



Status of U.S. Energy Policy and Outlook for the Future

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Public Utility Research Center

Research

Expanding the body of knowledge in public utility regulation, market reform, and infrastructure operations (e.g. benchmarking studies of Peru, Uganda, Brazil and Central America)

Education

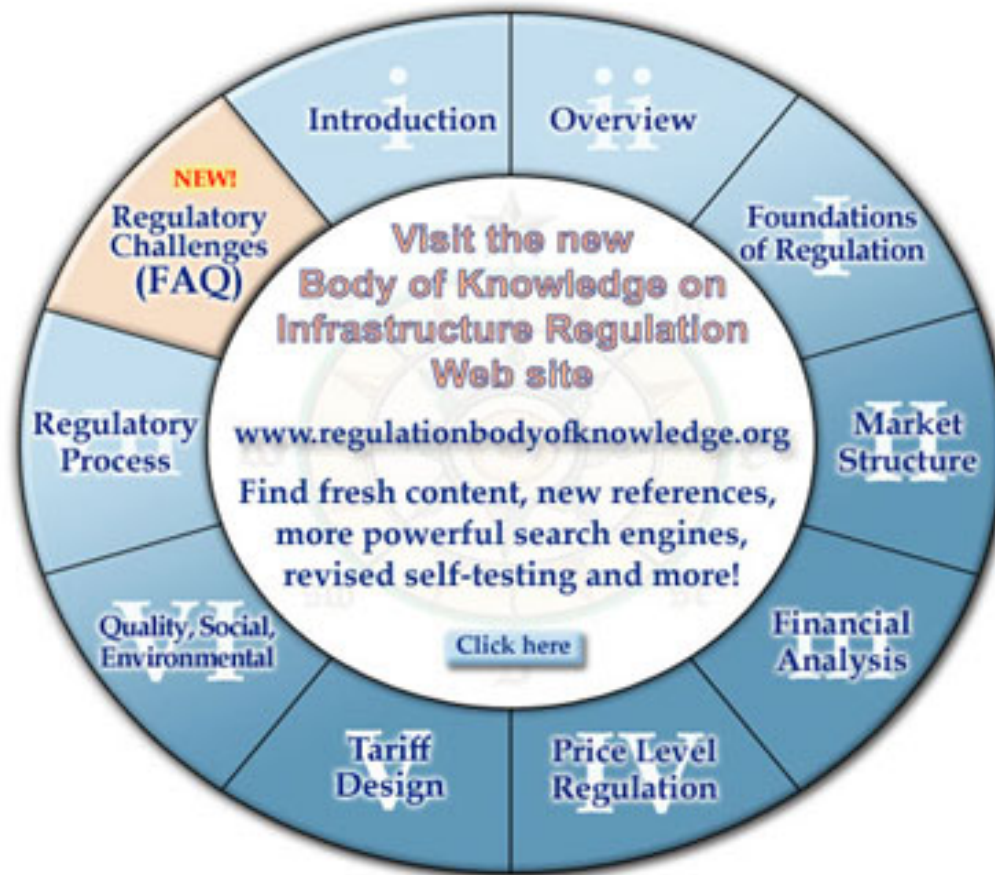
Teaching the principles and practices that support effective utility policy and regulation (e.g. PURC/World Bank International Training Program on Utility Regulation and Strategy offered each January and June)

Service

Engaging in outreach activities that provide ongoing professional development and promote improved regulatory policy and infrastructure management (e.g. in-country training and university collaborations)



The Body of Knowledge on Infrastructure Regulation





The Body of Knowledge on Infrastructure Regulation

www.regulationbodyofknowledge.org

8 New “Regulatory Challenges” on Clean Energy and Energy Efficiency about to be Released!



1. In terms of broad public policy, what is the role of the sector regulator in promoting renewable energy (RE) and energy efficiency (EE)?
2. What are standards that regulators can use to evaluate different approaches toward promoting renewable energy development and energy Efficiency?
3. What are the regulatory issues presented by renewable technologies (solar, wind, biomass, geothermal, and hydropower) and what are the basic characteristics of these options?
4. What are the different approaches for promoting renewable energy development and the role of the regulator under each approach?
5. If a government decides to consider feed-in tariffs (FITs) as a tool to promote distributed generation via renewable energy, what are the regulatory steps that should be taken to these implement rules?
6. If the government decides to use purchase power agreements as a tool to obtain renewable energy, what are the regulatory steps that should be taken to implement rules?
7. What is the role of the regulator in clean energy and energy efficiency?
8. How have countries linked policymaking related to energy efficiency to regulatory functions?



Outline

- State of Carbon Policy
- The EPA as Energy Policy Arm
- Role of Natural Gas
- Clean Energy Standards
- Nuclear Energy



Carbon Policy in the U.S.

- No further movement since Waxman-Markey and Kerry-Boxer bills died
- State of the economy has reduced the willingness of the administration to address emissions reduction through an explicit carbon tax
- Likely no movement until the economy begins to show improvement
- Likely no movement with a change in administration
- Significant long term investments are being made, making some assumption about carbon prices
- Some are going to be wrong, leading to stranded assets



