

HART ENERGY

“North American Shale/Tight Oil Outlook”



Third IEA – IEF – OPEC Symposium on Energy Outlooks
IEF Secretariat | Riyadh, Saudi Arabia
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by

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Key Questions

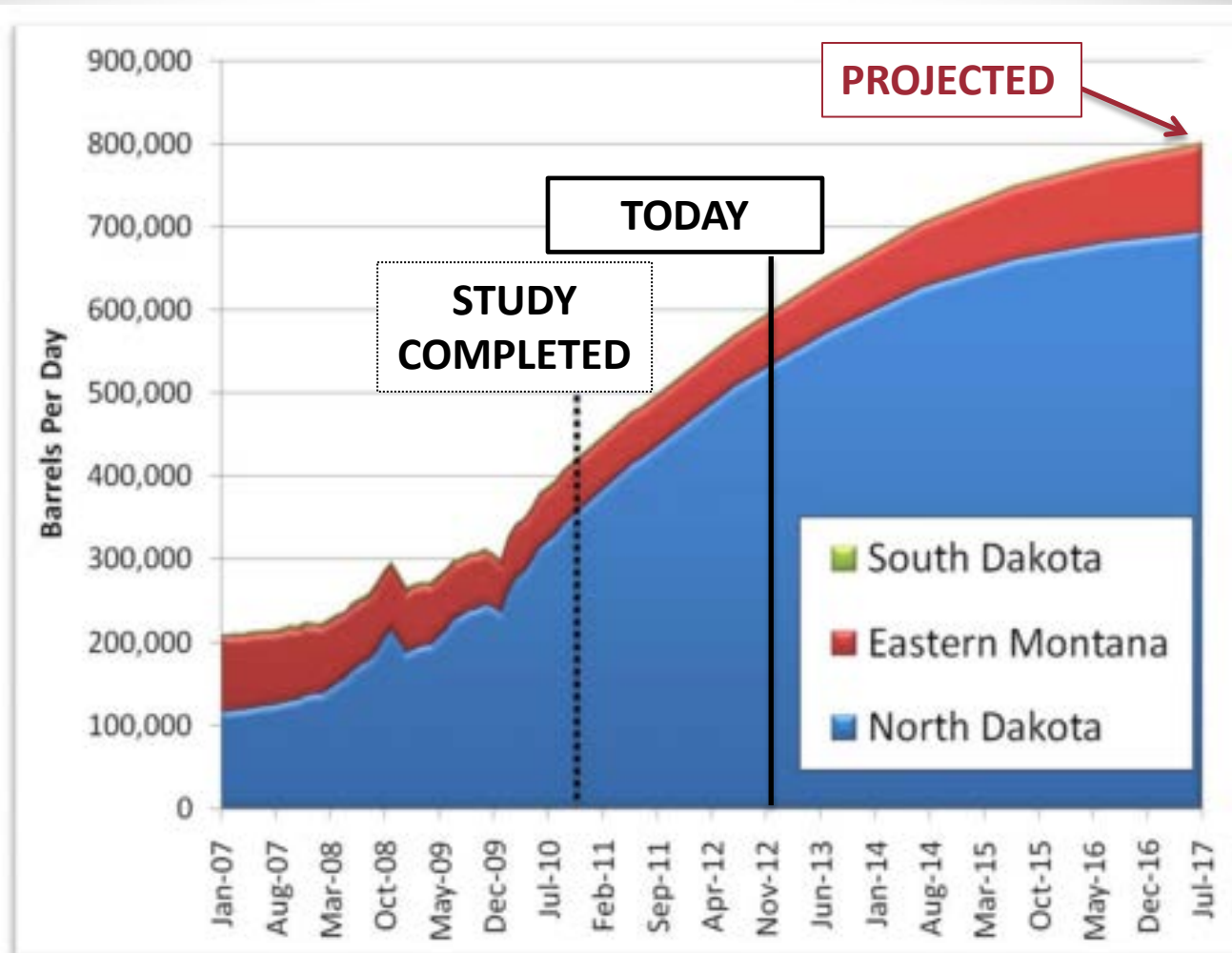
- Is N.A. shale/tight oil expansion sustainable?
- What are the main challenges to N.A. shale/tight oil expansion?
- What has been the evolution of N.A. shale/tight oil production?
- What are the collateral effects of N.A. shale/tight oil production?
- Is N.A.'s shale/tight oil experience replicable abroad?

Drivers for NA Liquids

- Price differential between WTI crude oil and Henry Hub natural gas remains elevated.
- Independents moving rigs to “oiler plays;” majors continue drilling dry gas plays.
- Prices for the NGL basket held up until last year.
- Success of the Bakken/Three Forks play.

NA Liquids Production Sustainable

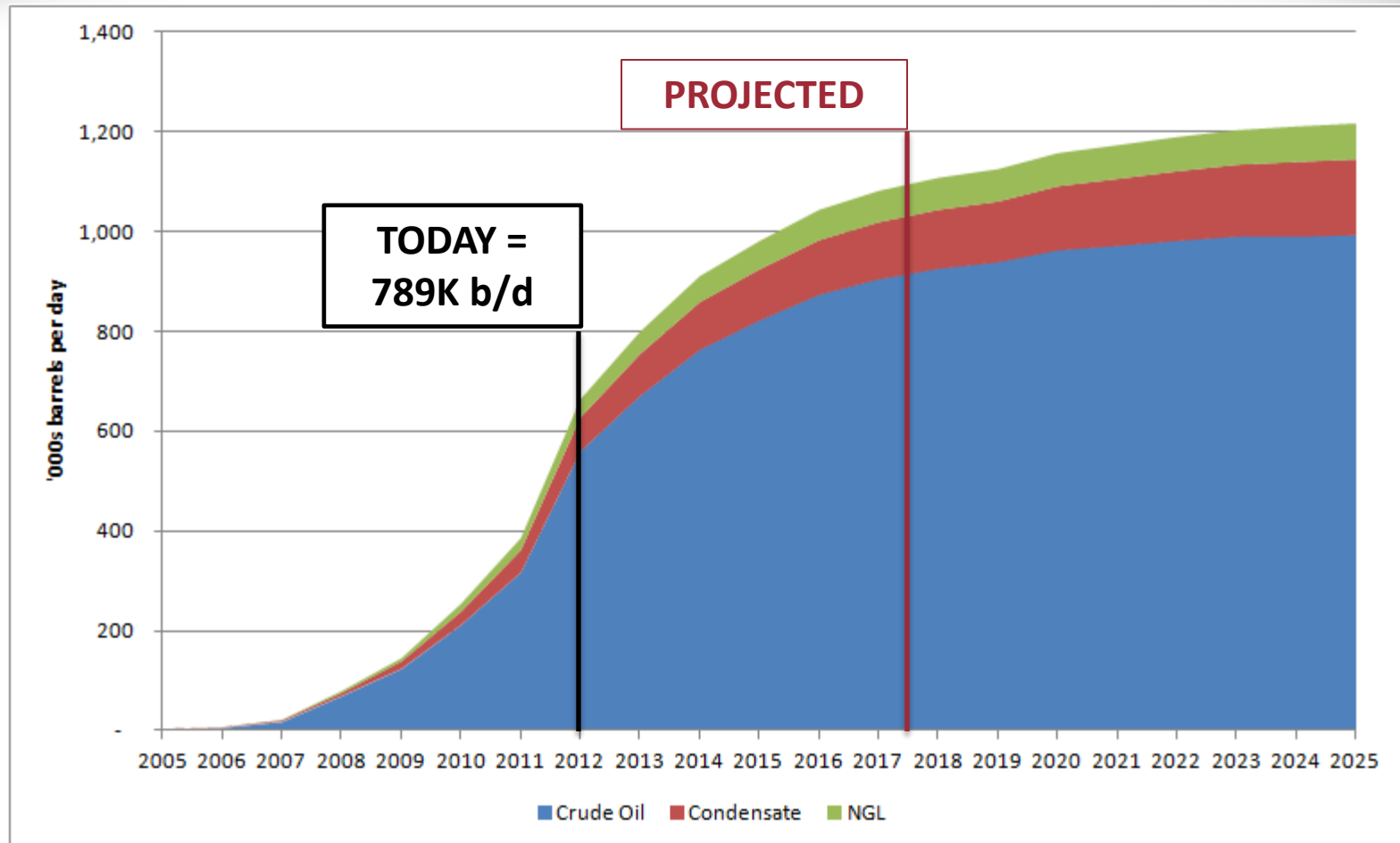
WILLISTON OIL PRODUCTION OUTLOOK, DEC. 2010



