



***Gas to Liquids: Unlocking Value From Natural Gas***  
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*Texas A&M  
Gas and Fuels Research Initiative  
28 March 2014*

## *forward-looking statements*



Forward-looking statements: Sasol may, in this document, make certain statements that are not historical facts and relate to analyses and other information which are based on forecasts of future results and estimates of amounts not yet determinable. These statements may also relate to our future prospects, developments and business strategies. Examples of such forward-looking statements include, but are not limited to, statements regarding exchange rate fluctuations, volume growth, increases in market share, total shareholder return and cost reductions. Words such as “believe”, “anticipate”, “expect”, “intend”, “seek”, “will”, “plan”, “could”, “may”, “endeavour” and “project” and similar expressions are intended to identify such forward-looking statements, but are not the exclusive means of identifying such statements. By their very nature, forward-looking statements involve inherent risks and uncertainties, both general and specific, and there are risks that the predictions, forecasts, projections and other forward-looking statements will not be achieved. If one or more of these risks materialise, or should underlying assumptions prove incorrect, our actual results may differ materially from those anticipated. You should understand that a number of important factors could cause actual results to differ materially from the plans, objectives, expectations, estimates and intentions expressed in such forward-looking statements. These factors are discussed more fully in our most recent annual report under the Securities Exchange Act of 1934 on Form 20-F filed on 9 October 2013 and in other filings with the United States Securities and Exchange Commission. The list of factors discussed therein is not exhaustive; when relying on forward-looking statements to make investment decisions, you should carefully consider both these factors and other uncertainties and events. Forward-looking statements apply only as of the date on which they are made, and we do not undertake any obligation to update or revise any of them, whether as a result of new information, future events or otherwise.

## *presentation outline*



**about Sasol**

**GTL value proposition**

**ORYX GTL, Qatar**

**the North American energy landscape**

**Sasol's US projects**

**about Sasol**

**GTL value proposition**

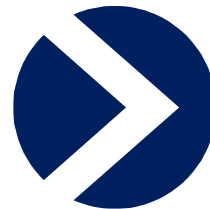
**ORYX GTL, Qatar**

**the North American energy landscape**

**Sasol's US projects**

## Sasol at a glance

- An international integrated energy and chemical company
- The world's largest producer of synthetic fuels
- Pioneer in gas-to-liquids (GTL) and coal-to-liquids (CTL) technology
- 60 years experience in gas conversion related technologies
- In-house technology development capacity
- Strong intellectual property portfolio
- Joint venture partner with Qatar Petroleum in ORYX GTL – 32,400 bpd GTL plant
- Already a strong presence in the US



- Turnover (US\$20.5bn)<sup>1</sup>
- Market cap (US\$28.3bn)<sup>2</sup>
- Listed on JSE (SOL) and NYSE (SSL)
- Exploration, development, production, marketing and sales operations in more than 38 countries
- ~35 000 employees worldwide

### Notes

- <sup>1</sup> For year ending 30 June 2013
- <sup>2</sup> Market capitalisation at 30 June 2013

