Winter 2014-15: Propane Supply & Infrastructure

For State Heating Oil and Propane Program (SHOPP) Workshop

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By

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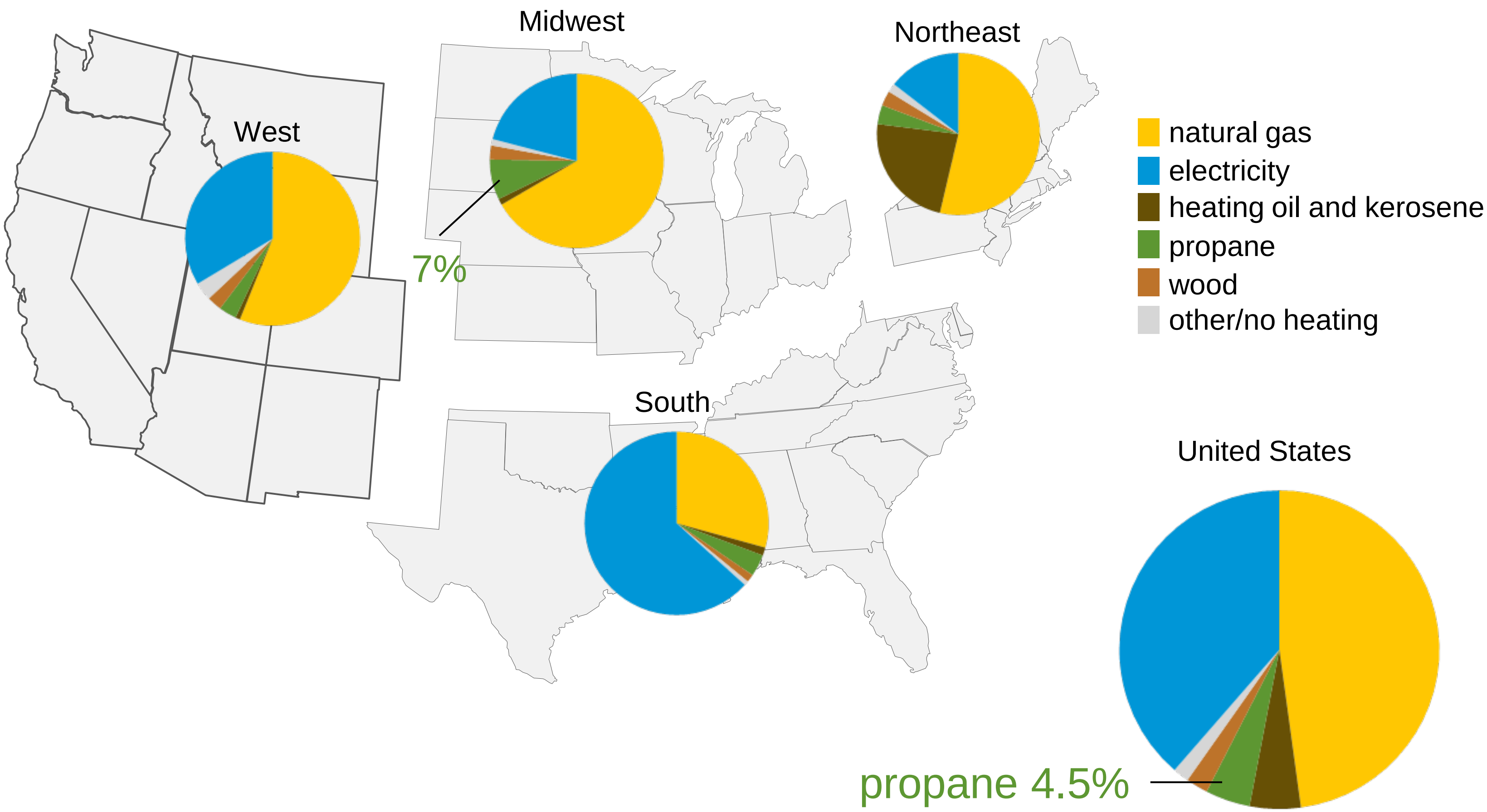
U.S. Energy Information Administration

Winter 2014-15 takeaways and potential issues– propane

- Primary propane stocks in the Gulf Coast and Midwest are currently 10 million barrels (17%) above this time last year
- Propane production from natural gas plants is up and is projected to average 970,000 bbl/d this winter, 110,000 bbl/d higher than last winter
- The outlook for propane demand is uncertain
  - Another record corn crop is expected
  - U.S. winter heating degree days have recently ranged from a low of 3,225 in 2011-12 to 4,114 in 2013-14
- Propane supply is adjusting to recent infrastructure changes
  - Cochin Pipeline Reversal
  - New and expanded rail facilities in the Midwest
  - Pre-season secondary and tertiary inventories will be critical to meeting demand from cold weather and/or a wet corn harvest

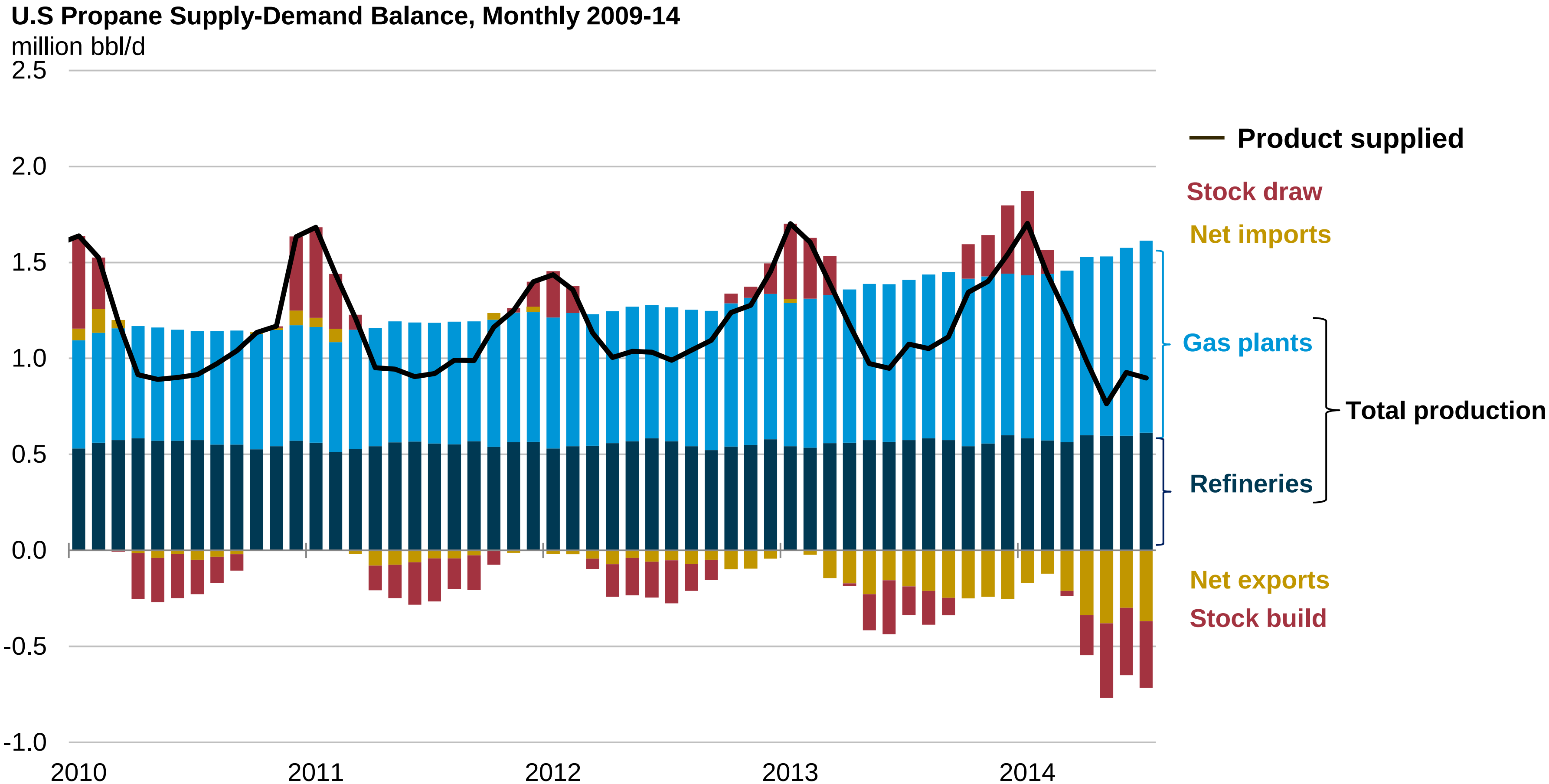
The Midwest has highest concentration of homes heated with propane

Share of homes by primary space heating fuel and Census Region



Source: EIA calculations based on U.S. Census Bureau, 2013 American Community Survey

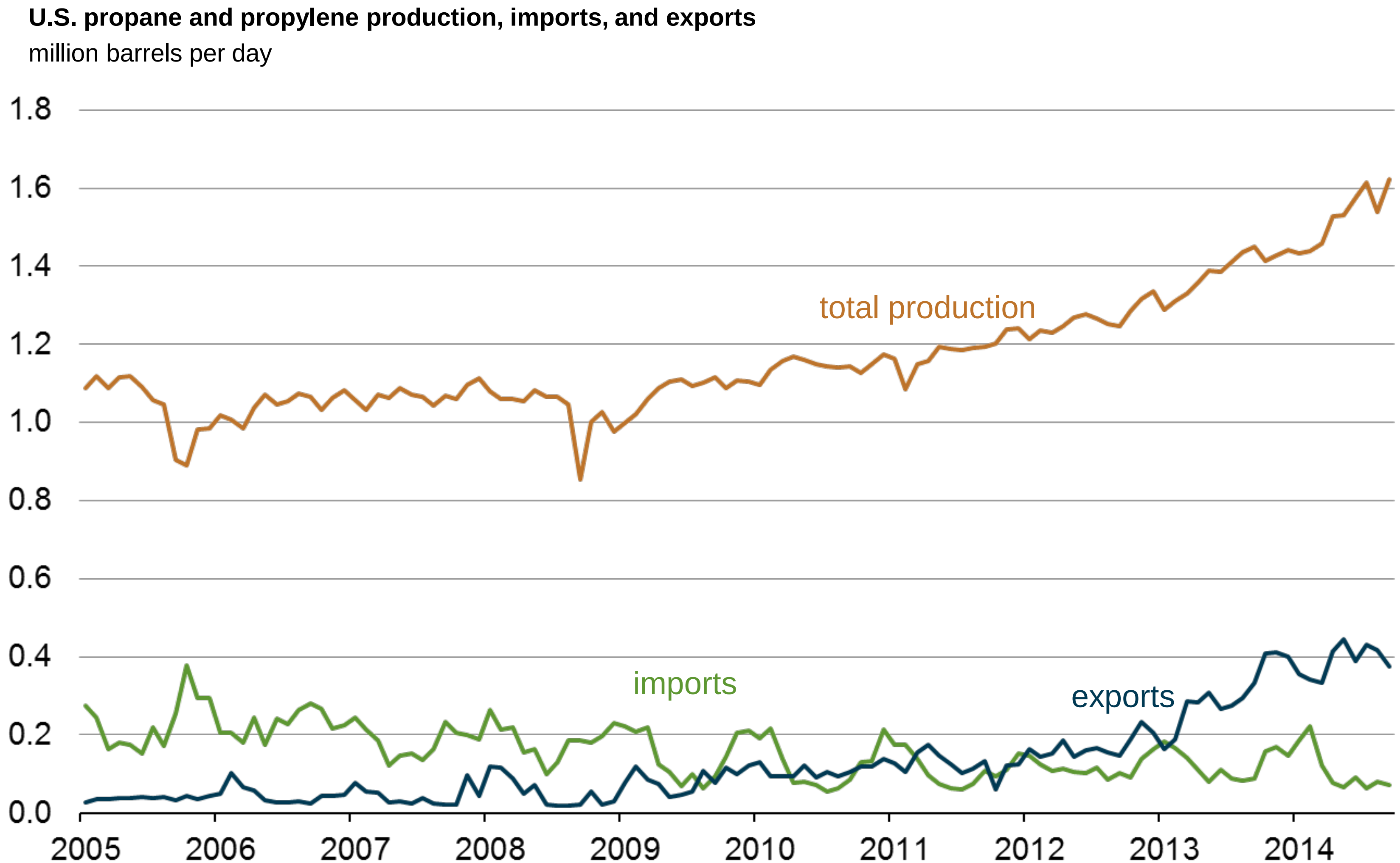
Increasing production and exports change U.S. propane supply-demand balance