North Dakota Pipeline Authority, "N.D. Oil Transportation Infrastructure"

NA Liquids Production Sustainable

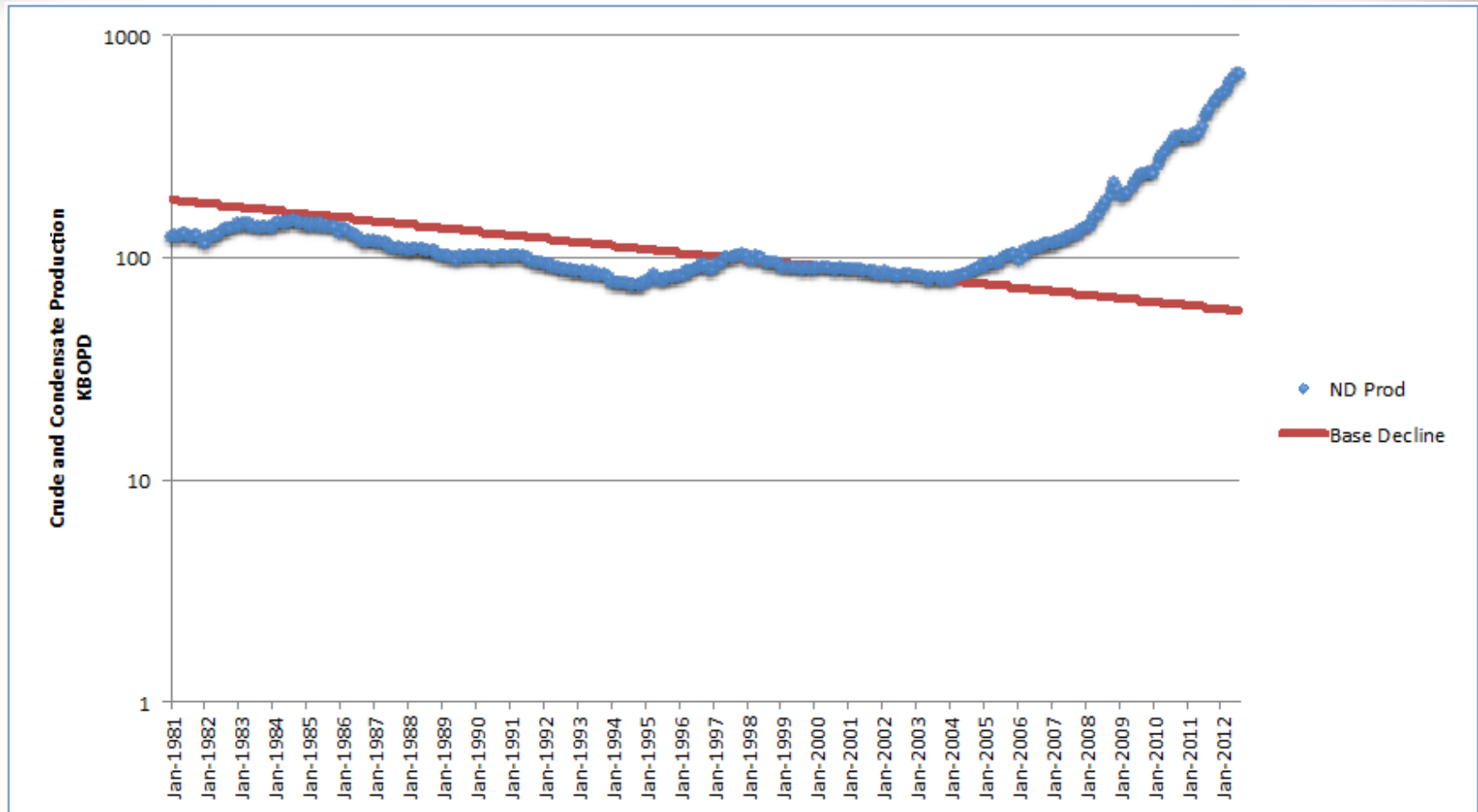
BAKKEN/THREE FORKS UNCONVENTIONAL LIQUIDS PRODUCTION



