When Energy Markets Go Crazy!

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Overview

- Compare pricing of heating fuels
  - Review of heating fuels used in Wisconsin and their characteristics
  - Price/MMBtu
- The role of biomass for the residential market
- Prognostication
  - Supply and pricing of winter fuels this summer, and upcoming winter

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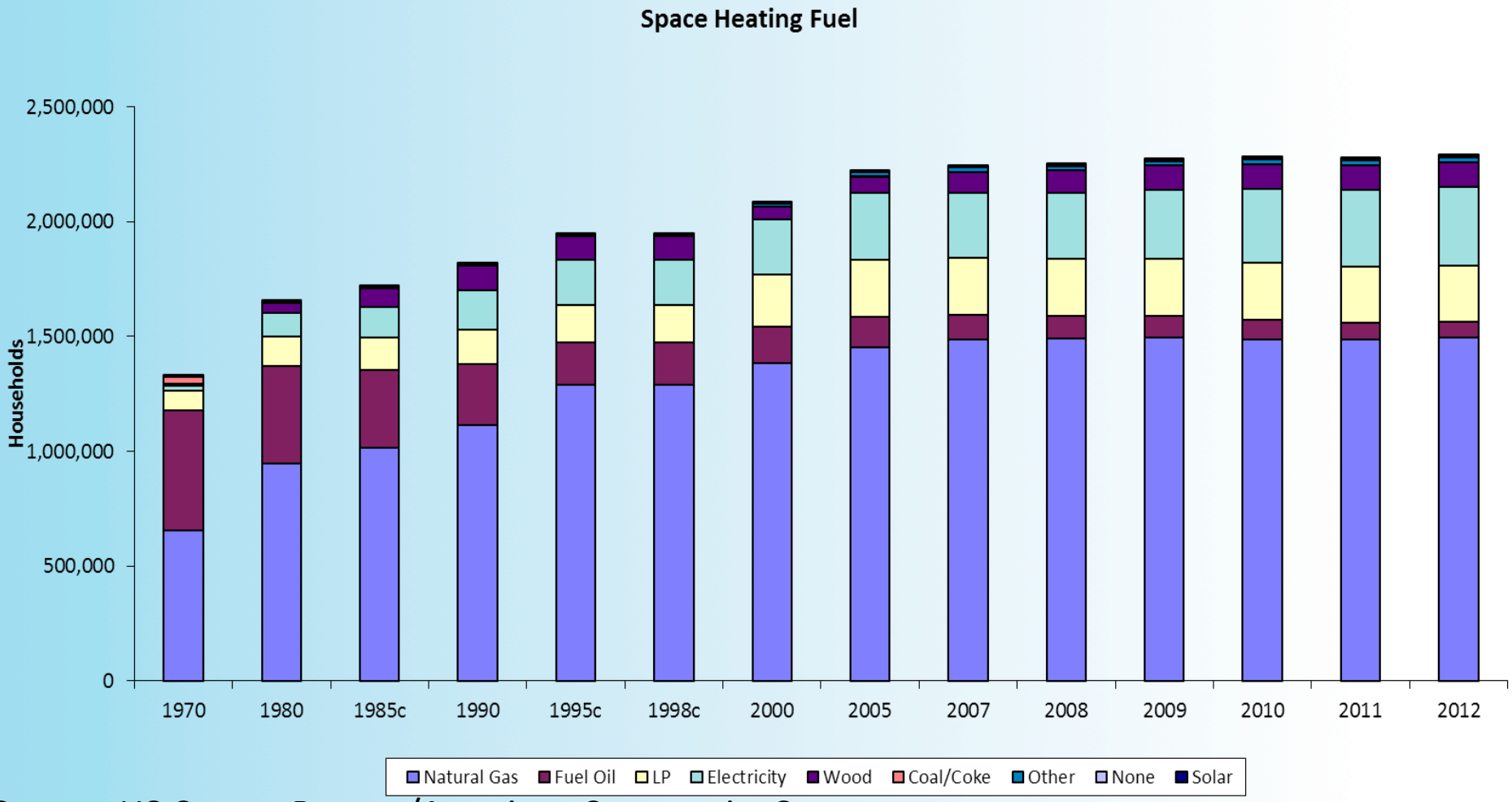
Residential Heating Fuels



Source: US Census Bureau/American Community Survey




Fuel Characteristics

- Heating Oil
  - Similar to on-road diesel fuel; more sulfur and red dye
  - Prices generally follow the crude oil market
  - Demand is seasonal – 2013-2014 winter price peaked on February 24 at $3.712/gallon ($26.765/MMBtu)
  - Average seasonal price $3.559/gallon ($25.661/MMBtu)
  - Unregulated fuel

- Electricity
  - Available across the state
  - Most expensive fuel for space heating with average seasonal price of $.135/kWh ($39.668/MMBtu)
  - Seasonal consumption more apparent in the summer
  - Regulated fuel

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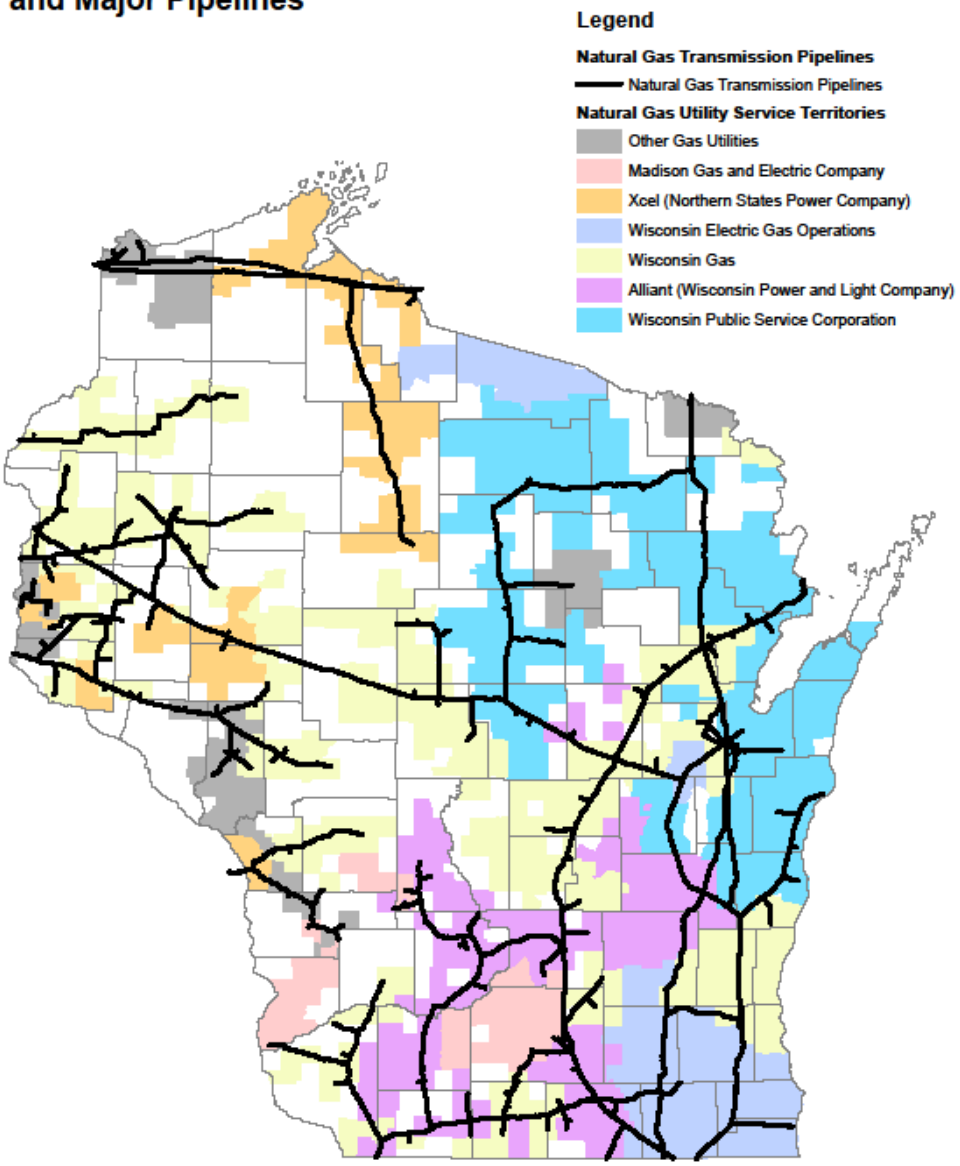
Wisconsin Natural Gas Utility Service Territories and Major Pipelines



