

# Downstream Opportunities in Kurdistan

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# About EPRINC

- Energy Policy Research Foundation Inc. (EPRINC), ***formerly the Petroleum Industry Research Foundation Inc. (PIRINC)***
- Founded in NY in 1944
  - Moved to Washington from NYC in Feb 2007
  - EPRINC brings policy analysis and industry economics to bear on current energy issues

# Takeaways

- Iraq needs several hundred thousand barrels per day of new capacity for internal consumption
- However, existing expansion plans may overcompensate
- Lack of regional export markets and refined product transport infrastructure
- Exports from KRG could be politically complicated

# The Problem: Iraq's Refined Product Disposition

<b>Consumption</b>	<b>(000 b/d)</b>
Gasoline	115
Kerosene	52
Distillate	110
Resid	133
Other	155
<b>Total</b>	<b>565</b>
<b>Supply</b>	
Gasoline	72
Kerosene	52
Distillate	102
Resid	247
Other	41
<b>Total</b>	<b>514</b>

Source: OPEC Data

# Current Capacity – Kurdistan and Iraq

	Capacity (000 b/d)	Nelson Complexity Rating
Kurdistan	60	
Daurah	140	6.8
Basra	140	3.8
Baiji I and II	320	5.9
Others (incl. teapots)	120-140	
Total	~780-800	

# Industry Needs Upgrading, Expansion to Meet Domestic Demand

- Several large, simple refineries with many small topping plants
  - The worldwide trend (China/Asia in particular) has been to retire “teapot” refineries, eliminate resid
- Refineries throughput at ~75% of capacity
  - Although capacity is effectively lower as nearly ½ of production is residual fuel oil.
- Iraq imports ~40 kbd of gasoline (1/3 of demand) and some other light products

# KRG Projects Initiate Iraqi Downstream Modernization

- 20,000 b/d topping plants built in Erbil (Kalak) and Suleimaniya (Bazyan) in mid-2000's.
  - Kalak received a 20,000 b/d upgrade during the past year, focusing on gasoline production
- Kalak produced Iraq's first unleaded gasoline

<b>Kalak Upgrade</b>	<b>(000 b/d)</b>
Naptha Hydrotreater	9
Reformer	6
Isomerization unit	2.5

## Further Refinery Upgrades in the Works

- Kalak and Bazyan to receive additional gasoline-centric upgrades by end-2012:
  - Kalak – 60,000 b/d
  - Bazyan – 34,000 b/d
- New 60,000 b/d Taqtaq refinery in planning phase
- Combined give KRG ~154,000 b/d of capacity, excluding teapots and Taqtaq, by end-2012.



# Additional Upgrades Planned Throughout Iraq

	<b>Planned Capacity</b>	<b>Status</b>
Karbala	140-200	Contract let to Saipam engineering.
Kirkuk	150	Design and Engineering
Missan	150	Design and Engineering
Nassiriyah	300	Design and Engineering
Ninevah	150	
<b>Total</b>	<b>900-960</b>	
Basra Rehabilitation, Crackers at Others		

## Nearly 2 mm b/d of capacity by 2020?

- Expect rationalization of teapot refineries
  - Elimination of 100,000-200,000 b/d of underperforming capacity – will become uneconomic when faced with competition
- Don't count on all projects to be built
  - Construction of all 5 projects announced by central government seem unlikely
    - \$30 billion+ investment
  - But Karbala and the Basra upgrade are probable as a starting point, perhaps Nassiriyah as well.

