



CSLF Task Force on Non-Enhanced Hydrocarbon (EHR) Utilization Options

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Background



CSLF Conference of Ministers Key actions, “Exploring new utilization concepts beyond CO₂ enhanced oil recovery (CO₂-EOR) that have the potential to add commercial value”

CSLF TG Meeting in April 2018 – Discussion on CO₂ mineralization and utilization and revisit non-EOR options; re-constitute the task force.

CSLF TG Meeting in October 2018 – Formalized membership: US (Chair), Australia, Brazil, China, Canada, France, the Netherlands, Saudi Arabia, and the IEAGHG.

Previous CSLF Task Force



Timeline

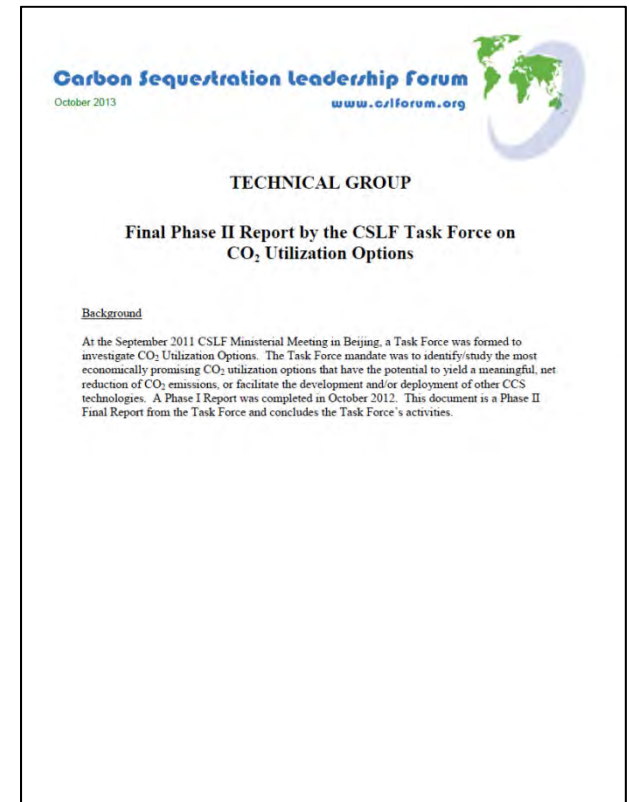
- Beijing, P.R. China, September 2011: Utilization Options for CO₂ Task Force was created.
- Perth, Australia, October 2012: Phase 1 Report completed. Options for further evaluation in Phase 2 discussed and selected.
- Washington, DC, October/November 2013, Phase 2 report completed.