Hart Energy's North American Shale Quarterly, 4Q2012

NA Liquids Production Sustainable

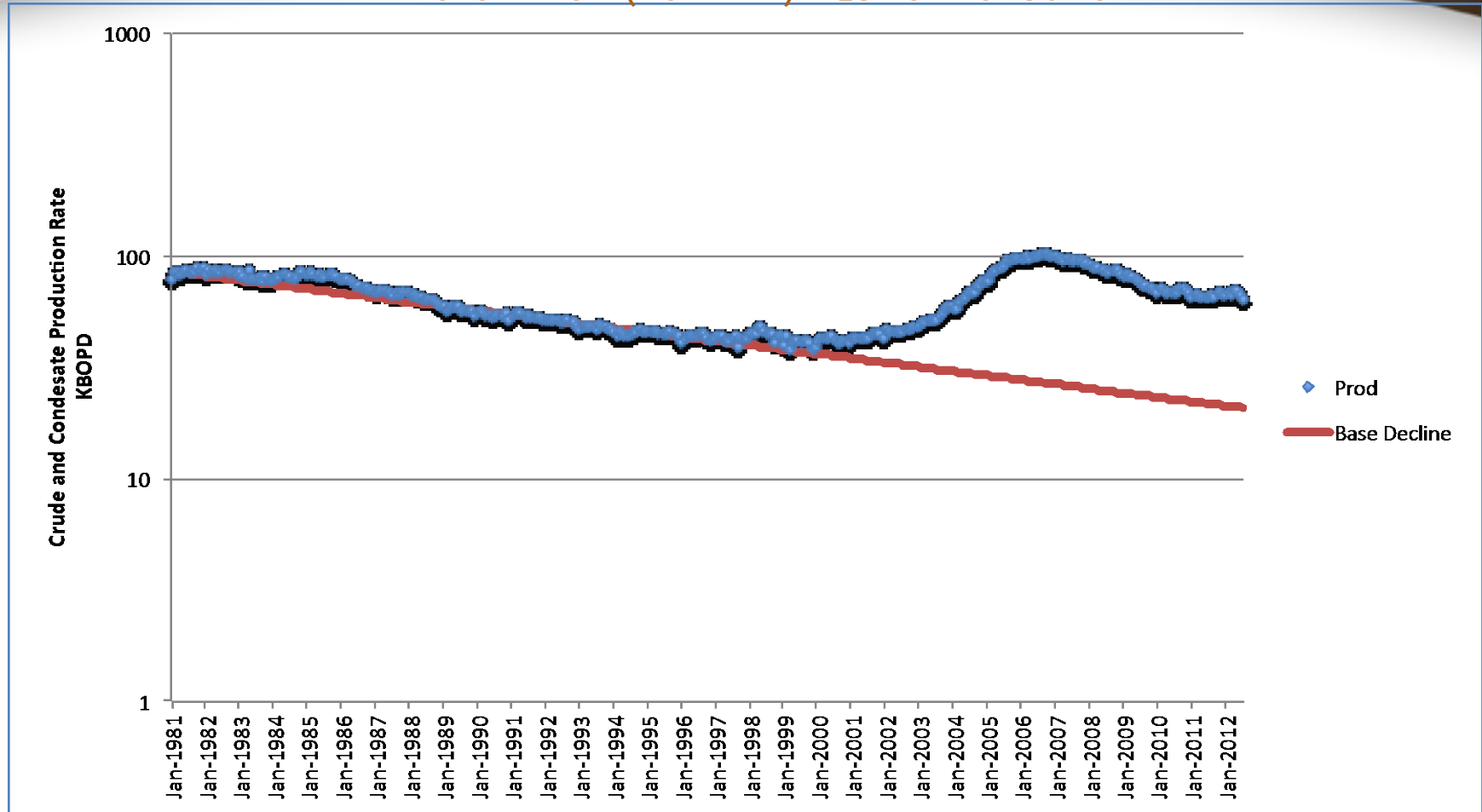
WILLISTON BASIN (NORTH DAKOTA) LIQUIDS PRODUCTION



Hart Energy's North American Shale Quarterly, 4Q2012

NA Liquids Production Sustainable

WILLISTON BASIN (MONTANA) LIQUIDS PRODUCTION



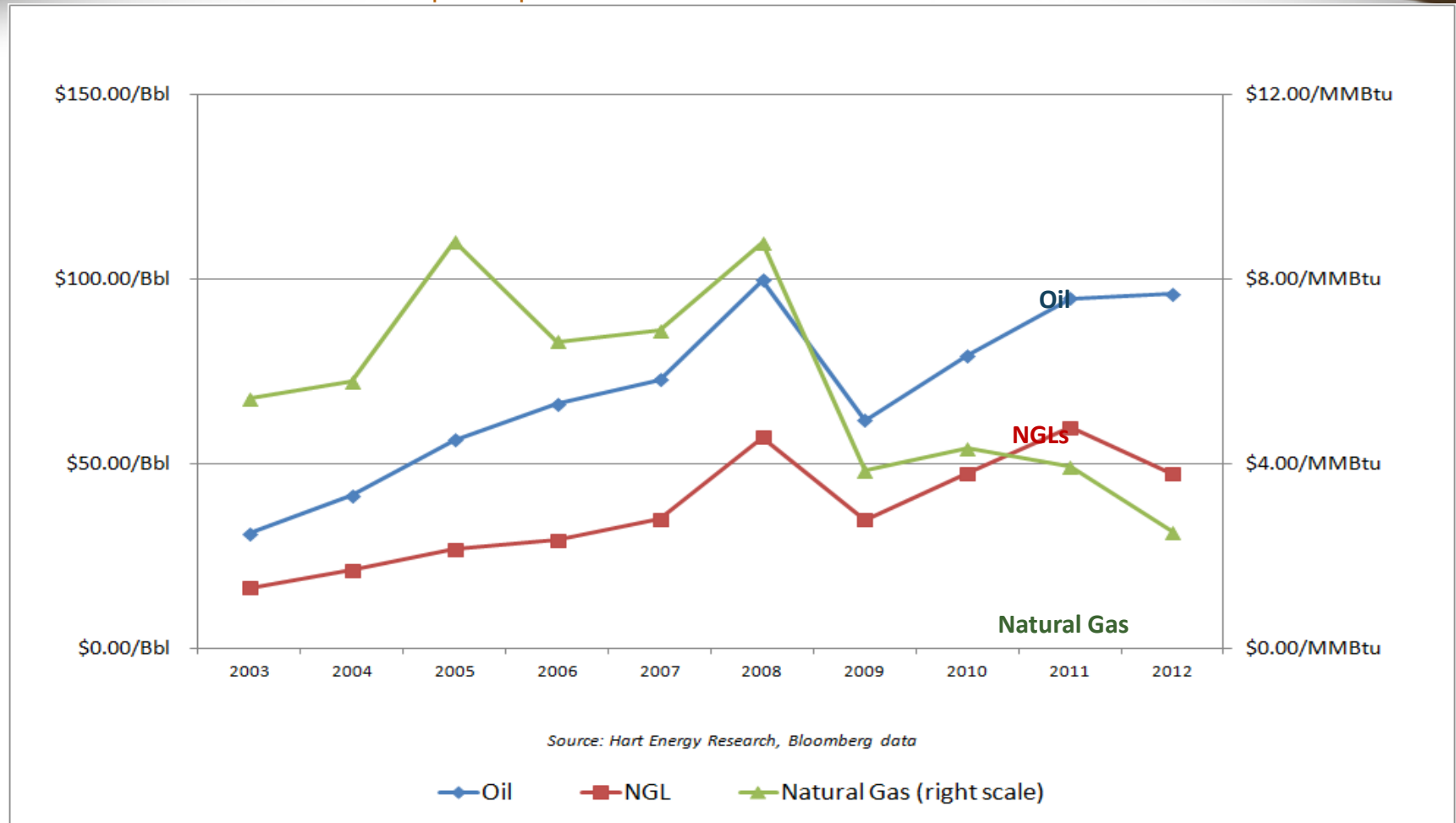
Hart Energy's North American Shale Quarterly, 4Q2012

Challenges to Shale/Tight Oil Production?

- Prices for the NGL basket are starting to fall; only natural gasoline has increased.
- Not every play is going to be like the Bakken.
- Federal regulatory issues could impact the industry.
- Lower forecasted WTI prices given oversupply of liquid sweet crude into PADD 3 refining & lack of export opportunity.

