Future Energy/Efficiency Requirements **(and their impacts on design)**

ASGE Technical Conference

June 8, 2010

Charlie Adams

“Hi. We’re the Government(s), and we’re here to …….. *help*! (?)”

… and why the gas technical community needs to be paying attention!!

Ways the Gov can, is, or is planning to, “help”

- Legislation
- Regulation
- Administration
- Codes/Rules
- Technology development/funding
- Enforcement
- “Interpretive Rules”
- Information
- ……..

How much “help” is out there?

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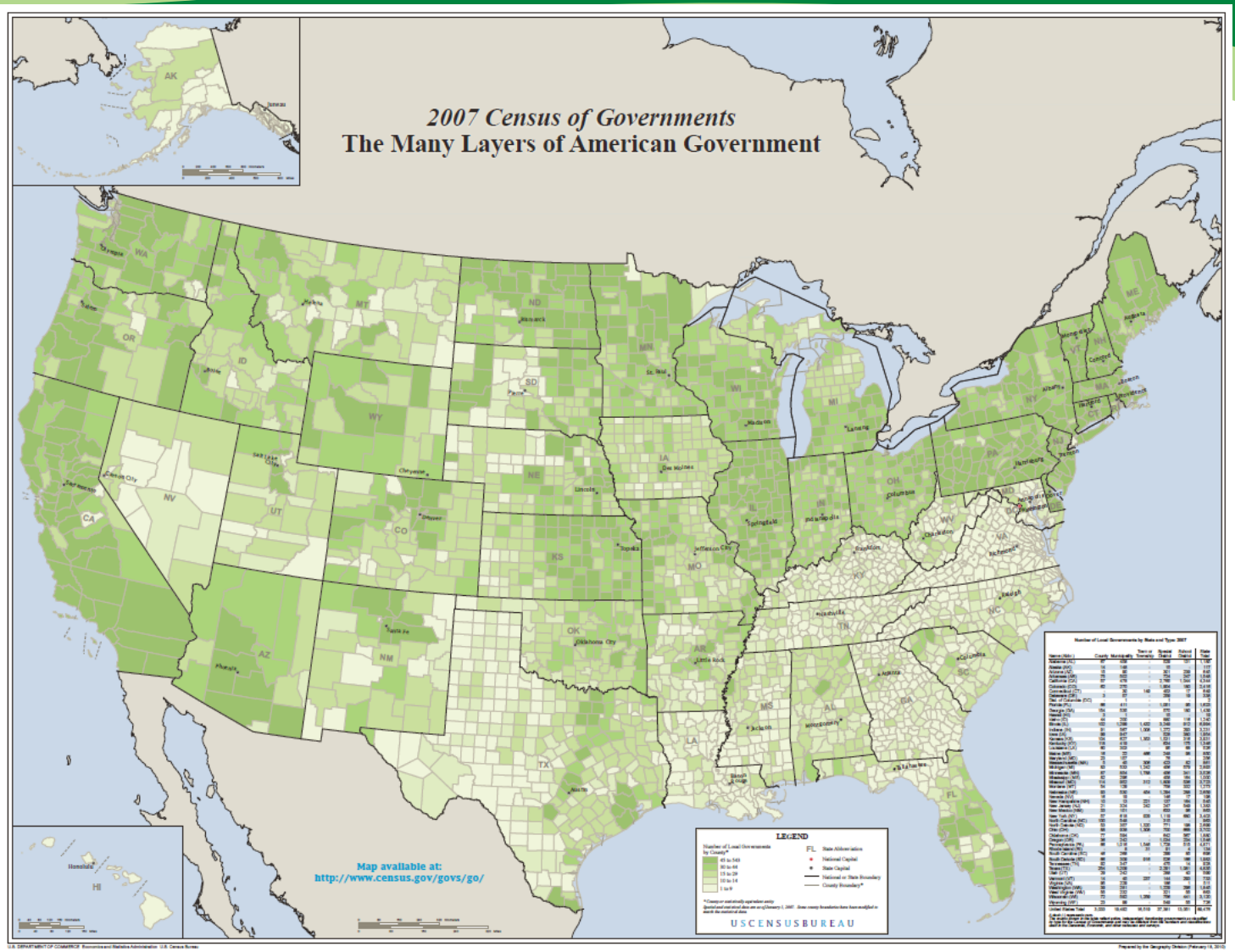

