

Agenda Report



Date: January 12, 2016
To: Honorable Mayor and City Council
From: Jeffrey W. Collier, City Manager
Subject: Energy Efficiency Projects

RECOMMENDATION

It is recommended the City Council:

1. Award construction contracts for energy efficiency projects prepared by The Energy Network (TEN) to:
 - a. ACCO Engineered Systems for mechanical improvements in the amount of \$649,237.58;
 - b. Comet Electric Inc. for street lighting in the amount of \$1,200,186.90;
 - c. Facilities Systems Group for indoor lighting in the amount of \$379,971.84;and
2. Authorize the City Manager to execute agreements.

BACKGROUND

On March 11, 2014, the City Council received a report on the City's recent and active initiatives for energy conservation and sustainability, including a partial list of recently completed and active green projects (Attachment A). The list exemplified the strong commitment to environmentally friendly values that is part of the Whittier community and institutional culture. The report also described the City's new initiatives to save energy and develop sustainable practices.

To continue the green initiatives, the City enrolled in The Energy Network (TEN), a service to public agencies for upgrading public facilities. TEN is administered by Los Angeles County with funding from California rate payers through grants by the California Public Utilities Commission. At no cost to public agencies, TEN identifies energy-saving measures and works with local governments to provide energy consulting, project design, financing assistance, and construction management. TEN will design selected projects and prepare specifications for construction bids. During construction, TEN offers oversight and administrative support services.

TEN provided the City with energy benchmarking reports to prioritize locations for energy audits and at City direction subsequently completed audits at City Hall, Police Department, Central Library, Community Center, and Palm Park. The audits resulted in recommendations for a variety of proposed energy efficiency projects.

On March 15, 2015, the City Council reviewed and discussed potential projects that the City could undertake for further energy savings, improving the energy efficiency of lighting and mechanical equipment at City facilities. The City Council approved moving forward with final scopes and costs to determine which projects to ultimately pursue.

DISCUSSION

TEN recommended that the City take advantage of the National Joint Powers Authority (NJPA), which competitively bid construction tasks with pre-set unit prices and specifications for mechanical and lighting services including materials, equipment, and labor costs. The California Government Code authorizes public agencies to participate in cooperative purchasing agreements like those established by the NJPA, while still remaining within the City's adopted rules and procedures for purchasing. A team of City staff members then worked with TEN representatives and an approved contractor from the NJPA, ACCO Engineered Systems, to determine final construction costs for the Palm Park Pool and for mechanical work at various sites; Comet Electric Inc. for street lighting and conversion of series to multi-fed street light systems; and Facility Solutions Group for interior facility lighting. TEN representatives and City staff worked with Southern California Edison (SCE) to determine available incentives and on bill financing (OBF) for the projects. The final costs, incentives and payback years for energy efficiency projects are discussed below, including a comparison of March 2014 preliminary estimates with final project costs.

Payback periods are based on total annual savings, including costs for maintenance, electricity, and natural gas¹. Projects include the installation of advanced control systems. Although the control systems increase initial costs and thus extend payback periods, the systems are recommended to improve efficiency of lighting management and provide better control of lighting.

The staff and consultant team studied a number of energy projects that were ultimately deemed not economically feasible due to high initial costs and payback periods longer than the life of the improvements. For example, lighting improvements at the Central Library resulted in higher than expected costs and an eight-year minimum payback period so that work is not recommended at this time. In a few cases, elements of these projects have been incorporated into the recommended measures. However, none are recommended as stand-alone projects due to cost infeasibility.

INTERIOR LIGHTING

Community Center

¹ Added cost for natural gas occurs as new LED lighting generates less heat thereby creating the need for additional natural gas heat on cool days.

The project installs LED lights throughout the Community Center, including the gymnasium and theatre. System controls will manage the light usage and reduce energy. The useful life of the proposed improvements exceeds the payback period, making the project economically advantageous.

