Pennsylvania Public Utility Commission

Annual Winter Reliability Assessment

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Introduction

The **Energy Association of Pennsylvania** represents the interests of its

Member Natural Gas Distribution Companies:

Columbia Gas of Pennsylvania
National Fuel Gas Distribution Corp.
PECO Energy Company
Peoples Natural Gas Co.
Peoples TWP
Peoples Natural Gas - Equitable Gas Division
Philadelphia Gas Works
Pike County Light & Power
UGI Central Penn Gas, Inc.
UGI Penn Natural Gas, Inc.
UGI Utilities, Inc. - Gas Division
Valley Energy

Distributing natural gas to just under three million residential, commercial and industrial customers in Pennsylvania

Supply and Demand

Winter 2014-2015

(all natural gas volumes in billions of cubic feet)

Expected Demand	**212.8** Bcf
Expected Supply	
Flowing Interstate Gas	106.8
Storage Withdrawals	94.0
Local Production	10.8
Peak Shaving	1.2
TOTAL	**212.8**

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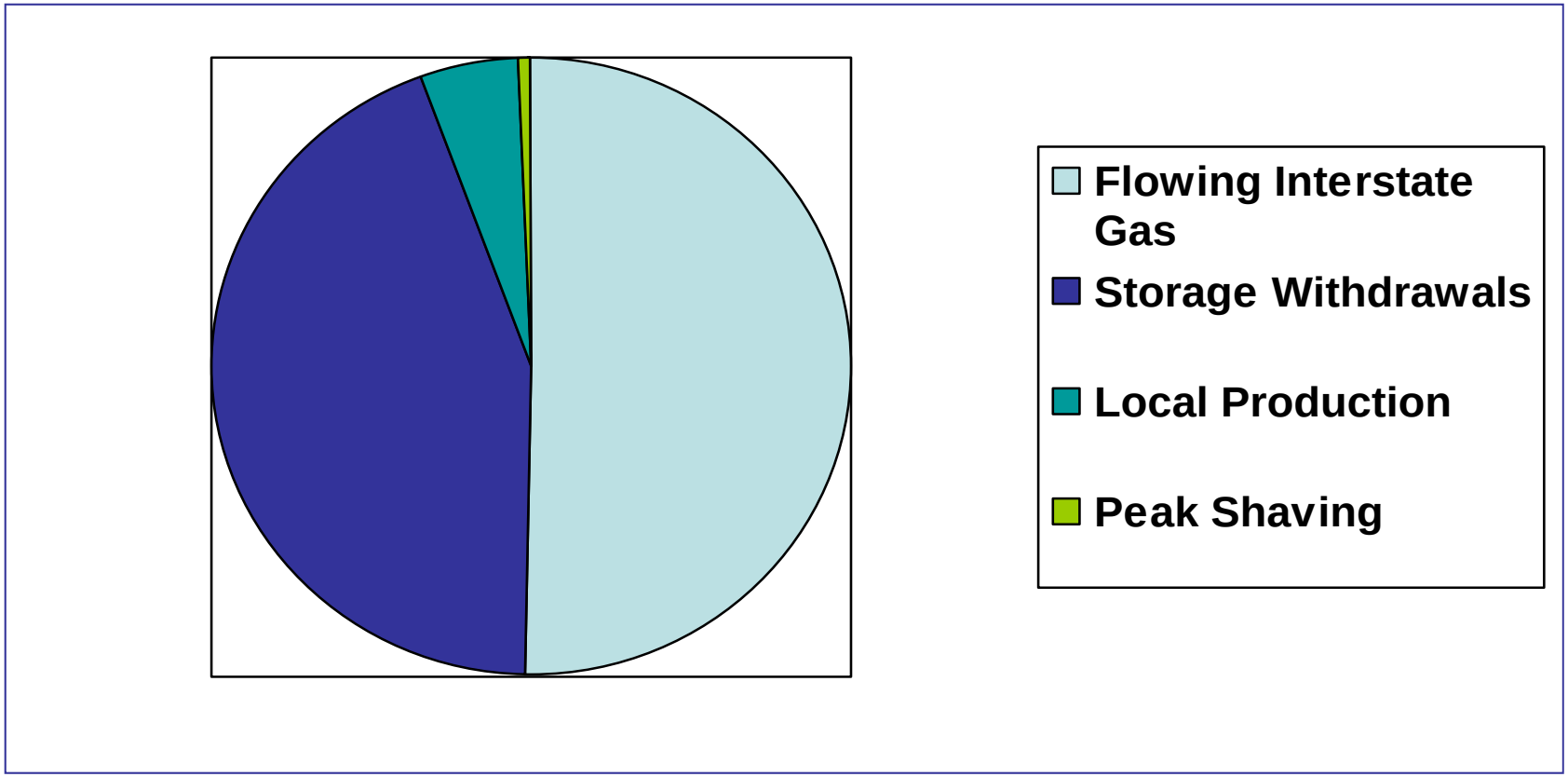
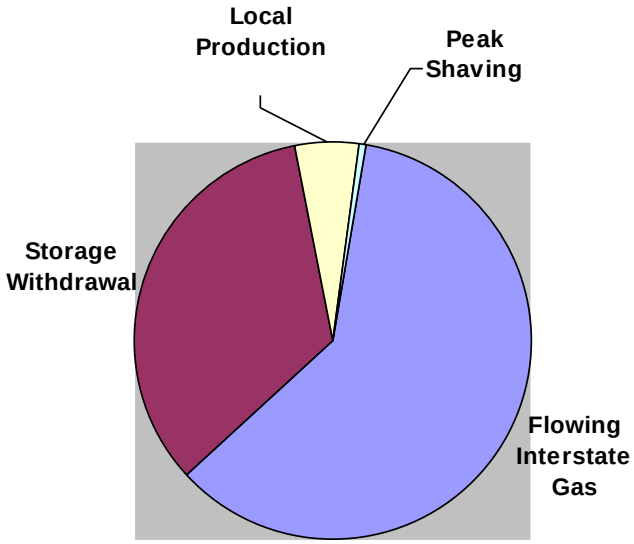
Winter 2014-2015: Supply Sources