Source: Public Service Commission of Wisconsin

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Fuel Characteristics

- Natural Gas
  - Most popular, least expensive fuel for space heating in Wisconsin. Average price for the season is $8.50/MMBtu
  - Emissions: 117 lbs of CO^2/MMBtu. HO, 161.3 lbs/MMBtu; propane, 139 lbs/MMBtu.
  - Regulated fuel
  - Utility price set by commodities market

- Propane
  - Residential and agricultural customers
  - Price set by commodities market; historically tracks petroleum, recently tracking natural gas
  - Unregulated fuel

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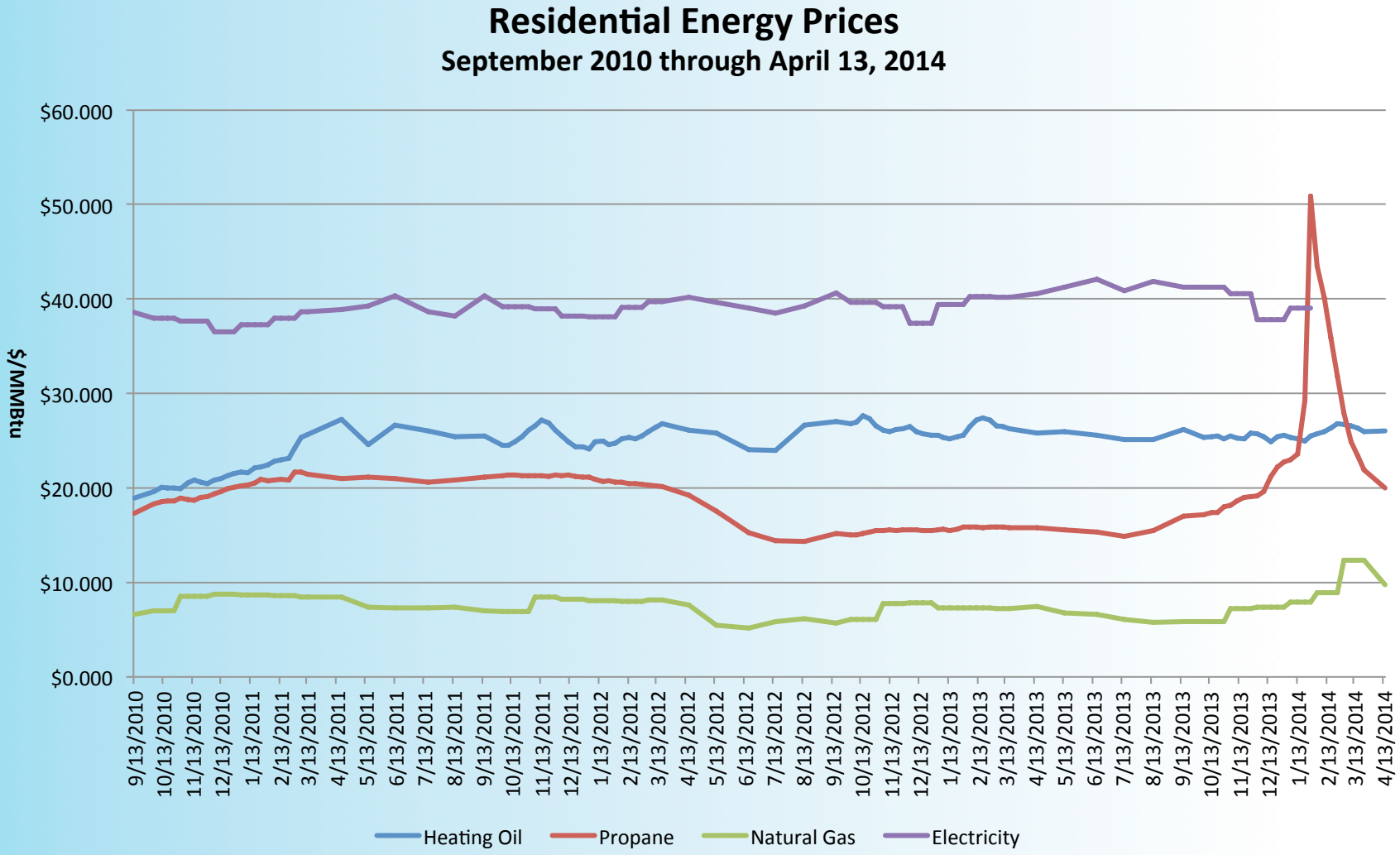
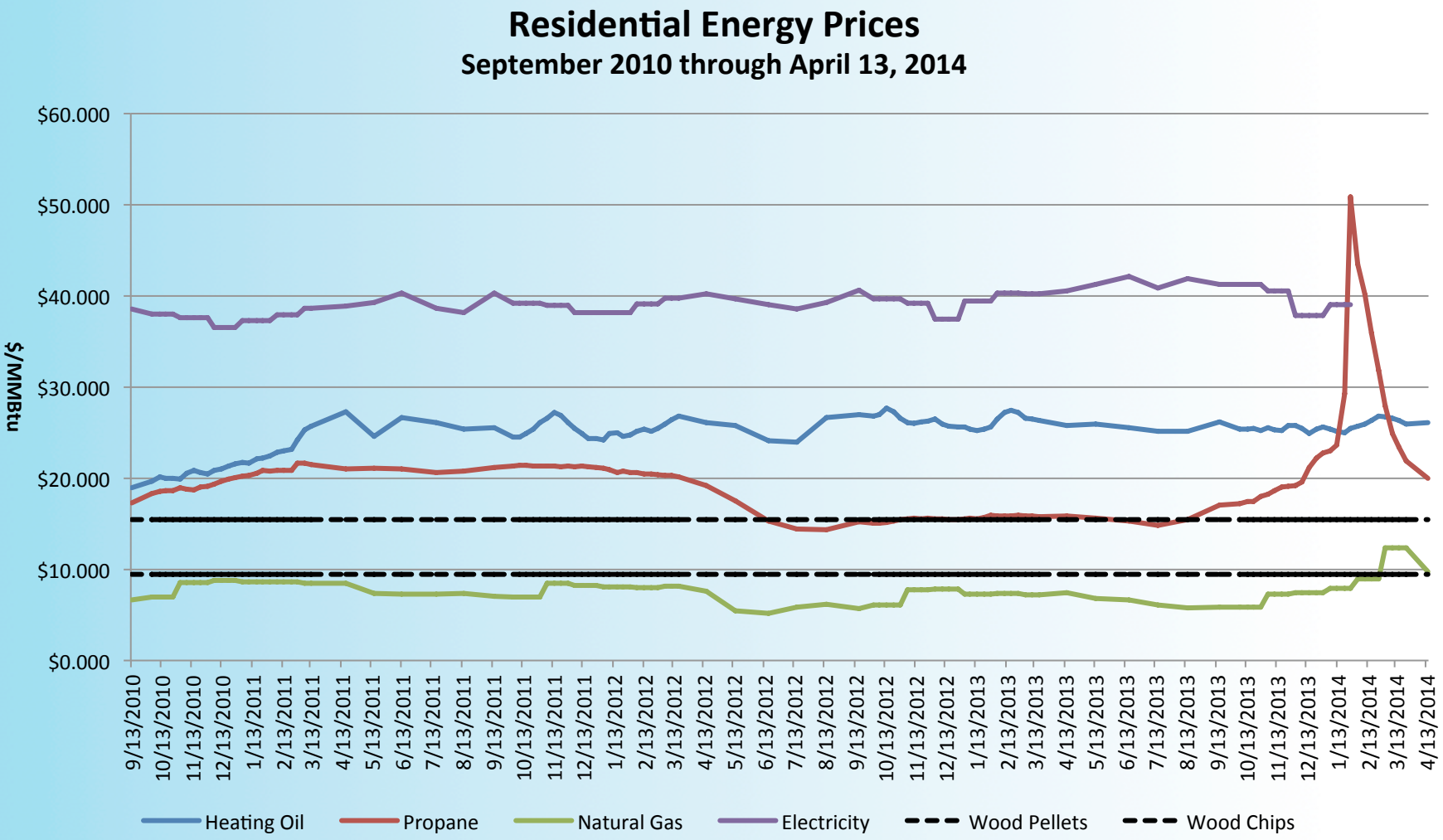
Residential Energy Prices



Residential Energy Prices






What's in a Price?

