

Policy Options to Accelerate CCS in US States

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Driving CCS Deployment

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The Regulatory Assistance Project

RAP is a non-profit organization providing technical and educational assistance to government officials on energy and environmental issues. RAP is funded by US DOE & EPA, several foundations, and international agencies. We have worked in 40+ states and 16 nations.


Richard Cowart was Chair of the Vermont PSB, Chair of NARUC's Energy & Environment Committee, and of the National Council on Electricity Policy. Recent assignments include technical and policy assistance to NARUC's clean coal and climate committees, RGGI, the New York ISO, the California PUC, the Oregon Carbon Allocation Task Force, the Western Climate Initiative and to China's national energy and environmental agencies.



Context for CCS

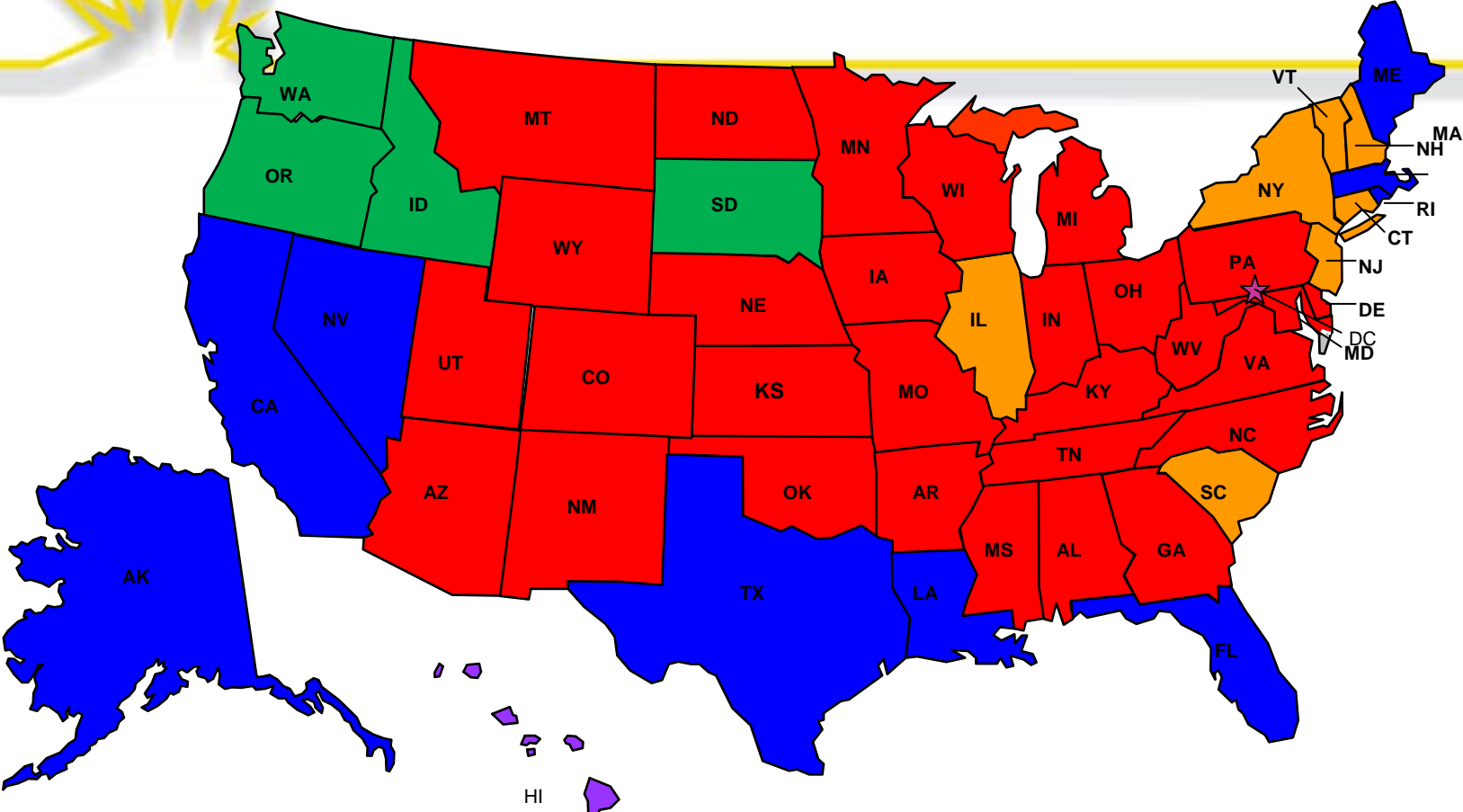
- CCS success is an essential element in climate stabilization –
- CCS development in the EU and US is essential to deployment in China & India
- However -- Price signal from cap-and-trade regimes (ETS, US, or global) will not be enough to develop the industry
- Many attempts in US states to advance CCS

