



# Developments in North American Oil, Gas, and LNG

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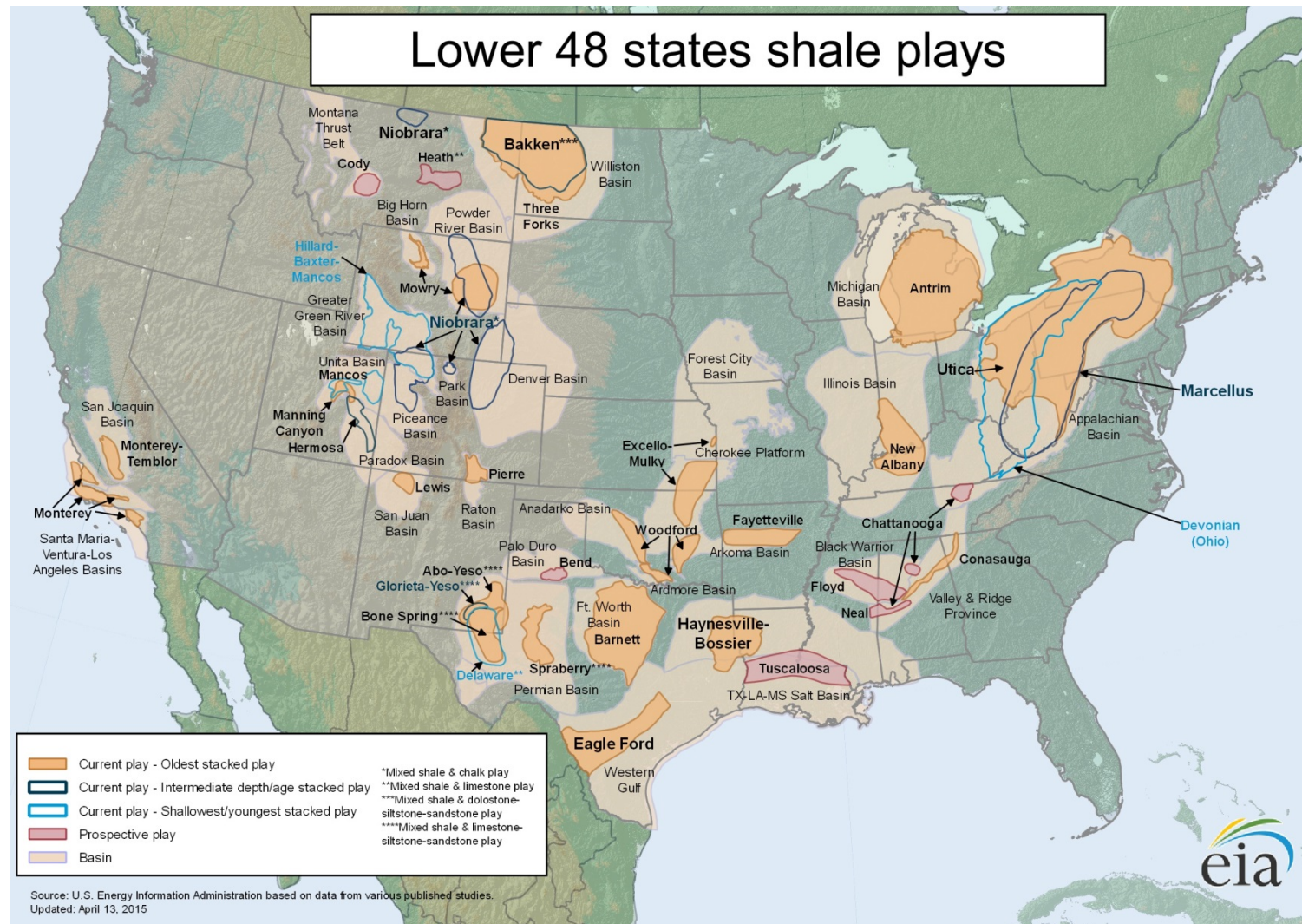
## Overview

- Backdrop: U.S. Production
- Status of North American LNG export projects
- U.S. crude oil exports
- Midstream infrastructure developments
- New regulatory initiatives impacting oil, gas, and LNG

