



# BUSINESS CASE ANALYSIS: PHASED BUILDOUT

## OVERVIEW

SimCCS<sup>PRO</sup>, an optimization tool that creates regional network topology and corridors under multi-objective criteria, producing point-to-point pipeline financials (CAPEX/OPEX, pipeline diameters, and lengths of required pipeline, road, and railroad) for each source-to-sink configuration, was used to determine how pipelines could be employed to store CO<sub>2</sub> in two stages:

- Phase I: Store 15 MtCO<sub>2</sub> in years 1-5, and
- Phase II: Store an additional 15 MtCO<sub>2</sub> in years 6-30.
- Injection period is 30 years for Phase I, and 25 years for Phase II.
- Interest rate is 10%, project dollar is 2024, and years for capital recovery is 10 years after the project begins.

## MODELING INPUTS

### Capture costs and volumes

- Any CO<sub>2</sub>-emitting facility in Wyoming.
- Capturable volume and costs derived from NETL models.

### Storage costs and potential

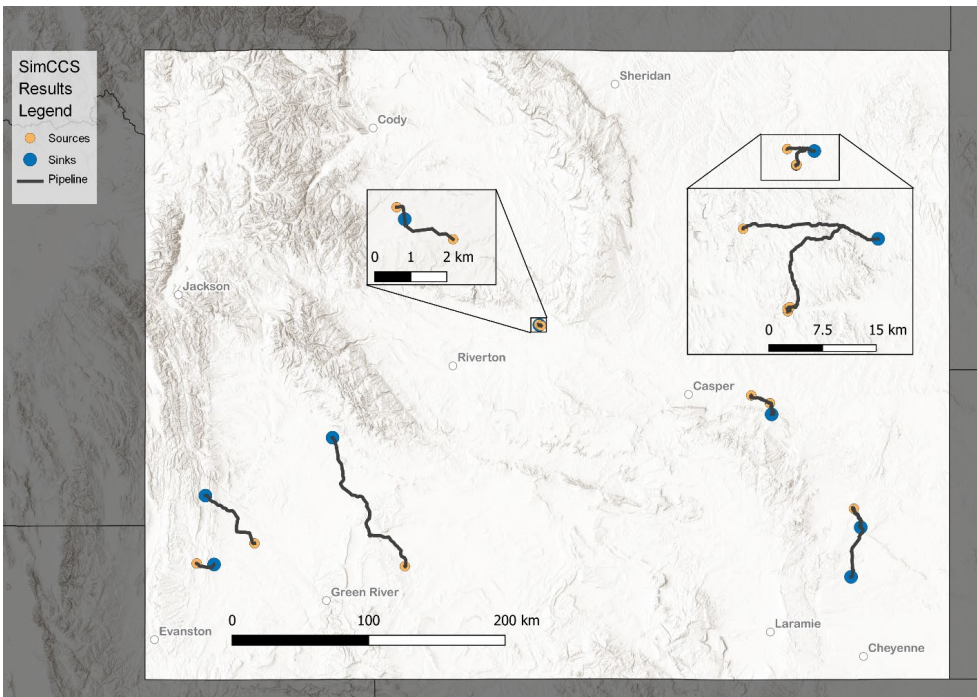
- Storage potential was aggregated to 50km x 50km grid cell.
- Storage costs and potential derived from the SCO<sub>2</sub>T<sup>PRO</sup> tool.

### Transportation Network

- Only pipelines were used to connect sources to storage locations.

## RESULTS

Variables	Yrs 1-5	Yrs 6-10	Yrs 11-15	Yrs 16-30
Number of Captured Sources	7	13	13	13
Number of Utilized Sinks	6	10	10	10
Length of Pipeline (km)	195	247	247	247
Annual CO <sub>2</sub> Stored (MtCO <sub>2</sub> /yr)	15.0009	30.0019	30.0019	30.0019
Capture Annual Cost (\$M/yr)	1462.07	3005.02	1849.70	635.01
Total Transport Annual Cost (\$M/yr)	46.13	106.63	67.26	15.71
Storage Annual Cost (\$M/yr)	125.61	252.90	174.56	94.81
Total Annual Cost (\$M/yr)	1633.81	3364.55	2091.51	745.54
Capture Unit Cost (\$/tCO <sub>2</sub> )	97.47	100.16	61.65	21.17
Transport Unit Cost (\$/tCO <sub>2</sub> )	3.08	3.55	2.24	0.52
Storage Unit Cost (\$/tCO <sub>2</sub> )	8.37	8.43	5.82	3.16
Unit Cost (\$/tCO <sub>2</sub> )	108.91	112.14	69.71	24.85



Map of Phase I and Phase II SimCCS<sup>PRO</sup> results.

## KEY TAKEAWAYS

- ✓ Wyoming has sufficient storage to permanently store 30 MtCO<sub>2</sub>/yr.
- ✓ Using an optimization model that does not require storage hubs, almost every facility has a unique storage sink.
- ✓ There is adequate storage throughout the state of Wyoming without cross-state pipelines.