UC SANTA BARBARA Community Labor Project

UC SANTA BARBARA The 2035 Initiative

Modeling the Impact of Decarbonization on Labor in California's Central Coast

2024-2025 Master of Environmental Data Science Capstone Project Proposal
October 18, 2024

Proposers / Clients

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Proposed Project

Objective

The objective of this project is to model **fossil fuel job loss** and **clean energy job growth** in California's Central Coast. This analysis will be used by labor, indigenous, environmental, and community organizations to inform the conversation about offshore wind energy jobs, as well as to advocate with and on behalf of fossil fuel workers for a "just transition."[1]

Environmental Motivation

In December 2022, three global companies won the rights[2] to develop offshore wind farms off the coast of San Luis Obispo County. The clean energy output could power 3.5 million homes, marking a significant step towards California's carbon neutrality goals. It will also lead to the creation of a new economy around clean energy in the region, with employment opportunities for residents in the area. At the same time, however, the Central Coast stands to lose reliable, unionized fossil fuel jobs as the region shifts to a decarbonized energy supply. To this end, the three companies - Equinor, Golden State Wind and Even Keel Wind (Invenergy) - have committed $27 million for community benefits and an additional $66 million for workforce and supply chain development on the Central Coast.

Labor, indigenous, environmental, and community organizations in the area are already working to ensure that this funding goes towards projects that benefit the maximum number of residents; that people from the most disadvantaged communities can access clean energy jobs; and that the new jobs support raising a family and provide great benefits. But, these groups need reliable, up-to-date information to guide their interventions and strategy.

This project will serve to address this need. Estimates of where, how many, and what type of energy jobs will be gained (and lost) during this transition will inform conversations and policy decisions around offshore wind installation and the community investment funding. In doing so, this project can serve as a model for how research can support just transitions in energy communities across the United States.

Data Science Need

The students on this project will draw on economic data to build a model that will estimate the effects of decarbonization by region. This model will *predict the number of jobs created by expanding clean technologies*, especially building electrification and wind energy developments. We aim to look at the whole clean energy supply chain, including manufacturing, as well as job creation through decommissioning fossil fuel infrastructure. Ultimately, the model output will be estimates of changes in employment by region, occupation, and year – e.g., "Santa Barbara County will gain 500 electrician jobs by 2035."

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[1] What is just transition? And why is it important? (n.d.). UNDP Climate Promise. https://climatepromise.undp.org/news-and-stories/what-just-transition-and-why-it-important

[2] REACH. (2024, October 12). Offshore Wind » REACH. https://reachcentralcoast.org/offshore-wind/

Similarly, the team will build a model to *predict the impacts of climate and clean energy policies on fossil fuel jobs,* quantifying the job loss associated with phasing out fossil fuels. The model will aim to provide projections of the region's changes in fossil fuel employment by industry, occupation, and year. The output will be analogous estimates such as "Santa Barbara county's natural gas industry will lose 300 pipefitter jobs by 2035."

Deliverables

The main deliverable for this project will be a Shiny web app that visualizes the modeling outcomes. This will take the form of an interactive map that users can navigate to understand the likely impacts of the clean energy transition on different parts of the Central Coast. The team will also compose a short report explaining the methodology and key findings of the analysis. The web tool will be hosted and maintained by the 2035 Initiative.

The project and its deliverables will contribute to the work of the researchers and policy analysts at the 2035 Initiative and the UCSB Community Labor Project. The UCSB Community Labor Project is an initiative of the Blum Center to advance labor rights and economic justice. The 2035 Initiative is a UC Santa Barbara "think-and-do" tank that uses empirical research, policy development, and media engagement to support actionable roadmaps for enacting climate policy. Ultimately, the audience for the tool will be the aforementioned labor and community groups, as well as policymakers who are interested in understanding the economic implications of energy transitions for their districts.

Data Access and Availability

The analysis will draw on publicly available economic data. From the start, the client team will provide access to data from the following sources:

- American Community Survey
- O*NET 29.0
- Quarterly Census of Employment & Wages (BLS)

These data are all accessible through the provided links.

These sources primarily consist of geocoded, time-varying data on labor trends, such as employment across occupations. However, it is also likely that other demographic characteristics for a geographic unit will help predict the labor effects of decarbonization, such as level of education. Depending on decisions taken in the course of building the models, the team may be tasked with discovering additional sources for information not available in the initial datasets (for example, if we have reason to believe that an additional variable will improve the predictive accuracy of a model on training data).

Project Requirements

The MEDS team will build a model that predicts future trends in labor market outcomes for energy jobs. This will require cleaning and joining datasets from the aforementioned sources. The team will also be tasked with selecting a methodology to make predictions with the data.

For this, we will provide the team with a strong starting point in research by Aklin, Lim, and Mildenberger (n.d.).[3] This research utilizes economic data sources to study the alignment between existing distributions of skilled labor and the projected distributions of skilled labor necessary to meet decarbonization targets. To do this, they estimate the labor hours needed to facilitate a transition to decarbonized heating & air conditioning and extrapolate to estimate the change in employment necessary, given the state of the energy industry in a region. A similar process could generate estimates for this project. Matto Mildenberger, one of the paper's co-authors, is the Faculty Director of The 2035 Initiative and will be able to consult with the team as needed.

Another possible approach is to utilize a machine learning model that predicts past changes in job outcomes following similar decarbonization projects, and use that model to build estimates of future trends. The team will be asked to test different approaches to building this model, evaluate their relative performance, and select the best option.

Supporting Materials

Budget and Justification

We estimate that no additional budget is required to complete the project. Should they prove necessary, proprietary data sources will be provided by the client.

[3] This is an internal document that will be provided to the team.

October 18, 2024

Bren School of Environmental Science & Management
UC Santa Barbara
Santa Barbara, CA 93106-5131

Dear Bren School Group Project Coordinators:

It is my pleasure to write a letter in support of the MEDS Capstone Project Proposal being submitted to the Bren School in collaboration with the UCSB Community Labor Center. The 2035 Initiative is a UC Santa Barbara "think-and-do" tank that uses empirical research, policy development, and media engagement to support actionable roadmaps for enacting climate policy. The UCSB Community Labor Project is an initiative of the Blum Center to advance labor rights and economic justice. This proposal would support the work of 2035 Initiative researchers as well as labor, indigenous, environmental, and community organizations along the California Central Coast.

We are grateful to have an opportunity for brilliant graduate students at the Bren School to help inform the equitable distribution of community benefits and workforce development funding as part of a just energy transition. Specifically, this project would provide valuable analytical insights into jobs created from the expansion of clean energy technologies and jobs lost due to fossil fuel phaseout on a subregional scale. The project team's assessment will support researchers and local organizations engaging with and advocating for policy decisions around offshore wind development and community investment funding.

As the client of this project, we are committed to providing consultation and relevant data through the entire duration of the project. We do not foresee any additional funding needs beyond the Capstone Project budget. If additional funding or data sources are required for the project's success, The 2035 Initiative will be responsible for providing those resources.

Sincerely,

Lucas Boyd

Lucas Boyd
Executive Director
The 2035 Initiative