG generation associated with the building. These appliances include space heaters in the apparatus area, a domestic water heater, a clothes dryer, and an oven/cooktop. These equipment are in good working order, and staff recommends considering electric replacement units as they reach the end of their useful lives.

Fire Station No. 1 Recommendation

Staff recommends Option 2, the air-to-water heat pump, and presents the following pros and cons for Council’s consideration.

Pros:

- By replacing natural gas with renewable energy from SVCE, Option 2 provides a significant reduction in GHG emissions;
- Unlike Option 3, Option 2 provides for simultaneous heating and cooling, which is not provided by the other all-electric option. With sun on one part of the building

and shade on another, the system sometimes calls for simultaneous heating and cooling to maintain the desired air temperature; and

- Option 2 is the least expensive of the two all-electric options and provides the same level of GHG reduction as Option 3.

Con:

- Option 2 is more expensive and provides slightly less ongoing energy cost savings than Option 1, replacement in kind.

City Hall/CPA

The City Hall/CPA HVAC system has been failing for a number of years. A major project was undertaken to replace the chillers in 2008, and many components of the control system have been replaced after failure or as part of remodels of portions of the building. The major components still in need of replacement include the boilers, the cooling tower, and the remainder of the control system. The boilers, which are required to heat the building, are of particular concern, having been repaired approximately five years ago. Parts are no longer available for these two 30-year old boilers. When they were in better operating condition, one boiler could have temporarily heated both buildings; however, both boilers are now operating at diminished capacity and neither can heat the buildings on its own. Another failure within the next year or two is considered likely and could result in significant downtime for the building heating system.

A comparison of a replacement in kind with a natural gas option and an all-electric option follows.

Replacement-in-Kind Option

Replacement in kind includes new boilers, cooling tower, and replacement of the remainder of the control system. The proposed equipment would be more efficient, require less maintenance, and would fit within the spaces occupied by the current equipment. These improvements are shown as “Base Scope” in Table 2.

This option also includes an Add Alternate cost item for the replacement of seven transformers and improvements to the existing chiller that provide high cost-effective energy conservation improvements, resulting in approximately \$24,000 of annual energy savings.

Electric Option

Converting such a large facility on a constrained site from natural gas to electric presents challenges since natural gas heating systems require significantly less space, and all-electric systems need more extensive equipment to exchange energy with either air, water, or soil that is not needed for natural gas systems.

The Civic Center site that includes City Hall and the CPA is constrained above ground by buildings, trees, parking, park improvements, and ancillary uses, such as dumpsters, delivery areas, and other uses. Below ground, the site is constrained by the underground parking garage and the cemetery that underlies Pioneer Park. See Figure 2, Civic Center Constraints.



Figure 2: Civic Center Constraints

It was clear early in the evaluation that there was not enough aboveground space on-site for an air-to-water heat exchanger like what staff is recommending at Fire Station No. 1.

Even without the cemetery, there is insufficient unconstrained underground space in Pioneer Park to provide a ground-source heat-exchange field for City Hall/CPA.

With these on-site constraints, the next feasible option appears to be an underground heat-exchange field at the nearest City-owned site of sufficient size, Eagle Park. To provide the required heat exchange, a field of 102 300' deep bore holes would be required, as shown in Figure 3. Conduits would be needed to connect the bore field to the building. Eagle Park would have to be closed for up to a year during the construction period, but would be restored aboveground to previous conditions after construction is completed.



Figure 3: Civic Center Ground Source System

Table 2 provides a comparison of the costs, energy cost savings, and GHG savings for the two options.

