PENNSYLVANIA'S ENERGY RESOURCES

Powering Communities into the Future

American Planning Association – PA Chapter

October 22, 2013

Session Overview

Powering Communities into the Future

- Keys to Successful Planning
- Examples of State Planning
  - State planning case studies
- Keystone State's Energy Portfolio
- Marcellus Shale – A Game Changer
- A Changing Energy Landscape
- Benefits to Consumers
- Non-Traditional Energy Resources
- PA State Energy Plan
- What's Coming Up Next?
- Questions?

Keys to Successful Planning

- Assessment & Baseline
  - Know where you are to know where you are going
- Objective data & information
- Realistic goals & objectives
  - Are they attainable?
- Periodic review & update
- Keep your target audience(s) in mind
  - Who is going to use it?

Examples of State Planning

- Statewide Water Resources Plan
- Alternative Energy Portfolio Standards
- Solid Waste & Recycling Plan
- Pennsylvania State Energy Plan

Statewide Water Resources Plan

A Case Study

What?

- Act 220 of 2002
- Regional & State Water Plan – update each 5 yrs.
- Critical shortages & future demands
- Prioritize infrastructure improvements
- Balance competing interests
- Educate & inform policymakers

Why?

- 2nd most stream miles (86,000) in U.S. (Alaska)
- 162,000 acres of lakes
- 404,000 acres of wetlands
- 2nd most private water wells (1m) in U.S. (Michigan), serving 3.5 m residents

Alternative Energy Portfolio Standards
A Case Study

What?

- Act 213 of 2004
- Statutorily prescribed plan
- Annually increases mandatory use of alternative & renewable resources through 2020 (18%)
- Regular reports to General Assembly evaluating competitiveness of alternative & renewable energy

Why?

- Diversify PA's electric generation portfolio
- Lower emissions
- Attract capital investment to PA

Solid Waste & Recycling Planning
A Case Study

What?

- Act 101 of 1988
- Requires county & municipal planning
- Updated at least 3 years prior to exhausting permitted disposal capacity
- Must submit to all municipalities & advisory committee

Why?

- Ensure availability of sufficient processing & disposal capacity for generated waste
- Provide for transportation, collection & storage of municipal waste
- Reduce waste disposal through recycling

Keystone State's Energy Portfolio

<u>OVERVIEW</u>

Pennsylvania's Energy Portfolio

Worth Planning For?

Keystone State's Energy Portfolio

ABUNDANT…AFFORDABLE…DOMESTIC

- Coal
- Oil & Gas
  - Unconventional Shale gas
  - Conventional oil & gas
- Nuclear
- Renewables & Alternatives
- Energy Efficiency & Storage
- Competitive Electric & Gas Markets

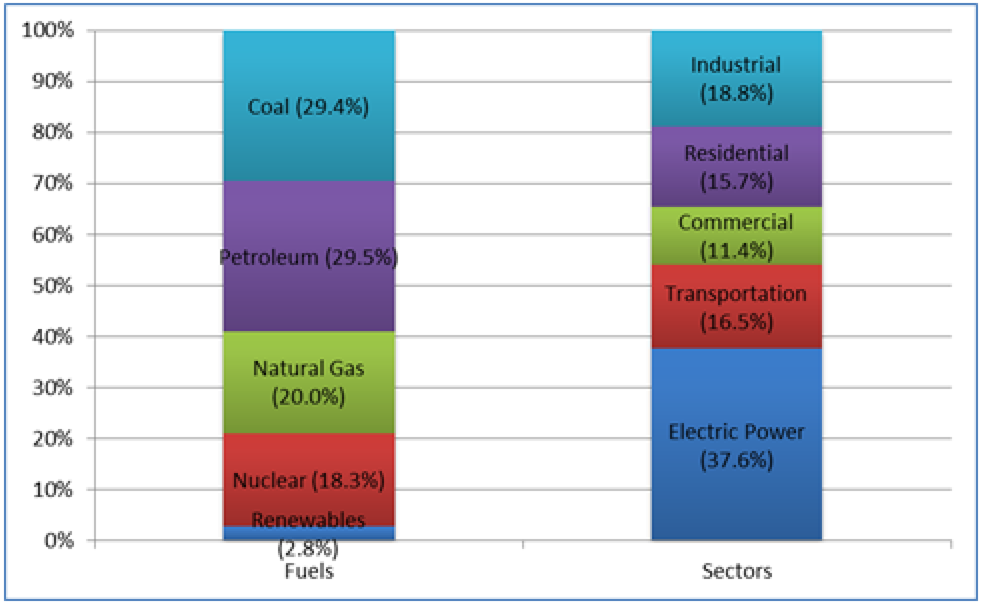
Keystone State's Energy Portfolio ~ continued ~

ABUNDANT…AFFORDABLE…DOMESTIC

- 2nd largest energy field in the world
- 4th largest energy producer in U.S.
- 2nd largest electric generator in U.S.
- 2nd largest nuclear generator in U.S.
- 4th largest coal producer in U.S.
- 3rd in natural gas production in U.S.
  - 2 TCF in 2012, double from 2011
  - Net exporter for first time in 100 years
- 15th in total wind capacity installed
- 2+ million electric choice customers

Keystone State's Energy Portfolio ~ continued ~

PA Energy Consumption by Source & Sector – 2010 (BTUs)



