WEEKLY STATUS REPORT

|  |  |
| --- | --- |
| Name: | Julian Florez |
| Week Ending Date: | 02/06/2022 |
| Self-Assessment: | Green, ~~Yellow~~, ~~Red~~ |

|  |
| --- |
| ACTIVITIES COMPLETED THIS WEEK |
| The following activities were completed this week:   * Development of green ammonia production optimization model in line with the conceptual outline below (initially decided against incorporating a hydrogen fuel cell that can contribute to energy demand, however after reviewing yearlong model runs and seeing that hydrogen storage is used as a seasonal buffer vs daily load management-I am leaning towards including a fuel cell option)      * Data and general work update repository are located here: [GitHub - julflore000/KAUST: Work/research done for my summer at KAUST!](https://github.com/julflore000/KAUST) * Mathematical formulation of model in repository: [KAUST/greenAmmoniaFormulation.pdf at main · julflore000/KAUST · GitHub](https://github.com/julflore000/KAUST/blob/main/productionOptModel/formulation/greenAmmoniaFormulation.pdf) * Initial visualization of results from data and validation that model is operating within expectations can be found at the jupyter notebook [KAUST/modelOutputAnalysis.ipynb at main · julflore000/KAUST · GitHub](https://github.com/julflore000/KAUST/blob/main/productionOptModel/dataAnalysis/modelOutputAnalysis.ipynb) * Currently getting wind and solar data from the following resource: [JRC Photovoltaic Geographical Information System (PVGIS) - European Commission (europa.eu)](https://re.jrc.ec.europa.eu/pvg_tools/en/tools.html) * It appears that there is also data available for wind and solar from the following atlas however I am unable to access the resource: [Renewable Energy | King Abdullah City for Atomic and Renewable Energy](https://www.energy.gov.sa/en/futureenergy/renewableenergy/pages/renew2.aspx) * First runs of geographical data included below. Past studies have found most optimistic green global LCOA ~ .4-.5$/kg ([source](https://pubs.rsc.org/en/content/articlelanding/2021/se/d1se00345c#!) see table 6). Other studies ([source](https://pubs.rsc.org/en/content/articlelanding/2020/ee/d0ee01707h)) have found LCOA around $1/kg for Saudi Arabia currently. Initial results with current day parameters have an output from my model ~ $1.2/kg (see image below for what the final graphics I expect to look like/breakdown in costs). * Takes ~30 minutes for full year run-want to explore running model on cluster |
|  |

|  |  |  |
| --- | --- | --- |
| ACTIVITIES IN PROCESS | NEXT ACTIONS | DUE DATE |
| 1. **Testing multiple electroyzer options in model (to capture the economies of scale). Right now in initial tests I used just one electroyzer with fixed constraints, however will provide a range of models to choose from** 2. **Developing GUI for non developer interaction of model (initial sketch up done however focusing on model validation first)-since the model will probably require being run on a cluster-does it make sense to develop a GUI?** | * **Review model assumptions and identify if model needs to be tweaked** * **Initiate first look at distribution and cracking side of Ammonia supply chain** |  |

|  |
| --- |
| ACTIVITIES TO BE STARTED NEXT WEEK |
|  |

|  |
| --- |
| LONG TERM PROJECTS |
| * Analyzing optimal economic analysis of green ammonia from production to end consumption * Increasing useability of model for non-developer use. |

|  |
| --- |
| ISSUES FOR IMMEDIATE ATTENTION |
| * N/A |

|  |
| --- |
| KEY TEAM INTER DEPENDENCIES |
| * N/A |