Status of EU Emissions Trading

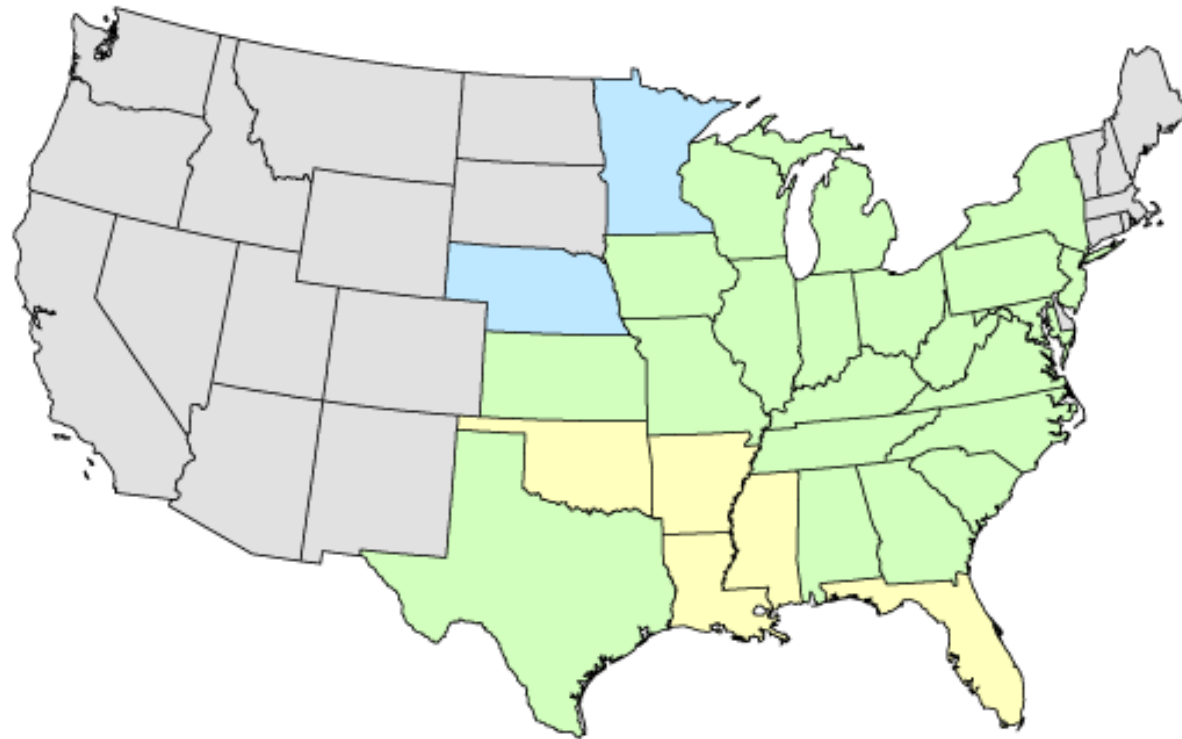
- EU includes air transportation this year
- Still some uncertainty about what Phase III will look like in 2013
- Decline in energy use as a result of the recession has led to surplus of allowances
- EU seems to want to hold non-EU airlines liable, as European Court of Justice Advocate General disagreed with arguments by North American airlines
 - Airlines get 85% of their allowances free in 2012, falls to 82% for Phase III
 - Obama Administration fighting the inclusion of U.S. airlines
 - Chinese government has banned its airlines from participating in ETS



Cross-State Air Pollution Rule

- Revised rule to control SO₂ and NO_x emissions, replacing CAIR
- Initial allowance allocation this past summer caused significant outcry, most notably in ERCOT
- EPA revised allowance allocation in the fall, but some states remain in significant short positions
- With stay from DC court, CAIR is still in place with CSAPR implementation now delayed from 2012 until 2014

EPA Map of Transport Rule States



- States controlled for both fine particles (annual SO₂ and NO_x) and ozone (ozone season NO_x) (21 States)
- States controlled for fine particles only (annual SO₂ and NO_x) (2 States)
- States controlled for ozone only (ozone season NO_x) (5 States)
- States not covered by the Cross-State Air Pollution Rule



Balance between 2012 Allowance Allocation and 2010 Emissions

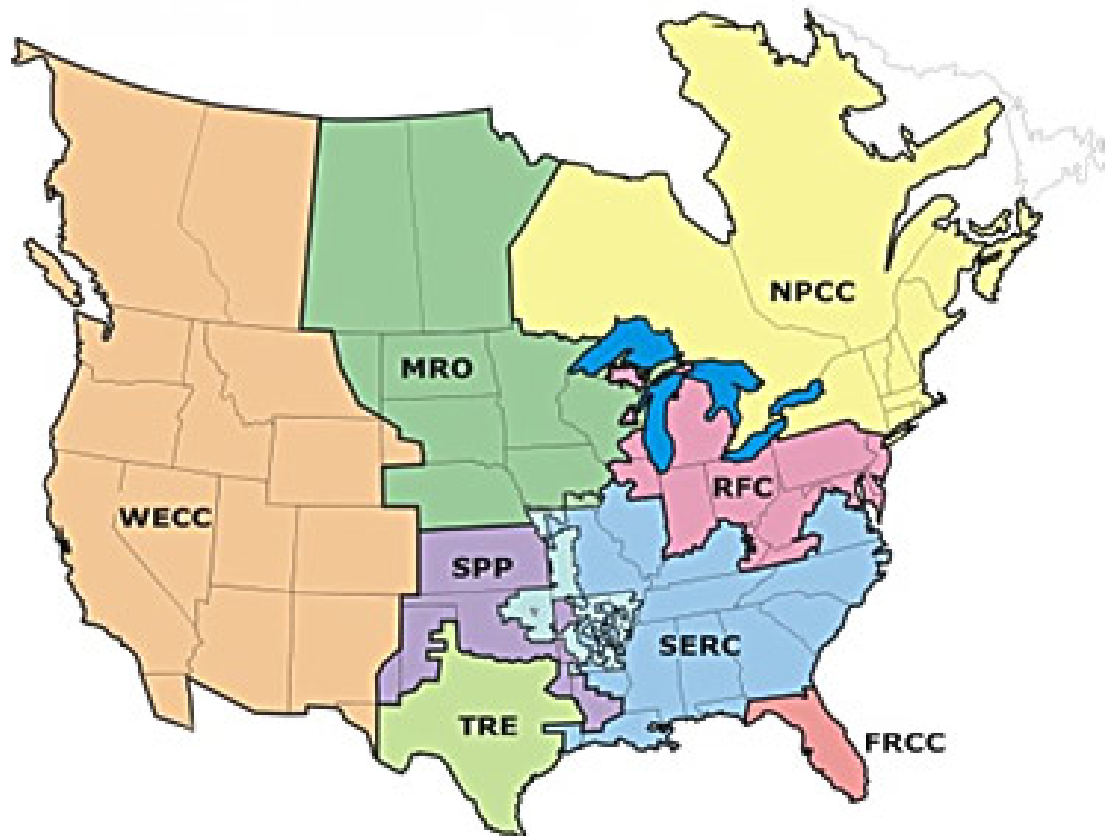
State	SO ₂	State	NO _x
West Virginia	26,877	South Carolina	4,257
Tennessee	26,466	Alabama	3,618
Alabama	7,518	West Virginia	3,198
North Carolina	5,540	Georgia	185
Illinois	3,047	Tennessee	-55
Iowa	278	New Jersey	-1,297
Maryland	-433	Minnesota	-2,196
Minnesota	-435	New York	-2,859
Nebraska	-1,736	Maryland	-3,146
Kansas	-4,558	Wisconsin	-3,579
New Jersey	-7,756	Arkansas	-3,636
South Carolina	-7,808	Indiana	-3,692
Michigan	-18,707	Mississippi	-4,040
New York	-19,342	Kentucky	-4,350
Virginia	-25,403	Louisiana	-6,040
Missouri	-32,881	Texas	-6,045
Wisconsin	-33,136	Virginia	-6,724
Kentucky	-52,681	North Carolina	-7,078
Georgia	-63,566	Missouri	-7,426
Indiana	-135,697	Iowa	-7,480
Pennsylvania	-140,368	Ohio	-8,319
Texas	-162,586	Kansas	-9,072
Ohio	-268,097	Florida	-9,254
		Nebraska	-15,621
		Pennsylvania	-15,765
		Michigan	-21,402
		Illinois	-32,267
		Oklahoma	-71,433