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Backdrop: U.S. Production

# Backdrop



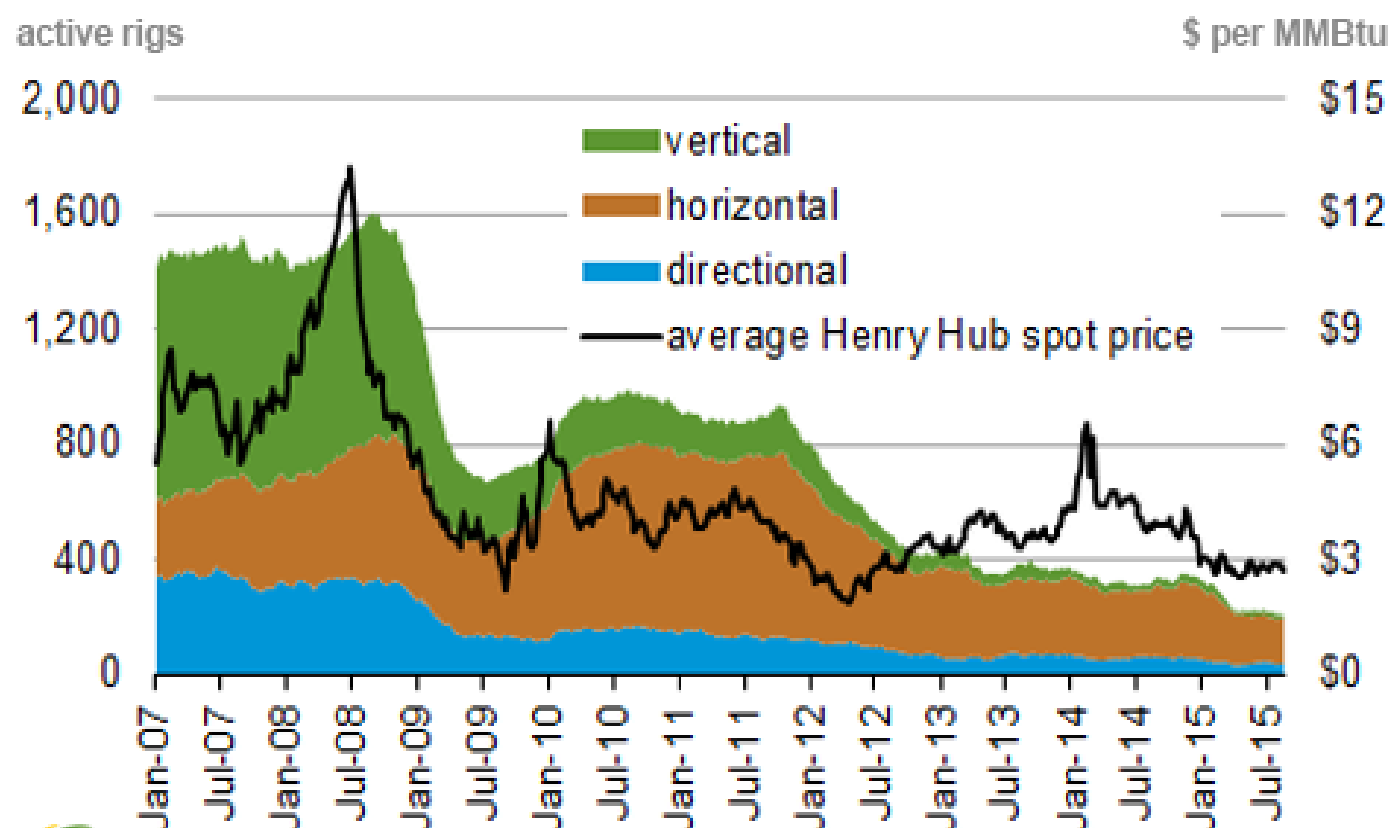
Source: U.S. Energy Information Administration, [http://www.eia.gov/oil\\_gas/rpd/shale\\_gas.pdf](http://www.eia.gov/oil_gas/rpd/shale_gas.pdf) (April 13, 2015).

