



The Role of Natural Gas in Texas and America

CEA Meeting August 24th, 2010



About ANGA

Our Mission

- America's Natural Gas Alliance exists to promote the economic, environmental and national security benefits of greater use of clean, abundant, domestic natural gas.

Our Members

- We represent 34 of North America's largest independent natural gas exploration and production companies and the leading developers of the shale plays now transforming the U.S. clean energy landscape.

In Response to New Federal Mandates

- Texas will need clean, abundant and efficient power to meet federal mandates
- We can achieve this in:
 - 15-20 years if we invest in new carbon sequestration experiments,
 - 10-20 years if we invest in new nuclear plants,
 - 7-10 years if we invest in new CREZ lines through our ranchland

Natural Gas. The Natural Choice Now.



Natural Gas Is the Answer for Texas

Texas Needs

- Cleaner energy
- Improved air quality
- Enhanced domestic resources
- More jobs & economic development
- Increased tax revenue without raising taxes

Natural Gas Provides

- Clean, efficient energy
- Significant emission reductions
- Energy security
- Statewide economic development
- High-wage jobs
- Significant tax revenues

Why Natural Gas?

- Abundant natural gas should be the cornerstone of Texas energy strategy.
 - U.S. natural gas reserves growing exponentially
 - 100-year + supply & growing
 - Clean
 - Lowest emitting conventional fuel that can be used to achieve huge emissions reductions at moderate cost
 - Most cost-effective source of new electric generation
 - Essential to ensure consistent, reliable electricity supply, and to use wind and the Smart Grid effectively

Why Natural Gas?

- Abundant natural gas should be the cornerstone of Texas energy strategy.
 - Reduces foreign oil dependency
 - Use of CNG in heavy-duty trucks and vehicles is the best means available to reduce dependence upon imported oil
 - Texas is largest U.S. producer of natural gas
 - Greater production than that of most countries, and plays key role in health of Texas economy by creating huge number of jobs and tax revenues at state and local level
 - Texas can set example for other states
 - Opportunity to take the lead in maximizing natural gas use across the U.S.

