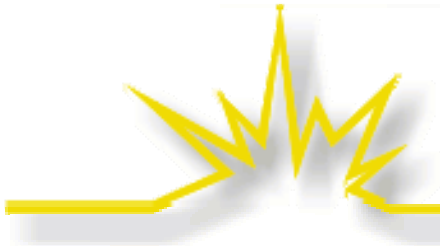
Natural Gas
Pressure on the Status Quo and Energy Efficiency

Workshop for Michigan PSC
April 3, 2007
Richard Sedano and Wayne Shirley



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Introduction

Regulatory Assistance Project

RAP is a non-profit organization, formed in 1992, that provides workshops and education assistance to state government officials on electric utility regulation. RAP is funded by the Energy Foundation, US EPA & US DOE.

Richard Sedano was Commissioner of the Vermont Department of Public Service, 1991-2001

Wayne Shirley was Chair of the New Mexico Public Utilities Commission 1995-1998

The Regulatory Assistance Project

- RAP Mission:

RAP is committed to fostering regulatory policies for the electric industry that encourage economic efficiency, protect environmental quality, assure system reliability, and allocate system benefits fairly to all customers.

Natural Gas Trends

- Pressure on Demand
  - Still the marginal new generation fuel
    - On the margin ~half the time for Michigan market
  - End use demand strong despite efficiency boost
- Pressure on Supply
  - Production declining
  - More contention for gas from other countries
- Pressure on Prices
  - Risk management task evolving

Energy Efficiency More Important

- Reduce Demand Pressure (Reduces Prices)
  - Barriers to cost-effective energy efficiency
  - Regional effort needed for significant results
  - Connection to electric sector very clear
    - Generation competing with gas end uses
  - Climate change strategy and compliance
  - Attrition may slow or stop
- NARUC Resolutions

Natural Gas Energy Efficiency

- Not as important as electricity efficiency for purpose of reducing gas demand and lowering pressure on prices.
- Is very important as a starting point for improving efficiency resource policies, especially decoupling because state regulators very focused and concerned.

Gas Efficiency Programs

- Furnace replacement rebates.
  - $250 rebates on $4000-5000 furnace.
    - Probably not big enough.
- Water heating.
- Building shells. Attics.
- Heat pumps.
- Process improvements for industry.

Electric / Gas End Use Competition

- Some states require all fuels (fuel neutral) analysis (CT, VT, WI)
  - Has been very difficult except for joint gas/electric utilities
  - Especially regarding fuel switching
- Decoupling helps – some.
- TRC analysis looks at avoided equipment costs as well as fuel.

Full Fuel Cycle Costs

- Energy efficiency from extraction to end use and all steps in between (not just site)
- Gas looks very good in residential and heating applications. 90% efficient.
- Electricity generation about 30% efficient – for all fossil fuels.
- Natural gas generator efficiency: 40%+.
- Coal generator efficiency: high 30%+

Utility Incentives & Energy Efficiency

Michigan PSC Informational Workshop
April 3, 2007

Presented by
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Approaches to Address Utility Incentives for Energy Efficiency

- Lost Revenue/Expense Recovery
- Decoupling utility profits from sales volume
- Providing positive incentives for meeting efficiency goals

Net Lost Revenue Recovery

- Adjustment that tracks the implementation of energy efficiency and uses statistical means to determine net lost revenues
- Recovery of net lost revenue can be contingent on achieving certain energy efficiency program goals
- Alternatively, recovery of “program expenses”

Lost Revenue/Expense Approaches

- Kentucky
- Nevada

Lost Revenue/Expense Approaches: Kentucky

- Allows lost revenue recovery for both electric and gas DSM programs.
- Recovery mechanisms are determined on a case-by-case basis
- Utilities can recover
  - Full costs of commission-approved demand-side management programs and
  - Revenues lost
  - Incentives designed to provide financial rewards to the utility for implementing cost-effective demand-side management programs
- Not in active use for all eligible utilities

Lost Revenue/Expense Recovery Approaches: Nevada

- Utility required to track and separate costs
- For Commission approved action plan programs, utility may recover labor, overhead, materials, incentives paid to customers, advertising, marketing and evaluation

Traditional Regulation: Provides Strong Disincentives for Energy Efficiency

- Utility revenues and profits are linked to unit sales (kW, kWh, therms, etc.)
- Loss of sales due to successful implementation of energy efficiency will lower utility profitability
- The effect may be quite powerful…

Assumptions for A Sample Utility

Assumptions	
Operating Expenses	$160,000,000
Rate Base	$200,000,000
Tax Rate	35.00%

Cost of Capital	% of Total	Cost Rate	Weighted Cost Rate		Dollar Amount	
			Pre-tax	After-Tax	Pre-Tax	After-Tax
Debt	55.00%	8.00%	4.40%	2.86%	$8,800,000	$5,720,000
Equity	45.00%	11.00%	4.95%	7.62%	**$9,900,000**	$15,230,769
Total	100.00%			10.48%		

Revenue Requirement	
Operating Expenses	$160,000,000
Debt	$5,720,000
Equity	$15,230,769
Total	$180,950,769
Allowed Return on Equity	$9,900,000

How Changes in Sales Affect Earnings

	Revenue Change		Impact on Earnings		
% Change in Sales	Pre-tax	After-tax	Net Earnings	% Change	Actual ROE
5.00%	$9,047,538	$5,880,900	$15,780,900	**59.40%**	17.53%
4.00%	$7,238,031	$4,704,720	$14,604,720	**47.52%**	16.23%
3.00%	$5,428,523	$3,528,540	$13,428,540	**35.64%**	14.92%
2.00%	$3,619,015	$2,352,360	$12,252,360	**23.76%**	13.61%
1.00%	$1,809,508	$1,176,180	$11,076,180	**11.88%**	12.31%
0.00%	$0	$0	$9,900,000	**0.00%**	11.00%
-1.00%	-$1,809,508	-$1,176,180	$8,723,820	**-11.88%**	9.69%
-2.00%	-$3,619,015	-$2,352,360	$7,547,640	**-23.76%**	8.39%
-3.00%	-$5,428,523	-$3,528,540	$6,371,460	**-35.64%**	7.08%
-4.00%	-$7,238,031	-$4,704,720	$5,195,280	**-47.52%**	5.77%
-5.00%	-$9,047,538	-$5,880,900	$4,019,100	**-59.40%**	4.47%

A Change in Approach Is Needed

- "Throughput" incentive is at odds with a requirement to invest in cost-effective energy efficiency
- Policies should, instead, align utilities' profit motives with acquisition of all cost-effective energy efficiency
- Decoupling & profit incentives, coupled with strong regulatory and legislative policy support and industry leadership are a part of the solution

New Mexico: Example of Clear Policy Direction

- It serves the public interest to support public utility investments in cost-effective energy efficiency and load management by removing any regulatory disincentives that may exist and allowing recovery of costs for reasonable and prudently incurred expenses of energy efficiency and load management programs
- The commission shall identify any disincentives or barriers that may exist for public utility expenditures on energy efficiency and load management and, if found, ensure that they are eliminated in order that public utilities are financially neutral in their preference for acquiring demand or supply-side utility resources

New **Mexico** Statutes, Chapter 62-17-2

Revenue-Profit Decoupling: What is it?

- Breaks the mathematical link between sales volumes and profits
- Objective is to make profits levels immune to changes in sales volumes
  - This is a revenue issue
  - This is not a pricing issue
  - Volumetric pricing approaches need not be changed
- Not intended to decouple customers bills from consumption (another topic for another day)

History of Decoupling: California

- California 1990s to Present
- Decoupling functioned well in early 90s
- Move to retail competition precipitated its end in 1996 on theory that market forces and consumer choice would handle efficiency
- Reinstated following the energy crisis of 2000-2001
- Continues to work well

History of Decoupling: Washington

- Washington (Puget Sound Energy) adopted decoupling in 1990
- Variable power costs recovered via a true-up based on actual experience (same as traditional regulation)
- Fixed costs recovered based on a revenue-per-customer calculation
- Marginal fixed costs were much lower than average fixed costs
- Purchased power costs were higher than expected
- Result: over recovery of fixed costs & large increases in power costs
- Lead to negative consumer reaction
- But, root cause of problem was underlying cost structure, not decoupling
- Recent effort to restore decoupling with Puget foundered over cost of capital issue

History of Decoupling: Maine

- Central Maine Power adopted decoupling in early 1990s
- Used an annual adjustment mechanism
- Economy suffered steep economic downturn that reduced sales several percent
- Result was large, unexpected increases in prices
- Again, root cause was underlying cost structure, not decoupling *per se*

History of Decoupling: Lessons Learned

- Annual adjustments may result in large price changes
- Consider limiting overall size of prices changes over time
- Consider use of exit ramps or required reviews if prices changes exceed some threshold
- Consider sharing arrangements for prices changes above some threshold

Revenue Decoupling: The Basic Concept

- Most effective method to decouple sales & profits
- Basic Revenue-Profit Decoupling:
  - Utility "base" revenue requirement determined with traditional rate case
  - Each future period has a calculable "allowed" revenue requirement
  - Differences between the allowed revenues and actual revenues are tracked on an average use per customer or other basis
  - The difference (positive or negative) is flowed back to customers in a small adjustment to unit rates

Decoupling Examples:

- Maryland – Gas Utilities
- North Carolina – Gas Utilities
- California – 3 IOUs (Electric & Gas)
- Oregon – Northwest Natural Gas
- New Jersey (NJNG)
- Utah (Questar)
- Idaho (Idaho Power)
- Washington (Avista & Cascade)

Decoupling: Maryland Baltimore Gas & Electric

- Decoupling mechanism for residential and general service gas customers
- Straight revenue-per-customer method
- Based on prior rate case test year for base revenue per customer
- Monthly adjustment mechanism similar to traditional fuel and purchase power adjustments
- MADRI Model Rate Rider starting point

Maryland:
How BG&E Decoupling Works

- Allowed Revenues = Test Year Average Use per Customer X No. of Customers X Delivery Price
- Adjustment to Delivery Price = Allowed Revenues - Actual Revenues ÷ Estimated Sales
- Any difference between actual and estimated sales is reconciled in a future month
- Calculated separately for each class
- Calculation of the billing adjustment are filed monthly with the Public Service Commission

Decoupling: North Carolina An Interesting Read

- North Carolina's three major gas utilities have decoupling mechanism
- Expressed importance of highly volumetric rate structures and lower fixed customer charges
- Rejected some arguments against decoupling
- Good overall discussion of policy framework for decoupling

North Carolina: Approaches Rejected

- Rejected higher fixed charge approach as unpopular with customers
- Rejected Attorney General's argument that proposal would penalize customers for conserving

North Carolina: Customers & Shareholders

- "Different usage patterns and tariffs of industrial customers" provide good cause to exclude class from mechanism
- Approved as an experimental tariff limited to no more than 3 years
- Required utility contribution toward conservation programs (e.g. $500,000 per year for Piedmont)
- Required utility to work with the Attorney General and the Public staff to develop appropriate and effective conservation programs to assist its residential and commercial customers

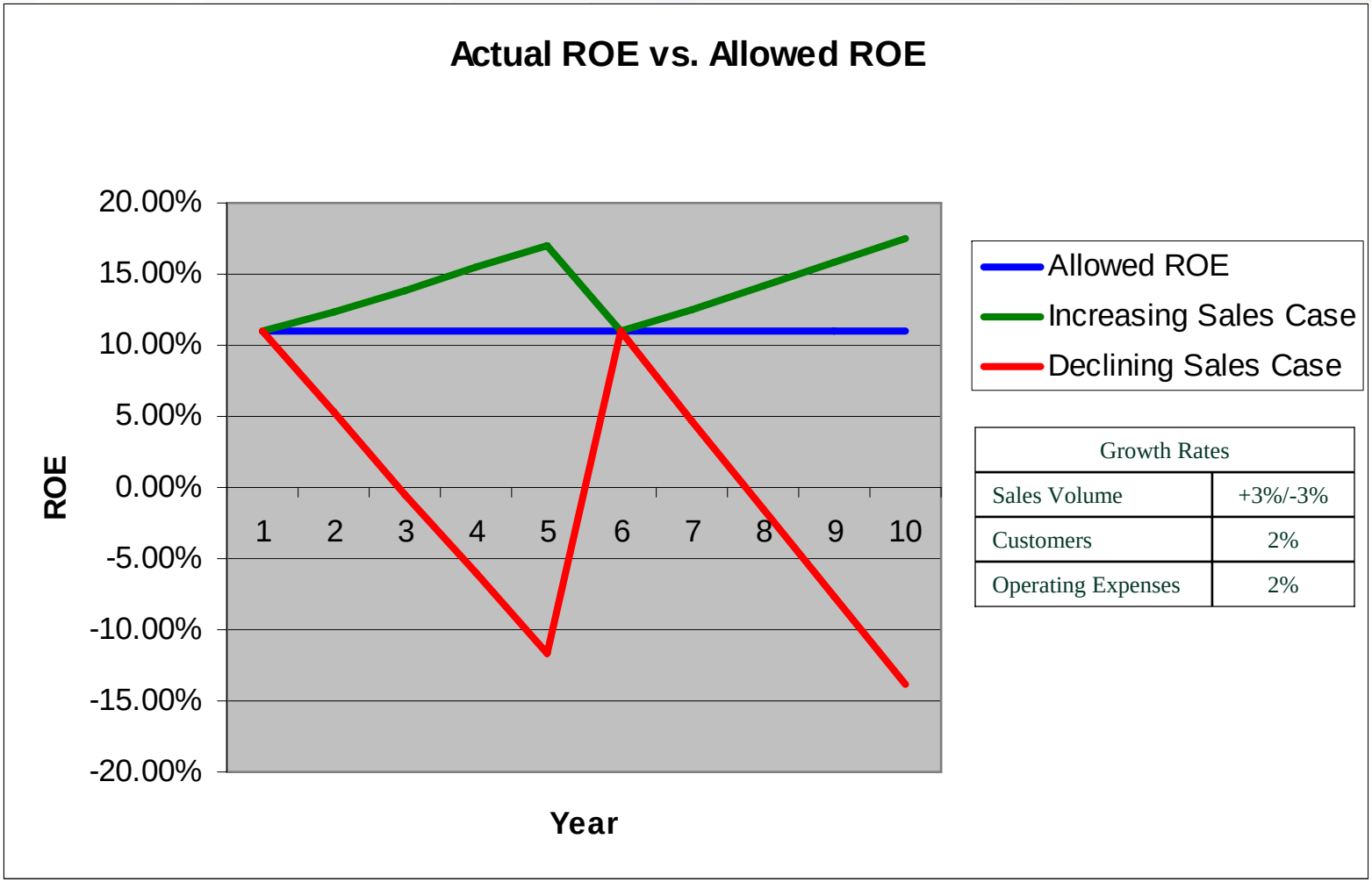
Decoupling: North Carolina Rationale for Decoupling

- Recognized conservation has potential for financial harm to the utility and its shareholders
- Cited number of benefits: Improved opportunities for conservation of energy resources, savings for customers, downward pressure on wholesale gas prices, helping utility recovery of margin and a reasonable return
- Decoupling better aligns interests of Company and customers with respect to conservation
- Commission on Shareholder Risk: "In a period of declining per-customer usage, a mechanism that decouples recover of margin from usage, without requiring the utility to file frequent rate cases or increase unpopular fixed charges, clearly reduces shareholder risk."