Pieces of the puzzle in the US



- CCS development & deployment requires:
 - **No “backsliding”** -- stop new high-emission coal projects
 - Public **financial support**
 - Overcoming **regulatory barriers** and problems
- Challenges of a federal system:
 - **National** funding needed for RD&D& commercialization (no state wants to pay for it alone)
 - Siting, cost recovery, “need” determinations are **controlled by states.**
 - Transport and storage may require approval from several states

Primary Fuel Source by State

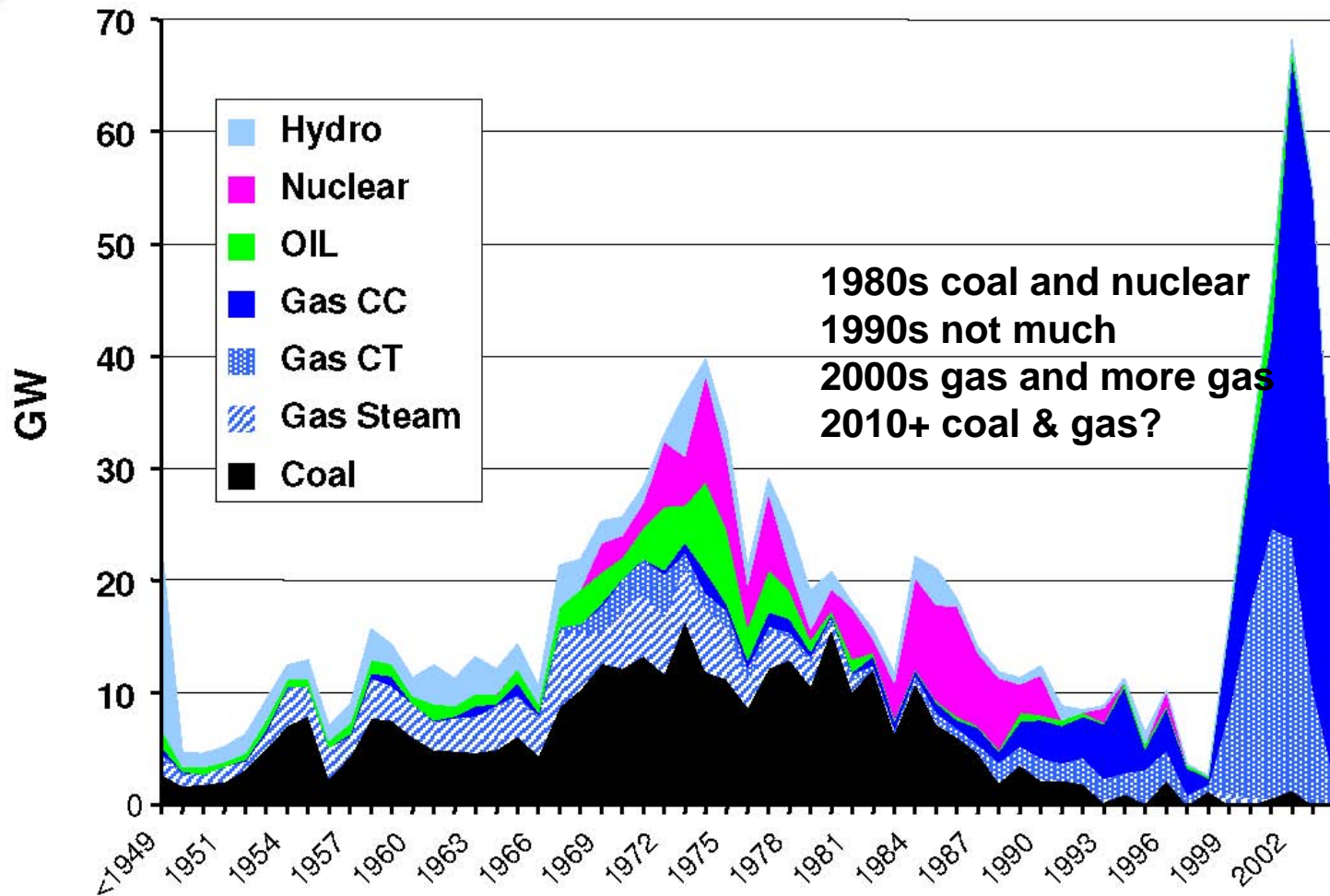


Legend: Coal, Gas, Nuclear, Petroleum, Hydroelectric

Source: Energy Information Administration, Selected Electric Industry Summary Statistics by State, 2006
www.eia.doe.gov

Why CCS?

The “dash to gas” & gas supply issues
Coal’s central role in US power supply



Coal revival slowed but still a big factor

Current Coal-Fired Capacity Projects (2008 year change)
Table 1

		Number of Plants			Capacity (MW)		
General Status		December 2007	January 2009	Net Change	December 2007	January 2009	Net Change
Progressing Projects	<i>Under Construction</i>	28	28	0	14,885	16,319	+1,434
	<i>Near Construction</i>	6	7	+1	1,859	2,812	+953
	<i>Permitted</i>	13	13	0	6,422	7,000	+578
	SUB TOTAL	47	48	+1	23,166	26,131	+2,965 (+13%)
Uncertain Potential and Timing	<i>Announced (early stages of development)</i>	67	47	-20	42,394	31,869	-10,525 (-25%)
