

TECH SPECS: Coal Company of America

Your Plant:

Company Name: Coal Company of America ("Coalcoa")

Power Plant: Newark, New Jersey

Technical Specifications:

Capacity: 800MW

Fuel: Coal

Year Built: 1961

CO₂ emissions: 10.0 million tons per year ("10.0 mty")

Emissions Reductions Strategies Available to Your Plant:

Technology	Reduction (mty)	Cost (\$ millions)	Notes
High-Tech Smokestack Scrubbers (HTSS)	2.5	\$65	HTSS costs \$65 million instead of \$50 million because the project will require an additional \$15 million in permitting fees to the State of New Jersey.
Low-Tech Smokestack Scrubbers (LTSS)	2.0	\$48	Cannot do both HTSS and LTSS together. Only one type of scrubber may be installed.
Upgrade Boilers	0.5	\$12	
Upgrade Generators	1.0	\$24	
Switch to natural gas	1.0	\$24	
Purchase or sell credits		?	

MW = Megawatt mty = million tons of CO₂ per year

Scenario 1: Command-and-Control Regulation

1. NAGGI requires every coal-burning power plant in the US and Canada to install a High-Technology Smokestack Scrubber ("HTSS").
2. HTSS is expected to cost approximately \$50 million to install (at most plants).
3. HTSS is expected to reduce annual CO₂ emissions about 25% (at most plants).

Scenario 2: Cap-and-Trade Regulation

NAGGI requires every coal-burning power plant in the US and Canada to achieve a 25% reduction in CO₂ emissions, starting from your current level of 10 mty.

Each plant may devise its own strategy to achieve the 25% reduction.

Failure to achieve a 25% reduction results in huge fines and possible shutdown of the plant.

Credits and offsets:

If a plant achieves CO₂ reductions in excess of 25%, it earns a credit for the amount of the excess reductions.

Companies can buy and sell credits on the Carbon Trading Exchange.

Purchasers can use credits to offset their annual CO₂ emissions to reach the 25% goal.

Example: Plant X emits 10 mty. To achieve a 25% emissions reduction, Plant X must lower its emissions to 7.5 mty. If Plant X reduces emissions to 6.5 mty, it earns a credit of 1.0 mty. The company can then sell that credit on the Carbon Trading Exchange, and the purchaser can subtract 1 mty from its annual emissions.

TECH SPECS: Ontario Electric Power Company

Your Plant:

Company Name: Ontario Electric Power Co.

Power Plant: Toronto, Ontario

Technical Specifications:

Capacity: 700 MW

Fuel: Coal

Year Built: 1960

CO₂ emissions: 10.0 million tons per year ("10.0 mty")

Emissions Reductions Strategies Available to Your Plant:

Technology	Reduction (mty)	Cost (\$ millions)	Notes
High-Tech Smokestack Scrubbers (HTSS)	2.5	\$80	HTSS costs \$80 million instead of \$50 million because the project will require an additional \$30 million modification to smokestacks.
Low-Tech Smokestack Scrubbers (LTSS)	2.0	\$64	Cannot do both HTSS and LTSS together. Only one type of scrubber may be installed.
Upgrade Boilers	1.0	\$32	
Upgrade Generators	0.5	\$16	
Switch fuel to coal/oil blend	1.0	\$32	
Purchase or sell credits		?	

MW = Megawatt mty = million tons of CO₂ per year

Scenario 1: Command-and-Control Regulation

1. NAGGI requires every coal-burning power plant in the US and Canada to install a High-Technology Smokestack Scrubber ("HTSS").
2. HTSS is expected to cost approximately \$50 million to install (at most plants).
3. HTSS is expected to reduce annual CO₂ emissions about 25% (at most plants).

Scenario 2: Cap-and-Trade Regulation

NAGGI requires every coal-burning power plant in the US and Canada to achieve a 25% reduction in CO₂ emissions, starting from your current level of 10 mty.

Each plant may devise its own strategy to achieve the 25% reduction.