Texas Economic Impact



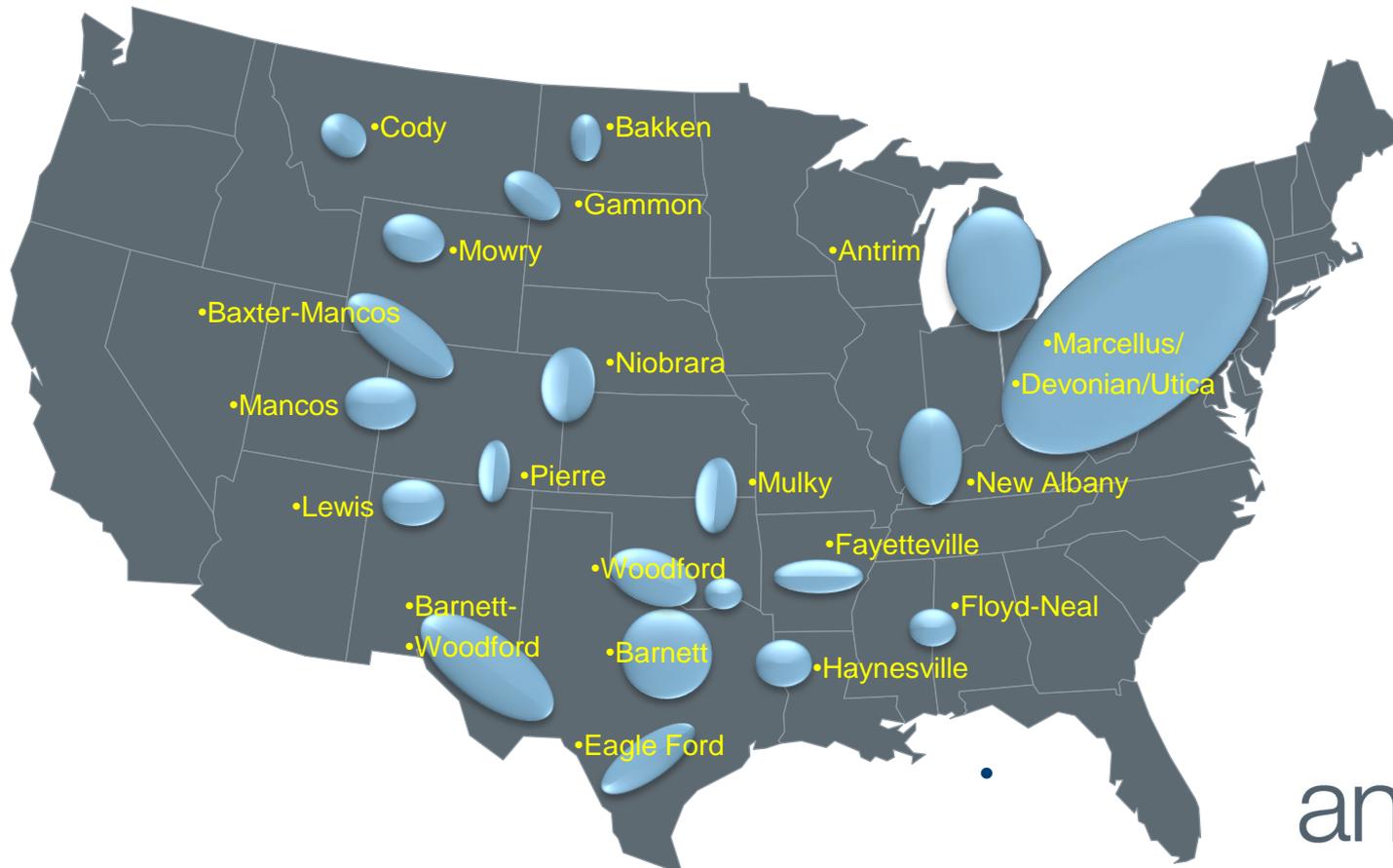
- \$133 billion in value-added economic output
- 1.3 million total jobs, 12% of total employment
- \$60.3 billion in total labor income
- Nearly \$10 billion in state taxes and royalties in 2008
- Ad valorem taxes assessed in 2009: \$107 billion

Natural Gas: The Lifeblood of Texas

- State Fiscal Impact
 - Nearly \$10 billion in state taxes and royalties in 2008
 - 95% of the Rainy Day Fund generated from taxes on E&P industry (~\$8 billion balance)
- Local Fiscal Impact
- Ad valorem taxes assessed in 2009: \$107 Billion
- Valuations assessed in 1,033 of the total 1,563 school districts
- E&P ad valorem taxes support 66% of Texas school systems

