

THE ALGAE CAPSTONE

Testing the science myself: a Grade 11 study of algae-based biofuel.

WHEN

Grade 11 capstone, about one month

WHERE

COMSATS University Islamabad (lab access)

MENTOR

Hira Wajahat

EXPERIMENTAL DESIGN — ALGAE-BASED BIOFUEL

1

CULTIVATE

Grew two algae species side by side under lab conditions.

Chlorella vulgaris

Spirulina



2

TRACK

Tracked growth with daily measurements, checking cells under the microscope.

Optical density

Cell counts



3

EXTRACT

Compared three lipid extraction methods on both yield and energy cost.

3 methods

Yield

Energy cost



4

REUSE

Tested the leftover biomass as fish feed — waste from one system became input for another.

Biomass reuse

START



TEST



TELL

BEYOND THE LAB

From a one-month capstone to Columbia, Khalifa University and the World Energy Summit.

FROM THE LAB BENCH TO THE WORLD

1

LITERATURE REVIEW

Capstone literature review accepted at Columbia University

The written research behind the lab work passed review at Columbia.

2

KHALIFA UNIVERSITY

Post-research lab work at the Climate Solution Symposium

Took the results of the capstone to the Khalifa University Climate Solution Symposium.

3

FUNDING • ABU DHABI

Won funding to display the solution at the World Energy Summit

Algaloop Energy — “Clean Fuel. Lower Energy. Stronger Seas.”



Algaloop stand, World Energy Summit, Abu Dhabi



With the sample vial at the stand



“The Sea Moves the World”

The capstone taught me **to test** — to measure what I'd only been teaching.

START



TEST



TELL