## Backdrop

- With steep decline in oil and gas prices, production has declined generally ... but the picture is not entirely clear
  - Current Lower 48 natural gas production in September is the highest production rate ever – 74.2 Bcf/d
  - Crude oil production in August averaged 9.3 MMb/d
    - Down from decades high of 9.7-9.8 MMb/d earlier in 2015 ...
    - But up 5.4% from August 2014
  - Rig count is decreasing, but noticeable shift in remaining operating rigs to more dry gas production and best producing areas in oil and gas plays

## Backdrop – Rig Count

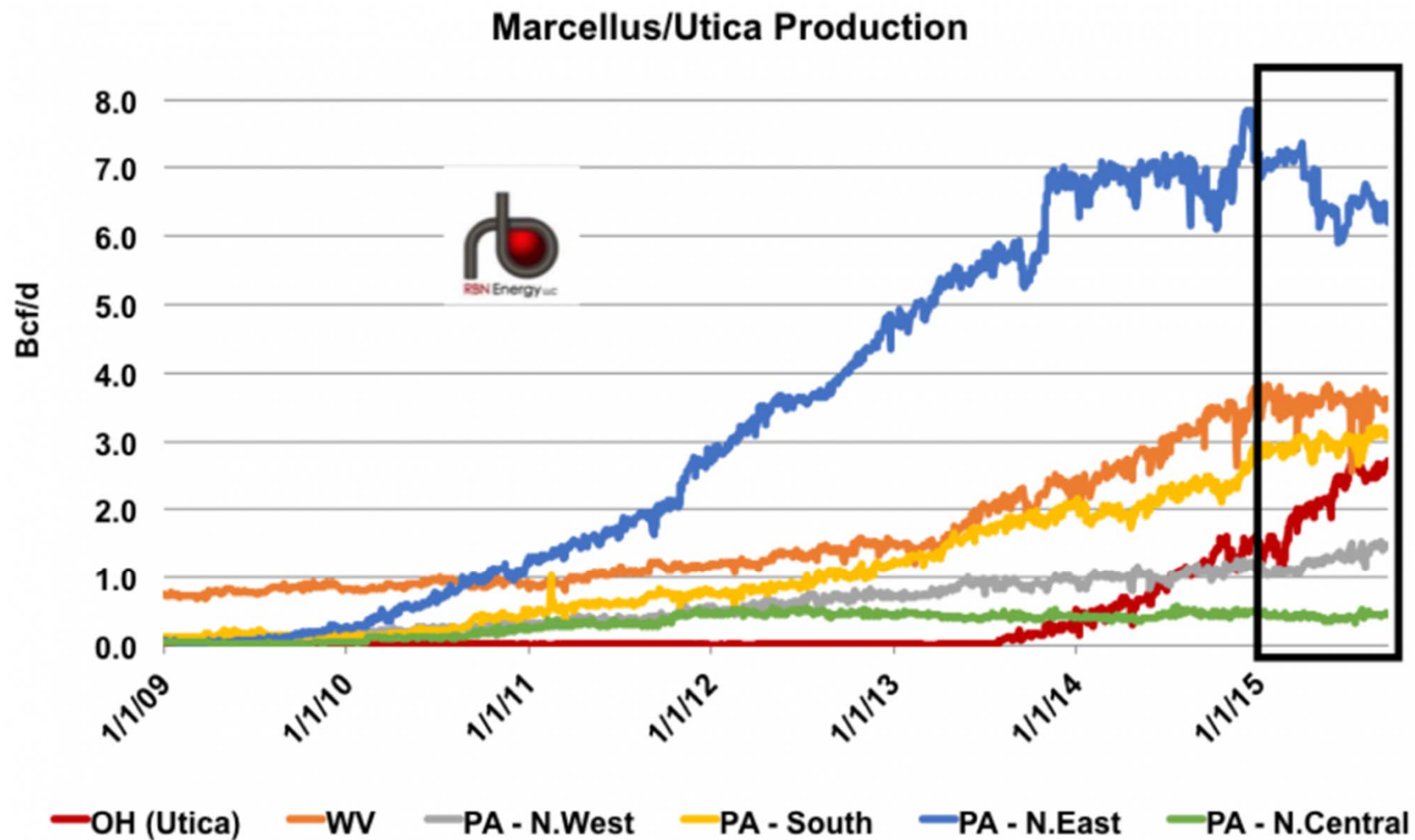
Weekly natural gas rig count and average spot Henry Hub



Source: Baker Hughes



## Backdrop – Gas Production



Source: RBN Energy, "Dry County? Utica Gas Wells Headline Third Quarter Production Spurt," September 21, 2015.