	<u>Estimate</u>	<u>Final</u>
Gross project cost	\$126,780	\$111,229
Less incentives	<u>\$ 522</u>	<u>\$ 1,009</u>
Net initial cost	\$126,258	\$110,220
Projected annual savings	\$ 15,858	\$ 31,748
Payback	8 years	3.5 years

City Hall

A number of lighting improvements have been made in recent years so the differences in energy efficiency at City Hall are not as dramatic as at other locations. The project installs LED lights throughout the building in offices, public areas and storage rooms. The useful life of the proposed improvements exceeds the payback period, making the project economically viable.

	<u>Estimate</u>	<u>Final</u>
Gross project cost	\$196,247	\$268,742
Less incentives	<u>\$ 1,405</u>	<u>\$ 1,739</u>
Net initial cost	\$194,842	\$267,003
Projected annual savings	\$ 10,666	\$ 20,836
Payback	18.3 years	12.8 years

Central Library – Not Recommended

While the intrinsic value of improved lighting quality could outweigh pure cost considerations, staff recommends that the City not proceed at this time. If the Library is renovated within the next eight years, lighting improvement costs would not be recovered.

	<u>Estimate</u>	<u>Final</u>
Gross project cost	\$162,814	\$218,995
Less incentives	<u>\$ 2,475</u>	<u>\$ 0</u>
Net initial cost	\$160,339	\$255,717
Projected annual savings	\$ 16,073	\$ 26,261
Payback	10 years	8.3 years

MECHANICAL

A new building management system is included in the mechanical costs for City Hall, Central Library, Police building, and the Community Center. The management system will allow more energy efficient operational control and improve occupant comfort.

City Hall/Police Property Room

The project replaces some portions of aging heating/ventilation/air conditioning (HVAC) units and air handling devices, including the compressor. The compressor is a key piece of the mechanical equipment which is difficult to maintain and has exceeded its useful life.

	<u>Estimate</u>	<u>Final</u>
Gross project cost	\$106,032	\$407,797
Less incentives	<u>\$ 3,695</u>	<u>\$ 7,402</u>
Net initial cost	\$102,337	\$400,395
Projected annual savings	\$ 28,437	\$ 48,856
Payback	3.6 years	8.2 years

Central Library

The project installs a temperature reset program for the condenser and chilled water supply, resulting in a relatively short payback period. This work would survive any future building renovation.

	<u>Estimate</u>	<u>Final</u>
Gross project cost	\$9,900	\$ 10,204
Less incentives	<u>\$ 312</u>	<u>\$ 537</u>
Net initial cost	\$9,588	\$ 9,667
Projected annual savings	\$2,159	\$ 2,564
Payback	4.4 years	3.8 years

Police Department

The Police Department headquarters building was constructed in 2009 and has relatively new and efficient HVAC equipment. This project capitalizes on the now-established building usage patterns and installs a temperature reset program for the condenser and chilled water supply, and air handling mechanical equipment.

	<u>Estimate</u>	<u>Final</u>
Gross project cost	\$24,514	\$ 32,932
Less incentives	<u>\$ 2,154</u>	<u>\$ 4,709</u>
Net initial cost	\$22,360	\$ 28,223
Projected annual savings	\$19,922	\$ 20,466
Payback	1.2 years	1.4 years

One other energy-related project is recommended at the Police facility to improve operations although no direct energy conservation benefits can be measured from implementation. The Police Department shares an electrical meter with City Hall so energy consumption is jointly reported. The project installs a separate electrical sub-meter so electricity consumption and efficiency measures at both buildings can be directly monitored. This separation of data will allow the City to more effectively track energy consumption and more easily identify any patterns or changes in energy usage. The resulting data can be used to make educated decisions regarding equipment, maintenance, and energy usage. Estimated cost for the sub-meter is \$7,018.

Community Center

The project installs advanced air conditioning unit controls and temperature reset program for the condenser water supply and restores the economizer function for HVAC units at the Community Center. It also installs an upgraded building management system to match the equipment at other Civic Center facilities to allow efficient control of the HVAC and improve occupant comfort.