## *a history in synthetic fuels*



## *a history in synthetic fuels*



**about Sasol**

**GTL value proposition**

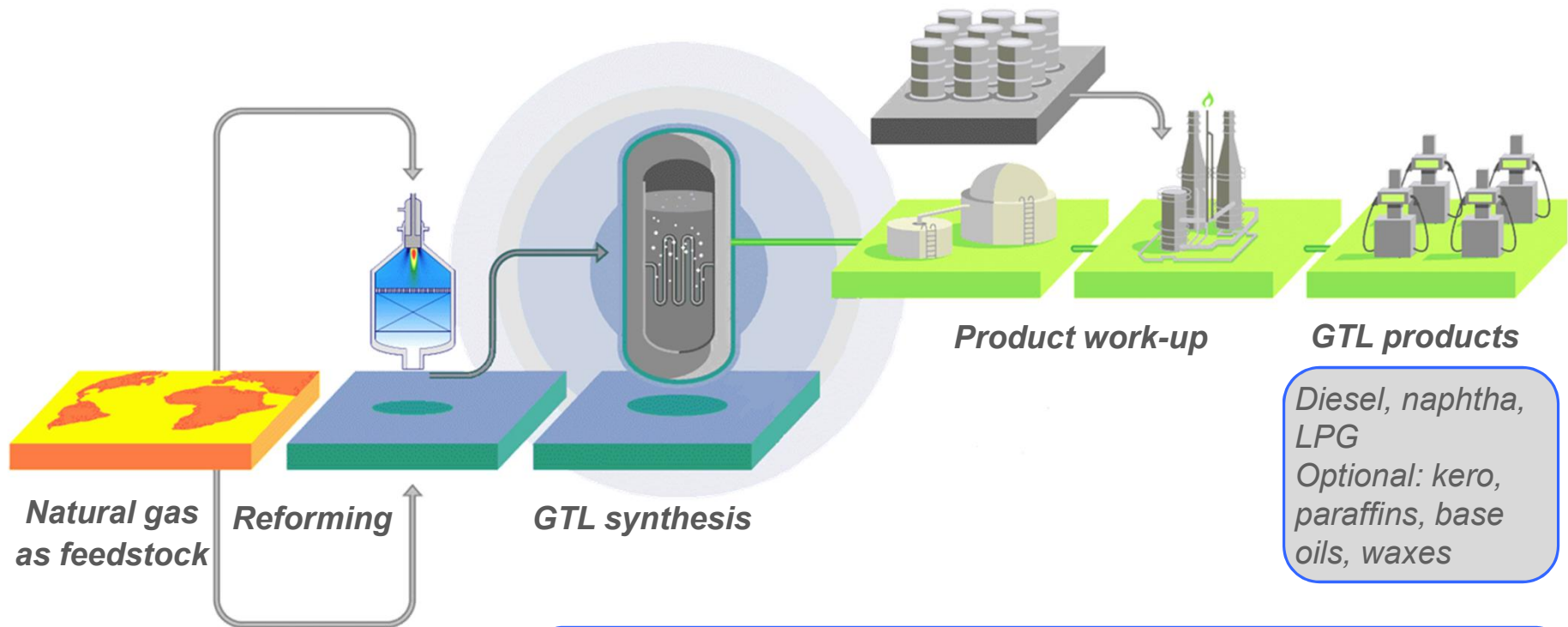
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# gas to liquids (GTL) in a nutshell



10 mcf → 1 barrel of product  
1 bcf/d → 100 000 bbl/day  
1 tcf reserve → 100 million bbl of products  
Over 30 years

