

Alternative Fuels

CAC Workgroup

Meeting #1

June 1, 2022



**Climate Action
Council**

Agenda

- > Draft Workplan
- > Alternative Fuels and Final Energy Use in the Integration Analysis
- > Key Principles for Alternative Fuels from the draft Scoping Plan
- > CJWG feedback on Alternative Fuels in the draft Scoping Plan
- > Scheduling the next meeting

Objective of this CAC subgroup

Workgroup Purpose

This working group will develop guidelines for Council consideration on the use of fuels such as hydrogen, renewable natural gas and other biofuels (e.g. renewable diesel, renewable jet fuel) in meeting the Climate Act emission limits. The group will ensure consistent application of these principles throughout the Scoping Plan, providing recommended revisions to the draft scoping plan for Council consideration.

Key Focus Areas

- Limited and strategic uses
- Hard to electrify end uses - aviation, freight, industry
- Avoid extending reliance on fossil fuel infrastructure
- On-site cogeneration or local use applications
- Sustainable use of waste-based feedstocks
- RD&D for promising technologies and end-use applications
- Avoid disproportionate impacts on DACs

Draft Workplan

> Meeting 1

- Alternative Fuels in the draft Scoping Plan

> Meeting 2

- Feedstock Potential
- Emissions Accounting

> Meeting 3

- Health, co-pollutant and equity considerations

> Meeting 4

- Review and discuss public comments on alternative fuels

> Meeting 5

- Review draft plan language and recommend revisions, if needed

> Meeting 6

- Review draft plan language and recommend revisions, if needed

> Meeting 7

- Review draft plan language and recommend revisions, if needed

> Meeting 8

- Finalize recommended revisions for full Council consideration

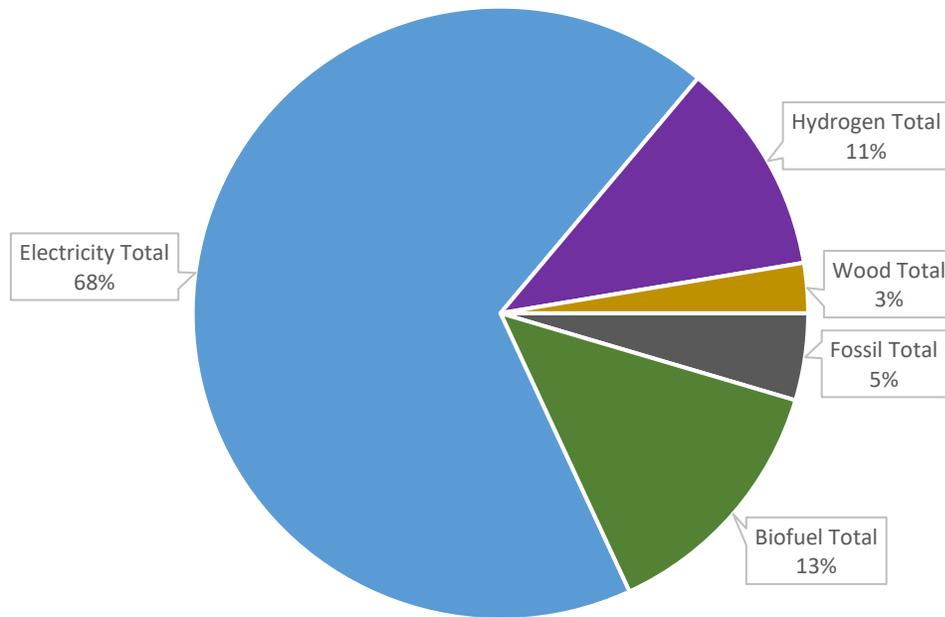
Alternative Fuels Considerations in the Integration Analysis

