ENERGY SERVICES PERFORMANCE CONTRACT FOR CITY BUILDING FACILITIES

Presentation for

City Council
TRANSPORTATION, SUSTAINABILITY & HEALTH COMMITTEE MEETING

May 18, 2021
Resilience Strategy Pillar III – Climate Security

GOAL 1: Clean Energy Economy

- **Action 20**: Reduce Taxpayer Expense and Increase Renewable Energy Through a City-Wide Energy Contract

  *Performance Metrics:*
  - Decrease City purchase of external energy
  - Increase kW of renewable energy generation produced by City facilities
  - Reduce greenhouse gas emissions

- **Action 21**: Establish an Energy Benchmarking Standard for O`ahu Commercial Buildings

GOAL 2: Clean Ground Transportation

- **Action 24**: Expand Electric Vehicle Charging Infrastructure
- **Action 27**: Transform the City’s Fleet to 100 Percent Renewable Fuel by 2035
Climate Action Plan required by Ordinance 20-47

- **Ordinance 20-47** requires a Climate Action Plan be developed and updated every 5 years to transition O‘ahu to 100% clean energy and net-negative carbon economy by 2045
- A first-ever strategy to reduce O‘ahu‘s greenhouse gas emissions from energy, transportation, and waste sectors
- Built on extensive public input starting with workshops co-hosted by City Council
- Today’s presentation aligns with Strategies 4 (Electrify fleet), 5 (Increase Energy Efficiency) and 6 (Efficiency City Operations)
The Energy Savings Performance Contract (ESPC) Model

Thirty-party financing is used to fund the project. Repaid through the utility bill savings up to a maximum 20-year term. **Savings are guaranteed** by contractor.
Phase 1 Project Summary and Status

10 facilities:
FMB, HPD HQ, HFD HQ, CCPS, HPD Training Academy, Kapolei Police Station, Old Gov’t Office Building, Walter Murray Gibson Buildings (Old Police Station), Wahiawā Police Station/Satellite City Hall, Kapālama Hale

Energy Conservation Measures (ECMs):
Solar PV, LED Lighting, HVAC System Retrofits & Control System Upgrades, Energy Efficient Transformers, Plug Load Management, Electric Vehicles (EVs) & EV Chargers, Water & Sewer Conservation

Baseline:
- 18,556,308 kWh annually
- $4,072,373 annually

Area:
Totaling 1.1 million sq. ft.

Average Energy Use Index (EUI):
16.9 kWh/sq. ft.*

* EUI is a measure of a building’s energy efficiency, similar to MPG for a vehicle. A low number is an indication of an efficient building.
Phase 1 Project Summary and Status (Cont.)

Utility Bill Savings: $2,100,000 annually

Utility Rebates: $995,168 from Hawaii Energy

Energy Savings: 480,000,000 kilowatt-hours (Over the 20-year Project Term)

Equivalent to:

- 339,472 metric tons of CO2e
- 785,951 barrels of oil
- 5,613,253 trees planted
- 443,336 acres of forests preserved

Benchmarking: Facilities greater than 10,000 sq. ft. will be benchmarked and EUI tracked and monitored as part of the post-construction measurement and verification process.
Phase 1 Project Summary and Status (Cont.)

- Proposals Submitted: June 5, 2020
- IGA Contract Executed: July 16, 2020
- Phase 1 Amendment: December 18, 2020
- Phase 1 Construction Started: May 10, 2021
- Phase 1 Construction End Date: December 2022

Phase 1 is estimated to create 321 jobs

Electrician replacing fluorescent tube light with LED tube light in Fasi Municipal Building
Phase 2 Project Summary and Status

80+ facilities:

ECMs:

Baseline:
• 21,491,496 kWh annually
• $5,992,856 annually

Area: TBD

Average Energy Use Index (EUI): TBD
Utility Bill Savings: $1,423,205 annually

Utility Rebates: $430,957 from Hawaii Energy

Energy Savings: 3,860,000 kilowatt-hours annually

Equivalent to:
- 64,418 metric tons of CO2e
- 149,141 barrels of oil
- 1,065,164 trees planted
- 84,127 acres of forests preserved

Benchmarking: Facilities greater than 10,000 sq. ft. will be benchmarked and EUI tracked and monitored as part of the post-construction measurement and verification process.
Phase 2 Project Summary and Status (Cont.)