Failure to achieve a 25% reduction results in huge fines and possible shutdown of the plant.

Credits and offsets:

If a plant achieves CO₂ reductions in excess of 25%, it earns a credit for the amount of the excess reductions.

Companies can buy and sell credits on the Carbon Trading Exchange.

Purchasers can use credits to offset their annual CO₂ emissions to reach the 25% goal.

Example: Plant X emits 10 mty. To achieve a 25% emissions reduction, Plant X must lower its emissions to 7.5 mty. If Plant X reduces emissions to 6.5 mty, it earns a credit of 1.0 mty. The company can then sell that credit on the Carbon Trading Exchange, and the purchaser can subtract 1 mty from its annual emissions.

TECH SPECS: Fossil Energy Resources

Your Plant:

Company Name: Fossil Energy Resources, Inc.

Power Plant: Albany, New York

Technical Specifications:

Capacity: 880MW

Fuel: Coal

Year Built: 1977

CO₂ emissions: 10.0 million tons per year ("10.0 mty")

Emissions Reductions Strategies Available to Your Plant:

Technology	Reduction (mty)	Cost (\$ millions)	Notes
High-Tech Smokestack Scrubbers (HTSS)	1.0	\$60	HTSS costs \$60 million instead of \$50 million because the project will require an additional \$10 million to protect against high winds.
Low-Tech Smokestack Scrubbers (LTSS)	1.0	\$24	HTSS only achieves a 10% reduction because the plant already has modern triple-cycle turbines. Cannot do both HTSS and LTSS together. Only one type of scrubber may be installed.
Upgrade Boilers	1.0	\$40	
Upgrade Generators	0.5	\$30	
Switch to coal/oil blend	0.5	\$30	
Purchase or sell credits		?	

MW = Megawatt mty = million tons of CO₂ per year

Scenario 1: Command-and-Control Regulation

1. NAGGI requires every coal-burning power plant in the US and Canada to install a High-Technology Smokestack Scrubber ("HTSS").
2. HTSS is expected to cost approximately \$50 million to install (at most plants).
3. HTSS is expected to reduce annual CO₂ emissions about 25% (at most plants).

Scenario 2: Cap-and-Trade Regulation

NAGGI requires every coal-burning power plant in the US and Canada to achieve a 25% reduction in CO₂ emissions, starting from your current level of 10 mty.

Each plant may devise its own strategy to achieve the 25% reduction.

Failure to achieve a 25% reduction results in huge fines and possible shutdown of the plant.

Credits and offsets:

If a plant achieves CO₂ reductions in excess of 25%, it earns a credit for the amount of the excess reductions.

Companies can buy and sell credits on the Carbon Trading Exchange.

Purchasers can use credits to offset their annual CO₂ emissions to reach the 25% goal.

Example: Plant X emits 10 mty. To achieve a 25% emissions reduction, Plant X must lower its emissions to 7.5 mty. If Plant X reduces emissions to 6.5 mty, it earns a credit of 1.0 mty. The company can then sell that credit on the Carbon Trading Exchange, and the purchaser can subtract 1 mty from its annual emissions.

TECH SPECS: Québec Carbon Light and Power

Your Plant:

Company Name: Québec Carbon Light and Power

Power Plant: Sainte Anne de Bellevue, Québec

Technical Specifications:

Capacity: 900MW

Fuel: Coal

Year Built: 1990

CO₂ emissions: 10.0 million tons per year ("10.0 mty")

Emissions Reductions Strategies Available to Your Plant:

Technology	Reduction (mty)	Cost (\$ millions)	Notes
High-Tech Smokestack Scrubbers (HTSS)	1.5	\$50	HTSS achieves only a 15% reduction because the plant already has LTSS as required under Québec law.
Upgrade Boilers	1.0	\$50	
Upgrade Generators	0.5	\$50	
Switch fuel to coal/oil blend	0.5	\$75	
Purchase or sell credits		?	

