Creating a Commercial Path to CCS

HOT TOPIC HOUR
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Outline

- About the Clean Air Task Force
- Commercial carbon sequestration path
  - Goal
  - Illustrations
- Needed enabling policies

About CATF

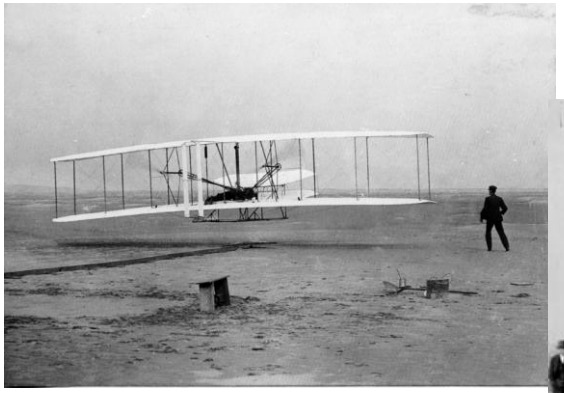
- Non-profit US corporation founded in 1996
- 15 senior professionals including scientists, engineers, MBAs, lawyers, and outreach professionals
- Governing board of senior energy industry executives and environmental advocates
- Advisory Board of leading US atmospheric scientists and energy experts
- Headquartered in Boston with offices in the Midwest and Washington DC, and collaborating partners in the EU, China, and India
- 2008 budget is approx $3.5 million, half of which flows to university and lab-based researchers and other private sector and non-profit collaborating organizations.
- Nearly all of our funding at present comes from foundations; we do not accept corporate or government money

Sequestration is Proven, Safe, Economic, with Enormous Potential – but its not off the shelf

- Since the 1970s CO2 has been injected to enhance oil recovery, incidentally sequestering CO2.
  - 30 million tons are injected each year.
- IPCC concluded properly injected CO2 is safe and will remain sequestered for thousands of years or longer
- IPCC estimated that CCS would reduce cost of climate stabilization by 30%
- Natural gas has been safely stored in geologic formations for nearly a century
- Geologic formations have been found to hold CO2 for up to 65 million years.
- The Department of Energy estimates that there is 3,800 billion tons of CO2 storage capacity in the US, primarily in saline formations.
- *The next challenge is to deploy sequestration at wide-scale – integrated with industrial carbon capture*

Commercialization

- ***Establish a viable CCS commercial industry over the next 2 decades***
- ***20 GW of coal with carbon capture and storage by 2020.***
- ***Not unlike the challenge facing aviation a century ago***



Kitty Hawk, 1905

Early Industry 1925

Fully Modern 1950's

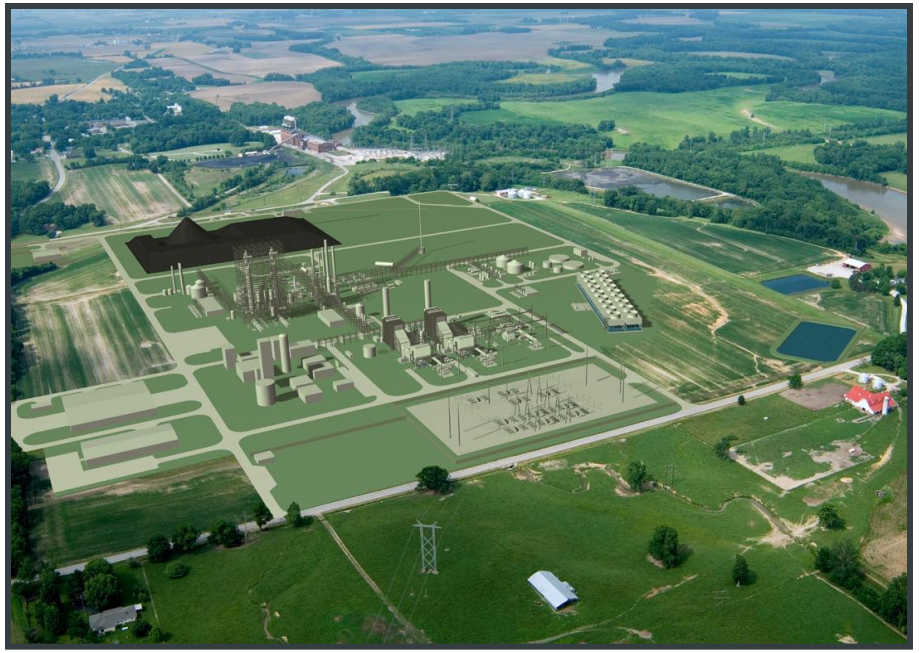
CLEAN AIR TASK FORCE

Path elements

- Deploy technology in parallel, not series
  - NowGens and FutureGens
  - EOR and geologic sequestration in saline aquifers
- Establish enabling institutions
  - Utilities whose mission is geologic sequestration
  - Government regulatory bodies that provide certainty
  - Private and government RD&D
- Infrastructure
  - Pipelines
  - Industry know-how

Illustration- Midwest

- NowGens
  - IGCC - 15%- 20% CCS
    - Edwardsport, IN
  - SNG with capture plus NGCC- 50% CCS
    - Taylorville, IL
    - Cash Creek, KY
- FutureGen
  - Mattoon, IL -90% CCS
- Midwest pipeline to Gulf EOR
- Geologic Sequestration Utility



Edwardsport, IN IGCC


Geologic Storage Utility
FutureGen
Taylorville SNG/NGCC
Edwardsport IGCC
Cash Creek SNG/NGCC

Key Enabling Policies

- Advanced Coal/CCS RD&D aimed at ***lowering costs***
- Coal performance standards, cap and trade modifications, direct payment reverse auctions, incentives that ***drive CCS adoption***
- Infrastructure development that ***deploys CO2 pipelines*** and the ***commercial saline sequestration industry***.
- ***Long-term site care*** issues which address ***liability barriers*** at CCS storage sites
- Regulations that ***enable CO2 storage*** such as injection, monitoring, and permitting.

Current Climate Legislation

Need	*Waxman-Markey*	*Comments*
Establish carbon reduction targets and performance standards	A 50% interim new coal plant standard, gong to 65% + in 2020	90% reduction for coal and natural gas
Direct payments to narrow gap between allowance price and technology deployment costs **-**	- Phase I fixed credit – 6GW - Phase II reverse auction – 66GW (Administrator can opt for fixed) - Estimated $180 billion through 2050	- Needs conditionally offered credits - Needs expiration date for Phase I - Reverse auction should get underway before opt out considered
Geologic Sequestration Utilities and CO2 long-term care		Develop sequestration utilities to manage CO2 in non-hydrocarbon bearing sequestration formations (e.g. basin scale management); develop federal long-term care/liability program for initial saline sequestration projects
CO2 Pipelines and sequestration site exploration	No explicit incentives	Ensure infrastructure and site development aren't excluded from incentive programs (e.g. loan guarantees); direct payments for early saline sit characterization projects
Federal financing	Clean Energy Development Administration (CEDA) established	Need to capitalize CEDA for CCS projects
Federal RD&D to lower technology costs	Program to fund large-scale commercial demonstration	Need full R,D&D for post-combustion capture, geologic storage, advanced gasification, underground gasification, direct air capture

Thank You

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