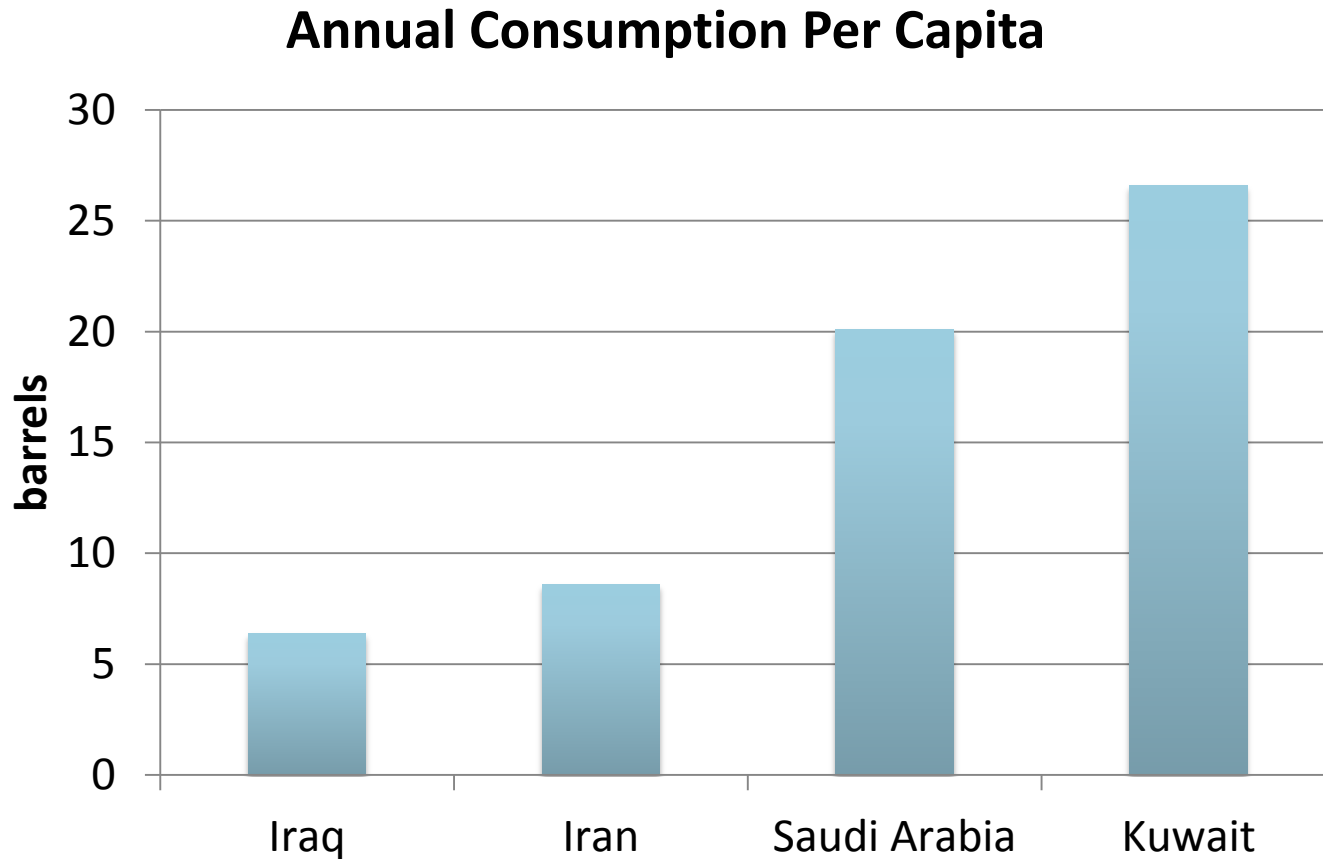
## Where does this leave supply?

- Given KRG upgrades and Karbala/Basra projects, Iraq should be able to meet current internal demand
  - And provide higher quality gasoline in the process
  - While reducing resid output
- Upgrades and new construction should continue in order to improve the value and quality of the product slate

## Opportunities Remain in Kurdistan

- Replacement of inefficient teapots with complex capacity – improving the value of the product slate
- Meeting demand growth
- Export of refined product

# Iraqi Consumption in Perspective – Room to Grow



# Risks Remain

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- Political acceptance of refined product exports out of the KRG?
  - How will Baghdad react to increased exports?
  - Will such exports fall (and remain) outside the purview of the crude oil export deal?
  - Outcry from teapots

## Potential for Regional Competition

- Saudi Arabia planning 1.2 mm b/d of capacity
  - But also hope to curb demand – could lead to exports
- Turkey broke ground on 200,000 b/d refinery in October
  - \$4.5-5 billion cost, plan some exports
- IEA sees Middle East distillation capacity increasing 2.3 mm b/d 2010 – 2016
  - Making it the second largest growth center after China
- Capacity in the region becoming more complex, efficient