Source: U.S. Energy Information Administration, *Petroleum Supply Monthly.*

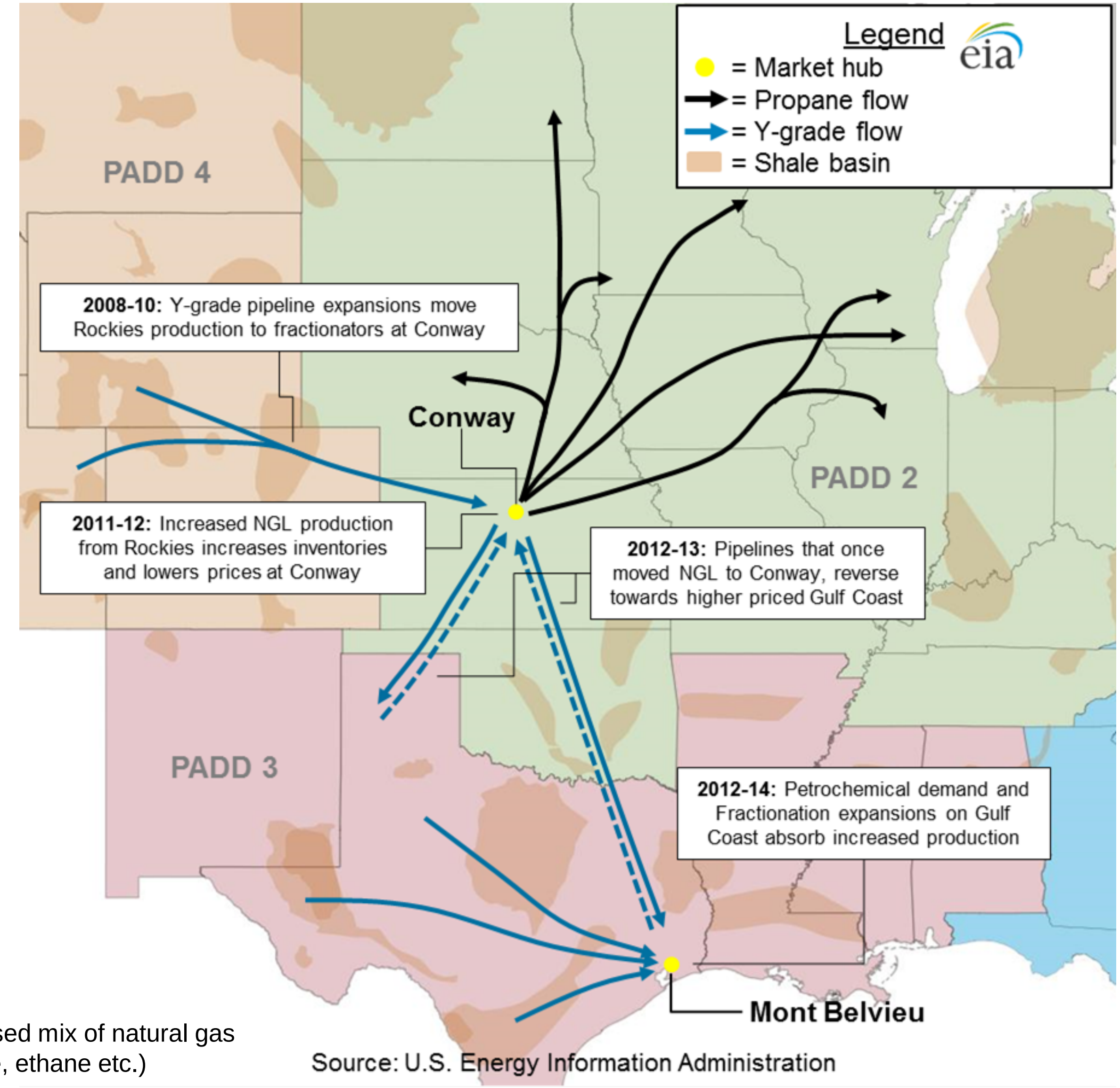
Propane demand is seasonal - stocks build in the summer and are drawn in the winter to meet heating needs

U.S. propane production and trade trends



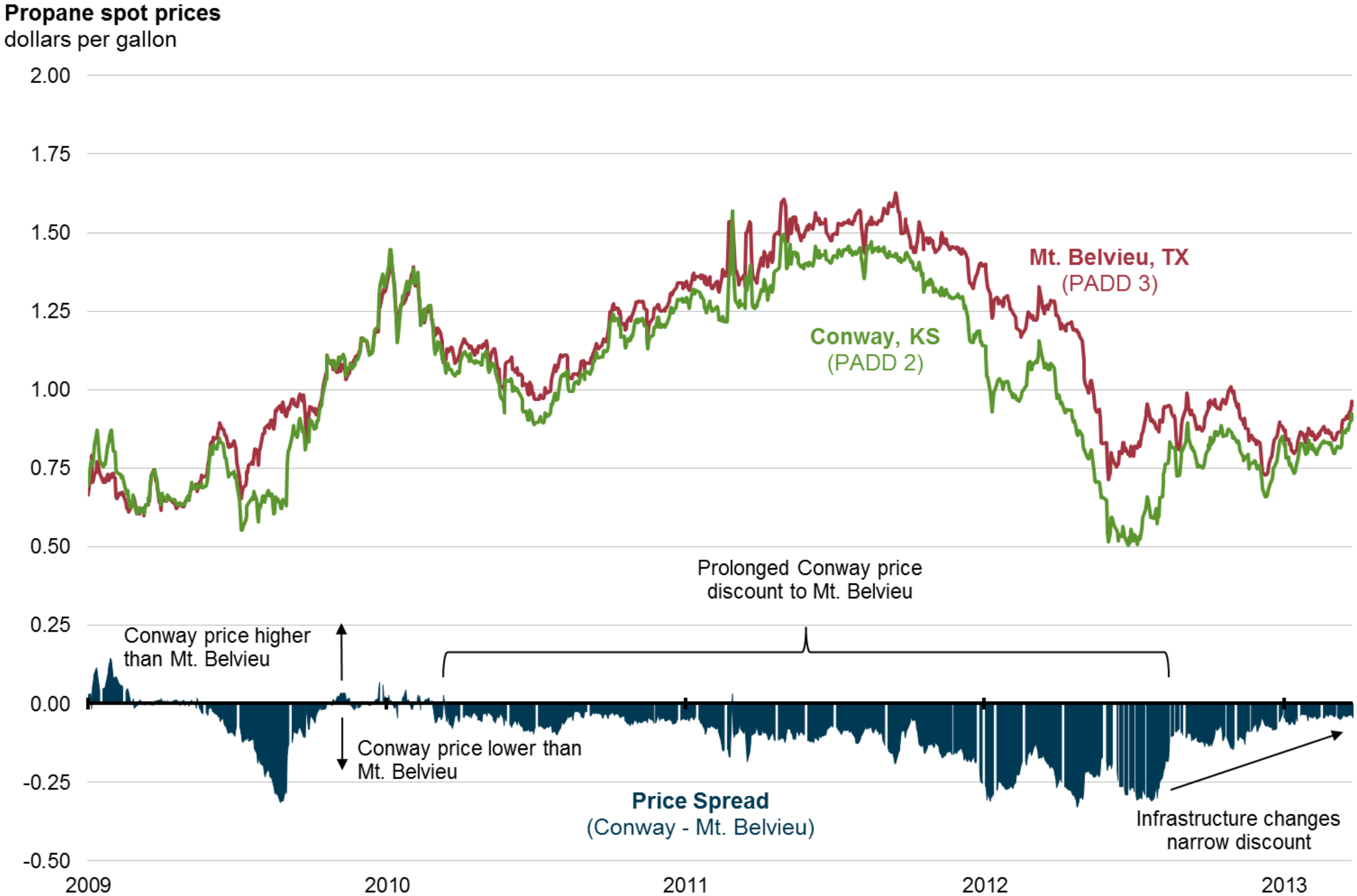
Source: EIA, Petroleum Supply Monthly through July 2014; August and September 2014 are estimates

Changes in propane infrastructure and flows



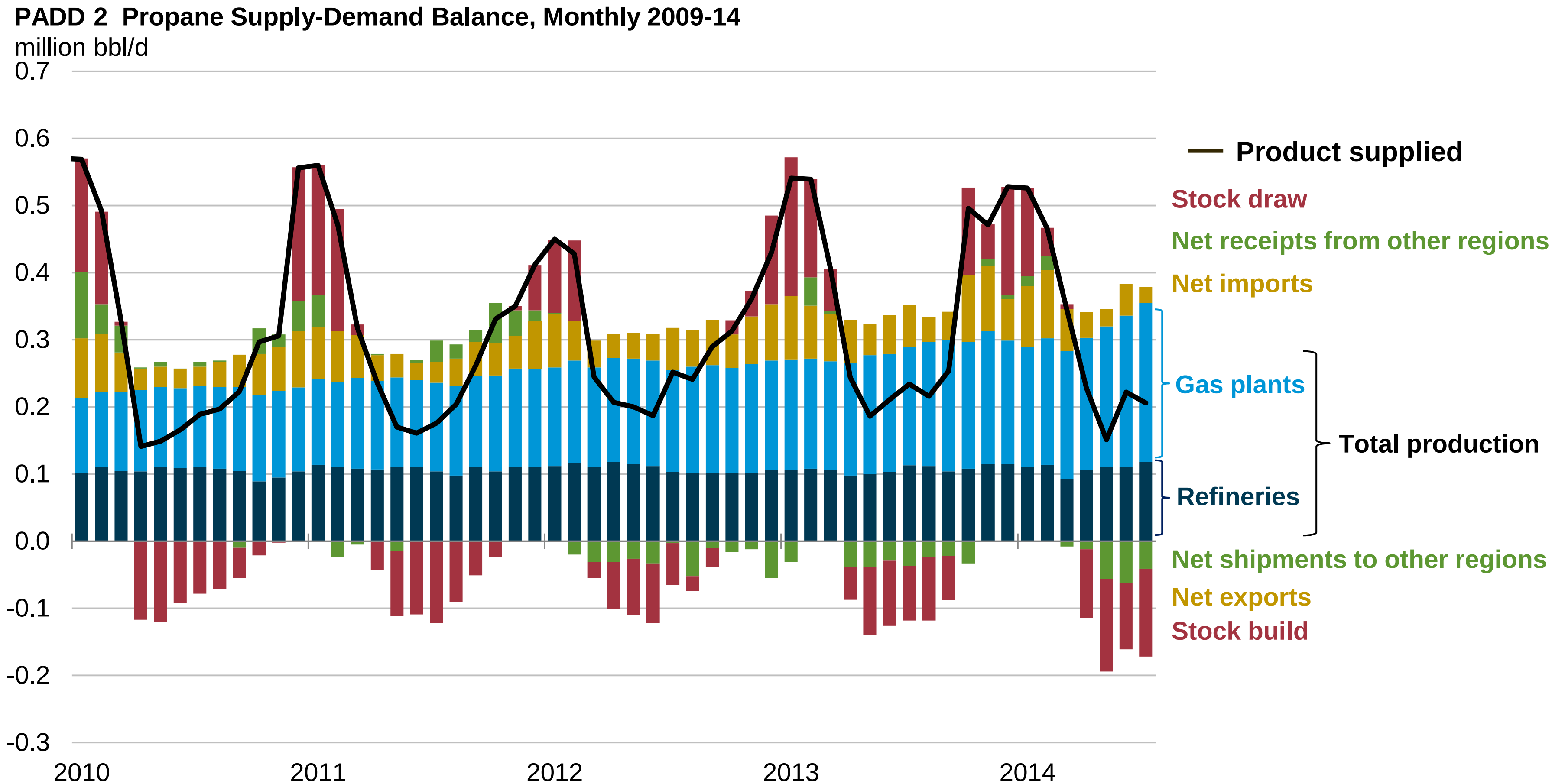
*(Y-Grade) = Unprocessed mix of natural gas liquids (propane, butane, ethane etc.)

