



CCS AND CCUS EFFORTS

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TOPICS

- About the Global CCS Institute.
- North American Knowledge Sharing Network.
- Summary of CO₂ Contracting Workshop.
- Global CCS Institute CCUS activities.

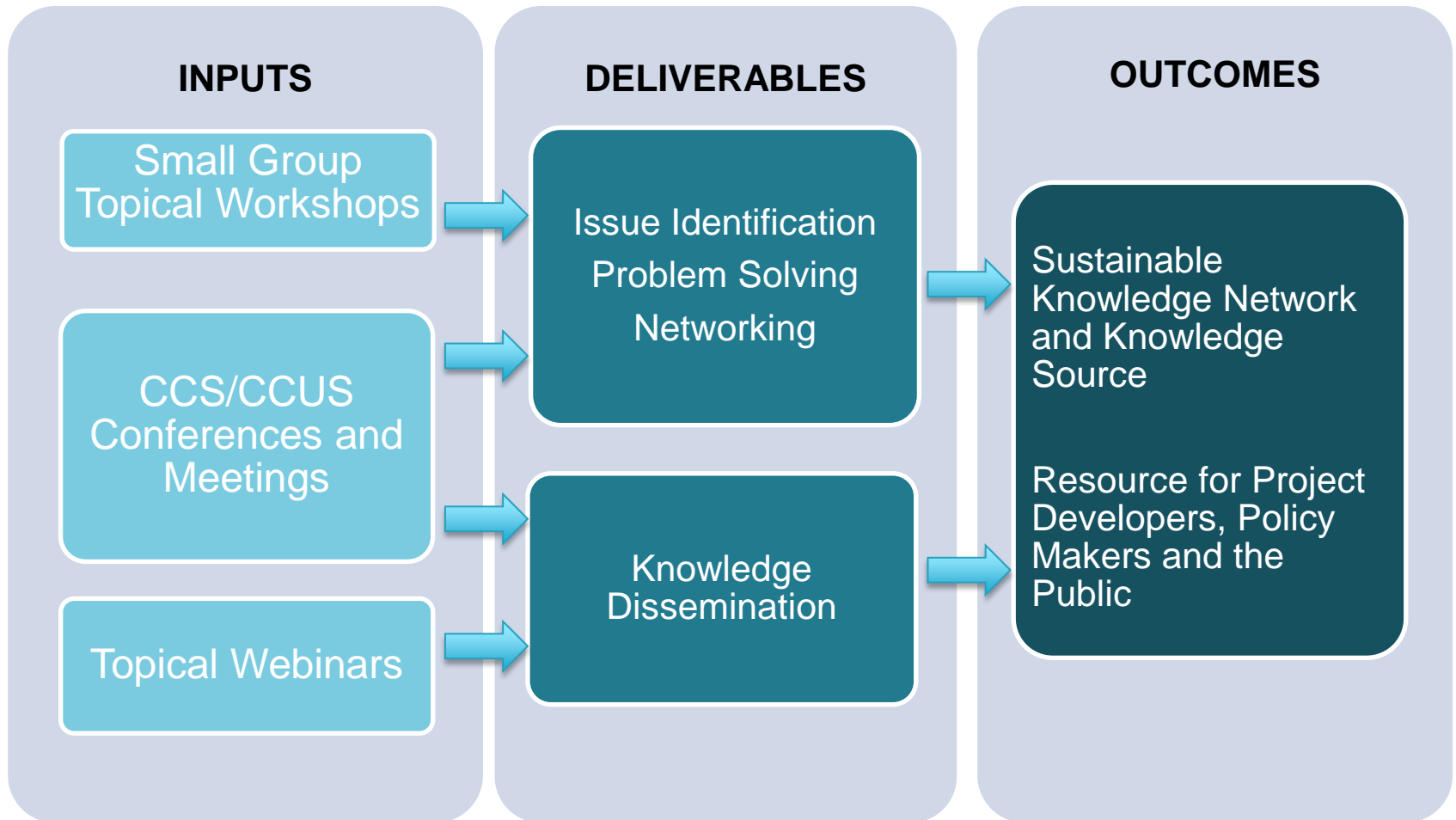


ABOUT THE GLOBAL INSTITUTE

- Mission to accelerate the development and deployment of CCS, globally.
- Member owned, not-for-profit company.
- 350+ Members, internationally.
- Seed funding from the Australian Government.
- Transitioning to a sustainable organization driven and funded by its Members that will build on its track record to act as the global champion for CCS.