## Backdrop

- Substantial capital still is being invested in the North American oil and gas market
  - New natural gas and oil product pipelines
  - LNG export projects continue advancing ... and more new proposals on the way
  - Refining and processing capacity
- This despite what many feel is an uncertain regulatory environment based on a patchwork of federal agencies
  - Federal Energy Regulatory Commission (FERC)
  - Environmental Protection Agency (EPA)
  - Interior Department
  - Department of Energy (DOE)
  - Department of Commerce/Bureau of Industry and Security (BIS)



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# Status of North American LNG Export Projects

## Status of U.S. LNG Export Projects

Project	Status	Volume		Project	Status	Volume
Sabine Pass LNG (Trains 1-4)	Under construction	2.76 Bcf/d		CE FLNG	FERC Pre-filing	1.07 Bcf/d
Sabine Pass LNG (Trains 5 & 6)	Under construction	1.4 Bcf/d		Louisiana LNG	FERC Pre-filing	0.30 Bcf/d
Cameron LNG	Under construction	1.7 Bcf/d		Cameron LNG Expansion	FERC Pre-filing	1.41 Bcf/d
Freeport LNG	Under construction	1.8 Bcf/d		Freeport LNG Expansion	FERC Pre-filing	0.72 Bcf/d
Corpus Christi LNG	Under construction	2.1 Bcf/d		Corpus Christi LNG Expansion	FERC Pre-filing	1.41 Bcf/d
Cove Point LNG	Under construction	0.82 Bcf/d		Texas LNG	FERC Pre-filing	0.54 Bcf/d
Jordan Cove LNG	Pending before FERC	0.9 Bcf/d		Annova LNG	FERC Pre-filing	0.94 Bcf/d
Oregon LNG	Pending before FERC	1.25 Bcf/d		Rio Grande LNG	FERC Pre-filing	3.6 Bcf/d
Elba Island LNG	Pending before FERC	0.35 Bcf/d		Downeast LNG	FERC Pre-filing	0.46 Bcf/d
<i>Magnolia LNG</i>	<i>Pending before FERC</i>	<i>1.08 Bcf/d</i>		Alaska LNG	FERC Pre-filing	2.55 Bcf/d
Golden Pass LNG	Pending before FERC	2.1 Bcf/d		Eagle LNG	FERC Pre-filing	0.075 Bcf/d
Gulf LNG	Pending before FERC	1.5 Bcf/d		Port Arthur LNG	FERC Pre-filing	1.42 Bcf/d
Venture Global LNG	Pending before FERC	1.41 Bcf/d		Plaquemines LNG	FERC Pre-filing	2.8 Bcf/d
<i>Trunkline LNG</i>	<i>Pending before FERC (FID Delayed)</i>	<i>2.2 Bcf/d</i>		Delfin LNG	Pending before USCG/MARAD	1.8 Bcf/d

## Status of Canadian West Coast LNG Export Projects

Project	NEB Status	Environmental Assessment Status (British Columbia)
Douglas Channel LNG	Approved	Not required
Kitimat LNG	Approved	Certificate Issued
Prince Rupert LNG	Approved	Pre-Application
LNG Canada Gas	Approved	Approved
Pacific Northwest LNG	Approved	Approved
Triton LNG	Approved	Not yet applied
WCC LNG	Approved	Pre-Application
Aurora LNG	Approved	Pre-Application
Grassy Point LNG	Approved	Not yet applied
Orca LNG	Approved	Not yet applied
Kitsault Energy	Pending	Not yet applied
Stewart Energy	Pending	Not yet applied
Cedar LNG	Pending	Not yet applied

## Status of North American LNG Export Projects

- Drop in global oil and gas prices is forcing some projects out of the market
  - Excelerate Energy formally withdrawn from FERC and DOE
  - CE FLNG – FERC has threatened termination of proceeding for lack of regulatory progress
- Can new large projects survive?
- Shifting LNG demand sources
  - Chinese buyers (distribution companies, major industrials etc.)
  - Europe ... with interesting pricing models
  - Domestic U.S. demand – oilfield services, transportation fuel, etc.