1. Supply and Demand
2. Seasonality
3. Regulation

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Supply and Demand

- Keeping supply and demand in balance
  - Commodities market
    - Propane, heating oil and natural gas
  - Price planning – keeping stable pricing for customers
- Supply variables
  - Storage
  - Pipeline capacity, allocation
- Demand variables
  - Weather
  - Availability of other fuels

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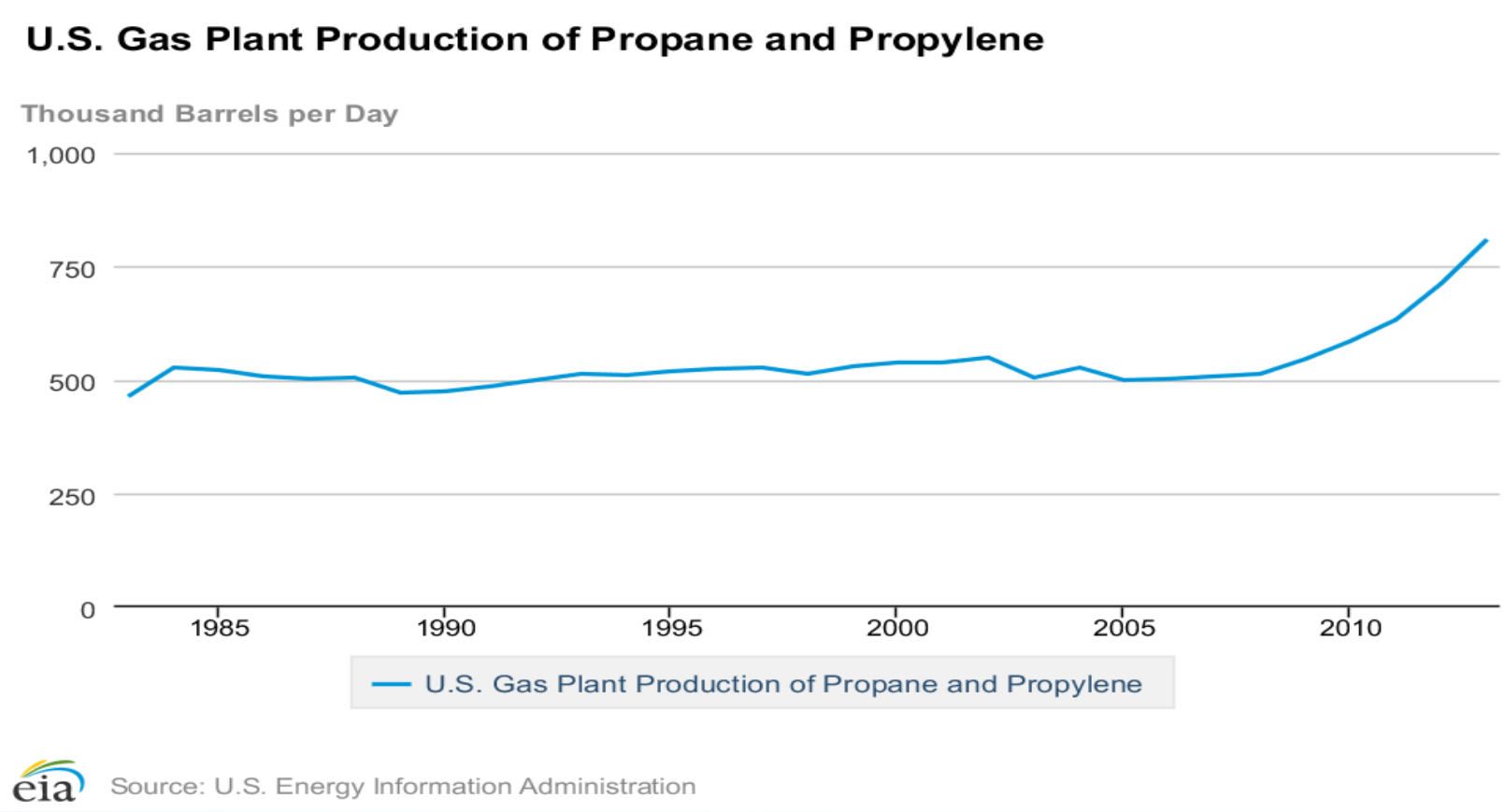
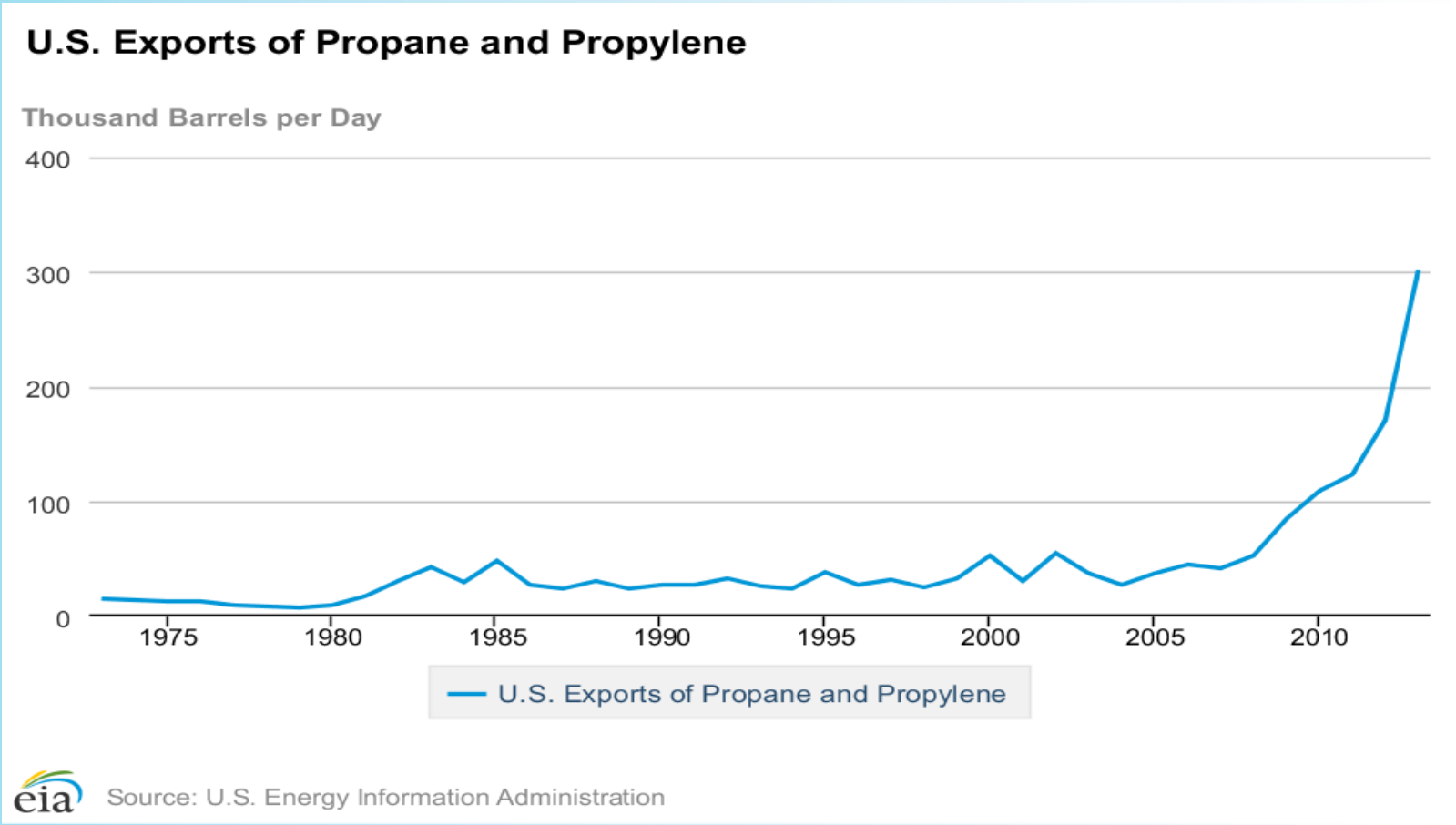
LP Production