Challenges to Shale/Tight Oil Production?

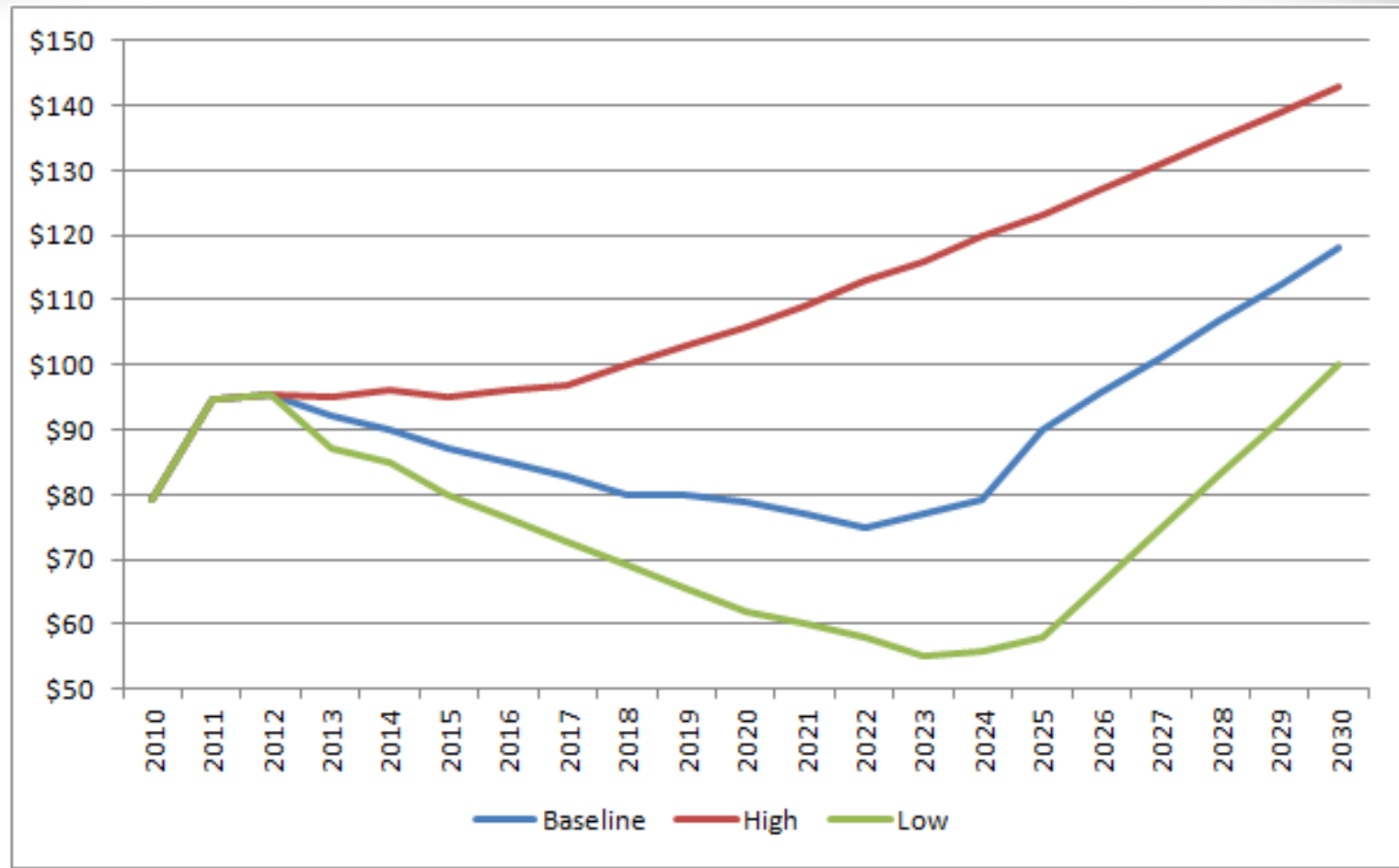
WTI | NGL | NATURAL GAS AVERAGE ANNUAL PRICES



Hart Energy's Refining Unconventional Oil, 2013

Challenges to Shale/Tight Oil Production?

HART ENERGY WTI CUSHING CRUDE OIL PRICE FORECAST



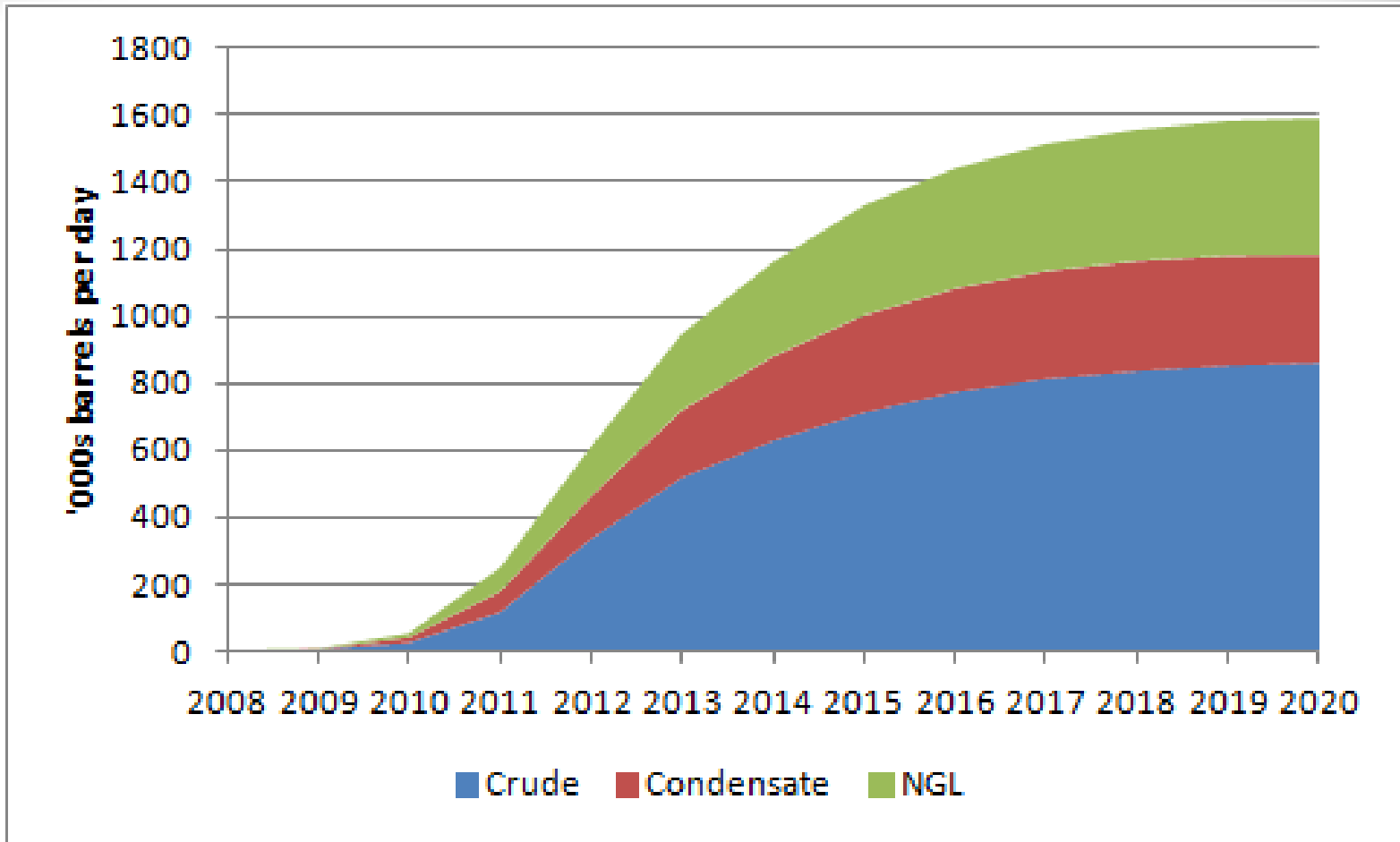
Hart Energy's World Refining & Fuels Service, 2013