	<u>Estimate</u>	<u>Final</u>
Gross project cost	\$84,422	\$174,972
Less incentives	<u>\$ 6,153</u>	<u>\$ 9,628</u>
Net initial cost	\$78,269	\$165,344
Projected annual savings	\$10,867	\$ 15,090
Payback	7.2 years	11 years

Palm Park Pool

The project installs a variable flow pump and tunes up the pool heater. The work pays for itself quickly.

	<u>Estimate</u>	<u>Final</u>
Gross project cost	\$10,251	\$23,332
Less incentives	<u>\$ 4,945</u>	<u>\$ 7,517</u>
Net initial cost	\$ 5,306	\$15,815

Projected annual savings	\$10,454	\$10,443
Payback	>1 year	1.5 years

STREET LIGHTING

The federal government has challenged local agencies to replace 1.5 million streetlights with high efficiency lighting by May 2016 to reduce emissions by 369,000 tons per year². Recent advances in LED lighting technology have doubled the lights' usable life and halved their initial costs; also, LED streetlights can cut energy use in half. These changes make retrofitting street lights a substantial energy saver and viable sustainable use. Cities face the challenge of identifying capital funds to implement such projects but the benefits in energy conservation are significant.

Whittier Streetlight Systems

Whittier has a variety of streetlight systems throughout the community. A large portion of the street lighting is maintained through a Los Angeles County street lighting district that was not transferred to the City upon incorporation and continues to be managed by the County. Other areas are served by City-owned and maintained streetlights, including some old high voltage lights. Yet other areas of the City have SCE-owned and maintained street lights that are paid for via City General Funds. TEN has investigated possible opportunities for conversion of street lighting to LED in order to produce ongoing energy and maintenance savings.

City-owned lights—The project retrofits 1,629 City-owned fixtures—1,580 LS-2 (unmetered) and 49 LS-3 (metered) streetlights—with LED fixtures. Replacing the existing luminaires with LEDs will save \$158,156 annually in energy costs. Furthermore, because LED luminaires can last 15 years or more, converting to LED luminaires will reduce the cost of maintaining the entire inventory of streetlights. The project is expected to realize an estimated annual electricity savings of 1,261,254 kWh—an energy conservation savings of approximately 68% of total existing streetlight electricity usage.

SCE-owned lights—SCE does not allow cities to retrofit SCE-owned lights to LED.

Series wiring—Some of the City's older lighting areas are connected with "series wiring" which requires new underground conduit to retrofit, which can be a very expensive proposition. Series-wired fixtures in the Penn Park area will be improved to multi-feed wiring as part of this project. The project's scope of work is twenty street lights and approximately 4,400 feet of conduit. Replacement of series-wired fixtures in the Uptown

² Martin Cooper, "LED Street Lights: Energy Savings Likely to Outweigh Initial Costs for These Three Cities", PublicCEO, February 27, 2015, In Local Government

area will be deferred and combined with future streetscape improvements that will necessitate major infrastructure work.

	<u>Estimate</u>	<u>Final</u>
Gross project cost	\$1,147,125	\$1,200,186
Less incentives	<u>\$ 100,443</u>	<u>\$ 621,963</u>
Net initial cost	\$1,046,682	\$ 578,223
Projected annual savings	\$ 148,137	\$ 158,156
Payback	8.4 years	3.7 years

Conclusion

The City has aging facilities and infrastructure which predictably result from its long history as an established community. Many of these old systems are still in use and are, as expected, less efficient in terms of energy consumption than new systems would be. As outlined above, the team has identified measures that can be implemented concurrently to further the City's energy conservation efforts already underway. The recommended projects represent a significant investment demonstrating Whittier's commitment to environmentally friendly values that is part of both the community and institutional culture.

FISCAL IMPACT

If all recommended projects are awarded, the initial gross cost is \$2,229,396. Incentives of \$654,504 will be paid six to eight weeks after construction completion. The FY 2015-16 budget has \$50,000 in account 635-30-981-914-751350 for HVAC controls at the Community Center and City Hall.