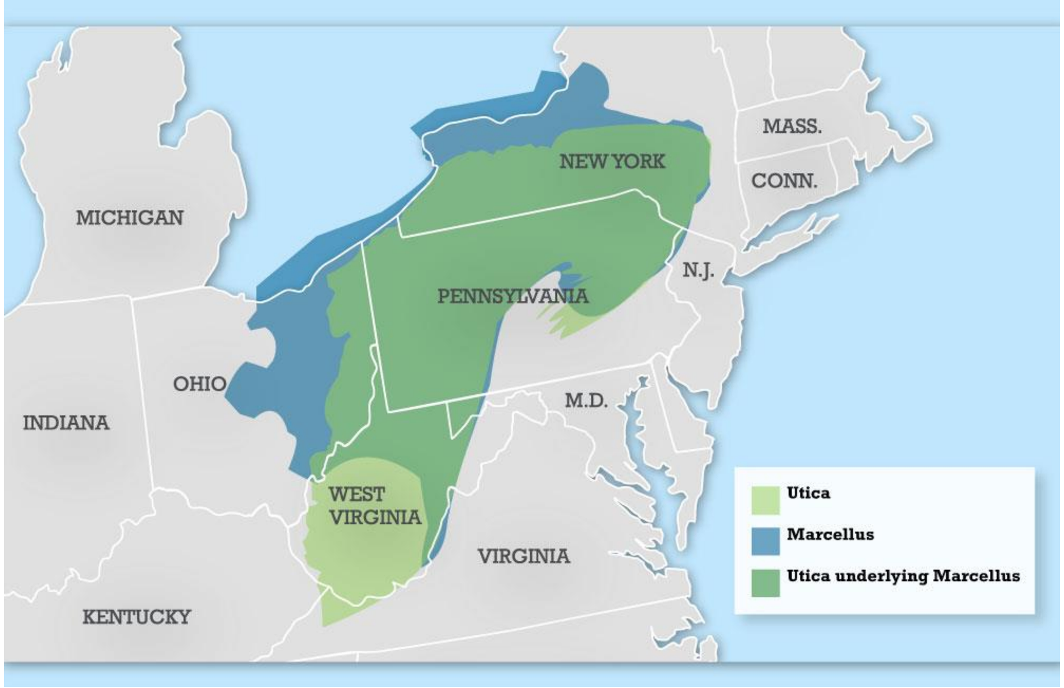
Source: U.S. Energy Information Administration

Marcellus Shale – A Game Changer

Marcellus What??

Marcellus Shale – A Game Changer

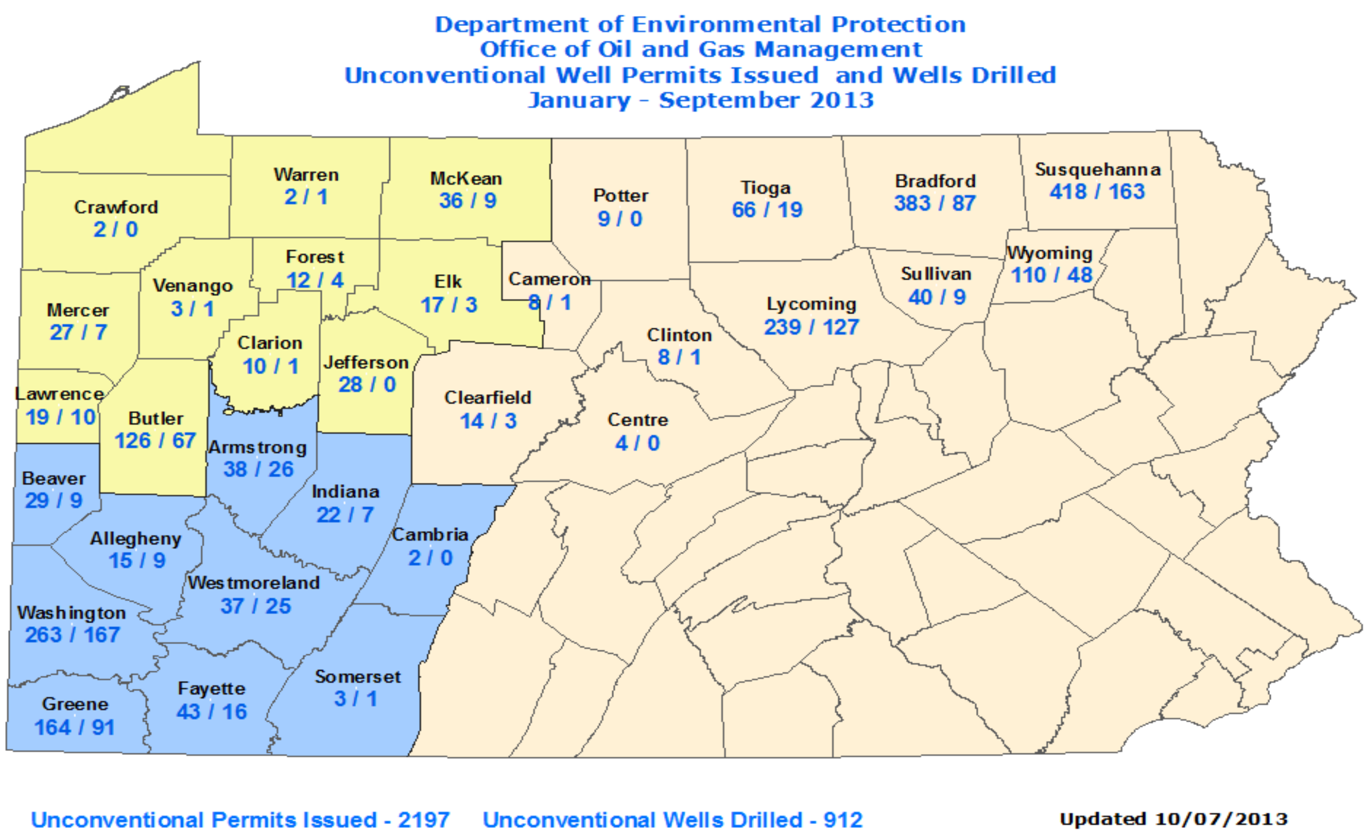
- 489 tcf of *technically recoverable* gas (2009 – T. Engelder)
- Largest Unconventional Shale Gas Play in Nation
- 9 bcf/day – 25% of all U.S. shale gas production
- Production doubled in 2010, 2011 & 2012



By the Numbers…Drilling

- How many unconventional wells drilled?
  - 7,125 (since 2005)
  - 1,365 (2012)
  - 905 (2013 – thru 9/26)
- Gas Production
  - 4,227 producing wells (June 30, 2013)
  - Amount of production reported every 6 months
    - 631 bcf (July- Dec '11)
    - 894 bcf (Jan- June '12)
    - 1,146 bcf (July-Dec '12)
    - 1,406 bcf (Jan-June '13)

Marcellus Wells Permitted and Wells Drilled - 2013



Energy = Jobs

Oil & Gas Industry

- 30,752 Employed in Core Industries
  - 164% increase since 2009
- 214,302 Employed in Ancillary Industries
  - 7.9% increase since 2009 (total employment increased 2.7% across all industries)
- <u>Average Salaries</u>
  - $82,643 (core industries)
  - $64,559 (ancillary industries)
  - $47,922 (all industry sectors)
- $2.0 billion corporate & personal taxes paid (since ‘07)
- $406 million impact fees (‘12-’13)