History of Conway (KS) and Mt. Belvieu (TX) prices – 2009-13



Source: U.S. Energy Information Administration, Thomson Reuters, data through March, 2013

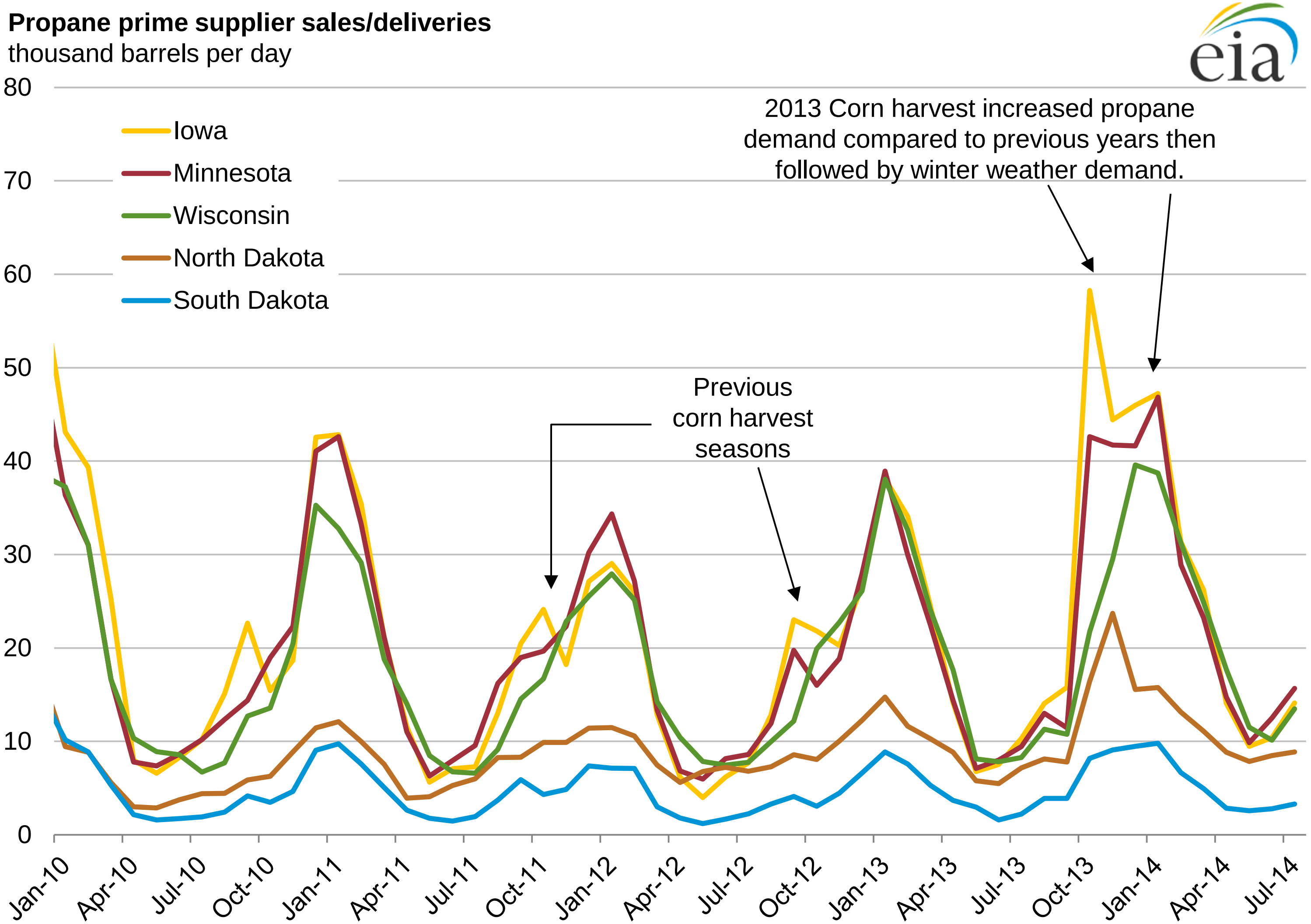
PADD 2 changes to net supplier of other regions as a result of infrastructure changes



Source: U.S. Energy Information Administration, *Petroleum Supply Monthly.*

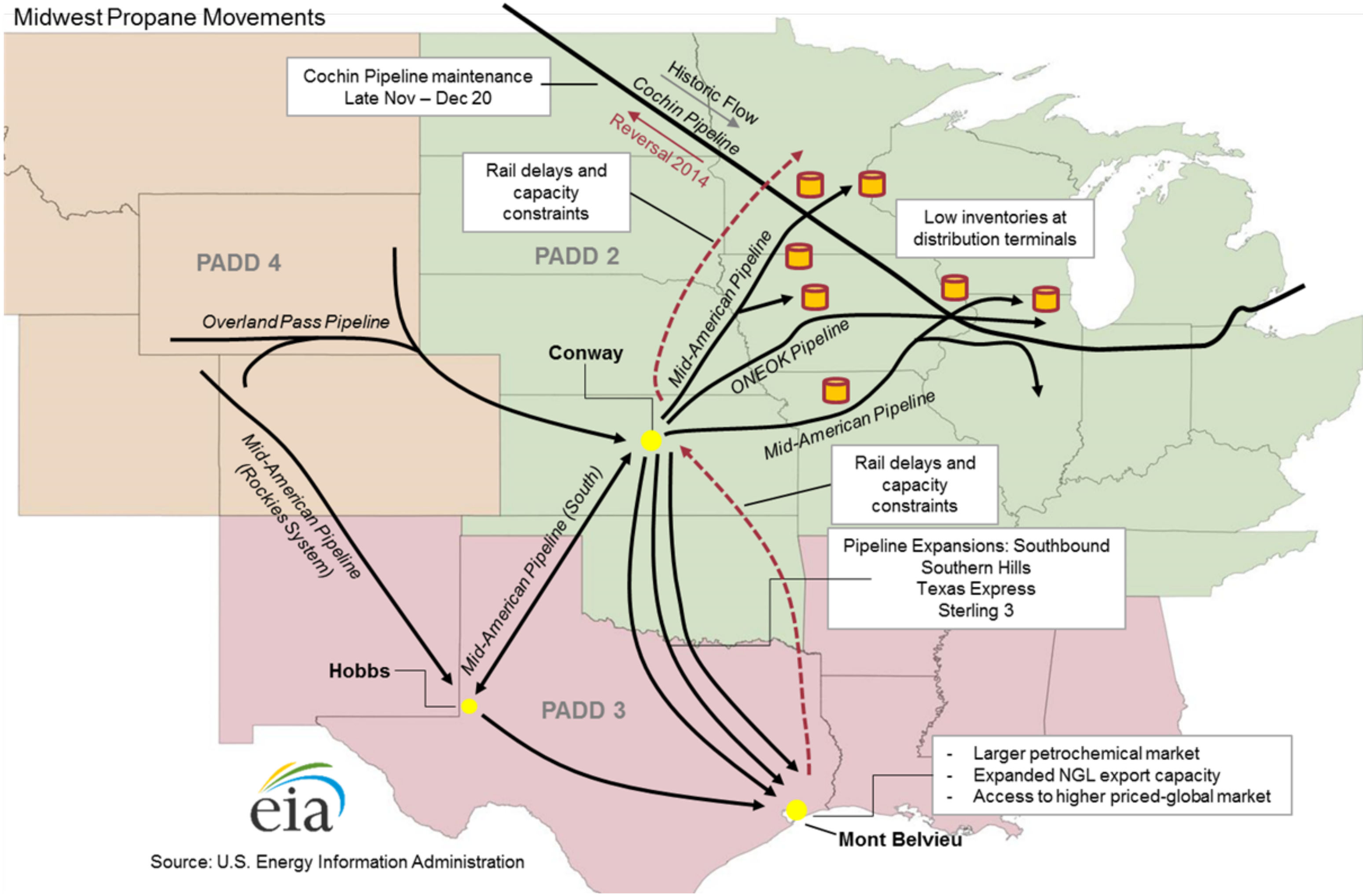
PADD 2 switched to sending more propane to other regions than receiving in 2012

Last year, the corn harvest immediately followed by winter weather increased propane demand