Shale Gas Revolution Began in Texas

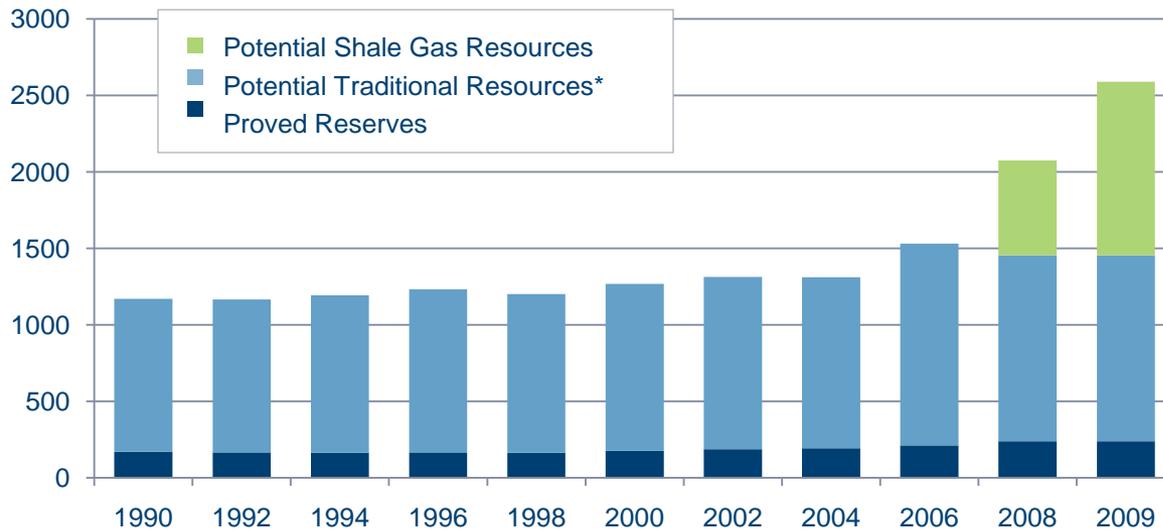
- U.S. natural gas reserves have increased by more than 70%



Source: NPC 2003, PGC 2009, EIA, INGAA, others

Abundance: Potential Gas Committee Report

Total Potential Natural Gas Resources
(trillion cubic feet)



2,074 TCF

Future Supply in 2008

58%

Increase 2004-2008

100+ YEARS

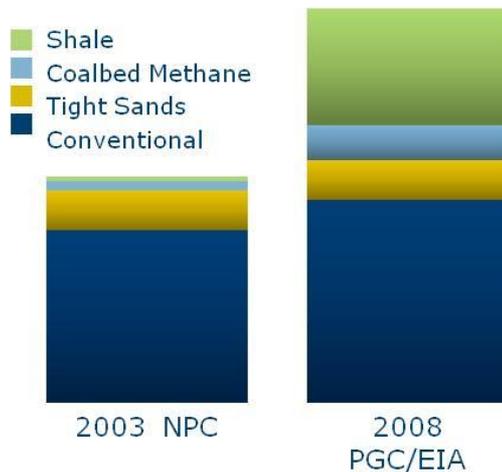
Supply Here in the US

*From 1990-2006, traditional resources include shale gas, which was not broken out separately by the PGC until 2008.

Stable Supplies = Stable Prices

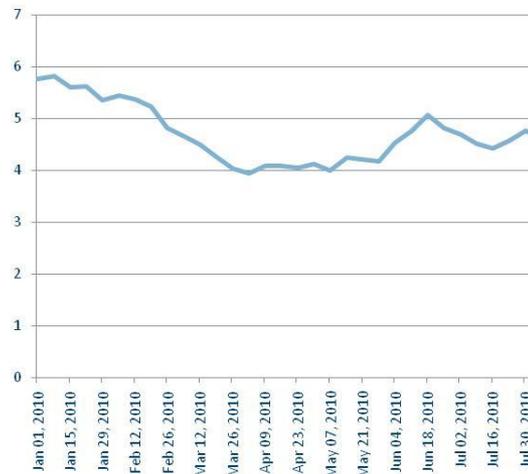
- U.S. natural gas reserves have increased by more than 70%
- Price volatility has declined sharply, even though still at an early stage of developing new sources of supply, due to:
 - Prolific on-shore production of gas from shale
 - Vastly expanded pipeline distribution system