Energy = Jobs

Oil & Gas Industry

- Between 2010 and 2015, the shale gas industry in Pennsylvania's economy will grow by nearly 19 % annually
- By 2035, will contribute $42.4 billion annually to Pennsylvania's economy – up from $7.1 billion in 2010
- Shale industry job growth is averaging 14% a year
- "Jobs Contribution" will grow from 56,884 in 2010 to 111,024 in 2015 and 270,058 in 2035

Source: IHS Global Insight

PA – Shale Gas
Doing It Right

REGULATORY

- Well Permit Fee Increase
  - DEP oversight/permit staff doubled (202 staff)
- Chapter 78 Revisions
  - Well Construction Standards
- Chapter 95 Revisions
  - Wastewater Treatment Standards (TDS)
- DEP's Call to Operators
  - April 19, 2011 - Stop Transporting Waste Water to Grandfathered Facilities

PA – Shale Gas
Doing It Right

LEGISLATIVE

- Act 15 of 2010
  - 6 Month Production Reporting
  - Posted on DEP's Website
- Act 127 of 2011 – Gas & Hazardous Liquids Pipelines Act
  - Authorizes PUC to enforce federal pipeline safety laws; creates registry
- Act 9 of 2012 – Unconventional Well 911 Emergency Response Information
  - Requires operators to adopt, register and display unique GPS coordinate address at well site
  - Operators must also develop and file an emergency response plan
- Act 13 of 2012
  - First comprehensive update of Oil & Gas Act since 1984
  - Impact Fee & Enhancement of Environmental Standards

PA – Shale Gas
Doing It Right

PUBLIC NOTICE & SETBACK DISTANCES

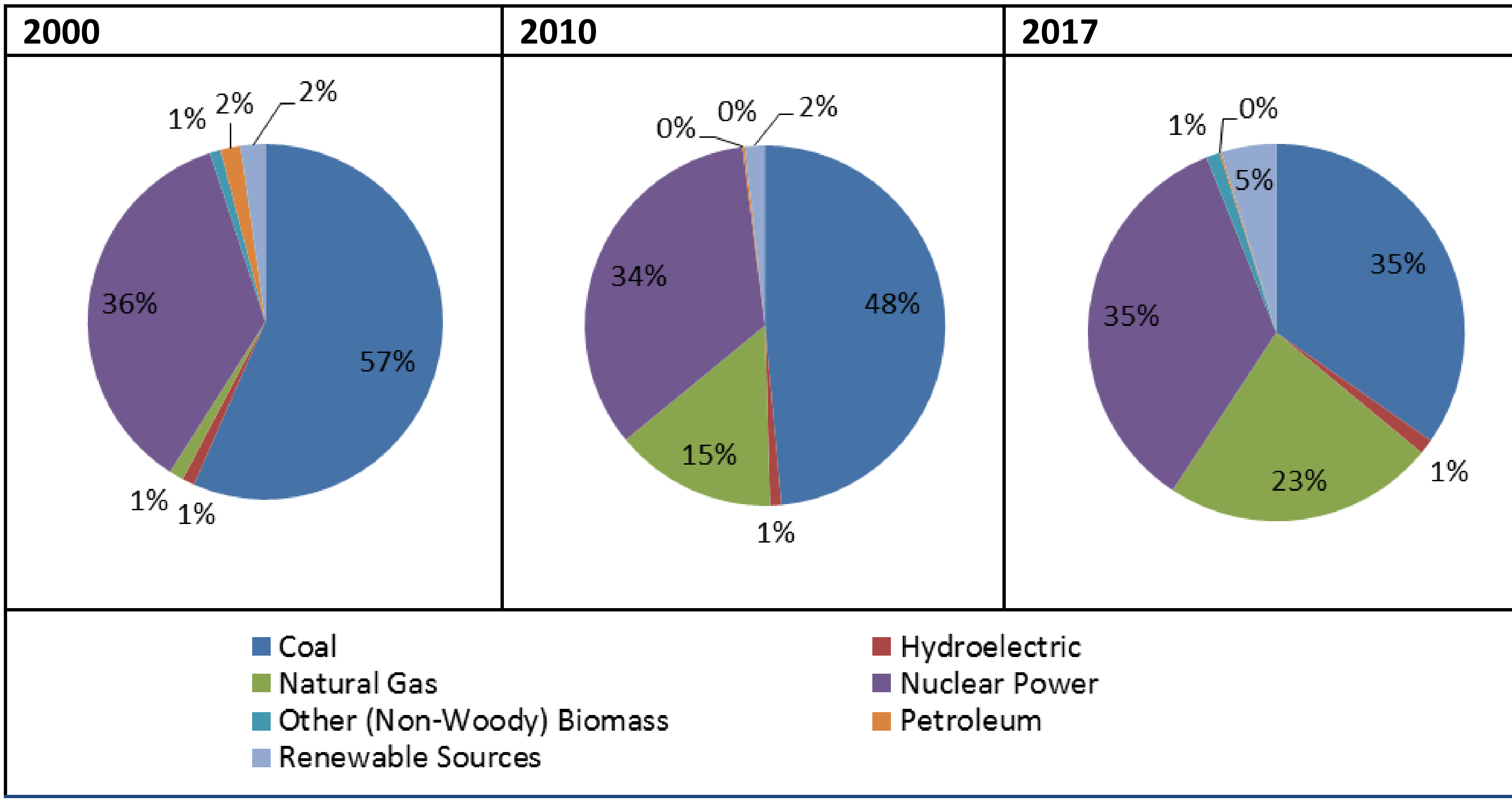
- Extends permit notification:
  - 1,000 feet increased to 3,000 feet
  - Municipality and adjacent municipality
  - E-FACTS – online notification (free email subscription)
- Extends well setback distances:
  - Streams, rivers & waterways: 100 feet increased to 300 feet
  - Buildings: 200 feet increased to 500 feet
  - Water wells: 200 feet increased to 500 feet
  - Public water supplies: 1,000 feet (new standard)
  - Maintain 100 foot setback from edge of disturbance and waterways
  - Limits on drilling activity and storage of material in floodplains
- Outlines standards for well pad containment systems

A Changing Energy Landscape

- Recent trends in energy development & use
  - Where were we?
  - Where are we?
  - Where are we going?