- > Alternative fuels such as bioenergy or hydrogen will likely play a critical role in helping to decarbonize sectors that are challenging to electrify
 - By 2030, initial market adoption of green hydrogen in the following applications: medium and heavy-duty vehicles, high-temperature industrial
 - Additional promising end-use applications include district heating and non-road transportation, e.g., aviation and rail
- > Alternative fuels might serve as a backstop to difficult-to-attain electrification
 - Vehicles: Short distance freight may be electrifiable but some long distance (>500 mi/day) may be infeasible due to energy density and weight constraints of batteries
 - Industry: Some industrial processes require high heat or use fuels as feedstock and energy source
 - Aviation: Due to weight and volume constraints, batteries are unlikely to replace combustion in airplanes for long-distance travel
- > In the power sector, alternative fuels may play a role by providing firm capacity for reliability

Alternative Fuels in 2050

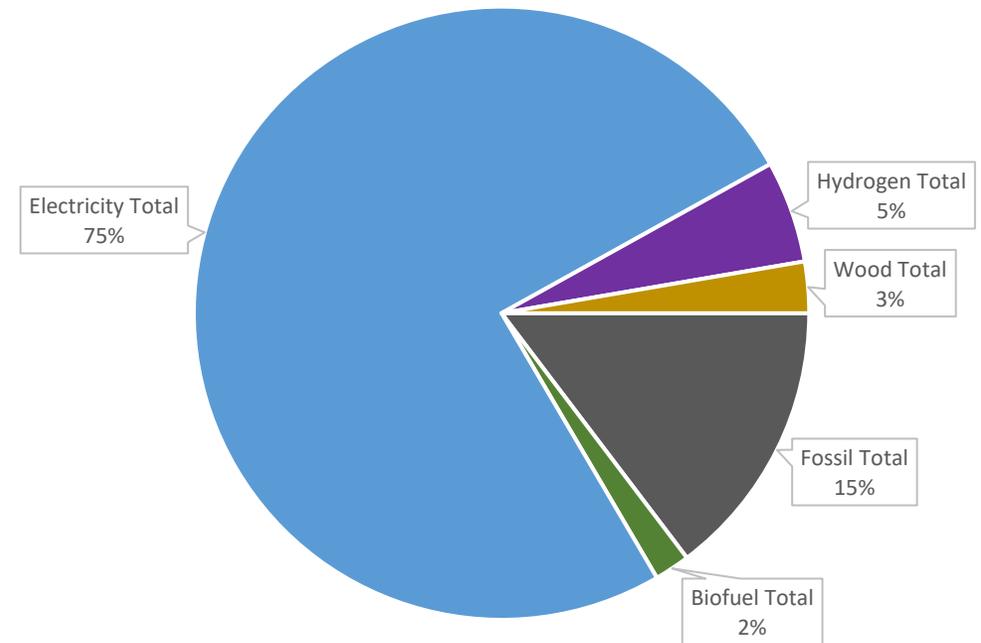
S2 – Low Carbon Fuels

1,304 TBTU