Mercury and Air Toxic Standards

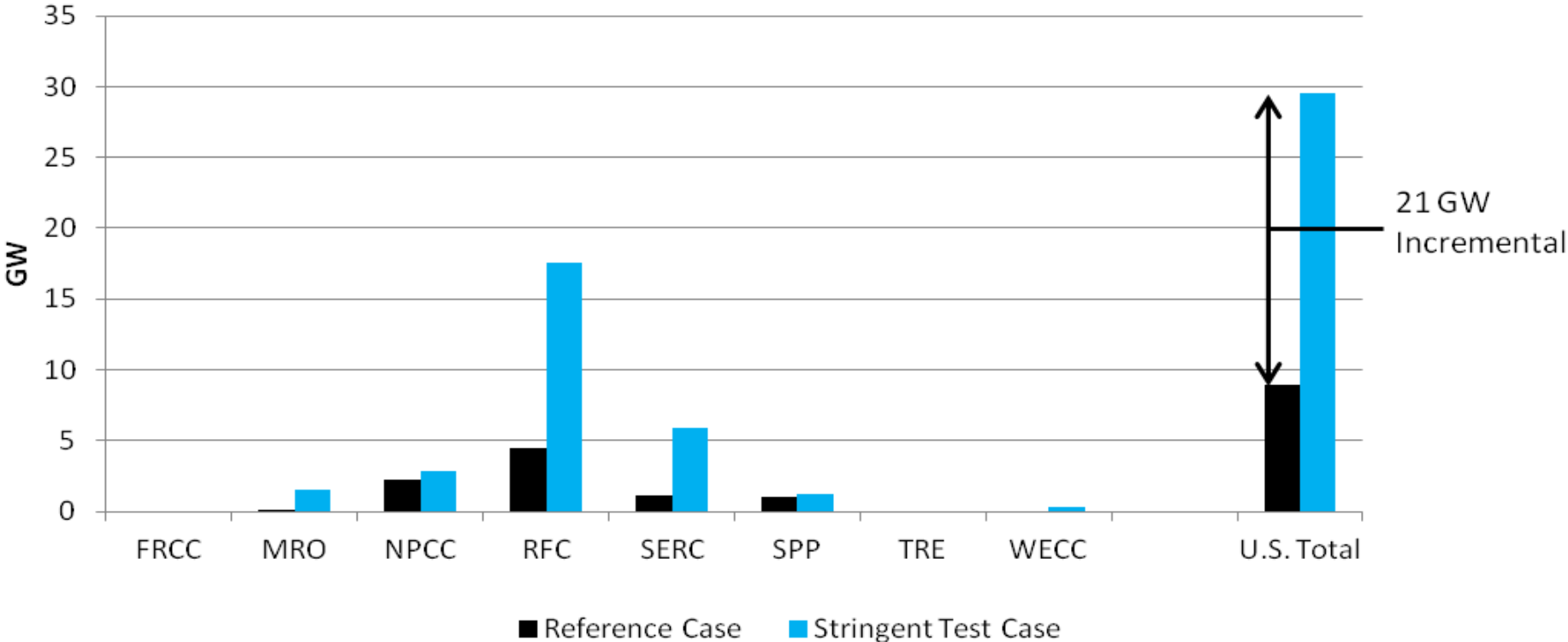
- Apply to all coal and oil-fired units 25 MW or greater
- Compliance scheduled to begin in 2015, but state authorities can authorize an additional year
- New construction must be as effective as *any* current comparable unit
- Existing construction must be as effective as the top 12% of existing comparable units
- EPA may regulate beyond these standards

