Cruel Summer

Natural Gas Market Expectations for Summer 2017 and Beyond

A PointLogic Energy Webinar
May 3, 2017
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**Supply Module**
- Gas processing plant volumes and natural gas liquid volumes by refining district and purity product
- Detailed storage estimates by EIA region
- Daily supply & demand fundamentals. Natural gas price survey & bid week prices.
- Natural gas wellhead and dry estimates at a daily, weekly and monthly level – months before EIA estimates are available

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**Market Module**

**Storage Module**

**NGL Module**
I. How did we get here: Back to back winter demand disappointment puts forward curve in flux.

II. Summer Demand Expectations: Weather, inter-fuel competition and exports, the changing landscape and cruel reality of summer demand.

III. Lower 48 Production Response & Projects: Where is the growth and how will pipeline projects impact pace of growth?

IV. Summer Prices and Storage: Henry Hub influences, basis expectations and storage impact of supply and demand.
Winter 2016/17 vs. Winter 2015/16

<table>
<thead>
<tr>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Prod</td>
<td>Power</td>
</tr>
<tr>
<td>LNG Im</td>
<td>Industrial</td>
</tr>
<tr>
<td>Can Imports</td>
<td>Res/Com</td>
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<tr>
<td>Supply</td>
<td>Mex Ex</td>
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<tr>
<td></td>
<td>LNG Ex</td>
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<tr>
<td></td>
<td>Demand</td>
</tr>
</tbody>
</table>

Prod Slowdown and Demand Flub Leaves Market **1.9 Bcf/d** Short vs Last Winter

Storage inventory remains elevated as only **295 Bcf** incremental withdrawn vs last winter

Source: PointLogic Energy Supply & Demand Report
Winter 2016/17 in Historical Terms

Winter Domestic Demand (Bcf/d)

<table>
<thead>
<tr>
<th>Winter 13-14</th>
<th>Winter 14-15</th>
<th>Winter 15-16</th>
<th>Winter 16-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDDs: 3,356</td>
<td>3,151</td>
<td>2,445</td>
<td>2,543</td>
</tr>
<tr>
<td>86.0</td>
<td>85.8</td>
<td>79.7</td>
<td>77.5</td>
</tr>
</tbody>
</table>

Were winters 13/14 and 14/15 anomalies?
Only times in history where res/com demand averaged greater than 41.0 Bcf/d.

Are winters 15/16 and 16/17 anomalies?
HDDs averaged 16% below 8 year normal and 23% below Winters 13/14 and 14/15.
Summer 2017 Weather Expectation

Cooling Degree Days (Apr-Oct)

<table>
<thead>
<tr>
<th>Year</th>
<th>Degree Days</th>
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<tbody>
<tr>
<td>2013</td>
<td>788</td>
</tr>
<tr>
<td>2014</td>
<td>739</td>
</tr>
<tr>
<td>2015</td>
<td>959</td>
</tr>
<tr>
<td>2016</td>
<td>977</td>
</tr>
<tr>
<td>8 Year Norm</td>
<td>890</td>
</tr>
<tr>
<td>2017</td>
<td>1000?</td>
</tr>
</tbody>
</table>

Source: Statweather and NOAA
Summer Brings More Natural Gas Generation Capacity

Summer Capacity in GW – July 2016 vs. July 2017

Growth in gas-fired capacity does not necessitate growth in utilization for Summer 2017
Warm Winter Also Boosted Coal Supply

Coal Supply (mmst)

- Winter 15-16
- Winter 16-17

Delta Cost of Generation (Coal vs. Gas in $/MMBtu)

Cost margin increased by $1.12 yoy in March, $0.99 in April

Source: EIA, PointLogic
Coal demand remains at the mercy of gas market dynamics

- Coal demand in 2017 will be up, a function of a very weak 2016.
- CAPP and NAPP coal are most susceptible to displacement while Illinois and PRB coal remain modestly insulated.
Summer 2017 Power Demand

Power Demand (Bcf/d)

- Avg Summer 17 Pow = 27.3 Bcf/d
- Avg Summer 16 Pow = 30.1 Bcf/d

Source: PointLogic Supply/Demand and Two Season Balanced Forecast

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LNG Exports Surges; US Now Net Exporter

