

# IMPACTS OF NORTH AMERICA CRUDE SUPPLY GROWTH ON SPR EFFECTIVENESS

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The Future of the Strategic Petroleum Reserve  
Center for Strategic & International Studies, Washington, DC

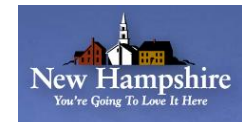
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# EnSys Energy

## Specialists in:

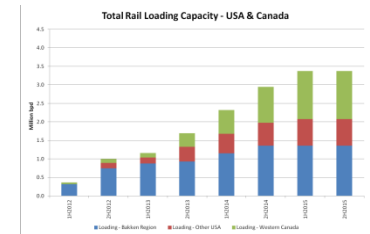
- Oil sector national and international developments
- Strategic issues in U.S. and global refining, markets & logistics
- Analysis of North America crude logistics developments
- Disrupted markets, 6+ studies of real and hypothetical disruptions



# EnSys Energy

## Recent US oriented projects:

- 2010 DOE, 2011 DOS, 2013 New DOS Keystone XL Assessments:
  - Alternative pipeline & rail logistics for Canadian and US crude oils
- EnSys North America Infrastructure Review (monthly)
  - Highlights and database on pipeline, rail and marine developments in Canada and USA – crude, NGL/condensate/diluent, products
  - Logistics balances: Cushing, Western Canada, Rail, Bakken
- 2014 API US Crude Oil Exports analysis
  - Impacts of allowing exports on oil trade, refining, pricing, US economy
- 2005 study (with Intek) for DOE OSPR of a range of hypothetical disruptions in 2015
  - Strategic Petroleum Reserve Crude Compatibility Study, Dec 2005



# Disruptions analyzed in 2005 still apply

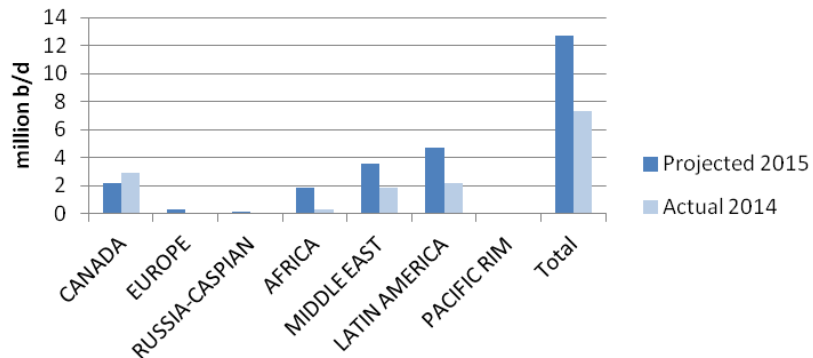
- Multiple elements in total disruption impact

Disruption	PG wide + Military	Saudi	W Africa	Venezuela	GC Offshore Hurricane
Duration months	6	6	3	6	3
<b>Total Crude/NGL Loss</b>	<b>(8.14)</b>	<b>(9.05)</b>	<b>(2.77)</b>	<b>(3.78)</b>	<b>(1.52)</b>
<b>Offsets</b>	<b>6.10</b>	<b>6.61</b>	<b>2.69</b>	<b>3.63</b>	<b>1.52</b>
- OPEC Surge Production	0.00	0.69	0.69	0.63	0.00
- Govt. Stock Draw ( IEA & Others )	2.31	1.50	0.00	0.00	0.00
- Govt. Stock Draw ( SPR )	3.79	4.42	2.00	2.00	2.00
<b>Net Supply Disruption</b>	<b>(2.04)</b>	<b>(2.44)</b>	<b>(0.08)</b>	<b>(0.15)</b>	<b>0.00</b>
<b>Jet Fuel</b>	<b>0.34</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
- Military Demand Increase	0.70	0.00	0.00	0.00	0.00
- Civilian Demand Loss	(0.36)	0.00	0.00	0.00	0.00
<b>Demand Cuts</b>	<b>(1.88)</b>	<b>(1.94)</b>	<b>(0.08)</b>	<b>(0.15)</b>	<b>0.00</b>
- Disrupted Region(s)	(1.62)	(1.10)	(0.08)	(0.15)	0.00
- Rest of World	(0.26)	(0.84)	0.00	0.00	0.00
<b>Product Offsets</b>	<b>(0.50)</b>	<b>(0.50)</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
- SPR Reserves	0.00	0.00	0.00	0.00	0.00
- Foreign Reserves	(0.50)	(0.50)	0.00	0.00	0.00
<b>Net Demand Reduction</b>	<b>(2.04)</b>	<b>(2.44)</b>	<b>(0.08)</b>	<b>(0.15)</b>	<b>0.00</b>
<b>Refining Loss</b>	<b>(2.90)</b>	<b>(1.56)</b>	<b>(0.40)</b>	<b>(1.15)</b>	<b>0.00</b>