NORTH AMERICAN KNOWLEDGE NETWORK





CCS VALUE CHAIN

POSSIBLE WORKSHOP TOPICS - ISSUES ORIENTED

GENERATION	CAPTURE	TRANSPORT	STORAGE	CCUS
Legal/Regulatory Framework	Legal/Regulatory Framework	Legal/Regulatory Framework	Legal/Regulatory Framework	Legal/Regulatory Framework
Incentives	Incentives	Incentives	Incentives	Incentives
Liability	Liability	Liability	Liability Stewardship	Liability
Permitting	Permitting	Permitting	Permitting	Permitting
Business Models	Business Models	Network Models	Business Models	Business Models
Technology Advancement	Technology Advancement			Technology Advancement
		MMV/MRV	MMV/MRV	MMV/MRV
Cost Reduction	Cost Reduction			



SUMMARY OF CO₂ CONTRACTING WORKSHOP

- Insufficient CO₂ is available to meet current demand
- A-CO₂ sources can satisfy current and future needs.
- CO₂ contracting practices allows considerable flexibility to meet buyer and seller interests.
- Prices can be fixed or variable.
- Long-term contracts are doable.
- Production failure is unlikely with proper front-work.



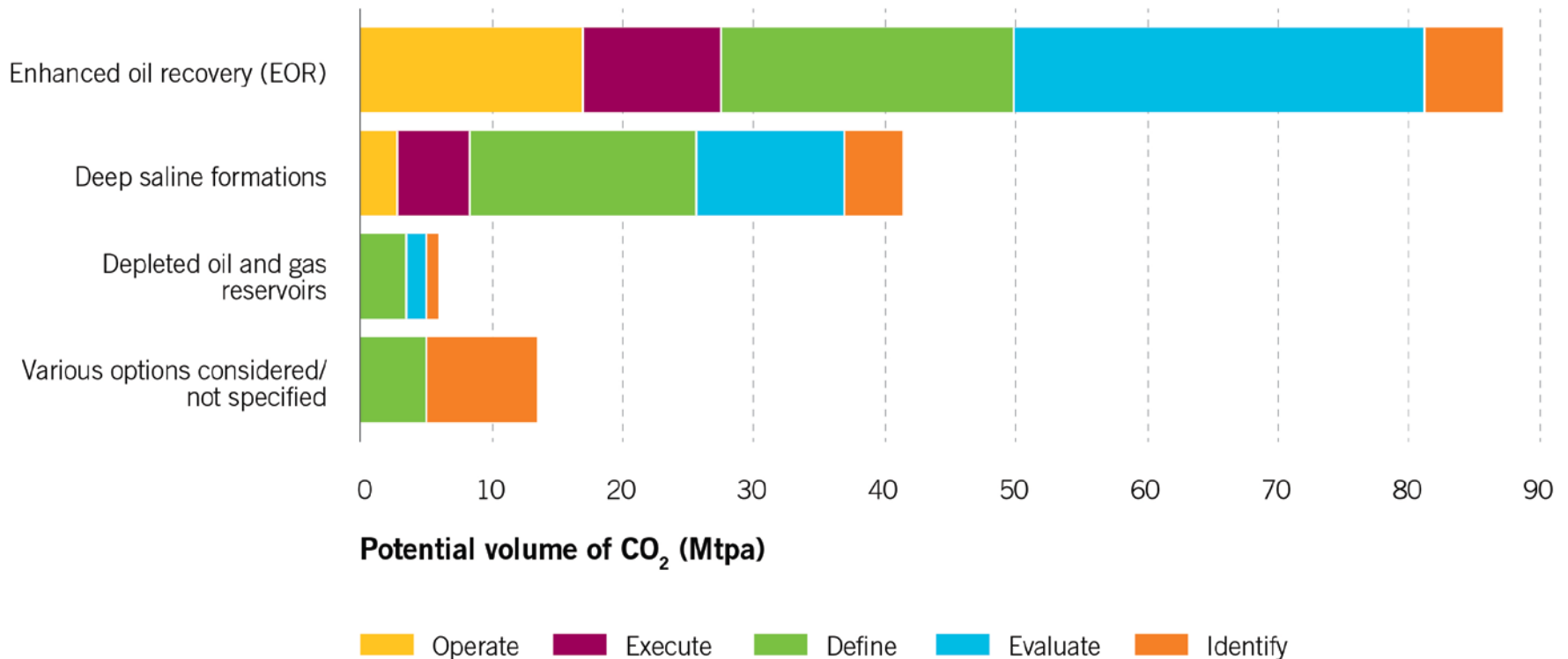
SUMMARY OF CO₂ CONTRACTING WORKSHOP

- A-CO₂ from sources subject to GHG permitting presents new contracting challenges.
- Longer term contracts may be necessary to match seller needs.
- Quantity reduction and termination provisions may impact seller's ability to operate within permit limits.
- Greater purchase price stability may be required to support seller project financing.
- Accountability requirements may impact buyer's ability to re-use or re-sell purchased CO₂.
- Regulatory burden/risk/uncertainty increases buyer cost and impacts CO₂-EOR financial model.



LARGE-SCALE INTEGRATED PROJECTS

Potential volume of CO₂ stored by storage type options and asset lifecycle





CCUS STUDIES UNDERWAY

- CO₂-EOR Project Study:
 - role of CO₂-EOR in CCS;
 - economics;
 - Legal and Regulatory Frameworks; and
 - benefits and challenges.
- Analysis of production tax credit proposals and offsetting revenue from increased oil production.
- New liability valuation case study for CO₂-EOR
 - building on the Institute's June 2012 Report:

<http://www.globalccsinstitute.com/publications/valuation-potential-risks-arising-model-commercial-scale-ccs-project-site>



OBSERVATIONS: CCUS

BENEFITS	CHALLENGES
Significant opportunity to enable CCS cost reduction and technology improvement in timeframes needed to support deployment.	CO ₂ -EOR is geographically and capacity limited. Saline and other storage options must simultaneously be developed
CO ₂ revenue improves business case for demonstration and early mover projects.	CO ₂ revenue is insufficient alone to bridge gap for high capture cost scenarios.
Mitigates: (1) integration risk between capture, transport, and storage elements: and, (2) cost/time risk when compared to development of deep saline storage.	Gaps exists between geologic storage permitting and CO ₂ -EOR regimes.
Potential to store large quantities of anthropogenic CO ₂ .	Life-cycle emission considerations.
Supports CO ₂ transportation network development where EOR is an option.	Impact of legal/regulatory requirements for A-CO ₂ on CO ₂ contracting models.



OBSERVATIONS: PRODUCTION TAX CREDIT

- Closes the cost gap for high capture cost scenarios.
- Enables more early mover projects which can accelerate CCS cost reduction and technology advancement.
- Favorable federal budget scoring implications due to tax revenue on increased oil production.
- For certain classes of projects the credit incentive may not be sufficiently bankable to support financing for early activities (e.g. FEED and permitting.)



OBSERVATIONS: LEGAL AND REGULATORY

- Existing CO₂-EOR permitting regimes are mature, well understood, and can be readily adapted to meet legal/regulatory requirements of A-CO₂ storage.
- Policymakers must determine what is needed to account for EOR as storage.
- Consideration should be given to the differences between:
 - incidental storage during BAU CO₂-EOR;
 - incremental storage during EOR operations; and
 - additional storage after EOR stops.
- Additional regulatory burden impacts CO₂-EOR financial and business models and may deter projects.
- Policymakers should weigh costs and benefits when crafting rules.

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