

# Developments in Energy Benchmarks



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*By*

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# Presentation Outline

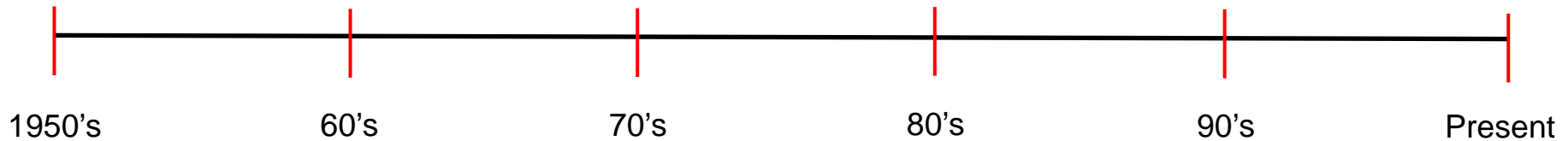
- History of Oil Pricing
- Review of Current Oil Price Benchmarks
- Future Challenges

# History of Oil Pricing

Market Based- Benchmarks

Rise of OPEC- OSP

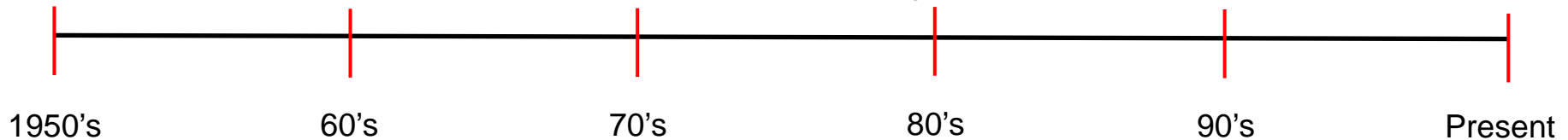
7 Sisters- Posted Prices



# History of Oil Pricing

## 7 Sisters- Posted Prices

- Oil industry & ownership dominated by large, multi-national, vertically integrated companies
- No spot market
- Crude transactions not disclosed
- Posted prices used to calculate revenue stream to host governments, not for transactions

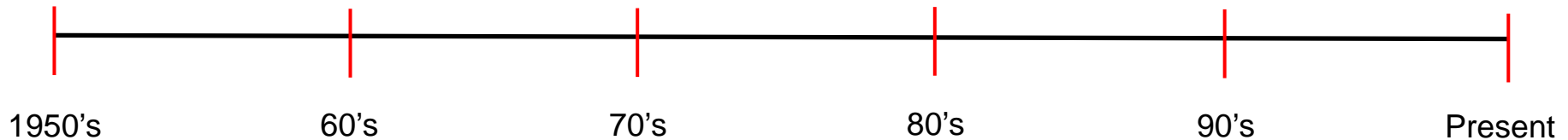


# History of Oil Pricing

## Rise of OPEC- OSP

- Strong demand growth creates seller's market, increases OPEC power
- Oil nationalization, equity participation led to open market sales
- Official Selling Price (OSP) adopted, similar to posted price but used for actual transactions
- Lack of transparency leads to Saudi Light reference pricing- one OSP