- LP production increases with the development of natural gas from shale formations



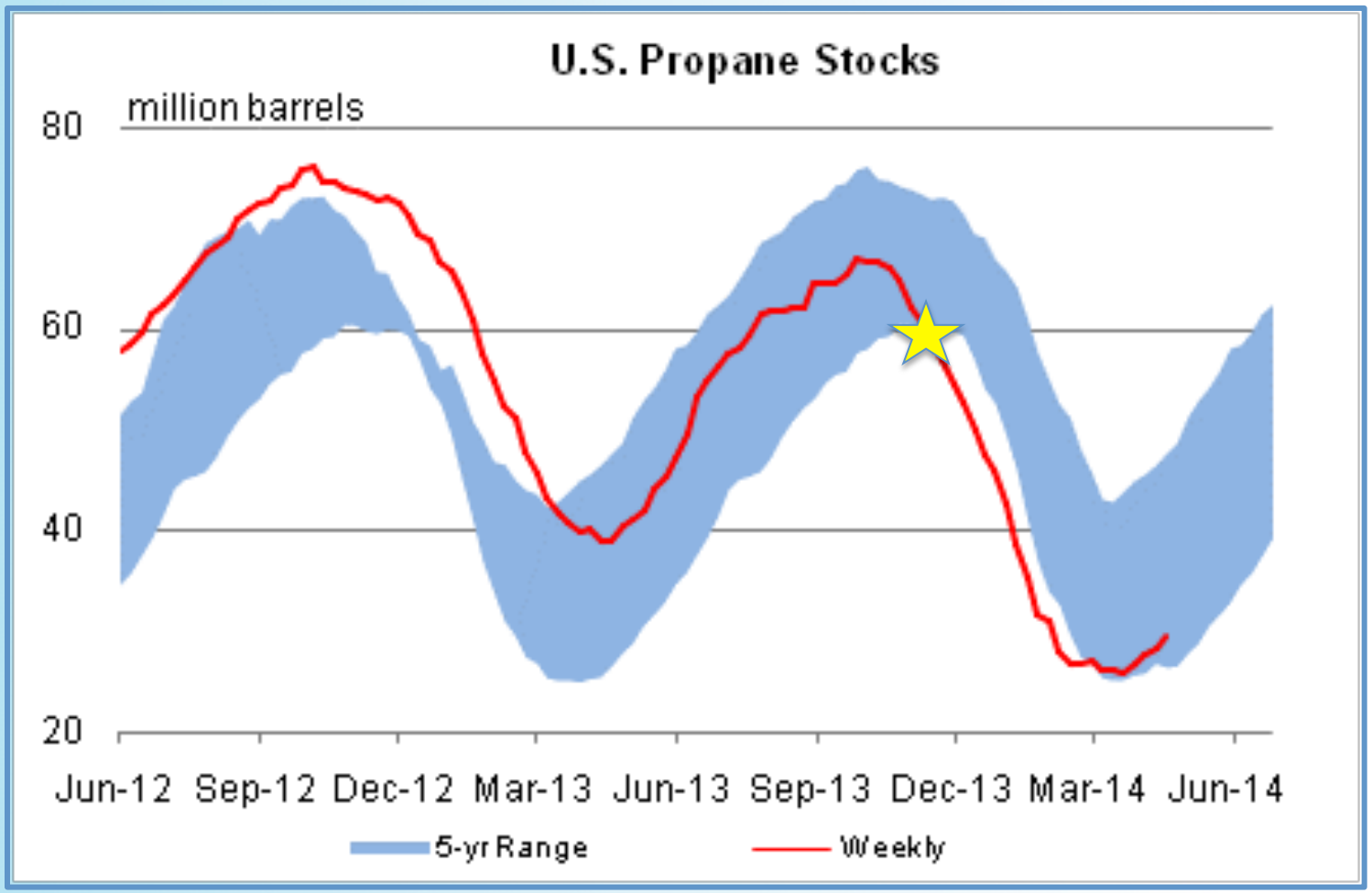
LP Exports


U.S. Exports of Propane and Propylene
Thousand Barrels per Day
400
300
200
100
0
1975
1980
1985
1990
1995
2000
2005
2010
U.S. Exports of Propane and Propylene
eia
Source: U.S. Energy Information Administration