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# U.S. Crude Oil Exports

## U.S. Crude Oil Exports

- Subject to limited exceptions, U.S. law has prohibited the export of crude oil since the 1970s
- Guidance issued 30 December 2014 by the U.S. Department of Commerce's BIS clarifies when light hydrocarbons might be exported without refining
  - “Lease condensate,” or “light liquid hydrocarbons recovered from lease separators or field facilities” from gas wells, may be exported if processed through a crude oil distillation tower
  - Once lease condensate is stabilized in a distillation tower, it is not considered crude oil for the purposes of export restrictions
- The Obama Administration does not view permitting the export of lease condensate as a change in policy
- In August 2015, Obama Administration approved limited exports of crude oil to Mexico for first time in nearly 40 years as part of swap transactions

## U.S. Crude Oil Exports

- Significant efforts underway in Congress to relax or eliminate restrictions on exporting crude oil
  - Consensus may be forming in Congress, but no clear path forward yet
    - Republicans now all seem to support repeal
    - Indications from some Democrats, including prominent ones like Senate Minority Leader Harry Reid, have indicated a compromise may be possible
  - Spokesman for President Obama recently said the President disagrees with efforts to repeal the export ban ...
    - But to date there has been no threat of a veto in the event legislation passes
  - Nuclear deal with Iran has altered the debate significantly
- As a result, crude oil exports will be one of the most important policy debates in Washington over the next 12-18 months
  - Added to the drama will be the November 2016 US presidential election



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# Midstream Infrastructure Developments

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- Natural gas pipelines expanding in U.S. Northeast and U.S. Southeast
  - Provides additional transportation capacity
  - Connects new producing regions with market centers in Northeast and Southeast, and Canada
- LNG infrastructure expanding
  - Big is not necessarily better
  - Expanding infrastructure for marine fuel, but what about vehicles
- NGL processing projects, such as ethane crackers and methanol facilities planned for Marcellus/Utica basins
- Wood Mackenzie says that US\$1.5 trillion in oil infrastructure projects uneconomic with oil sub-\$50/bbl