# Export Infrastructure

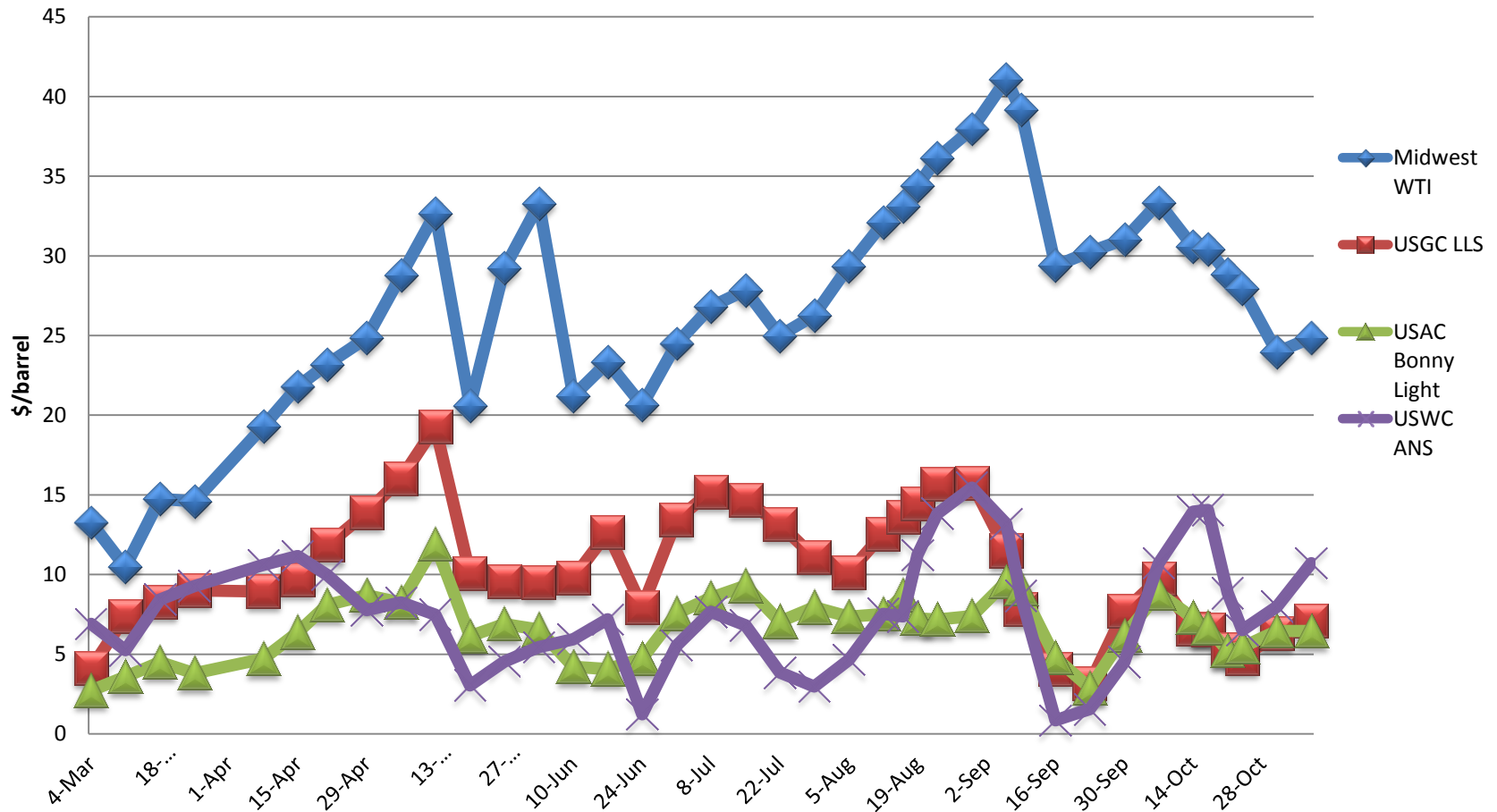