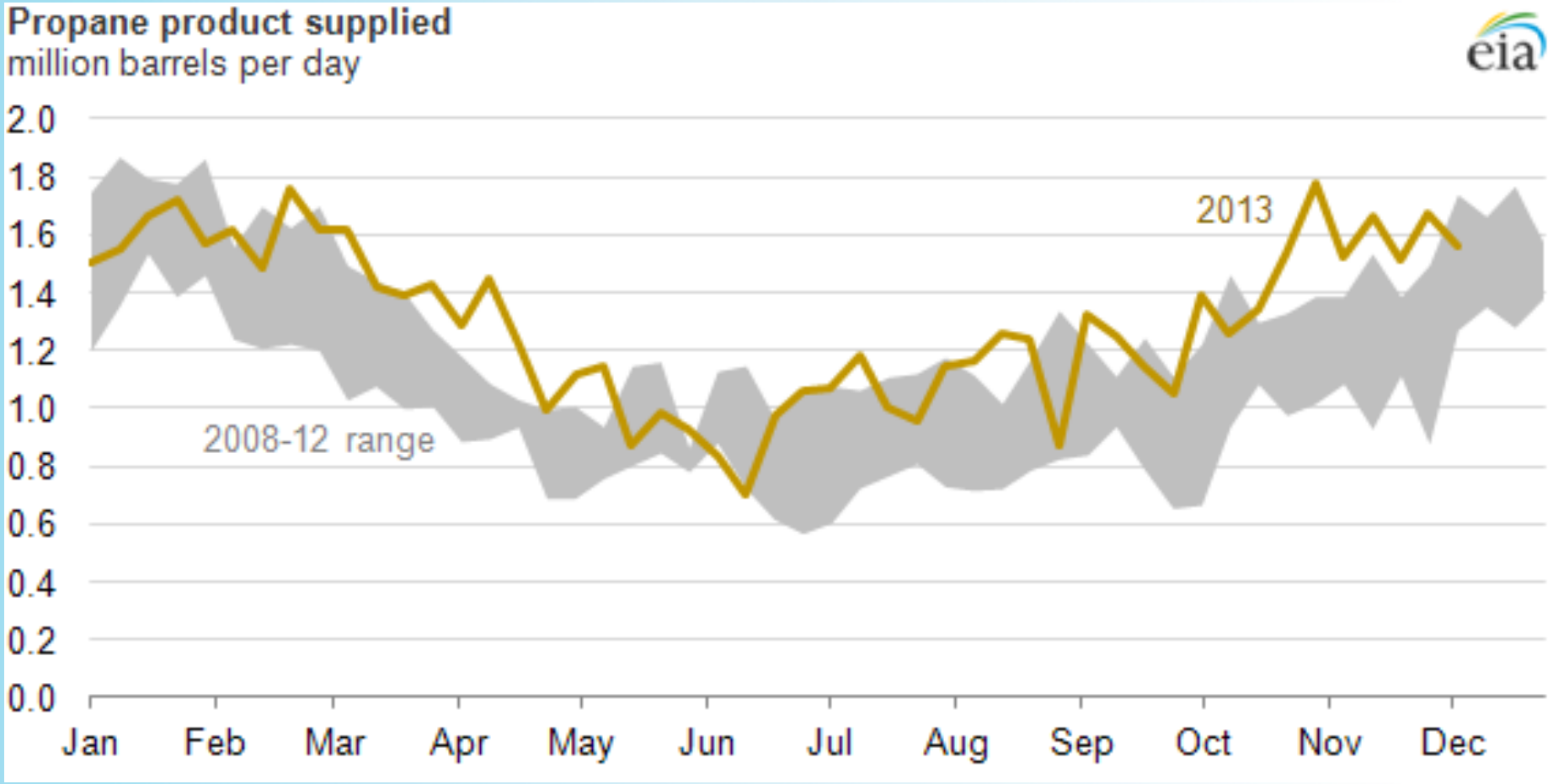

LP Inventories—10/2013

- In October 2013, US propane stocks , middle of historic range



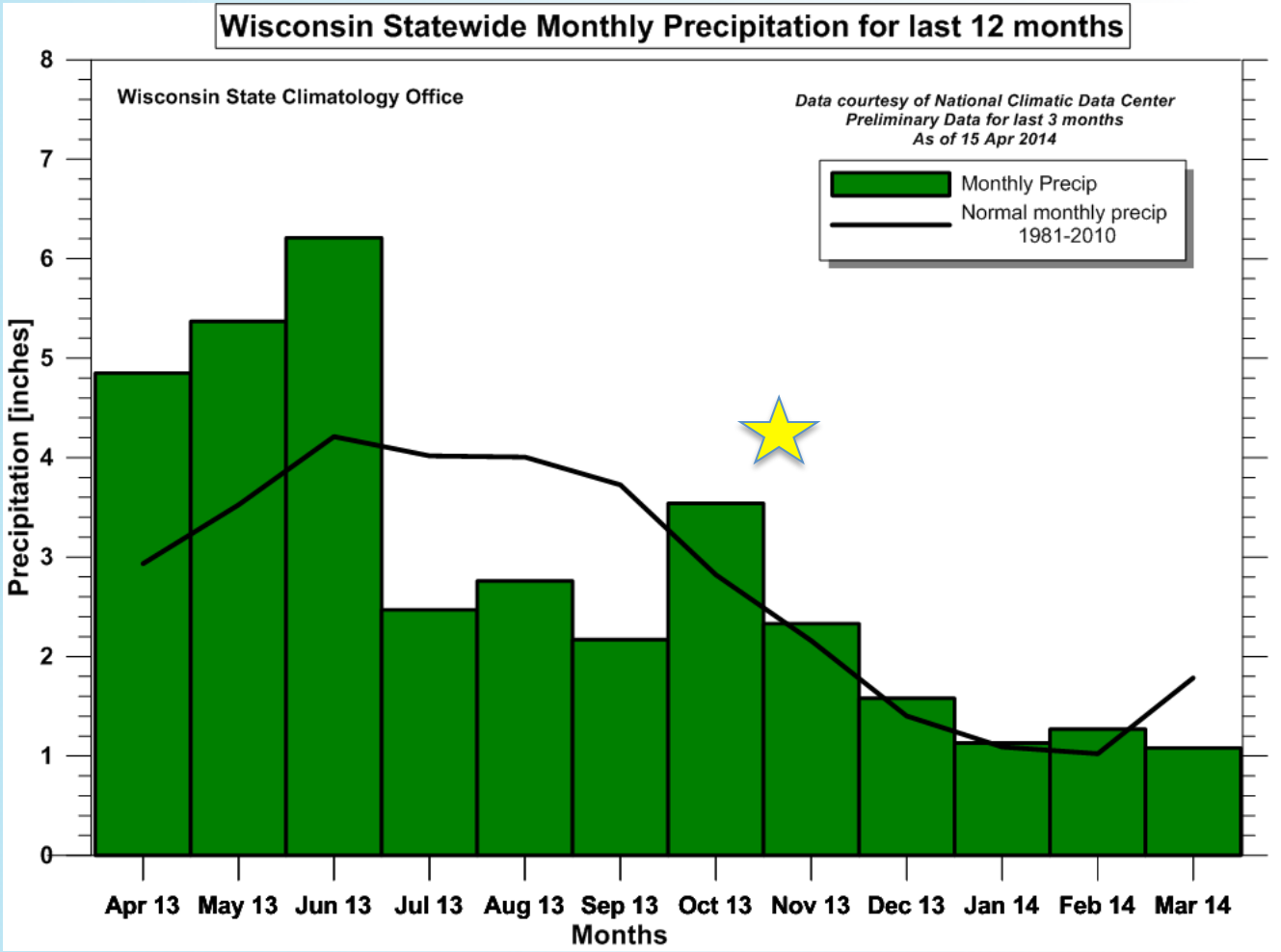
Record Domestic Demand for LP

- Domestic demand hits a record high

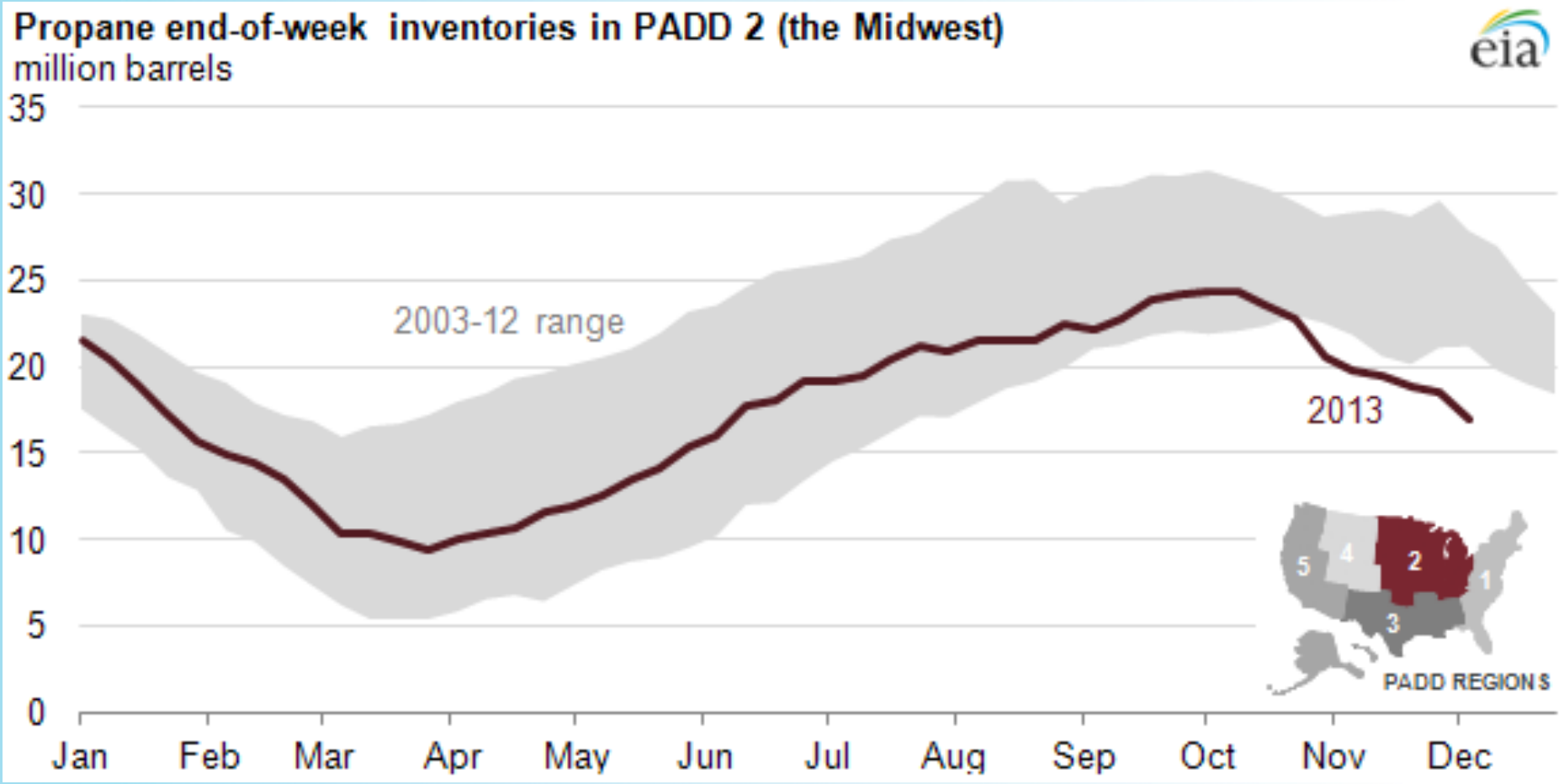


Wet Fall

- Wet fall for crop harvesting

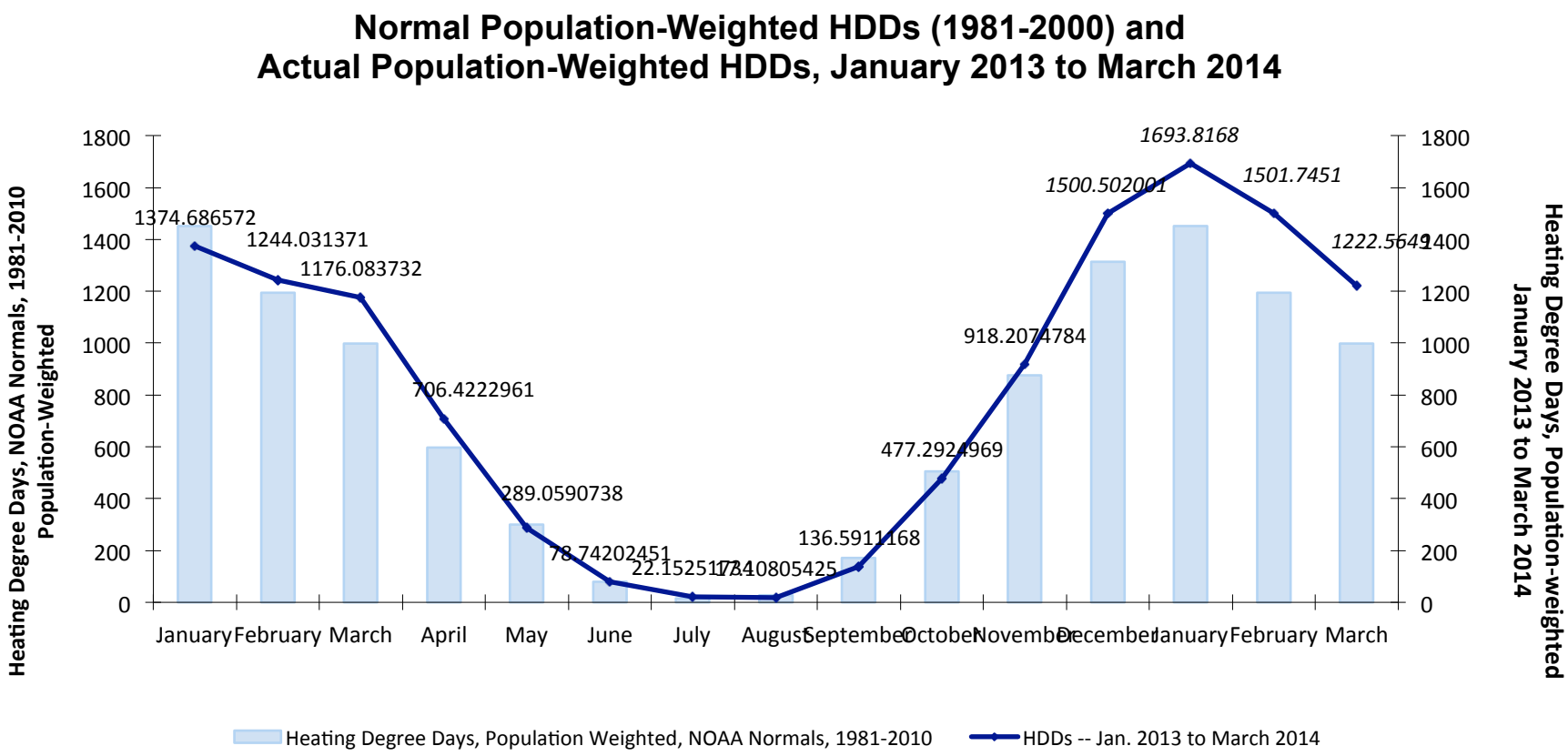


LP Inventories—12/2013



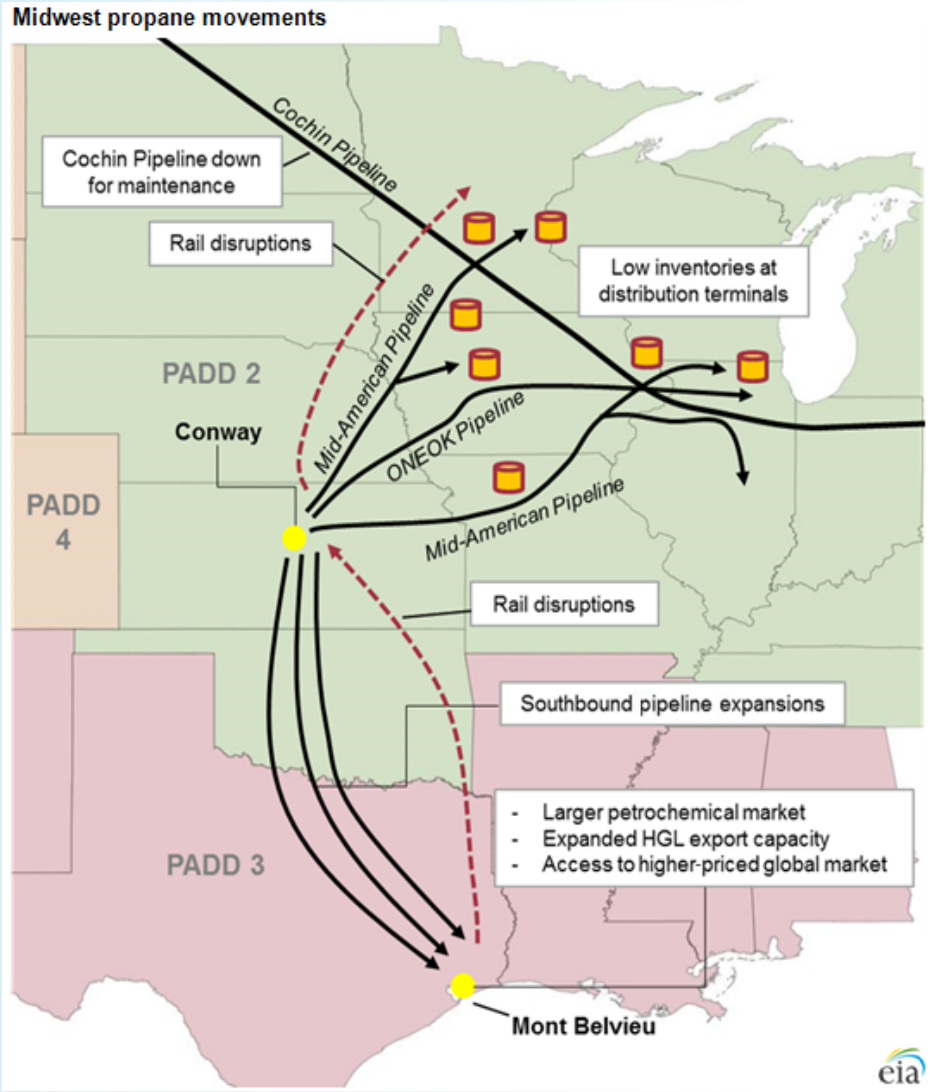
Very Cold Winter

- Very cold winter; 19.7% more heating degree days than the previous winter



