



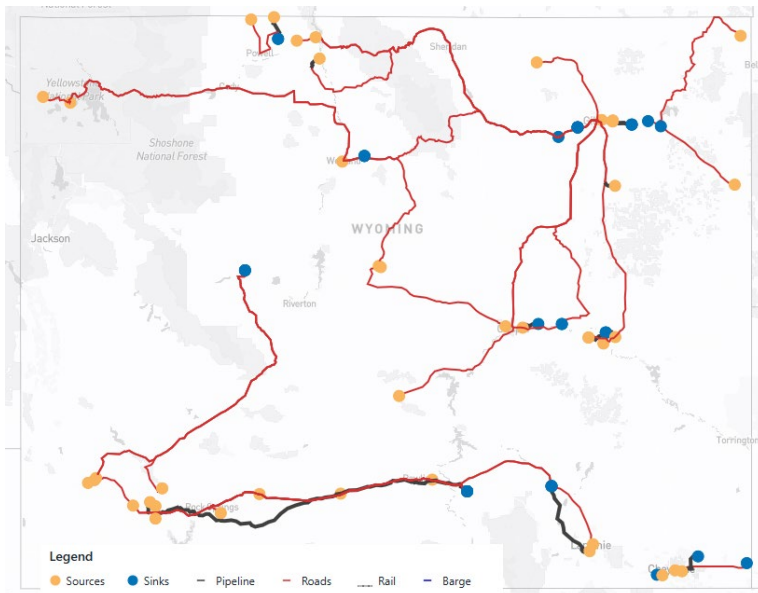
BUSINESS CASE ANALYSIS: INTERMODAL EOR BUILDOUT

OVERVIEW

SimCCS^{PRO}, 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 model how existing railways and roads can be used to transport CO₂ from emissions sources to EOR storage locations. This mode of transport may be required to initially transport CO₂ until pipelines are constructed. Each model assumes 2024 dollar year, 10 year financing period with 10% interest rate and 30 years of injection.

RESULTS

	Scenario	Min. Unit Cost: Thunder Creek Buckshot	Median Unit Cost: Sisecam Wyoming	Max Unit Cost: Old Faithful	Avg across all scenarios
Add'l Information	# of Captured Sources	1	1	1	1
	# of Utilized Sinks	1	1	1	1
	Pipeline Length (km)	17	10	2	8
	Road Length (km)	0	247	346	156
Annual Costs	Annual CO ₂ Stored (MtCO ₂ /yr)	0.1181	0.7738	0.0056	0.2124
	Capture (\$M/yr)	6.51	112.23	0.56	26.56
	Total Transport (\$M/yr)	2.32	33.30	1.20	6.26
	* Pipeline (\$M/yr)	2.32	2.07	0.68	1.40
	* Road (\$M/yr)	0.00	31.23	0.52	4.87
	Storage (\$M/yr)	0.00	0.00	0.00	0.00
	Total (\$M/yr)	8.83	145.53	1.76	32.82
Unit Costs	Capture (\$/tCO ₂)	55.18	145.04	99.55	133.37
	Transport (\$/tCO ₂)	19.64	43.03	212.59	50.44
	* Pipeline (\$/tCO ₂)	19.64	2.68	120.23	15.57
	* Road (\$/tCO ₂)	0.00	40.36	92.37	34.86
	Storage (\$/tCO ₂)	0.00	0.00	0.00	0.00
Total (\$/tCO ₂)	74.82	188.07	312.14	183.81	



Map combining all individual source-to-sink intermodal SimCCS^{PRO} results.

MODELING INPUTS

Capture costs and volumes

- Any facility within 1 km of existing highways & <1 MtCO₂/yr of emissions.
- Capturable volume & costs derived from NETL models.

Storage costs and potential

- Aggregated to a 50km x 50km grid cell, limited to sites near rail or road AND EOR locations.
- Storage costs and potential derived from the SCO₂T^{PRO} tool.

Transportation Network

- Existing roads and railroads for non-pipeline routing.
- Pipelines preferentially followed WPCI.

KEY TAKEAWAYS

- ✓ Road and rail are able to route CO₂ from distant facilities with small emissions to EOR locations.
- ✓ For many facilities, costs are expensive.