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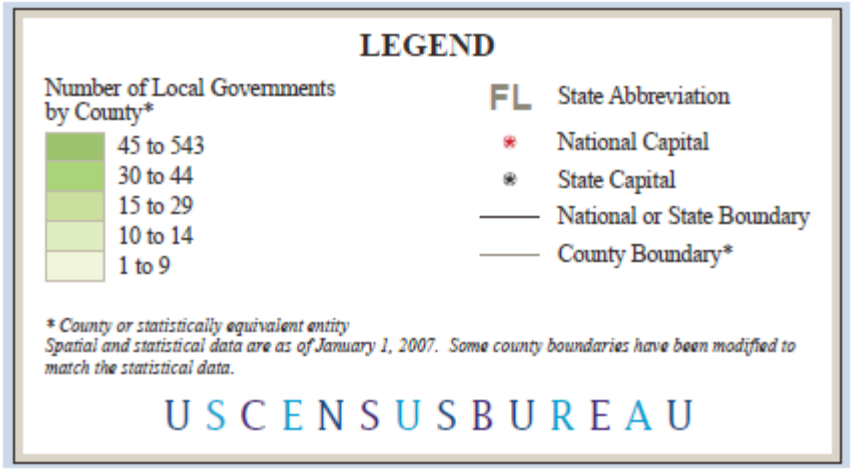

- US total – 89,476 *local;* plus 50 State, 5 Territorial; and, of course, the Federal Gov.
- The most - *543 local gov’s in one county!!*
- http://www.census.gov/govs/go/

Number of Local Governments by State and Type: 2007

Name (Abbr.)	County	Municipality	Town or Township	Special District	School District	State Total
Alabama (AL)	67	458	-	529	131	1,185
Alaska (AK)	14	148	-	15	-	117
Arizona (AZ)	15	90	-	301	239	645
Arkansas (AR)	75	502	-	724	247	1,548
California (CA)	57	478	-	2,765	1,044	4,344
Colorado (CO)	62	270	-	1,904	180	2,416
Connecticut (CT)	-	30	149	453	17	649
Delaware (DE)	3	57	-	259	19	338
Dist. of Columbia (DC)	-	1	-	1	-	2
Florida (FL)	66	411	-	1,051	95	1,623
Georgia (GA)	154	535	-	570	180	1,439
Hawaii (HI)	3	1	-	15	-	19
Idaho (ID)	44	200	-	880	116	1,240
Illinois (IL)	102	1,299	1,432	3,249	912	6,994
Indiana (IN)	91	567	1,008	1,272	293	3,231
Iowa (IA)	99	947	-	528	380	1,954
Kansas (KS)	104	627	1,353	1,531	316	3,931
Kentucky (KY)	118	419	-	634	175	1,346
Louisiana (LA)	60	303	-	95	68	526
Maine (ME)	16	22	466	248	98	850
Maryland (MD)	23	157	-	76	-	256
Massachusetts (MA)	5	45	306	423	82	861
Michigan (MI)	83	533	1,242	456	579	2,893
Minnesota (MN)	87	854	1,788	456	341	3,526
Mississippi (MS)	82	296	-	458	164	1,000
Missouri (MO)	114	952	312	1,809	536	3,723
Montana (MT)	54	129	-	758	332	1,273
Nebraska (NE)	93	530	454	1,294	288	2,659
Nevada (NV)	16	19	-	146	17	198
New Hampshire (NH)	10	13	221	137	164	545
New Jersey (NJ)	21	324	242	247	549	1,383
New Mexico (NM)	33	101	-	633	96	863
New York (NY)	57	618	929	1,119	680	3,403
North Carolina (NC)	100	548	-	315	-	963
North Dakota (ND)	53	357	1,320	771	198	2,699
Ohio (OH)	88	938	1,308	700	668	3,702
Oklahoma (OK)	77	594	-	642	567	1,880
Oregon (OR)	36	242	-	1,034	234	1,546
Pennsylvania (PA)	66	1,016	1,546	1,728	515	4,871
Rhode Island (RI)	-	8	31	91	4	134
South Carolina (SC)	46	268	-	299	85	698
South Dakota (SD)	66	309	916	526	166	1,983
Tennessee (TN)	92	347	-	475	14	928
Texas (TX)	254	1,209	-	2,291	1,081	4,835
Utah (UT)	29	242	-	288	40	599
Vermont (VT)	14	45	237	144	293	733
Virginia (VA)	95	229	-	186	1	511
Washington (WA)	39	281	-	1,229	296	1,845
West Virginia (WV)	55	232	-	321	55	663
Wisconsin (WI)	72	592	1,259	756	441	3,120
Wyoming (WY)	23	99	-	549	55	726
United States Total	3,033	19,492	16,519	37,381	13,051	89,476

A dash (-) represents zero.
The counts shown in the table reflect active, independent, functioning governments as classified by type for the Census of Governments and may be different from the numbers and classifications used in the Decennial, Economic, and other censuses and surveys.

