

State Policy Options for Accelerating CCS

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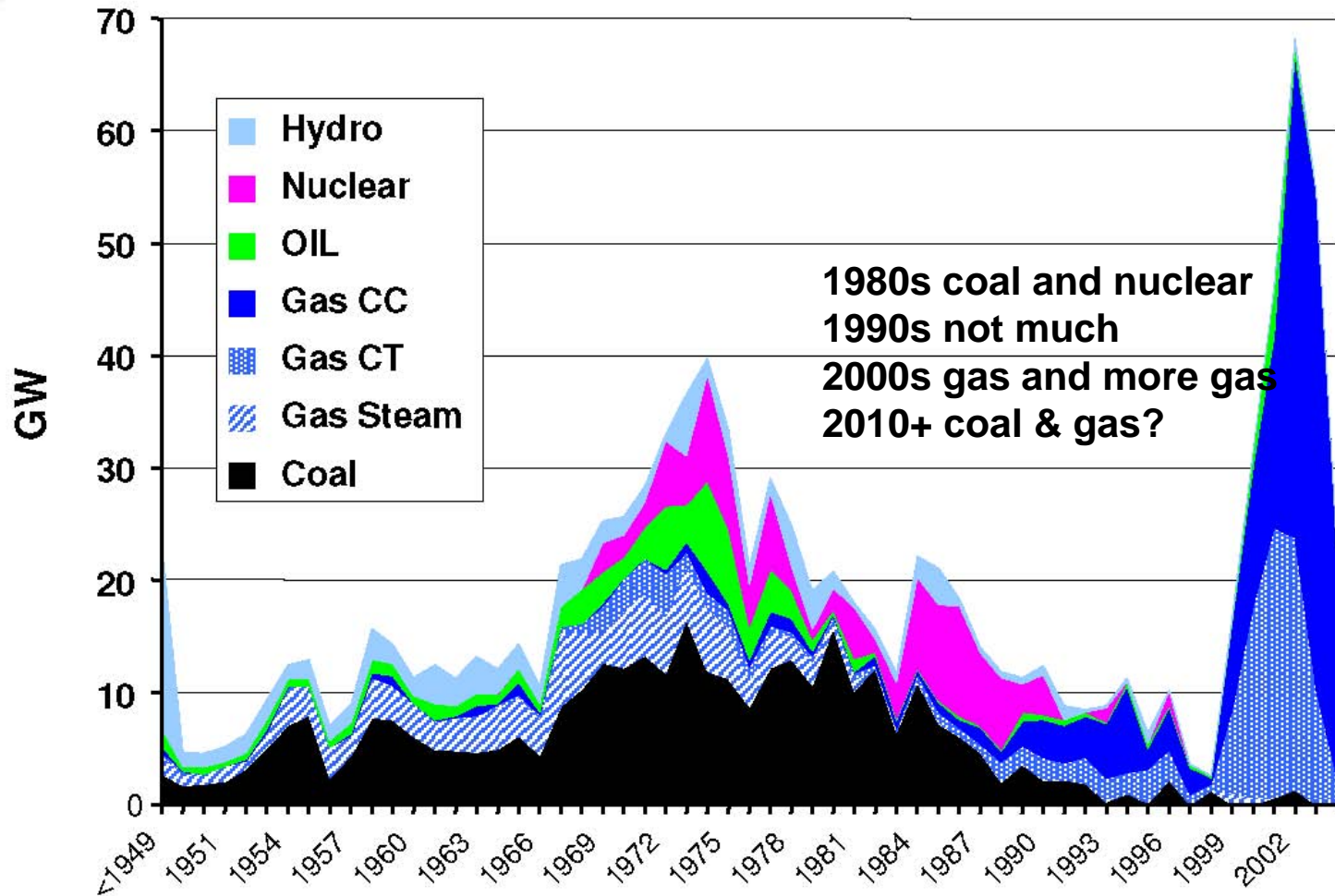