	TOTAL	114	95	-19	65,560	58,000	-7,560 (-12%)
	Operational this Year (2008)	-	5	+5	-	1,392	+1,392
	TOTAL (with Operational)			-14			-6,168 (-9%)

Status Listing	Description
<i>Under Construction</i>	Project is under construction.
<i>Near Construction</i>	Project has been approved; majority or all permits are obtained. Sponsor is contracting vendors and Engineering, Procurement and Construction (EPC) contractors. Site preparation has begun.
<i>Permitted</i>	In the permitting phase. Two or more permits approved or fuel or power contracts have been negotiated.
<i>Announced</i>	Early stages of development to filing for permits. May include a feasibility study.



Will cap & trade do it?

➤ **Possible Advantages for CCS:**

- Declining cap might forestall “backsliding” with new non-CCS builds, give support to new CCS

➤ **Challenges:**

- State and regional plans vulnerable to leakage via imports
- Won’t necessarily advance CCS – CCS cannot depend on carbon prices alone for market-based deployment

➤ **Major concern: *Even a national cap-and-trade won’t necessarily lead to viable CCS projects:***

- 1. Cost containment is a real concern in Congress – CO₂ prices unlikely to be very high*
- 2. CCS not needed for load growth -- RPS + EE likely to take up all load growth*
- 3. Existing coal keeps running unless CO₂ price is very high*
- 4. Even optimists say \$90/ton CO₂ price needed to launch*



