



## **BKV dCarbon High West, LLC (DE-FE0032499)**

CO<sub>2</sub> Barge Transportation FEED Study for Gulf Coast of Louisiana, Mississippi, and Alabama

August 7, 2024





## Table of Contents

1. Executive Summary
2. BKV Overview
3. Grant Study Proposal
  - A. Project Goals & Key Deliverables
  - B. Technical Assessment & Impacts
  - C. Community Benefits Plan

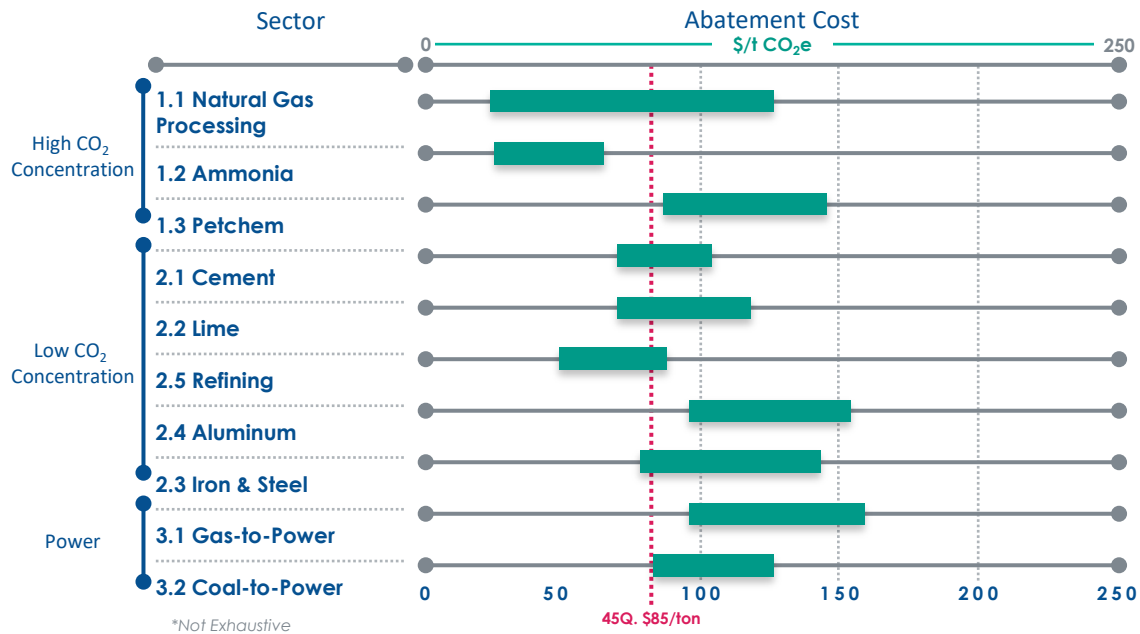
# Executive Summary

BKV dCarbon Ventures proposes to study barge transportation of CO<sub>2</sub> in the Gulf Coast region to a regional geologic sequestration hub

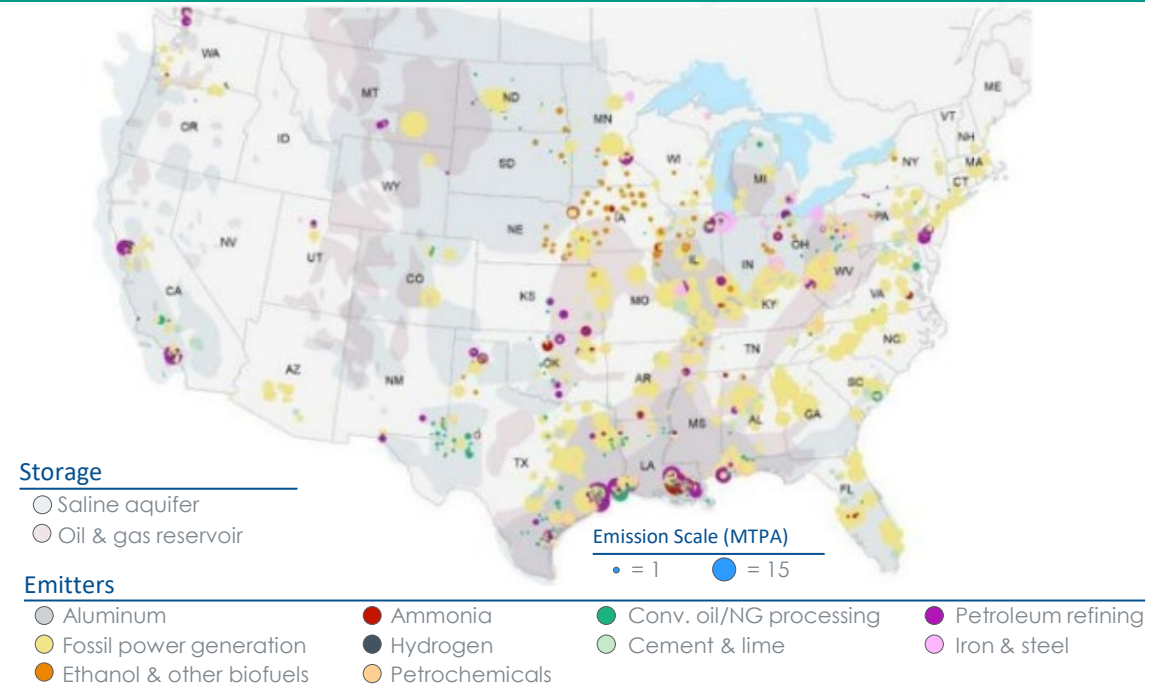
- Many emission sources lack suitable subsurface attributes for geologic sequestration.
- The distance between source and sequestration sites often makes CCS projects uneconomic
- BKV proposes regional sequestration centers with greater reach than the source-to-sequestration model relying on pipelines.