## 7 Sisters- Posted Prices



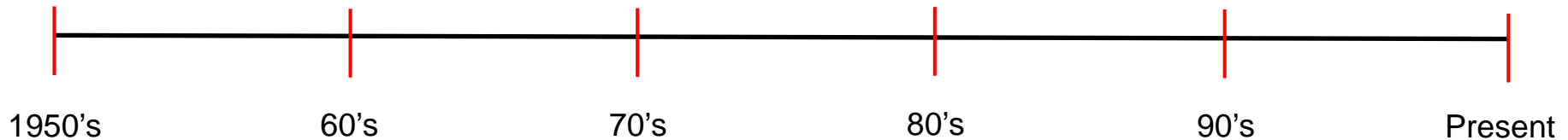
# History of Oil Pricing

Rise of OPEC- OSP

7 Sisters- Posted Prices

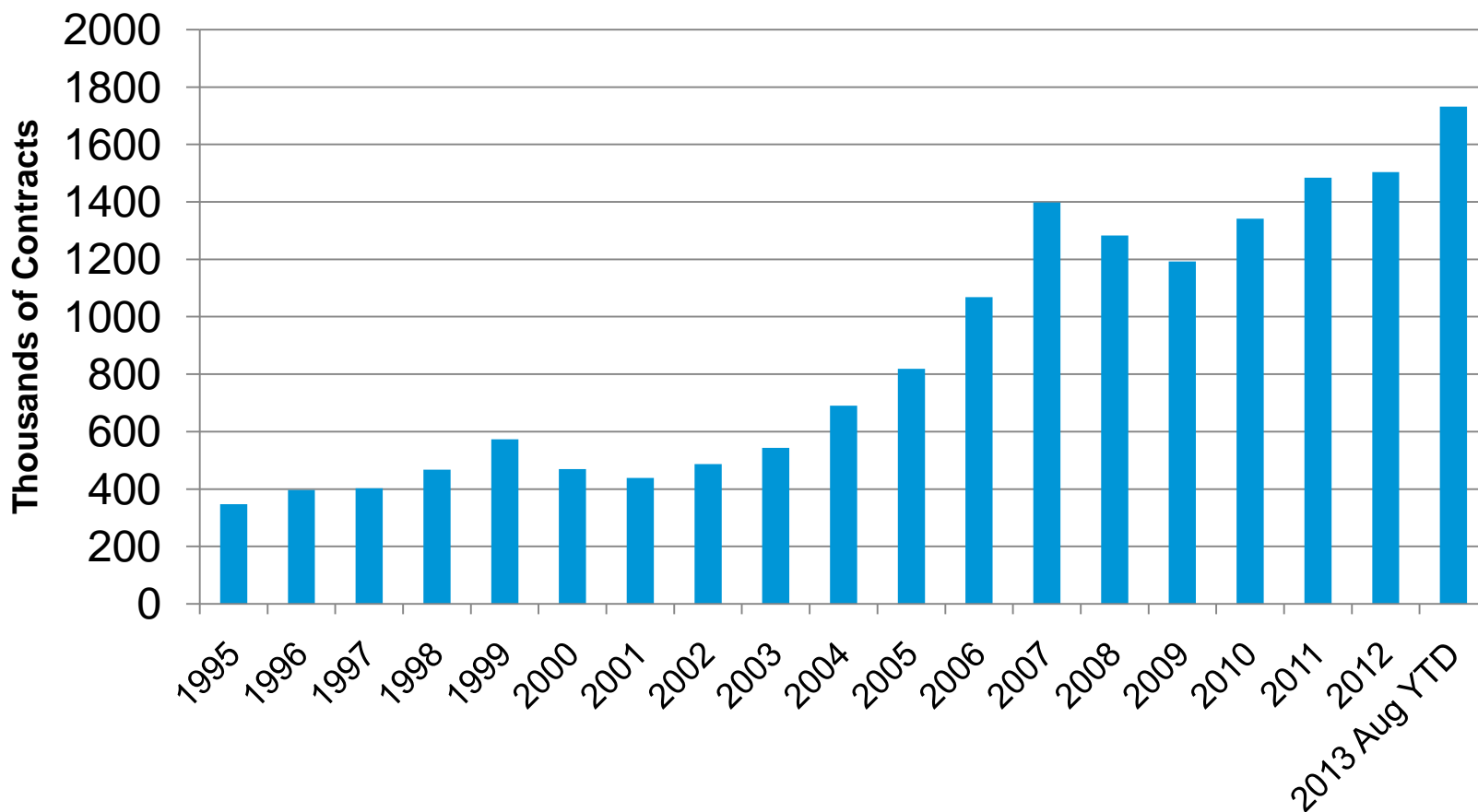
## Market Based- Benchmarks

- 80's fall in prices challenges OPEC administered pricing, OPEC market share falls from 51% to 28%
- 1987- OPEC abandons administered prices and adopts market based system
- U.S. market undergoes structural changes:
  1. Price decontrol
  2. Establishment of Futures Market
  3. Growth of independent refiners



# History of Oil Pricing: Establishment of Futures Market

WTI Crude Contract- Open Interest



Source: Bloomberg

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# Review of Current Oil Price Benchmarks