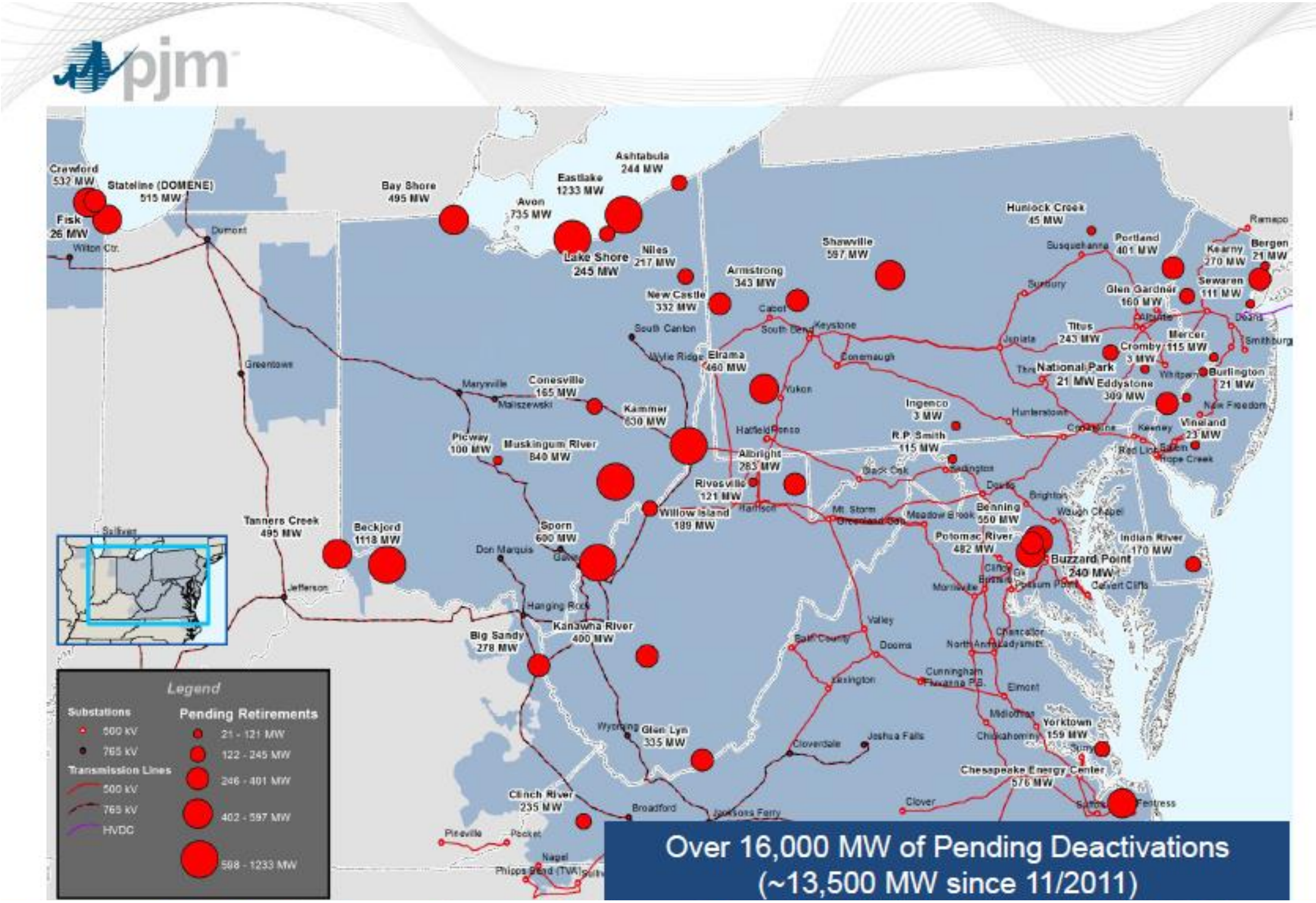
A Changing Energy Landscape

PA Electricity Generation by Fuel Type



A Changing Energy Landscape

Pending Coal Fired Power Plant Retirements



A Changing Energy Landscape

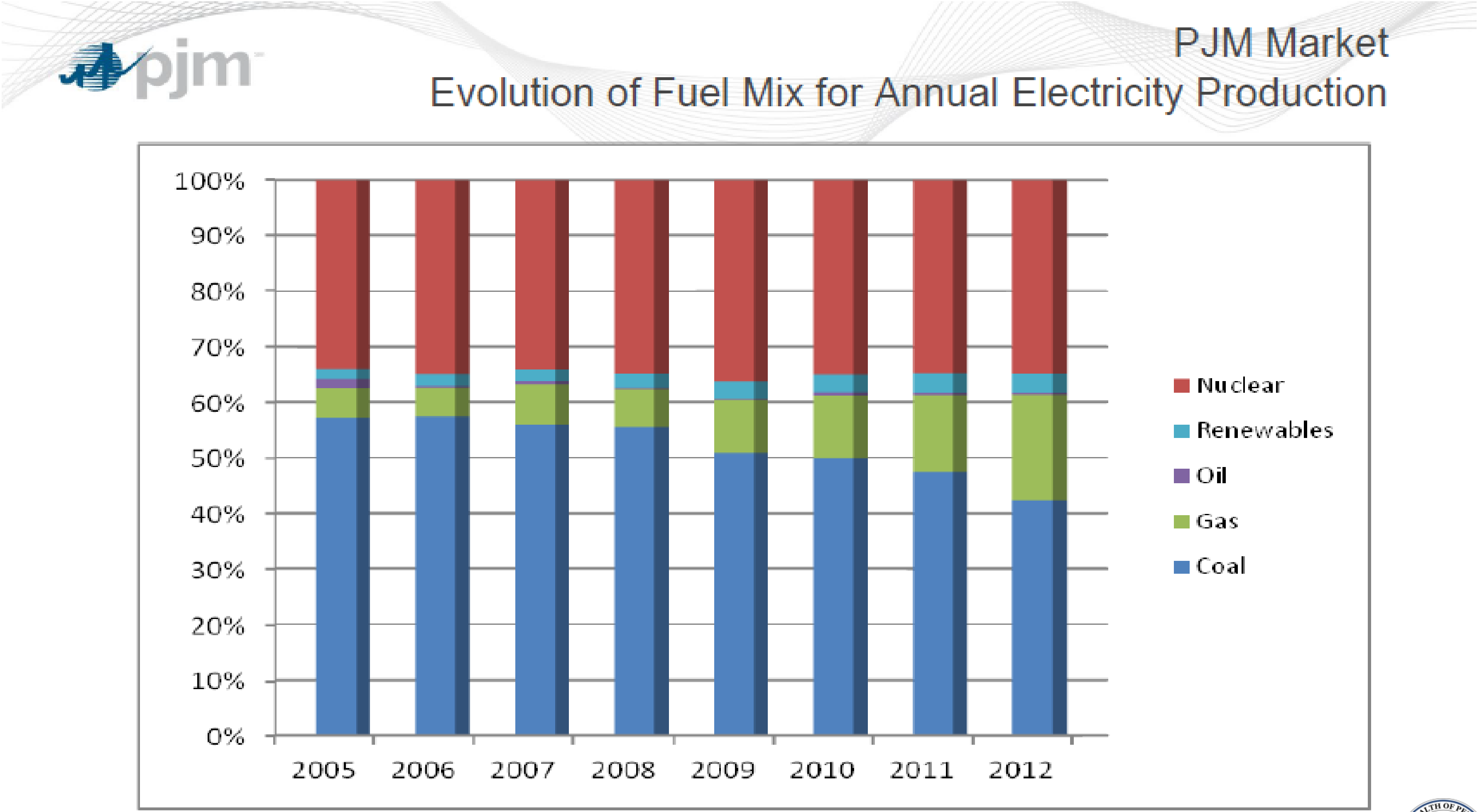
Proposed Gas Fired Power Plants

Applicant	County	Approximate Capacity (MW)
Moxie Liberty, LLC	Bradford	900
Berks Hollow Energy Associates, LLC	Berks	855
Moxie Patriot, LLC	Lycoming	900
Bakers Farm Energy, LLC	York	650
Hickory Run Energy, LLC	Lawrence	750
Tenaska Pennsylvania Partners, LLC	Westmoreland	900
Tenaska Pennsylvania II Partners, LLC	Lebanon	900
Sunbury Generation LP	Snyder	1,064
Future Power PA, Inc.	Schuylkill	300
	TOTAL	**7,219**