Portions of the street lighting and interior lighting improvements are eligible for SCE's zero percent on-bill financing (OBF). The City will use SCE OBF to fund \$782,613 for lighting; energy savings will pay SCE for this initial capital funding over a maximum of ten years. Electric bills will either show cost savings or be cost neutral; in no case will the bills increase. If future SCE rate increases occur, the payback period will be extended proportionally.

After incentives, OBF, and previously budgeted amounts, the remaining capital costs of \$742,279 are recommended to be funded by General Fund reserves, which will be recovered within a combined payback period for all recommended energy conservation projects of approximately 3.6 years.

	<u>Estimate</u>	<u>Final</u>
Gross capital costs	\$2,108,135	\$2,229,396
Incentives	\$ 122,104	\$ 654,504
OBF	\$1,232,801	\$ 782,613
FY 2015-16 budget	<u>\$ 50,000</u>	<u>\$ 50,000</u>
Subtotal	\$1,404,905	\$1,487,117
General Fund	\$ 703,230	\$ 742,279

Submitted by:



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Prepared by:



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Attachment: A – Existing energy conservation projects

ENERGY CONSERVATION PROJECTS

Facilities

City Hall: A federally funded project four years ago replaced two-thirds of the original windows at City Hall with dual-glazed windows. The building's original heating and air conditioning (HVAC) equipment dates to 1955. The boilers were recently replaced. The lobby lights were recently updated to LED.

Street Lighting: Whittier has a variety of streetlight systems throughout the community. A large portion of Whittier's street lighting is maintained through a Los Angeles County street lighting district that was not transferred to the City upon incorporation and is still managed by the County. Other areas are served by City-owned and maintained streetlights, including some old high voltage lights. Yet other areas of the City have SCE owned and maintained street lights that are paid for via City General Funds. The City is in the process of updating the traffic safety lights at signalized intersections with LED lighting.

Central Library: The Library has recently updated HVAC mechanical systems.

Landfill: The landfill uses the trash to produce gas, which is piped to PIH Health to meet power needs.

Water Resources Management

Whittier Greenway Trail Bioswale: Funded by a State Proposition 84 grant, a bioswale was constructed at the Walnut Station adjacent to Whittier Boulevard between Mar Vista Avenue and Pickering Avenue. The bioswale addresses an existing urban runoff problem into a swale area lined with rocks, gravel, and plants to slow the drainage and facilitate its reintroduction into the ground.

Waterless urinals: As a demonstration project, many public buildings have been outfitted with waterless urinals to conserve water.

Drought tolerant plants: Native and other low-water plants have been installed in many City parks and landscaped areas. Perhaps the most notable use of drought tolerant plants has been along the Whittier Greenway Trail, and a native plants demonstration garden was recently opened at Laurel Station. Estimates indicate that drought tolerant plants can save between 20% and 40% of irrigation costs.

Smart irrigation: As capital funds become available, the City has converted irrigation systems at most parks and City Hall grounds to smart controllers. The smart systems detect moisture in the ground and deliver irrigation only as needed to sustain plant life. Drip systems deliver the water directly to the plants' roots to avoid evaporation. The system also sends messages when an unusually high level of water is recorded to warn of possible leaks in the system.

Water conservation: The City adopted a water efficient landscaping ordinance in 2009 to establish provisions for water management practices and water waste prevention.

Since the adoption of the ordinance, hundreds of properties have submitted landscape and irrigation plans adhering to the ordinance requirements.

Pumping plant: The City is constructing a replacement water pumping plant. The project includes the installation of energy efficient pumps and controls. The controls system will maximize energy savings by pumping water during the off-peak evening hours.

Recycled water: The City uses recycled water to irrigate portions of Founders Park, Guirado Park, and Palm Park.

Solid Waste Management and Recycling

Public recycling: Personal and community recycling containers are available in City parks and buildings. Hundreds of City workers and the public regularly recycle paper products and beverage containers, substantially reducing the amount of solid waste disposed by landfilling.