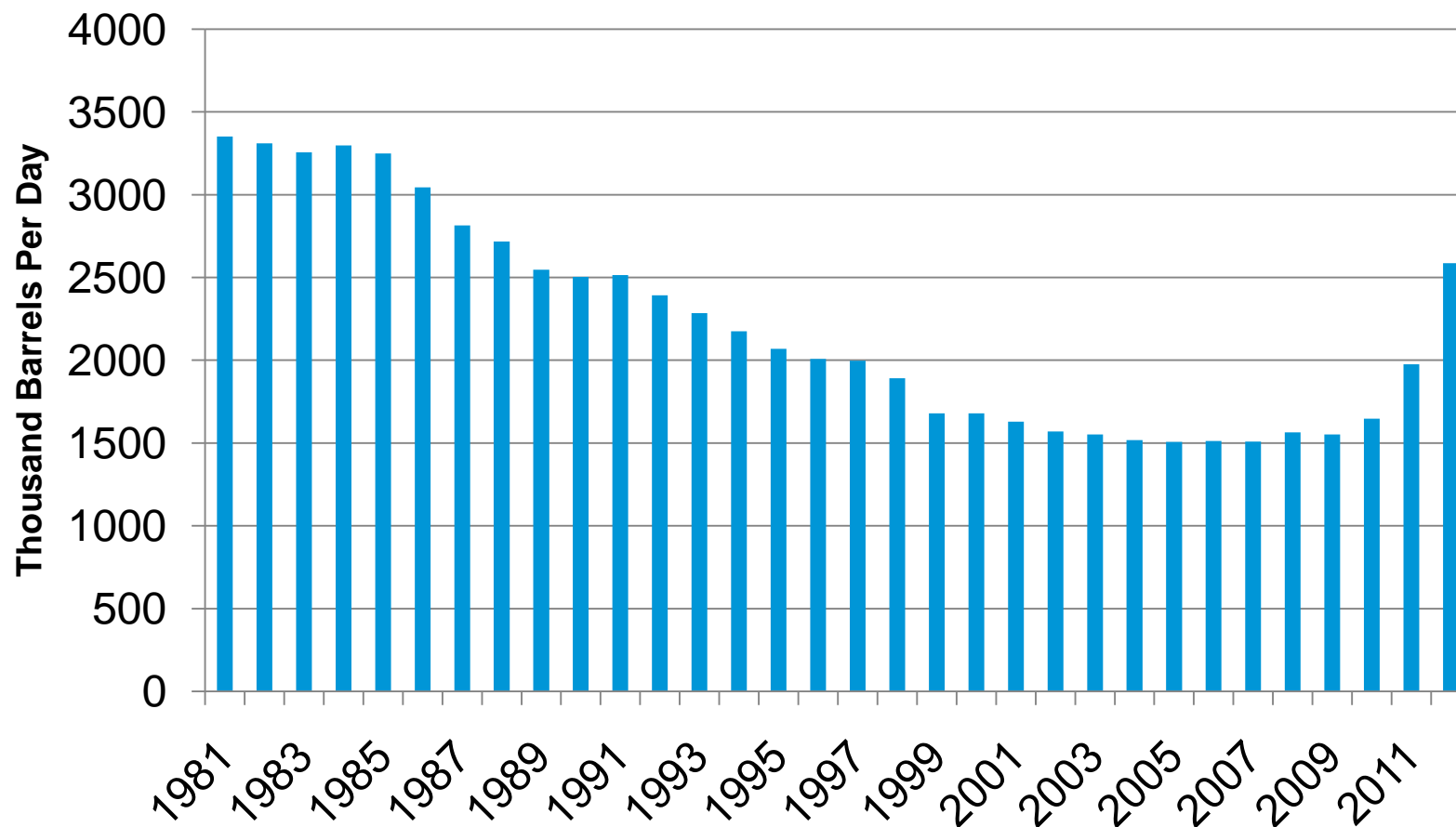
- Definition  
Pricing basis which reflects unconstrained third party transactions and which can be levered to cover larger related transactions
- Purpose  
Allow efficient price discovery
- Characteristics
  - sufficient liquidity to eliminate distortions & squeezes
    - volume element
    - diversity of buyers and sellers
  - free of legal, tax, and regulatory distortions
  - minimal basis risk in leveraging to other transactions
    - denominated in strong currencies
    - delivered at location(s) which allow arbitrage- linkage to world markets