# Midstream Infrastructure Developments

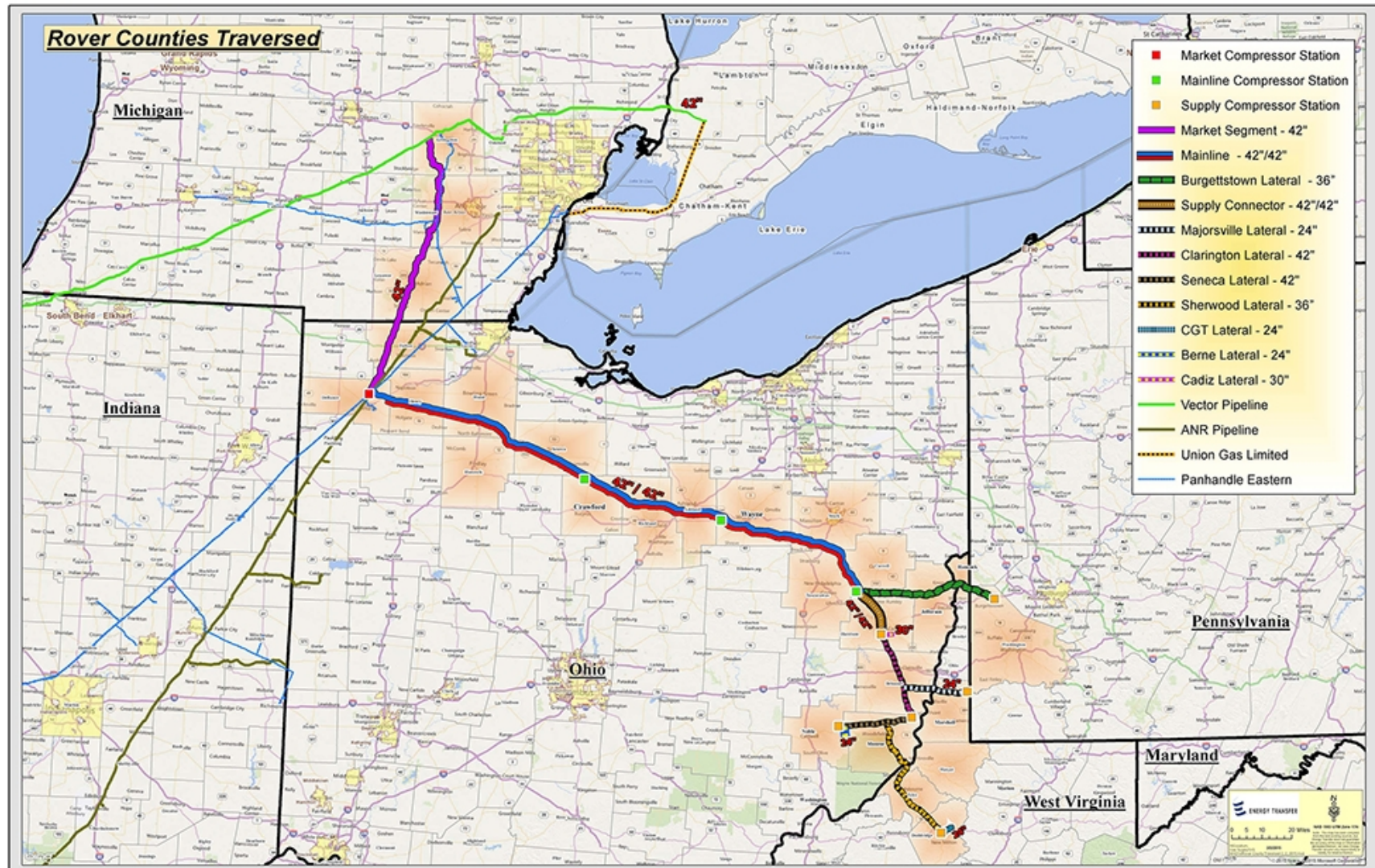
## Natural Gas Activities through August 31, 2015

January through August 31, 2014

Status	No. of Projects	Storage Capacity (Bcf)	Deliverability (MMcf/d)	Capacity (MMcf/d)	Miles of Pipeline	Compression (HP)
Pipeline						
Placed in Service through August 31, 2014	15 9			5,230.7 888.2	194.5 73.9	127,925 30,950
Certificated through August 31, 2014	24 22			6,711.0 6,176.6	326.5 228.6	234,818 221,623
Storage						
Placed in Service through August 31, 2014	3 5	3.4 17.25	53 110			0 4,800
Certificated through August 31, 2014	2 3	2.7 1.2	0 0			0 2,500
LNG (Import & Export)						
Placed in Service through August 31, 2014	0 0	0 0	0 0			0 0
Certificated (Import/Export) through August 31, 2014	1 3	0 3.4	1,400 4,060			0 0