# *GTL fuels can be supplied through existing supply infrastructure*

- compatible with existing engine technology and fuelling infrastructure



tankers



existing fuelling infrastructure



pipeline



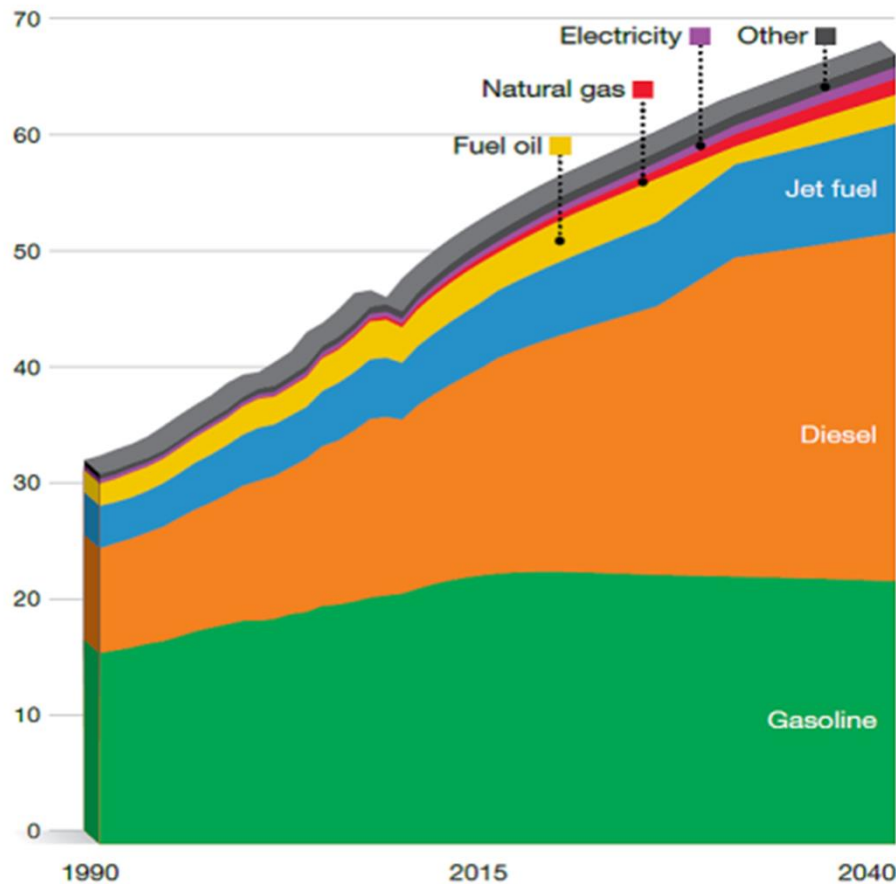
conventional engines



# GTL is responsive to market demands



transportation fuel demand  
(millions of oil-equivalent barrels per day)



- middle distillate is the fastest growing segment of the transport fuel demand
- GTL produces 65-75% of product in the middle distillate range, with the balance of the slate comprising chemical naphtha or added value chemicals, with no “bottom of the barrel” products

Source: ExxonMobil Outlook for Energy (2012)

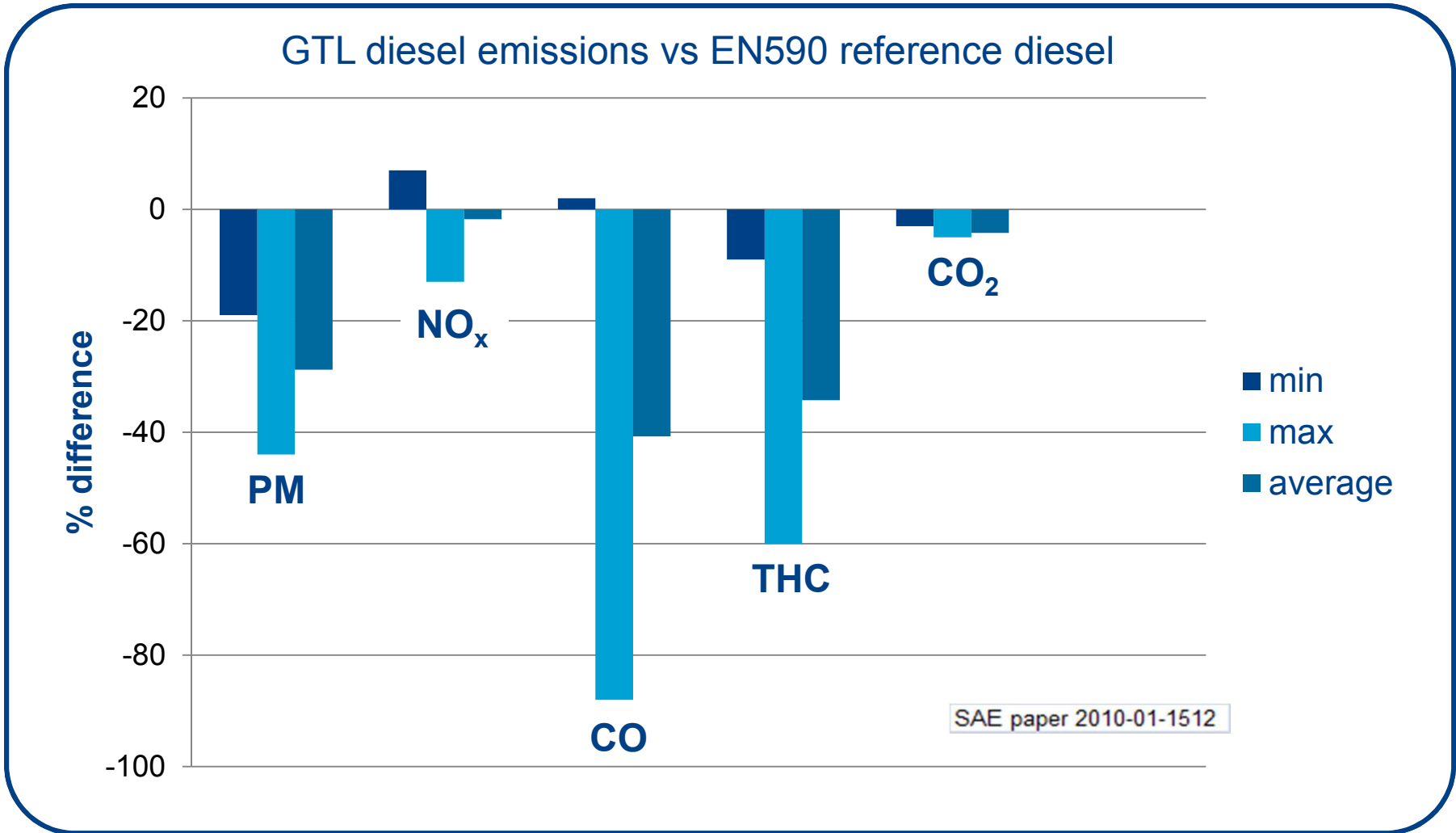
## *GTL raises the bar on quality and performance*