NERC Planning Regions



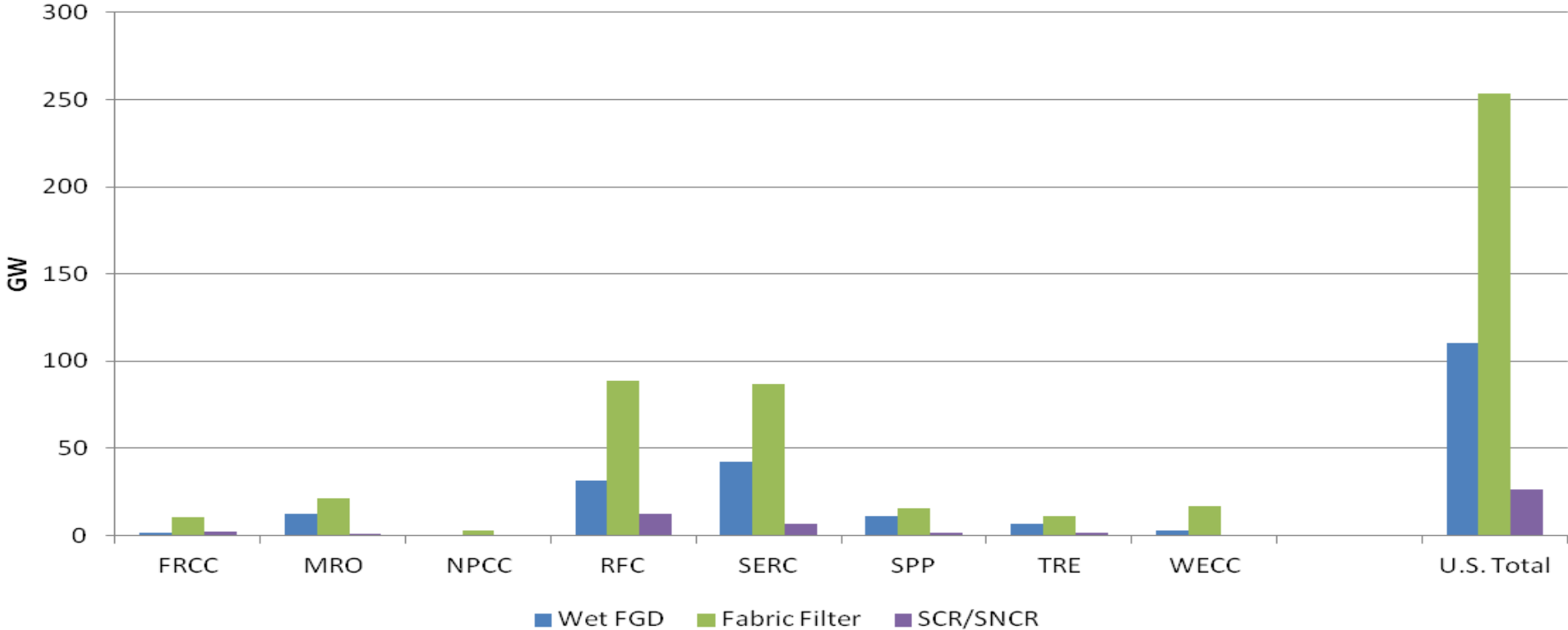
DOE Impact Assessment

Cumulative Coal Retirements by 2015 (Reference Case and Stringent Test Case)



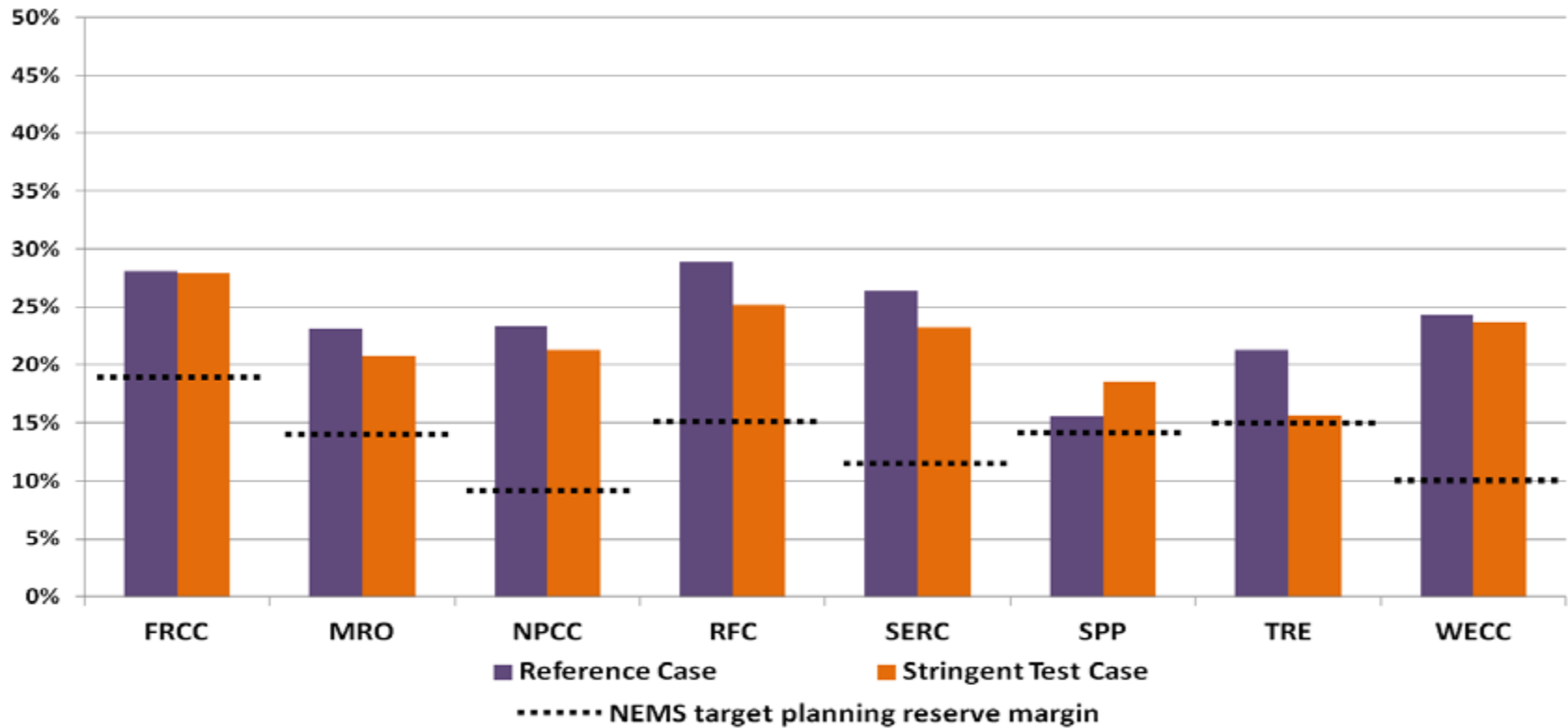
DOE Impact Assessment

Cumulative Retrofitted Capacity by 2015 (Stringent Test Case)



Impact on Reserve Margins

2015 Planning Reserve Margins by NERC Region and Scenario
(Reference Case and Stringent Test Case)





EPA Regulation of Coal Ash

- Coal ash regulation in the wake of the 2008 containment failure at TVA's Kingston plant
- Two proposals for regulation
 - Ash as hazardous waste; provide standards for disposal
 - Ash as non-hazardous waste; supply guidelines for disposal, but states establish guidelines
- Environmental groups recently sued EPA over 'refusal' to regulate coal ash



EPA Draft Emissions Rule for New Power Plants

- Draft rule issued on March 25
- Would limit CO₂ emissions from new power plants to 1,000 pounds per MWh
- Plants must achieve emissions standard *on average* over 30 years
- Criticism stems from current problems with CCS technology
- Possible precedent in new natural gas rules