Table 2: City Hall/CPA Options

City Hall/CPA	Estimated Construction Cost	Current Annual Utility Costs	Annual Utility Cost Savings	<u>After Project</u> New Annual GHG Generation (Annual Reduction)
Replace In Kind				
Base Scope	\$2,368,039	\$574,310	\$108,000	
Transformers/ Chiller Improvements (Add-Alternate)	\$186,503	\$0	\$24,127	
Total	\$2,554,542	\$574,310	\$132,127	1,599,219 lbs./725 Metric Tons (79,958 lbs./36.3 Metric Tons)
All-Electric				
	\$5,040,000 - \$7,560,000	\$588,507	\$40,692	0 (1,679,177 lbs./762 Metric Tons)

The cost of the all-electric system is a wide range because the evaluation is preliminary. A detailed feasibility study of an all-electric option is a significant undertaking that would require more time and funding for consultant services. Considering the time sensitivity associated with replacing the failing City Hall/CPA HVAC system components, staff considered the preliminary analysis appropriate as it could be done relatively quickly and provides sufficient information for staff’s recommendation.

City Hall/CPA Recommendation

Staff recommends replacement in kind of the existing system. While Council has clearly established the intent to reduce GHG emissions from municipal operations, SAP-4 does not include criteria for evaluating and determining when to convert from natural gas to electricity when replacing systems in existing City-owned buildings that are not undergoing major renovations or expansion. Staff’s recommendations are based on the following reasons:

1. Cost. The cost of the all-electric system is two to three times (approximately \$2.5 million to \$5.0 million) more than replacement in kind. Staff consulted with SVCE about grant funding for the project and was told that SVCE may be able to provide some grant funds for planning or design, but there are no known grant funding

sources for construction, which represents most of the increased costs for electrification.

The Capital Improvement Program's (CIP's) primary funding sources for City facility major maintenance and upgrades, such as HVAC replacements, are the Construction/Conveyance Tax and CIP Reserve. Staff anticipates that both of these sources will be limited for the next few years. These same two funding sources also support pavement maintenance/resurfacing and many planned bicycle/pedestrian improvements. It is also anticipated that the City will receive less funding for pavement maintenance from outside of the City over the next few years with the expected decline in Measure B sales tax and the State gas tax revenues. With reduced funding and other capital needs, such as returning the City's pavement condition index to targeted levels, staff recommends replacement in kind rather than reducing investments in other CIP priority projects to fund an all-electric conversion.

2. Schedule. The all-electric option does not meet the criteria of Government Code Section 4217 as the savings are not equal to the higher project cost. Fire Station No. 1 does not meet the criteria on its own. Any of the Fire Station No. 1 options combined with replacement in kind at City Hall/CPA meet the criteria, but any Fire Station No. 1 option combined with the all-electric City Hall/CPA option does not.

If the all-electric option at City Hall/CPA is selected, the City would begin a design-bid-build process for both sites. Under such a scenario, construction would not be complete for 18 to 24 months, and Eagle Park would require closure for up to a year. Staff's primary concern about the extended time frame is the existing infrastructure at both sites continuing to function for that long and the impacts on City operations should the systems fail. Staff has conducted best- and worst-case failure scenarios for the boilers. The best case assumes a leak that could be patched or bypassed, leading to a down time with no building heat for approximately two weeks. The worst case would be a leak that cannot be patched or a component that cannot be replaced, resulting in a need to replace the boiler in-kind and a down time of up to six months.

3. Other Opportunities. Staff recommends and will continue to evaluate conversion of City-owned buildings to all-electric as opportunities arise. In addition to Fire Station No. 1, current opportunities for electrification of City facilities include the following:

- Fire Station No. 2 is already served by all-electric heating and cooling;

- All-electric infrastructure is planned for the new Rengstorff Aquatics Center, which is currently in design. The Rengstorff Aquatics Center would likely be the City's second-highest user of natural gas if year-round programming were located there with the current natural gas system;
- The analysis performed for Fire Station No. 1 and City Hall/CPA revealed that there is likely space at most or all of the City's facilities, with the exception of the Library, to convert HVAC systems to electric. These include large natural gas users, such as the Municipal Operations Center and Eagle Park/Pool; and
- Another large user is the Police/Fire Administration Building, which can be converted as part of renovation or reconstruction.