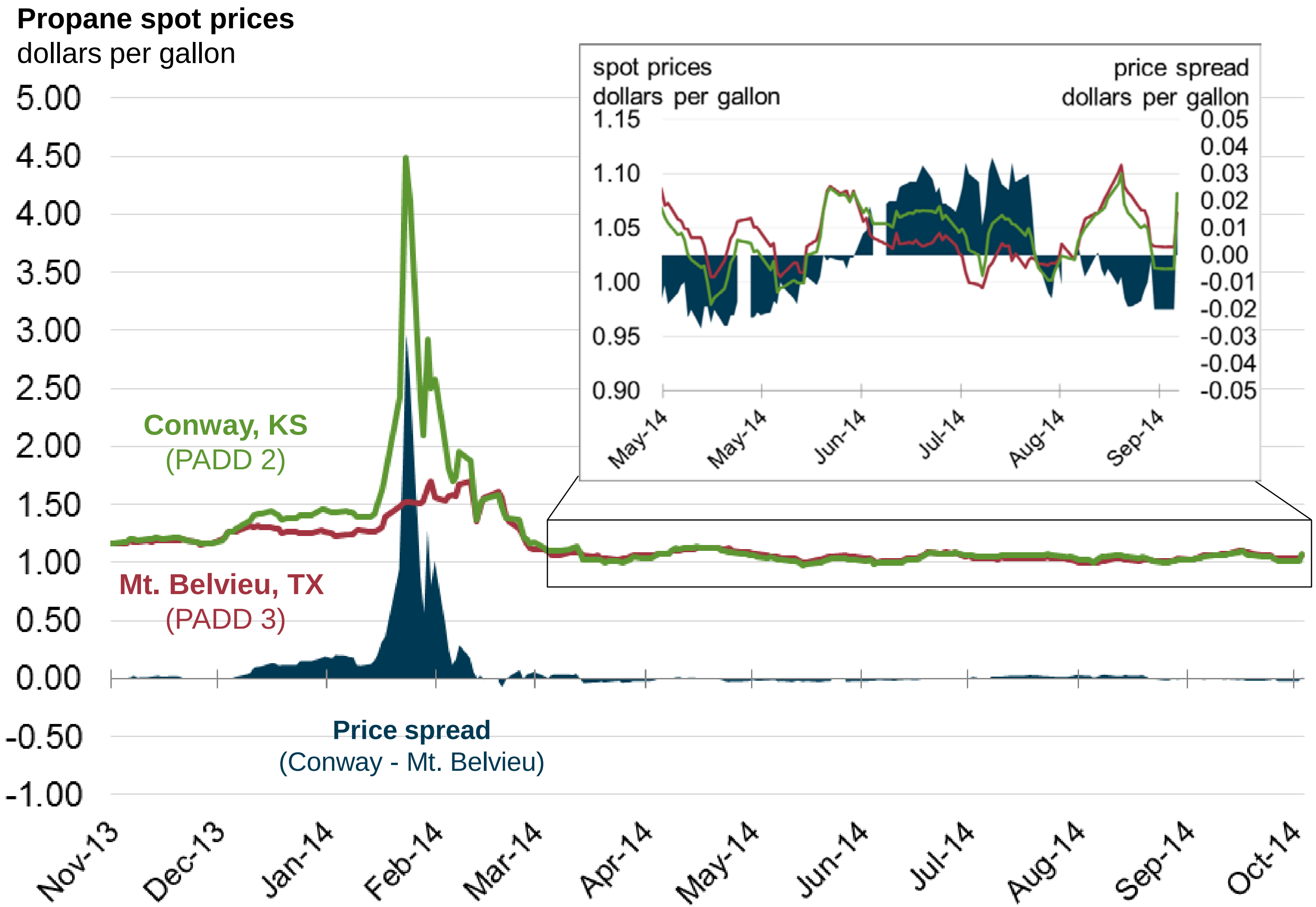


Source: U.S. Energy Information Administration, *Petroleum Marketing Monthly*.

Propane infrastructure and flows: Winter 2013-14



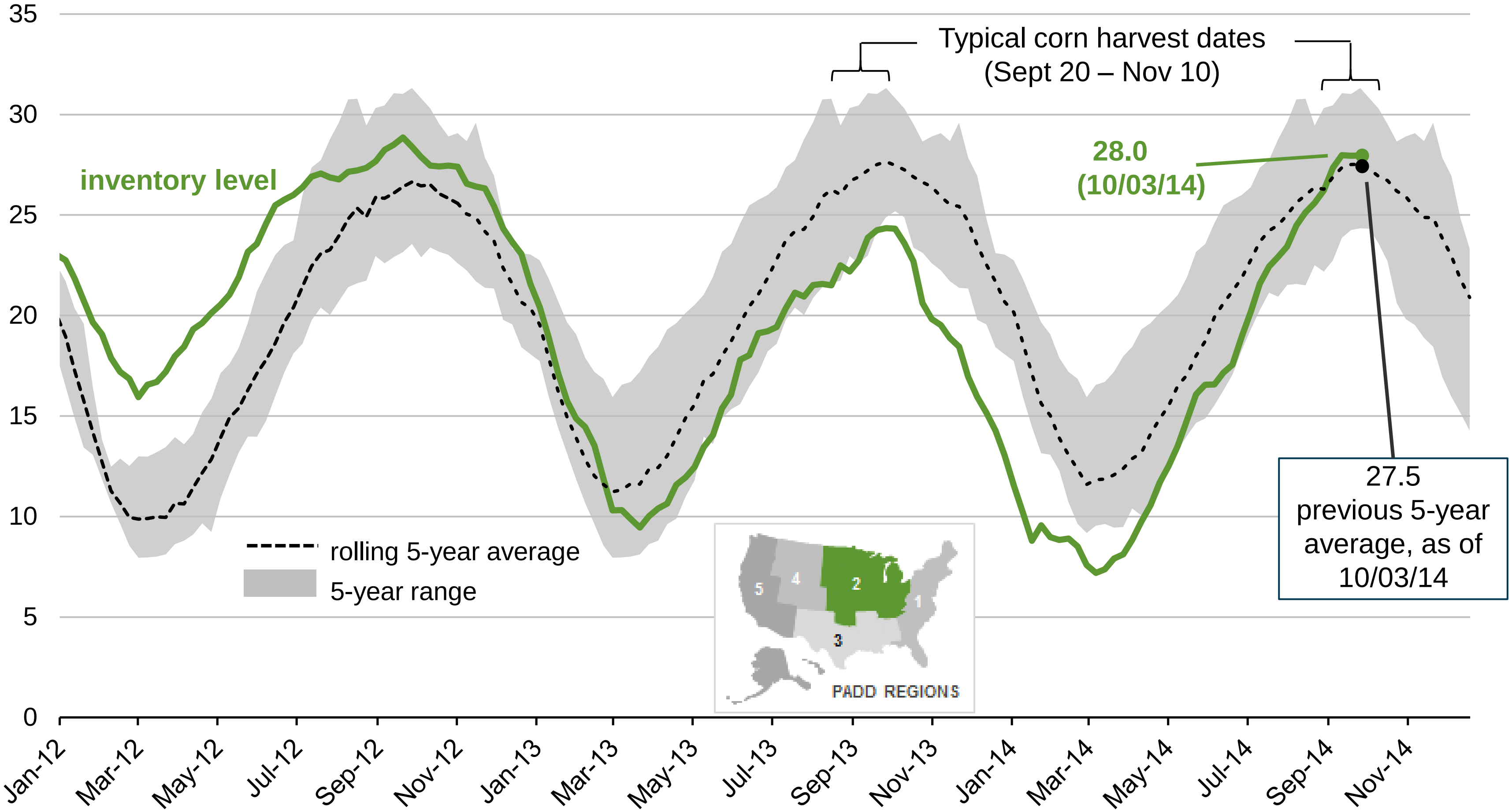
Conway price premium over Mt. Belvieu grew rapidly in late January



Source: U.S. Energy Information Administration, Thomson Reuters, data through October 3, 2014

PADD 2 (Midwest) propane inventories are within the five-year range and above the five-year average

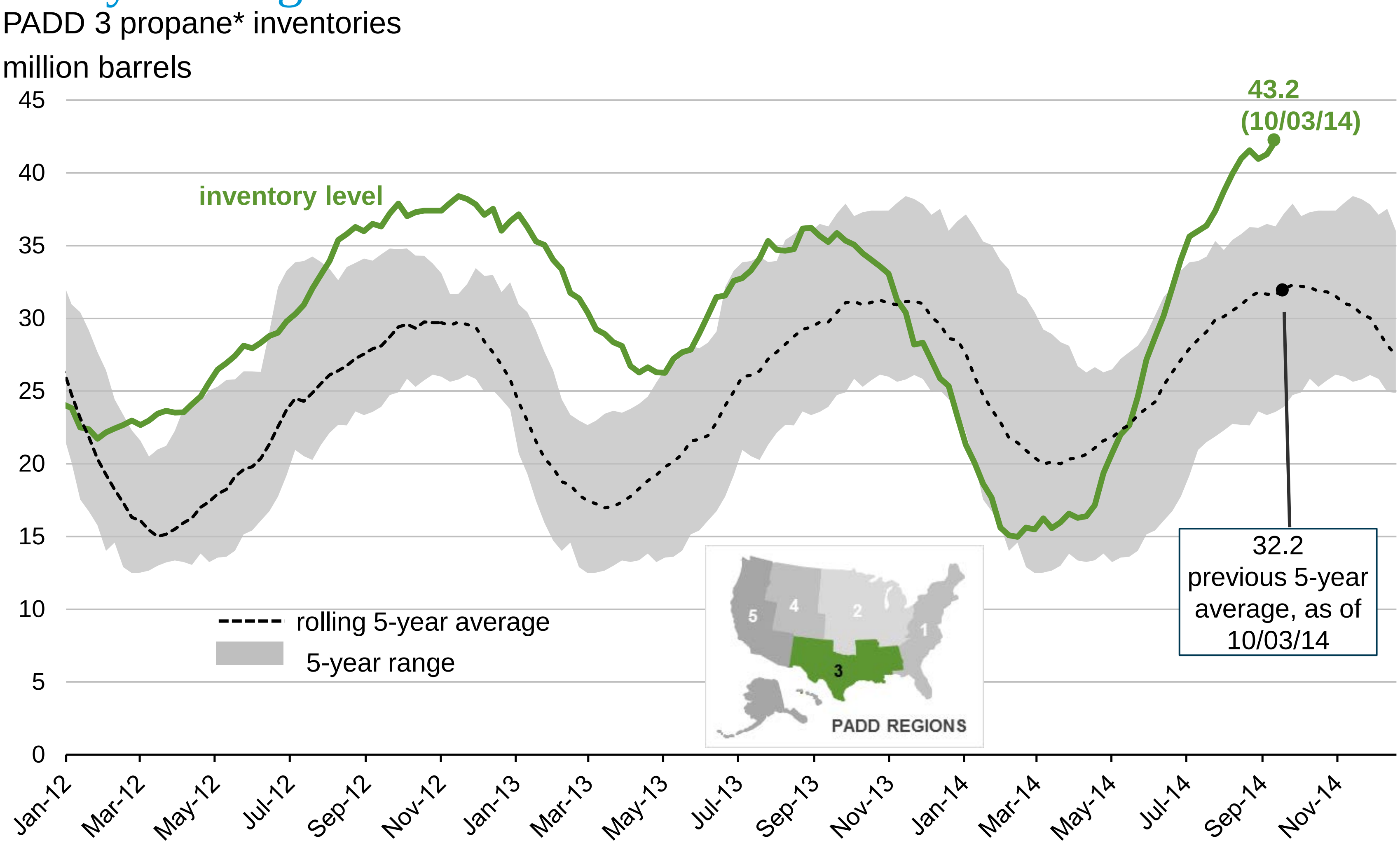
PADD 2 propane* inventories
million barrels