# Review of Current Oil Price Benchmarks: WTI

| Benchmark Characteristic  | WTI Crude Market   |
|---|--|
| <ul style="list-style-type: none"><li>• Liquidity<ul style="list-style-type: none"><li>- Overall Volume</li></ul></li></ul> | <ul style="list-style-type: none"><li>• Liquidity<ul style="list-style-type: none"><li>- Resurrected from extinction</li></ul></li></ul> |

# Review of Current Oil Price Benchmarks: WTI

Four State Crude Production  
(Texas, New Mexico, Oklahoma, Kansas)



Source: EIA

# Review of Current Oil Price Benchmarks: WTI

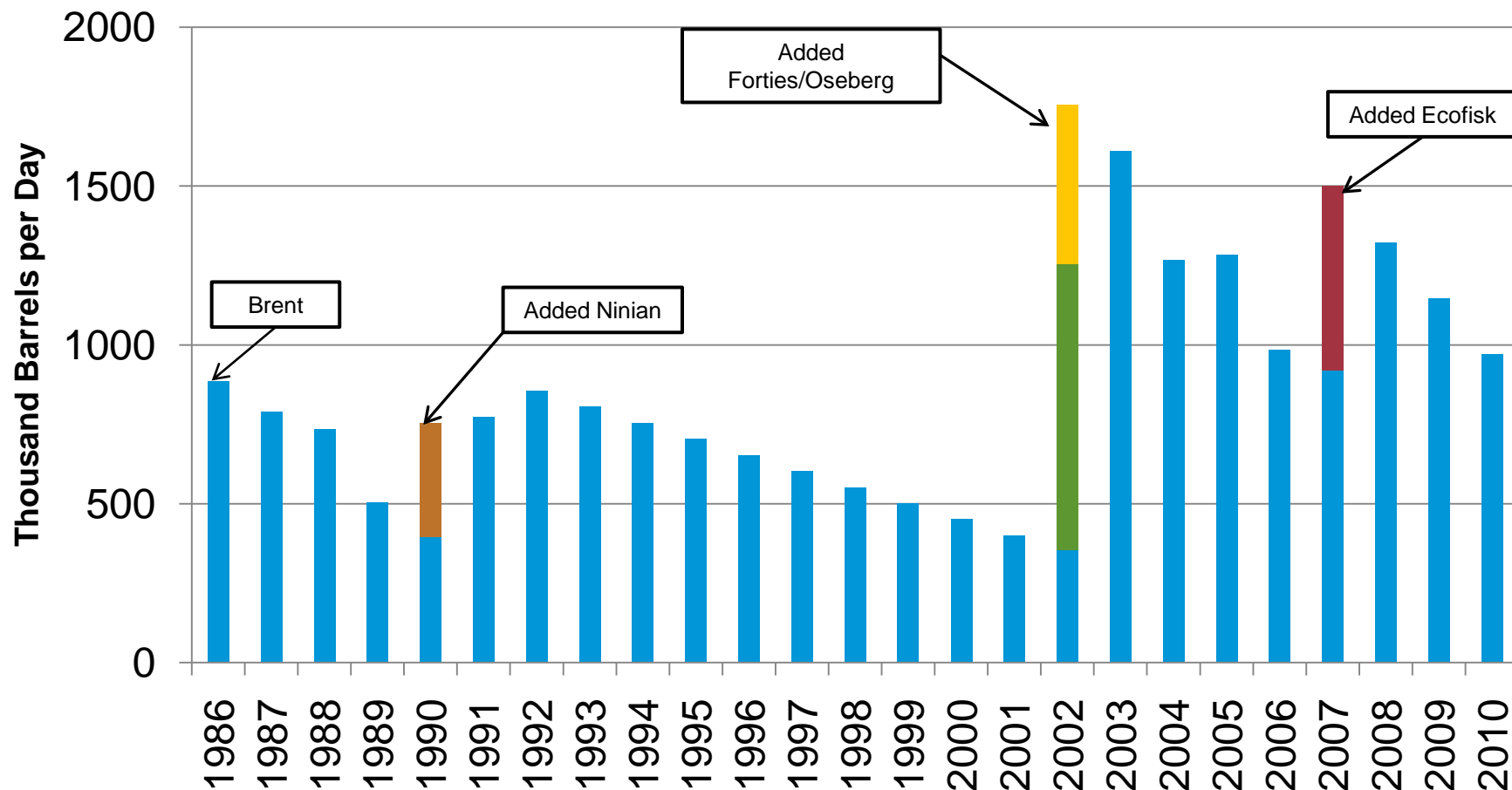
| Benchmark Characteristic  | WTI Crude Market  |
|---|---|
| <ul style="list-style-type: none"><li>• Liquidity<ul style="list-style-type: none"><li>- Overall Volume</li><li>- Diversity of Buyers/Sellers</li></ul></li><li>• Free of legal, tax, regulatory distortions</li><li>• Minimal basis risk/ability to leverage<ul style="list-style-type: none"><li>- Strong Currency</li><li>- Ability to Arbitrage</li></ul></li></ul> | <ul style="list-style-type: none"><li>• Liquidity<ul style="list-style-type: none"><li>- Resurrected from extinction</li><li>- Large number of producers/ small transaction volumes allow large number of buyers</li></ul></li><li>• Yes</li><li>• Minimal basis risk/ability to leverage<ul style="list-style-type: none"><li>- Yes</li><li>- A recent problem-discussed later</li></ul></li></ul> |