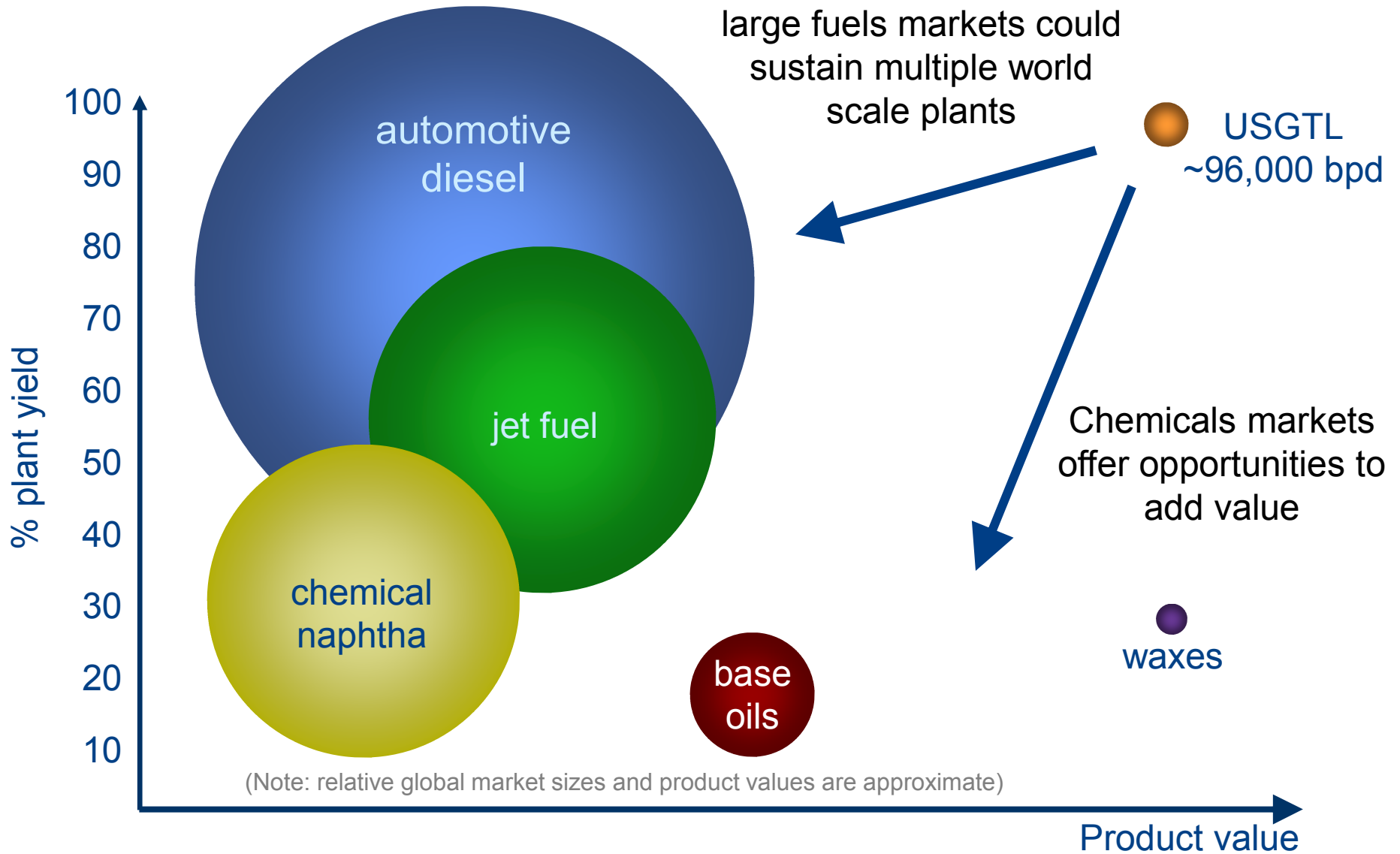
- clear, clean burning fuels with high cetane number and no sulfur or aromatics
- can be used “pure” or in blends
- upgrades refinery streams and reduces constraints
- could enable development of new generation internal combustion engine technologies
- improved engine efficiency
- further reduction in tailpipe emissions
- naphtha is an ideal cracker liquid feedstock or diluent for oil sands bitumen