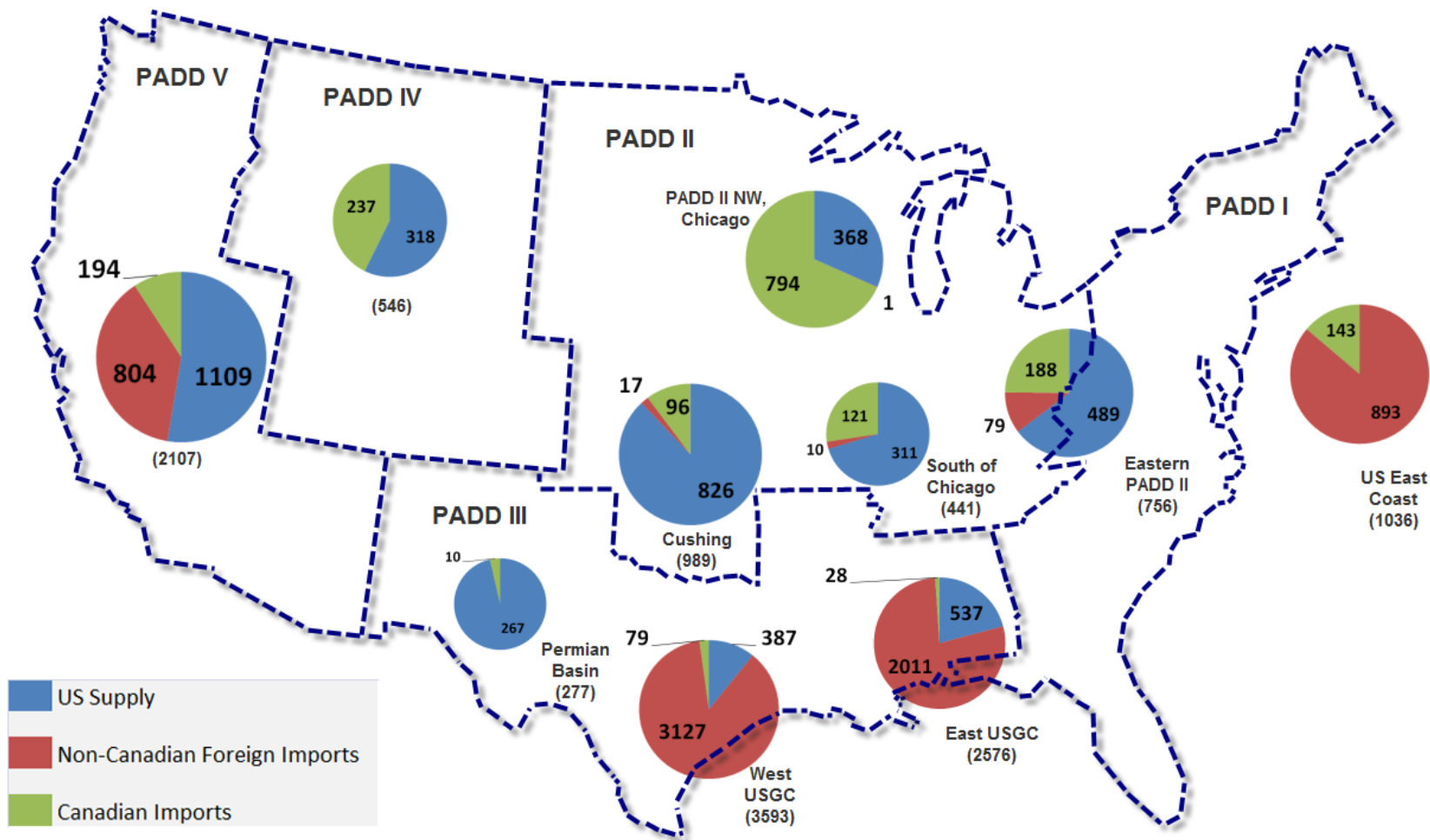
# What's going on in the U.S.?