Source: EIA, Weekly Petroleum Status Report, data through October 03

**propane/propylene for fuel use only*

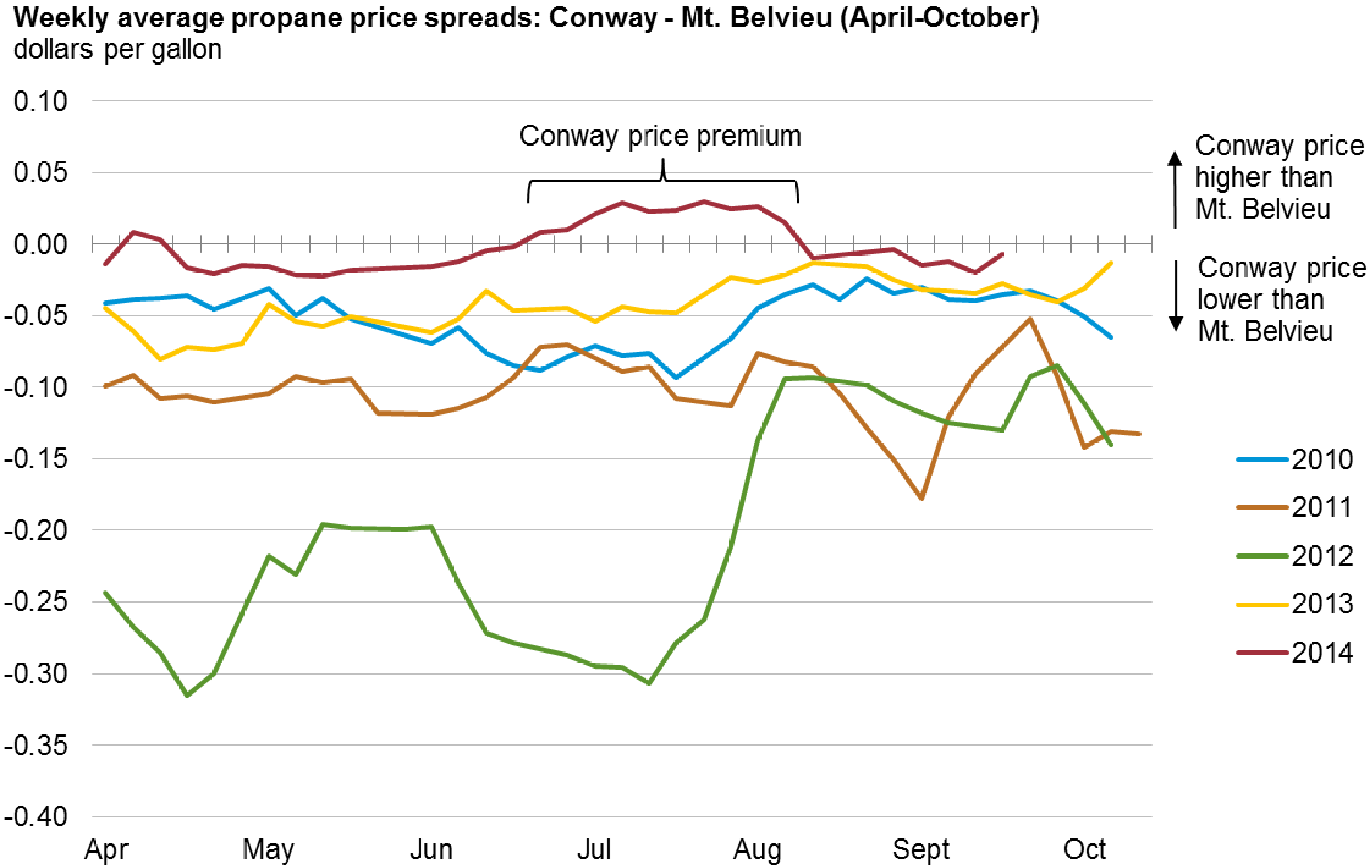
PADD 3 (Gulf coast) propane inventories are well above the five-year range



Source: EIA, Weekly Petroleum Status Report, data through October 03

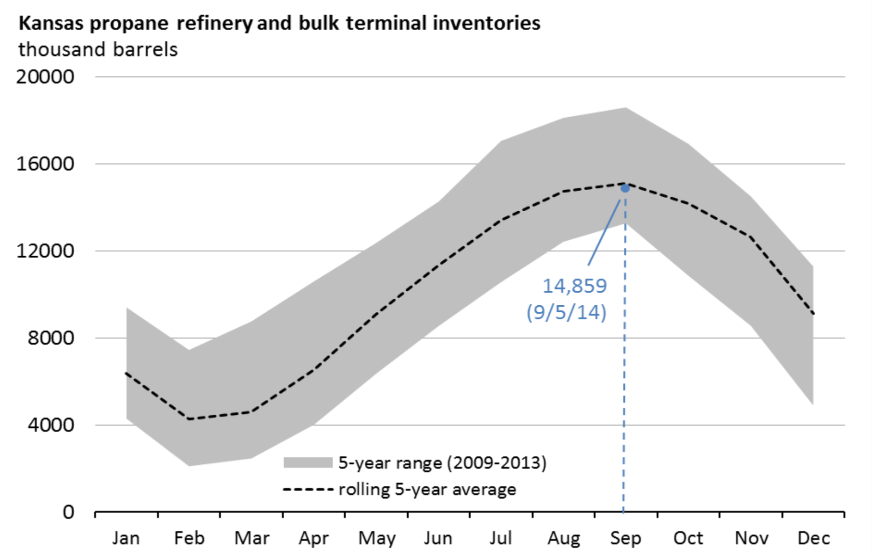
**propane/propylene for fuel use only*

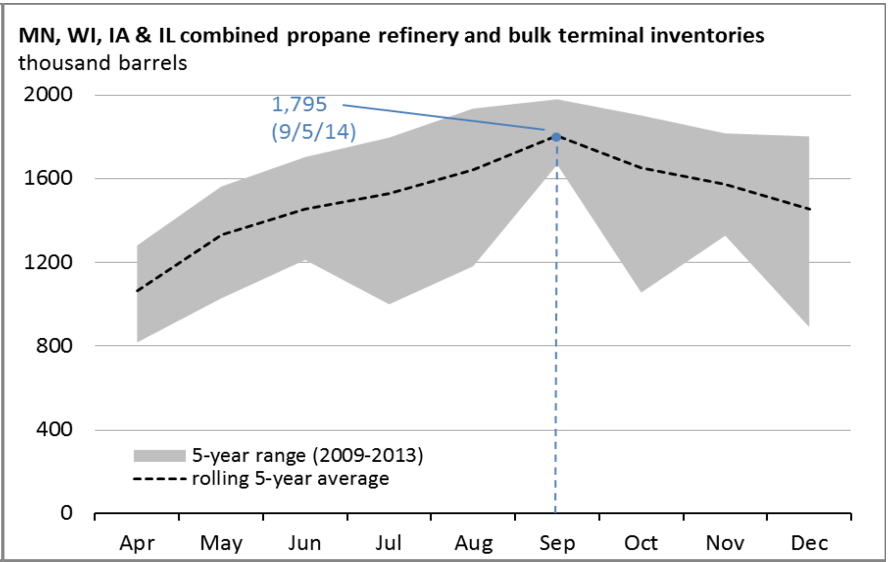
Price premium in Conway (KS) has encouraged inventory building in PADD2

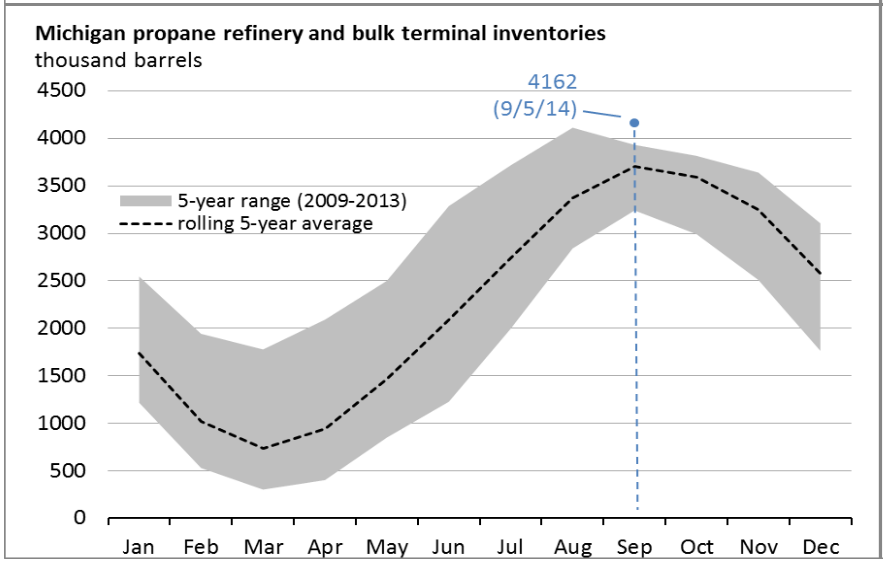


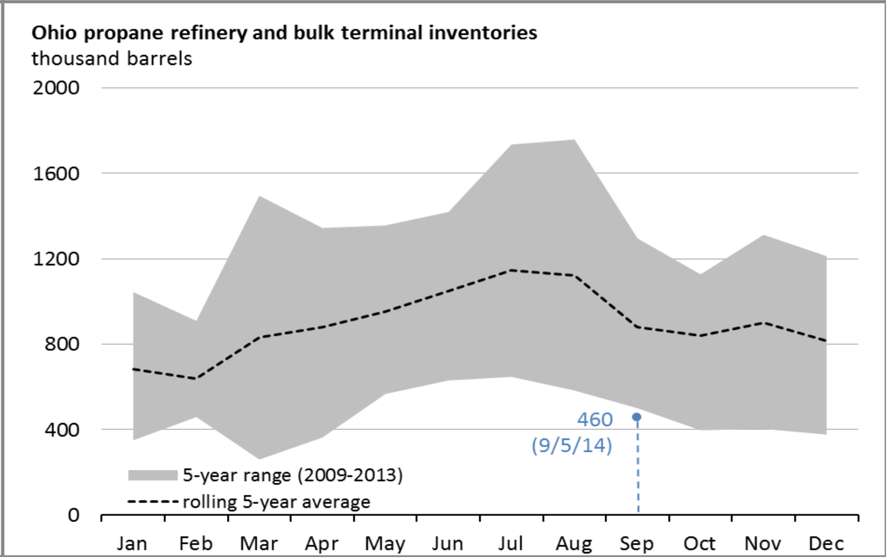
Source: U.S. Energy Information Administration, Thomson Reuters, data through October 3, 2014