Residential curbside recycling: All residential buildings up to fourplexes are provided blue containers for mixed recycling automated collection and green containers for green waste automated collection. Since this program was put in place, the City's total waste diversion from landfill has been approximately 65%.

Commercial and multifamily recycling: In 2013, the City implemented a commercial and multifamily recycling program. Apartment complexes with more than 4 units and businesses now also have the opportunity to subscribe to recycling services.

Rubberized asphalt street resurfacing: Some street resurfacing projects have used rubberized asphalt in the asphalt concrete mix. This material is made from crumb rubber from recycled tires which would otherwise be disposed. Public Works just recently completed a project on Janine Drive.

Landfill disposal in city limits: Most California communities dispose of their solid waste in regional landfills that are often many miles away from the areas where the waste is generated. Whittier, however, owns and operates its own landfill in the center of the City. This substantially reduces the traffic and air quality impacts of transporting solid waste.

Energy and Air

CNG vehicles: Whittier was one of the first cities in California to begin converting its fleet to clean burning compressed natural gas (CNG) instead of using gasoline and diesel. Now, virtually the entire fleet of City garbage trucks is made of CNG trucks. In addition, the City has CNG fueled lift trucks, sewer maintenance trucks, transit buses and street sweeping vehicles. The City has constructed a CNG filling station at the City Yard to serve its growing fleet of CNG vehicles and equipment.

Electric and hybrid vehicles: Fully electric and hybrid gasoline/electric vehicles also make up part of the City's vehicle fleet. This further reduces air pollution.

Window replacement: Whittier received a federal grant to replace many of the old windows in City Hall with dual pane energy efficient windows. The benefits of the new windows include energy conservation and improved comfort for employees and visitors in City Hall.

Conversion to efficient lighting: Many City buildings have new energy efficient lighting installed when existing bulbs and tubes were due for replacement. The result is less energy used and less waste heat produced compared to old style lighting.

LED traffic signals to LED: As traffic signals are updated, they are replaced with LED signal heads that use less energy than the old style bulbs.

Paperless hand dryers: Some of the City's newer and recently remodeled buildings are equipped with paperless hand dryers that reduce solid waste, are more sanitary, and reduce total energy and water consumption.

Light controls: For over 10 years, City Hall and other City buildings have been outfitted with photo cell and motion sensor light controls to reduce energy consumption by turning out lights that are not needed.

Landfill gas to energy: The City's Savage Canyon Landfill captures methane gas from the decomposing waste. This gas is pumped through underground pipelines to PIH Health. The gas is then used to operate engine generators to create electricity for the hospital campus. This project saves thousands of dollars in hospital power bills and serves as an alternative energy source.

Solar powered bus stop lighting and bus stop poles: The City received a federal grant to improve bus stops and shelters. As part of this project, bus stop lights and poles are being powered by solar energy.

Energy efficient HVAC systems: Both the Central Library and the Whittwood Branch Library recently had heating, ventilation, and air conditioning systems replaced with new energy-efficient systems.

Land Use and Transportation

Bicycle Transportation Plan: Whittier is one of only a few cities in Los Angeles County to have completed a Bicycle Transportation Plan. This plan provides guidance for incorporating bicycle facilities into maintenance and development projects. The City has been very aggressive about competing for grant funding to provide new and improved bicycle facilities. The star of the show is the Whittier Greenway Trail, which opened in 2009 on the old railroad right-of-way. Bicycles are a very environmentally friendly alternative to traditional transportation modes.

Low Impact Development Ordinance: Whittier recently adopted a Low Impact Development ordinance as part of the Whittier Municipal Code. The ordinance prescribes green practices for new construction, especially practices that reduce the amount of pollutants that are carried by storm water to creeks, rivers, and the ocean.

Green Streets Policy and Green Streets Guidance Manual: In 2013, Whittier adopted these documents which provide a policy and guidance for design of street improvement projects to encourage the reduction of polluted surface water runoff.

