

The Hydrogen Economy - Technology, Pathways, Economics and Policy
Final Class Project

The goal of the class project is to perform a detailed analysis of important aspects of the hydrogen economy or hydrogen pathways that you are interested in. This analysis should draw on tools and concepts developed in this class. The analysis should include economic and environmental parameters and incorporate existing work from the literature. The development of a model to simulate key processes for the analysis is encouraged (Excel, GIS, Matlab, etc). The use of H2A, GREET, and other existing models is also encouraged.

The project definition is open-ended and allows you to determine the scope of the project. It can range from a very narrow focus on one aspect of hydrogen infrastructure (e.g. refueling station design analysis) to very broad, high-level questions (e.g. comparisons of hydrogen pathways with other potential uses of particular feedstocks).

Please discuss the project with Chris Yang as you develop your ideas. Many lecturers have indicated their interest in helping out with student projects.

Report structure (~20 pages):

1. **Executive summary** (2 pages)
2. **Introduction of the problem** (background, motivations, objectives)
3. **Literature review** (at least 4 key sources should be summarized and discussed)
4. **Description of the model/analysis methods**
5. **Results and discussion**
6. **Conclusions**
7. **References**

Potential project ideas (do not feel constrained by these examples):

- A technical and economic comparison of hydrogen and other electricity storage systems
- Fuel cells, energy stations and cogeneration for buildings
- Hydrogen vehicle models
- A technical and economic comparison of energy carriers (e.g. H₂, electricity, methanol, natural gas, gasoline)
- Hydrogen infrastructure models incorporating refineries or other industrial H₂ sources to meet near-term demand
- Dynamic model for hydrogen stations design and operation
- Analysis of rural hydrogen production and infrastructures
- Analysis of tradeoffs for natural gas usage, between H₂ production and electricity generation