Propane inventories for key individual states

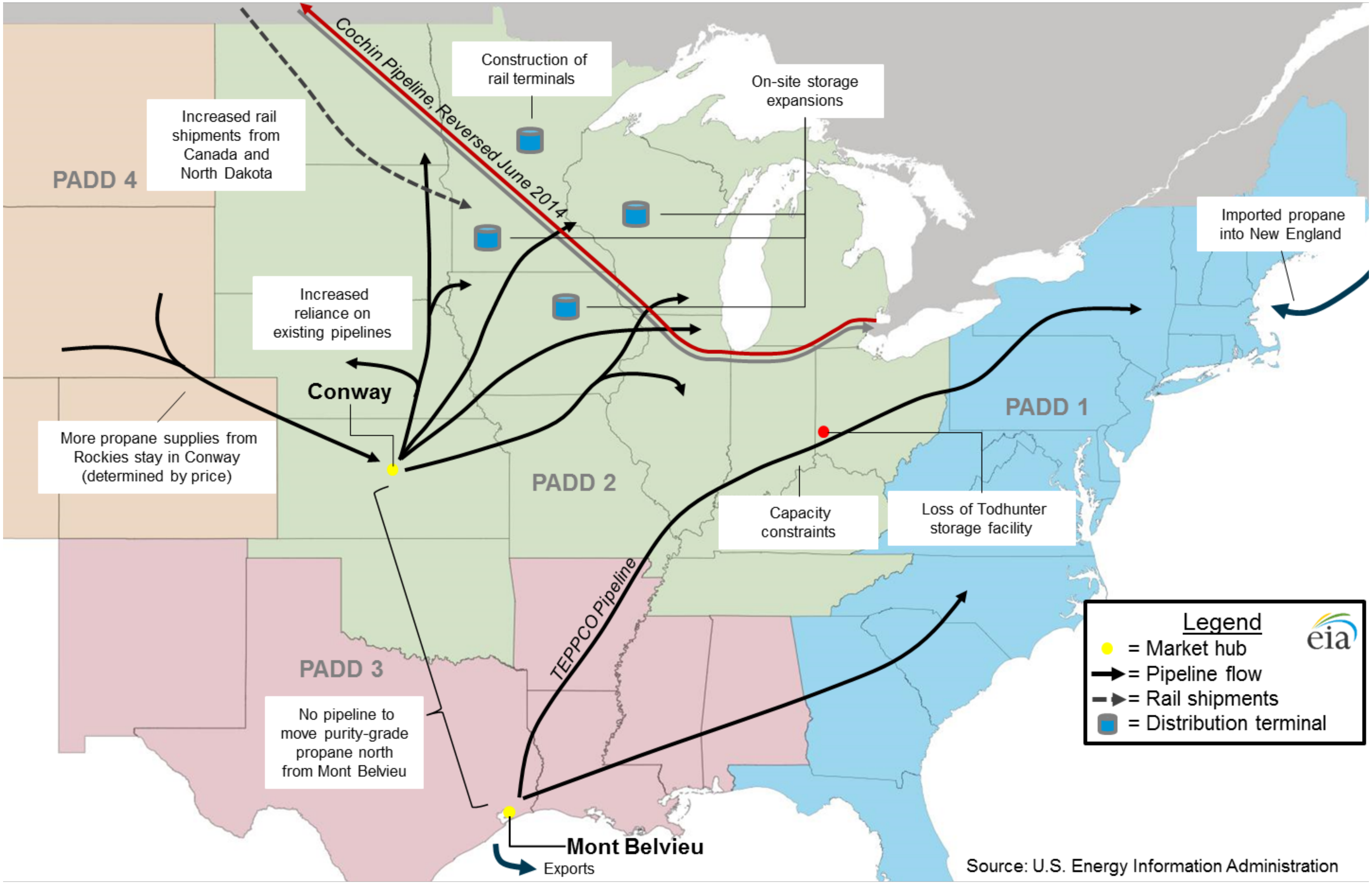






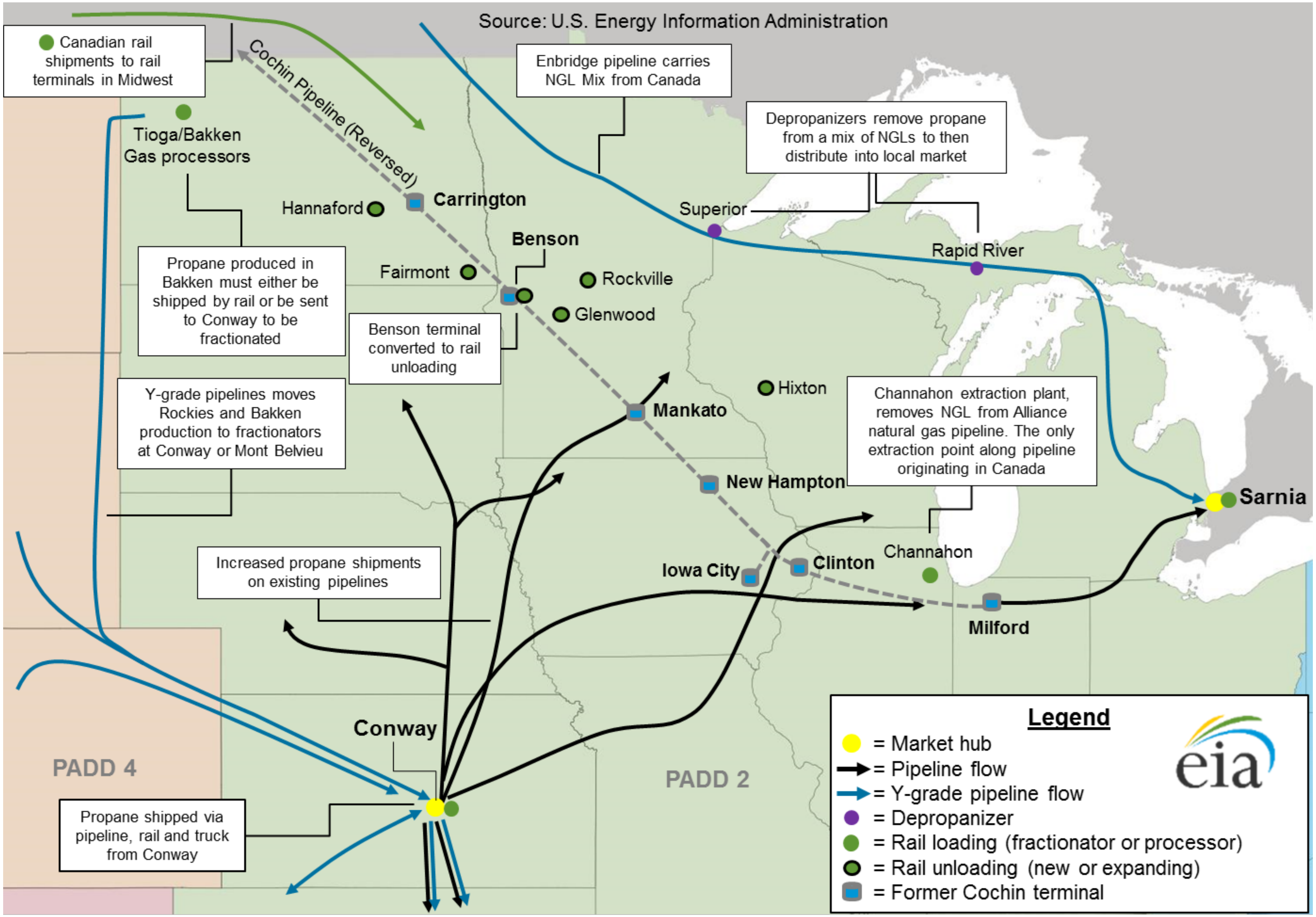


Winter 2014-15 propane supply diagram



Source: U.S. Energy Information Administration

Evolving Propane Supply Situation



Evolving Midwest Propane Supply Situation

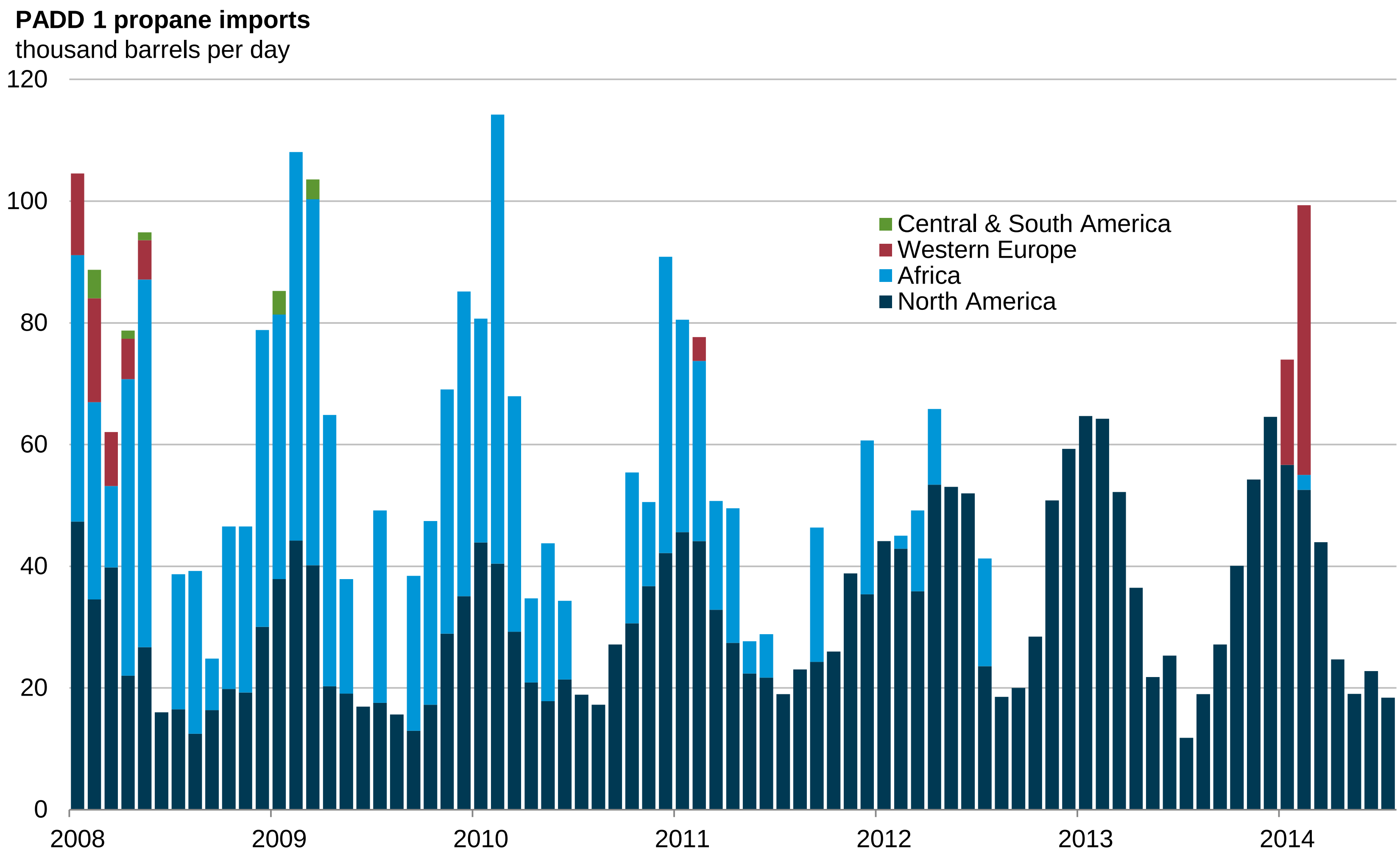
- **Markets**
  - **Prices**
    - Summer price premium at Conway incented storage builds in Midwest and indicated off season buying
  - **Secondary and tertiary storage**
    - Distributors promoting early fills for customers

- **Supply situation**
  - **Bakken**
    - Currently no pipeline to move purity propane from gas processors in North Dakota to the rest of Midwest
  - **Canada**
    - Rail loading facilities under construction to move propane out of Alberta to Midwest in response to Cochin
  - **Rockies**
    - Production must first be fractionated at Conway or Mont Belvieu, prices determine destination

- **Cochin pipeline alternatives**
  - **Pipelines**
    - Limited remaining capacity on existing pipelines
    - Regulation currently prevents prioritization of propane shipments over other products
  - **Rail**
    - New and expanded propane by rail unloading terminals
    - Limited pressurized railcar availability
    - Fallible in cold weather and prone to delays
    - Limited rail loading capacity
  - **Truck**
    - Costly when done over long distances
    - Limited by hours of service and weight limitations

