Beneficial Reuses of CO_2

WESTCARB Meeting
October 19, 2010

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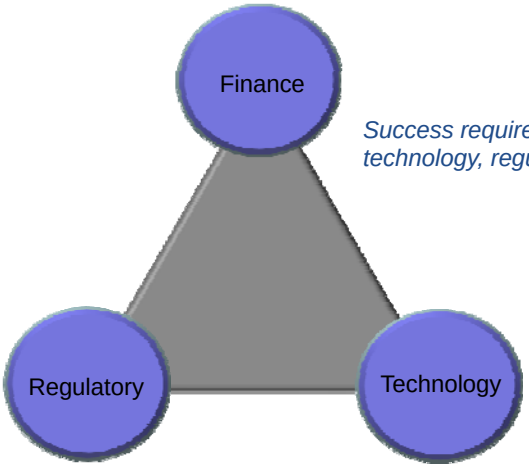
Beneficial Reuse Projects



Success requires connection of technology, regulatory, finance

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Definitions of Beneficial Reuses

- Permanent
  - Building Materials
  - EOR / EGR
  - Geothermal
  - Water Production
- Non-Permanent
  - Algae (fuels)
  - Chemical conversion (chemicals and fuels)
  - CFC replacement
  - Consumer uses (Dry cleaning, etc)
- Compared to “Conventional CCS”, i.e. CCS in aquifers

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Barriers to Beneficial Reuse

- Funding
  - need to be included in the calls and on equal footing with conventional CCS
- Permitting
  - pathway best outlined for EOR
- Lifecycle Analysis
  - Complicated for biofuels
  - Simpler for building materials and EOR / EGR
- Market issues for projects
  - Is market local vs. global?
  - Market size, will you drive down prices and over supply?

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Barriers to Beneficial Reuse

- Public Perception
  - Viewed as truly reducing CO2?
- Liability Issues
  - Long term risks
  - Unintended consequences (e.g. residual impurities with long term health impacts)

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Comparison of Attributes

	Building Materials	EOR	Algae & Bioconversion	Chemical Conversion	Geothermal	Water production	CFC Replacement	Consumer	Conventional CCS (aquifers)
Geographic Constraints	L	H	M	L	H	L	L	L	H
Backend Liability	L	M	L-M	?	M	M	L	L	H
Difficulty of Lifecycle Analysis	L	L-M	H	H	L	M	M	H	L-M
Sensitivity of Market Economics (Local: H; Regional: M; Global: L)	M	L	L	M	M	M	H	H	M

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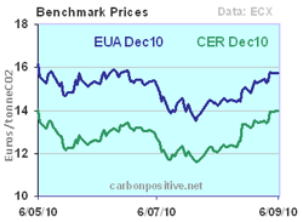
Key Needs

- Certainty of Credits / Carbon Pricing
  - Needed to make projects viable financially
- EOR / EGR Learn by Doing
  - Creates natural transition



- Combining resources to move forward
  - Jump starts market by creating funding opportunities

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