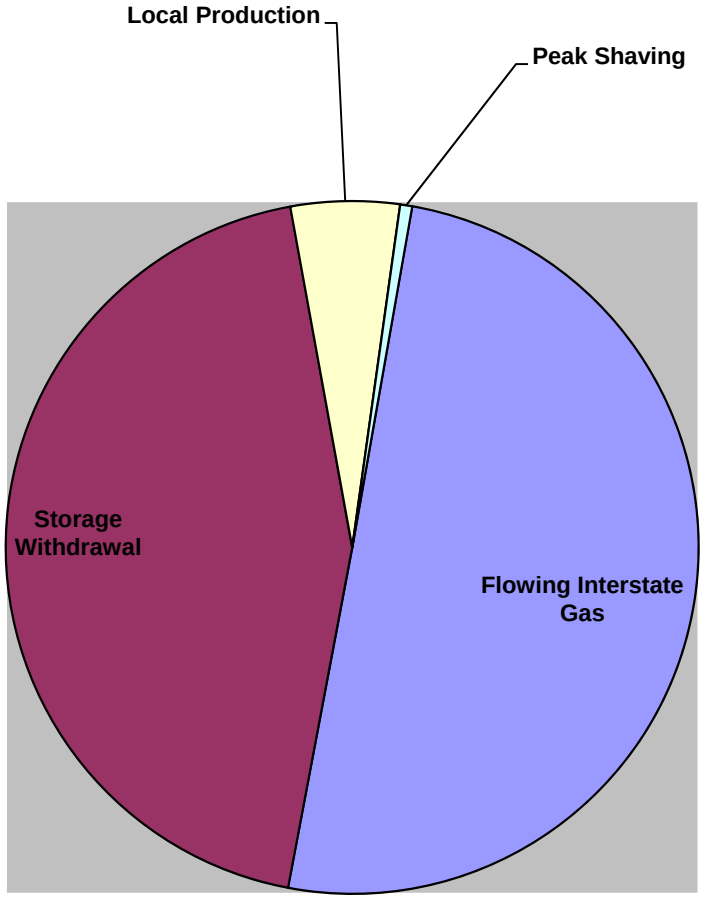


Comparison of Forecasts
Last Winter and This Winter

Winter 2013-2014:
Supply Sources by Type
209.8 Bcf



Winter 2014-2015:
Supply Sources by Type
212.8 Bcf



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System Planning Strategies

Objective: To identify supply resources (including upstream transportation and storage capacity) that will be necessary to preserve service reliability at anticipated levels of firm demand