Large volume of addressable emissions, but opportunities aren't created equal

US Annual CO<sub>2</sub> Emissions 2,400 Million Metric Tons (MMT/yr.)



The lowest-cost opportunities exists where large emitters and good CO<sub>2</sub> sinks overlap



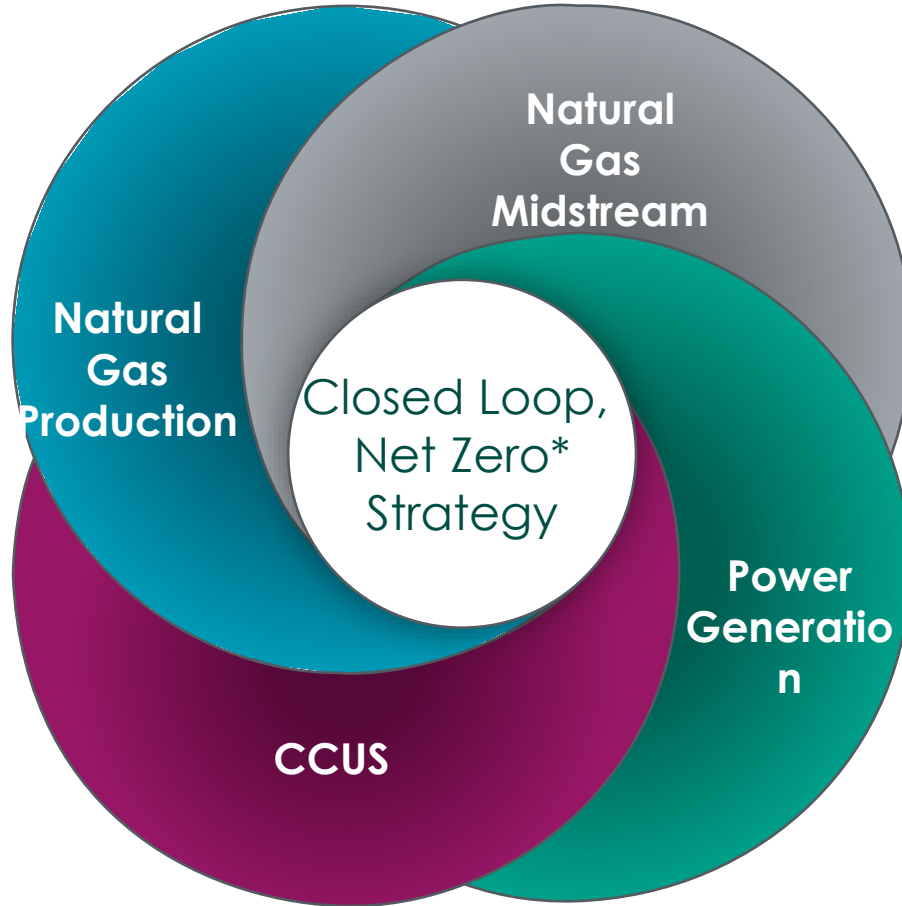
# BKV Overview

CCS is a Critical Component of BKV's Strategy

## 1. Natural Gas Production

## 4. CCUS

CO<sub>2</sub> Capture, Utilization, and Sequestration



## 2. Natural Gas Midstream

Gathering, Processing, and Transportation

## 3. Power Generation

Combined Cycle Gas Turbines, Retail power

\*Net Zero refers to the full elimination and/or offset of Scope 1 and Scope 2 emissions from BKV's owned and operated upstream and midstream businesses.

# BKV Asset Overview

Natural Gas Upstream			
	Avg Net Production (MMcfe/d) Mar '24	Dec '23 SEC 1P Reserves (Tcfe)	Net Acres As of Mar '24
Barnett	688	3.67	460,000
NEPA	133	0.42	37,000
<b>Total</b>	<b>821</b>	<b>4.09</b>	<b>496,000</b>

CCUS			
	Maximum Forecasted Annual Injection Rate MTCO <sub>2</sub> e	% of Forecasted Annual Upstream Emission Reductions <sup>(1)</sup>	Initial Injection
Barnett Zero <sup>(2)</sup>	210K	12%	Q4 2023
Cotton Cove <sup>(2)</sup>	40K	3%	1H 2026

