Carbon Neutrality: The Role of Carbon Capture, Sequestration, and Options for Utilization

DECEMBER 11, 2019
Webinar Logistics

- **Presentation and link to submit and view informal comments:** [https://ww3.arb.ca.gov/cc/scopingplan/meetings/meetings.htm](https://ww3.arb.ca.gov/cc/scopingplan/meetings/meetings.htm)

- **Webcast** available: [https://video.calepa.ca.gov/](https://video.calepa.ca.gov/)
California’s GHG Emissions Reduction Targets

Emissions to be reduced by 2020:
- 2020 Target: 431 MMTCO₂e

Additional reductions by 2030:
- 2030 Target: 260 MMTCO₂e

Additional reductions by 2050:
- 2050 Goal: 86 MMTCO₂e

Source: CARB, 2018
Framing the Path Forward

IPCC Report – Carbon neutrality by 2045 may hold global warming to 1.5°C

Sources = Sinks

Some regions are net emitters; others are sinks

Carbon Neutrality by 2045

Reduce fossil energy and NWL emissions; evaluate potential sinks
California Carbon Neutrality (CO$_2$e)

Today

- AB 32 GHG Inventory
- Conversion
  - Natural & Working Lands Inventory

Both categories emit GHGs

Mid-century

- Minimize emissions
- Increase sequestration

No net GHG emissions
Carbon Capture and Sequestration Protocol: Low Carbon Fuel Standard

- Protocol allows CCS credit generation for:
  - Low carbon fuel pathways (e.g. ethanol)
  - Direct air capture projects
  - Projects at crude oil extraction operations and refineries
- Rigorous accounting & permanence requirements
  - Includes 100-year post-injection monitoring
Today’s Workshop

- What are the biggest barriers to near-term deployment of capture technology, and what actions can industry and policy-makers undertake to overcome these barriers?
- How can existing infrastructure be transitioned to process, transport, store and monitor CO₂?
- What are the tradeoffs between reducing fossil fuel combustion versus relying on carbon capture and sequestration for achieving our deep decarbonization goals?
Panelists:

- Ben Haley, Co-Founder, Evolved Energy Research
- Lee Beck, Senior Advisor, Global CCS Institute
- Jeffrey Brown, Principal, Brown Brothers Energy and Environment, LLC
- Jennifer Wilcox, Professor, Worcester Polytechnic Institute
- Geoff Holmes, Business Development, Carbon Engineering
- Keith Pronske, President and CEO, Clean Energy Systems
Resources

- CARB, 2017: [California’s 2017 Climate Change Scoping Plan](#)
- IPCC, 2018: [Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty](#)
- USGCRP, 2018: [Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II](#)
Thank You

- Climate Change Scoping Plan
  - [https://ww3.arb.ca.gov/cc/scopingplan/scopingplan.htm](https://ww3.arb.ca.gov/cc/scopingplan/scopingplan.htm)

- Carbon Neutrality Workshops
  - [https://ww3.arb.ca.gov/cc/scopingplan/meetings/meetings.htm](https://ww3.arb.ca.gov/cc/scopingplan/meetings/meetings.htm)