Evolution of NA Liquids-Rich Plays



Evolution of NA Liquids-Rich Plays

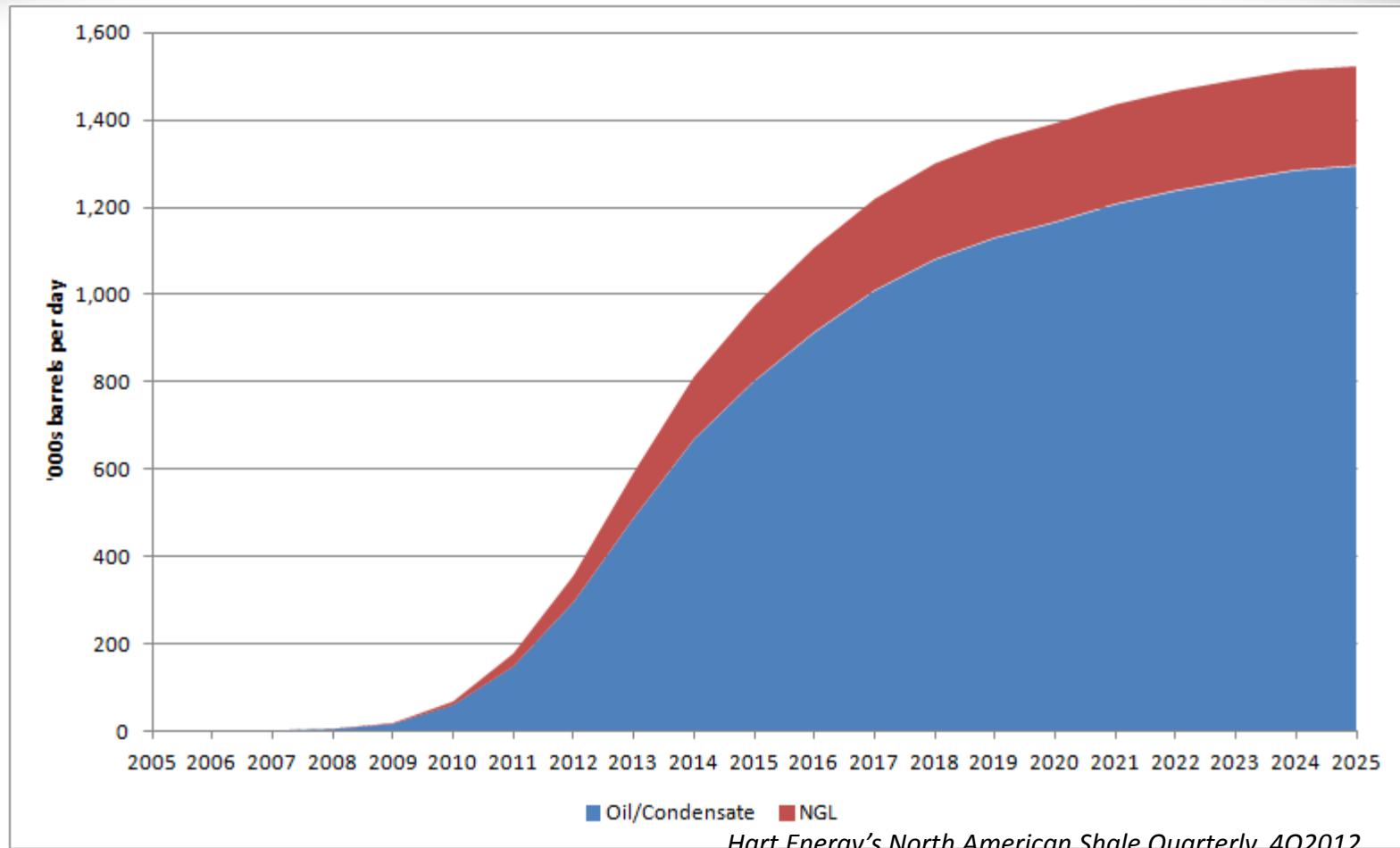
EAGLE FORD UNCONVENTIONAL LIQUIDS PRODUCTION