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System Planning Strategies

Capacity and Supply Assets: NGDCs commit to capacity and supply assets as necessary to meet firm customer needs, including operational swings. Commitments may include a reserve, but do not include service to interruptible customers. These assets include:

- Pipeline deliveries per firm transportation agreements
- Underground storage withdrawals (on-system, off-system)
- Pennsylvania production (where available)
- Peak shaving facilities

System Planning Strategies - Production

- Record high natural gas production this year is helping to ensure that adequate supplies of natural gas are available, after ending last winter with the lowest storage inventories since 2003. Current production for the year-to-date is running 4.3 percent higher than year-to-date production in 2013. The Energy Information Administration (EIA) forecasts that natural gas production will increase to 71.4 billion cubic feet (Bcf) per day, on average, this winter. This is an increase of 3.3 Bcf per day over last winter's 68.1 Bcf per day average. In 2015, EIA expects natural gas marketed production to grow by an annual rate of 2.0 percent.

- The productivity of natural gas wells is steadily increasing in many basins across the United States because of the increasing precision and efficiency being realized in oil and natural gas extraction.

- The combination of two technologies —horizontal drilling and hydraulic fracturing — has made it possible to produce shale gas economically. The United States has experienced a rapid increase in natural gas production from shale resources.

(American Gas Association (AGA), Natural Gas Market Indicators, 10/15/14; US Energy Information Administration (EIA), Natural Gas Weekly Update, 10/23/14; US EIA, Short Term Energy and Winter Fuels Outlook, released 10/7/14; US EIA, Growth in U.S. Hydrocarbon Production from Shale Resources by Drilling Efficiency, 3/11/14, http://www.eia.gov/todayinenergy/detail.cfm?id=15351)

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System Planning Strategies

PA Energy Boom – Marcellus Shale

	2007	2012
Gas Produced	182,277 MMcf	2,256,696 MMcf
State Rank – Gas Production	15th	3rd
Wholesale Gas Price	$9.35 per Mcf	$5.52 per Mcf
Wholesale Electricity Price*	$83.70/MWh**	$40.86/MWh

- MMcf = volumetric measure of natural gas, per 1 million cubic feet; Mcf = per 1 thousand cubic feet
- * PJM annual average day ahead on-peak price
- ** Data from 2008
- Sources: EIA, http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcf_a.htm
  FERC, http://www.ferc.gov/market-oversight/mkt-electric/pjm.asp#prices

System Planning Strategies - Price

- The Henry Hub in southern Louisiana is the best known spot market for natural gas. The Energy Information Administration (EIA) expects the Henry Hub natural gas spot price, which averaged $4.53 per million British thermal units (MMBtu) last winter, to average $4.00 per MMBtu this winter. Their price forecast reflects the significantly higher natural gas production this winter and also lower than expected heating demand.

- The Henry Hub price is currently about $3.68 per MMBtu.

- Prices in the Northeast trading hub have remained below prices at the Henry Hub. The price is currently about $2.68/MMBtu at the Transcontinental Pipeline Zone 6 (New York). Some Northeast hubs, such as Dominion South and Leidy Interchange, dropped to $1.50/MMBtu earlier this month.

(American Gas Association (AGA) Natural Gas Market Indicators – 10/15/14; US Energy Information Administration (EIA) Short-Term Energy and Winter Fuels Outlook, released October 7, 2014; US EIA, Natural Gas Weekly Update, for week ending 10/22/14, released 10/23/14)

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System Planning Strategies - Pipeline Capacity Reliability

- The national pipeline network is comprised of 305,000 miles of interstate and intrastate transmission pipelines and 400 underground natural gas storage facilities. Development of this infrastructure helps meet the needs of the market, bringing natural gas to households, businesses, industrial customers, refineries and electric power generators.