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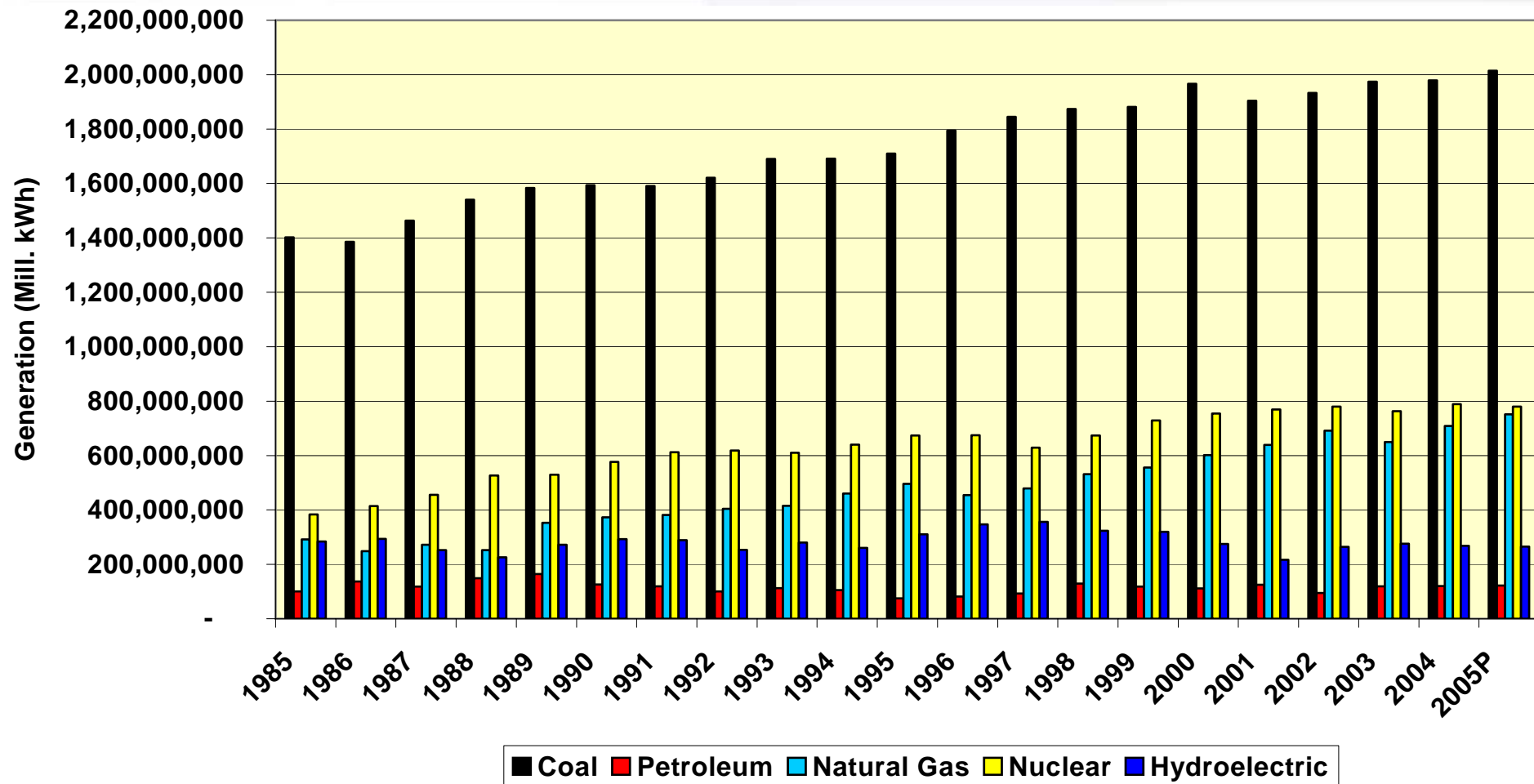
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Why CCS?