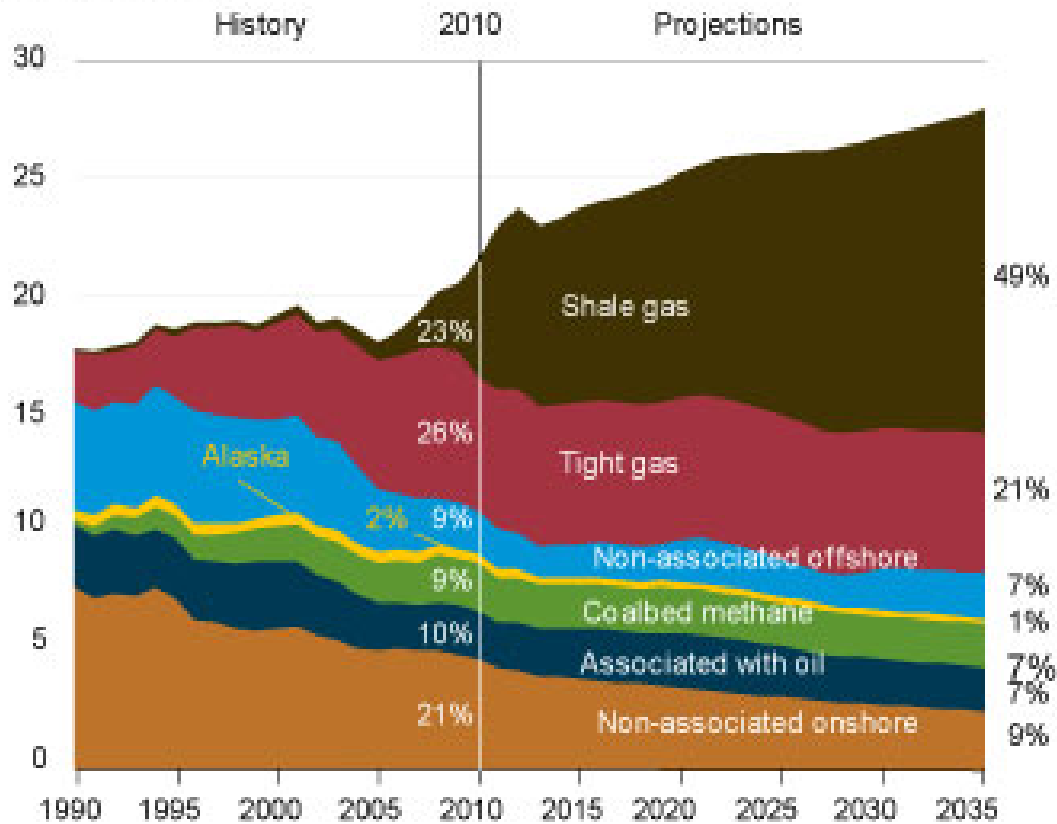


Natural Gas

- U.S. now expected to become net exporter of LNG around 2016, and net exporter of all natural gas in 2021
- New rules for natural gas drilling on Federal lands could surface shortly from Department of the Interior, but were expected last fall
- Focus on chemical disclosure requirements, well integrity, and well construction
- Difficult to assess costs before rules are known, but certain to increase
- New EPA rule focuses on air pollution at well sites
 - Requires capture by 2015, allows flaring until then



Figure 2. natural gas production, 1990-2035
(trillion cubic feet)





Role of Shale Gas

- Shale gas represents roughly one third of the U.S. natural gas reserves
- U.S. has roughly 100 years' worth of reserves at current production (and consumption) rates, if reserve estimates do not change

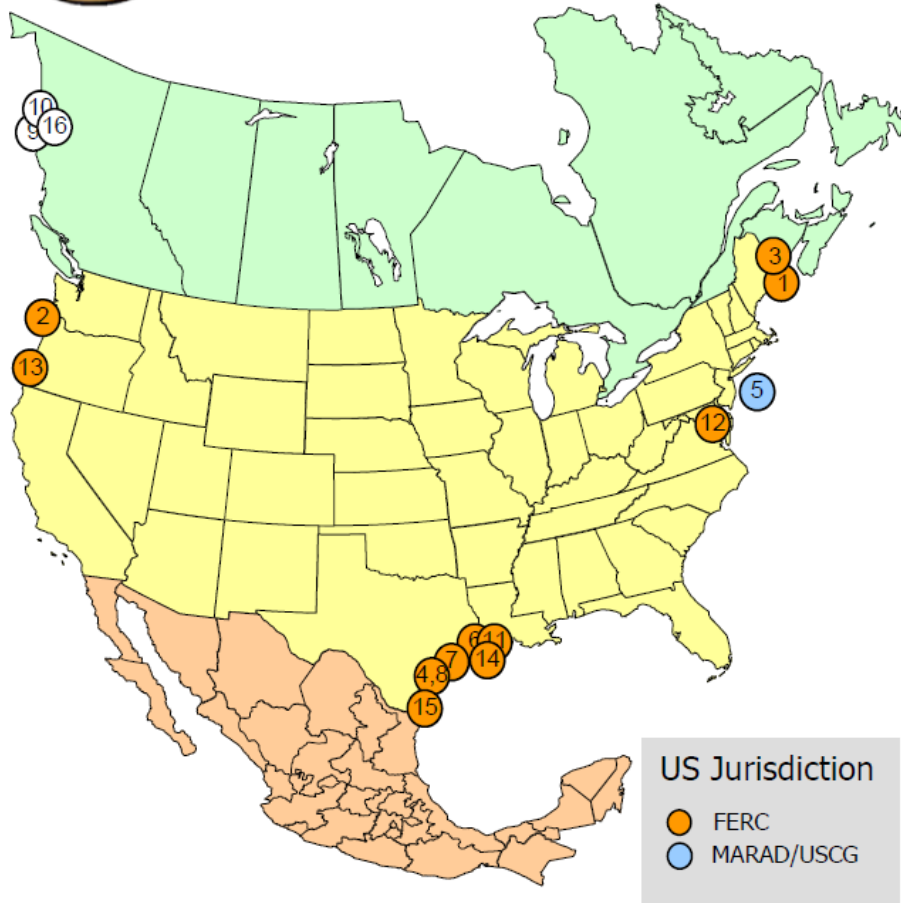
World LNG Estimated April 2012 Landed Prices





North American LNG Import/Export Terminals

Proposed/Potential



Import Terminal

PROPOSED TO FERC

1. **Robbinston, ME:** 0.5 Bcfd (Kestrel Energy - Downeast LNG)
2. **Astoria, OR:** 1.5 Bcfd (Oregon LNG)
3. **Calais, ME:** 1.2 Bcfd (BP Consulting LLC)
4. **Corpus Christi, TX:** 0.4 Bcfd (Cheniere – Corpus Christi LNG)