S3 – Transition Away from Combustion

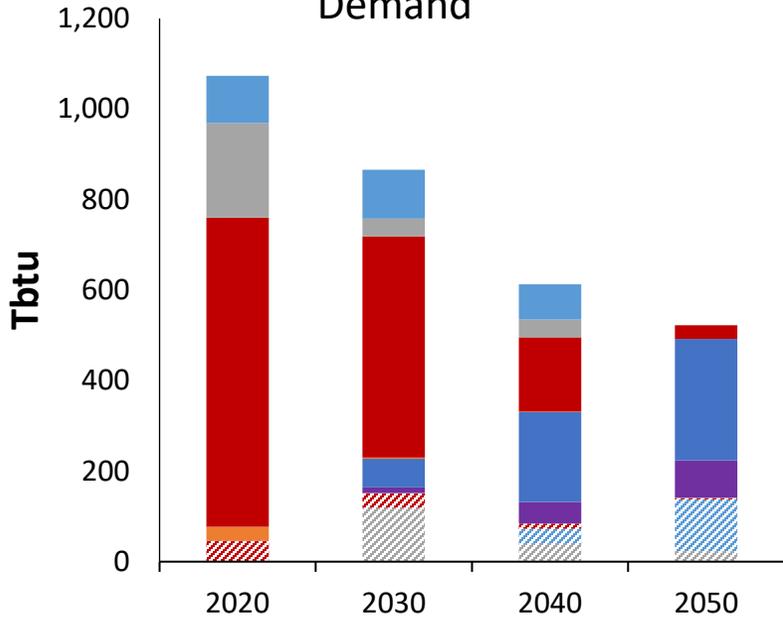
1,270 TBTU



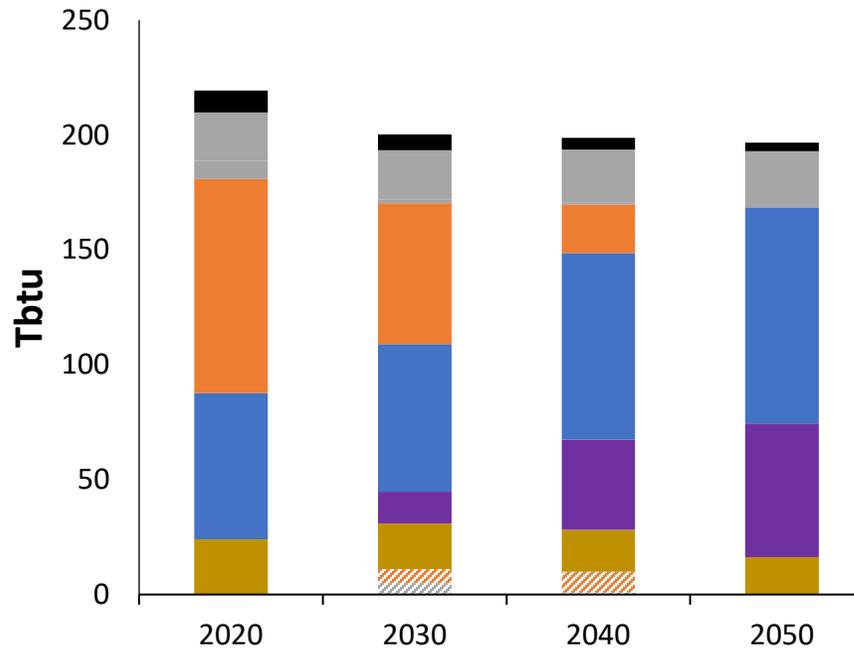
Alternative Fuels in S2

Strategic Use of Low Carbon Fuels

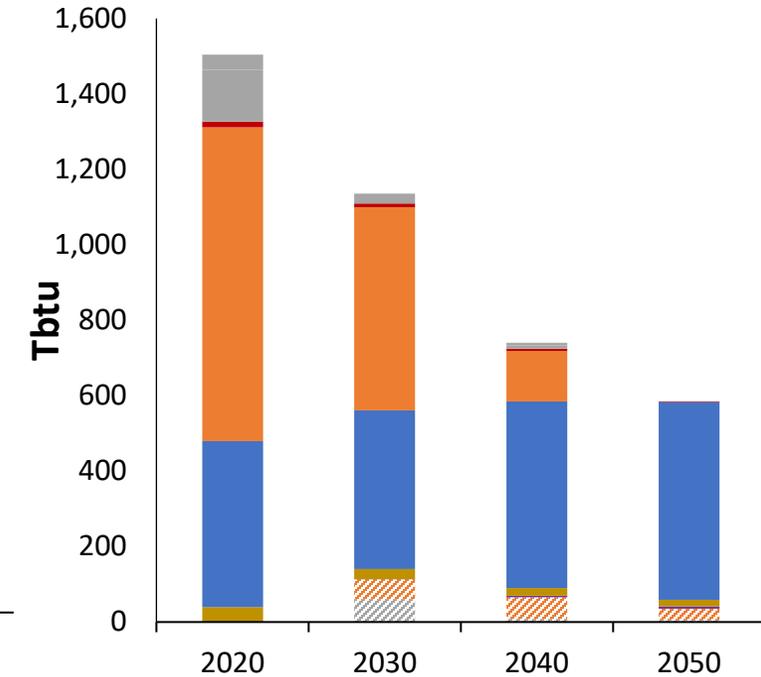
Transportation Final Energy Demand



Industry Final Energy Demand



Buildings Final Energy Demand

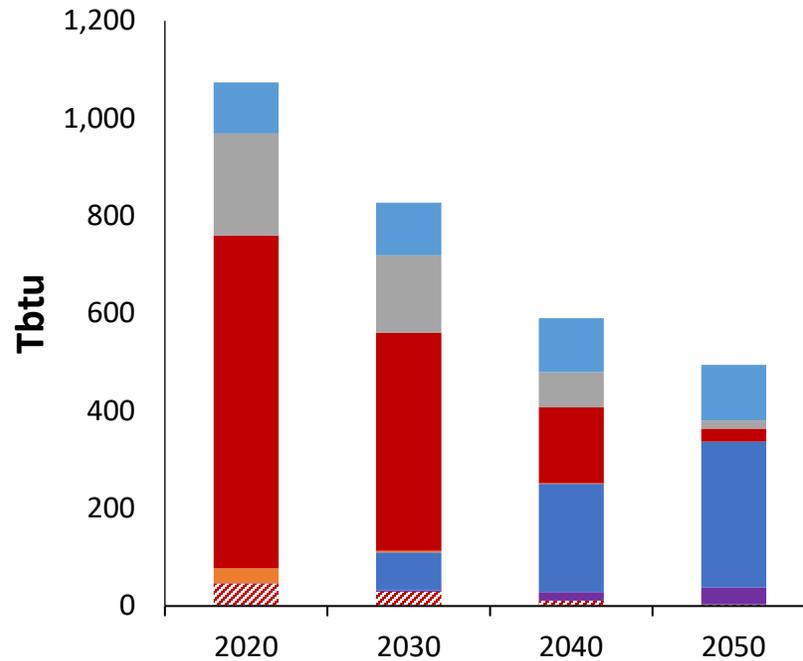


- Renewable Distillate
- Renewable Natural Gas
- Electricity
- Distillate
- Coal
- Renewable Jet Fuel
- Wood and Waste
- Natural Gas
- Jet Fuel
- Renewable Gasoline
- Hydrogen
- Gasoline
- Other Petroleum