U.S. NG Production at 100 Years

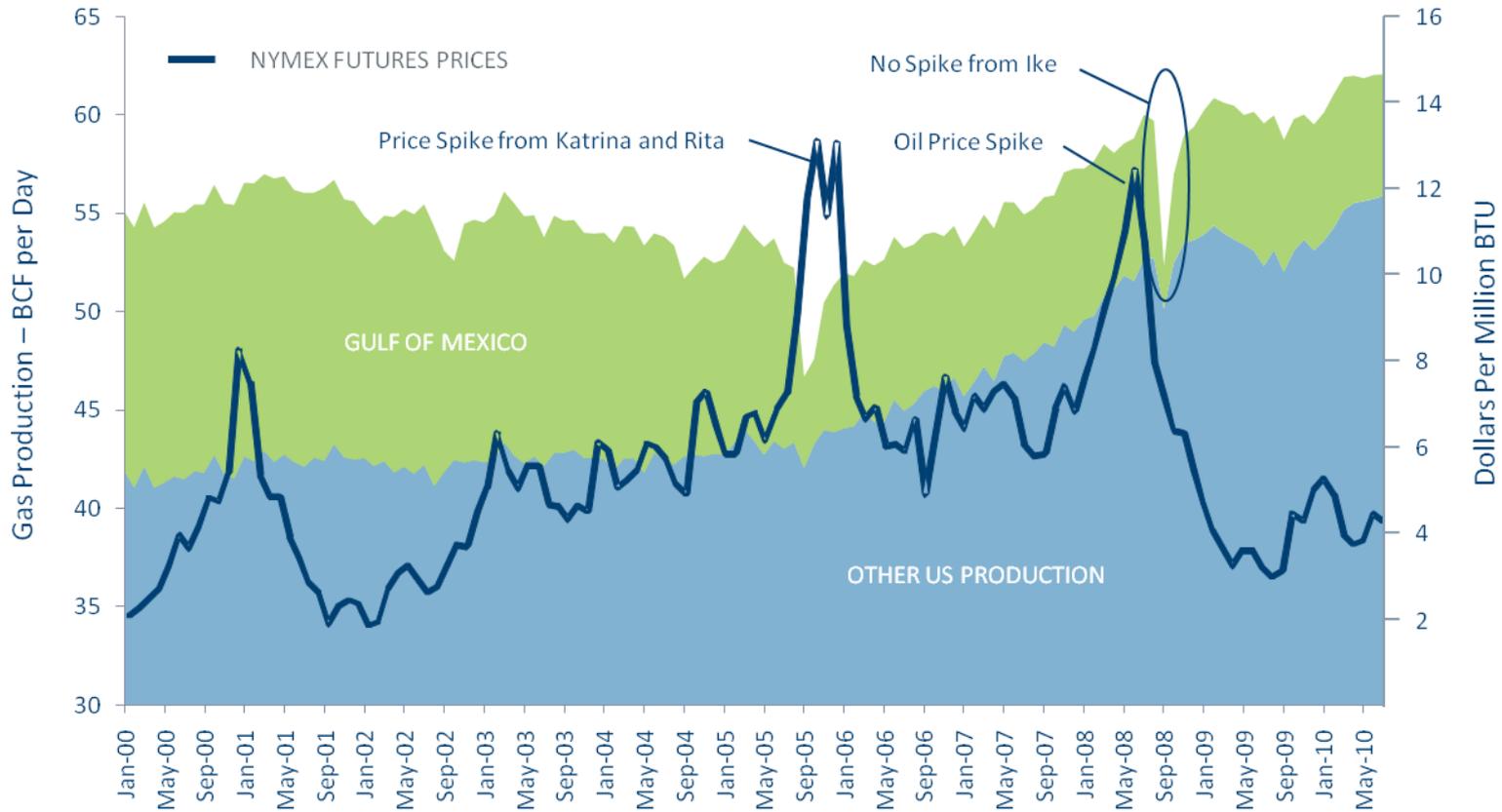


Natural Gas Futures (NYMEX)

(Dollars/Mil. BTUs)