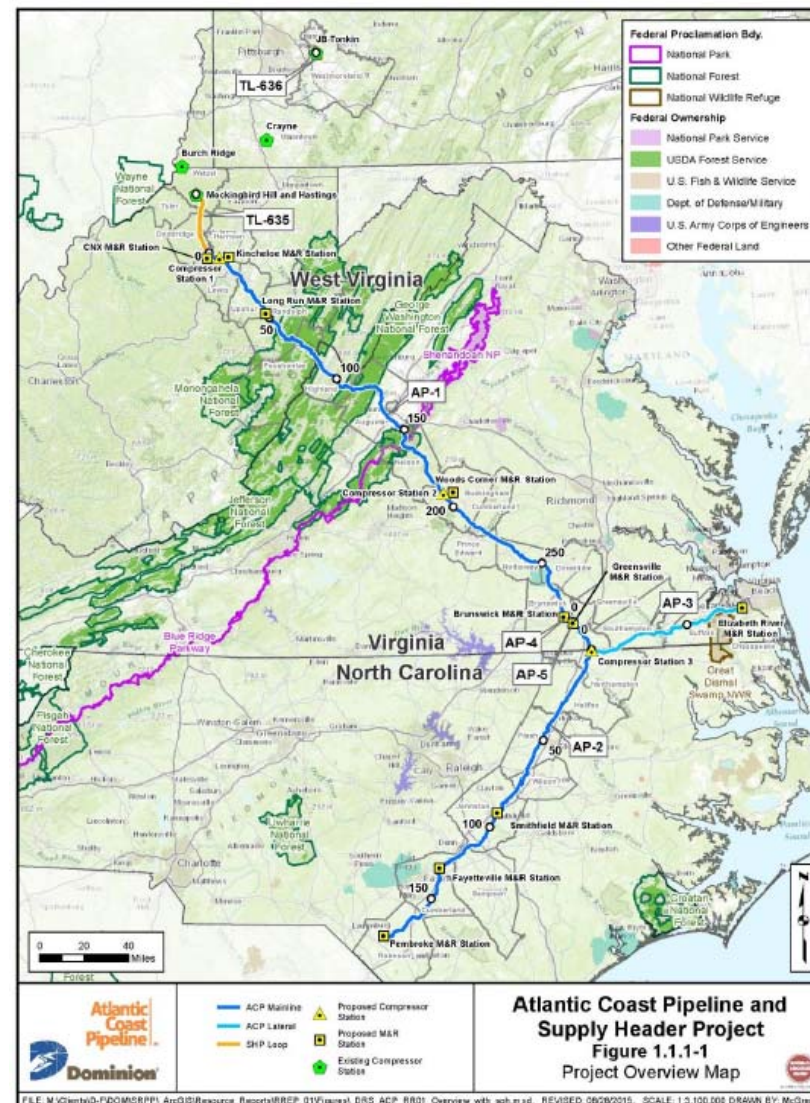
Source: FERC, Office of Energy Projects, Energy Infrastructure Update for July 2015, available at <http://www.ferc.gov/legal/staff-reports/2015/aug-infrastructure.pdf>.

# Midstream Infrastructure – Rover Pipeline





# Midstream Infrastructure – Atlantic Coast Pipeline



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# New Regulatory Initiatives Impacting Oil, Gas, and LNG

## New Regulatory Initiatives

- EPA's Clean Power Plan (CPP) encourages U.S. power generators to displace coal- and oil-fired generation with renewables and natural gas
  - Requires U.S. states to develop and implement plans to reduce CO<sub>2</sub> emissions
  - State plans can meet the standards by
    - Improving coal-fired power plants
    - Replacing coal with natural gas-fired power plants
    - Deploying renewable power
- CPP likely will be key factor for the U.S. natural gas market, driving infrastructure buildout and impacting demand



## New Regulatory Initiatives

- White House's Council on Environmental Quality (CEQ) revised draft guidance for GHG analysis
  - Guidance describes how federal agencies should consider GHG emissions in environmental analyses of new infrastructure
  - Encourages agencies to adopt a wider review of potential **upstream and downstream impacts** it considers
- FERC response: Our environmental review process already complies with federal law
- Other agencies are adopting the CEQ guidance
- Environmental opponents already citing CEQ's guidance in opposing infrastructure projects
- Significant risk: Interagency disagreement and major litigation

## New Regulatory Initiatives

- With evolving market opportunities for LNG and natural gas, FERC's jurisdictional approach is evolving
  - FERC has jurisdiction over interstate transportation of natural gas by pipeline – FERC has expressly disclaimed jurisdiction over LNG transported by truck and rail
- In 4 precedent-setting decisions in the last 18 months FERC has held that it:
  - Has jurisdiction over LNG transported by marine vessel in interstate commerce if it is reinjected into a pipeline for redelivery
  - Does not have jurisdiction over facilities exporting LNG if the LNG does not arrive at the shoreside facility by a cryogenic pipeline
- Policy may evolve further

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QUESTIONS?

## Thank You



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