PROPOSED TO MARAD/COAST GUARD

5. **Offshore New Jersey:** 2.4 Bcfd (Excalibur Energy – Liberty Natural)

Export Terminal

PROPOSED TO FERC

6. **Sabine, LA:** 2.6 Bcfd (Cheniere/Sabine Pass LNG)
7. **Freeport, TX:** 1.8 Bcfd (Freeport LNG Dev/Freeport LNG Expansion/FLNG Liquefaction)
8. **Corpus Christi, TX:** 1.8 Bcfd (Cheniere – Corpus Christi LNG)

PROPOSED CANADIAN SITES IDENTIFIED BY PROJECT SPONSORS

9. **Kitimat, BC:** 0.7 Bcfd (Apache Canada Ltd.)
10. **Douglas Island, BC:** 0.25 Bcfd (BC LNG Export Cooperative)

POTENTIAL U.S. SITES IDENTIFIED BY PROJECT SPONSORS

11. **Lake Charles, LA:** 2.0 Bcfd (Southern Union & BG LNG)
12. **Cove Point, MD:** 1.0 Bcfd (Dominion – Cove Point LNG)
13. **Coos Bay, OR:** 1.2 Bcfd (Jordan Cove Energy Project)
14. **Hackberry, LA:** 1.7 Bcfd (Sempra – Cameron LNG)
15. **Brownsville, TX:** 2.8 Bcfd (Gulf Coast LNG Export)

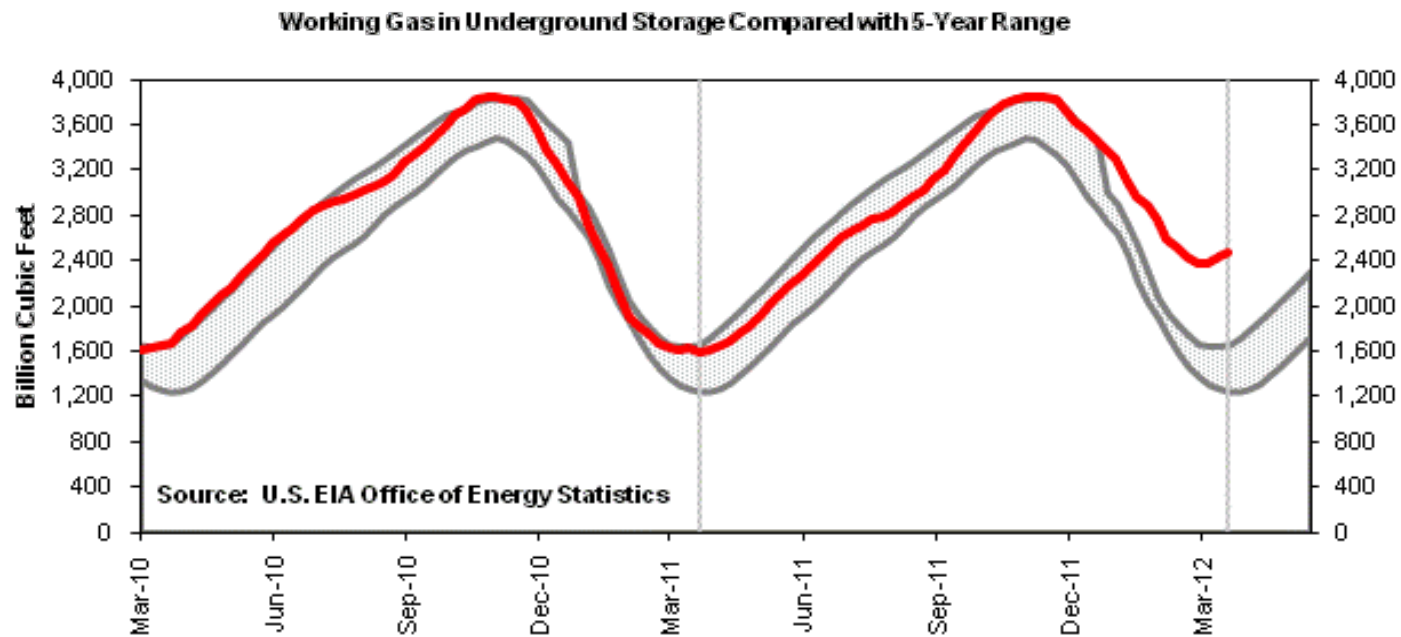
POTENTIAL CANADIAN SITES IDENTIFIED BY PROJECT SPONSORS

16. **Prince Rupert Island, BC:** 1.0 Bcfd (Shell Canada)

As of February 28, 2012

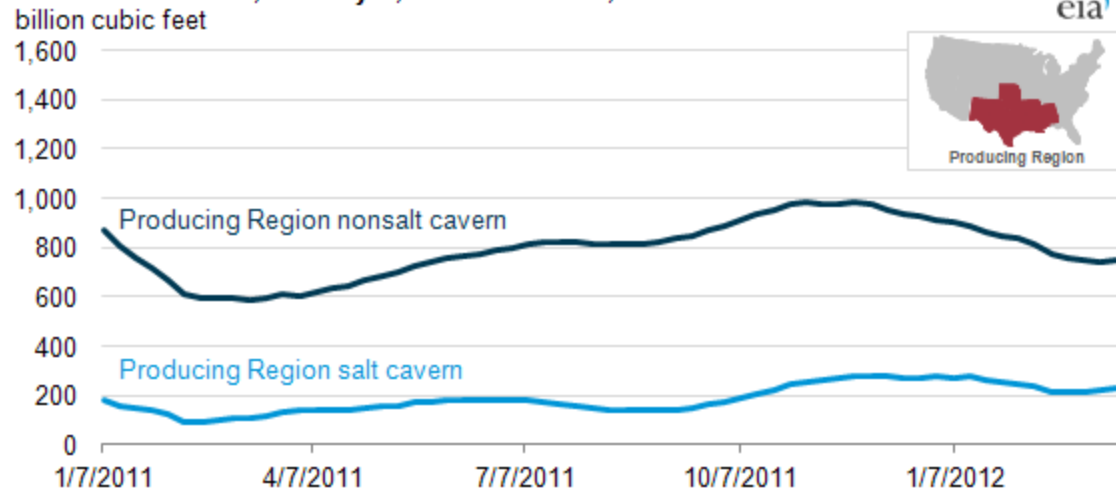
Office of Energy Projects

Natural Gas in Storage





Weekly Producing Region underground natural gas storage inventories, salt cavern and nonsalt cavern, January 7, 2011 - March 16, 2011