Midwest LP Supply Disruptions

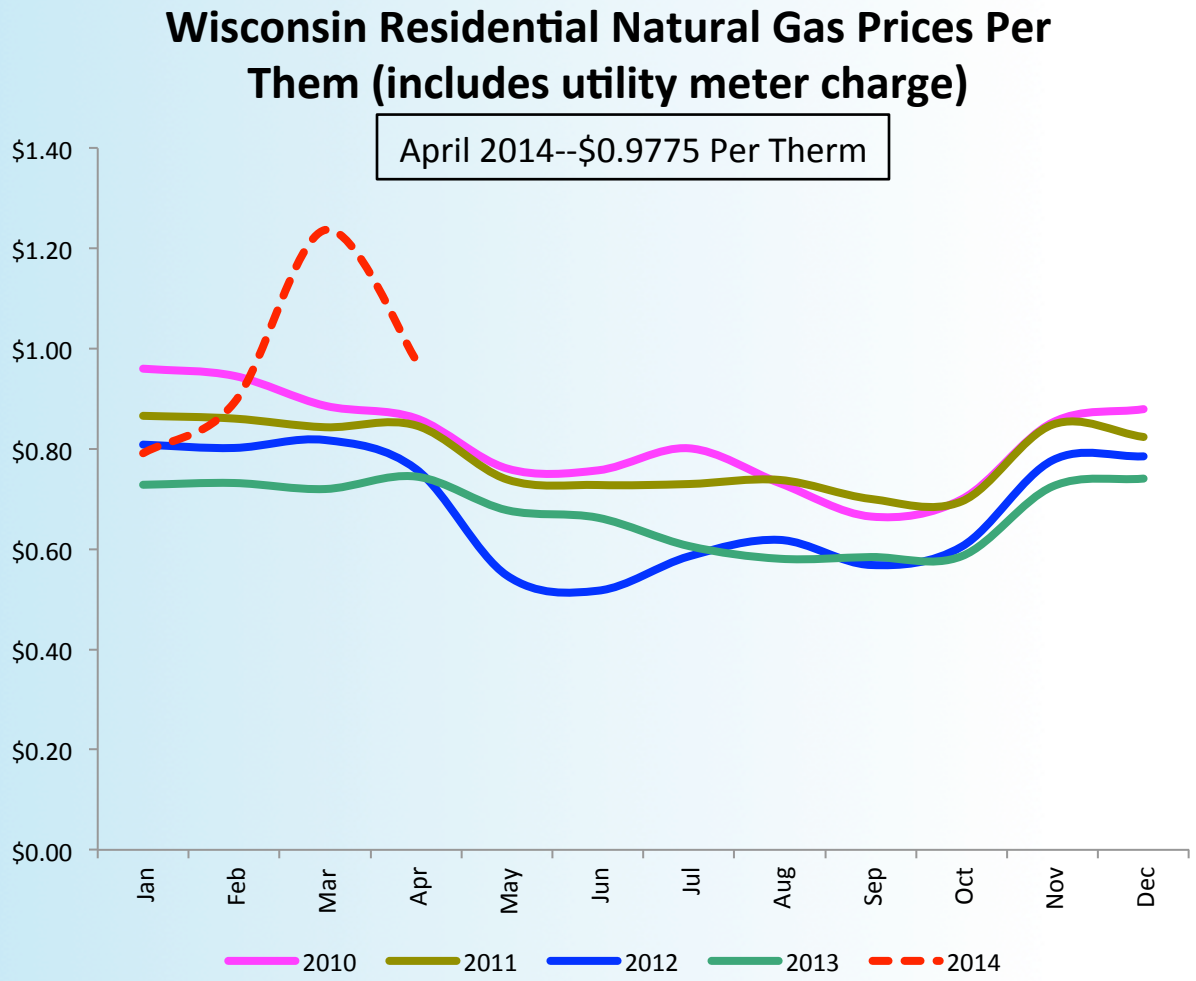
- Midwest terminals unable to replenish supply after large demand for crop drying
- Rail delivery disruptions
- Cochin Pipeline reversal



Result? High LP Prices

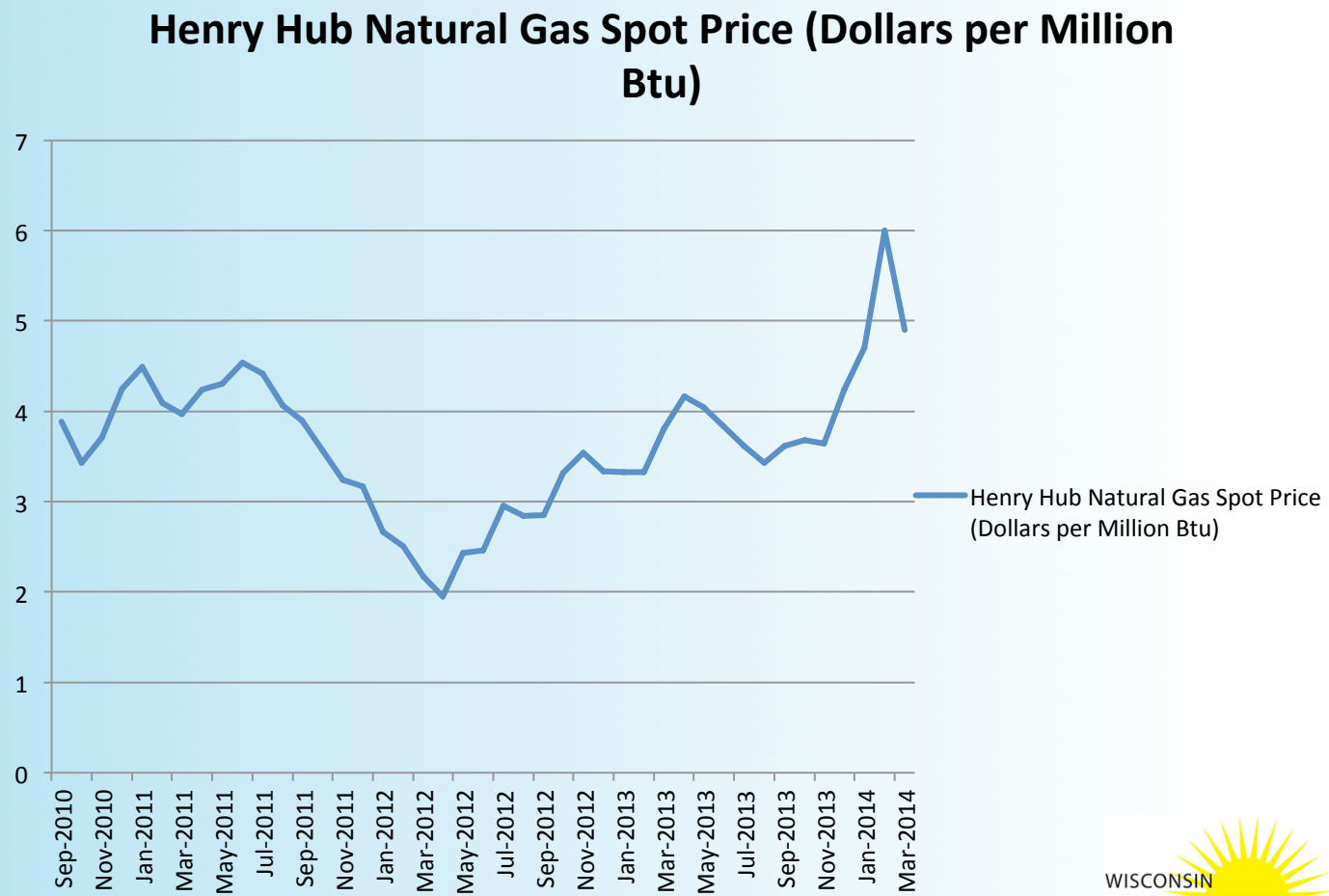
Natural Gas Pricing

- Cold weather
- High demand
- Spot market volume and percentage






Natural Gas Pricing



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Regulation and Pricing

- Regulated
  - Price increases are less dramatic
- Unregulated
  - Price spikes are more dramatic
- Datasets

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Danger of High Prices

- The danger with high prices
  - Demand destruction
- Example
  - Gasoline prices in 2008
  - LP prices in 2013?

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Role of Biomass?

- Biomass as space heating fuel
  - Fuel switching
  - Primary vs. secondary thermal source
  - Costs
  - Emissions
  - Resource proximity and availability