Hart Energy's North American Shale Quarterly, 4Q2012

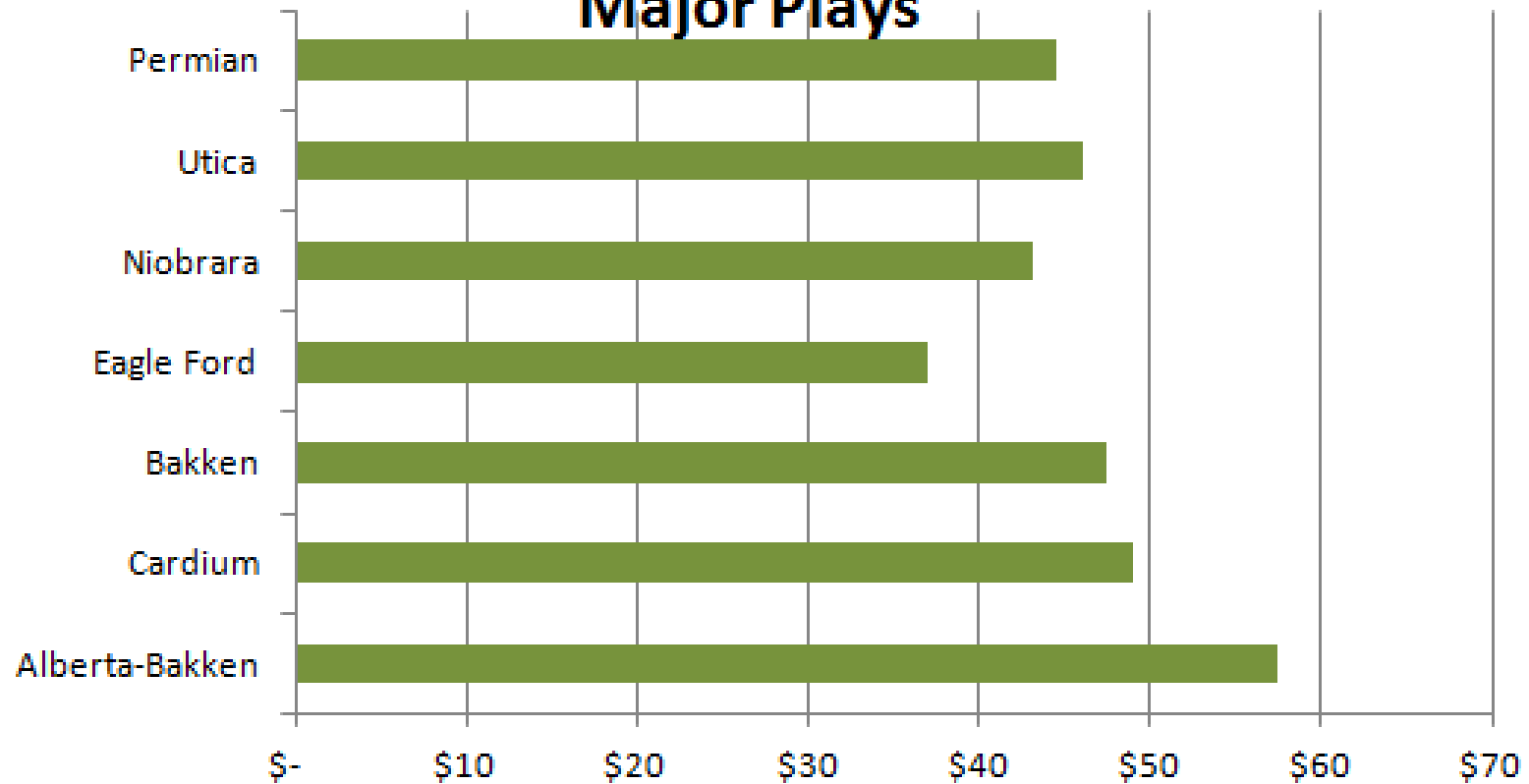
Evolution of NA Liquids-Rich Plays

PERMIAN BASIN UNCONVENTIONAL LIQUIDS PRODUCTION



Evolution of NA Liquids-Rich Plays

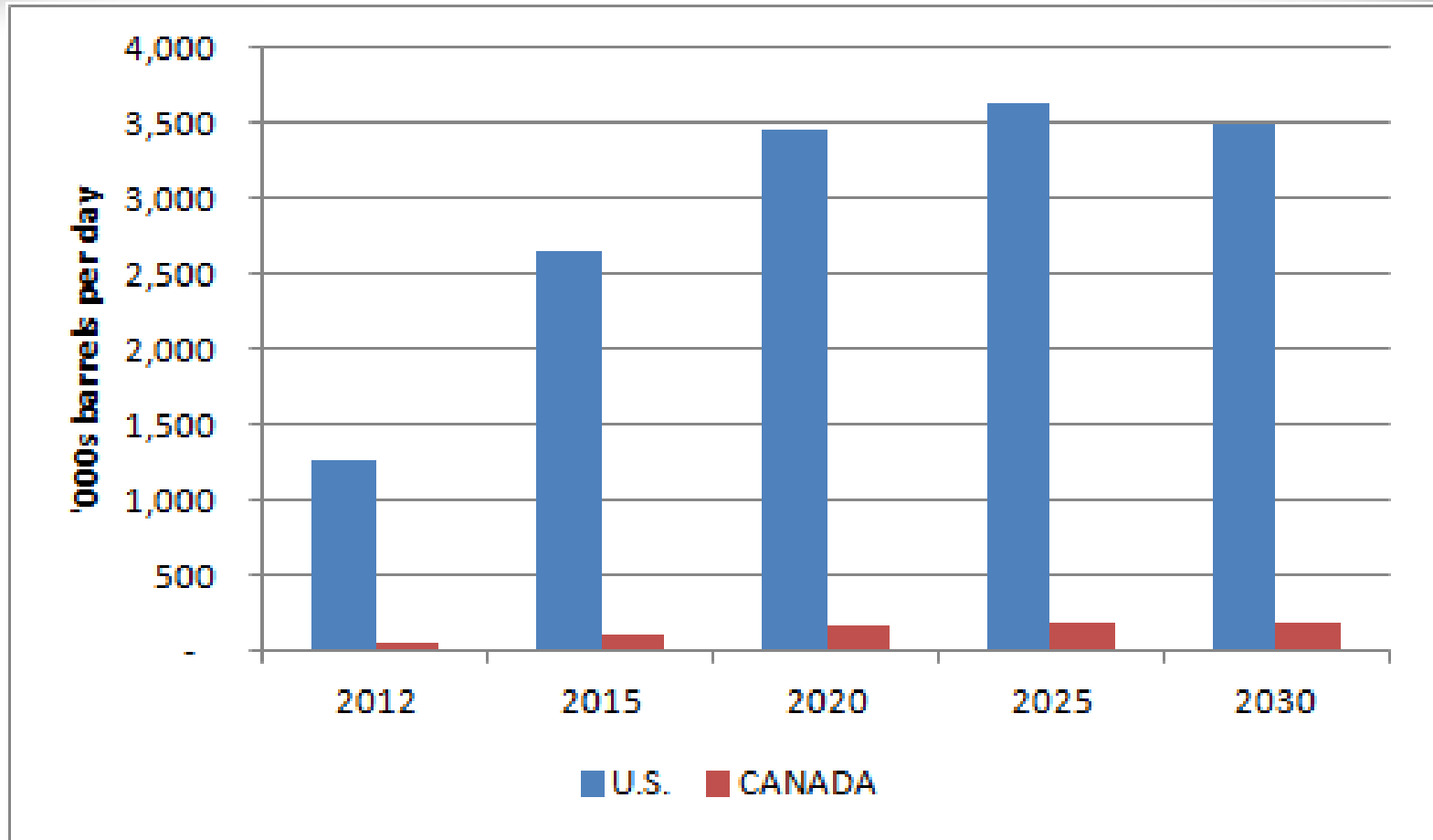
Weighted Average Breakeven Prices for Major Plays