MW = Megawatt mty = million tons of CO₂ per year

Scenario 1: Command-and-Control Regulation

1. NAGGI requires every coal-burning power plant in the US and Canada to install a High-Technology Smokestack Scrubber ("HTSS").
2. HTSS is expected to cost approximately \$50 million to install (at most plants).
3. HTSS is expected to reduce annual CO₂ emissions about 25% (at most plants).

Scenario 2: Cap-and-Trade Regulation

NAGGI requires every coal-burning power plant in the US and Canada to achieve a 25% reduction in CO₂ emissions, starting from your current level of 10 mty.

Each plant may devise its own strategy to achieve the 25% reduction.

Failure to achieve a 25% reduction results in huge fines and possible shutdown of the plant.

Credits and offsets:

If a plant achieves CO₂ reductions in excess of 25%, it earns a credit for the amount of the excess reductions.

Companies can buy and sell credits on the Carbon Trading Exchange.

Purchasers can use credits to offset their annual CO₂ emissions to reach the 25% goal.

Example: Plant X emits 10 mty. To achieve a 25% emissions reduction, Plant X must lower its emissions to 7.5 mty. If Plant X reduces emissions to 6.5 mty, it earns a credit of 1.0 mty. The company can then sell that credit on the Carbon Trading Exchange, and the purchaser can subtract 1 mty from its annual emissions.

TECH SPECS: Industrial Energy Generating Group

Your Plant:

Company Name: Industrial Energy Generating Group, Inc.

Power Plant: Morgantown, West Virginia

Technical Specifications:

Capacity: 1,000MW

Fuel: Coal

Year Built: 1981

CO₂ emissions: 10.0 million tons per year ("10.0 mty")

Emissions Reductions Strategies Available to Your Plant:

Technology	Reduction (mty)	Cost (\$ millions)	Notes
High-Tech Smokestack Scrubbers (HTSS)	2.0	\$100	Plant has 2 smokestacks; one HTSS is required for each. HTSS only achieves a 20% reduction because the plant already has LTSS as required for all plants built after 1980 in WV.
Upgrade Boilers	0.5	\$60	
Upgrade Generators	0.5	\$50	
Switch fuel to coal/oil blend	0.5	\$60	
Purchase or sell credits		?	

MW = Megawatt

mty = million tons of CO₂ per year

Scenario 1: Command-and-Control Regulation

1. NAGGI requires every coal-burning power plant in the US and Canada to install a High-Technology Smokestack Scrubber ("HTSS").
2. HTSS is expected to cost approximately \$50 million to install (at most plants).
3. HTSS is expected to reduce annual CO₂ emissions about 25% (at most plants).

Scenario 2: Cap-and-Trade Regulation

NAGGI requires every coal-burning power plant in the US and Canada to achieve a 25% reduction in CO₂ emissions, starting from your current level of 10 mty.

Each plant may devise its own strategy to achieve the 25% reduction.

Failure to achieve a 25% reduction results in huge fines and possible shutdown of the plant.

Credits and offsets:

If a plant achieves CO₂ reductions in excess of 25%, it earns a credit for the amount of the excess reductions.

Companies can buy and sell credits on the Carbon Trading Exchange.

Purchasers can use credits to offset their annual CO₂ emissions to reach the 25% goal.

Example: Plant X emits 10 mty. To achieve a 25% emissions reduction, Plant X must lower its emissions to 7.5 mty. If Plant X reduces emissions to 6.5 mty, it earns a credit of 1.0 mty. The company can then sell that credit on the Carbon Trading Exchange, and the purchaser can subtract 1 mty from its annual emissions.