Source: PA Department of Environmental Protection

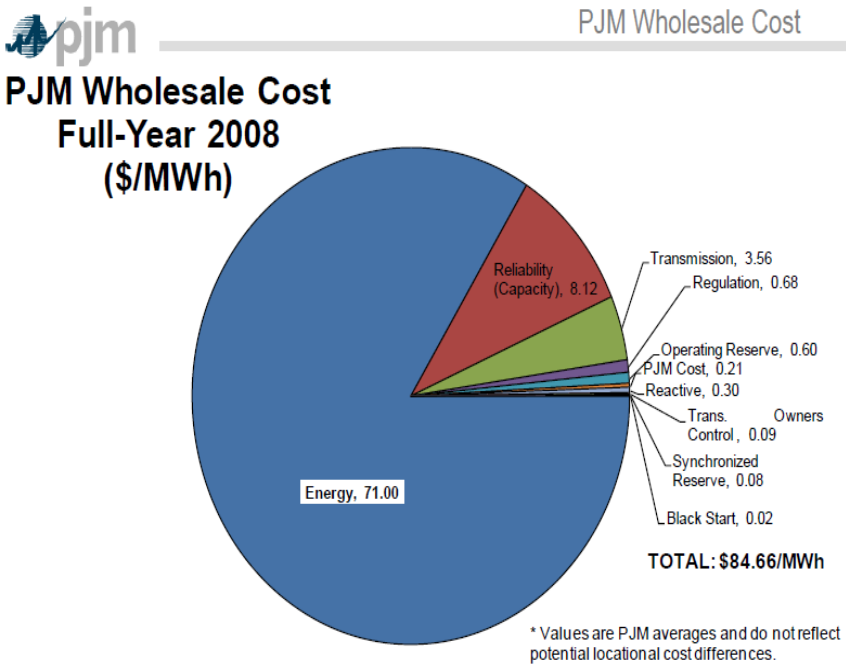
A Changing Energy Landscape

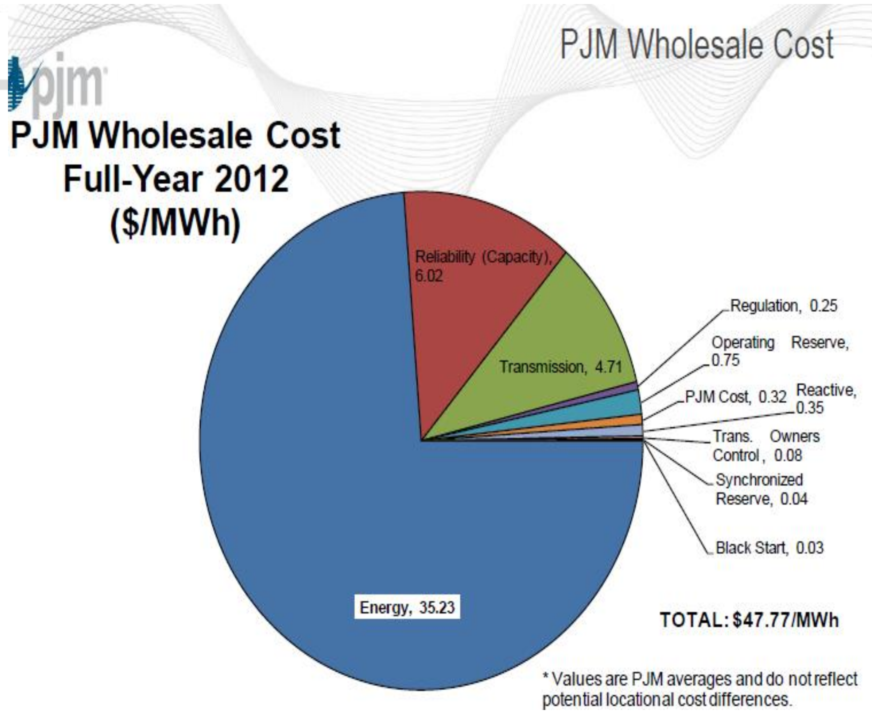
PJM Fuel Mix: 2005 – 2012



Benefits to Consumers

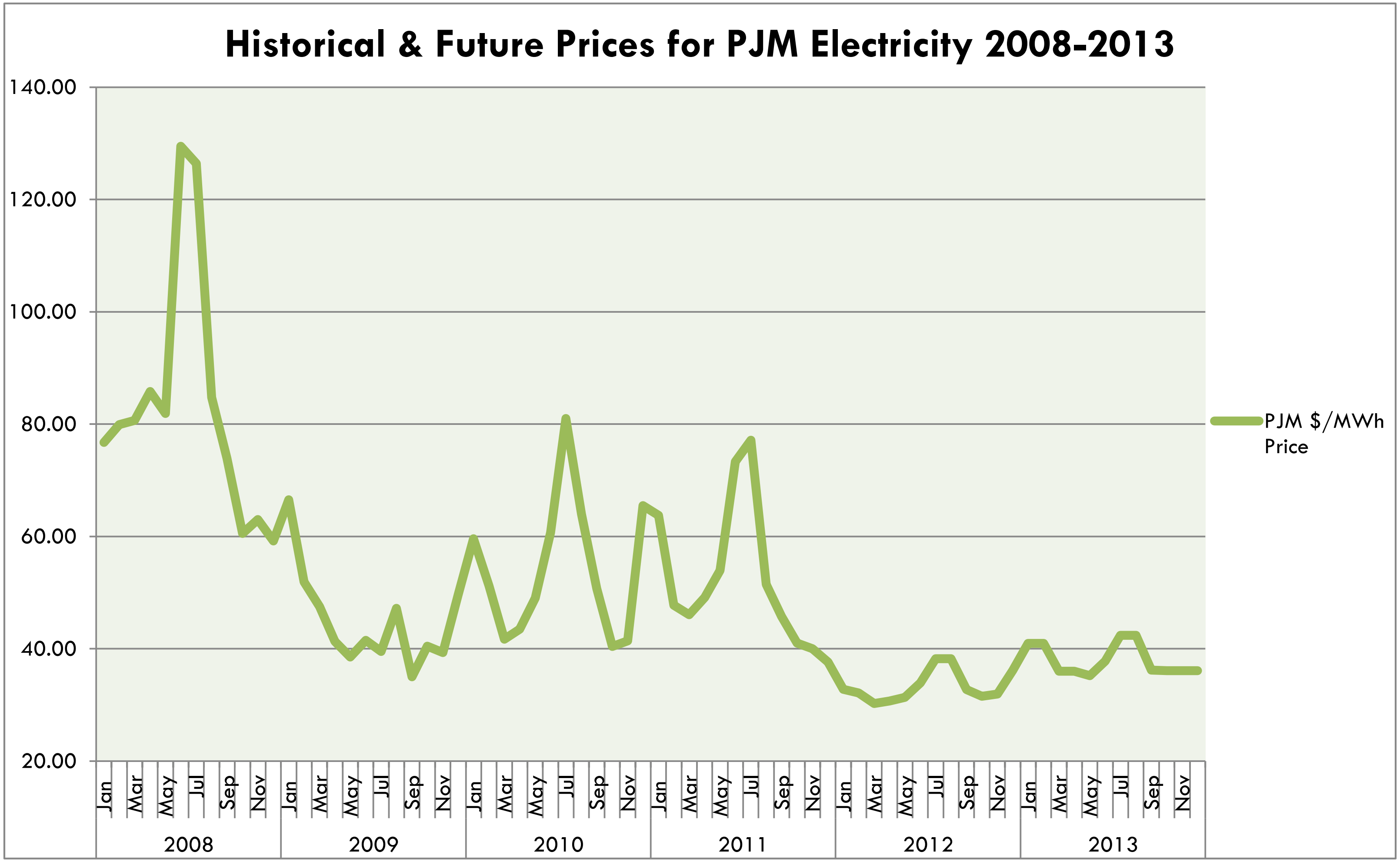
Reduced Energy Costs – 2008 v. 2012





Benefits to Consumers

Reduced Energy Costs – Wholesale *Electricity Prices*



Benefits to Consumers

Reduced Energy Costs – Lower Purchased Gas Costs

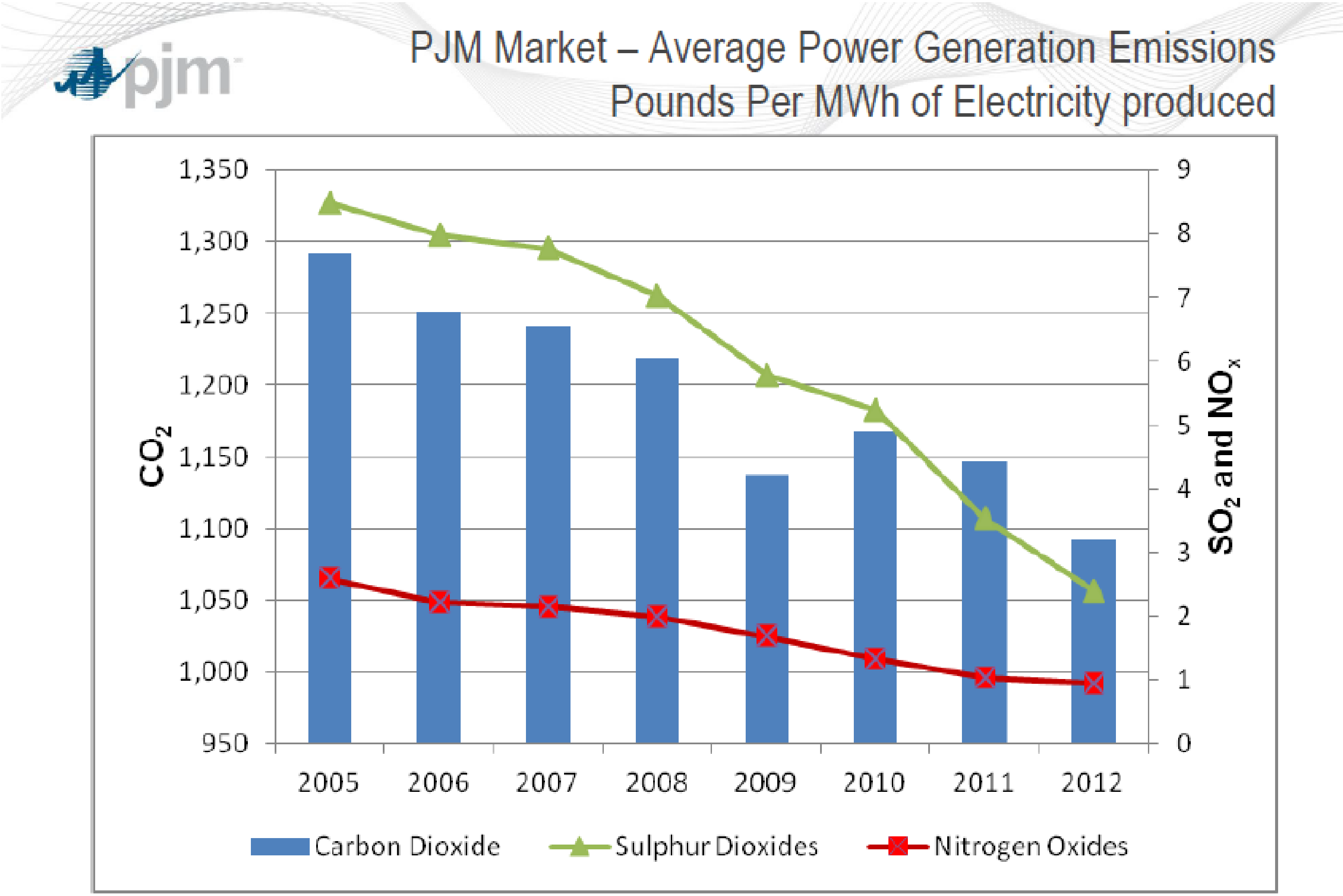
Utility	PGC Rate / mcf		% Change	Customer Savings
	2008*	2012*	2008-2012	Monthly
PECO	$11.10	$5.49	51%	**$84.15**
NFG	$10.34	$4.82	53%	**$82.80**
PGW	$10.58	$4.71	56%	**$88.05**
Columbia	$10.25	$4.15	60%	**$91.50**
Equitable	$11.81	$5.56	53%	**$93.75**
UGI	$11.79	$6.38	46%	**$81.15**
UGI Penn	$10.66	$5.22	51%	**$81.60**
Peoples	$9.53	$3.39	64%	**$92.10**

* 1st Quarter 2008 & PUC-approved rate for 2012

* Residential heating customer using 15 mcf/month

Benefits to Consumers

Improved Air Quality



Non-Traditional Energy Resources

- Alternative & Renewable Energy
- Energy Efficiency & Demand Response
- Competitive Markets

Mehoopany Wind Farm – Wyoming County

PA Solar Park – Carbon County 2012

Alternative & Renewable Energy

- Alternative Energy Portfolio Standards Act
  - Tier 1, Tier 2 & solar carve out
  - 18% by 2021
    - 8% Tier 1 (including 0.5% solar)
    - 10% Tier 2