# Review of Current Oil Price Benchmarks: Brent

| Benchmark Characteristic  | Brent Crude Market  |
|---|---|
| <ul style="list-style-type: none"><li>• Liquidity<ul style="list-style-type: none"><li>- Overall Volume</li></ul></li></ul> | <ul style="list-style-type: none"><li>• Liquidity<ul style="list-style-type: none"><li>- Constantly resurrect</li></ul></li></ul> |

# Review of Current Oil Price Benchmarks: Brent

## Brent Contract Crudes



Source: McGraw-Hill, Bassam Fattouh, EIA interpolation

# Review of Current Oil Price Benchmarks: Brent

| Benchmark Characteristic  | Brent Crude Market   |
|---|--|
| <ul style="list-style-type: none"><li>• Liquidity<ul style="list-style-type: none"><li>- Overall Volume</li><li>- Diversity of Buyers/Sellers</li></ul></li><li>• Free of legal, tax, regulatory distortions</li><li>• Minimal basis risk/ability to leverage<ul style="list-style-type: none"><li>- Strong Currency</li><li>- Ability to Arbitrage</li></ul></li></ul> | <ul style="list-style-type: none"><li>• Liquidity<ul style="list-style-type: none"><li>- Constantly resurrected</li><li>- Large number of producers/<br/>large transaction volumes<br/>limit number of buyers</li></ul></li><li>• Yes</li><li>• Minimal basis risk/ability to leverage<ul style="list-style-type: none"><li>- yes- issues with Euro</li><li>- Waterborne</li></ul></li></ul> |