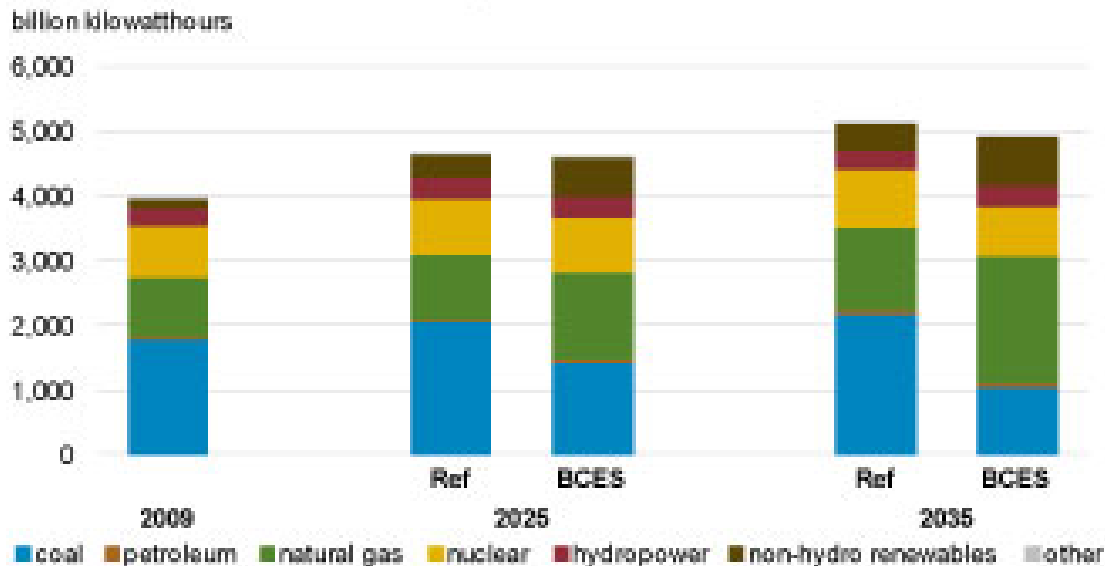


Clean Energy Standards

- The mandate to produce a certain amount of electricity from renewable (alternatively clean) energy sources
- Popular market structure
 - Generators receive credits (RECs) for the production of renewable energy
 - Distributors purchase RECs from generators (and pass costs on to customers) and surrender them to the regulatory authority
- EIA Conducted a study of the Bingaman Clean Energy Standard (introduced March 1) in December
 - 45% clean energy by 2015
 - 95% clean energy by 2050
 - Fossil plants can earn ‘partial’ credits

EIA BCES Analysis

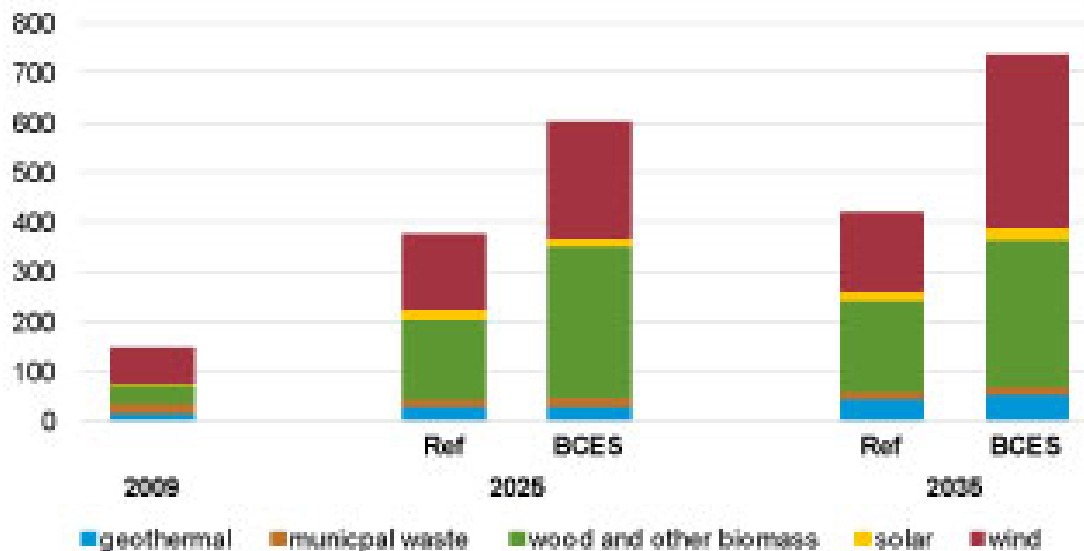
Figure 1. Total Net Electricity Generation



