



## Capturing Carbon and Using Renewable Hydrogen to Produce Renewable Methane and e-Methanol to Reduce Carbon Emissions at a Wastewater Treatment Facility

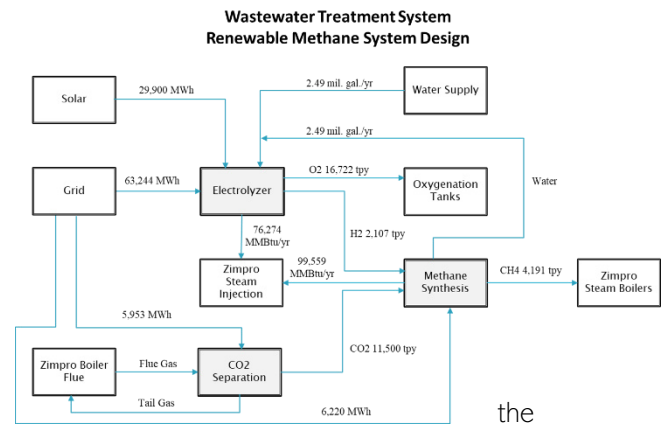
### Situation

A wastewater treatment facility was facing challenges associated with receiving approvals for certain investments designed to improve operational resilience. To address local concerns over a potential increase in carbon emissions, the management of the facility decided to investigate the potential to reduce the facility's overall carbon emissions by capturing and putting to work waste gas streams.

### Solution

Velerity was engaged to assess the facility's potential to put waste gas streams to work including cross leveraging thermal, chemical, electrical, land and other assets at the facility in an integrated solution. The approach taken included:

- Characterizing existing gas streams at the wastewater treatment facility including chemical composition and flow rates;
- Setting a target carbon-dioxide reduction target for facility upon which to base the carbon mitigation design target;
- Identifying and characterizing suitable carbon-dioxide separation technologies;
- Designing suitable methane and methanol synthesis solutions;
- Determining renewable hydrogen production requirements and evaluating in situ hydrogen production solutions via electrolysis and off-site hydrogen sourcing options; and
- Building a detailed mass flow, energy, chemical and financial model including capital requirements, operational cost impacts to assess financial implications.



Velerity also conducted interviews with prospective equipment providers in order to verify engineering designs, availability and cost and performance specifications.

### Result

Velerity prepared and provided a complete engineering and financial analysis to the management team associated with mitigating 20,000 tons per year of carbon dioxide emissions for the facility, either through renewable methane production or renewable methanol production.