FEASIBILITY STUDIES FOR THE IMPLEMENTATION OF CO_2 CAPTURE AND ABSORPTION PROCESS FOR SUSTAINABLE LARGE-SCALE ALGAE GROWTH

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INTRODUCTION

Currently, hundreds of tons of carbon dioxide are released from power plants across the United States. AlgaeNation and OUC are seeking to curtail these emissions through a liquid-based absorption system that would deliver waste CO_2 to algae ponds – fostering algae growth.

OBJECTIVE 1: Perform process optimization experiments

OBJECTIVE 2: Prepare a comprehensive techno-economic assessment

METHODS

Objective 1:

- Bench-scale absorption column to find optimum absorption parameters
- Henry's Constant analysis to find optimal absorption parameters

Objective 2:

- Scale-up equation to find dimensions of industrial-sized column
- Comparison to competing absorption technology – Global Thermostat

RESULTS

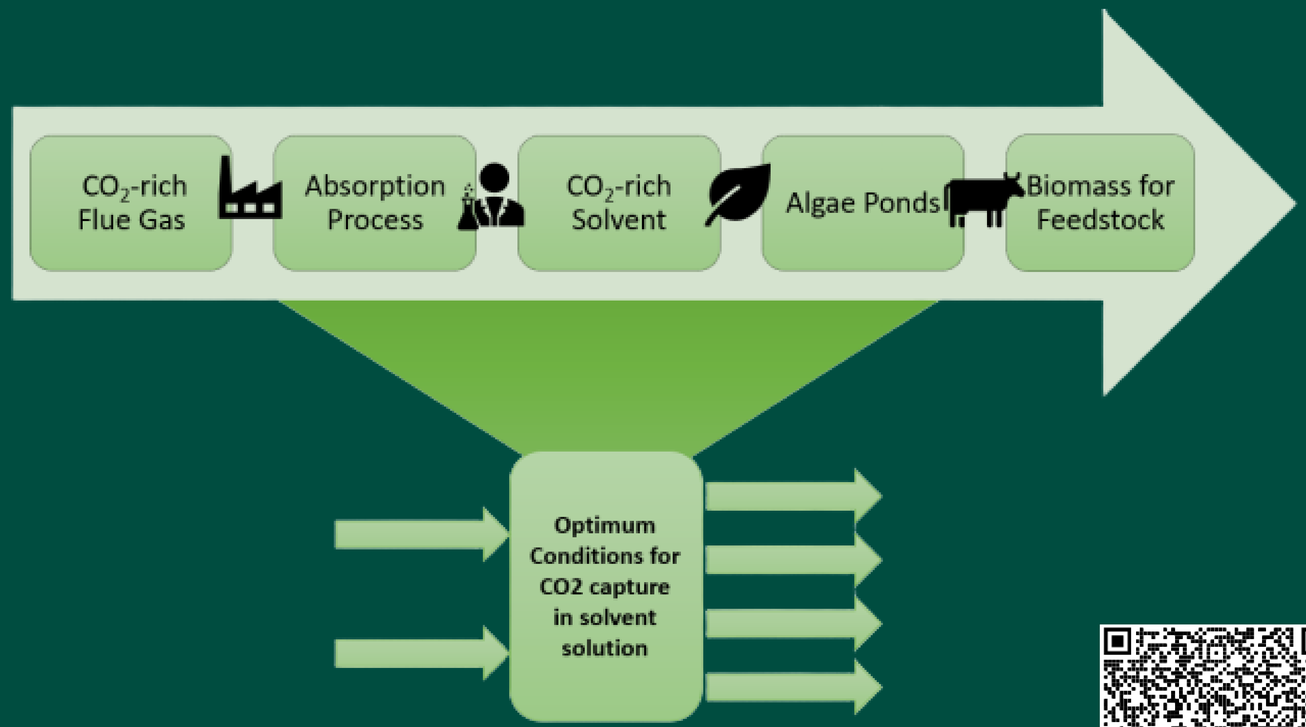
Objective 1:

- Optimal solvent concentration of 15%
- Optimal inlet CO_2 concentration of 15%
- Optimal flowrate ratio of 76 L/m^3

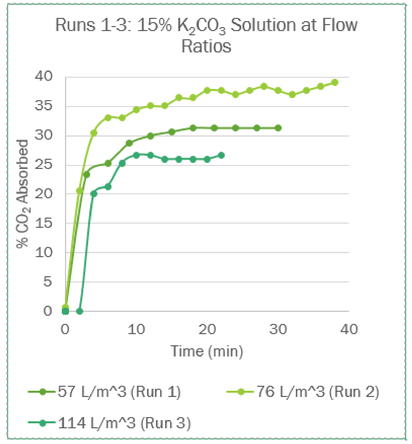
Objective 2:

- Total transfer area of 1.4m^2
- Fixed Capital Investment: $18.600

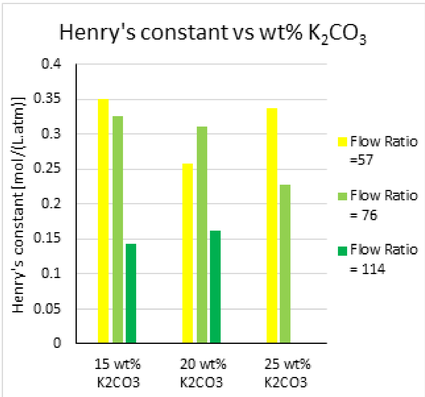
Potassium Carbonate solvent provides an **efficient** Carbon Dioxide absorption solution.



SUPPLEMENTAL INFO



Optimal bench-scale run: Run 1



Item	Quantity	Cost
Potassium Carbonate	10,044 kg/day	$42.11/hour
Water	15,035 gal/day	$0/hr
Fixed Cost	1 column	$18,600

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