Reducing Volatility Through Greater Supply

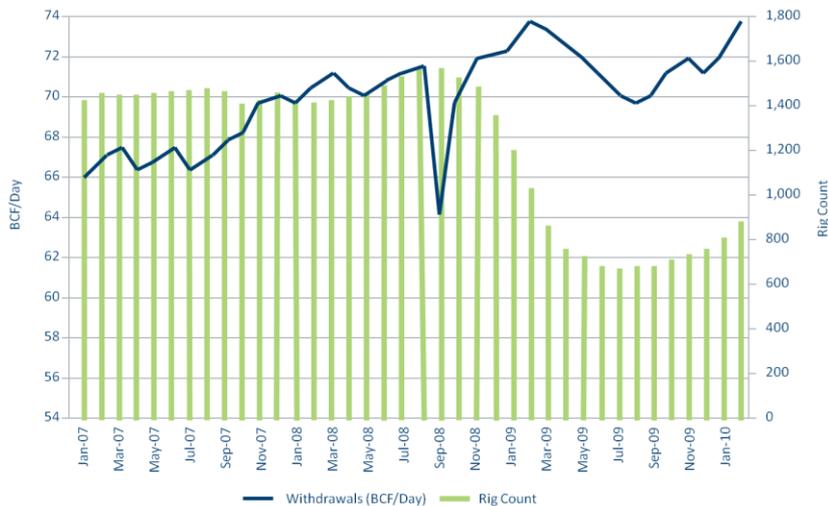


Source: EIA

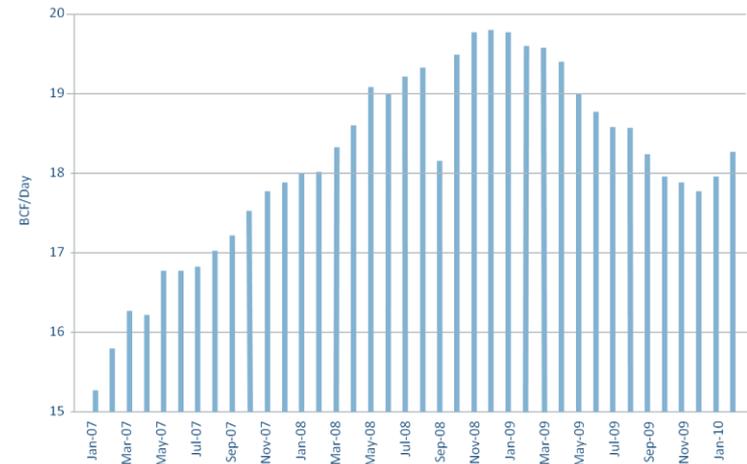
Drilling Cutbacks, Production Highs

- Productivity from newly drilled wells has been growing dramatically
- Despite 40% + drop in rig count, U.S. production is setting new records
- Texas production peaked earlier, but has recently begun to rebound

