



Charting the Course of Carbon Capture: Is Ocean-going CO₂ Transport Environmentally Sustainable?

Angelina Guzman, University of California, Davis

Mentor: Caspar Donnison, Lawrence Livermore National Laboratory

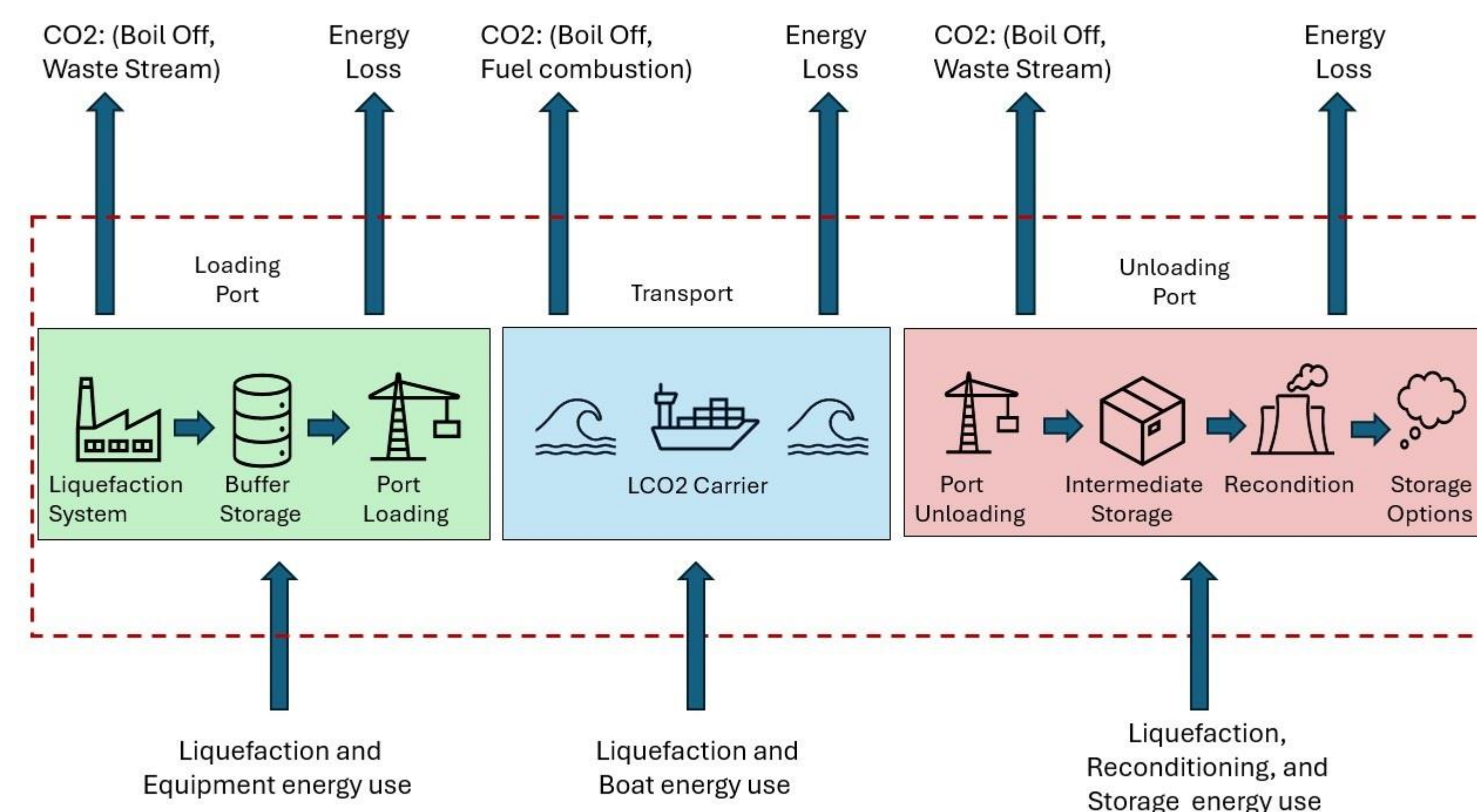
ABOUT ME

- **Major:** Chemical Engineering, B.S.
- **Career Goals:** My goal is to work in the medical or pharmaceutical industry while continuing my education.
- **Why LLNL?:** As a lifelong Livermore resident, the Lab was my original inspiration to pursue STEM. I chose this fellowship to be part of an institution that has profoundly impacted my life and community. I am deeply grateful to the Kim Cupps Scholarship from the Pedrozzi foundation for supporting my STEM journey.
- **Interests:**
 - Running
 - Paddleboarding
 - Listening to music



SUMMER RESEARCH

- **Abstract:** The purpose of the project was to calculate how much CO₂ emissions were produced when transporting CO₂ via shipping (LCO₂ transporters) using a life cycle analysis (LCA). This allows us to determine whether this type of transport is environmentally feasible.
- **Methods:**
 - **System Boundary Definition:** Divided the overall lifecycle analysis (LCA) system into three distinct operational stages: Loading Port, Transport, and Unloading Port, to systematically isolate carbon emission sources and energy pathways.
 - **Parameter Identification:** Conducted an extensive literature review to define key LCA variables and isolate critical high-energy costs, with a primary focus on the CO₂ liquefaction process.
 - **Predictive Modeling Framework:** Established the mathematical framework to calculate operational expenditure (OPEX) CO₂ emissions, which will serve as part of the final evaluation metric for environmental feasibility.



LLF AWARD

- The LLF funds will help support the rest of my education, while enabling me to live independently and build a baseline for my future finances.
- I feel like this fellowship gave me an opportunity to learn what life as a PHD entails and explore advanced research at the frontiers of carbon capture. During this experience, I got to meet wonderful people through networking and became more confident in my work when it came to applying technical aspects that I have learned from school.



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