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Legislation

- Federal
  - Energy
    - Minimum efficiencies, test methods
      - Wait! Isn't that regulatory? … *not necessarily!*
        - » Furnaces, water heaters
        - » S. 3059, S. 2908
    - Incentives
      - HomeStar (S. 3177, HR. 5019)
      - BuildingStar (S. 3079, HR. 5476)
      - Best-in-Class Appliance Deployment (HR. 1786)
      - Fuel-switching (!) – S. 1643, oil to natural gas
      - 25C tax credits
      - ARRA (Stimulus)

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Legislation

- Federal
  - Energy and Climate
    - Greenhouse gas reduction
      - Waxman-Markey ACES (HR. 2454)
        - » 20% reduction (from 2005 base year) by 2020
        - » 83% reduction by 2050
        - » 20% RPS + EPS goal by 2039
      - Bingaman ACELA (S. 1462)
        - » 15% RPS + EPS goal by 2039
        - » Expand production of low Btu natgas (< 250 Btu/scf!)
        - » Fund Alaska natgas pipeline (on-line 2023)

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TKYAN: If NOx is important now, …….

- How about gas leaks (and CO_2)?

1 therm =	1.055E+08	joules
methane density =	0.68	kg/m3
NOx level	10	ng/joule
GWP CH4 =	11.92	times that of NOx
1 m3 =	35.315	ft3
1 g =	0.0022	lb.
1 ng =	1.000E-09	g
no. therms used =	250.0	
efficiency =	80%	
output therms =	200.0	

NOx generated =	263.8 grams =	0.58025 lb.

amount of leaked methane to have the same GWP as this amount of NOx:

163.27 ft3 , or	0.7% of therms used

incidentally, there were also 3000 lbs. of CO2 generated
which have 17.3 the GWP impact as the NOx

Regulation

- Federal
  - NAECA and EPACT minimum efficiencies
    - Furnaces (pre-empted by legislation – or Final Rule by May 2011)
    - Water heaters (2015)
    - Pool heaters (2013)
    - Direct heating equipment (2013)
    - Boilers (2012)
    - Clothes dryers – Final Rule due by June 2011

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Regulation

- DOE's Building Technology Program focus:
  - *To create technologies and design approaches that enable net-zero energy buildings at low incremental cost by 2025. A net-zero energy building is a residential or commercial building with greatly reduced needs for energy through efficiency gains (60 to 70 percent less than conventional practice), with the balance of energy needs supplied by renewable technologies. These efficiency gains will have application to buildings constructed before 2025, resulting in a substantial reduction in energy use throughout the sector.*

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Administration

- Executive Orders
  - EO 13514 – October 5, 2009
    - Federal Government to reduce GHG emissions 28% by 2020, among other sustainability goals
- Presidential Memoranda
  - February 5, 2009, to DOE
    - Requested completion of new efficiency standards ahead of deadlines

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Codes/Rules

- The obvious – building codes
  - The (maybe) new wrinkle – ***Federal involvement***
    - Both ACELA and ACES provide for DOE to essentially take over the building codes if the current code agencies do not adopt the efficiency improvements that DOE directs
      - Which are in the 30 – 50% less energy consumption range!
- The all-too-familiar – air quality rules
  - SCAQMD *(and friends)*
    - Rule 1121 small water heaters
    - Rule 1146.2 large water heaters
    - Rule 1111 furnaces