Which Brings Us To: A Policy Tale of Two Utilities

- Rising revenue-per-customer utilities:
  - Experience rising earnings between rate cases
  - Typical of many electric utilities
- Declining revenue-per-customer utilities:
  - Experience declining earnings between rate cases
  - Typical of many gas utilities
- Under reasonable assumptions, not symmetric between rising and declining cases
- Usually driven by differences in the average consumption between new and old customers
- Policy question: Should decoupling be "profit neutral" relative to future such profit expectations?

What Happens to ROE Under Traditional Regulation?



Growth Rates	
Sales Volume	+3%/-3%
Customers	2%
Operating Expenses	2%

California Decoupling Basics

- Part of an aggressive and comprehensive policy framework designed to deploy cost-effective energy efficiency
- Covers SDG&E/SocCalGas, PG&E and SCE
- Tracks difference between allowed revenues and actual revenues
- Trued up each year to that year's authorized revenues
- Revenue requirements are adjusted each year for inflation
- Each utility has individual mechanisms for determining annual revenue requirements

California Case Specifics: Company Plan Features

- Southern California Edison
  - Citing:
    - Poor financial health of company
    - Changed circumstances since such adjustments were rejected (20 years ago)
  - Commission approved "non-test year" revenue requirement adjustments
  - Implemented revenue balancing account for over- / under-collections of revenue adjustment
- San Diego Gas & Electric and SoCalGas
  - Each year's revenue requirement is determined by the previous year's base margin adjusted by CPI
  - Minimum and maximum authorized adjustments (in 3%-4% range)
  - Balancing account for adjustment collections
  - Sharing mechanism

California: SDG&E/SoCalGas Shareholder & Customer Sharing

Earnings Band	Shareholders	Ratepayers
0 - 50	100%	0%
51 – 100	75%	25%
101 – 125	35%	65%
126 – 150	45%	55%
151 – 175	55%	45%
176 – 200	65%	35%
201 – 300	75%	25%
Over 300	Suspension	

Pacific Gas & Electric

- Separate Distribution and Generation mechanisms:
  - DRAM (Distribution revenue adjustment mechanism) and
  - UGBA (Utility Generation Balancing Account) revenue adjustment mechanisms
- Allowed revenues: annual CPI-based attrition adjustments for 2004-2006, with following minimums and maximums:

Year	Min	Max
2004	2.00%	3.00%
2005	2.25%	3.25%
2006	3.00%	4.00%

Decoupling: Oregon Northwest Natural Gas

- Defers and subsequently amortizes 90 percent of the margin differentials in the residential and commercial customer groups
- Average customer margin-per-therm calculation
- Calculated Monthly
- Places weather risk on utility

Speaking of weather… What about weather risk?

- Myth: Decoupling "shifts" weather risk from utility to customer
- Reality: Utility and customer take (or avoid) weather risk together
- Simplest form of decoupling insulates utility and customers from weather risk
- Elimination of weather risk has cost of capital implications

MADRI Model Rule

- Used BG&E Rate Rider as starting point
- Model Rule is product of collaborative stakeholder process
- Available at: http://www.raponline.org/Feature.asp?select=78
- Tracks on demand and energy basis

Positive Incentives

- Arizona
- Connecticut
- Massachusetts
- New Hampshire
- Nevada
- Vermont

Positive Incentives

- Arizona
  - Required funding levels ~$10M+ & low income assistance
  - Utility keeps up to 10% of net economic benefits
- Connecticut
  - Utilities receive “performance management fees” tied to performance goals based on lifetime energy savings and demand savings (2004: ~$5.3M)
  - Incentives earned for outcomes from 70-130% of pre-determined goals (2006 budget $2.9M)
- Massachusetts
  - Shareholder incentive of five percent of funding for 75%-110% of design level performance
  - Regulatory finding: Incentives must be large enough to promote good program management, but small enough to leave almost all of the energy efficiency funds to directly serve customers

Positive Incentives

- Minnesota
  - Utilities receive a percentage of total net benefits (avoided costs minus program costs) when performance levels are met or exceeded
- New Hampshire
  - Cost-effectiveness incentive of 4% of budget times cost-effectiveness ratio (actual to planned cost-effectiveness) – minimum ratio of 1.0
  - Energy Savings incentive of 4% of budget times ratio of actual to saved energy savings - minimum 65% of planned energy savings

Positive Incentives

- Nevada
  - DSM bonus rate of return 5% higher than returns for supply investments
  - Critical Facilities Incentive for reliability, diversity of supply- and demand-side resources, development of renewable resources, fulfilling statutory mandates and/or retail price stability, can be enhanced return on equity, CWIP treatment or creation of “regulatory asset” account
- Vermont
  - Efficiency Vermont receives performance incentives for meeting or exceeding specific goals in contract with Vermont’s Public Service Board (PSB)
  - Incentive categories:
    - Program Results Incentives (electricity savings & resource benefits)
    - Market Effects Incentives (significant market transformation)
    - Activity Milestones Incentive (exemplary performance for rapid start-up and/or infrastructure development)

Learn More

- **Energy Efficiency Policy Toolkit**
  - http://raponline.org/Pubs/General/EfficiencyPolicyToolkit3-1-06.pdf
- **Profits & Progress Through Least-cost Planning**
  - http://www.raponline.org/Pubs/General/Pandplcp.pdf
- **Profits and Progress Through Distributed Resources**
  - http://www.raponline.org/showpdf.asp?PDF_URL=Pubs/General/ProfitsandProgressdr.pdf
- **Performance-based Regulation For Distribution Utilities**
  - http://www.raponline.org/Pubs/General/DiscoPBR.pdf
- **Performance-Based Regulation in a Restructured Electricity Industry**
  - http://www.synapse-energy.com/Downloads/pbr-naruc.doc

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  - www2.njresources.com/news/trans/newsrept.asp?year=2005
- VT:
  - www.greenmountainpower.biz/atyourservice/2006ratefiling.shtml

Decoupling & Incentives

- Questions?

Cost Recovery Monitoring and Verification Programs

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Energy Efficiency Program Cost Recovery

- Expectation for any just and reasonable cost prudently incurred
- Methods
  - Rate case approved cost of service
  - Tariff rider adjusts for allowed spending changes
  - System benefit charge (dedicated surcharge)

Cost Recovery Considerations

- Timely recovery avoids negative attitude
- Program Stability
  - Core programs create business infrastructure and consumer expectations
- Budget Stability
  - Consider a minimum funding level
- Enable Opportunity Investments
  - Process to approve increases takes advantage of modular nature of energy efficiency

Cost Recovery Connection to Energy Savings

- Energy Efficiency in Resource Planning requires savings performance
- Cost recovery can be tied to performance
  - As generation efficiency has been by some PUCs
  - Or performance can just drive incentive rewards
- Good to have energy savings (or emissions avoided) as the focus rather than dollars spent

Expense or Capitalize?

- Full rate effect early
- No carrying cost
- Unlike capital alternatives

- Lower rate effect early
- Carrying cost adds
- Like capital alternatives

Answer will affect outcome of the RIM Test

Monitoring & Verification

- Calculating energy and capacity savings
  - Emission savings
  - Portfolio standard credit (and offsets?)
  - Consistency (a therm is a therm)
- Consistent PUC Protocols
  - Process, definitions
  - International Performance Measurement and Verification Protocol (IPMVP) a good start

M&V Considerations

- Use of good statistical samples for sites and expansion of sample analysis results to the program population
- Use of inexpensive and readily available site energy consumption and program tracking data
- Regression analysis of energy use/savings from multiple sites
- Analysis of attribution (free ridership, spillover, program effects) - net to gross ratios

A general approach to M&V

- Determining gross program energy savings
  - A sample of project savings are determined
  - Statistical analyses of large volumes of energy billing data
  - Quality assurance reviews of existing documentation
- Convert to net energy savings using a range of possible considerations (e.g., free rider, persistence corrections)
- Emission factors are derived and applied to net savings in order to determine avoided emissions

M&V Challenges

- Applying "deemed savings"
  - Benefits from improved methods, climate-driven
- Market transformation programs
  - Measuring market changes, not savings
- Budget
  - M&V costs 3-5% of program budget
  - An investment worth making

Vermont Equipment Replacement Rebates

Hot Air Furnace	90% to 92% AFUE	$150.00
Hot Air Furnace	92.1%+ AFUE	$300.00
Hot Water Boiler	87%+ AFUE 650 ccf/yr	for Heat $400.00
Steam Boiler	82%+ AFUE 700 ccf/yr	for Heat $150.00
Water Heater	40/50 gal..61+ EF	$100.00
Tankless WH	.80+ EF	$100.00

Multiple boiler/furnace systems and non-conventional designs will be evaluated on a case-by-case basis.

http://www.vermontgas.com/efficiency_programs/res_programs.html#equipment (information on tax credits and compatibility with electric EE also)

Commercial Replace and Retrofit Service and Rebates

- Free walk-through audit to identify potentially cost-effective energy efficiency measures.
- Engineering assistance to evaluate potentially cost-effective energy efficiency measures from audit.
- Possible financial incentives to install cost-effective measures, including high efficiency equipment and controls.
- Energy efficient equipment info.
- Engineering assistance to quantify savings and cost-effectiveness of an equipment replacement project.
- Assistance in locating and selecting qualified consulting engineers.
- Possible assistance in financing the cost of an engineering analysis.

- Unit heaters
- Furnaces
- Hot Water Boilers
- Steam Boilers
- Modulating Burners
- Pool Heaters
- Domestic Hot Water Heaters
- Venturi Steam Traps
- Kitchen Exhaust Hoods
- Air to Air Heat Recovery Equipment
- Waste Heat Recovery Equipment
- Heat Exchangers

Competition

- Natural Gas competes with unregulated fuels
  - Energy Efficiency is a cost that the competition does not have
  - Energy Efficiency is a service that the competition does not offer

Are Utility Energy Efficiency Programs Anti-Competitive?

- Some are concerned that utility programs make it harder for ESCOs to make a market for their services
- Yet there remains significant unmet potential
- Utilities can use contractors to match skills with tasks and expand the local market through their ubiquity, web presence, etc.

Whole Building Opportunities

- The best energy efficiency service is available to low income homes receiving weatherization service
  - Measures consider how the whole building works
- Suggests merits of electric and gas program coordination where possible to increase benefits/cost

Regulatory Structure

- Statutes: General least cost or specific EE
- Rulemaking: clarity of process (AR, NM)
  - http://www.apscservices.info/efilings/Docket_Search_Documents.asp?Docket=06%2D004%2DR&DocNumVal=83 (Order #12)
- Part of Resource Adequacy (IRP): context
- Periodic Program Approval
- Annual Reporting
- Transparency (collaborative, advisory)

National Action Plan for Energy Efficiency

- http://www.epa.gov/cleanenergy/actionplan/report.htm Recommendations:
  - Recognize energy efficiency as a high priority energy resource
  - Make a strong, long-term commitment to implement cost-effective energy efficiency as a resource
  - Broadly communicate the benefits of and opportunities for energy efficiency
  - Promote sufficient, timely, and stable program funding to deliver energy efficiency where cost-effective.
  - Modify policies to align utility incentives with the delivery of cost-effective energy efficiency and modify ratemaking practices to promote energy efficiency investments.