# GTL reduces engine-out emissions



# GTL value addition

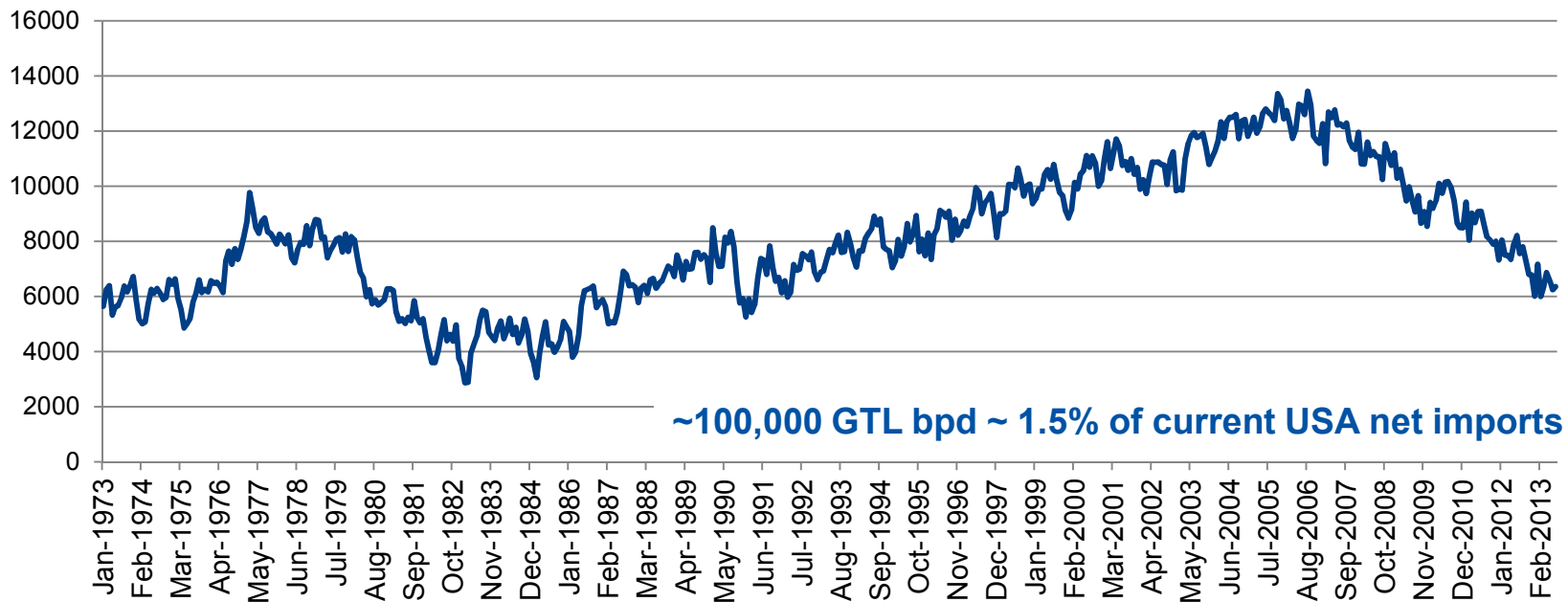


## GTL can improve energy security (certain cases)



- diversifies transport fuels supply
- can reduce dependence on imported petroleum products

US net imports of crude oil and petroleum products  
(‘000 barrels per day)



