



Commodifying Absence: Carbon Offsets and UC Irvine

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Introduction

The University of California, Irvine (Figure 1) aims to be carbon neutral in its Scope 1 and 2 emissions (directly related to campus activities and electricity to power those activities) by 2025 (UCI, 2016). The campus aims to be carbon neutral in Scope 3 emissions by 2050. Scope 3 emissions occur outside the school's boundaries and are typically tied to transportation (e.g. commuting, conference and athletics air travel) (UCI, 2016).

According to UC Irvine's 2016 Climate Action Plan, Scope 3 emissions account for 36% of the University's overall emissions. A main action item for the near future includes purchasing offsets to counterbalance Scope 3 emissions that are not mitigated by transportation design.

Carbon offset projects typically target gases with high global warming potentials (GWPs) as identified during the Kyoto Protocol: carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) (Ramseur, 2009).

UC Irvine has the opportunity to invest in carbon offset projects within the UC system or to look independently for other projects. Part of this fellowship was researching project types and deciding how to best invest.



Figure 1. This project occurred at the UC, Irvine campus.

The other part of this fellowship involved fostering student and administrator support. Throughout this fellowship, I have aimed to raise student and faculty awareness of the idea of carbon offsets through reusable PowerPoint slides and presentations.

Project Goals

Deliverables for this project included:

- Creation of reusable presentation slides that could be used in various scenarios (e.g. classroom settings, sustainability working groups, seminars) to explain the definition and importance of carbon offsets. These would be downloadable for future teaching opportunities.
- Intense literature review and collection related to carbon offsets in different sectors, offset project types (and their pros, cons, and ability to offset UC Irvine's Scope 3 emissions).
- Investigation into what other campuses are doing to achieve carbon neutrality via personal interviews, using the STARS-AASHE website, and reading press releases.

By the end of the fellowship, I aimed to create an executive summary for administrators in the UC Office of Sustainability to quickly understand carbon offsets and the options the UC, Irvine campus has for investing. This document would summarize what offset types were available, what other campuses in the UC system and beyond were pursuing, and the pros and cons of different decisions.

Materials and Methods

This project was completed primarily using an internet-enabled laptop (Figure 2) equipped with the following:

- Google Scholar
- Microsoft Suite (Word, PowerPoint)
- Zoom

Academic carbon offset articles were gathered and annotated via Microsoft Word. Slides were created via Microsoft PowerPoint. A list of "best practices" was compiled from schools pursuing or achieving carbon neutrality via their press releases or the STARS-AASHE website. I conducted interviews with members of various institutions (other campuses and consulting agencies) via email and Zoom conference calls.



Figure 2. Laptop.

Results and Outcomes

Past and current literature on carbon offsets, both nationally and internationally, was collected, read and annotated. A thirty page document containing notes and takeaways from the literature was created to be passed on to future fellows. This document also contains notes about the funded Phase I projects from other UC campuses, interview notes and contacts from outside the UC system, and best practices from campuses that are pursuing or have achieved carbon neutrality.

I created a presentation explaining the definition, history, and importance of carbon offsets. This was presented to the UC Irvine Sustainability Meeting on November 20th, 2019. About thirty representatives from the student body, Housing, Physical and Environmental Planning, the Office of Sustainability, the School of Law, Urban Studies and Planning, and more attended. The same presentation was given to undergraduates in the Campus as a Living Lab seminar-internship to prepare them to be sustainable leaders on April 2, 2020. I also spoke of my experience as a Carbon Neutrality Initiative Fellow for a Global Sustainability class on February 26, 2020. Slides from the presentation will be used to update the Office of Sustainability "Climate Protection" webpage.

Lastly, I created a report for the UC Office of Sustainability summarizing what was learned during the fellowship, and recommendations for moving forward. I was particularly inspired by what other campuses were doing to garner student support and alignment with mission statements (Johnson, 2020; Campbell, 2020). Many campuses successful in pursuing or achieving carbon neutrality chose methane reduction strategies, and this was also my recommendation.

Dairies produce ~50% of CA's methane emissions and are primarily located in the San Joaquin Valley (CARB, 2017; CDFA, 2016). This Valley is also home to many disadvantaged communities (OEHHA, 2018). Installing anaerobic digesters over the wet manure (Figure 3) at these facilities will clean up the air while also converting methane to biogas, used for power or heat.



Figure 3. Dairy manure lagoon in the San Joaquin Valley.

Conclusions

In conclusion, I was successful in creating sustainable materials that could be reused by administrators and future fellows.

A Microsoft PowerPoint presentation was created describing what carbon offsets are, their pros and cons, and why we need them at this time.

An executive summary was created for the Office of Sustainability containing tables and recommendations generated from hundreds of hours of reading carbon offset literature and interviewing representatives at other campuses nationwide.

Future Goals

Aside from being a fellow this year, I am also a graduate student in the Rowland-Blake lab. We are an atmospheric chemistry group and study air from all over the world. My dissertation focuses primarily on air quality surrounding California landfills and dairies (Figure 4). Both are huge greenhouse gas emitters that could be better controlled through carbon offset projects. This is a potential opportunity to combine research occurring at UC Irvine with carbon offsets in the real world.

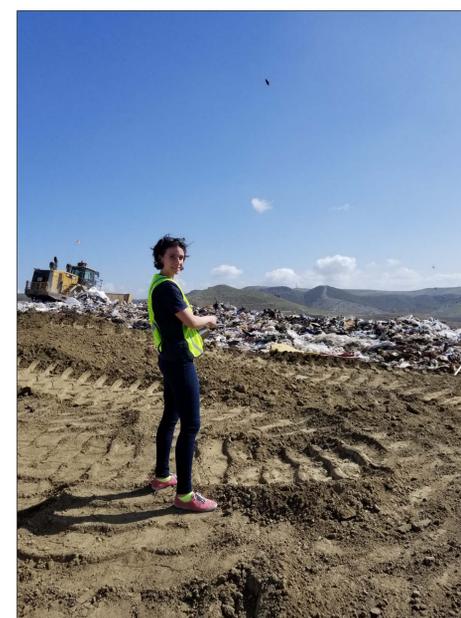


Figure 4. Air sampling at a CA landfill.

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