Back up slides on Natural Gas and Energy Efficiency

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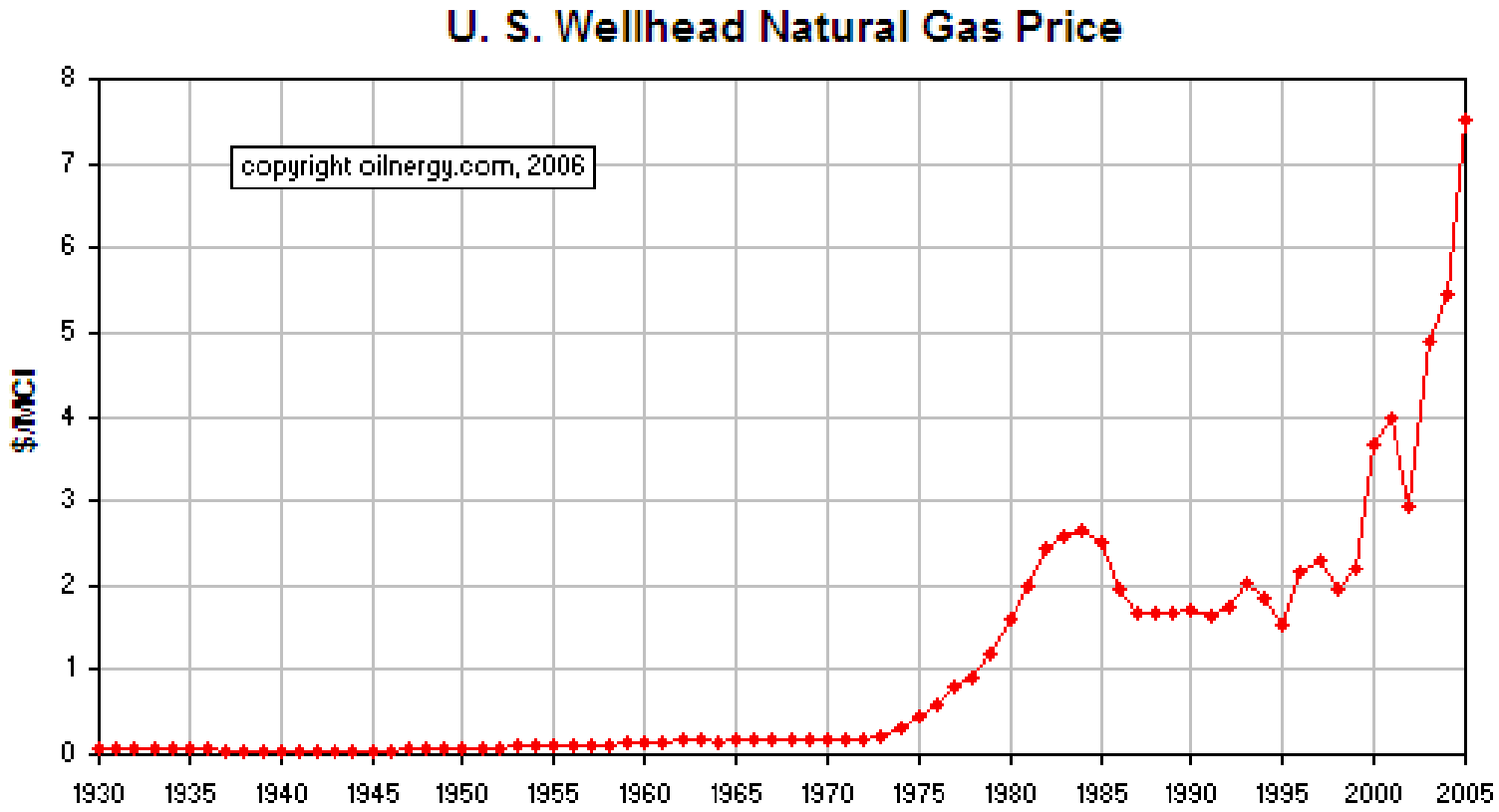
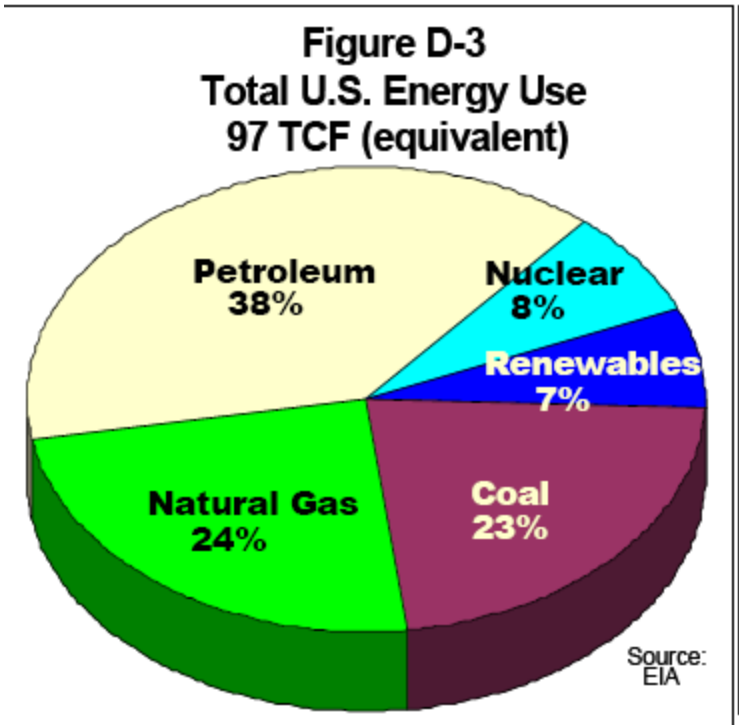
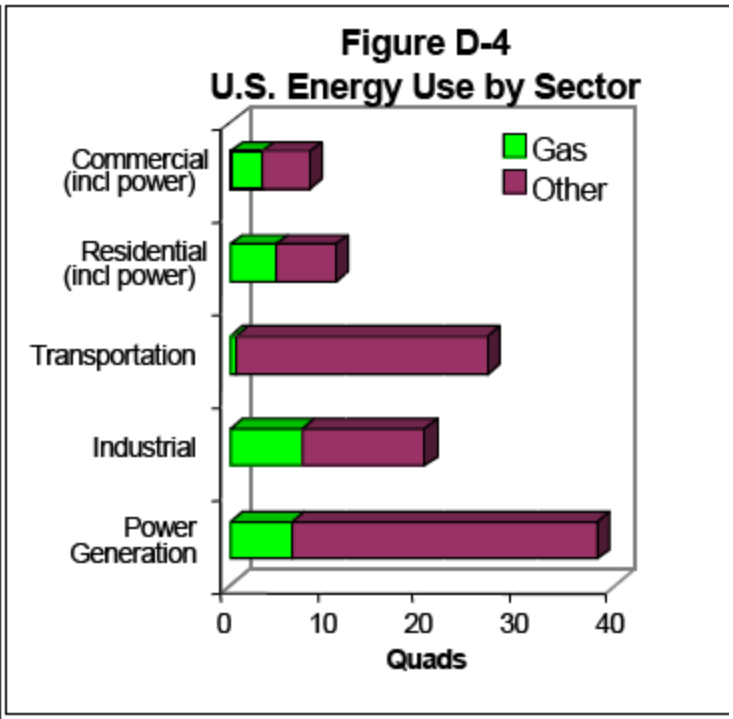
Why think about Natural Gas?