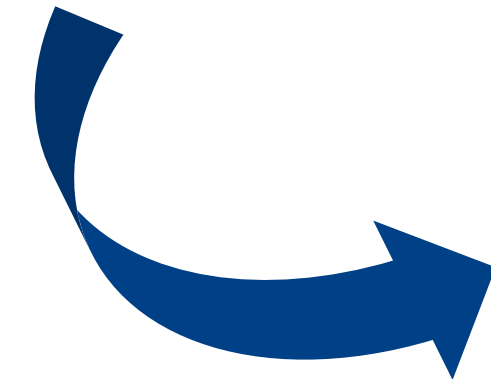
Source: EIA

# GTL offers gas market diversity for resource owners



traditional pathways for natural gas to remote markets

or



chemical conversion



ORYX GTL, Qatar



## *the GTL value proposition is compelling*



- alternative natural gas monetization option
- pathway for natural gas into transportation
- energy security
- products transparent to supply infrastructure
- high product quality relative to conventional equivalents
- product responsive to markets demands
  - middle distillates and chemicals
- sound environmental credentials
- job creation
- fiscal revenue

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GTL value proposition

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## ORYX Qatar, Sasol's GTL flagship



- A joint venture with Qatar Petroleum
- 32 400 bbl/d nameplate capacity (GTL diesel, GTL naphtha, LPG)
- First cargo shipped to international markets in April 2007
- A total of 56+ million barrels produced to date
- On-line availability has improved significantly, enabling stable, increased production
  - nine months at 99+% on-line availability

*Highly profitable venture with handsome returns to shareholders*



# ORYX GTL (32,400 bpd)



## other GTL projects in the pipeline

### *Escravos GTL, Nigeria*

- Joint venture with Chevron + NNPC
- 32 400 bbl/d – Oryx look alike
- GTL diesel, naphtha, LPG



### *OLTIN YO'L GTL, Uzbekistan*

- Joint venture with Uzbekneftegaz + Petronas
- 38 400 bbl/d – enhanced Oryx
- GTL diesel, kero, naphtha and LPG



## identified various levers to extract greater value



- Across the fence utility supply
- Modularisation
- Partnerships and alliances

- Chemicals
- Electricity
- Base oils

- Reactor intensification
- Generation 3 FT catalyst
- Improvement in reforming technology



## *GTL reactor facts*

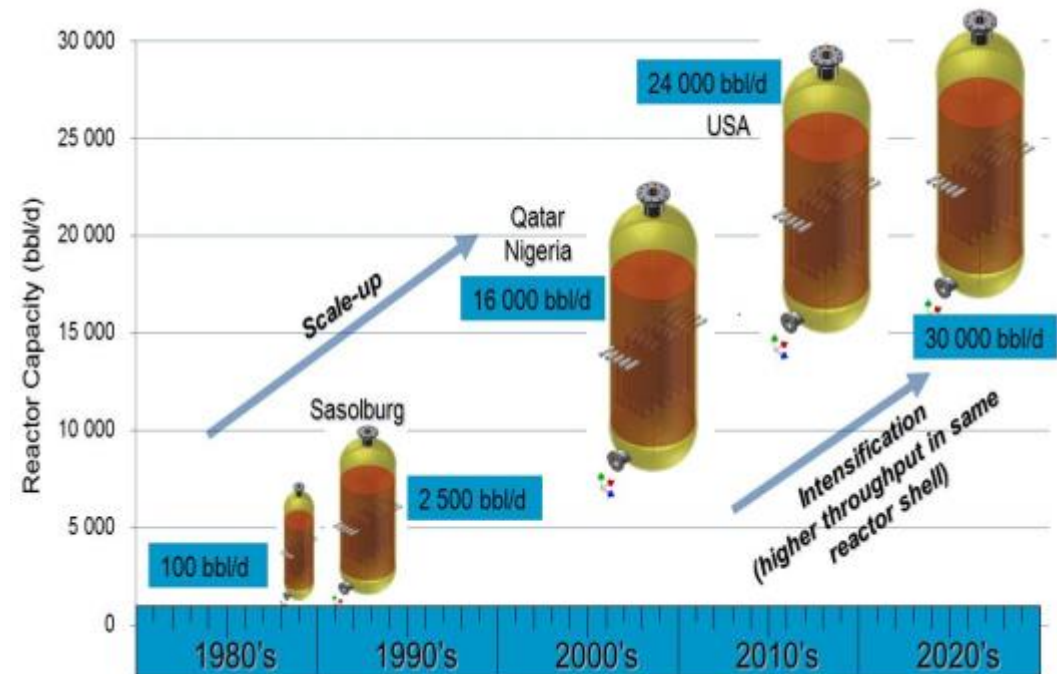
- Height = ~170 ft (~50 m)
- Diameter = ~35 ft (~10 m)
- Mass = ~2,200 tons