GHG Offsets

Because the recommended alternative does not eliminate the use of natural gas or GHG emissions from the City Hall/CPA HVAC system, staff recommends that Council consider the purchase of offsets for the continued emissions over the life of the HVAC improvements if Council supports the staff recommendation for replacement in kind.

Offsets fund GHG reduction or sequestration through projects conducted by others. Examples include tree planting, methane capture at agricultural sites, and forest conservation programs. Such projects are ones that would not be implemented if not for the offsets. Some agencies, including the City of Palo Alto, have established programs to offset GHG emissions from natural gas use. Council considered offsets for communitywide GHG emissions that exceed the City's targets at its December 3, 2019 meeting. Council's direction was to consider such offsets in the context of achieving carbon neutrality by 2045, a target that was adopted at the same meeting, but not to purchase them at this time as part of achieving GHG emissions targets. Council has not considered offsets for individual projects such as the City Hall/CPA HVAC replacement project.

Staff estimates that the cost of one-to-one offsets for the natural gas-related emissions at City Hall/CPA to be \$6,000 to \$12,000 per year, or \$150,000 to \$300,000 over the 25-year life of the improvements. Because of the significant additional cost and time needed for electrification, staff considers offsets to be a reasonable alternative. Staff recommends that Council fund offsets at a two-to-one ratio or in the amount of 200 percent of the City Hall/CPA natural gas-related emissions for an overall greater reduction in GHG.

If the recommended action is approved by Council, staff will initiate a selection process for offsets and return for approval of the expenditure as part of the Fiscal Year 2021-22 Operating Budget process.

Estimated Project Costs

The project costs, including Syserco’s quoted not-to-exceed design and construction price for the recommended options with a construction contingency added, permits, and City administration costs, are detailed below.

Table 3: Estimated Costs

	Fire Station No. 1 (Option 2)	City Hall/CPA (Replace in Kind)	TOTAL
Design/Construction (base scope)	\$ 913,486	\$2,368,039	\$3,281,525
Construction Contingency	90,000	250,000	340,000
Subtotal Design/ Construction	\$1,003,486	\$2,618,039	\$3,621,525
Permits/Inspection	25,000	75,000	100,000
City Administration	66,852	175,048	241,900
Subtotal Base Scope (rounded)	\$1,095,000	\$2,868,000	\$3,963,000
City Hall/CPA Add-Alternate (Transformers/Chiller Improvements)		186,503	186,503
City Administration		12,120	12,120
Subtotal Add- Alternate (rounded)		\$ 199,000	\$ 199,000
TOTAL (rounded)	\$1,095,000	\$3,067,000	\$4,162,000

The actual price may be lower based on updated quotes from subcontractors but will not exceed the contract price.

Section 4217 Findings

To substantiate the findings required by Section 4217, staff and Syserco evaluated the anticipated energy savings for comparison to the cost of the services to be provided under the recommended contract. The net present value of the energy savings over the anticipated 25-year life of the improvements is estimated at approximately \$4 million, which compares favorably with the estimated construction cost of the improvements. With the value of the energy savings exceeding the cost of the improvements, the recommended contract meets the test required in Section 4217 for Best Value Contracting.

Another significant benefit to the recommended approach is the streamlined process for design and construction. The recommended Syserco contract is inclusive of both design and construction, saving the City the effort of managing a separate design consultant and preparing documents for competitive bidding. With the recommended Best Value Contracting approach, the project will be completed more quickly and with less staff time than with the traditional design-bid-build approach. The contract is, therefore, in the best interests of the City.

These findings are made in the attached resolution (Attachment 1).

California Environmental Quality Act (CEQA)

Pursuant to CEQA Guidelines, Section 15301, “Existing Facilities,” this project has been determined to be categorically exempt as “Repair and Maintenance of Existing Facilities.”