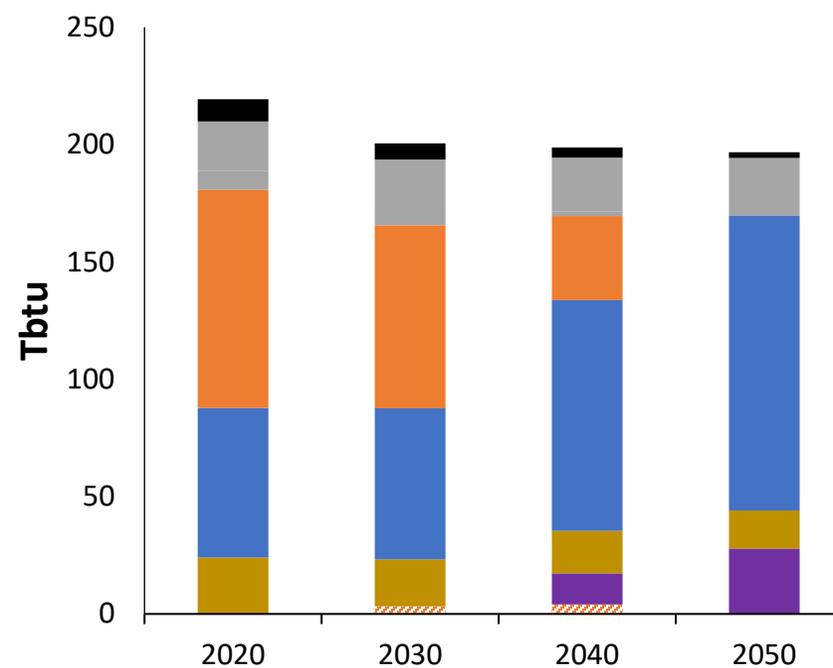
Alternative Fuels in S3

Accelerated Transition Away from Combustion

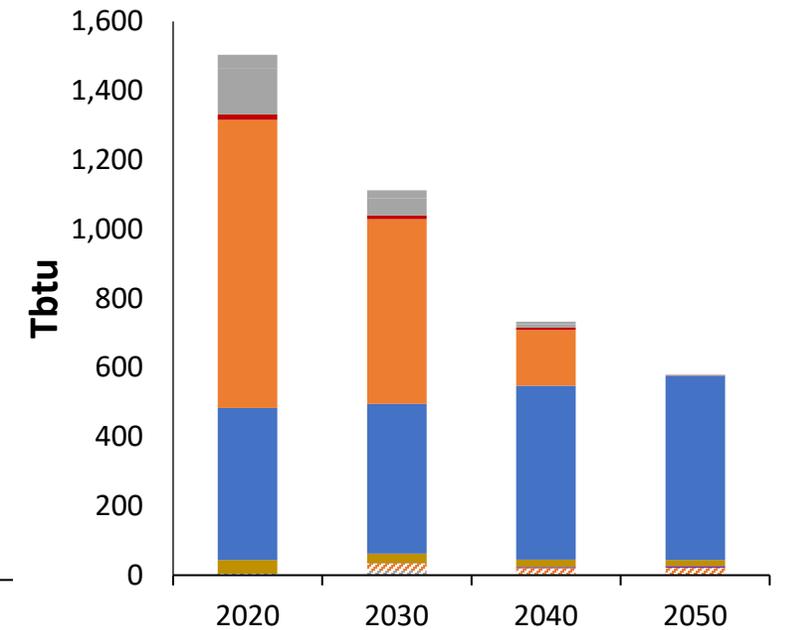
Transportation Final Energy Demand



Industry Final Energy Demand



Buildings Final Energy Demand



Key Principles - Alternative Fuels in draft Scoping Plan

- > Limited and strategic use
- > Hard to decarbonize fuels needs (e.g. jet fuel)
- > Hard to electrify end-uses
 - Industrial high heat applications
 - Certain buildings or district heating applications
 - Heavy-duty/Long-haul transportation
 - Other limited applications (Cogen applications that have reliability benefits – eg, hospitals)
- > Sustainable feedstock production, waste-based in-state feedstocks
- > Methane leakage is minimized (e.g. maximize on-site use of biogas at WRRFs)
- > Co-pollutant emissions must be minimized
- > Track technology advancement/innovation alongside concerns around scalability, feasibility, environmental impact, and air quality issues
- > Address research needs (feasibility, climate impact, and health impacts) prior to investment

CJWG Feedback - Alternative Fuels in draft Scoping Plan

- > Opposed to policies supporting renewable fuels on the grounds that they still release harmful air pollutants, particularly in areas overburdened with diesel emissions, and that the State should focus instead on expeditiously electrifying vehicles and the use of hydrogen fuel cells.
- > Avoid policies that extend reliance on fossil fuels, that require new fossil fuel infrastructure, or allow emissions from fuel combustion to continue to disproportionately impact Disadvantaged Communities
- > Strong concern about the promotion of some emerging technologies, including green hydrogen, RNG, biofuels, biomass, and waste-to-energy, which it claims can add more GHGs to the environment rather than less, and also leads to more localized pollution which is concentrated in environmental justice communities.
- > Need for further research and consideration of lifecycle GHG accounting and potential air quality and health impacts of these technologies prior to supporting demonstration projects

Next Steps