when hydrogen from SMR is used. Electricity from solar power, wind, natural gas with carbon capture and sequestration, hydropower, and combined cycle combustion of willow are examples of electricity energy sources that would result in carbon savings.

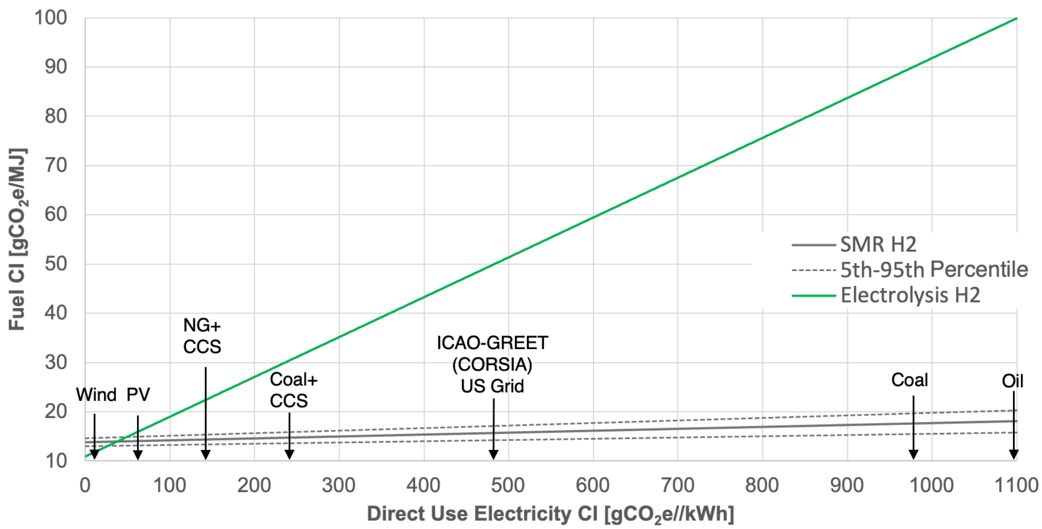

Figure 3. Sensitivity of carbon intensity (CI) for hydro-processed ester and fatty acid from used cooking oil fuel to the electricity CI for H_2 from steam methane reforming (SMR) and electrolysis. CCS: carbon capture and sequestration; NG: natural gas; PV: photovoltaic.

Milestone
The MIT team presented the initial modeling approach to the FAA and other stakeholders.

Major Accomplishments
The MIT team presented initial model results, which will provide the basis for further modification of the model.

Publications
None.

Outreach Efforts
- The team provided insights into the modeling approach during the Fall 2021 and Spring 2022 ASCENT meetings.
- The team presented this work to the Fuels Task Group in October 2022.

Student Involvement
During the reporting period, Tae Joong Park (MIT graduate student) worked this task.

Plans for Next Period
The team aims to roll out the model for additional CORSIA-eligible pathways. In addition, the team intends to start analyses on novel fuel pathways.

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Task 7 - Analyze the Prospects of DAC of Atmospheric CO_2 to Provide a Carbon Source for SAF Production

Massachusetts Institute of Technology

Objectives

Under Task 7, the MIT team aims to analyze proposed technological approaches for DAC as well as their readiness, scalability, and economic performance. Past and potential future trajectories of DAC technologies will be analyzed to define scenarios of how DAC could evolve to provide a potential carbon source for SAF production. In addition, the opportunity space for implementing different DAC technologies with conversion processes will be analyzed.

The initial step under this task was to provide an overview of the existing production technologies.

Research Approach

The team has focused on identifying different DAC technologies, their readiness, and potential development trajectories. This effort includes first-order stochastic assessments of economic performance for a range of technology scenarios. In addition to literature studies and detailed analyses of the different process steps, the team is conducting expert interviews.

Milestone

The MIT team ramped up work under this task in Fall 2022.

Publications

None.

Outreach Efforts

None.

Student Involvement

During the reporting period, Tara Housen (MIT graduate student) worked this task.

Plans for Next Period

The team will continue analyses of DAC processes, as described above.