Hart Energy's North American Shale Quarterly, 4Q2012

Impact on N.A. Crude Oil Production

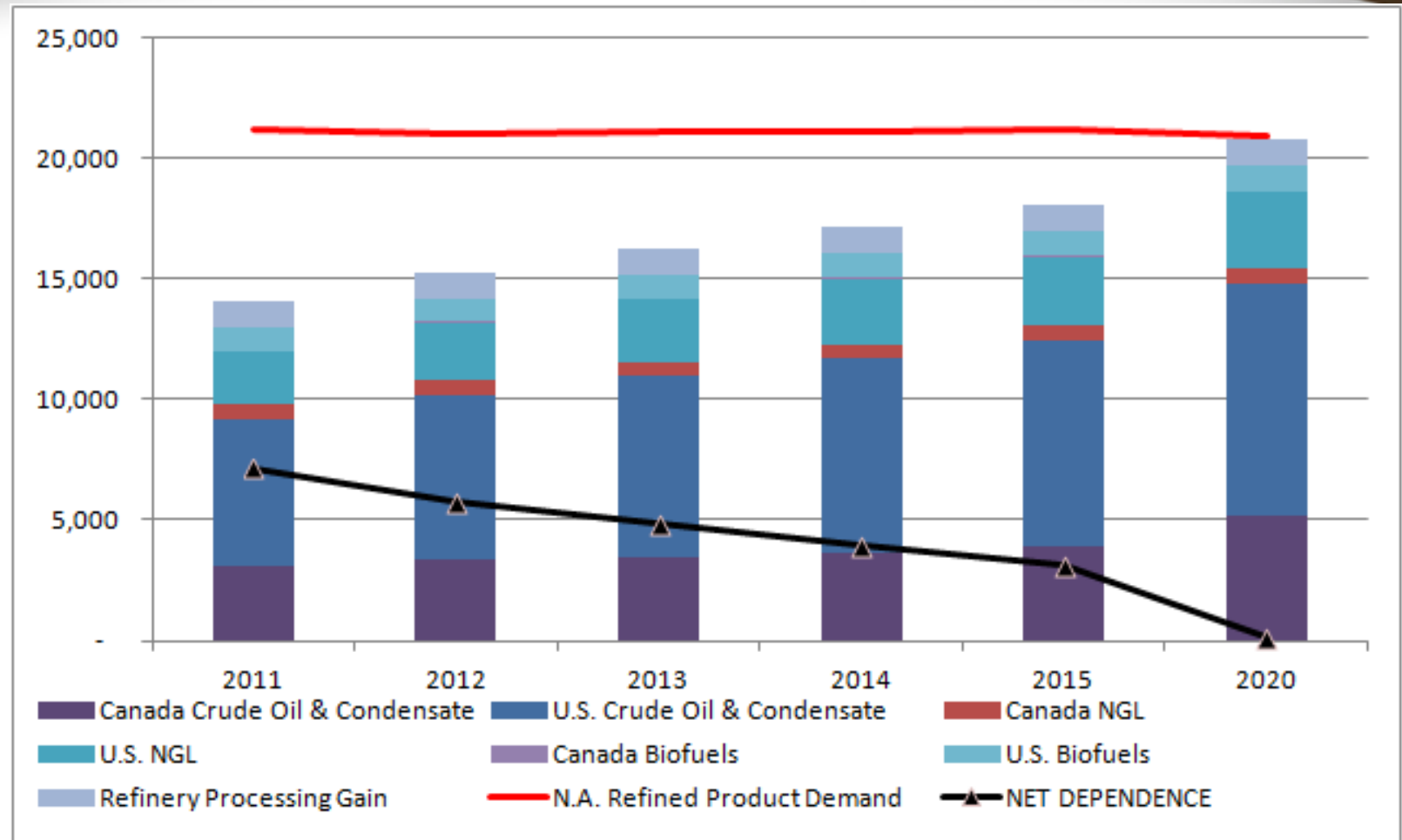
NORTH AMERICA SHALE/TIGHT OIL PRODUCTION



