

Energy Retrofit Project Change of Scope

Date: August 16, 2023

To: Board of Management of the Toronto Zoo

From: Director, Facilities & Infrastructure

Wards: All

SUMMARY

This report is to provide an update on the Change of Scope for the Peak Shaving Component of the Energy Retrofit Project (ERP). Further work on this project has shown that the existing Generac generators used for site-wide emergency back up are in need of replacement, and therefore not the best equipment to be used for the Peak Shaving Conservation Measure of the original Energy Retrofit Project.

At this time, the Zoo will be replacing the Peak Shaving Conservation Measure as approved by the Board with a heating and cooling system replacement conservation measure in Africa Pavilion and Indo Malaya Pavilion which will include heat pumps and new boilers similar to the Americas Pavilion Energy Retrofit Project. This alternative measure will realize an additional 409 tonnes of annual greenhouse gas emission savings of the original scope of the Energy Retrofit Project.

RECOMMENDATIONS

The Director, Facilities & Infrastructure recommends that:

1. The Board of Management of the Toronto Zoo receives this report for information.

FINANCIAL IMPACT

The alternative conservation measures (Africa and Indomalaya Pavilion heating system replacement with heat pumps) proposed by Ecosystem Energy Services falls within the approved budget for the Energy Retrofit Project and will realize greater annual greenhouse gas emission savings, however the project will have lower annual cost savings thus extending the payback period from 11 years to 20 years.

Details of Original Energy Retrofit Project:
Approved Project Cost: \$8,373,073
Annual Greenhouse Gas Savings: 154 tonnes
Annual Cost Savings: \$829,094

Details of New Energy Retrofit Project Scope:
Project Cost: \$8,349,123
Annual Greenhouse Gas Savings: 589 tonnes
Annual Cost Savings: \$260,386

The project has secured funding through the City of Toronto Energy Retrofit Loan Program at an interest rate of 2.5%.

DECISION HISTORY

Ecosystem Energy Services review of the existing Gensets during the Engineering Design phase of the Peak Demand project identified the condition of the gensets as being poor, requiring repair and failures are possible. Annual inspection of the generators by the Zoo's maintenance contractors has confirmed a number of significant repair requirements and has recommended the generators be replaced.

To meet the new Council Directive (IE26.16 - TransformTO - Critical Steps for Net Zero by 2040, 2021-12-15), the Toronto Zoo is investigating alternative emergency back-up measures instead of replacing the existing natural gas/diesel generators with new natural gas generators that will have an approximate lifespan of 30 years. In the interim we are arranging for portable back up power that will be utilized as required and will also allow us to take advantage of the Peak Shaving conservation measures.

COMMENTS

The first conservation measure of the Energy Retrofit Project with Ecosystems Energy Services, steam-to-hot water conversion in the Americas Pavilion, is complete. The conservation measure included the installation of 5 air-sourced electric heat pumps as the primary heating/cooling system for the building plus two natural gas boilers for emergency back up during power outages and to provide supplementary heating during peak cold days during winter. The project also included complete replacement of the distribution system for the building and new radiators in the Costa Rican Aviary. Zoo Utilities and Wildlife Care staff are pleased with the new system and improved environmental conditions within the building.

When it was determined the existing site-wide generators could not support the Peak Shaving conservation measure of the ERP, Ecosystems and Zoo staff discussed alternative measures that could be implemented in place of the Peak Shaving measure. Due to the success of the Americas Pavilion project and the condition of the heating systems for both Africa and Indomalaya Pavilion, it was determined similar scope

projects could be completed in both pavilions within the total project cost and have greater annual greenhouse gas emissions savings.

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