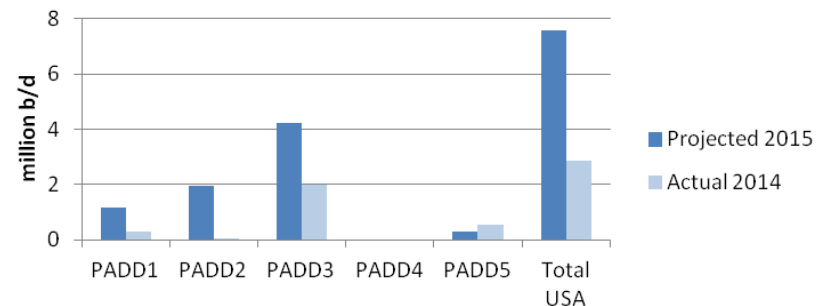
# Rising US & Canadian production and lower US demand / increased biofuels have dramatically reduced crude oil import dependency

- Vs 2005 study projections for 2015:
  - 12.74 mb/d projected imports drop to 7.34 mb/d (2014)
  - Canada imports higher, Africa almost gone
  - Middle East halved (3.6 -> 1.8), Venezuela to 1/3 (2.2 -> 0.7)
  - Vulnerability of PADD2 gone, PADDs 1, 3 reduced, PADD5 higher

**US 2015 Crude Imports Projected in 2005 vs Actual 2014**



**US 2015 Africa+ME+Ven Crude Imports Projected in 2005 vs Actual 2014**



# Far reaching implications for SPR draw to effectively impact US and global markets

- Logistics capacity

- SPR crude draw increases flows to/in GC i.e. SPR flows are *incremental* (see QER); only partially replace lost imports
- Of a 4 mb/d draw, potentially > 1 mb/d would need to go to PADDs 1 and 5
- Implications for distribution, dock and vessel capacity – also shipping time to PADD5

- Volume, imports displacement

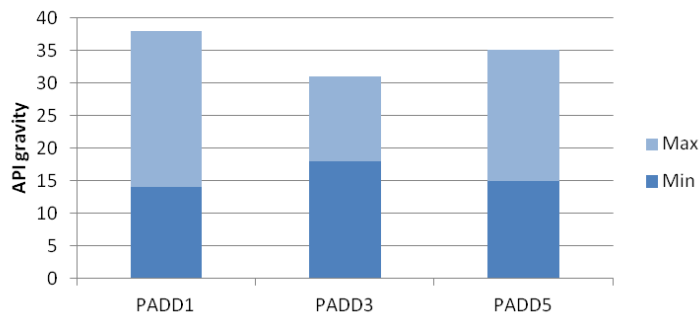
- Total Africa+ME+Ven crude imports are now at 2.8 mb/d and total non-Canadian at 4.5 mb/d
- Therefore a 4 mb/d SPR draw would displace / redirect onto international markets potentially >> 1 mb/d of non-disrupted imports

# Far reaching implications for SPR draw to effectively impact US and global markets

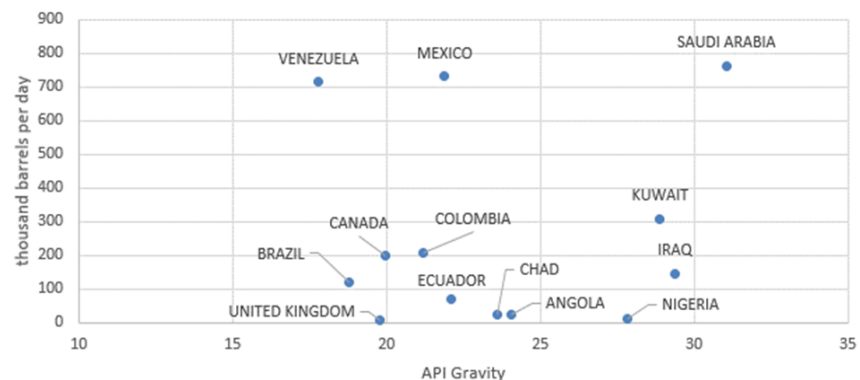
- Crude quality / mix / exports

- The bulk of crude imports into PADDs 3 and 5 are now in the 15 – 30 API range. PADD3 heavies especially difficult to back out
- SPR Sweet (37.5% of Reserve) is at 35.2-37 API, Sour at 30.8-33.3
- Difficult to see a market in US for SPR Sweet given today's ample domestic production (unless mix changed)
  - Better fit with Europe, Asia 34-35 API crude slates
- Implication is for SPR draw to have maximum impact on global markets and prices need to be able to export up to 1.5 mb/d Sweet

API Gravity Ranges of Crude Imports  
2014



Gravity and Volume of Main Crude Oil Imports into PADD 3 (2014)



# Far reaching implications for SPR draw to effectively impact US and global markets

- SPR size / draw rate / make-up

- Given the new situation is current SPR size and draw rate needed?
  - Primary impact of SPR draw is to reduce damage to US economy (and others around the world) by placing oil into world markets thereby reducing international and hence US oil prices
  - As such, ability to place 4+ mb/d into world oil markets arguably still warranted
    - Larger world economy / trade, high oil price spikes
    - But it needs to be able to get there (logistics, regulatory)
- Growing refining export capacity in Middle East means a gradual shift from export of crude to export of product, i.e. potential rising product dependency
  - Increases risk of refining capacity loss and, together with hurricane damage potential & time lag to get SPR crude to PADD5, arguably consideration for product reserves / commercial holdings



# THANK YOU !

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