Hart Energy's North American Shale Quarterly, 4Q2012

Impact on N.A. Crude Oil Production

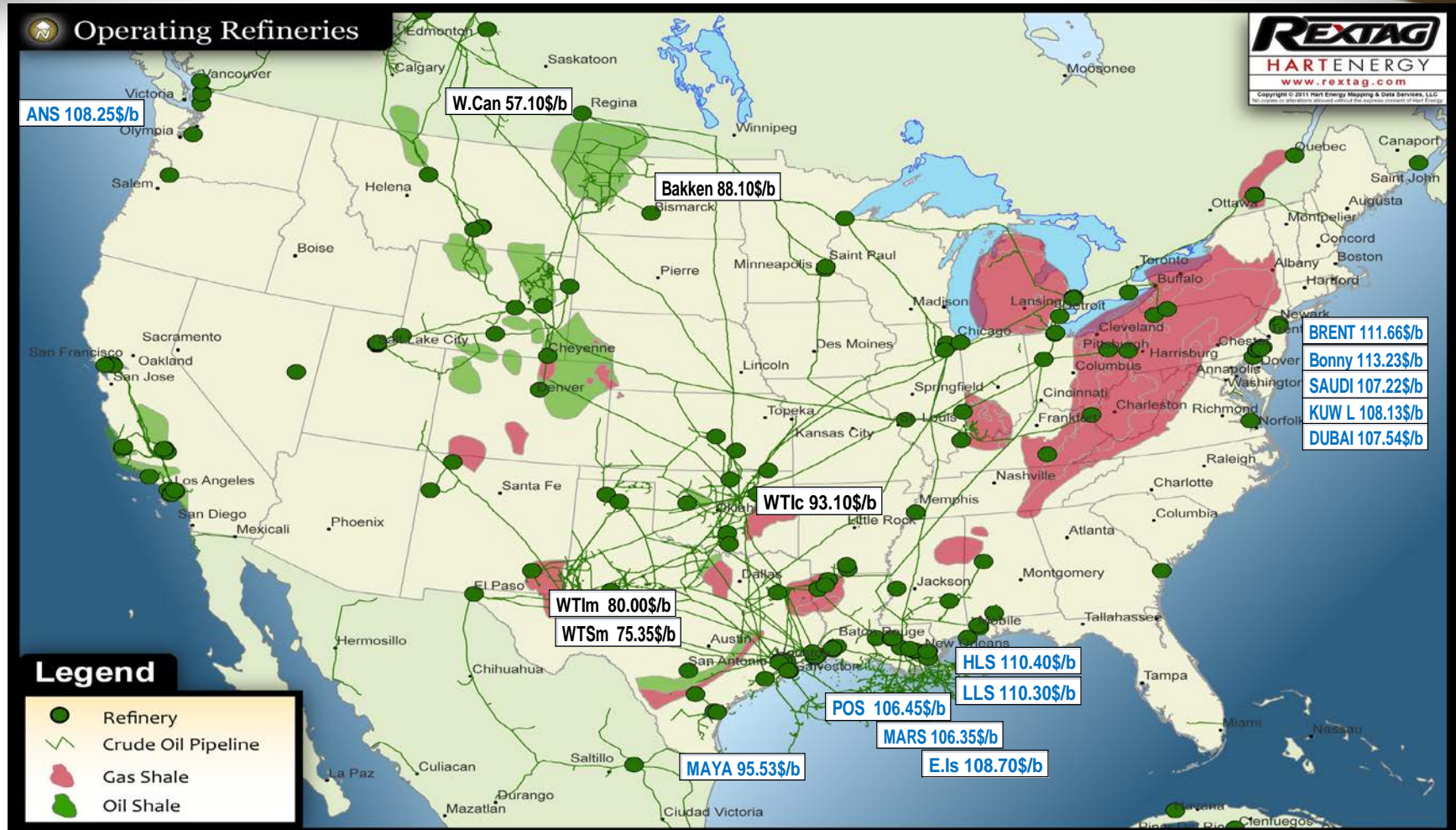
NORTH AMERICA SUPPLY/DEMAND BALANCE



Hart Energy's World Refining & Fuels Service, 2013

Collateral Effects of N.A. Shale/Tight Oil Production

U.S. REGIONAL CRUDE OIL PRICE BENCHMARKS



Hart Energy's Refining Unconventional Oil, 2013

Collateral Effects of N.A. Shale/Tight Oil Production

Estimated Global Landed LNG Prices July 2012, US\$/MMBtu



Hart Energy's Refining Unconventional Oil, 2013

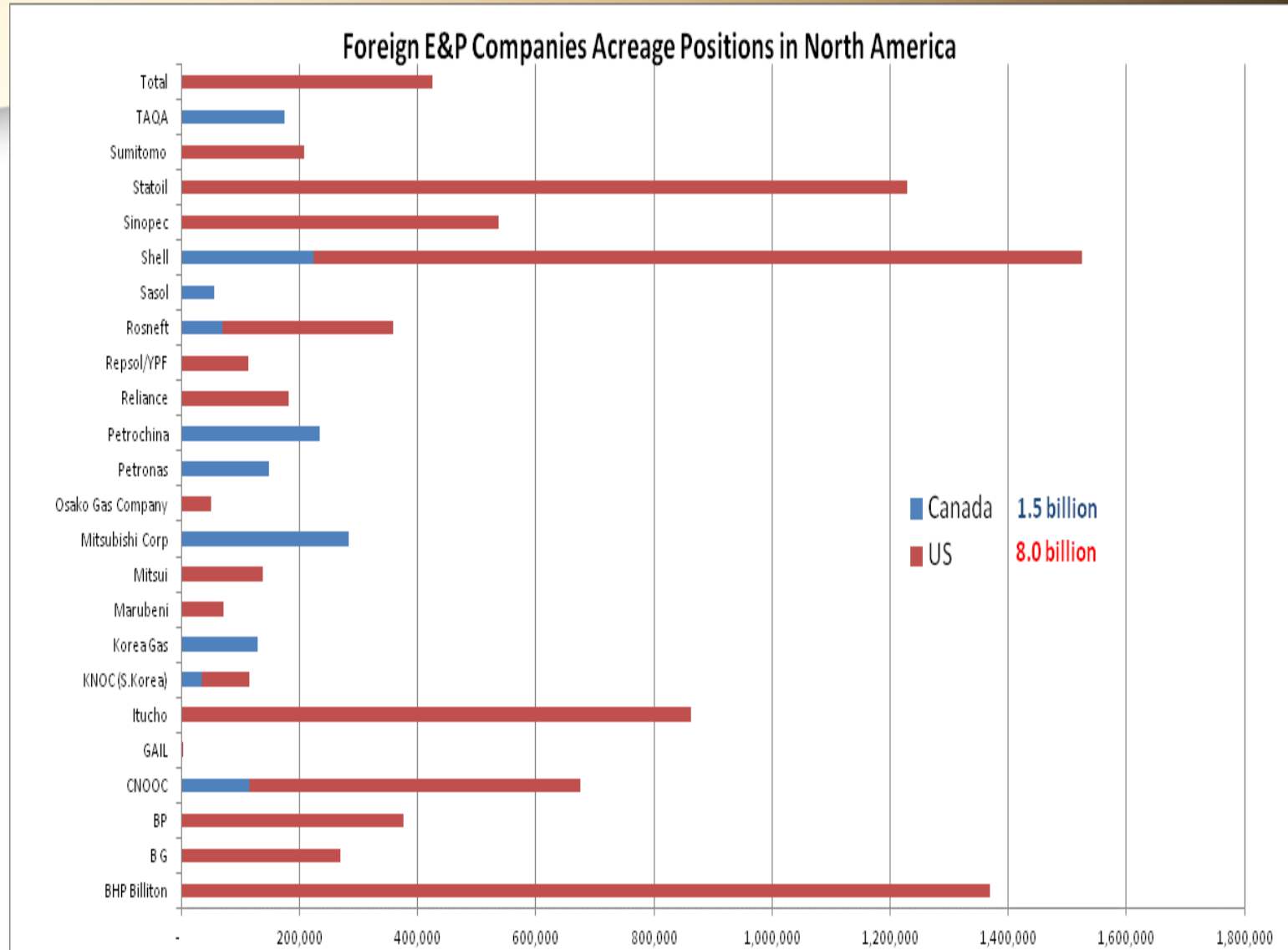
Collateral Effects of N.A. Shale/Tight Oil Production

NORTH AMERICA CRUDE BALANCE LESS PRODUCT EXPORT
(‘000 barrels per day)

SUPPLY	2012	2013	2014	2015		2020
Crude Oil Production						
Canada	3340	3460	3650	3910		5200
U.S	6860	7500	8040	8540		9590
Subtotal	10200	10960	11690	12450		14790
DEMAND						
Refinery Input	16670	21100	21100	16910		16570
Net Crude Requirement	6470	10140	9410	4460		1780
Refined Product Imports	-830	-940	-1040	-1140		-1160
Net Dependence	5640	9200	8370	3320		620

Hart Energy's World Refining & Fuels Service, 2013

N.A. Shale/Tight Oil Replicable Abroad?



Hart Energy's Global Shale Service, July 2013

N.A. Shale/Tight Oil Replicable Abroad?




HART ENERGY PRODUCTS (Upstream & Downstream)

Hart Energy Shale Research Service

HARTENERGY

North American Shale Quarterly

A Unique Service Covering All Companies and Their Activities in the Top 20 North American Shale Oil and Gas Plays



Provided For Each Play:

- >> Valuation Map with company well overlays
- >> Production forecast to 2015
- >> Company acreage, reserves and highlights
- >> Play economics including break-even prices on a company basis
- >> Infrastructure coverage of each play


Hart Energy Research Products



HARTENERGY


Global Shale Oil Study

The industry's most exhaustive evaluation of shale-oil geological prospects around the globe



A comprehensive report providing:

- >> An assessment of 75+ shale plays in all regions of the world, highlighting geological aspects and key properties of each play
- >> Current activities in each region/play, key market drivers, infrastructure, fiscal terms and challenges to commercial development
- >> Lessons learned from North America: well decline patterns, drilling and completion techniques, economics


With analytical contribution from: 

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Global Shale Gas Study

The Industry's Most Comprehensive Assessment of Reservoirs and Opportunities



A 200+ page report providing:

- >> A review and assessment of 100+ shale plays in all regions of the world, highlighting geological aspects and key properties of each play
- >> Current activities in each region/play, key market drivers, infrastructure, fiscal terms and challenges to commercial development
- >> Data requirements and how to evaluate a shale gas play
- >> Shale gas development considerations – well decline patterns, cost control techniques and shale gas economics under varying gas prices, development costs and fiscal terms

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