Natural Gas Use in US Economy





Natural Gas Supply

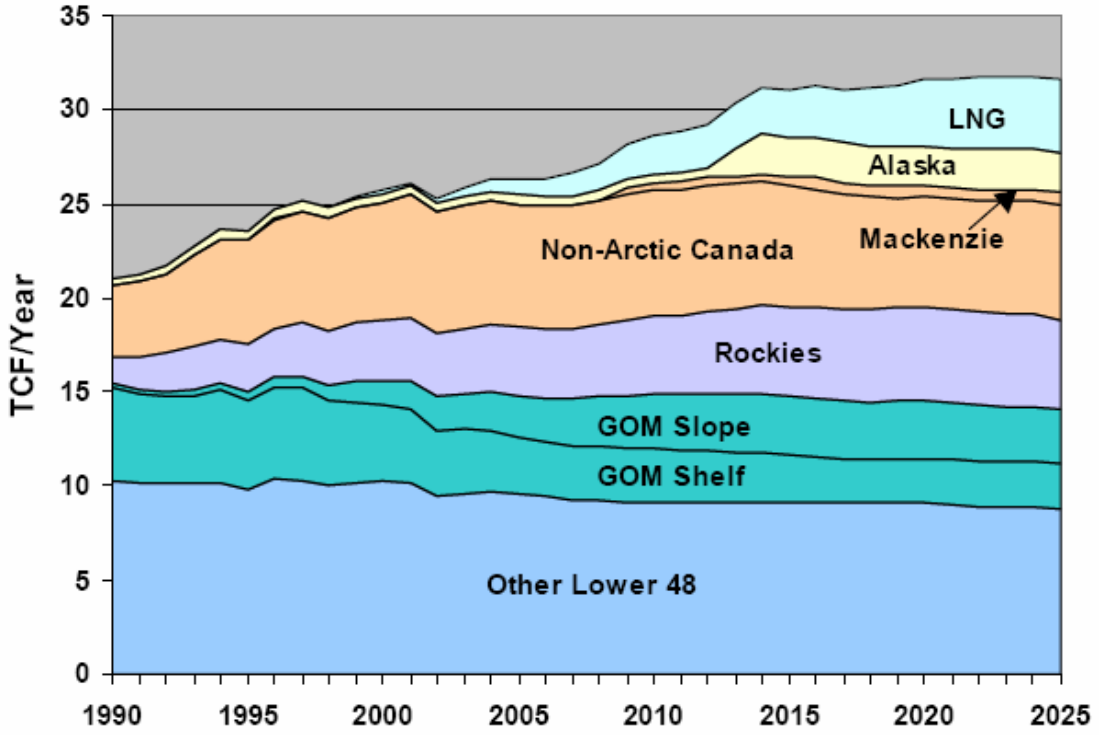


Figure 4c-1: Components of North American Supply

GOM=Gulf of Mexico

Domestic Production Declines

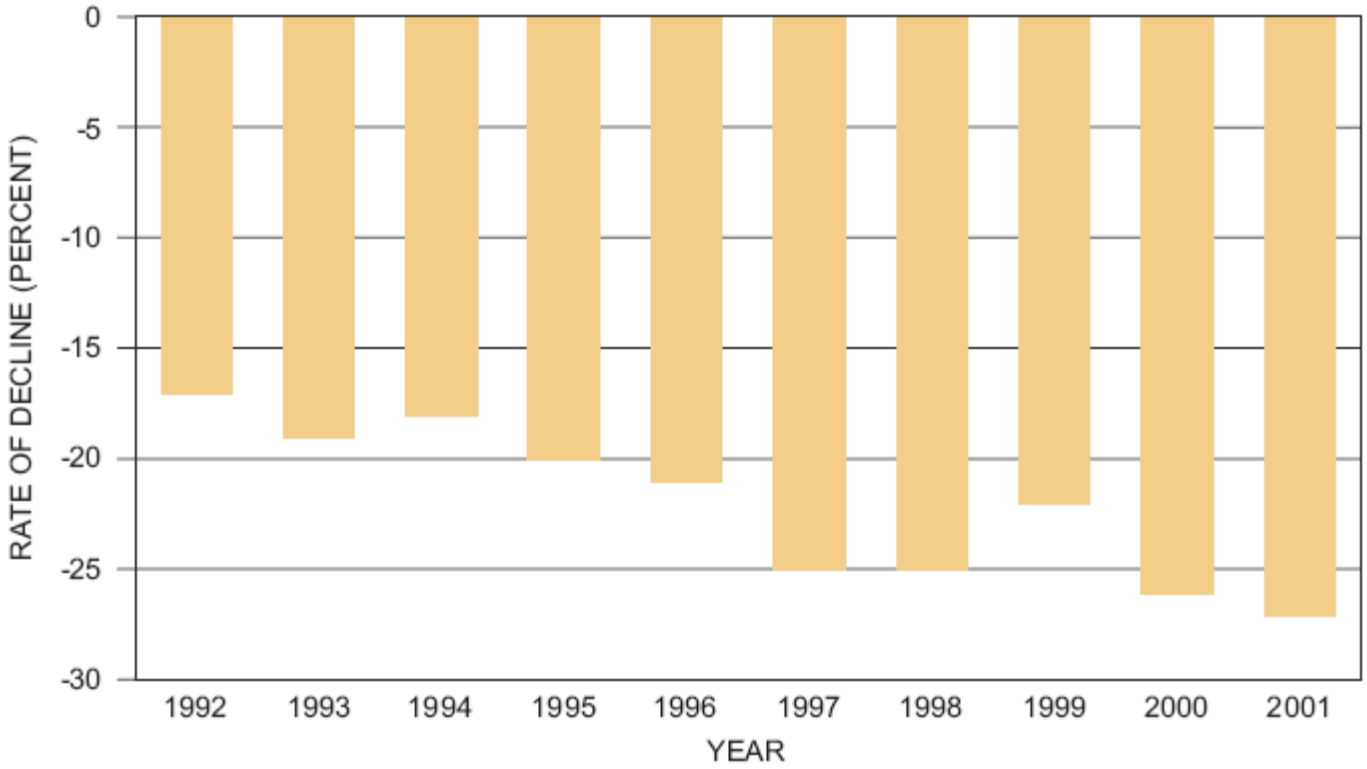


Figure 4c-8: Lower-48 Base Production Decline Rates

Declines Despite Increased Drilling

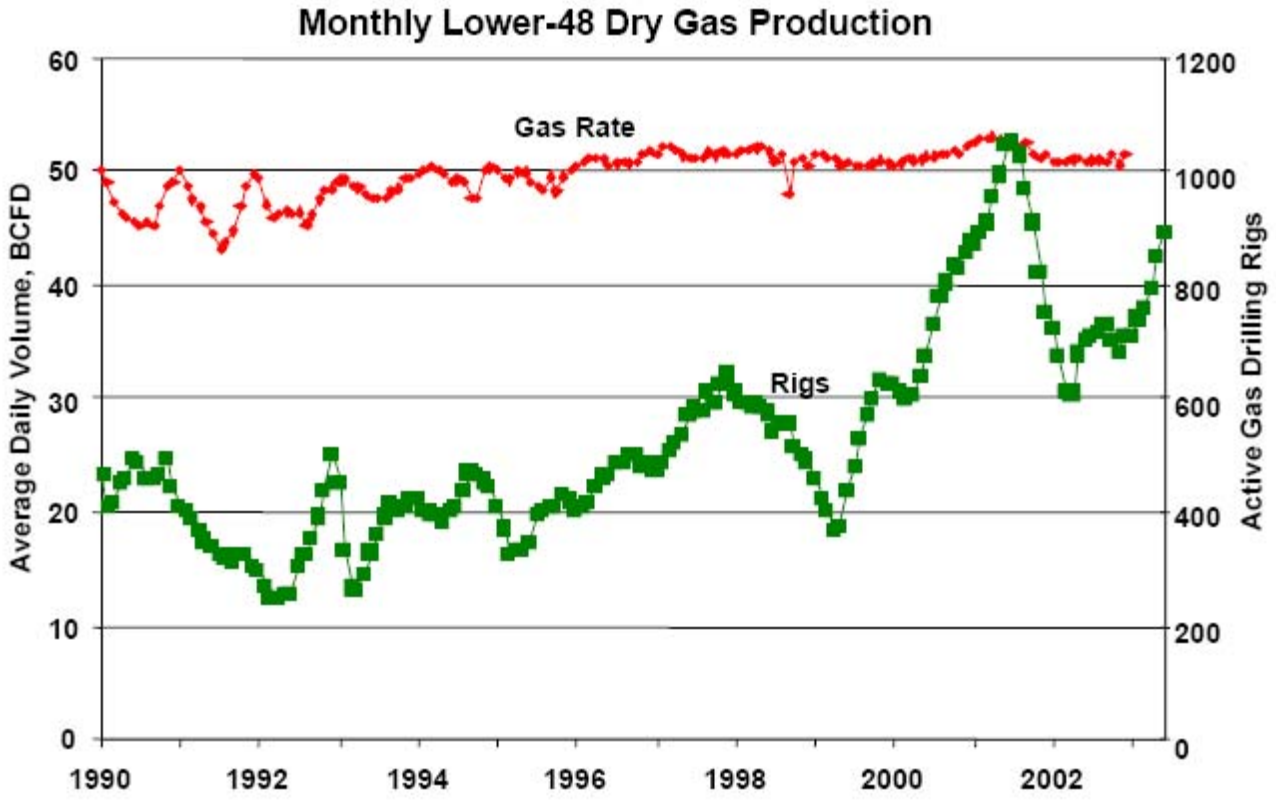
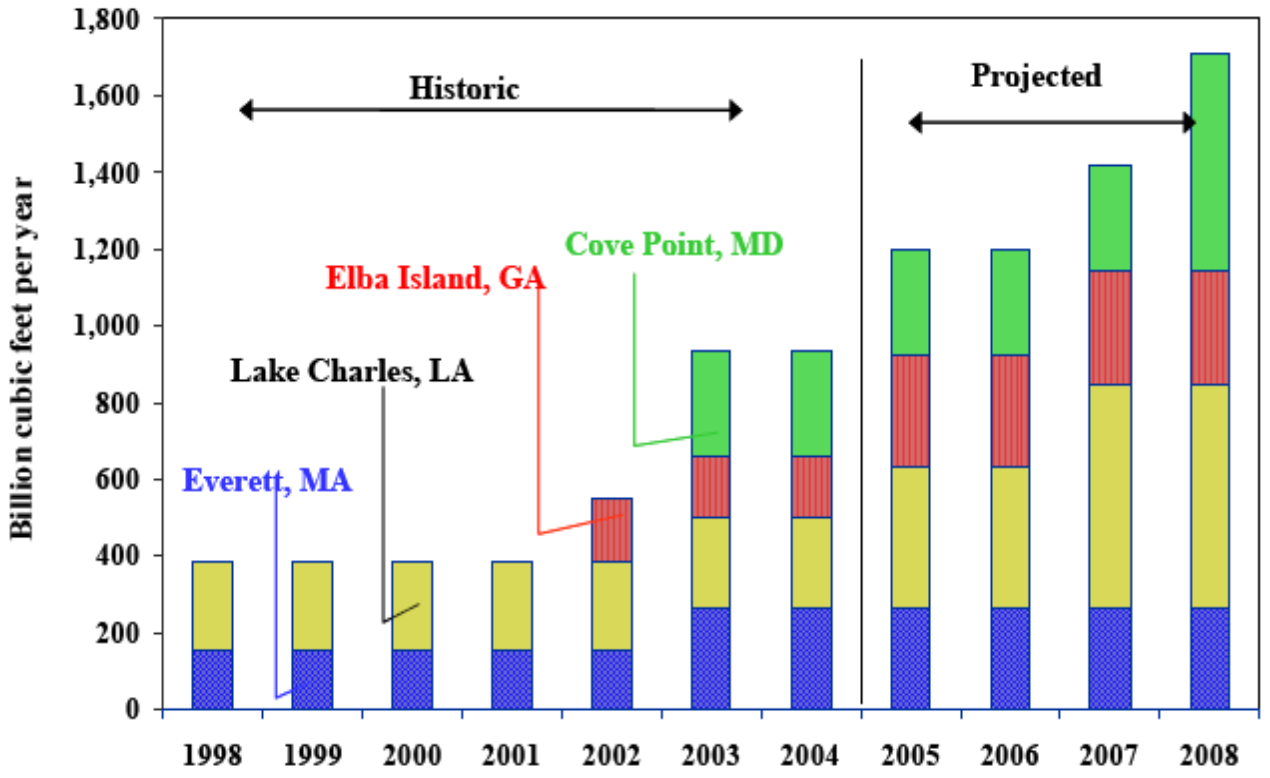


Figure 4c-9: Lower-48 Gas Production and Gas Rig Count

LNG Imports

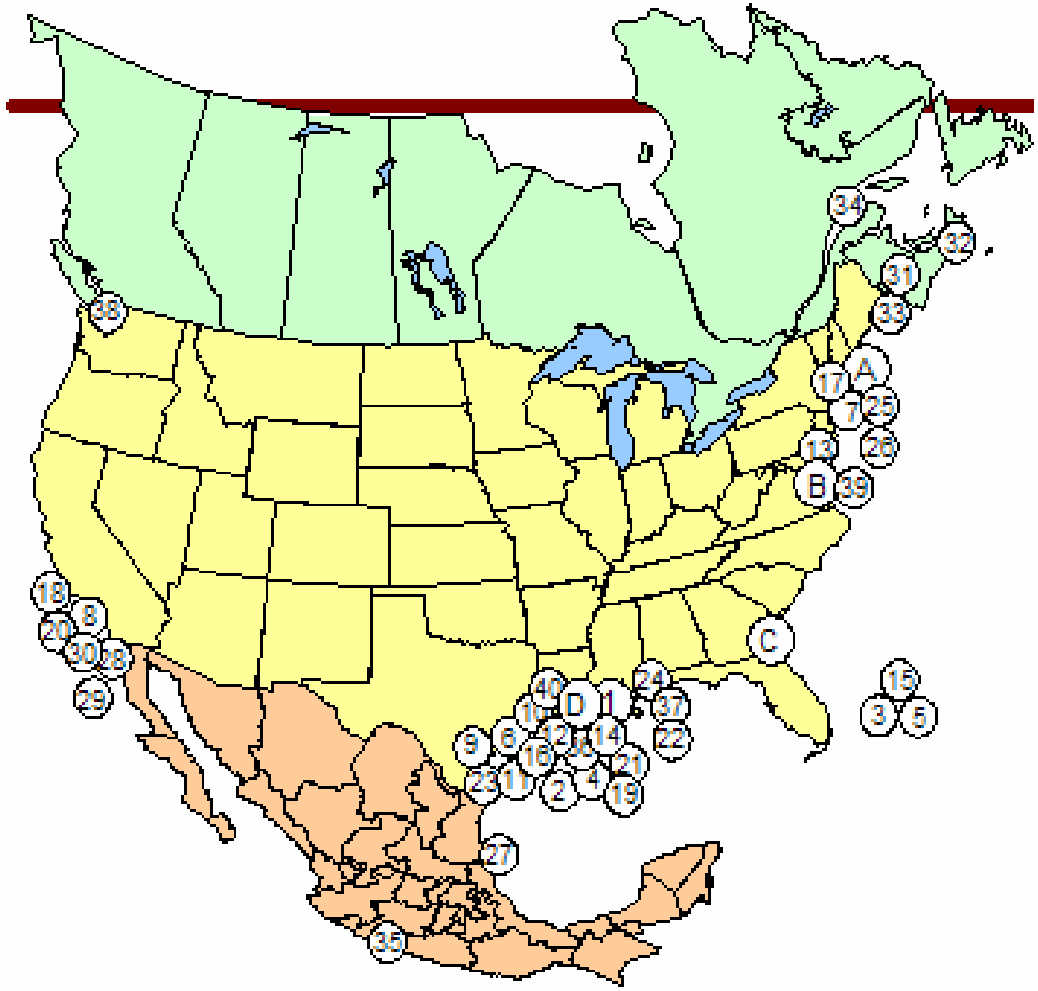
Figure 3. Historic and Proposed Baseload Capacity at Existing U.S. Receiving Terminals



Source: Energy Information Administration, Office of Oil and Gas, Natural Gas Division.

FERC

Existing and Proposed North American LNG Terminals



May 2004

Office of Energy Projects

Existing Terminals with Approved Expansions

A. Everett, MA : 1.035 Bcfd (Tractebel – DOMAC)
B. Cove Point, MD : 1.0 Bcfd (Dominion – Cove Point LNG)
C. Elba Island, GA : 1.2 Bcfd (El Paso – Southern LNG)
D. Lake Charles, LA : 1.2 Bcfd (Southern Union – Trunkline LNG)

Approved Terminals

1. Hackberry, LA : 1.5 Bcfd, (Sempra Energy)
2. Port Pelican: 1.6 Bcfd, (Chevron Texaco)
3. Bahamas : 0.84 Bcfd, (AES Ocean Express)
4. Gulf of Mexico: 0.5 Bcfd, (El Paso Energy Bridge GOM, LLC)
5. Bahamas : 0.83 Bcfd, (Calypso Tractebel)

Proposed Terminals and Expansions – FERC

6. Freeport, TX : 1.5 Bcfd, (Cheniere / Freeport LNG Dev.)
7. Fall River, MA : 0.8 Bcfd, (Weaver's Cove Energy)
8. Long Beach, CA : 0.7 Bcfd, (SES/Mitsubishi)
9. Corpus Christi, TX : 2.6 Bcfd, (Cheniere LNG Partners)
10. Sabine, LA : 2.6 Bcfd (Cheniere LNG)
11. Corpus Christi, TX : 1.0 Bcfd (Vista Del Sol/ExxonMobil)
12. Sabine, TX : 1.0 Bcfd (Golden Pass/ExxonMobil)
13. Logan Township, NJ : 1.2 Bcfd (Crown Landing LNG – BP)
14. Lake Charles, LA: 0.6 Bcfd (Southern Union – Trunkline LNG)
15. Bahamas : 0.5 Bcfd, (Seafarer - El Paso/FPL)
16. Corpus Christi, TX: 1.0 Bcfd (Occidental Energy Ventures)
17. Providence, RI : 0.5 Bcfd (Keyspan & BG LNG)

Proposed Terminals – Coast Guard

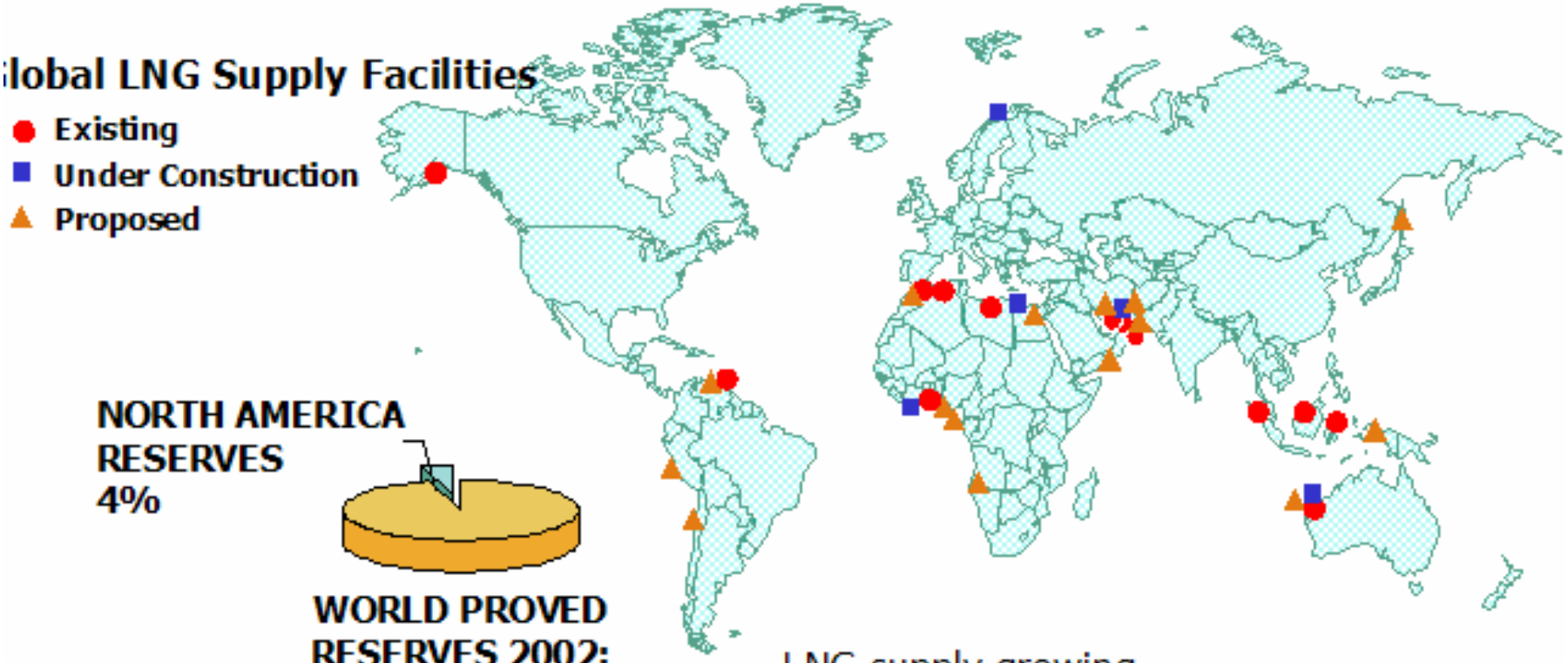
18. California Offshore: 1.5 Bcfd, (Cabrillo Port – BHP Billiton)
19. Louisiana Offshore : 1.0 Bcfd (Gulf Landing – Shell)
20. So. California Offshore : 0.5 Bcfd, (Crystal Energy)
21. Louisiana Offshore : 1.0 Bcfd (McMoRan Exp.)
22. Gulf of Mexico: n/a (Compass Port - ConocoPhillips)