- Status: IGA currently under review
- Construction Start: August 2021 (Anticipated)
- Construction End: December 2022 (Anticipated)
Renewable Energy

- Up to **9.3 MW** of PV systems is being financed through a Power Purchase Agreement (PPA), where the City will be purchasing electricity from a 3rd-party provider at two-thirds the cost of purchasing power from HECO. The provider owns, operates, and maintains the PV systems for 20 years.

- Estimated **$12 million savings** over the 20-year term.

- Planning and design is on-going for 50 + sites. HECO has approved the PV applications for 18 sites. Anticipate installation to begin this summer.
LED Lighting

• Under Phase 1, **19,206** fluorescent and legacy high-intensity discharge light fixtures and lamps will be replaced/retrofitted with equivalent LED fixtures.

  Over 1,000 lamps in FMB have already been replaced with LED lamps.

• Under the Phase 2, **21,523** fluorescent and legacy high-intensity discharge light fixtures and lamps will be replaced/retrofitted with equivalent LED fixtures.
Air Conditioning System Retrofits & Control System Upgrade

• Existing chiller and AHUs at HPD HQ will be replaced. Existing AHUs at FMB will be replaced using new “fan wall” technology.

• These projects would normally be funded through the CIP budget, but will now be funded through the energy savings.

• Existing A/C control systems will also be upgraded to include web-based systems to tie-in different controls in various buildings.
Energy Efficient Transformers

• Interior building transformers steps down high voltage power coming into a building to lower voltages that can be used by typical devices such as light fixtures, air conditioners, computers, etc. During the conversion, energy is lost through heat.

• Approximately 200 transformers will be replaced with more energy efficient transformers.

Infrared Scan of a Typical Indoor Transformer

New Energy Efficient Transformer at HFD Headquarters
Plug Load Management

- Networked plug load controllers will be installed on printers and copiers to turn off during evening hours when not in use. This measure will reduce the “phantom” loads that occur when these equipment are not in use.

Over 340 controllers are being install in Phase 1
Electric Vehicles and EV Chargers

- Three (3) Internal Combustion Engine (ICE) vehicles will be replaced by electric vehicles.

- The three (3) ICE vehicles:
  - traveled over 26,000 miles in 2020.
  - used 1,666 gallons of gasoline
  - cost over $5,800 to operate and maintain.

- Estimated savings for the three (3) new EVs is $3,580

- Public EV chargers will installed at Wahiawa Satellite City Hall and Kapalama Hale
Solar Window Film

Solar film will be applied to east and west facing windows at certain facilities to help reduce heat gain, which helps to reduce the burden on air conditioning systems, which also reduces energy costs.
Water and Sewer Conservation Measures

- Domestic plumbing fixtures will be replaced with low flow flush valves and high efficiency toilets and urinals will be installed in certain facilities.

- Existing irrigation controllers will be replaced with smart, weather-based controllers.

Estimated savings: 12 million gallons of water
Several fire stations have electric resistance hot water heaters that are in fair to poor condition. These will be replaced by air-sourced heat pumps that are more energy efficient.

Estimated savings: 127,979 kWh of electricity
In conjunction with the installation of roof-top solar PV systems, roof coating systems will be applied to help extend the life of the roof to align with the life expectancy of the PV systems.
Pre-COVID, 3,700 City computers were controlled by a power management software. The software was disabled to allow for employees to work remotely. This measure will reactivate the software, as more employees return to working in the office.

Estimated 35% energy reduction
MAHALO