Rideshare: City employees are encouraged to rideshare in a number of ways. An annual commuter survey tracks commuting patterns and offers employees the option of being linked with other employees who live nearby. City employees who rideshare qualify for reserved preferential carpool parking at City Hall and receive other incentives. The City also provides Whittier residents with a discount for Metro's monthly bus passes.

Bike to Work Day: The City hosts an annual Bike to Work Day event on the Greenway Trail near Palm Park, encouraging employees and residents to try bicycling to work, and to take advantage of the Greenway Trail.

Uptown Whittier Specific Plan: The City adopted this plan to guide development within the Uptown area. This plan provides for a mixed use development that allowing residents to live, work, and recreate within this one area.

Whittier Boulevard Specific Plan: Similar to the Uptown Whittier Specific Plan, the Whittier Boulevard Specific Plan provides for mixed use development patterns. The Plan provides various districts that offer opportunities for residents to live and work within Whittier while also providing access to entertainment and recreation, minimizing the need to drive.

Green Building Code

The City adopted the 2013 Green Building Code as a part of the California Building Code to establish environmentally sound design and to address energy sustainability in a number of areas.

Water conservation: New construction must reduce the overall use of potable water within a building by 20% and comply with statewide goals for water conservation.

Irrigation conservation: Integrated irrigation controllers and sensors should be weather- or soil moisture-based to reduce outdoor potable water use for landscaped areas around new construction.

Waste recycling: Half of all construction and demolition waste must be recycled to reduce the amount of waste generated by new construction that would be sent to the landfills, thereby extending the life of the landfills. The purpose is also to encourage material resource efficiency through reuse of construction waste products.

Fireplace emissions: The new Code establishes new fireplace emissions standards to prevent any unused fuel from escaping from the sealed fireplace to maintain indoor air quality and increase energy efficiency.

Building materials: The new Code sets limits on volatile organic compounds in building materials to reduce the volatile organic compounds of finish materials commonly installed on a project, which will improve air quality for the building occupants.

Bicycle parking: Updated bicycle parking requirements ensure that newly constructed projects provide short term and/or long term bicycle accommodations. Bicycle racks and storage lockers will promote the use of bicycles as an alternate means of transportation to reduce greenhouse gas emissions.

Clean air vehicles: Specially identified parking will promote the use of clean air vehicles. Parking reserved for alternative fuels, flexible fuels, and other fuel efficient vehicles will conserve natural resources and reduce greenhouse gas emissions.

Light pollution: Newly constructed projects must reduce the amount of light and glare from both interior and exterior light sources leaving the site. These standards will minimize light pollution and maintain dark skies.

Information Technology and Communications

The City has implemented numerous projects that lower energy consumption and reduce traffic and air emissions.

Network virtualization: The network virtualization that was implemented in 2008 decreases the number of physical servers required to run the network, lowering network costs and lowering electric usage to run the network and cool the server room.

Desktop virtualization: The 60 virtual desktop machines installed at the Central Library and Whittwood Branch cost less to purchase and use less electricity. Virtual PCs have fewer parts and so have longer lives (8 years vs. 5 years) than PCs and are more environmental friendly to recycle.

Microwave system: The City's microwave system is a private communication/data network linking City sites. The system reduces monthly service costs paid to commercial vendors and allows for wireless "hot spots" for City workers to link to the City's network, thus lessening the number of trips required to City Hall for updated information. It also provides the public with a basic Internet link at the Branch Library, Central Library, and City Hall with additional sites planned for the future.

Online business: The City has implemented online payments and permit renewals for business licenses, utility payments, and recreation class registration and payments. By allowing the public to conduct these transactions online, the City reduces the need for citizens to travel to City Hall, thus conserving energy, improving air quality, and allowing the public to save time and money.

Public meetings online: The City provides live streaming video of City Council and Planning Commission meetings online, in addition to the longstanding meeting videos on City Channel 3. Residents who may not have access to cable television can view meetings live and in the video archives on the website, so members of the public may more easily learn about decisions affecting the community. Having the agenda and

supporting documents also available online helps to better inform the public about community issues without the need for individuals to make trips to City Hall.