FISCAL IMPACT

The project is funded from multiple funding sources, as shown below:

Description	Funding Source*	Estimated Project Cost	Available Funding	Balance/Shortfall
Fire Station No. 1	Project 20-18	\$1,095,000	\$850,000	(\$245,000)
City Hall/CPA	Project 20-54	\$2,868,000	\$1,540,000	(\$1,328,000)
City Hall/CPA Add-Alternate	Projects 19-25 and 20-25	\$199,000	\$290,000	\$91,000

* These four CIP projects are funded by a combination of Construction/Conveyance Tax and CIP Reserve funds.

Fire Station No. 1

Funding is nearly sufficient for the replace-in-kind option, but additional funding in the amount of \$245,000 is needed for the recommended option.

City Hall/CPA

When preparing the five-year CIP in Fiscal Year 2019-20, the City Hall/CPA HVAC replacement was programmed in two phases, generally speaking, one for the boiler and one for the cooling tower, with funding budgeted in Fiscal Year 2019-20 (Project 20-54) and Fiscal Year 2021-22. The recommended actions would complete the project in one phase for approximately the same budget as originally planned. Staff recommends one phase because: (1) project management and administration is much more efficient; and (2) staff is concerned about the existing equipment failing. The recommended actions appropriate the funding planned for the Fiscal Year 2021-22 phase to the current fiscal year.

City Hall/CPA Add-Alternate

This component of the project includes replacement of seven transformers and improvements to the existing chiller that are energy conservation measures rather than part of the HVAC system replacement. Funding is proposed from two of the annual energy conservation Capital Improvement Projects (Projects 19-25 and 20-25). Sufficient funding is available in these projects, and the remaining funding will be used for other energy conservation initiatives.

Utility Cost Savings

The recommended projects are estimated to reduce annual utility costs by \$5,453 at Fire Station No. 1 and by \$132,127 at City Hall/CPA.

CONCLUSION

The HVAC systems at Fire Station No. 1 and City Hall/CPA are failing and were originally scheduled to be replaced this year. The replacement projects were deferred in order to explore options for converting from natural gas to all-electric for both systems in support of Council's goals to reduce GHG generation.

- Fire Station No. 1 – An evaluation of options determined that converting the HVAC system at Fire Station No. 1 to all-electric could be achieved with no site impacts at an

additional cost of \$245,000. The project adds minimal construction complexity and can be delivered within the next year. Staff recommends converting the Fire Station No. 1 HVAC system to all-electric using an air-to-water heat pump.

- City Hall/CPA – The constrained site for City Hall/CPA makes conversion to all-electric very challenging. Converting to all-electric would impact Eagle Park, require an additional two years to implement, and cost \$2.5 million to \$5.0 million more than replacement in kind. There is a possibility that the boilers could fail before this project could be completed. Staff recommends replacement in kind with the natural gas system and purchasing offsets in the amount of 200 percent of the City Hall/CPA natural gas-related emissions for an overall greater reduction in GHG at an estimated cost of \$300,000 to \$600,000 over the 25-year life of the HVAC system.

If Council approves staff's recommendations, findings can be made to support use of Best Value Contracting under Government Code Section 4217, which will allow a streamlined process that will be less staff time-intensive and deliver the projects more quickly. Should Council decide to pursue converting the City Hall/CPA HVAC system to all-electric, a traditional design-bid-build process will be used for both Fire Station No. 1 and the City Hall/CPA HVAC systems.

ALTERNATIVES

1. Direct staff to select a different alternative (Option 1 or Option 3) for Fire Station No. 1.
2. Direct staff to begin a design-bid-build process for both projects and pursue an all-electric option for both sites.
3. Direct staff to use a traditional design-bid-build process for the recommended improvements.
4. Provide other direction.

PUBLIC NOTICING

Agenda posting, and public notice was provided two weeks in advance of this meeting as required by Section 4217.

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Attachment: 1. Resolution