- Alternative Energy Investment Act
  - $650 million
    - $180 m residential & commercial solar projects
- Competitive Electricity Markets
  - At least 20 suppliers offering 24 "green" products
    - www.choosepawind.com
    - www.oca.state.pa.us

Energy Efficiency & Demand Response

Energy Efficiency

- Act 129 of 2008
  - Phase 1: 3.5% consumption reductions by May 2013
    - \$1.5 : \$1 benefit to cost ratio
  - Phase 2: Staggered targets May 2013-May 2016:

Utility Territory	Three-Year % of Energy Efficiency Reductions
Duquesne	2.0
Met-Ed	2.3
Penelec	2.2
Penn Power	2.0
PPL	2.1
PECO	2.9
West Penn	1.6
AVERAGE	**2.2**

Energy Efficiency & Demand Response

Demand Response

- Act 129 of 2008
  - 4.5% reduction during summer 2012 peak 100 hours
  - Robust economic DR participation in PJM Auction:
    - 14,832 MW in 3-yr forward auction (May 2012)
    - 12,408 MW in 3-yr forward auction (May 2013)
  - FERC Order 745 – full wholesale price paid for economic DR instead of difference with retail pricing

Competitive Markets

Electric Competition in PA

- 2,119,115 customers shopping
  - 37% of all customers
    - 36% residential
    - 46% commercial
    - 87% industrial
- 1st in nation with 47 licensed residential suppliers*
- 109 total suppliers & 200 brokers/marketers
- 2nd in nation in competitive residential markets*
- Drivers:
  - Lower costs, locked-in rates & associated products