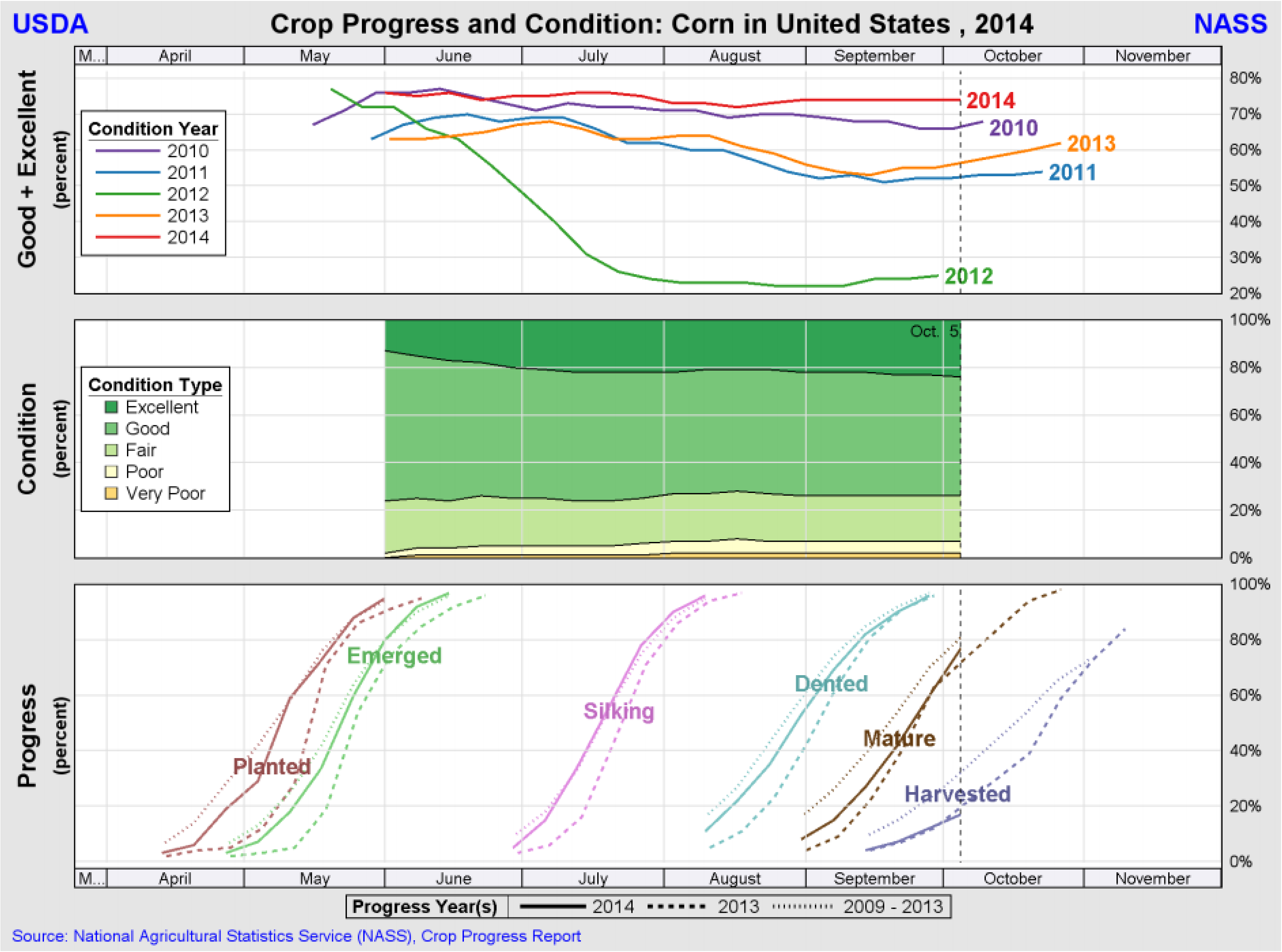
*(Y-Grade) = Unprocessed mix of natural gas liquids (propane, butane, ethane etc.)

The Northeast relies on propane imports for peak winter demand



Source: U.S. Energy Information Administration, Petroleum Supply Monthly

Weather will determine demand impact from corn harvest - 2014

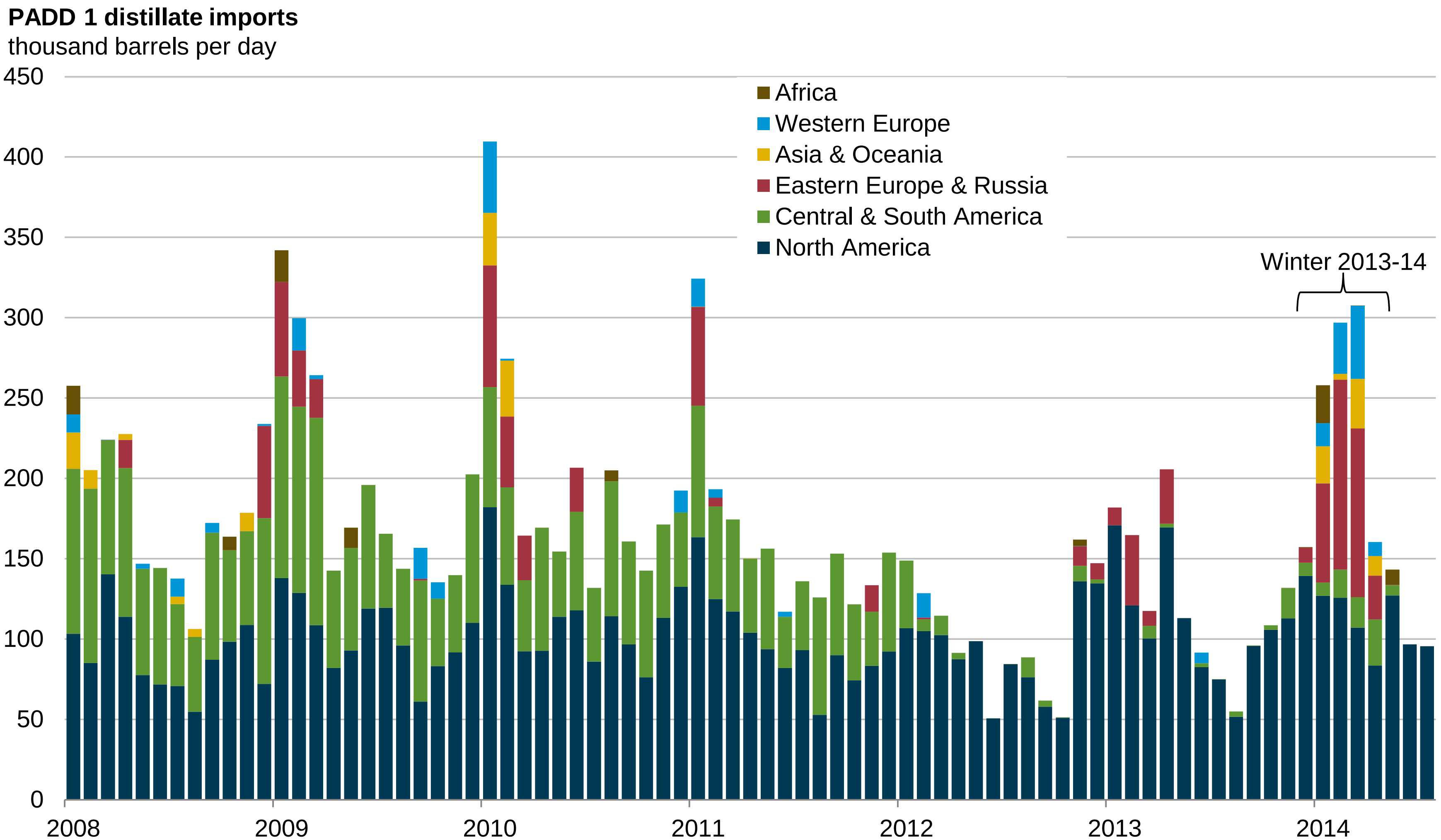


Source: U.S. Department of Agriculture, National Agricultural Statistic Service, *Crop Progress Report*

Winter 2014-15 takeaways and potential issues – heating oil

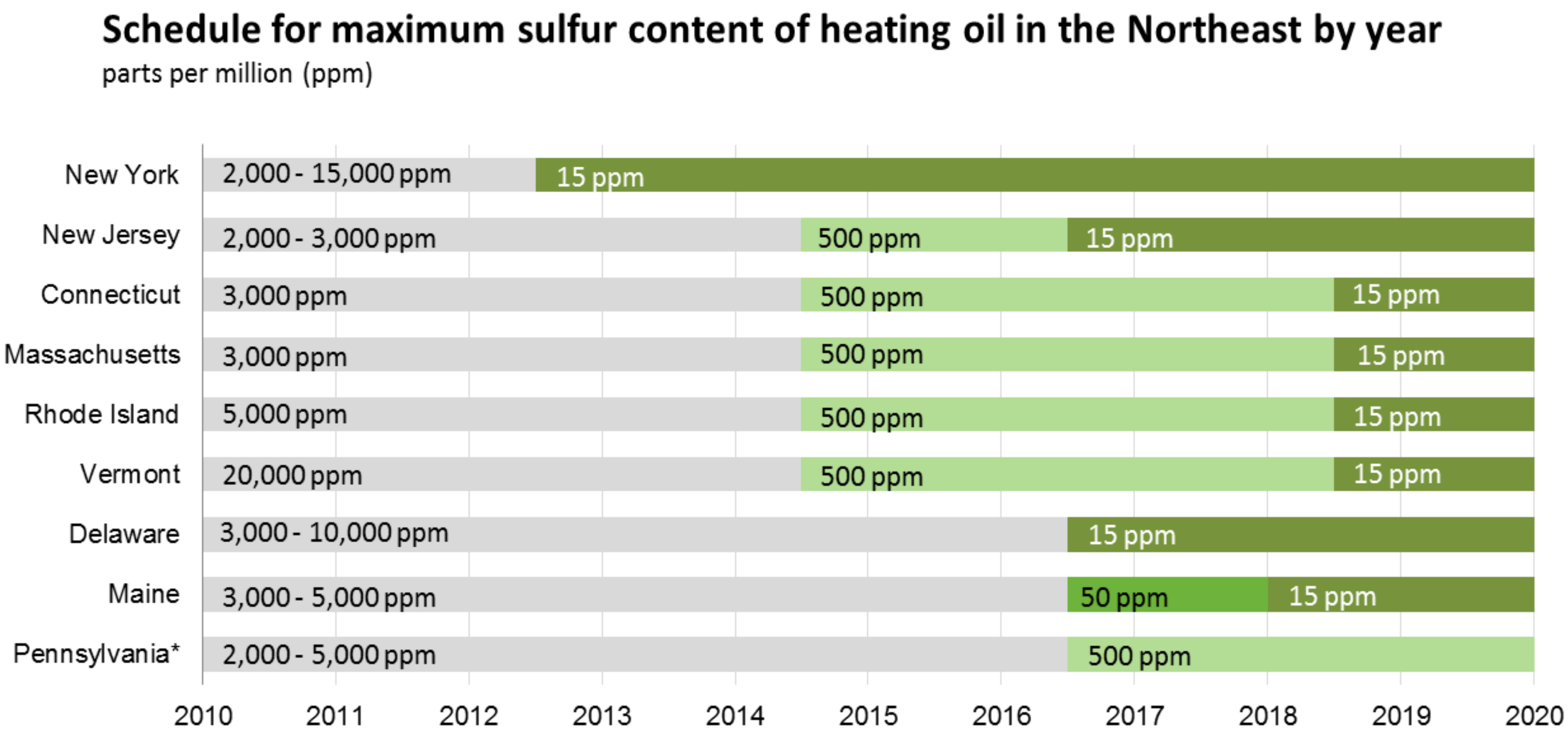
- Brent crude oil spot price forecast to average $9/barrel (22 cents/gal) lower this winter.
- Distillate stocks in the Northeast totaled 29.3 million barrels on September 26, 0.2 million barrels below the same time last year and the lowest level for this time of year since 2000. However, demand should be met via supplies from the Atlantic Basin market.
- Five states (CT, MA, NJ, RI, VT) lowered their heating oil maximum sulfur specification in July from 2,000+ ppm to 500 ppm.
- New regulations (MARPOL Annex VI) limit marine vessel fuel sulfur levels in certain costal waters to 1,000 ppm in January 2015.