EIA BCES Analysis

Figure 2. Total Non-Hydroelectric Renewable Generation

billion kilowatthours



EIA BCES Analysis

Figure 3. Electricity Sector Carbon Dioxide Emissions

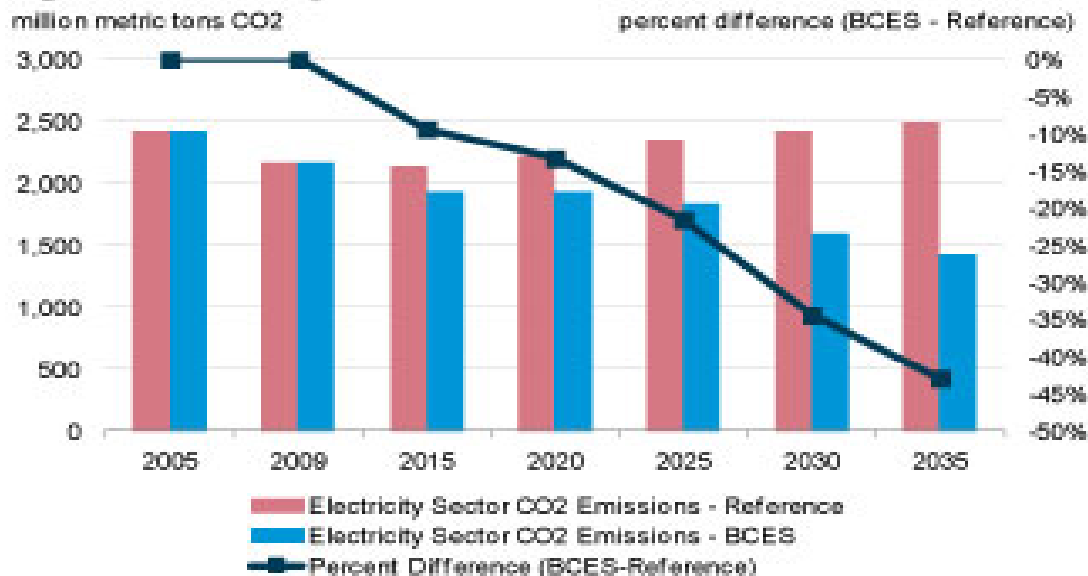


Table 3. BCES Regional End-use Sector Average Prices (2009 cents/kWh)

Region	2009	2025		2035	
		Reference	BCES	Reference	BCES
ERCT - ERCOT All	10.4	9.2	9.0	10.0	11.6
FRCC - FRCC All	11.6	10.9	12.0	11.2	13.6
MROE - MRO East	9.3	7.5	7.0	7.3	5.9
MROW - MRO West	7.6	6.8	8.0	6.9	8.9
NEWE - NPCC New England	15.7	13.6	12.2	13.1	14.3
NYCW - NPCC NYC/Westchester	19.9	16.8	16.7	16.9	19.6
NYLI - NPCC Long Island	18.1	16.7	17.4	16.6	21.8
NYUP - NPCC Upstate NY	11.6	11.9	11.1	12.6	14.4
RFCE - RFC East	12.2	10.7	11.7	10.9	12.4
RFCM - RFC Michigan	9.6	8.7	9.0	9.0	11.4
RFCW - RFC West	8.6	8.5	8.5	9.9	11.0
SRDA - SERC Delta	7.5	7.3	7.2	7.5	9.7
SRGW - SERC Gateway	7.8	6.5	6.7	7.0	9.6
SRSE - SERC Southeastern	9.1	8.7	8.9	8.5	10.3
SRCE - SERC Central	7.8	6.0	7.2	6.0	10.2
SRVC - SERC VACAR	8.6	8.1	9.1	8.3	11.2
SPNO - SPP North	7.9	7.6	6.9	7.5	8.9
SPSO - SPP South	6.9	7.8	8.0	8.5	10.4
AZNM - WECC Southwest	9.8	9.5	9.5	10.4	11.3
CAMX - WECC California	13.3	14.6	13.1	13.2	14.0
NWPP - WECC Northwest	7.0	4.6	6.4	5.2	8.4
RMPA - WECC Rockies	8.2	9.0	9.4	9.4	11.1
U.S. Average	9.8	9.0	9.4	9.4	11.3

BCES electricity price is 10-25 percent greater than the Reference case electricity price

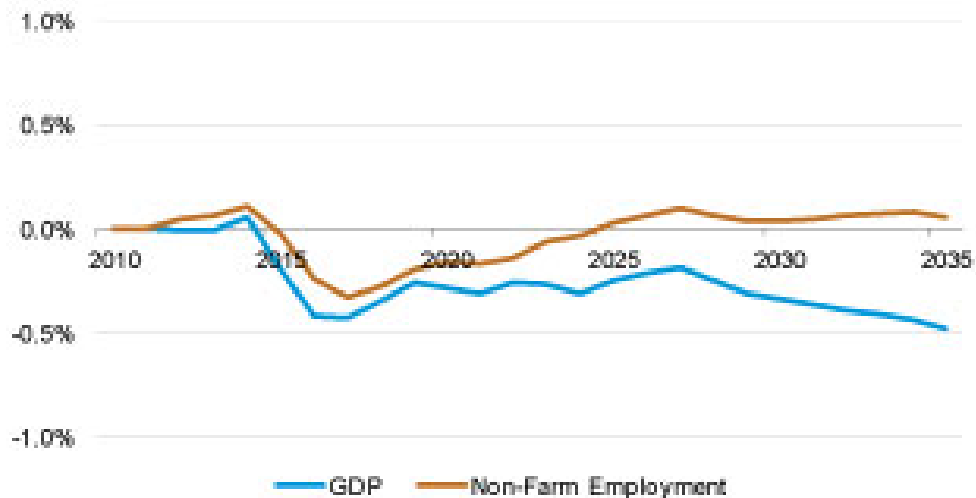
BCES electricity price is 25 percent or more greater than the Reference case electricity price

Source: U.S. Energy Information Administration. National Energy Modeling System, runs refhall.d082611b and cesbingbk.d100611a.

Note: See Appendix C for a map of the NEMS electricity market module regions.

Employment and GDP Impact

Figure 8. BCES Impact on Employment and Real GDP, Percent Difference (BCES Difference from Reference case)





Nuclear Outlook

- Fukushima Daiichi accident led to a reevaluation of nuclear energy
- Will concern over recent diesel generator failures in Virginia and Alabama in the aftermath of natural disasters lead to new safety standards
- China has announced that it plans to use nuclear generation to reduce emissions relative to growth
- Germany shut down 8 nuclear plants in March 2011
 - Announced plans to shut down all nuclear generators by 2022, but preliminary analyses show that most of this generation shortfall will be absorbed by imported nuclear and coal
 - Already changed from a net exporter to importer of nuclear energy since shutdown began
- EIA latest projections include a ‘60 year nuclear’ scenario where prices increase 4% over reference case



Blue Ribbon Panel Preliminary Report

- Consent-based approach to siting waste management facilities (such as Sweden's)
- New organization solely dedicated to nuclear waste management
- Access to funds already collected for disposal
- Develop geologic disposal facilities
- Develop consolidated interim storage facilities
- Continued U.S. innovation in nuclear energy technology
- Active U.S. leadership in international efforts for safety, waste management, and security



Conclusions

- EPA continues to develop policy initiatives
- Uncertainty around the form that environmental regulations will eventually take
- Concern over the cost of the regulation without regard for the fact that delay costs money as well
- Flexibility and communication are essential to addressing the challenges



Thank You

- Ted Kury

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