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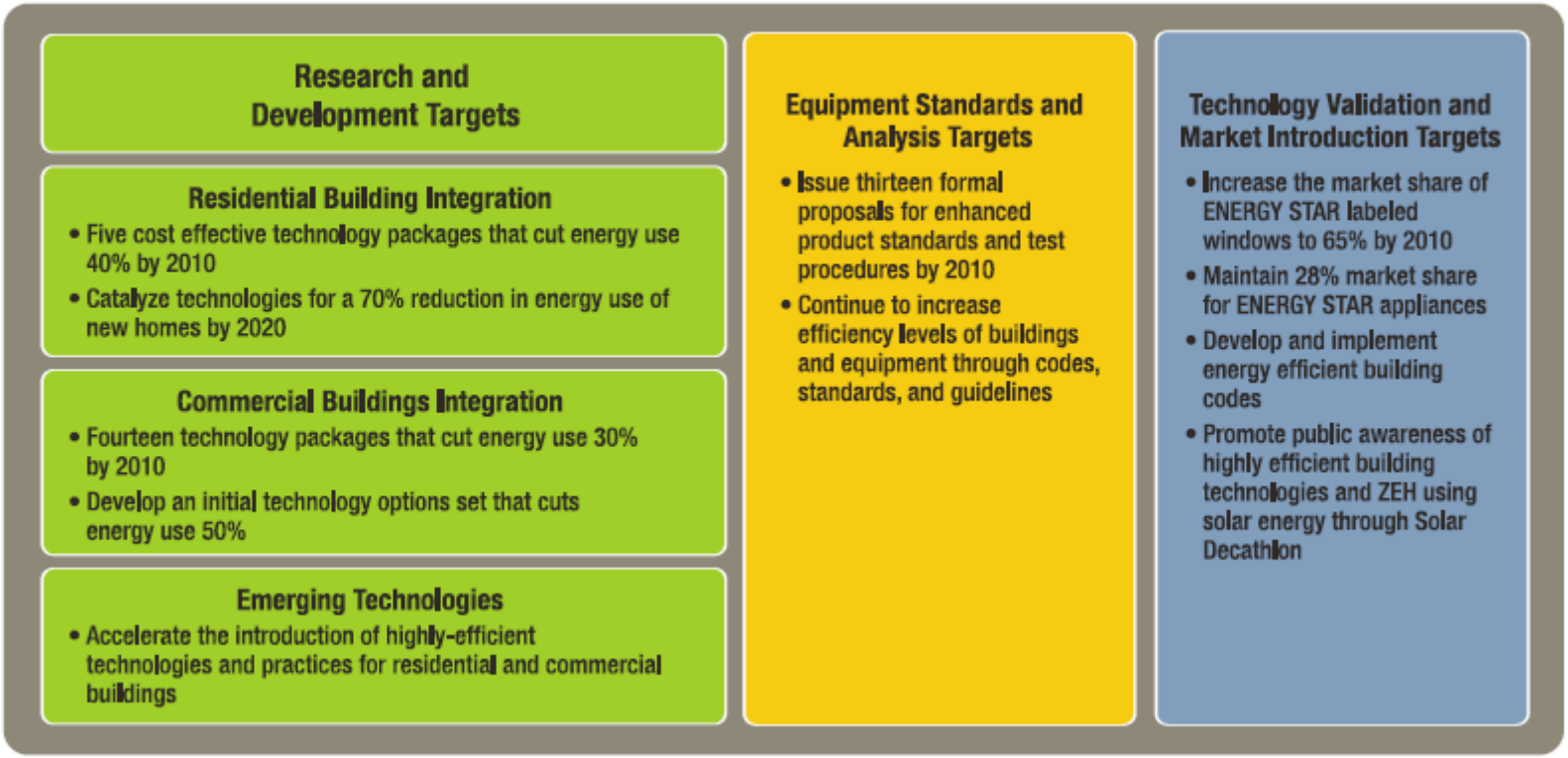
Technology development/funding

Figure 1-10 Research and Development Targets



http://www.eere.energy.gov/buildings/publications/pdfs/corporate/myp08overview_ch1.pdf

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Technology development/funding

U.S. Department of Energy - Energy Efficiency and Renewable Energy
EERE Financial Opportunities

Solicitations for Business, Industry, and Universities

The majority of Office of Energy Efficiency and Renewable Energy (EERE) financial opportunities are for business, industry, and universities.

To explore current EERE financial assistance solicitations and solicitation-related requests, click on the titles in the table below. If you are searching for listings in a particular technology area, be sure to also look at those labeled "crosscutting." These apply to more than one technology area.

The EERE Financial Opportunities RSS feed is updated when new EERE solicitations are posted. Subscribe to RSS feed

Sort by Technology	Sort by Solicitation Title	Sort by Open Date	Sort by Close Date
Wind & Hydropower-Hydropower	Marine and Hydrokinetic Technology Readiness Advancement Initiative	04/20/2010	06/07/2010
Solar	National Administrator of the Solar Instructor Training Network	04/21/2010	06/15/2010
Solar	High Impact Supply Chain Research and Development for PV Technologies and Systems	04/21/2010	07/02/2010
Geothermal	DE-FOA-0000318 Geothermal Energy Production from (A) Low-Temperature Resources, (B) Coproduced Fluids, and (C) Geopressured Resources	05/13/2010	07/09/2010
Biomass	Biomass Research and Development Initiative	05/07/2010	07/13/2010

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Technology development/funding

National Renewable Energy Laboratory
Managed and Operated by the Alliance for Sustainable Energy, LLC

Request for Proposals Number RDJ-0-40283

"Energy Efficient Housing Research Partnerships"

REQUEST FOR PROPOSALS

READ THIS DOCUMENT CAREFULLY

This solicitation is being conducted under the procedures for competitive subcontracts established by the National Renewable Energy Laboratory (NREL). NREL will award a subcontract based on the following.

BEST VALUE SELECTION

All Statement of Work (SOW) requirements being met with the best combination of:

- Technical factors (based on qualitative merit criteria), and
- Evaluated price (or cost)

Issue Date: 05/14/10 Due Date: 06/21/10 Time Due: 3:00 p.m. Mountain Time

Technical questions must be received in writing no later than 06/04/10

1. **Solicitation Type** Best Value Selection
   Fixed Price with Price Participation

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Enforcement

- **DOE Requires Manufacturers to Halt Sales of Heat Pumps and Air Conditioners Violating Minimum Appliance Standards**
  (June 3, 2010 DOE press release)

  Washington, DC - Today, the Department of Energy announced that three manufacturers -- [redacted] -- must stop distributing 61 heat pump models and 1 air conditioner model that DOE has determined do not comply with federal energy conservation standards. The manufacturers also must notify all of their customers that have been sold noncompliant units. The Department determined that these models were noncompliant based on certification information submitted to DOE for these manufacturers.