Winter 2013-14: U.S. East coast imported distillate to meet demand



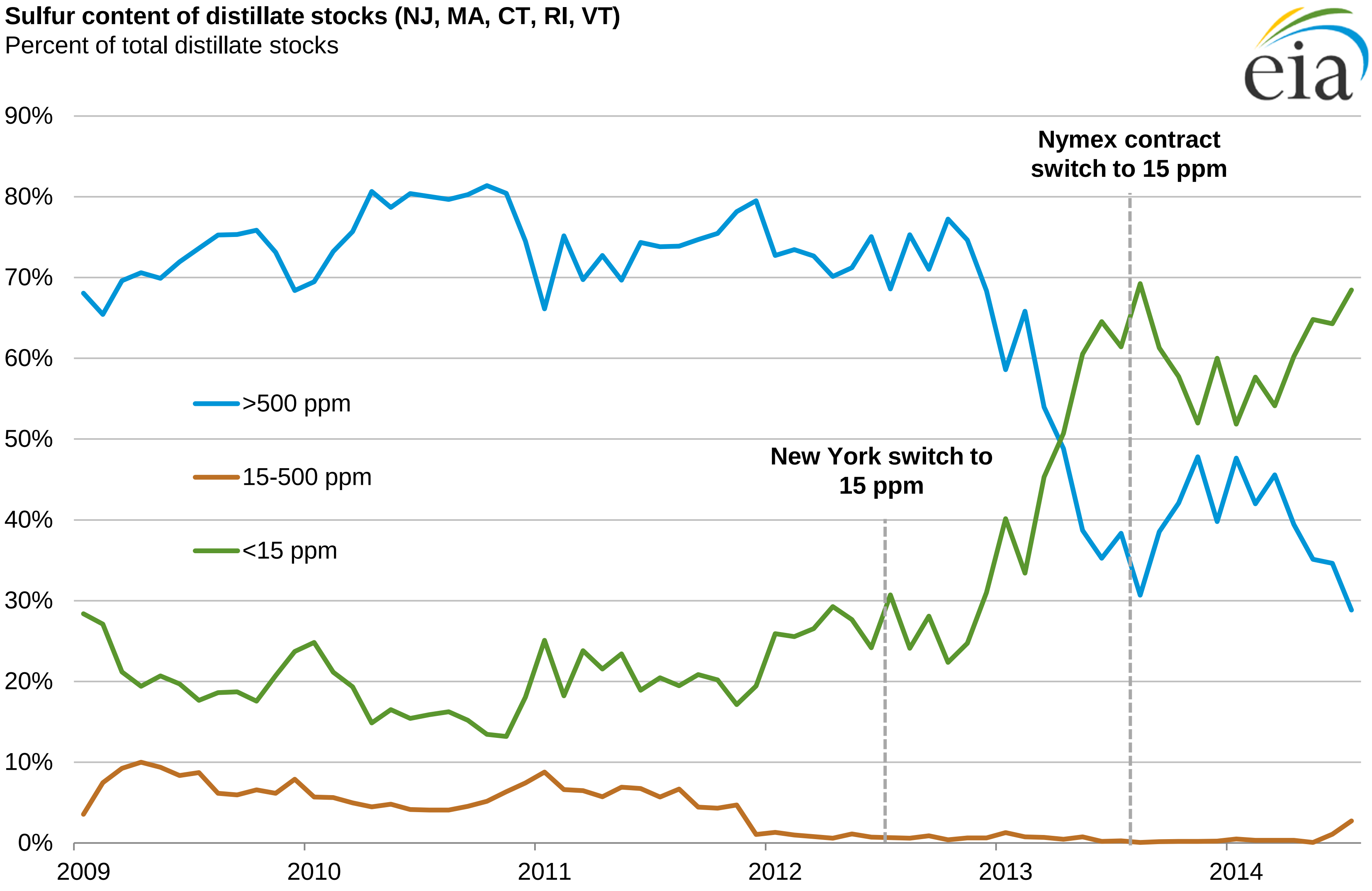
Source: U.S. Energy Information Administration, *Petroleum Supply Monthly*.

Heating oil sulfur specifications lowered in five states as of July 2014



Note: Specifications change on July 1 of the years shown, with the exception of Maine's 15 ppm requirement, which changes on January 1, 2018.
** Philadelphia, Pennsylvania changes from 2,000 ppm to 15 ppm on July 1, 2015.*
Source: U.S. Energy Information Administration

Northeast distillate inventories are changing sulfur content



Source: U.S. Energy Information Administration, *Petroleum Supply Monthly*.

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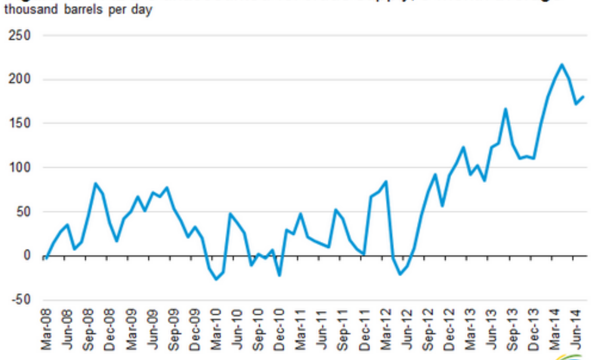
ANALYSIS | CRUDE OIL | GASOLINE | DISTILLATE | PROPANE

Crude delivered by rail continues to supply West Coast refineries

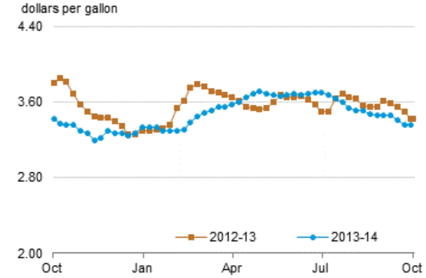
While EIA currently does not collect data on domestic movements of crude oil and products by rail, an examination of EIA data reveals that there is a growing supply of crude to the West Coast (PADD 5) that is not explicitly accounted for by production, imports, or movements from other PADDs via pipeline, tanker or barge (Figure 1). Based on data and information published by the California Energy Commission and on information published by U.S. West Coast refiners on crude volumes moving by rail, a significant portion of this growing unaccounted-for crude is delivered via railroad to West Coast refineries. Through July of this year (the latest data available) PADD 5 unaccounted-for supply has averaged 191,000 barrels per day (bbl/d), representing nearly 8% of regional supply.

Figure 1. PADD 5 unaccounted-for crude supply, 3-month average



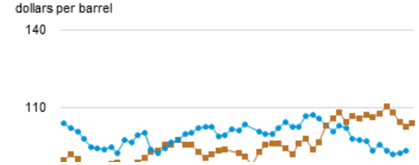
Source: U.S. Energy Information Administration, *Petroleum Supply Monthly*.

Retail prices *(dollars per gallon)*



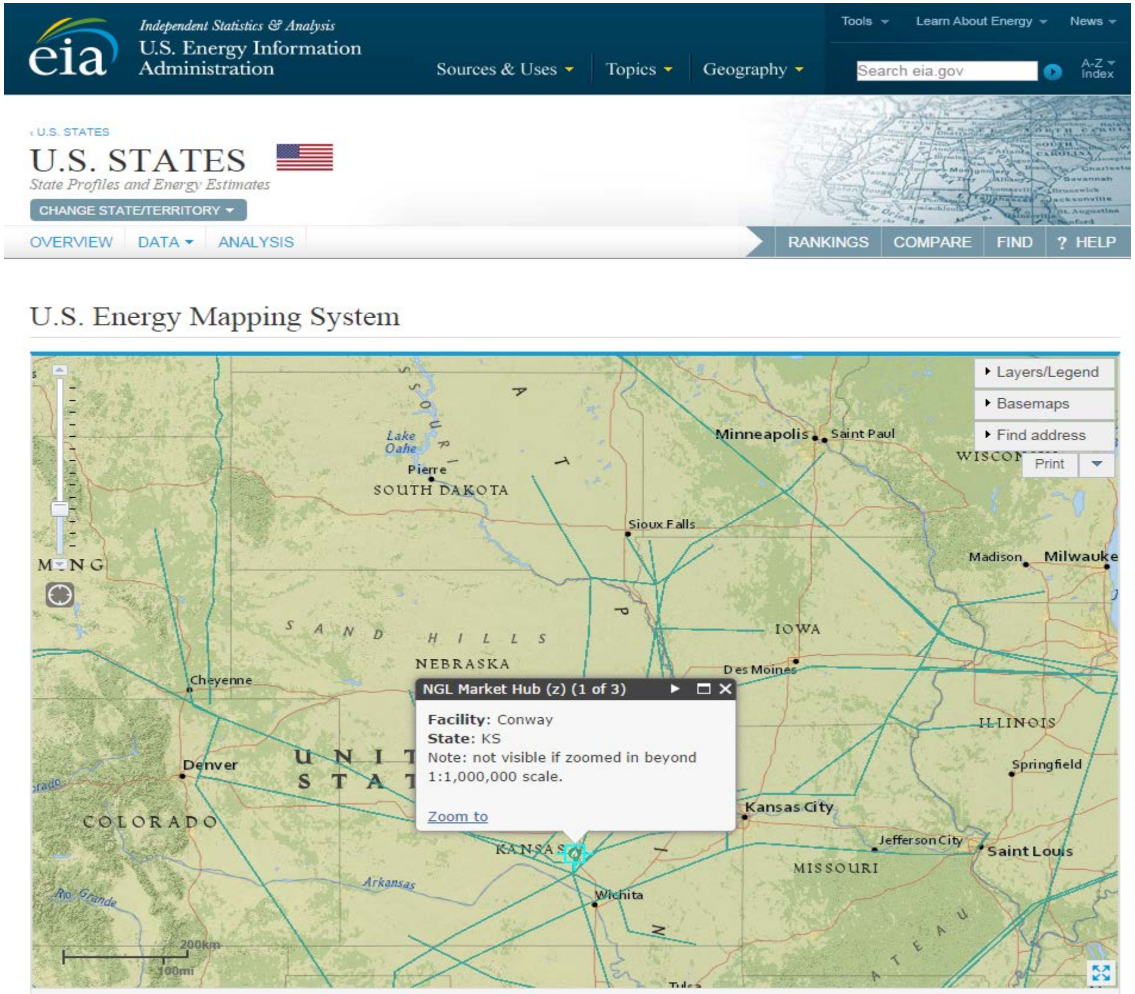
	Retail prices	Change from last	
	09/29/14	Week	Year
Gasoline	3.354	0.001 ▲	-0.071 ▼
Diesel	3.755	-0.023 ▼	-0.164 ▼

Futures prices *(dollars per gallon*)*



www.eia.gov/petroleum/weekly

U.S. Energy Mapping System - there is a map for that



www.eia.gov/state/maps

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National Propane Gas Association (NPGA): state affiliates indicate strong secondary and tertiary storage fill

- **ILLINOIS –** retailers indicate the majority of end-users have filled tanks, record corn crop could mean large demand for drying.

- **IOWA –** retailers' storage full including significant storage additions, many customers opted for summer fill, corn harvest expected to start second week in October.

- **MICHIGAN –** retailers report a range of 66-90% of customers opting for pre-buy and price-lock programs.

- **MINNESOTA –** deliveries up by 25 mil. gal. over any previous year, expect summer fill at + 30 mil. gal. over same time last year.

- **MISSOURI –** strong interest in contracts and "pre-buy"; many residential customers opted for summer fill; Concerns over bottlenecks if stocks draw down; Jefferson City terminal recently ran out of propane as it was opting to ship butane.

- **NORTH DAKOTA –** 85% of commercial and residential customers filled early, already seeing grain-drying; ~4 million gallons of new commercial storage; Concerns over reliability of rail for delivery.

- **Large Companies** – campaigns for residential and crop dryers to fill over the summer reportedly successful. Less success with COD customers.