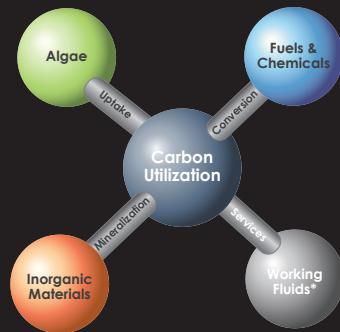


# Carbon Utilization (CU) Using Algae to Produce Valued Bioproducts

Developing microalgae and blue-green algae technologies that utilize waste CO<sub>2</sub>



## R&D ACTIVITIES

The program is exploring algae technologies such as: sodium bicarbonate microencapsulation, novel photobioreactor designs, dewatering methods and genomics – to improve CO<sub>2</sub> capture, transportation, uptake and conversion into high valued bioproducts.

## CHALLENGES

- Efficient capture, transportation, and release of CO<sub>2</sub> into algal media
- Developing energy efficient dewatering techniques
- Discovering/developing algal strains that grow well in the presence of SO<sub>x</sub> and NO<sub>x</sub>
- Improving utilization and biomass productivity

## KEY ADVANTAGES



### BIOMASS PRODUCTION

Algae can grow faster than any terrestrial plant to produce a high volume of biomass



### EMISSIONS UTILIZATION

Algae can utilize untreated CO<sub>2</sub> from various sources



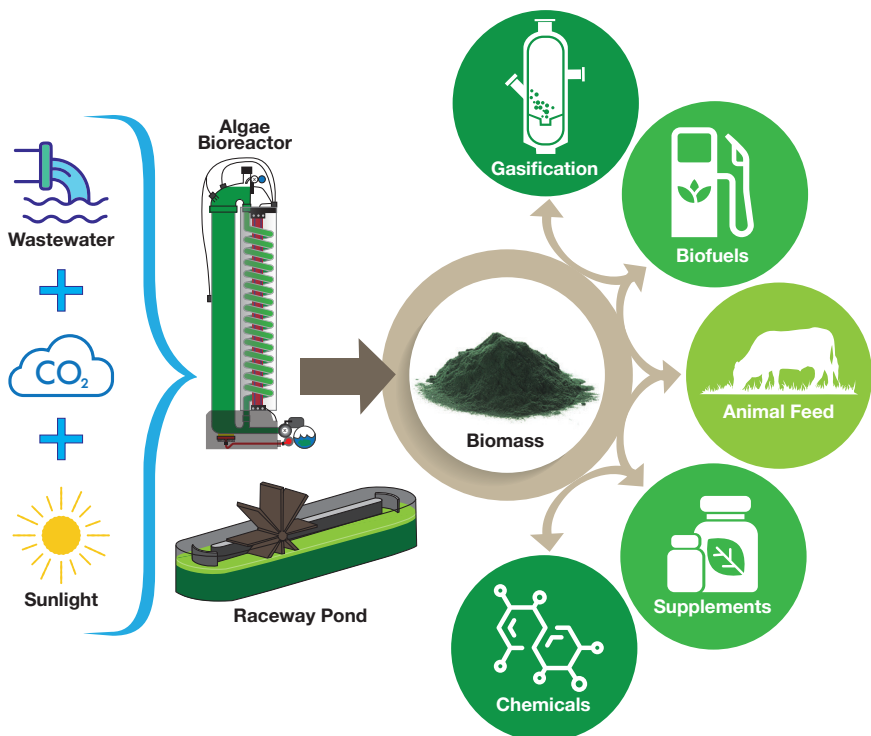
### WASTEWATER UTILIZATION

Algae allow economic and environmental benefits through wastewater utilization



### VALUED PRODUCTS

Biomass can be separated, gasified, and/or processed into a variety of valued products



## ACCOMPLISHMENTS

- ✓ Pilot scale photobioreactor achieved 17 months of stable operation utilizing waste CO<sub>2</sub>
- ✓ Achieved 90% CO<sub>2</sub> capture via lab scale algae photo-bioreactor system using novel dewatering technique, with 99% water recycle