  "Today's action makes clear that the Department of Energy will take the necessary steps to ensure consumers have access to products that meet the federal standards for energy efficiency," said Department of Energy General Counsel Scott Blake Harris. "As a part of this Administration's commitment to energy efficiency, we will continue to rigorously enforce the Department's energy efficiency requirements that save money for consumers and reduce unnecessary energy use."

- http://www.energy.gov/news/print/9026.htm

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TKYAN: "Interpretive Rule"

- This is a new one (to me) – and scary!
  - "Without advance notice to stakeholders, the U.S. Department of Energy has proposed to re-define showerheads as shower valves, which would allow only a single showerhead using no more than 2.5 gallons per minute of water per showering compartment. The new definition would effectively ban multiple outlet shower systems (hand showers, body sprays, gang showers and more) that have proven popular with segments of the market."
- No public review period required
- No stakeholder involvement required
- No notice other than publication in Federal Register required
- Can be implemented in as little as 30 days.

http://www.supplyht.com/Articles/Breaking_News/BNP_GUID_9-5-2006_A_10000000000000831250

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Information

Energy Information Administration

http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html

U.S. Energy Information Administration
Independent Statistics and Analysis

search

Glossary

Home > Natural Gas

Natural Gas

U.S. Data

Summary
- Monthly Summary of Prices and Volumes
- more Summary data

Prices
- Monthly Wholesale and Retail Prices
- more Price data

Exploration & Reserves
- Reserves Summary
- more Exploration & Reserves data

Production
- Gross Withdrawals and Production
- Number of Producing Wells
- Wellhead Value and Marketed Production
- more Production data

Imports/Exports & Pipelines
- Imports by country
- Exports by country
- Interstate Movements
- more Imports/Exports & Pipelines data

Storage
- Weekly Working Gas in Underground Storage
- Underground Storage

Reports

Weekly Natural Gas Storage normally updated Thursday (schedule)

Natural Gas Weekly Update normally updated Thursday 2 p.m.

Natural Gas Monthly normally updated the last week of month

more Natural Gas Reports...

Analyses

Natural Gas Residential Choice May 2010

Gulf of Mexico Fact Sheet May 2010

Revisions in Natural Gas Monthly Consumption and Price Data, 2004 - 2007 Dec 2009

What role does liquefied natural gas (LNG) play as an energy source for the United States? Dec 2009

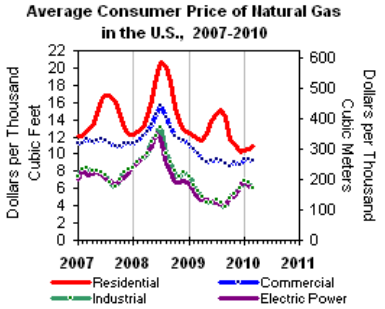
Expansion of the U.S. Natural Gas Pipeline Network: Additions in 2008 and Projects through 2011 Sept 2009

U.S. Natural Gas Imports & Exports: 2008 Sept 2009

Estimates of Peak Underground Working Gas Storage Capacity in the United States, 2009 Update Aug 2009

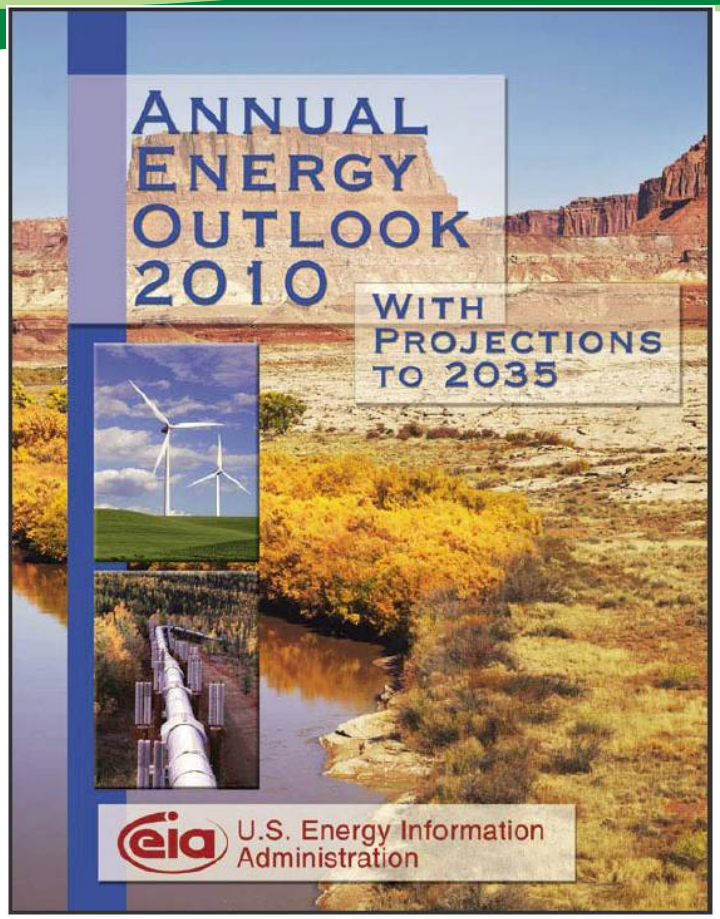
The Implications of Lower Natural Gas Prices for Electric Generators in the Southeast May 2009