Planned Terminals and Expansions

23. Brownsville, TX : n/a, (Cheniere LNG Partners)
24. Mobile Bay, AL: 1.0 Bcfd, (ExxonMobil)
25. Somerset, MA : 0.65 Bcfd (Somerset LNG)
26. Belmar, NJ Offshore : n/a (El Paso Global)
27. Altamira, Tamulipas : 1.12 Bcfd, (Shell)
28. Baja California, MX : 1.0 Bcfd, (Sempra & Shell)
29. Baja California - Offshore : 1.4 Bcfd, (Chevron Texaco)
30. California - Offshore : 0.5 Bcfd, (Chevron Texaco)
31. St. John, NB : 0.5 Bcfd, (Canaport – Irving Oil)
32. Point Tupper, NS 1.0 Bcfd (Bear Head LNG - Access Northeast Energy)
33. Searsport, ME : n/a
34. St. Lawrence, QC : n/a (TCPL and/or Gaz Met)
35. Lázaro Cárdenas, MX : 0.5 Bcfd (Tractebel)
36. Gulf of Mexico : 1.0 Bcfd (ExxonMobil)
37. Mobile Bay, AL: 1.0 Bcfd (Cheniere LNG Partners)
38. Cherry Point, WA: 0.3 Bcfd (Cherry Point Energy LLC)
39. Cove Point, MD : 0.8 Bcfd (Dominion)
40. Port Arthur, TX: 1.5 Bcfd (Sempra)

US pipeline approved; LNG terminal pending in Bahamas

How Much Natural Gas Is Out There?



NORTH AMERICA RESERVES 4%

WORLD PROVED RESERVES 2002: 6,270 TCF

- LNG supply growing
- Multiple LNG supply proposals announced
- Long term LNG supply outlook robust

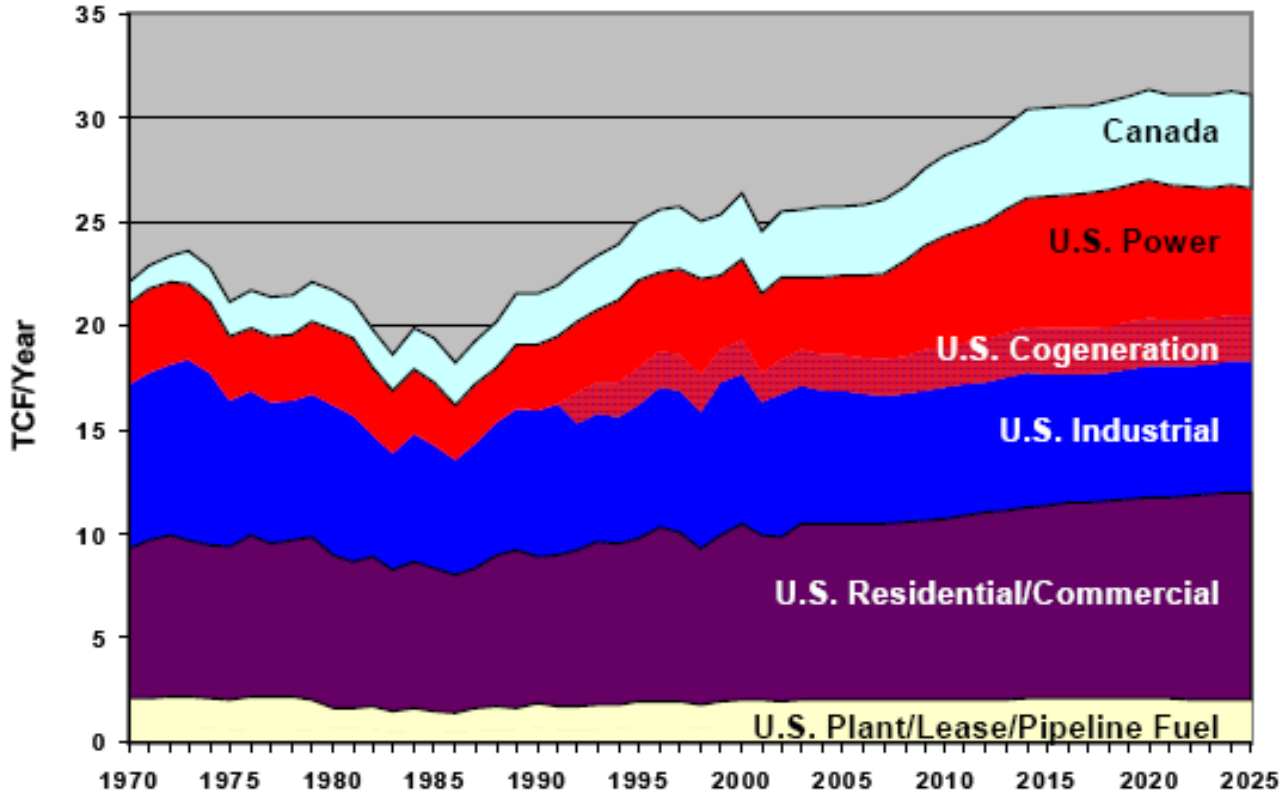
Source: Cedigaz, NPC

LNG World Contracts

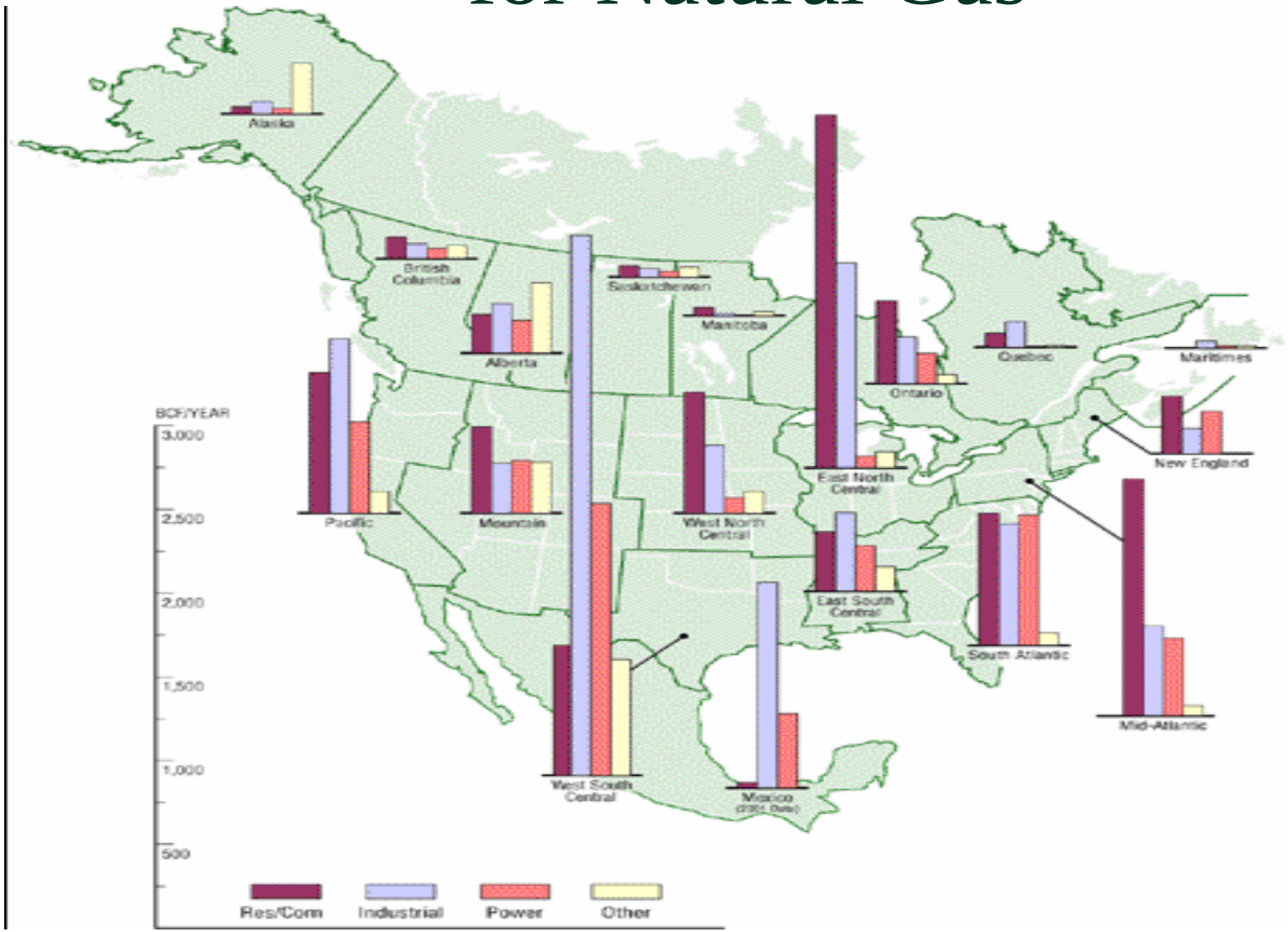
- Traditionally financed with long tem fixed price contracts *before* infrastructure built or movement of commodity begins.
- Not the way NG market works in US.
- Looks like we can build LNG terminals in the US market-based way.
- Uncertain whether compressing stations and tankers will built without support of long term fixed contracts.

Demand for Natural Gas

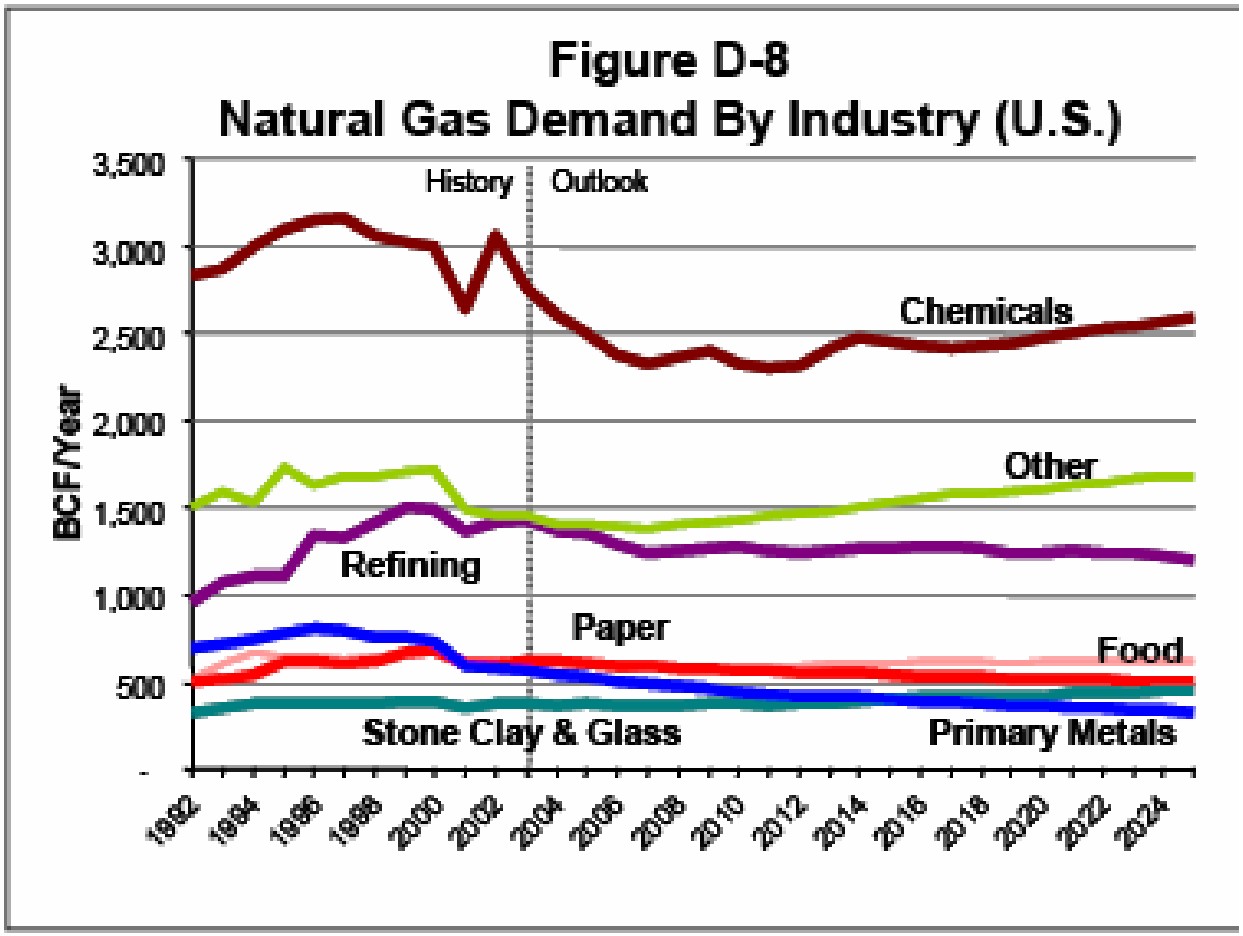
Figure D-2
North American Natural Gas Demand History and Outlook



