Market Reports Library

Summary
The **Circular Carbon Network (CCN)** maintains this bibliography as a shared resource and living library for members of our Network to access the latest third party reports about the investment, economic, and impact opportunities in the carbon utilization space. This document links to reports that contain an overview of markets for products that use carbon, key policies that may accelerate or slow growth in the carbon utilization space, technical challenges and opportunities, and perspectives from key stakeholders.

Some Key takeaways:

- **Large Impact Opportunity** 15-20% of the CO2 emissions gap to achieve the IPCC's 2 degree warming scenario can be addressed by CCU by 2030 ("A Roadmap for the Global Implementation of Carbon Utilization Technologies")

- **Large Economic Opportunity:** Potential revenue from CCU by 2030: $1 Trillion-plus ("A Roadmap for the Global Implementation of Carbon Utilization Technologies")

- **Multiple Scalable Pathways:**
    - Chemicals
    - Fuels
    - Building Materials
    - Polymers
    - Industrial Gases
    - Food & Agriculture
    - New Materials

Nominate a Report:
If you don't see a report listed below that you think would be relevant to capital providers, entrepreneurs, corporates, and other stakeholders in the Circular Carbon Economy, please let us know. We are primarily focused on providing educational resources to our Network that can accelerate investment and commercial activity in the sector (thus not, per se, on technology-focused documents more useful to a highly technical audience). Please email us at info@circularcarbon.org with you suggestions. Thank you!

RECENT REPORTS
(Most recent reports listed first)

Gaseous Carbon Waste Streams Utilization: Status and Research Needs
Category: Capital, R&D, commercial deployments, market data, policy,
Date: Early 2019
Issued by: The National Academies of Sciences, Engineering, and Medicine
Summary: 256 page study of the global status and progress of CCU technologies. Analyzes the current challenges faced by the industry to achieve viability and commercialization. Lays out ways for researchers to overcome these barriers, including implementing pilot plant facilities, optimizing bioreactors and cultivation, and avoiding stoichiometric additives.
PDF link

New Business Opportunities Based on Biogenic Carbon Dioxide Utilization
Category: R&D, commercial deployments, market data
Date: October 25, 2018
Issued by: VTT Technical Research Centre of Finland
Summary: 21 slide PowerPoint exploring new biogenic CCU technology opportunities in 4 key areas: chemical-looping combustion, polyols, paraffinic wax production, and P2X technically feasible processes.
PDF link

Novel Carbon Capture and Utilisation Technologies
Category: Policy
Date: April 2018
Issued by: High Level Group of Scientific Advisors, European Commission
Summary: 76 page exploration into the circumstances under which CCU can deliver climate benefits in the mid- and long-run. Recommends implementing an institutional framework to promoting CCU technologies, whether that be through grant qualifications requiring quantitative data about the amount of carbon utilized, a stable regulatory environment, or R&D initiatives.
PDF link

Why Commercial Use Could Be the Future of Carbon Capture
Category: Commercial deployments
Date: January 2018
Issued by: McKinsey and Company
Summary: 6 page summary document providing an overview of CCU technologies and applications. Outlines 3 main uses for CCU: captured carbon created fuels, carbon-cured concrete, and carbon dioxide turbines.
PDF link

Carbon Dioxide Utilization (CO2U) ICEF Roadmap 2017
Category: Policy

Date: November 2017
Issued by: ICEF
Summary: 60 page report introducing policy proposals to expand CO2U through tax credits, investment in R&D, adoption of life-cycle analysis standards, product standards, and national policy recognition.
PDF link

Circular Carbon Innovation: An Unrealized Investment Opportunity
Category: Commercial deployments, market data
Date: September 2017
Issued by: The Circular Carbon Network
Summary: 22 page overview of the circular carbon economy and its potential. Sets up a compelling case for the rapidly expanding sector of circular carbon, laying out the myriad uses of carbon from chemicals, fuels, and building materials, to polymers, agriculture, and industrial gases. Explains some of the institutional challenges to growth for the sector, while providing smart, efficient solutions to those challenges.
PDF link

The Potential and Limitations of Using Carbon Dioxide
Category: Commercial deployments, policy
Date: May 2017
Issued by: The Royal Society
Summary: 11 page policy brief explaining the myriad uses and applications of carbon for use as a feedstock. Outlines the potential for commercial use of carbon dioxide in polymers, mineralization, and syngas. Addresses challenges to carbon dioxide commercial viability in the areas of research partnerships, life-cycle analysis, catalysis, and demonstration facilities.
PDF link

CO2 Utilisation Today
Category: Commercial deployments, policy
Date: April 2017
Issued by: EIT Climate-KIC EnCO2re
Summary: 48 page report presenting various perspectives on CO_2 utilization from chemists, social scientists, start-up founders, and policy makers. Discusses the technical, economic, and social viability of CCU technologies. Recognizes that regardless the opinions about viability, if the right technical, political, economic and societal conditions present themselves, CCU technology could be transformational.
PDF link

A Roadmap for the Global Implementation of Carbon Utilization Technologies
Category: Commercial deployments, market data
Date: November, 2016
Issued by: CO2 Sciences | The Global CO2 Initiative

Summary: This 12 page summary briefing provides a market assessment on the environmental and economic impact of 25 products over 6 markets for carbon recycling.
PDF link

Carbon Capture Utilization and Storage: Climate Change Economic Competitiveness and Energy Security
Category: Commercial deployments, policy
Date: August 2016
Issued by: Department of Energy
Summary: 12 page document by the department of energy that outlines the advantages of CCUS for energy security, economic development, industry sector opportunities, differences and overlaps between natural gas and coal CCUS, and proposed policy incentives for CCUS.
PDF link

CO2 Building Blocks: Assessing CO2 Utilization Options
Category: Commercial deployments, market data, policy
Date: August 2016
Issued by: National Coal Council
Summary: 112 page US focused document that provides rationale for CCU, criteria for assessment, overview of CCU market, assessment of CCU as a pathway to CCS and the economic opportunity.
PDF link

Carbon Capture Utilization and Storage
Category: Commercial deployments, market data, policy
Date: January 2016
Issued by: SETIS Magazine - CCUS (European Strategic Energy Technology Plan)
Summary: 52 page summary with an update and overview of activities in Europe that advance carbon capture and utilization along with key technological breakthroughs for CO2 as a feedstock for chemicals, waxes, fuels, polymers, storage, cement, urea.
PDF link

A Strategic European Research and Innovation Agenda (SERIA) for Smart CO2 Transformation in Europe
Category: Commercial deployments, market data
Date: July 2015
Issued by: Smart CO2 Transformation (SCOT) project
Summary: 45 page summary document that sets out a SERIA for CO2 utilization. Results of over 300 interviews, 10 workshops, a detailed regional assessment to map CO2 utilization actors, a comprehensive socio-economic analysis to map emitters, elaborate desk research on three CO2 transformation routes: mineralization, power to fuels, and chemical building blocks.
PDF link