- More than one-third of the pipeline projects since 2008 addressed a growing need for additional natural gas pipeline capacity to support transportation of new natural gas production to regional markets. According to FERC, access to new production and added natural gas transportation capacity has contributed to breaking down long standing price differences between market hubs and has helped to reduce bottlenecks significantly

- About 27,800 miles of new natural gas transmission pipeline were placed in service in the U.S. from 1998 to 2011. At least 25 major pipeline projects were completed in the U.S. in 2011, adding a total of about 2,400 miles of pipeline and 13.7 billion cubic feet per day of capacity. After several years of this robust growth, pipeline capacity investment slowed in 2012. Over half of the U.S. pipeline projects in 2012 were concentrated in the Northeast and focused on the fast-growing Marcellus shale gas production

(US Energy Information Administration (EIA), Today in Energy, 3/25/13, 2/17/12; US EIA Natural Gas Year-In-Review 2011, released July 2012 and Year-In-Review 2009, released July 2010; US EIA, Major Changes in Natural Gas Transportation Capacity 1998-2008, J. Tobin, Office of Oil & Gas; FERC Summer 2012 Energy Market & Reliability Assessment, 5/17/12; www.eia.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/index.html)

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Ability to contract for interstate pipeline capacity

- Firm capacity assets are used to transport supplies and manage storage to serve firm customers and operationally balance system requirements
- Members routinely review the interstate capacity market to try to obtain the optimum portfolio of assets to meet their needs
- The temperature sensitive loads of residential and human needs customers require dedicated, firm gas supply assets, including interstate transportation and storage services: There is no substitute
- Members do not report difficulty contracting for firm interstate capacity **when it is available**

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Storage Management

- Inventories must be maintained at the levels necessary to fulfill obligations per planning criteria. Aggregate projected storage levels on Nov. 1, 2014 are sufficient to meet anticipated winter demand

- Warmer than normal weather affects storage utilization, given the need to meet minimum turnover requirements for the integrity of fields and to comply with pipeline tariff provisions

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Storage Management

- Where contractually and operationally permissible, an NGDC may leave gas in storage if projected replacement costs exceed current prices, or an NGDC may use storage in lieu of firm transportation if replacement costs are favorable

- Storage inventory is managed to prevent deliverability from being reduced before potential design day occurrence, and to prevent firm markets from going unserved for some part of the remainder of the season

- Working natural gas is the volume of gas in a reservoir that is available for withdrawal. Nationally, natural gas working inventories ended September of this year at an estimated 0.40 trillion cubic feet (Tcf) below the previous five year average (2009-2013).

- For the week ending October 17, 2014, working natural gas in underground storage totaled 3,393 billion cubic feet (Bcf). Injections of natural gas into underground storage have been at a record pace and well above the five year average. Even with this rapid rate of injections, the deep starting point for inventories at the beginning of the injection season still means storage volumes are about 10 percent below last year. However, in conjunction with record production, injections are on course to be the largest seasonal refill on record.

(American Gas Association (AGA) Natural Gas Market Indicators –10/15/14; US Energy Information Administration (EIA), Short-Term Energy and Winter Fuels Outlook, released October 7, 2014; US EIA, Weekly Natural Gas Storage Report, released October 23, 2014; US EIA Natural Gas Weekly Update, released October 23, 2014)

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Injections into LNG Facilities

- Two Association members inject into member-owned facilities
- Total volume injected: 3.4 Bcf
- PECO Energy anticipates using LNG to meet 1% of winter day requirements, PGW anticipates using LNG to meet 3% of winter requirements
- Management of LNG facilities is primarily a matter of preparedness

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Gas Price Volatility: Hedging

- Based on a weighted average of the members, 44.4**%** of this winter's supplies are hedged

- Supplies are considered hedged if they are
  - Already purchased and in storage
  - If they are contracted for delivery under:
    - Fixed-price contracts
    - Forward-priced contracts
    - Price caps

Conclusion: Supply

- Members are well prepared to accommodate the conditions forecasted in their winter season planning design.
- Underground storage and peak shaving inventories will be adequate to handle design conditions.

Thank you.

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