Current US Regional Demand for Natural Gas

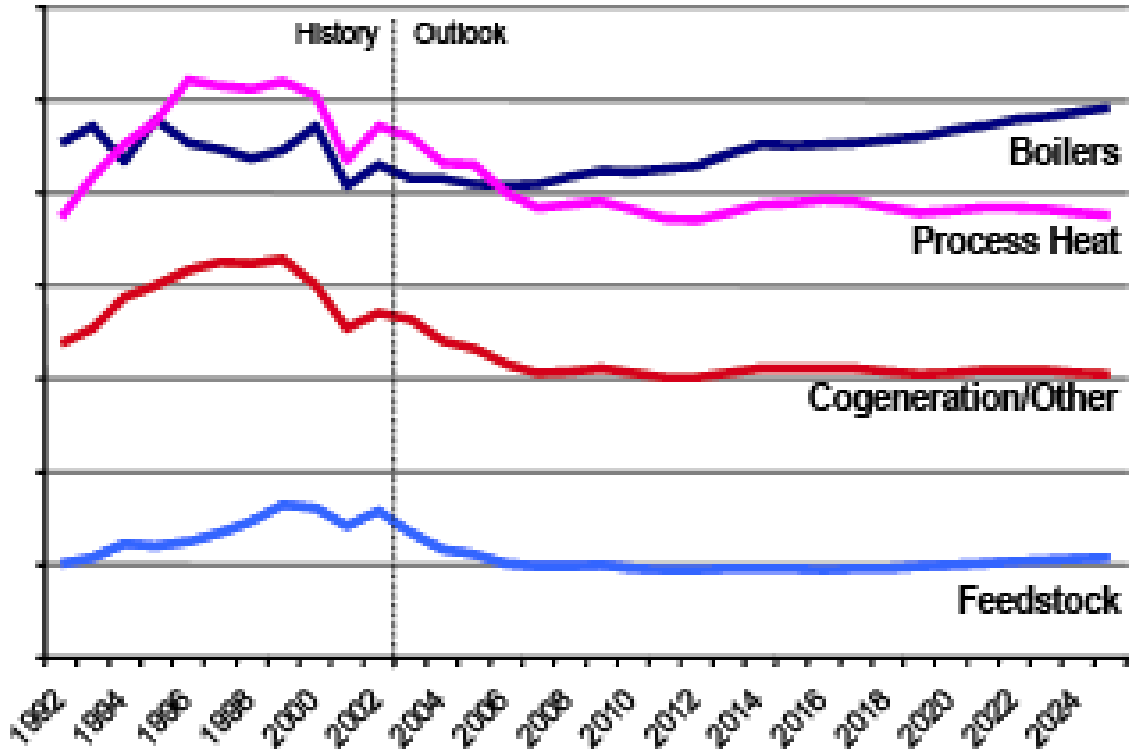


Industrial Demand in US



Demand by End Use

Figure D-9
Natural Gas Demand By End Use (U.S.)



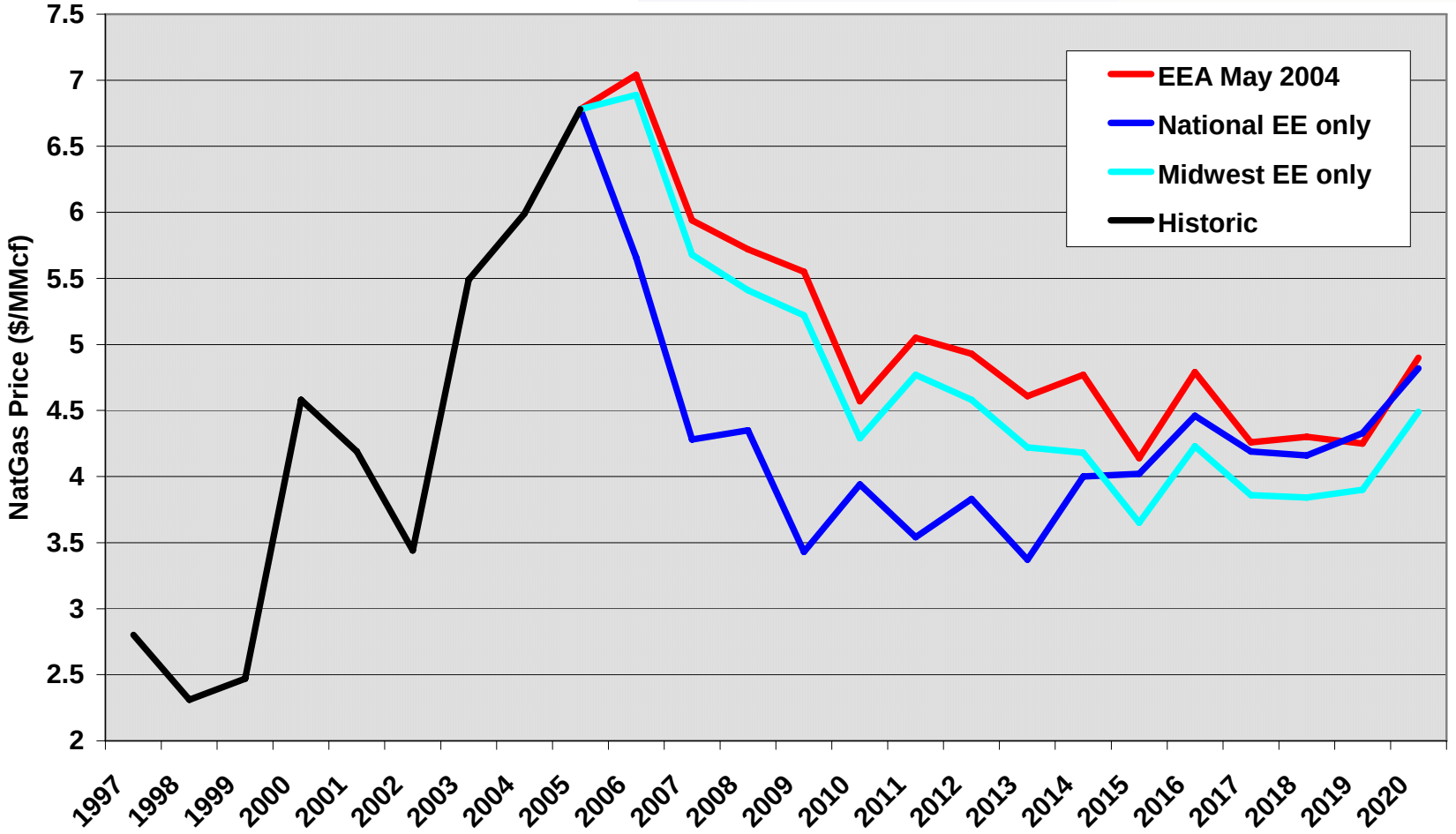
Residential End Uses

Table 3d-1

Residential Market 2001: Annual Natural Gas Consumption per Appliance[1]

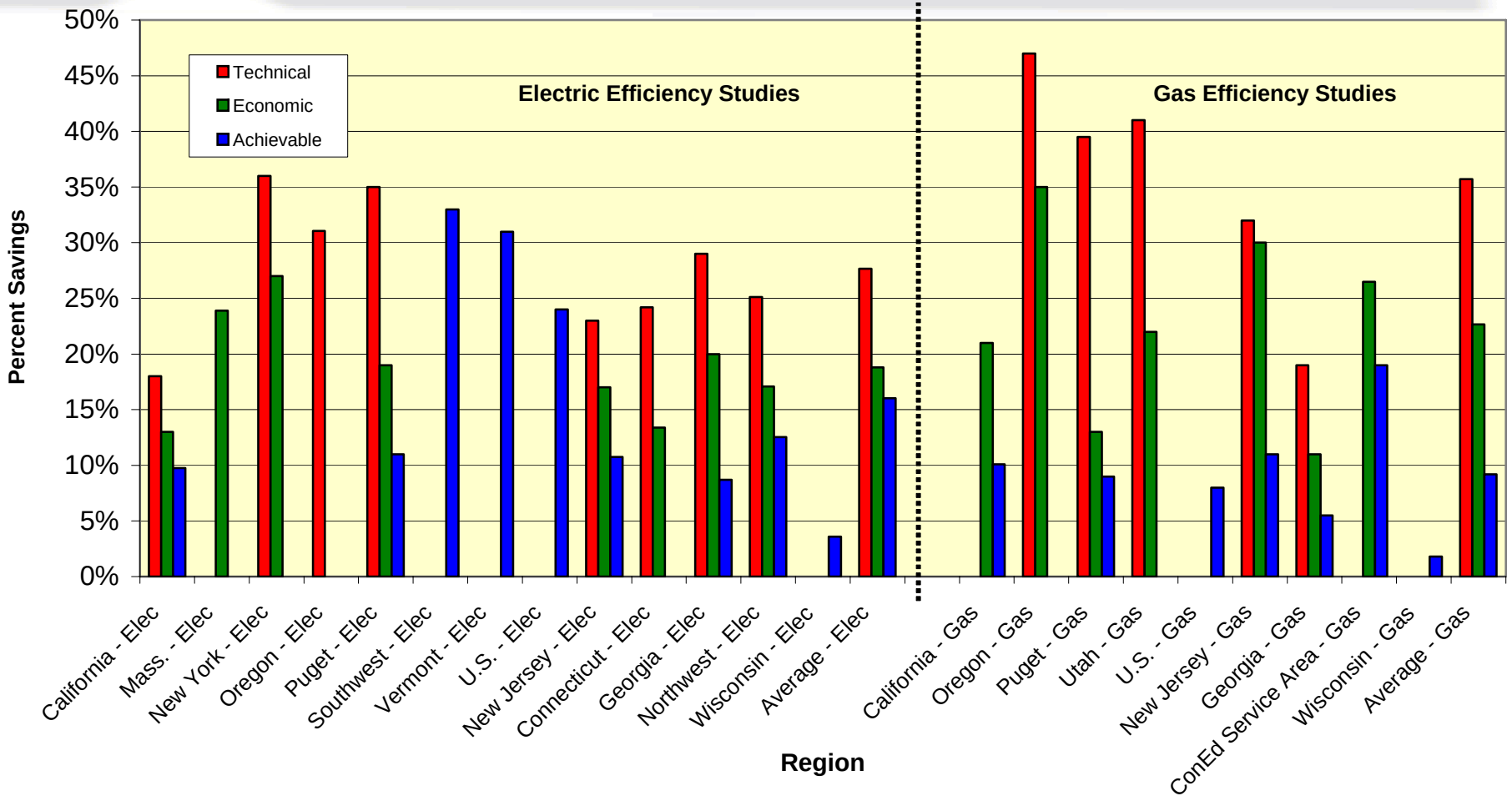
	(MCF)	Appliance Market Share (%)
Space heating	69.7	52
Water heating	34.1	51
Cooking	11.7	35
Clothes drying	3.7	22
Gas Fireplaces	9.7	NA