Operated Midstream			
	As of Mar '24 Throughput (MMcf/d)	Pipeline Miles	Midstream Compressors
Barnett	199	778	65

Power			
	Location	Heat Rate Btu/kWh	Capacity in MW+
Temple I	Bell County, TX	6,904	752
Temple II	Bell County, TX	6,950	751

## BKV Assets



Note: Reserves and associated PV-10 calculated based on 12/31/2023 SEC Pricing (HH: \$2.64/MMBtu, WTI: \$78.22/Bbl, and NGLs: 29.5% of WTI). Based on reserve reports prepared by Ryder Scott Company

<sup>1</sup>Relates to estimated Scope 1 and Scope 2 emissions from BKV's owned and operated upstream and midstream businesses as of 12/31/2023

<sup>2</sup>Estimates based on FID reached in June and October 2022 for Barnett Zero and Cotton Cove, respectively

<sup>3</sup>Project timelines are forecasted / goals



# Grant Study Proposal



# Mississippi Valley Climate Solutions

## Project Goals and Key Deliverables:

BKV proposes to perform a Front-End Engineering Design (FEED) and ES&H studies to assess barge transportation of CO<sub>2</sub> in the Gulf Coast region.

### • Areas of Project Interest:

- Baton Rouge, LA – CO<sub>2</sub> source and liquefaction site
- Pascagoula, MS - CO<sub>2</sub> source and liquefaction site
- Mobile, AL- CO<sub>2</sub> source and liquefaction site
- Luling, LA - CO<sub>2</sub> regasification and sequestration site

### • Key Grant Deliverables:

- Technical challenges
  - Identifying and addressing operating parameters and limitations of CO<sub>2</sub> transportation by barge
- Economic feasibility
  - Evaluating economic feasibility through technical optimization
- Environmental and safety assessment
  - Conducting environmental site assessments and health & safety impact studies
- Community impacts
  - Assessing the feasibility and community-level impacts of utilizing barges to transport CO<sub>2</sub> on community



\*Proposed Route: Baton Rouge, LA to Luling, LA



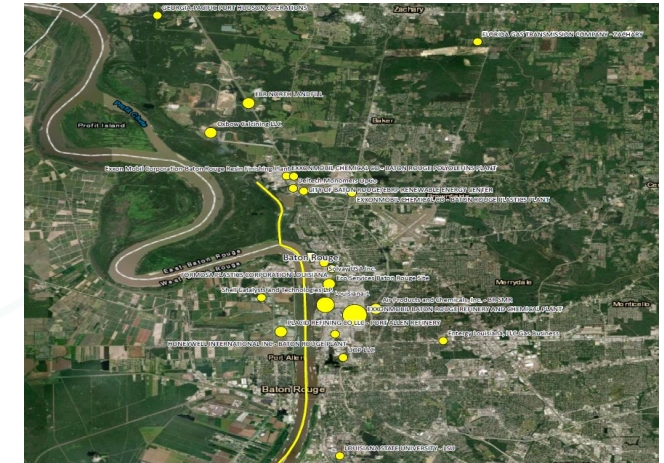
\*Proposed Route: Pascagoula, MS to Luling, LA

# Mississippi Valley Climate Solutions

## Technical Assessment and Impacts:

- Estimated to be 24 million+ metric tons of CO<sub>2</sub>
  - 20+ viable emission sources in Baton Rouge, LA
  - 13+ viable emission sources in the Pascagoula, MS & Mobile, AL
- **Barge Concept Design Study**
  - Barge transport may be an efficient mode of CO<sub>2</sub> transport in the Gulf Coast
  - Optimization of barge design for transportation dwell time relative to tonnage transported
- **Liquefaction Concept Study**
  - CO<sub>2</sub> sourced from existing amine capture facilities
  - CO<sub>2</sub> condensed into liquid, refrigerated, and stored for loading into a barge
- **Regasification Concept Study**
  - CO<sub>2</sub> unloaded from barge transport into regasification trains for delivery into sequestration pipeline
  - Key considerations include material balance and heat conservation to optimize CO<sub>2</sub> offloading

Concept expands the hub and spoke sequestration model to a true regional CO<sub>2</sub> sequestration solution



\*Baton Rouge, LA Sources



\*Pascagoula, MS and Mobile, AL sources



# Mississippi Valley Climate Solutions

## Community Benefit Plan:

The Community Benefits Plan for this grant will adopt a comprehensive, multi-faceted approach, comprising two main components:

1. Community Outreach Plan for Stakeholder Engagement
2. Creation of a Workforce Development Pipeline

### 1. Community Outreach Plan

- Phase 1: Introduction of BKV to the communities where the project will take place
- Phase 2: Development of a Community Benefits Agreement with stakeholders in the communities.

### 2. Workforce Development Pipeline

- Phase 1: Initial collaborative planning phase
- Phase 2: Implementation phase.

The proposed grant study project has garnered initial support and buy-in from United Way chapters in each location of study.

Aspects of DEIA and Justice 40 initiative will be incorporated into these efforts to maximize positive impacts on the communities engaged in this project.



Thank You