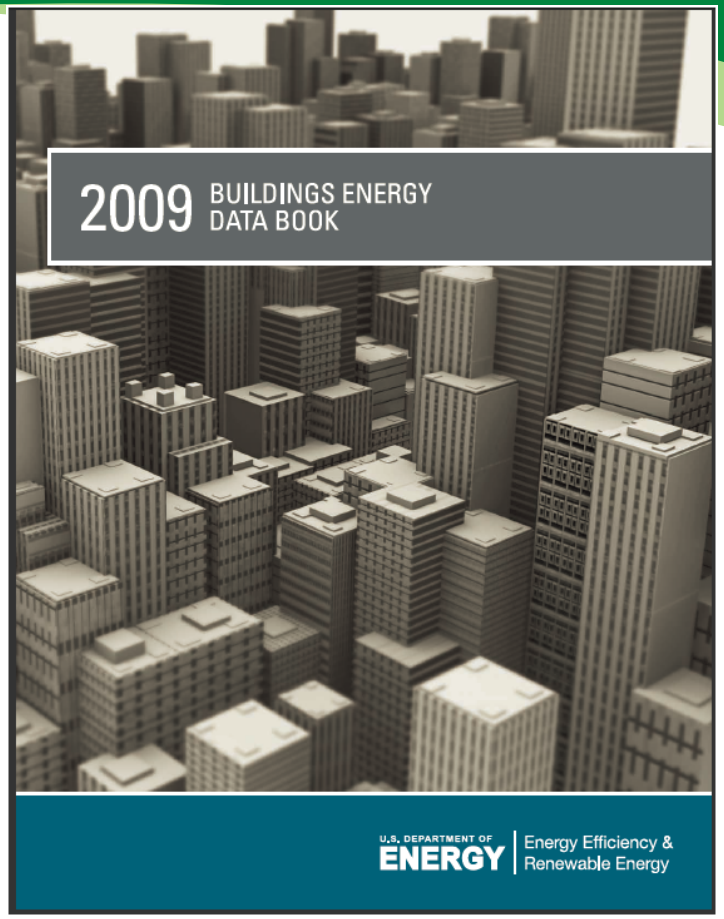
more Natural Gas Analyses...



Announcements & News
- What's New in Natural Gas
- Sign up for email updates
- Natural Gas Annual Product

Information





http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2010).pdf

http://buildingsdatabook.eren.doe.gov/images/download_PDFBr.gif

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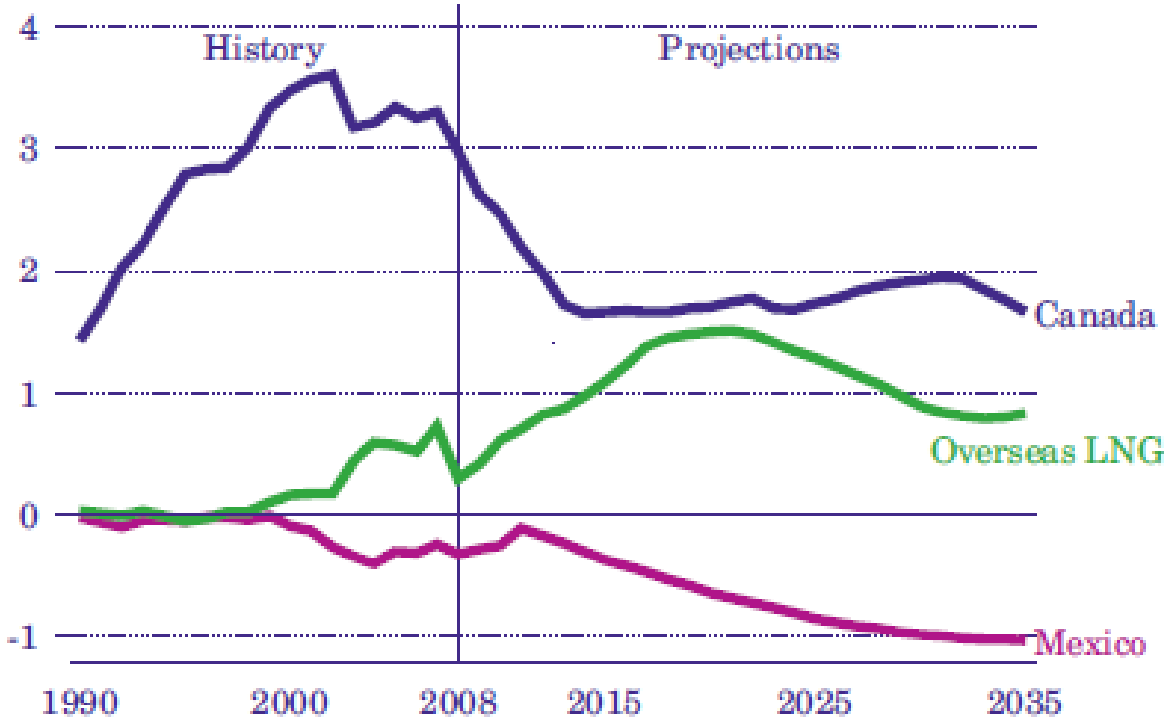
Factoids:

- LNG

Figure 77. U.S. net imports of natural gas by source, 1990-2035 (trillion cubic feet)



Source: AEO2010

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Factoids:

- "Total residential energy consumption is projected to grow at an average rate of 0.7 percent per year between 2005 and 2030, with the most rapid rate of growth projected by EIA for **natural gas fueled space cooling (31.8 percent)** and electricity use for personal computers (4.1 percent), color televisions and set top boxes (2.0 percent), and for the undefined and mostly electric "other" uses which EIA projects will increase 2.2 percent per year."

- "Homes and commercial buildings are also the dominant consumers of natural gas, at 55 percent of total primary consumption, and projected to consume 54 percent by 2030 (Figure 1-4). From the standpoint of utility bills, buildings account for over $97 billion in natural gas expenditures."

http://www.eere.energy.gov/buildings/publications/pdfs/corporate/myp08overview_ch1.pdf

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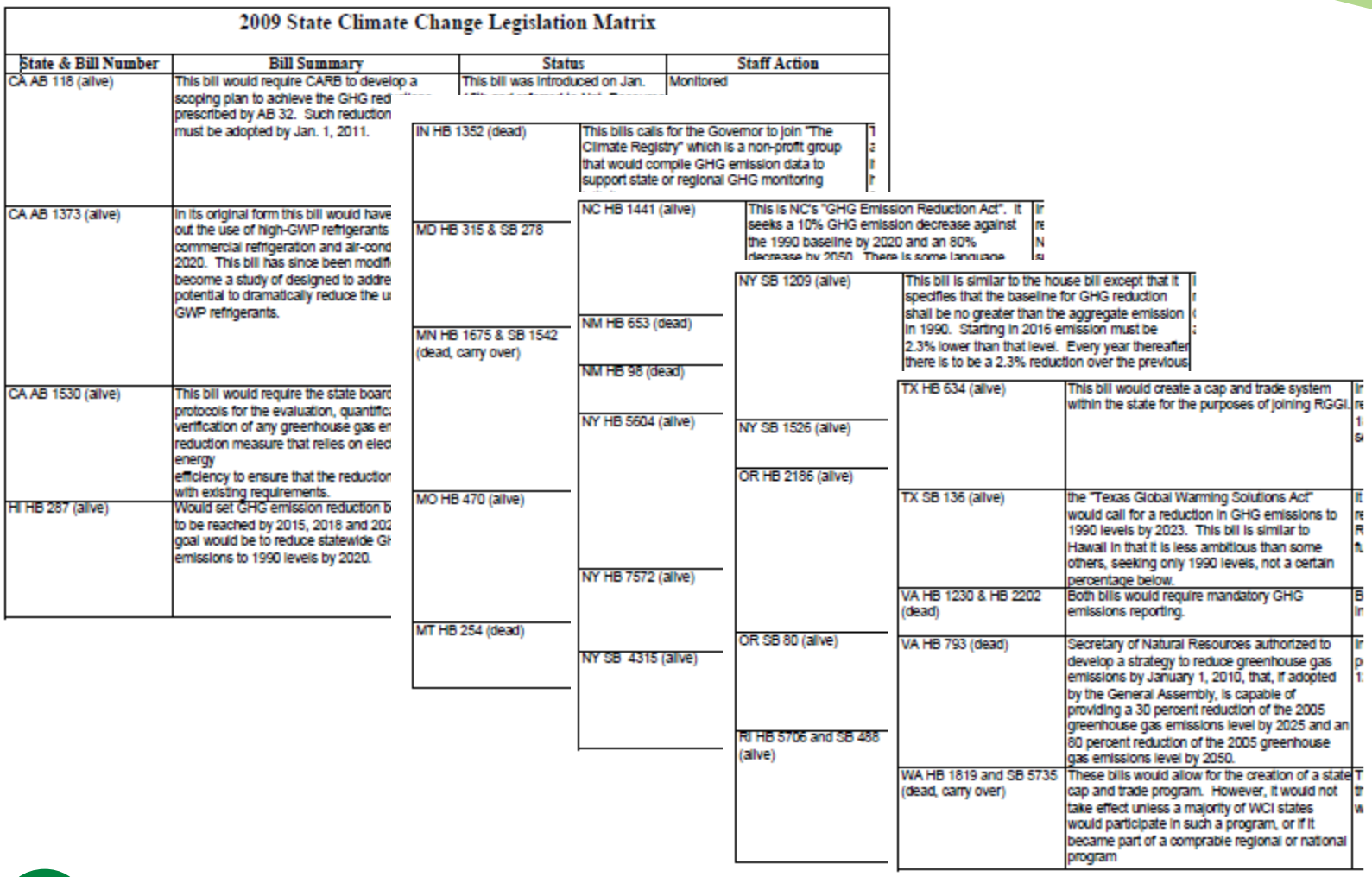
Now that we're through with the Feds, ….