Energy Efficiency Can Also Reduce Natural Gas Pricing



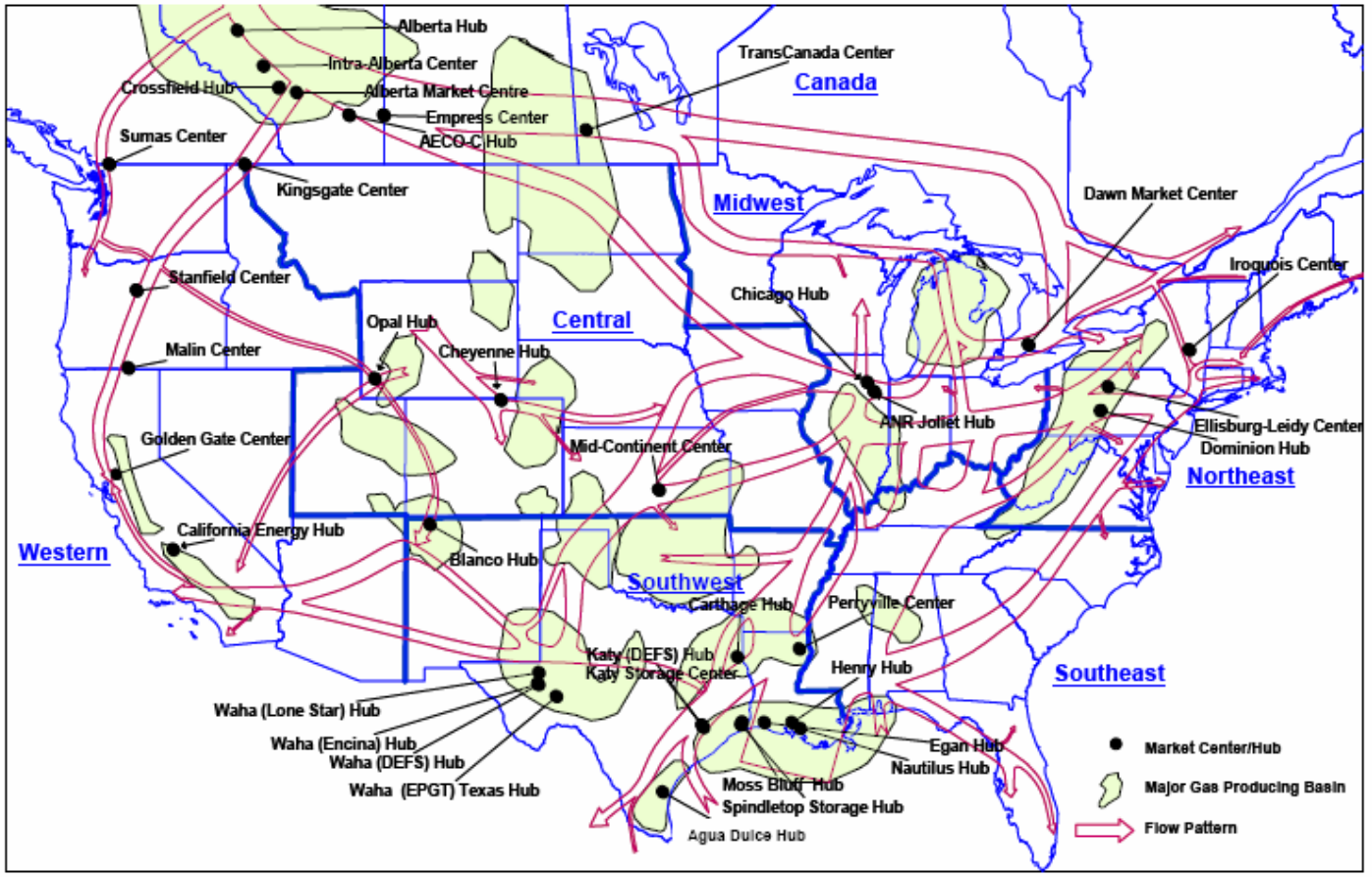
Source: EEA 2004 and ACEEE 2005

Summary of Recent EE Studies



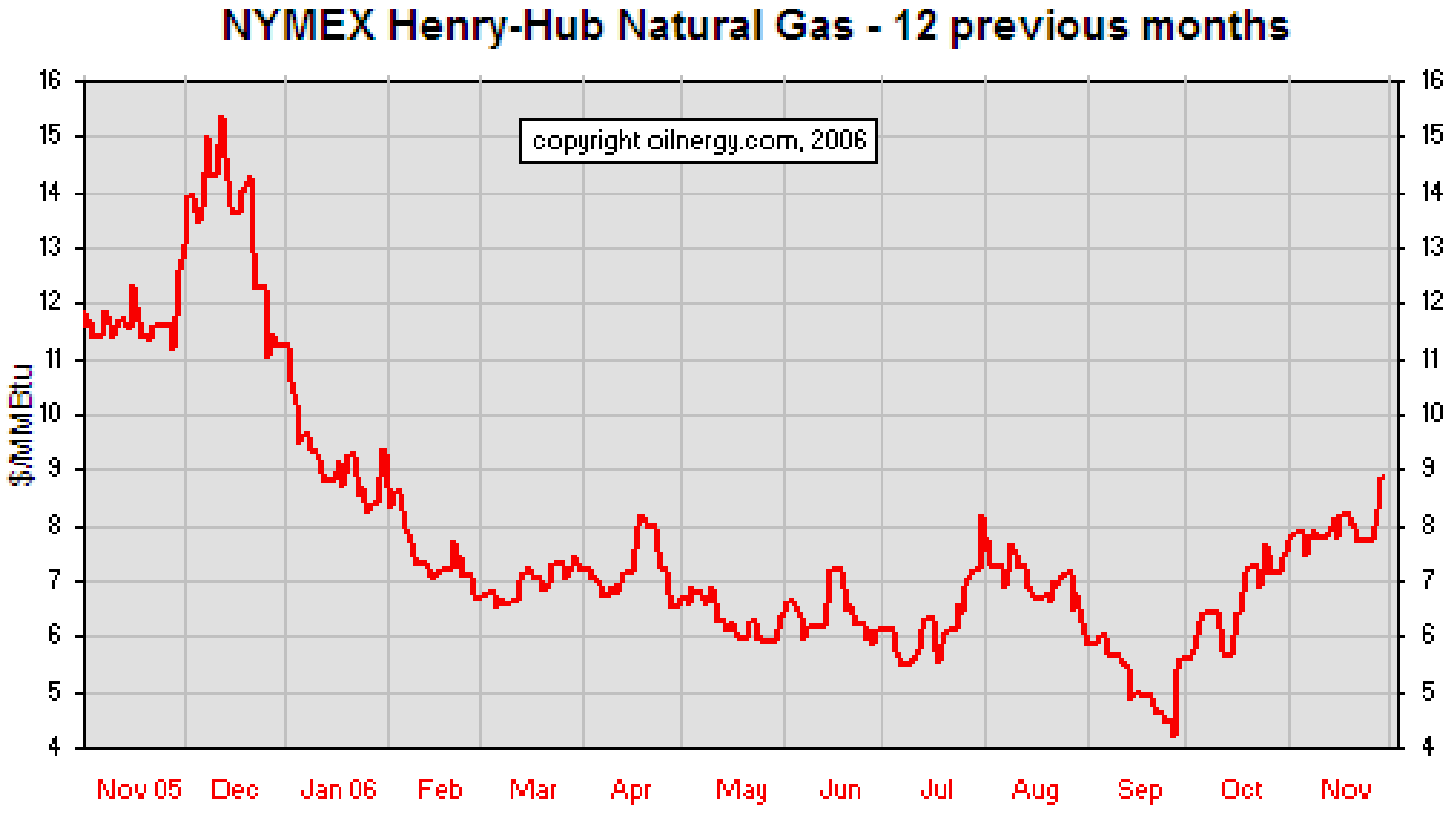
Hubs and Markets

Figure 1. Natural Gas Centers/Hubs in Relation to Production Basins and Major Flow Corridors



Note: DEFS = Duke Energy Field Services Co; EPGT = EPGT Texas Pipeline Co.
Source: Energy Information Administration, GasTran Gas Transportation Information System, Natural Gas Market Hubs Database, as of August 2003.

Hubs and Commodity Pricing



National Data: Gas and Electricity

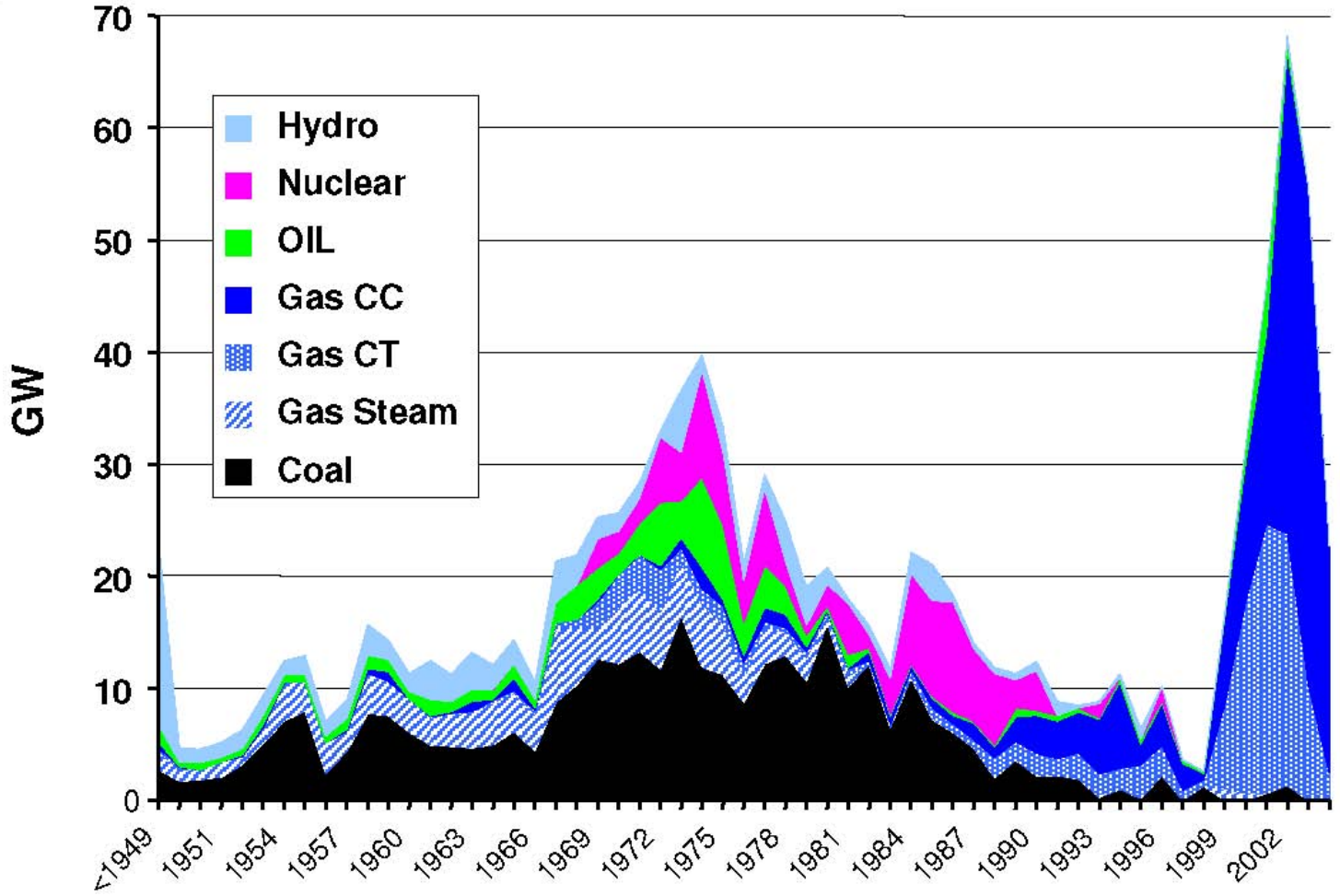
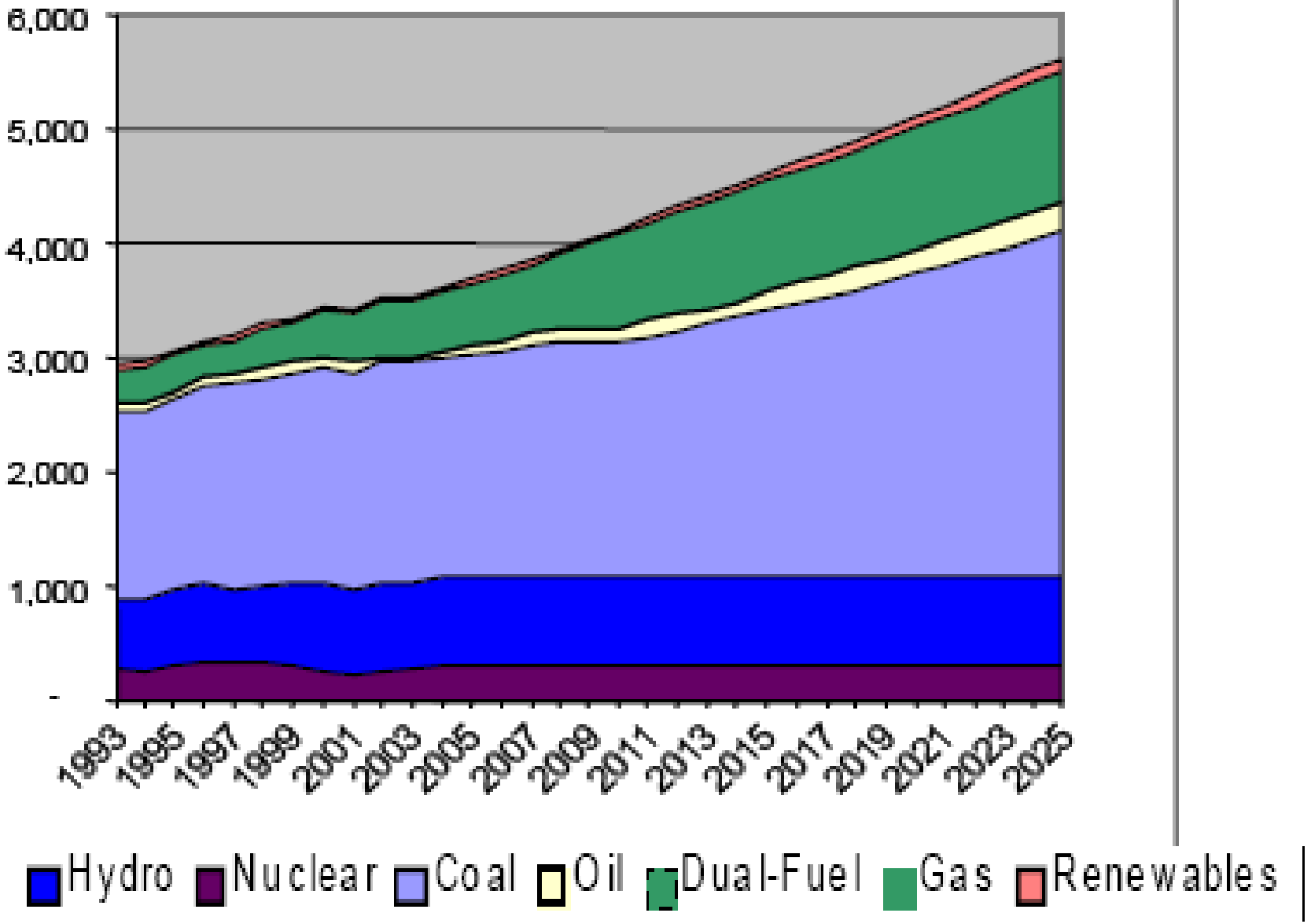
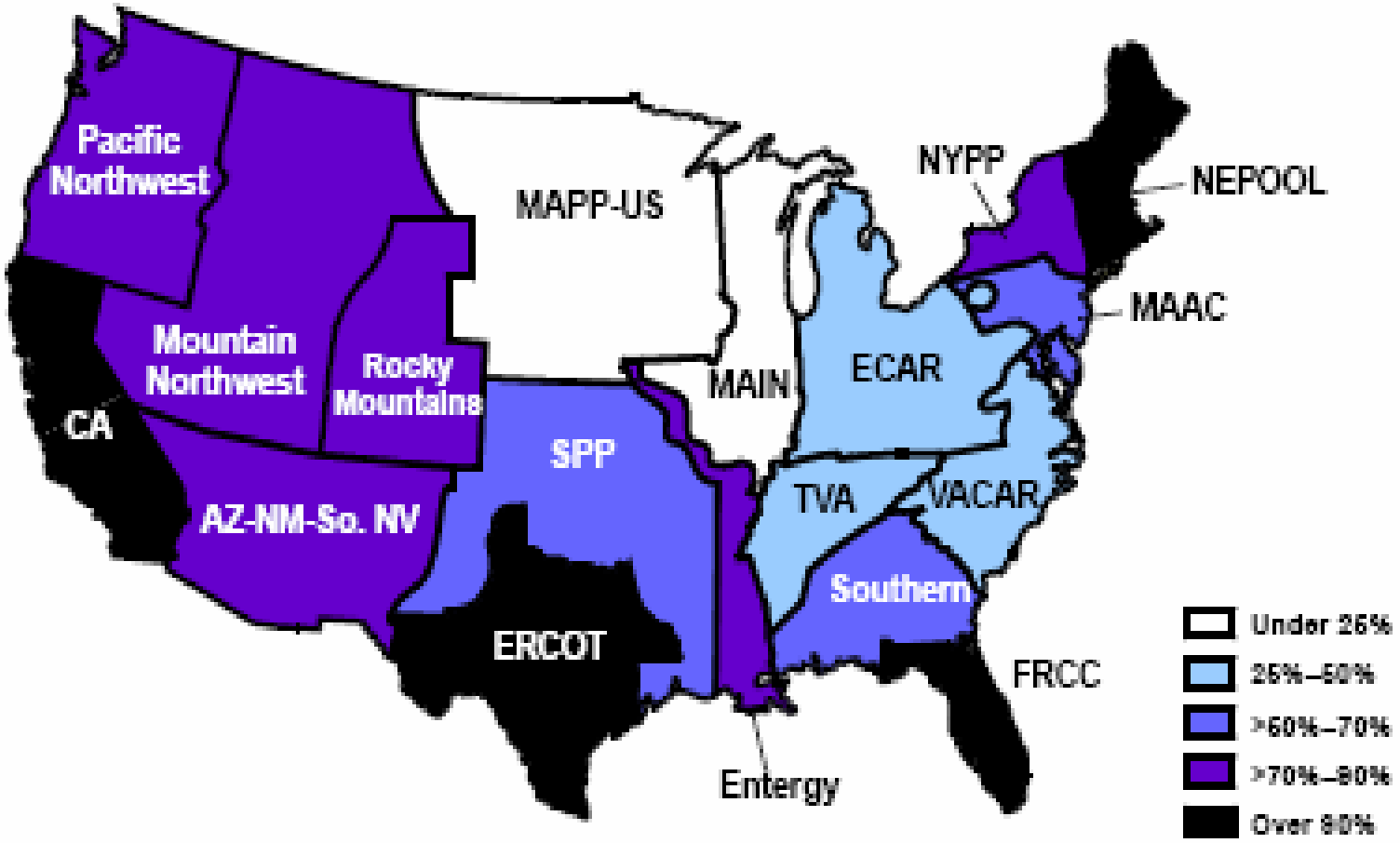