L48 Production vs. Rig Count



Texas Marketed Production



Cleaner Power Generation

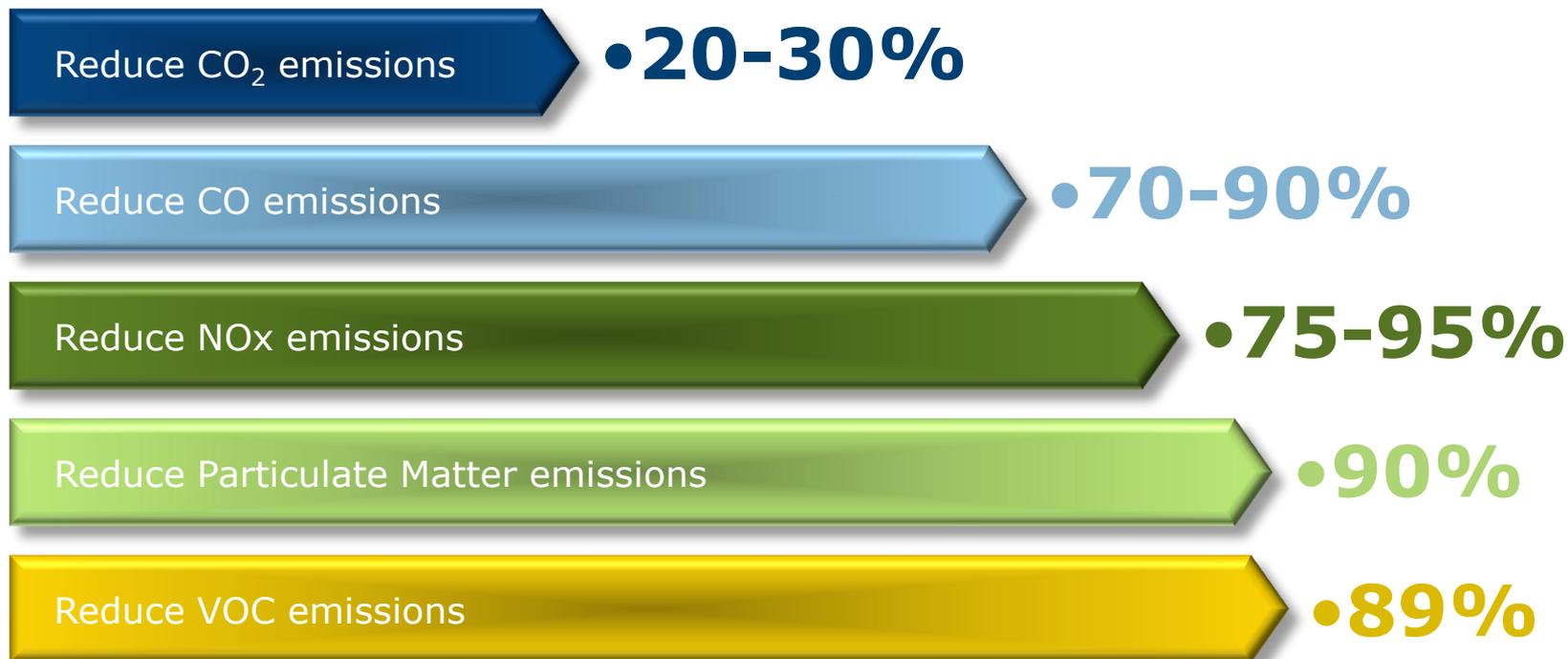
Natural Gas = Fewer Emissions

(Pounds per Billion BTU of Energy Input)

	Natural Gas	Coal
Carbon Dioxide	117,000	208,000
Carbon Monoxide	40	208
Nitrogen Oxides	92	457
Sulfur Dioxide	1	2,591
Particulates	7	2,744
Mercury	0	0.016

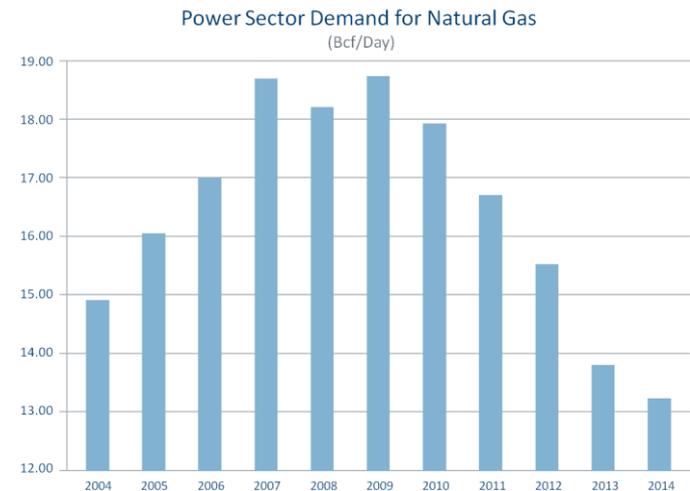
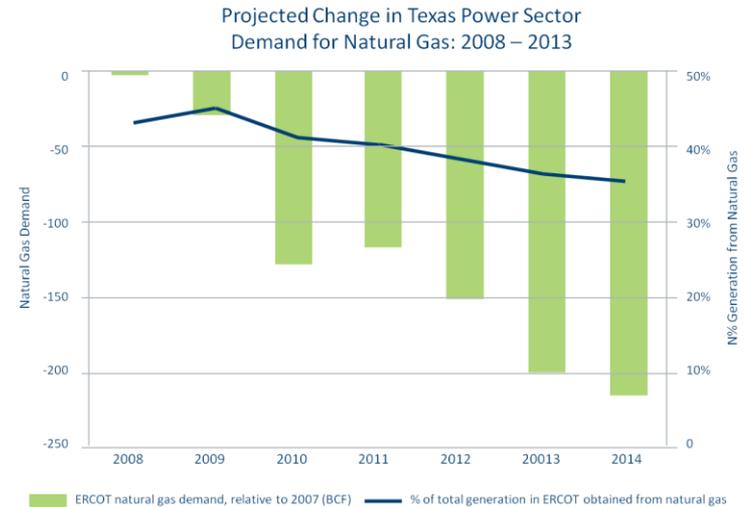
Cleaner Transportation