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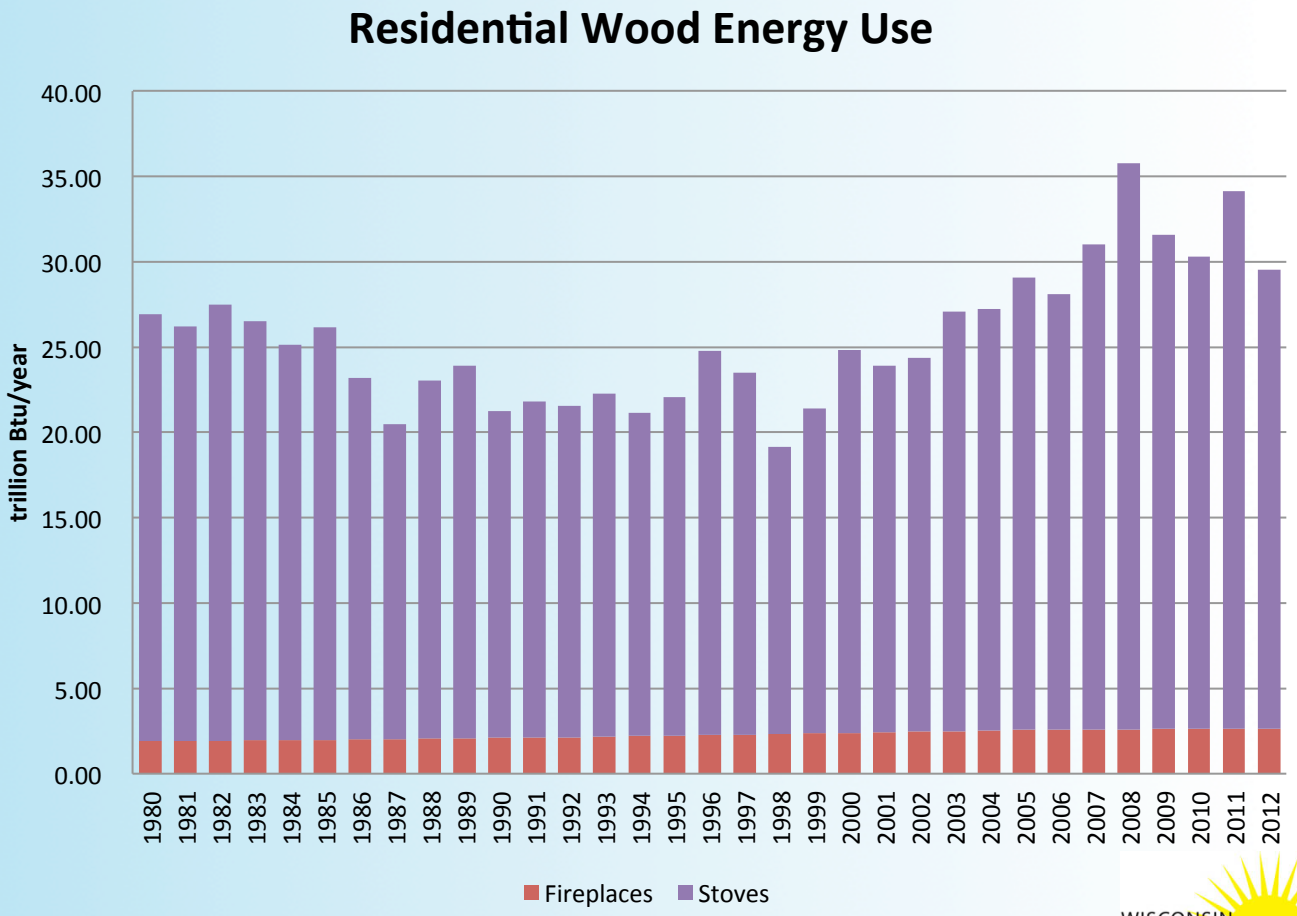
Residential Biomass Consumption



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Fuel Switching

- Wood vs. LP
  - Energy cost savings are not guaranteed
  - Savings? It depends.
  - Thermal portfolio diversification – thermal "peak shaving"
- Who are the customers?

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Pros and Cons

--Homegrown fuel, supports Wisconsin and the Midwest economy, and adds jobs

--Carbon neutral

--Displaces fossil fuels

--Sustainable and renewable fuel with relatively stable pricing

--Variable energy content

--Requires physical presence to tend the unit

--Requires physical strength to load wood or pellets

--Emissions must be controlled

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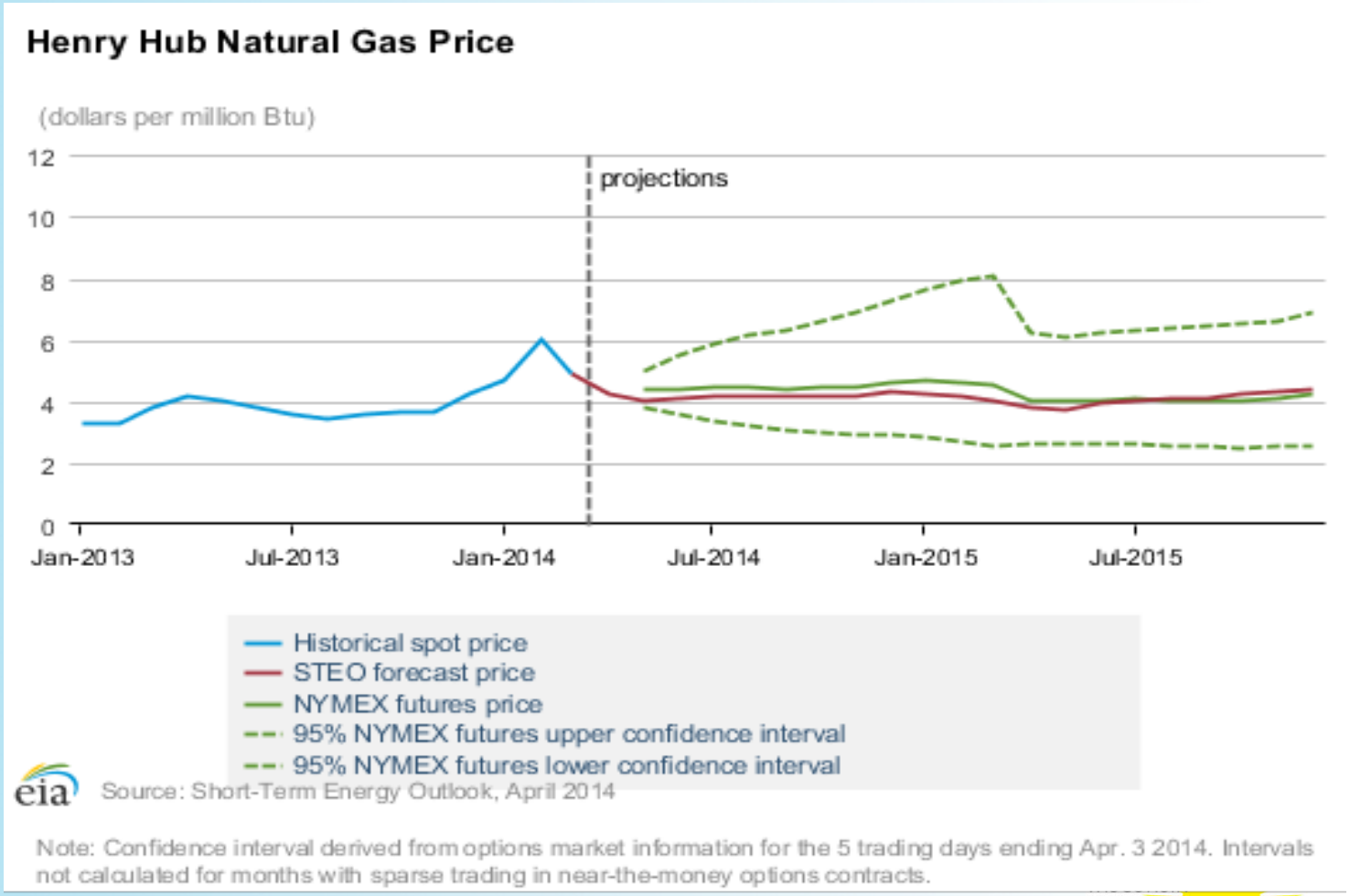
…the Crystal Ball Says…

Natural Gas

- Prices
  - Summer
    - Spot prices will continue to decline. Average Henry Hub price in 2014 expected to be $4.44/MMBtu (the price was $6/MMBtu in February and is now $4.90/MMBtu)
    - Prices will be slightly higher this summer
  - Winter
    - EIA is estimating that households using natural gas can expect to pay about 13% more this winter.
- Supply
  - The working gas in storage at the end of March this year was the lowest in 11 years. A large rebuild is expected through October .
  - EIA expects that demand from the power sector will be lower due to higher prices, but demand from the residential, industrial and commercial sectors is expected to offset the drop in




…the Crystal Ball Says…



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…the Crystal Ball Says…

Heating Oil

- Prices
  - Winter – EIA is projecting that households will spend 2% less this winter than last winter due to anticipated 5% decrease in price and 3% increase in consumption.
- Supply
  - Inventories of distillates are projected to start the summer 6 million barrels lower than last summer, and 26 million barrels lower than the 5-year average.
  - These inventories will build throughout the summer, and are expected to be on par with inventories at the end of last summer, which were well below the 5-year average.

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…the Crystal Ball Says…

Propane

- Prices
  - Winter – EIA is projecting that households will spend 9% more this winter in the midwest and 54% higher nationwide.
- Supply
  - Exports of propane are expected to continue climbing which puts pressure on inventories and supply.
  - The summer build in of supply has begun slowly.
  - The loss of the Cochin pipeline will reduce supply in the Midwest which is being addressed through three new terminals, two in MN and one in WI. These terminals will be served by rail car.

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…the Crystal Ball Says…

Electricity

- Prices
  - EIA estimates an increase of about 2% in overall seasonal cost.
  - The pressure on electric prices is the result of commodity costs for fuel and power plant fuel switching.

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Questions?

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