Changing Crude Supplies and Lack of  
Infrastructure Creating Distortions

# U.S. Cracking Margins



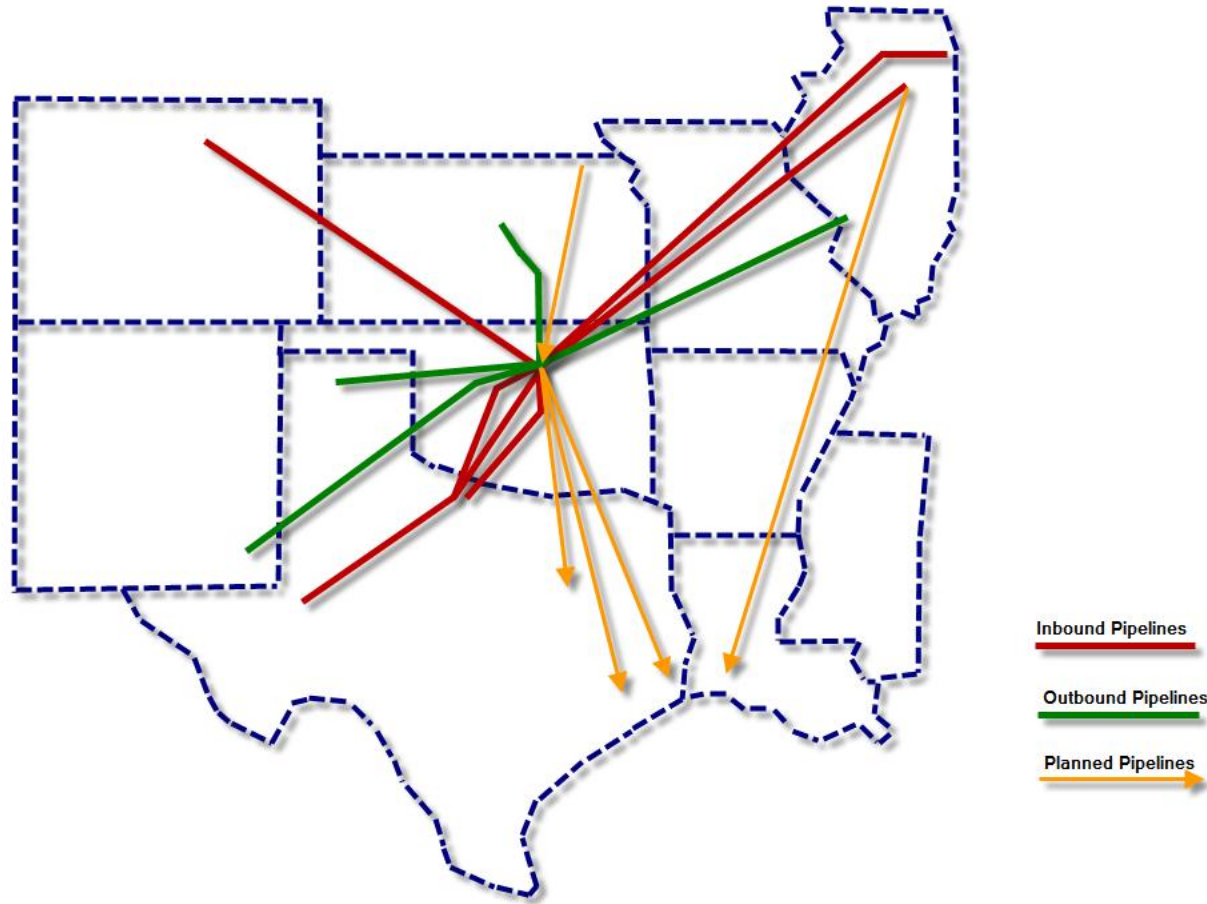
# U.S. Crude Oil by Source



Source: EPRINC rendition from Enbridge. Enbridge; Enbridge used EIA and NEB Data and Enbridge Estimates (with some averages)