- Natural gas vehicles...



Projected Use of Natural Gas in Texas

- Texas currently uses more natural gas for electric generation than any other state
 - But ERCOT projects 35.7% decline between 2008 and 2013
- Statewide decline could be as much as 1.5 to 1.75 Bcf per day
- Nationally, EIA projects 5.6 Bcf per day decline in power sector use of natural gas
- Further increases the amount of natural gas available to reduce ozone and control emissions of SO₂, NO_x, particulate matter, mercury and CO₂



Cleaner Air for Texas Cities

- The use of available natural gas in Texas can help to control emissions of SO₂, NO_x, fine particulates, mercury and CO₂ – and significantly reduce ozone concentration levels in major urban areas in Texas.

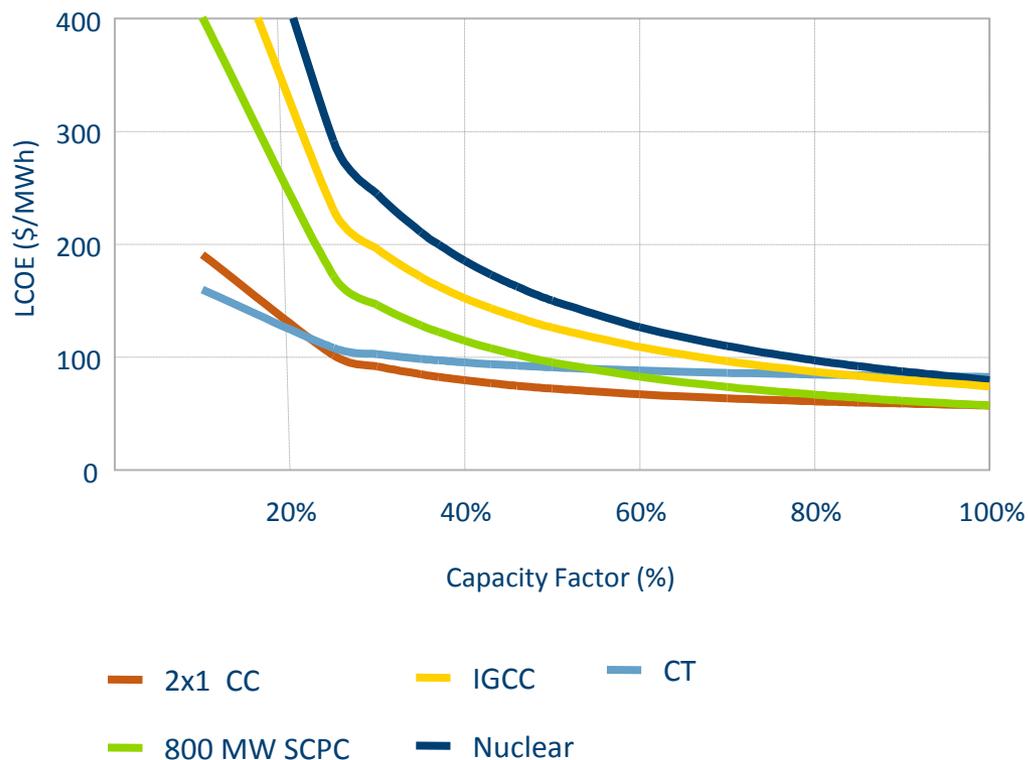
Emissions: Pounds Per Year

	Coal	Natural Gas	
Carbon Dioxide	66,670,232,070	25,659,266,948	→ 41 billion pounds less CO ₂
Carbon Monoxide	66,670,232	8,772,399	→ 57 million pounds less CO
Nitrogen Oxides	146,482,193	20,176,518	→ 126 million pounds less NO _x
Sulfur Dioxide	830,493,131	219,310	→ 830 million pounds less SO ₂
Particulates	879,534,215	1,535,170	→ 877 million pounds less PM
Mercury	5,128	0	→ No mercury

Price-Competitive for Power Generation

- Lowest cost alternatives are CTs for peaking, CCs for mid-range, and SCPC (conventional coal) for baseload.
- Renewables have limitations on capacity factor, shown for relative comparison purposes. Capital costs net of ARRA tax credit.
- PV is lowest cost among solar; solar thermal with storage allows for higher capacity factors, but costs more.
- No CO₂ or transmission costs considered.

Comparison of Levelized Cost of Electricity



Key Assumptions: Delivered fuel price (\$2009\$/Mmbtu): natural gas = \$5.59, coal = \$1.80

Renewables Need Clean, Reliable Backup

- Natural gas-fired generation is essential to balance swings in wind and solar