TECH SPECS: Giant Power Company

Your Plant:

Company Name: Giant Power Company

Power Plant: Toledo, Ohio

Technical Specifications:

Capacity: 760MW

Fuel: Coal

Year Built: 1957

CO₂ emissions: 10.0 million tons per year ("10.0 mty")

Emissions Reductions Strategies Available to Your Plant:

Technology	Reduction (mty)	Cost (\$ millions)	Notes
High-Tech Smokestack Scrubbers (HTSS)	2.5	\$60	HTSS costs \$60 million instead of \$50 million because the project will require an additional \$10 million in modifications to the plant.
Low-Tech Smokestack Scrubbers (LTSS)	2.0	\$32	Cannot do both HTSS and LTSS together. Only one type of scrubber may be installed.
Upgrade Boilers	1.0	\$16	
Upgrade Generators	1.0	\$16	
Switch fuel to coal/oil blend	0.5	\$8	
Purchase or sell credits		?	

MW = Megawatt mty = million tons of CO₂ per year

Scenario 1: Command-and-Control Regulation

The NAGGI requires every coal-burning power plant in the US and Canada to install a High-Technology Smokestack Scrubber ("HTSS").

HTSS is expected to cost approximately \$50 million to install (at most plants).

HTSS is expected to reduce annual CO₂ emissions about 25% (at most plants).

Scenario 2: Cap-and-Trade Regulation

NAGGI requires every coal-burning power plant in the US and Canada to achieve a 25% reduction in CO₂ emissions, starting from your current level of 10 mty.

Each plant may devise its own strategy to achieve the 25% reduction.

Failure to achieve a 25% reduction results in huge fines and possible shutdown of the plant.

Credits and offsets:

If a plant achieves CO₂ reductions in excess of 25%, it earns a credit for the amount of the excess reductions.

Companies can buy and sell credits on the Carbon Trading Exchange.

Purchasers can use credits to offset their annual CO₂ emissions to reach the 25% goal.

Example: Plant X emits 10 mty. To achieve a 25% emissions reduction, Plant X must lower its emissions to 7.5 mty. If Plant X reduces emissions to 6.5 mty, it earns a credit of 1.0 mty. The company can then sell that credit on the Carbon Trading Exchange, and the purchaser can subtract 1 mty from its annual emissions.

CO₂ Emissions Reductions Worksheet

Owner: Plant:

Initial Emissions Rate: million tons per year (mta)

Scenario 1: Command-and-Control Regulation

Emissions Reduction: mta

Cost:

Scenario 2: Carbon Tax

Emissions Reduction: mta

Cost of Upgrades: \$ Carbon Taxes Paid: \$

Scenario 3: Cap-and-Trade Regulation

A. Technological Reductions at your plant:

Technology	Emissions Reduction (mta)	Cost (\$ millions)
TOTALS:		

B. Sales and Purchases of Emissions Offsets

Name of Purchaser/ Seller	Offset Sold (mta)	Offset Purchased (mta)	Cost (\$ millions)
TOTALS:			

C. Final Accounting:

(Initial Emissions) – (Technological Reductions) – (Offsets Purchased) + (Offsets Sold) = FINAL EMISSIONS

(Cost of Tech. Reductions) + (Cost of Credits Purchased) – (Income from sale of Credits) = TOTAL COST

EMISSIONS OFFSET CONTRACT

This EMISSIONS OFFSET CONTRACT is hereby entered into

between _____ ("PURCHASER")

and _____ ("SELLER").

SELLER hereby promises that through certain technological improvements to its power plant at _____, it has or will earn CO₂ Emissions Reduction Credits in sufficient amount to fulfill its obligations under this Contract.

PURCHASER hereby agrees to purchase, and SELLER hereby agrees to sell, CO₂ Emissions Reduction Credits in the amount of _____ million tons per year.

SELLER shall deliver such CO₂ Emissions Reduction Credits to PURCHASER in accordance with the regulations of the North American Greenhouse Gas Initiative within 5 days from the execution of this contract.

Upon delivery of said CO₂ Emissions Reduction Credits, PURCHASER shall pay to SELLER \$ _____ by wire transfer or certified check.

Signed this _____ day of _____, 20 ____.

SELLER

Name: _____

PURCHASER

Name: _____

Title: _____ Title: _____