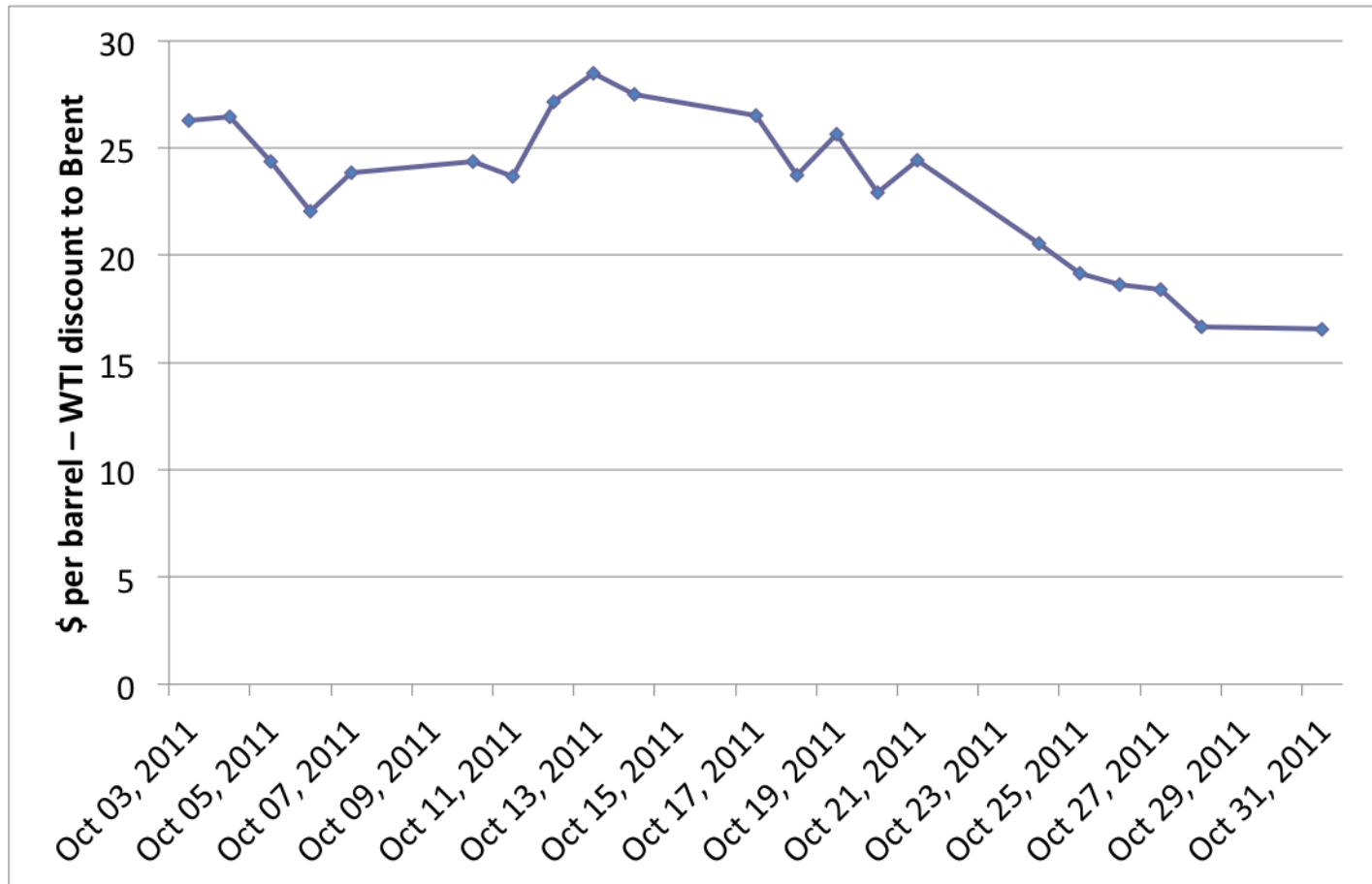
Crude Disposition by Region 2010 (MB/D)

# Pipelines In and Out of Cushing 2009



Source: Info. From CME Group and Purvin and Gertz Study

# The WTI-Brent Spread



# The Result: Atlantic Coast Refiners Being Put Out of Business