  - Preferred generation sources

* Annual Baseline Assessment of Choice in Canada & the United States (ABACCUS)

Competitive Markets

Electric Competition in PA

Weekly PAPowerSwitch Update

Pennsylvania Public Utility Commission

www.PAPowerSwitch.com

CUSTOMERS SWITCHING TO AN ELECTRIC GENERATION SUPPLIER

WEDNESDAY, OCTOBER 16, 2013

Electric Utility	Date Updated	Total Switching Customers			Residential Switching Customers			Commercial Switching Customers			Industrial Switching Customers		
		#	%	% of Load	#	%	% of Load	#	%	% of Load	#	%	% of Load
Duquesne	10/12/13	261,052	44.3	86.1	232,048	44.1	56.9	28,251	45.3	95.3	753	66.6	97.9
Met-Ed	10/16/13	194,920	35.1	63.6	165,043	33.8	32.2	29,141	44.3	65.6	736	83.7	96.6
PECO	10/15/13	524,052	33.0	62.0	441,709	31.0	34.0	79,537	49.0	68.0	2,806	89.0	95.0
Penelec	10/16/13	212,673	36.1	68.4	174,366	34.6	35.2	37,588	44.3	65.6	719	79.7	96.4
Penn Power	10/16/13	57,746	35.8	64.2	49,166	34.8	31.9	8,416	41.6	68.7	164	97.9	97.9
Pike County	10/8/13	2,655	59.0	59.0	2,151	60.0	63.0	500	54.0	60.0	4	57.0	46.0
PPL	10/12/13	644,273	45.7	74.7	548,541	44.6	47.8	92,775	53.0	88.7	2,957	68.3	98.6
UGI	10/12/13	734	1.2	21.3	4	0.0	0.0	662	8.0	35.8	68	35.6	77.6
West Penn Power	10/16/13	221,010	30.0	61.2	184,178	29.9	30.3	36,266	30.6	63.3	566	86.7	89.9
Statewide Total	10/16/13	2,119,115	37.4*	67.0**	1,797,206	36.1	37.3	313,136	46.2	75.7	8,773	86.6	95.2