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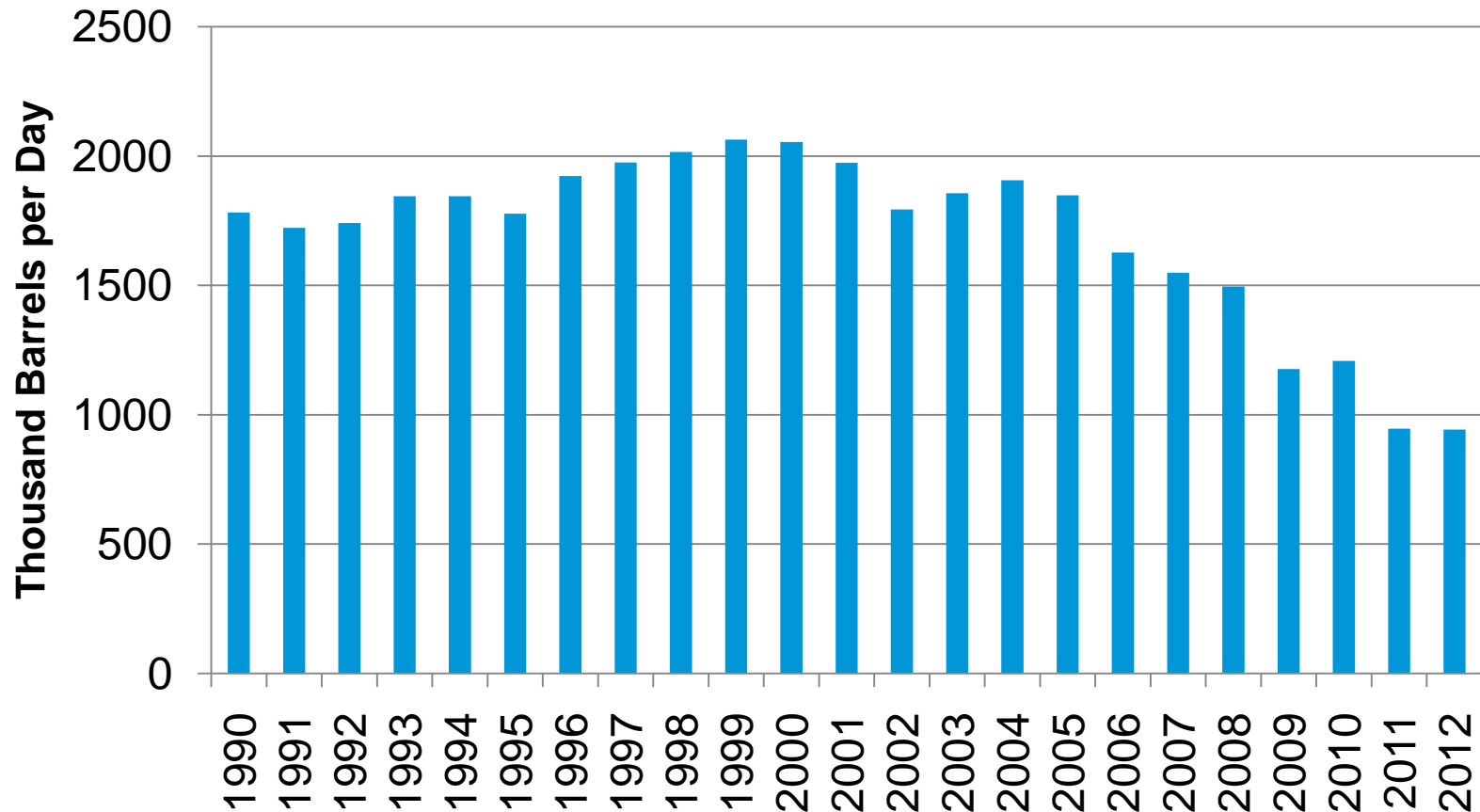


# Future Challenges

- Adequacy of Current Benchmarks
  - Brent - continued decline in production
  - WTI - arbitrage, linkage to world markets
    - linkage **to** Gulf Coast currently limited, future expansions
    - linkage **from** Gulf Coast declining

# Future Challenges: WTI Linkage

Crude movements from PADD 3 to PADD 2



Source: EIA

# Future Challenges

- Adequacy of Current Benchmarks
  - Brent - continued decline in production
  - WTI - arbitrage, linkage to world markets
    - linkage to Gulf Coast currently limited, future expansions
    - linkage from Gulf Coast declining
    - New oil production not WTI grade
    - Logistics bypassing Cushing, straight to Gulf Coast
    - Future crude stranded/crude exports

**Issue: Should WTI, Cushing benchmark be replaced by a basket light, sweet benchmark at Houston**

# Future Challenges

- Demand Growth shifting to Asia
  - Current benchmarks not reflective of Asian dynamics
  - Asian crudes illiquid- Minas, Tapis, Dubai
  - Saudi crude lacks transparency – one seller
  - Government to government supply lacks transparency  
Venezuelan crude to China as loan repayments
  - ESPO crude ?

**Issue: What can serve as an adequate Asian benchmark?**