2009 State Climate Change Legislation Matrix

State & Bill Number	Bill Summary	Status	Staff Action
CA AB 118 (alive)	This bill would require CARB to develop a scoping plan to achieve the GHG red prescribed by AB 32. Such reduction must be adopted by Jan. 1, 2011.	This bill was introduced on Jan.	Monitored
CA AB 1373 (alive)	In its original form this bill would have out the use of high-GWP refrigerants commercial refrigeration and air-cond 2020. This bill has since been modifi become a study of designed to addre potential to dramatically reduce the u GWP refrigerants.		
CA AB 1530 (alive)	This bill would require the state board protocols for the evaluation, quantific verification of any greenhouse gas er reduction measure that relies on elec energy efficiency to ensure that the reduction with existing requirements.		
HI HB 287 (alive)	Would set GHG emission reduction t to be reached by 2015, 2018 and 202 goal would be to reduce statewide GH emissions to 1990 levels by 2020.		
IN HB 1352 (dead)	This bills calls for the Governor to join "The Climate Registry" which is a non-profit group that would compile GHG emission data to support state or regional GHG monitoring		
MD HB 315 & SB 278			
MN HB 1675 & SB 1542 (dead, carry over)			
MO HB 470 (alive)			
MT HB 254 (dead)			
NC HB 1441 (alive)	This is NC's "GHG Emission Reduction Act". It seeks a 10% GHG emission decrease against the 1990 baseline by 2020 and an 80%		
NM HB 653 (dead)			
NM HB 98 (dead)			
NY HB 5604 (alive)			
NY HB 7572 (alive)			
NY SB 4315 (alive)			
NY SB 1209 (alive)	This bill is similar to the house bill except that it specifies that the baseline for GHG reduction shall be no greater than the aggregate emission in 1990. Starting in 2016 emission must be 2.3% lower than that level. Every year thereafter there is to be a 2.3% reduction over the previous		
NY SB 1526 (alive)			
OR HB 2186 (alive)			
OR SB 80 (alive)			
RI HB 5706 and SB 488 (alive)			
TX HB 634 (alive)	This bill would create a cap and trade system within the state for the purposes of joining RGGI.		
TX SB 136 (alive)	the "Texas Global Warming Solutions Act" would call for a reduction in GHG emissions to 1990 levels by 2023. This bill is similar to Hawaii in that it is less ambitious than some others, seeking only 1990 levels, not a certain percentage below.		
VA HB 1230 & HB 2202 (dead)	Both bills would require mandatory GHG emissions reporting.		
VA HB 793 (dead)	Secretary of Natural Resources authorized to develop a strategy to reduce greenhouse gas emissions by January 1, 2010, that, if adopted by the General Assembly, is capable of providing a 30 percent reduction of the 2005 greenhouse gas emissions level by 2025 and an 80 percent reduction of the 2005 greenhouse gas emissions level by 2050.		
WA HB 1819 and SB 5735 (dead, carry over)	These bills would allow for the creation of a state cap and trade program. However, it would not take effect unless a majority of WCI states would participate in such a program, or if it became part of a comprable regional or national program		

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And lest we forget our Canadian friends …….

- Depressurization
- Proposed standing pilot ban for boilers
- Differing minimum efficiency requirements on some products
  - (natural draft steam boilers, for example)

Lesson to be learned:

- Gas technologists ***MUST*** start/continue/ increase paying close attention to everything that is going on in the governmental arena – at all levels (all 90,000 or so of them)!!
  - If we don't:
    - Our businesses will be put at risk
    - There will be lost opportunities for business growth
    - We will either do without, or pay for, information needed to run our businesses more effectively, when that information already exists (and we paid for it!).

A.O. Smith

Thank you!

Questions?

Contact info:

Charles (Charlie) Adams

Chief Engineer, Director of Government Affairs

A.O. Smith Corporate Technology Center

11270 West Park Place

Milwaukee, WI 53224

414.359.4274

cadams@aosmith.com