

“VCCS™ Cycle” vs. Competing Carbon Capture Technologies

	Amine-Based (Post-Combustion)	IGCC (Pre-Combustion)	Oxy Combustion	VCCS™ Cycle (Post-Combustion)
Can be retrofitted to existing CO ₂ -emitting plants	Yes	No	No	Yes
Stand-alone system; can be implemented incrementally	Yes	No	No	Yes
Applicable for CO ₂ -emitting plants other than power plants	Yes	No	No	Yes
Commercially viable at small scales (not just large scales)	No	No	No	Yes
Yields multiple marketable byproducts	No	No	No	Yes
Requires fixed pipelines to deliver marketable byproducts	Yes	Yes	Yes	No
Parasitic load (energy required from power plant or grid)	++++	+++	+++	+ or None
Delivers <i>permanent</i> CO ₂ sequestration	No	No	No	Yes
Requires CO ₂ to be stored underground	Yes	Yes	Yes	No
Requires compression/dehydration of CO ₂ before storage	Yes	Yes	Yes	No
Requires sorbents, catalysts or other expensive materials	Yes	Yes	No	No
Requires steam for sorbent regeneration, etc.	Yes	No	No	No
Requires separation of CO ₂ from O ₂ , N ₂ , SO ₂ , NO ₂ in flue gas	Yes	Yes	No	No
Requires purification of CO ₂ separated from flue gas	Yes	Yes	Yes	No
Requires production of syngas or air separation (ASU's)	No	Yes	Yes	No
Water consumption	+++	++	++	None
Water production	None	None	None	Yes
Size of “footprint”	+++	+++	+++	++
Specialized equipment required (few or single vendors)	Yes	Yes	Yes	No
Capital costs	\$\$\$	\$\$\$\$	\$\$\$\$	\$
Operating costs	\$\$\$	\$\$\$	\$\$	\$