Scope

- EHR, fuels and chemicals, building materials/aggregate, working fluid

Key Messages

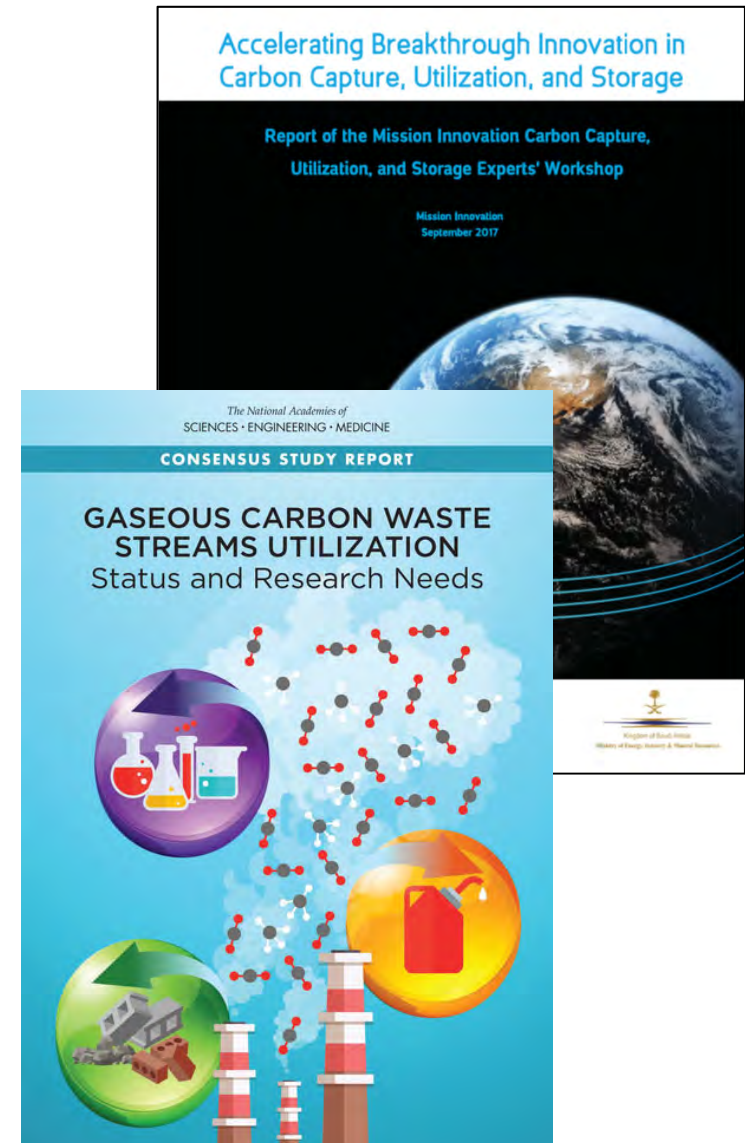
- Number of CO₂ utilization options available - mechanism for deployment and commercialization.
- EOR is the most near-term utilization option.
- Non-EOR CO₂ utilization options are at varying degrees of commercial readiness and technical maturity.
- Early R&D or pilot-scale activities should focus on: addressing key techno-economic challenges; independent tests to verify the performance; and support of small, pilot-scale tests of first generation technologies and designs.
- More detailed technical, economic, and environmental analyses should be conducted.



Some efforts since then (not all-inclusive)...



- Carbon X-Prize – launched in September 2015, 10 finalists
- Oil and Gas Climate Initiative (OGCI) investments:
 - Solidia Technologies – CO₂ utilization in concrete (October 2017)
 - Econic – CO₂ into polyols (September 2018)
- Reports:
 - UK report (May 2017) by Imperial College and ECOFYS: *Assessing the Potential of CO₂ Utilisation in the UK*
 - Mission Innovation report (September 2017) on CCUS: *Accelerating Breakthrough Innovation in Carbon Capture, Utilization, and Storage*
 - US National Academy of Sciences – October 2018 – *Developing a Research Agenda for Utilization of Gaseous Carbon Waste Streams*
 - US National Petroleum Council report on CCUS – due 2019
- Policies:
 - US: 45Q tax credit revision (2018). \$35/ton for converting into fuels, chemicals, or other useful products (e.g., cement).



Proposed Action Plan for the Task Force



- Main Goal: Add value and not re-invent
- Status check on where we are today
 - Reports, projects, conferences, activities, projects and major players
 - Government initiatives
- Summarize and develop recommendations

Proposed Task Force Activities



Activity	Date
Task 1. Reports	
1a. Develop a catalog/library of reports over the past five years on CO2 Utilization	TBD
1b. Identify and summarize technical and policy barriers; potential market sizes/volumes; findings; and recommendations.	IEAGHG Studies???
Task 2. Government Activities	
2a. Prepare and release template to CSLF delegates	Prior to next CSLF Meeting
2b. CSLF delegate responses returned	Prior to next CSLF Meeting
2c. Responses consolidated and summarized	Spring 2020 CSLF Meeting
Task 3. Identify major conferences and activities	Complete
Task 4. Identify major CO₂ utilization demonstration or commercialization projects and key players	Complete
Task 5. Prepare summary report and recommended next steps of task force or CSLF TG action	Autumn 2020 CSLF Meeting

Utilization Project Summary (not all inclusive)



- Pilot: 40
- Construction: 3
- Commercial/Operational Pilots: 18
- Completed (Pilots/Demos/Commercial): 5
- Technology Areas:
 - Majority are in algae/biological, mineralization/building materials
 - Several chemicals and fuels
 - Test centers



Other Opportunities??

- Reviewers for IEAGHG Studies?
 - CO₂ Conversion Routes Reality Check
 - CO₂ as Alternative Feedstock – promising pathways and benefits

- Future workshop?