 - Keeping grid in perfect balance 24 X 7 is a daunting challenge, especially if 18,000 MW of wind generation is on line by 2013
- Natural gas is a reliable, stable source of supply
- Without adequate back-up, over-dependence upon intermittent resources is risky
 - Large amounts of intermittent resources can drop off-line suddenly, creating potential for large-scale service disruptions
- Grid must be operated to minimize both reliability and costs
 - Potential for huge hour-to-hour or day-to-day swings in use requires careful management to avoid needless cost increases

Utilities Choosing Natural Gas

"Gas-Fired Idaho Power Plant Approved"

Idaho Statesman, 9/2/2009

"Power plant developer will use natural gas instead of coal..."

Las Vegas Sun, 3/22/2010

"Traverse City Light & Power Scraps Plan for Biomass Plant, Opts for Gas."

Bloomberg, 6/28/2010

"Calpine Approved for 600MW Natural Gas-Fired Plant"

Power-Gen Worldwide, 2/4/2010

"Tennessee Valley to Build Natural Gas Power Plant"

Associated Press, 6/4/2009

"Natural Gas Should Be Key In Energy Planning..."

San Antonio Express-News, 6/2/2010

"N.C. Regulators Approve Plan to Build Natural Gas-Fueled Power Generation"

WWAY News, 6/9/2010

"Natural Gas is Good for Texas and the Environment"

Corpus Christi Caller-Times, 7/2/2010

"Renewables Need Helping Hand From Gas"

San Diego Union-Tribune, 5/23/2010

"Move to Natural Gas Helps Clear the Air..."

Denver Post, 4/4/2010

Texas Can Set Example for Rest of U.S.

- Huge benefits can be achieved nationally by expanding the use of natural gas
- But many decisions can only be made on a state-by-state basis
- Most other states are not yet focusing on opportunities created by rapidly expanding supplies
 - Unique opportunity for Texas to take the lead
- Major potential benefits for Texas economy, at the same time emissions can be controlled cost-effectively – on a nationwide scale



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