
Racine WWTP Renewable Projects Scoping Memo

Presented to:



Submitted by:



A. General Information

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Project Name: City of Racine WWTP Renewable Projects Scoping
Customer Name: City of Racine
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B. Disclaimer

The intent of this Scoping Memo is to identify % renewable increases associated with Energy Efficiency Measures (EEMs). Appropriate detail is included in the following sections. However, this memo is not intended to serve as a detailed engineering design document. It should be noted that detailed design efforts may be required to implement the recommended upgrades.

While the calculations in this report have been reviewed for technical accuracy and are believed to be reasonably accurate, the findings are estimates and actual results may vary. As a result, Cascade Energy Inc. (Cascade Energy) is not liable if estimated % renewables or savings are not actually achieved. All calculations in the report are for informational purposes and are not to be construed as a design document or as guarantees.

The City of Racine (Racine) should independently evaluate any advice or direction provided in this report. In no event will Cascade Energy be liable for the failure to achieve a specified amount of % renewables or energy savings and any incidental or consequential damages of any kind in connection with this memo or the installation of identified EEMs.

C. Executive Summary

This memo summarizes the energy savings and potential % renewables increase from five identified EEMs, which were selected by Racine. The following table summarizes the findings of the analysis.

Table 1: Savings & % Renewables Summary

Baseline Energy		99,796,249	kBTU/yr
Baseline % Renewables		40.9%	
EEM No.	Description	Annual Site Energy Savings (kBTU/yr)	% Renewables = Plant Biogas Consumption / Total Plant Energy (Purch. Nat. Gas, Biogas, & Purch. Elec.)
1	Biogas Electric Generator & New Turbo Blower	10,359,151	45.6%
2	Aeration control upgrades	3,737,760	47.6%
3	Diffuser replacement	2,773,934	49.2%
4	Digester Gas Conditioner	9,716,998	55.7%
5	UV System Upgrade	4,283,227	59.2%
TOTAL		30,871,070	59.2%

Note the proposal identified 6 projects, but two projects (Turbo Blower Upgrade and Digester Gas Electric Generator) were combined for analysis simplification into EEM 1. For additional project descriptions, please see *C-22 efficiency.pdf*, titled *Blower and Engine/Generator Project Efficiency*, dated January 2023.

C. Analysis Details

Baseline

The baseline energy use was established from the most recent complete year of WWTP electrical use, biogas consumption, and natural gas consumption, which was 2020. Additionally, EEM 3 was completed in 2021, making 2020 a good baseline year. The % renewables (renewable energy) is defined as the biogas consumption divided by total baseline WWTP energy use, which included purchased electricity, biogas consumption, and natural gas consumption. The following table summarizes the baseline calculations and assumptions.