**LNG Demand vs. Capacity (Bcf/d)**
- Pipeline Deliveries
- Forecast
- Capacity

**Net Imports to the Lower 48 (Canada less Mexico and LNG in Bcf/d)**
- Forecast

2017 = Net Zero Imports

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Pipeline Exports to Mexico is the 2nd Largest Demand Growth Sector in 2017

- NET Mexico accounts for almost half of all U.S. exports to Mexico
  - Nearly 70% of exports are from intrastates, adding uncertainty to the market
- Current and Future Growth Will Come From Texas
  - Permian, Eagle Ford and Agua Dulce sourced supply
Mexico’s Energy Reforms Spark Infrastructure Boom

Over 10 Bcf/d of New Pipelines Within Mexico by 2019

- Service the power sector
- Reinforce dependability and supply redundancy
- Offer new geographic markets for gas
Export Capacity to Top 11 Bcf/d; Border Utilization Will Take Time

New U.S.–Mexico natural gas pipelines

+ > 5 Bcf/d of projects within and outside of Texas to push gas closer to the border
Production Response
2017 Production Delayed
Is this the Bottom?

L 48 Dry Gas Production (Bcf/d)

April'14 69.1 Bcf/d
April'15 74.0 Bcf/d
April'16 72.3 Bcf/d
April'17 69.9 Bcf/d

Source: PointLogic Supply/Demand and Two Season Balanced Forecast
Lower 48 Production to Decrease 0.7 Bcf/d from Summer 2016 to 70.6 Bcf/d.

Source: PointLogic Energy
A Concentrated Recovery

Production per Rig (Mcf/d)

Production per Rig (Mcf/d)

Lower 48 Rig Count

Annual Gain/Loss by Influential States (Bcf/d)

Source: EIA’s DPR

Source: Baker Hughes

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Oklahoma’s SCOOP and STACK

- Oil-Driven Play, next to Cushing gives it a strategic advantage, but it also creates new challenges for moving associated natural gas.
- Similar to Permian, 2016 saw major M&A activity, breakevens<$40/bbl.
- Operators to compete for upstream services (rising cost)
  - Majority of this would connect to pipes feeding into Perryville Hub
Permian, Too Much of a Good Thing?

- Permian is the most attractive play in North America, however despite 2016 resurgence new associated gas production **IS NOT** enough to offset continued declines elsewhere in Texas. But for the Western states, NM-Permian **IS** enough.
- Infrastructure projects across the hydrocarbon chain are planned.
  - Gas wise, large volume pipeline projects to move gas to Mexico and to Agua Dulce. By late 2019, + 3.5 Bcf/d to Agua Dulce.

5 TX Counties Account for 43% of Permian Rig Growth: Loving, Reeves, Howard, Martin, Midland

Source: Baker Hughes, PointLogic

Permian Rig Counts

- 430
- 205
Northeast Production Resurgence–Where’s the Beef?

• 2017 Growth will be Focused in Utica and Marcellus-Wet

• 2017 CapEx is up > 50% YoY, 2018 supply growth will be Huuuuuge.

• 2017/2018 Reliant on New Takeaway Capacity and Improved Net Backs

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**Utica Operator ‘17 Expectations and Side Notes**

- **CHK**
  - 0.0 Bcf/d
  - no notable YoY changes
  - owns 0.8 Bcf/d on Rover, growth is mix of OH, WV, PA

- **Antero**
  - +0.4 Bcf/d
  - owns 0.15 Bcf/d on Rover + 0.25 Bcf/d across TGT, CGT, TETCO projects

- **Gulfport**
  - +0.3 Bcf/d
  - 3 Operators make up nearly 70% of all production

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**WV-Wet Operator ‘17 Expectations and Side Notes**

- **Antero**
  - +0.4 Bcf/d
  - build out of NGL infrastructure is essential.
  - See Utica entry

- **EQT**
  - +0.2 Bcf/d
  - combination of SW PA-Wet and WV-Wet

2 Operators make up nearly 56% of all production

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**NE PA-Wet Operator ‘17 Expectations and Side Notes**

- **CHK**
  - 0.0 Bcf/d
  - Capital deployed to oil assets, NE acreage helf by production

- **Cabot**
  - 0.0 Bcf/d
  - Marginal NE growth, capital and growth focused in Eagle Ford