Generator performance standards

- **Each coal- or fossil-fueled generation unit or plant** must meet a standard
 - e.g., a maximum annual amount of CO₂ emissions or a maximum rate in CO₂/kWh
- Coverage: new plants vs. existing plants
- **Strengths:** Fits relatively easily into existing state processes for permitting and monitoring new facilities; clear and direct
- **Concerns:** potential to drive leakage; “alternate compliance” payment option does not promote CCS.
- *State examples: GPS in Oregon, Washington, Montana (50% or better CCS), Massachusetts.*



Retailer carbon standards

- Obligation to meet a carbon standard placed on load-serving entities, or retailers, options:
 - Increasing % of electricity from sources using CCS
 - Declining CO₂/kWh standard for the entire portfolio (“EPS”)
 - **Requiring new long-term power purchasing contracts to meet a specified CO₂/kWh standard**
- **Strengths:**
 - Can cover **imported electricity -- avoiding leakage**
 - Could allow **trading** by retailers to meet standard
 - **Retailers generally have more options** for reducing emissions than individual electric generators
- **Concerns:**
 - Without a specific carve-out, **won't necessarily promote CCS**
 - Need a tracking system to assign **emissions** from point of generation to point of sale (e.g., NEPOOL GIS system)
- *State examples: California & Washington (for new sources) (Penn Alternative Energy Portfolio Std includes IGCC, but does not require sequestration)*



System benefit charge/ feebate for CCS

- Goal: Provide funds to install CCS at fossil fuel-based electric generation plants – most likely coal-fueled plants
 - Fees could be levied on generators or on retailers on a “per-MWh” basis, or just on the fossil portion
 - With automatic distribution to CCS providers, could be viewed as a utility fee or “feebate” rather than as a general government tax
- **Strengths:**
 - Direct connection between program and CCS goals
 - Coal pays for the future of coal
 - First-mover benefits for coal-dependent states
 - If payment is automatic for CCS performance, gov’t is not “picking winners” among technologies
- **Concerns:**
 - Imported electricity – is it covered or not?
 - Funds vulnerable to political distribution, budget raids
 - Explicitly raises power costs and/or rates
- *State example: CO \$ for development of IGCC+CCS from clean energy fund; other SBCs do not include CCS.*



Direct state financial assistance

- Idea: direct state expenditures or tax credits for CCS investments or performance
- State examples: None yet for CCS explicitly, but two now in effect for IGCC
 - Illinois – direct financial assistance (a few million \$ per project) for front-end engineering design (FEED) costs for 3 IGCC plants
 - Indiana – tax credit to IGCC plants serving state residents



Managing transport and sequestration

- Existing pipeline laws – probably easily adaptable
- Interstate Oil & Gas Compact Commission -- **model rule for sequestration**; state agency rules in ND, WY, studies in other states
- **One-stop shopping** for power plant, transport and injection: e.g., Ohio Power Siting Board
- **Pre-screening injection sites** pro-actively: New York Advanced Clean Coal Power Plant Initiative – screened 120 sites, picked the best ones
- **Limiting liability for releases**: Texas



Public Utility Commission Policies for CCS -- Context

- States' goal: align coal's role in meeting power needs with climate change realities
- “Race to grandfather” now yielding to paralysis on new plants.
- Reasonable basis for PUC caution on CCS:
 - Cost overruns are a realistic concern. Nuclear was not “too cheap to meter.” CCS is unproven at scale.
 - Why should individual states shoulder the national burden for technology development?
 - Will leakage undermine our efforts?
 - How can we encourage CCS and insist on prudent project management at the same time?
- Needed – proper balance on costs and risks between shareholders and ratepayers



Leading PUC policies to support CCS

- Nationwide research reveals at least 25 different policy options under discussion, formally proposed, or adopted across the US
- Opportunity areas include policies that could affect all stages in the development, construction, and operation of CCS facilities:
 - ❖ **Utility planning:**
 - ❖ Include the cost of carbon constraints in utility resource plans
 - ❖ Mandate low-carbon resource acquisition (GPS, EPS, etc)
 - ❖ **Project applications and reviews:**
 - ❖ Site preapproval, one-stop shopping, expedited treatment
 - ❖ Waiver of need determination -- CPN for CCS despite higher costs
 - ❖ Waiver of competitive resource acquisition requirements