Figure D-6
Electricity Generated by Fuel Type, TWH/Year



Natural Gas Frequently Sets Regional Price

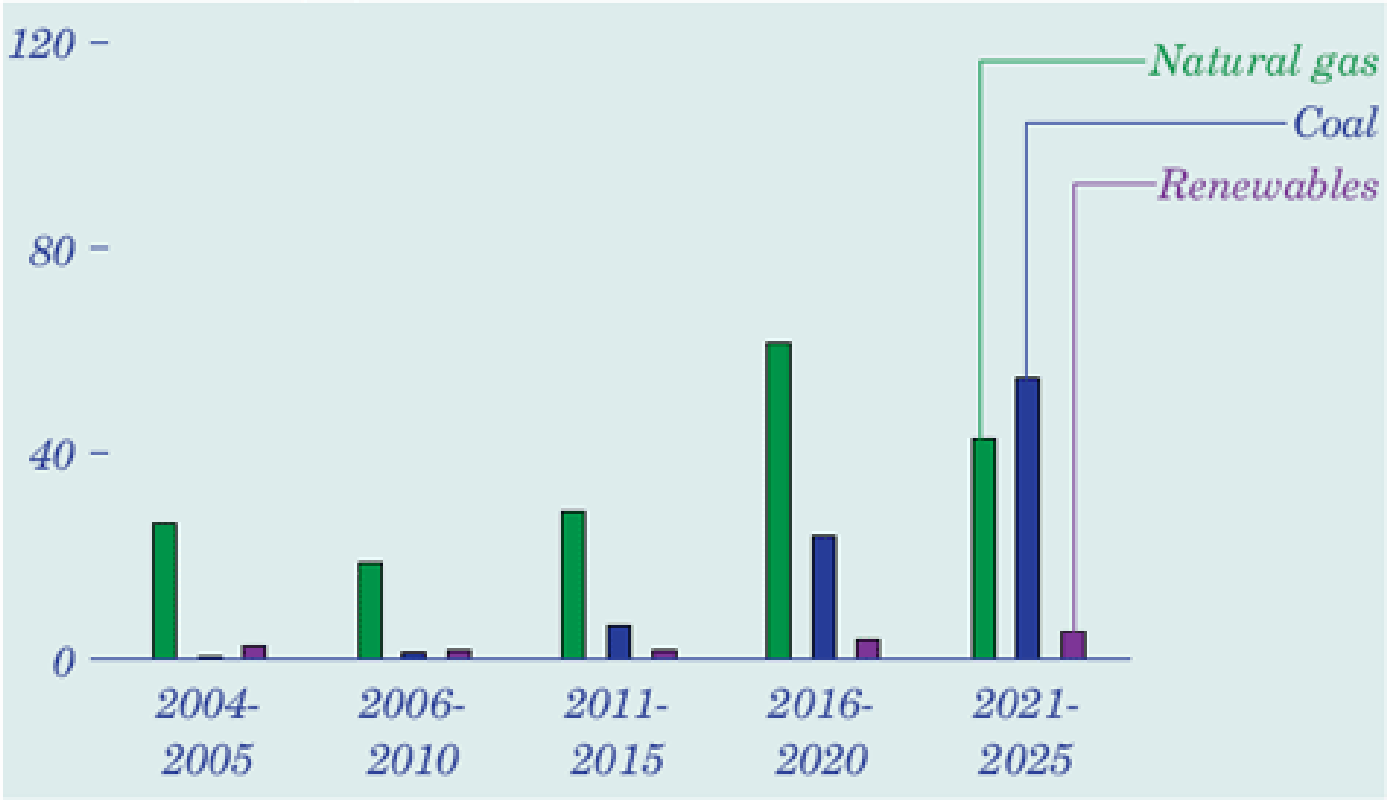
(Percent of time gas and oil on the margin projected in 2004)



Source: Cambridge Energy Research Assocs.
2003

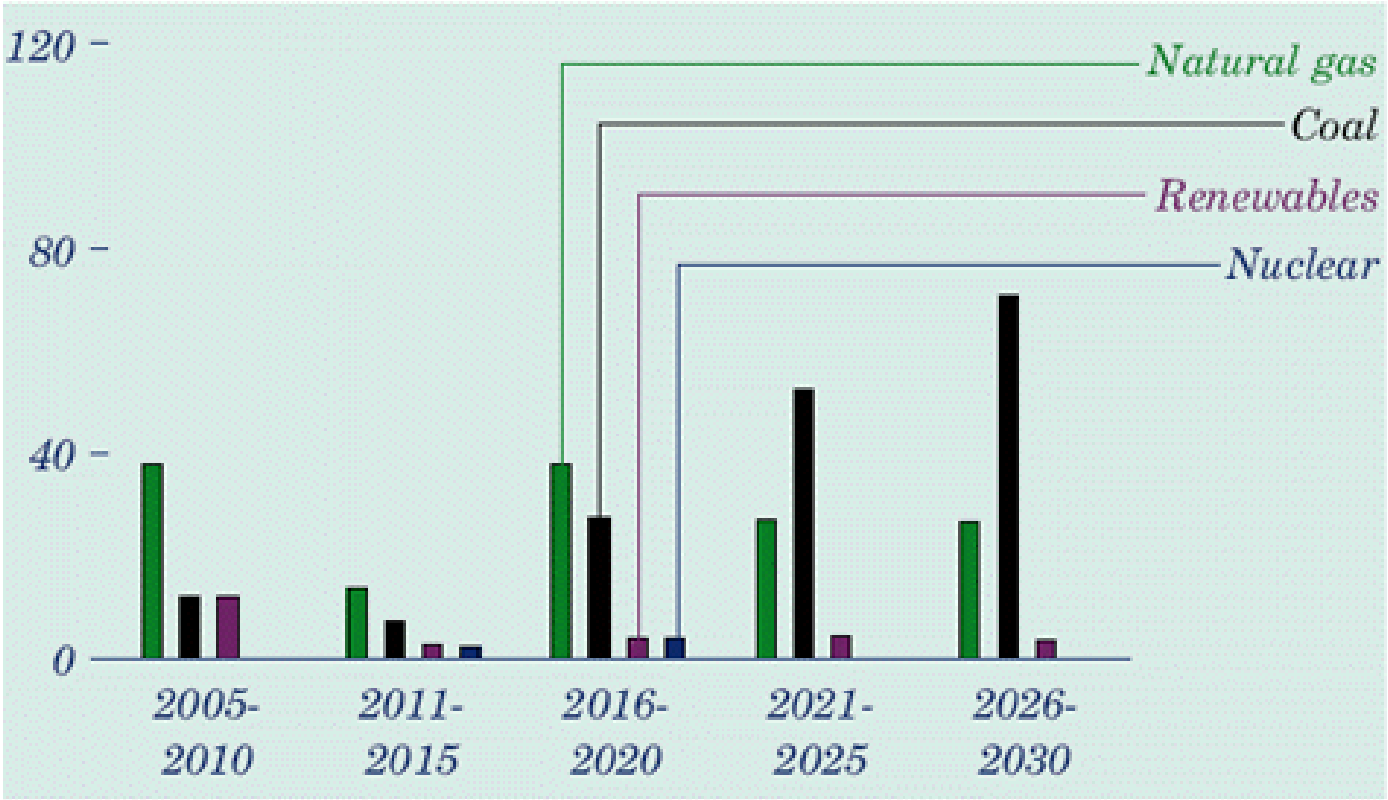
2005 Annual Energy Outlook

Figure 67. Electricity generation capacity additions by fuel type, including combined heat and power, 2004-2025 (gigawatts)



2006 Annual Energy Outlook

Figure 56. Electricity generation capacity additions by fuel type, including combined heat and power, 2005-2030 (gigawatts)



NARUC 1989 Resolution in Support of Incentives for Electric Utility Least-Cost Planning

RESOLVED, That the Executive Committee of the National Association of Regulatory Utility Commissioners (NARUC) assembled in its 1989 Summer Committee Meeting in San Francisco, urges its member state commissions to:

1)consider the loss of earnings potential connected with the use of demand-side resources; and

2)adopt appropriate ratemaking mechanisms to encourage utilities to help their customers improve end-use efficiency cost-effectively; and

3)otherwise **ensure that the successful implementation of a utility's least-cost plan is its most profitable course of action**

Sponsored by the Committee on Energy Conservation, Adopted July 27, 1989

NARUC: 2003 Resolution on EE Support and Incentives

RESOLVED, That … (NARUC)… supports the July 2003, call of the Department of Energy which encourages State and Federal Regulatory Commissions to revisit the level of support and incentives for existing gas and electric utility programs designed to promote and aggressively implement cost-effective conservation, energy efficiency, weatherization, and demand response in both gas and electricity markets.

Sponsored by the Committee on Energy Resources and the Environment Adopted by the NARUC Board of Directors July 30, 2003

NARUC: 2004 Resolution on Gas and Electric Energy Efficiency

RESOLVED, That the Board of Directors of …the NARUC… encourages State commissions and other policy makers to support the expansion of natural gas energy efficiency programs and electric energy efficiency programs, including those designed to promote consumer education, weatherization, and the use of high-efficiency appliances, where economic, and to address regulatory incentives to address inefficient use of gas and electricity; *and be it further*

RESOLVED, That the Board of Directors of the NARUC, encourages State and Federal policy makers to:

(i) review and upgrade the energy efficiency standards for buildings and appliances, where economic, to ensure these standards remain valid under potentially higher energy prices, and

(ii) promote the use of high-efficiency consumer products, where economic, including advanced building materials, Energy Star appliances, and energy "smart" metering and information control devices….

Sponsored by the NARUC Natural Gas Task Force, Committee on Gas, Committee on Consumer Affairs, Committee on Electricity, and Committee on Energy Resources and the Environment Adopted by the NARUC Board of Directors July 14, 2004

NARUC 2006 Resolution on National Action Plan for Energy Efficiency

RESOLVED, That the Board of Directors of the National Association of Regulatory Utility Commissioners (NARUC), convened in its 2006 Summer Meeting in San Francisco, California, **reaffirms its support for the Association's July 2004 "Resolution on Gas and Electric Energy Efficiency"**; *and be it further*

RESOLVED, That the Board of Directors commends the commitments made on July 31, 2006 at the opening session of these meetings by a number of State commissions and other stakeholders to take specific actions to move their States aggressively toward increased energy efficiency; *and be it further*

NARUC 2006 Resolution on the National Action Plan for Energy Efficiency

RESOLVED, That the Board of Directors:

- endorses the principal objectives and recommendations of the National Action Plan on Energy Efficiency, and
- commends to its member commissions a State-specific, and where appropriate, regional review of the elements and potential applicability of the energy efficiency policy recommendations outlined in the Plan, in an effort to identify potential improvements in energy efficiency policy nationwide.

Sponsored by the Executive Committee and the Committees on Consumer Affairs, Electricity, Energy Resources and the Environment, and Gas Adopted by the NARUC Board of Directors August 2, 2006