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



GHG Problem: Coal and gas *energy production both up* ~equally, 1992-2005



Source: EIA AER 2006



First: Do states have a role?

- CCS requires a ***national*** program of research, development, deployment (RD&D program could require \$24 Billion+)
- BUT: System reliability & fuel diversity & managing carbon are all ***state*** goals – Coal and CCS are critical to meeting them
- Deployment also requires
 - Utility resource policies to mandate and/or promote demand for CCS (a long-term strategy) rather than more immediate (and easier) supply adds like conventional PC and natural gas;
 - Air and other environmental permits & injection management rules;
 - Initial need determinations & CPNs or equivalent;
 - Siting approvals – plants, pipelines, and/or transmission paths;
 - Utility financing and cost recovery in rates;
 - Assignment of financial and physical risks
- These are all *state-level* decisions
 - Even with a federal RD&D program, there is no NASA or NIH for CCS
- Combined federal + state strategies are needed
- State policy to drive CCS can reduce costs, speed technological and regulatory developments and public acceptance, and inform and pave the way for future national policy.

State-level options to accelerate CCS



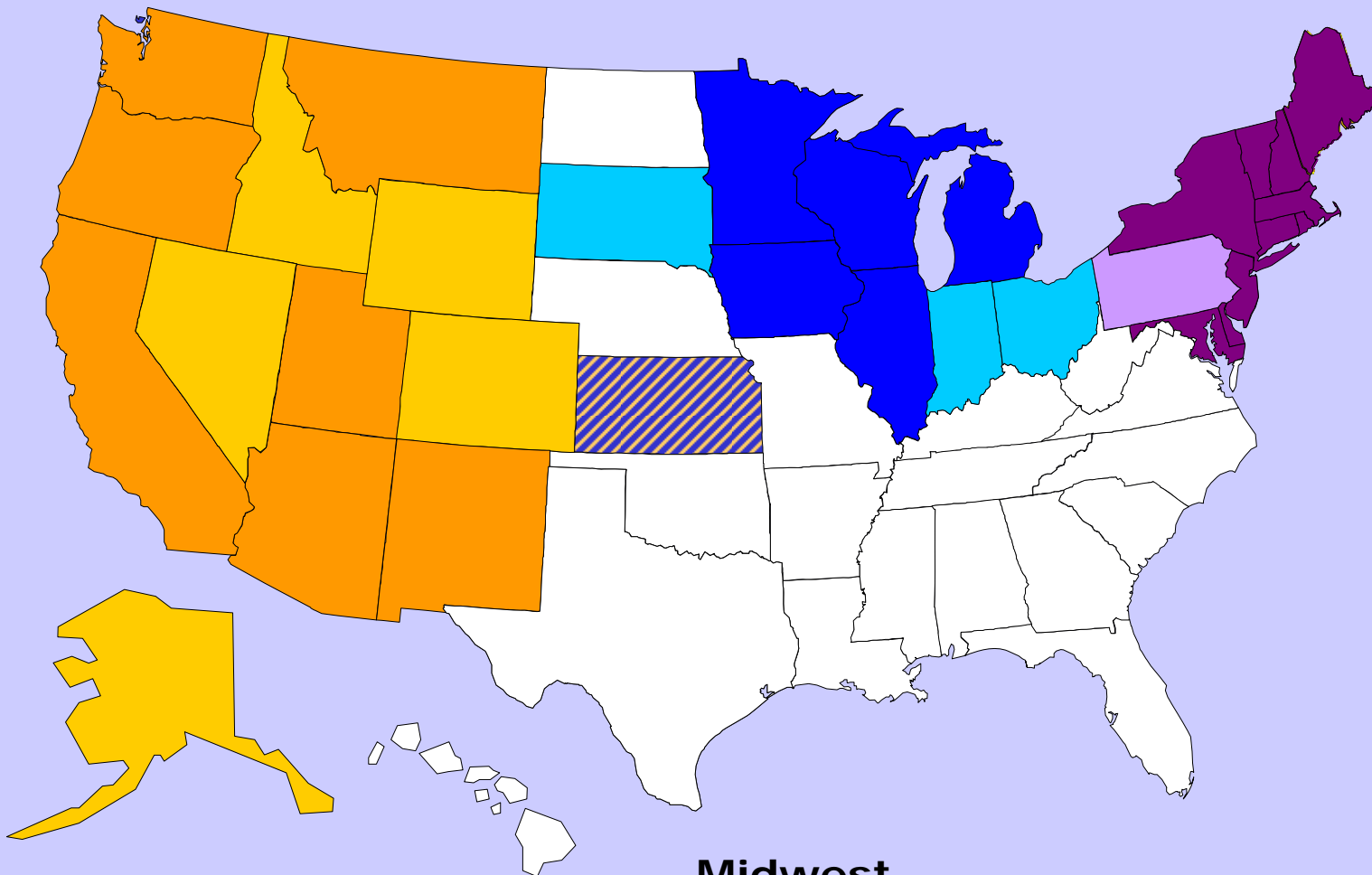
- Cap and trade
- *Generator* performance standards
- *Retailer* carbon content standards
- System benefit charges or feebates
- Ratemaking: PUC treatment of climate policy risks and CCS cost recovery protections
- CPN issues: Need standards, siting rules, preapproval, one-stop shopping
- Combined approaches: federal, PUC and other state policies working together





Cap and trade

- Modeled after U.S. Acid Rain Program and European Union ETS
- Can be power sector only, or economy-wide
- Can be generator-based, load-based, first-seller, or hybrid
- **Strengths:**
 - Generator-based resembles existing NO_x and SO₂ programs
 - Declining cap forestalls “backsliding” with new non-CCS builds
- **Concerns:**
 - State and regional plans vulnerable to leakage via imports
 - Won’t necessarily advance CCS
 - Hard for individual states to make progress – need regions
- *State and regional examples: RGGI, CA & OR, WCI, Midwest Accord*


Regional Cap and Trade Initiatives





 **Western Climate Initiative**


 **Western Climate Initiative - Observer**

Midwest

 **Greenhouse Gas Reduction Accord**

 **Midwest Accord - Observer**

 **RGGI**

 **RGGI - Observer**



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, e.g.:
 - 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)
 - Efficiency MWhs should be counted too
- *State examples: California & WA (for new sources) (PA Alternative Energy Port.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 “dash back to gas” vs. “facing the future”
- 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 our state 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



State regulatory policy options: Discussion topics

- Which policy criteria are most important? Are any of these criteria not so important? Should other essential criteria be added?
- What complementary state/federal policies – e.g., coal feebate or SBC for CCS – should PUCs support?
- Taking each policy option in turn, what are your thoughts? How do they rank?
- Based on your filled-in matrix and other judgments, which policy options are likely to be most effective?
- What additional high-value policy options would you propose that we advance or study?



For more information...

“State Options for Low-Carbon Coal Policy”

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