PUC policy areas and opportunities (con't)

❖ **Financial incentives:**

- ❖ Require investors in conventional coal without CCS to assume the risk of future carbon regulations
- ❖ Preapproval: Cost-recovery guarantees for CCS projects
- ❖ Ratemaking: Provide higher rates of return for CCS; grant bonding authority; accelerate depreciation
- ❖ Direct financial assistance for CCS: SBC/feebate; tax policy

❖ **Support for operations, technology development:**

- ❖ Guaranteed buyer or must-take requirements for CCS-generated power
- ❖ Cost recovery for power supply during unplanned outages
- ❖ Cost recovery, “used and useful” OK even if CCS plant is cancelled
- ❖ Cost recovery for early retirement of existing coal facilities due to CCS substitute



Evaluating the CCS policy options: criteria for regulators

Acceleration: Will it produce investment in CCS that would not otherwise occur?

Deterrence: Will it deter investment in high-emitting technology options?

Prudence & Accountability: Will it promote prudent project management?
Will those with responsibility be held accountable for performance?

Power supply costs: Does it help to lower the cost premium for CCS power?

Administrative costs: Does it help to lower administrative and regulatory costs for developers, government, and other parties?

Risk and cost balance: How well does it balance the interests of ratepayers and investors?

Innovation: Will it promote further CCS research and technical innovation?

Standardization: Will it promote CCS projects that could be replicated elsewhere?

Performance: Does it secure significant carbon reductions? Are any incentives scaled to real-world performance, measured especially in tons of CO₂ permanently sequestered?

Applying the criteria to 10 leading policy options

(values are provisional – for discussion)

Policy option → Decision criteria ↓	EPS or GPS	Pre- approval	Higher Returns	Cost of Outage s	Cance llation	Retire- ment	Single Siting Board	Pre- approved Sites	Waiver of Competitive Resource Acquisition	Guaranteed Buyer
Accelerates CCS	Medium	Medium	High	High	High	Medium	High	High	High	High
Deters PC investments	Very High	Neutral	Neutral	Neutral	Neutral	Medium	Neutral	Neutral	Neutral	Neutral
Accountability Encourages Prudent management	Normal	Low to Medium	Low	Low	Low	Neutral	Neutral	Medium	Neutral	Low
Limits Power Supply Cost Premium	Medium	Medium	Negative	Low	Low	Low	Medium (lowers costs)	Medium	Low	Low
Controls Administrative Costs	High	Low	Medium	Neutral	Neutral	Neutral	High	Medium	High	Neutral
Balances risks fairly	Neutral	Medium to Low	Low	Low	Low	Medium	Neutral	Medium	Medium to Low	Low
Promotes Innovation	High	Medium	Medium	Medium	High	Medium	Medium	Medium	Medium	Medium to High
Promotes Replicable projects	Low	Medium to High (if replication is a criterion)	Neutral	Neutral	Neutral	Medium	Medium to High (if replicability is a criterion)	Neutral	Neutral	Medium to High (if limited to replicable projects)
Secures significant carbon reductions	High (due to PC bar)	Medium	Medium	Low	Neutral	Medium (due to retirements)	Medium	High (good sites for storage)	Medium	Medium



Current political reality

- Coal state support is essential to passing national GHG legislation;
- Even with federal \$\$, CCS projects require state siting, cost recovery, power purchases;
- So far, ad hoc efforts to promote advanced coal in > 25 states --
- No political urgency in the US to develop CCS
- EU action will influence US action at both the state and federal levels



For more information...

“State Options for Low-Carbon Coal Policy”

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Pew Center on Global Climate Change
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