- **Range**
  - +0.6 Bcf/d
  - owns 0.4 Bcf/d on Rover, 0.4 Bcf/d Rayne Xpress

2 Operators make up nearly 45% of all production

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**Source:** Company Investor Presentations
Northeast Gas Flows Become Slightly Less Constrained: YTD Compare

<table>
<thead>
<tr>
<th>Region</th>
<th>Change in Flows (Bcf/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Canada</td>
<td>0.2</td>
</tr>
<tr>
<td>Net Midcon</td>
<td>-2.9</td>
</tr>
<tr>
<td>Net Southeast</td>
<td>-3.7</td>
</tr>
<tr>
<td>Net Northeast</td>
<td>-6.4</td>
</tr>
</tbody>
</table>

Net Northeast Flows: -6.4 Bcf/d

3.5 Bcf/d from 2016 YTD Net Flows

- +0.2 Bcf/d with Canada
- +1.2 Bcf/d with Midcon
- +2.1 Bcf/d with Southeast

Dominion South Basis
2016 YTD: ($0.66)/MMBtu
2017 YTD: ($0.33)/MMBtu
Delta: +$0.33/MMBtu

Source: PointLogic Energy
Escape Routes from the Appalachia

Annual Takeaway Capacity
2016 Actual: 13.9 Bcf/d Avg
2017: 8.4 Bcf/d*
2018: 5.0 Bcf/d
2019: 3.7 Bcf/d
Total: 17.1 Bcf/d
Cumulative Takeaway > 31 Bcf/d

* Assumes Projects Enter In-Service Dates as Announced

Midwest & Canada
Producers & LDCs
2017: +4.8 Bcf/d*
2018: +0.0 Bcf/d
2019: +0.0 Bcf/d

Gulf Coast
Mostly Producers + some LNG offtakers
2017: +2.5 Bcf/d
2018: +1.1 Bcf/d
2019: +0.0 Bcf/d

Atlantic Coast
2017: +0.2 Bcf/d
2018: +0.5 Bcf/d
2019: +2.2 Bcf/d

NY/NJ, Canada, New England
Mainly LDCs + some Producers
2017: +0.9 Bcf/d
2018: +3.4 Bcf/d
2019: +1.5 Bcf/d

* Includes Nexus

5.6 Bcf/d in Q4
2.5 Bcf/d in Q3

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Source: PointLogic’s Project Tracker
Northeast Projects on the Summer Horizon

**Rover Phase I:**
July 2017  2,200 MMcf/d

- Gets to Defiance where gas can move N & S on PEPL (related BH project) and ANR.
- Summer utilization is expected to be low.
- Connections to major GPP’s not until Phase II in Nov. 2017

**TETCO Gulf Markets Phase II:**
August 2017  400 MMcf/d

- Phase I was for 250 (100 EQT, 250 Range) M2 to ELA
- Phase II is assumed 250 from M2 and 150 from TX
Storage Deltas to the 5 Year Average

As the South Central goes, so does the US: regional S&D impacts price, erodes surplus.

Only region with deficit to 5 year average = upward price pressure.

Total U.S. Δ 5 Yr +299 Bcf
Summer 2017 vs. Summer 2016
Henry Hub and Location Basis

Wider Spread
Tighter Spread
Stronger Basis
Weaker Basis

Source: PointLogic Energy

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Summer 2017 vs. Summer 2016 vs. 5 Yr Avg

**Supply**
- Dry Prod: 1.5
- LNG Im: 0.6
- Can Imports: 0.0
- Supply: 2.0

**Demand**
- Power: 0.5
- Industrial: 0.2
- Res/Com: -1.0
- Mex Ex: 1.7
- LNG Ex: 2.0
- Demand: 3.4

Versus Summer 16
- Market 0.9 Bcf/d Long
- Injections up by 198 Bcf.
- Summer injection of 1,675 Bcf (vs. 1,477 Bcf).

Versus 5 Yr Avg
- Market 1.4 Bcf/d Short
- Injections down by 299 Bcf
- Erosion of surplus by late August.

Source: PointLogic Energy Supply & Demand Report
As Inventories Approach Five Year Average, Winter is Good News for Producers and Storage

Source: EIA, PointLogic
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