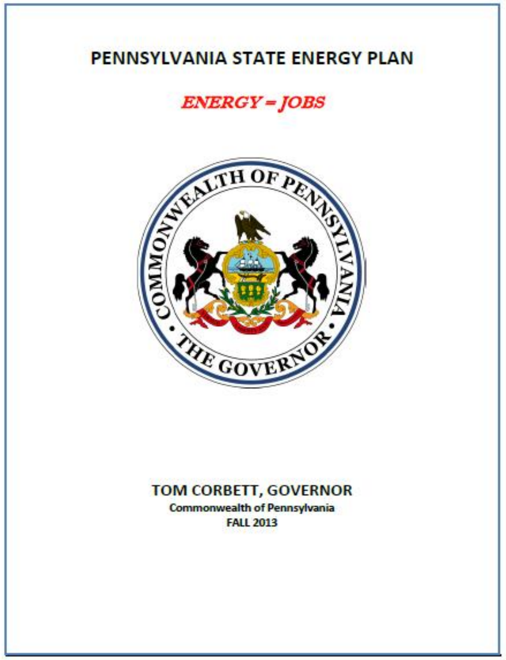
* Percentage based on the total number of customers of regulated electric utilities in Pennsylvania as of 2/1/13. (4,980,186 Residential + 687,602 Commercial/Industrial = 5,667,788 Total Customers).

** Percentage represents megawatt hours currently delivered by alternative suppliers.

PA State Energy Plan

WHAT IS AN ENERGY POLICY?

- Day-to-day decision making – started Jan. 18, 2011
- Philosophy of Government
  - "All of the Above"
  - Avoid picking winners and losers
  - Encourage innovation and creativity
- Priority the Administration Places on Energy Issues


PENNSYLVANIA STATE ENERGY PLAN

ENERGY = JOBS

COMMONWEALTH OF PENNSYLVANIA · THE GOVERNOR ·

TOM CORBETT, GOVERNOR
Commonwealth of Pennsylvania
FALL 2013

WHAT IS AN ENERGY PLAN?

- A Document
- Inventory of Assets & Resources
- Outlines Vision on How PA's Assets Will Grow Economy & Secure Energy Independence
- Focused on Target Audiences
  - Who will read & use the plan?

PA State Energy Plan

CORE PRINCIPLES

- ‘All of the Above’ – and Below
  - We need all our resources
- Embracing free markets
  - Consumers win when they can choose
- Energy independence leads to energy security
  - Energy imported = dollars exported
- Abundant, affordable & domestic
  - American energy for American jobs
- Enhancing our environment
  - Yesterday’s legacies are today’s opportunities
    - Brownfield redevelopment
    - Acid mine drainage
    - Waste coal electric generation

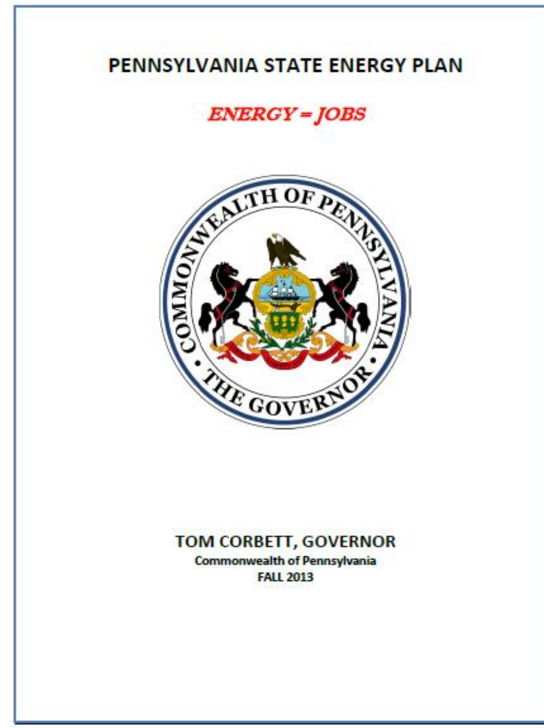
PA State Energy Plan

- Pennsylvania's history as an Energy Capital
- The energy resources positioning PA as the new Energy Capital
- Energy Portfolio
  - What we have
  - Making use of our resources
- Benefits & opportunities for job-creators
  - Abundant, affordable, domestic
- Enhancing Pennsylvanians' quality of life
  - Today's opportunities helping clean up yesterday's environmental legacies
- Highlighting success stories
- Resources
  - Economic development network
  - Workforce training

PA State Energy Plan

Who is the Audience?

- Job-Creators:
  - Business & Industry
  - Capital Investors
  - Regional Chambers of Commerce
- Governor's Administration
  - Cabinet Members
  - Agency Personnel Involved in Energy Policy & Economic Development
- General Assembly & Other Elected Officials
- All Pennsylvanians
  - Clear Understanding of Pennsylvanians Assets
  - Clear Understanding of Gov. Corbett's Vision for these Assets



PENNSYLVANIA STATE ENERGY PLAN

ENERGY = JOBS

COMMONWEALTH OF PENNSYLVANIA • THE GOVERNOR •

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What's Coming Up Next?

- Default Electric Procurement
  - Act 129 of 2008 – prudent mix
  - PUC Retail Markets Investigation (90 day procurement)
  - Competitive suppliers proposal (SB 1121)
- Natural Gas Extension – SB 738 & SB 739
  - PUC-approved utility plans evaluating extension opportunities
  - 10-year financing
  - Funding for gas line extensions
- Energy Efficiency Targets – Phase 2
  - May 2013 – May 2016
  - Evaluation of demand response cost effectiveness

QUESTIONS?

THANK YOU

~

AMERICAN PLANNING ASSOCIATION

PA CHAPTER

Planning Innovations:
Capital Ideas for our Communities
APA-PA 2013
Annual Conference

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Patrick Henderson, Governor's Energy Executive

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