## scale up and intensification of GTL reactor



- Significant scale-up during successful commercialization at ORYX GTL
- Subsequent focus on intensification to increase production in essentially the same shell
- Enabled by:
  - Integrated catalyst and reactor technology developments
  - Intensive fundamental studies, model systems and semi-commercial piloting
  - Understanding critical design parameters and margins based on commercial operation – enabled significant optimization
- US GTL design at 150% of ORYX GTL reactor capacity





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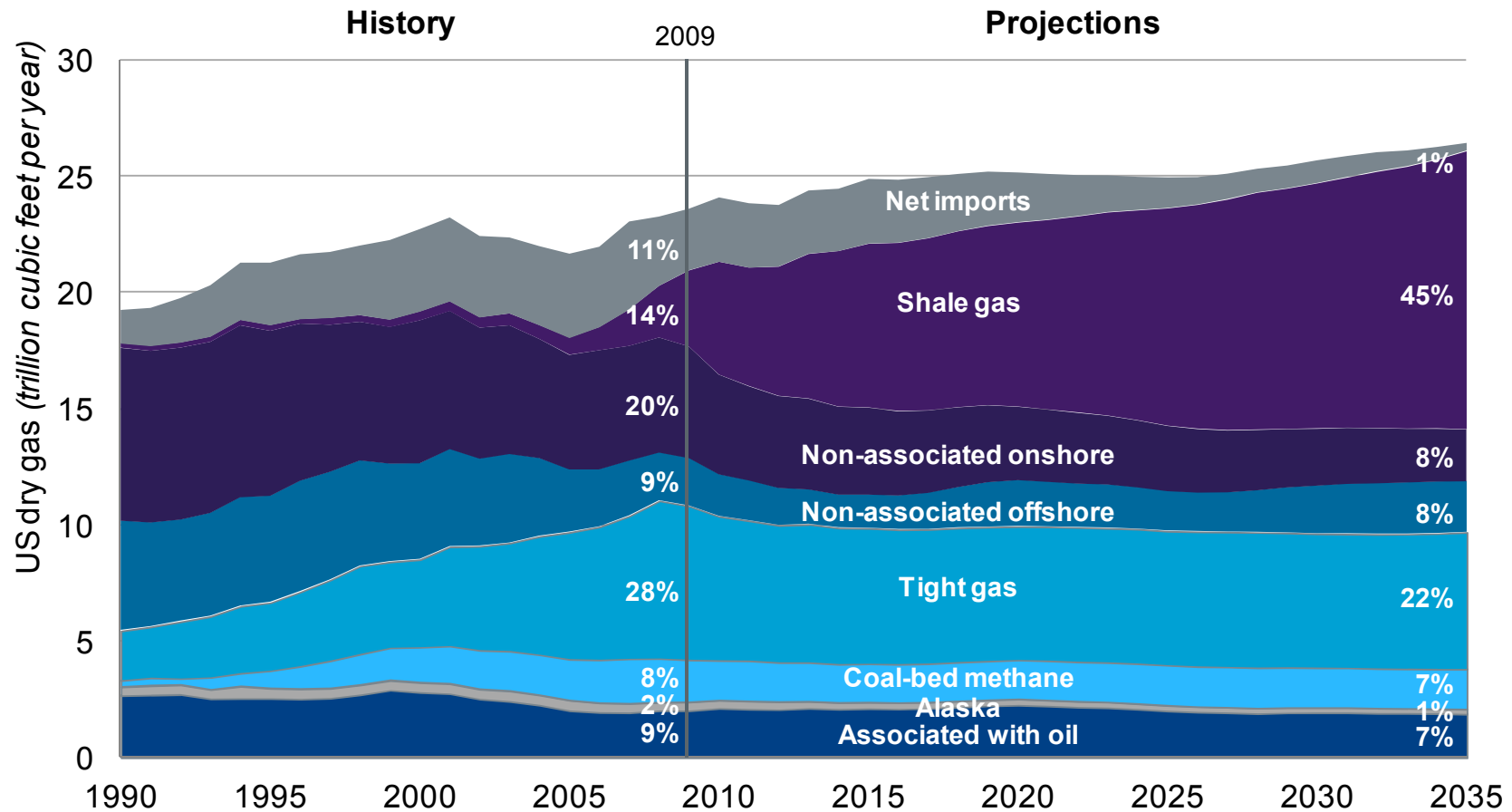
GTL value proposition

ORYX GTL, Qatar

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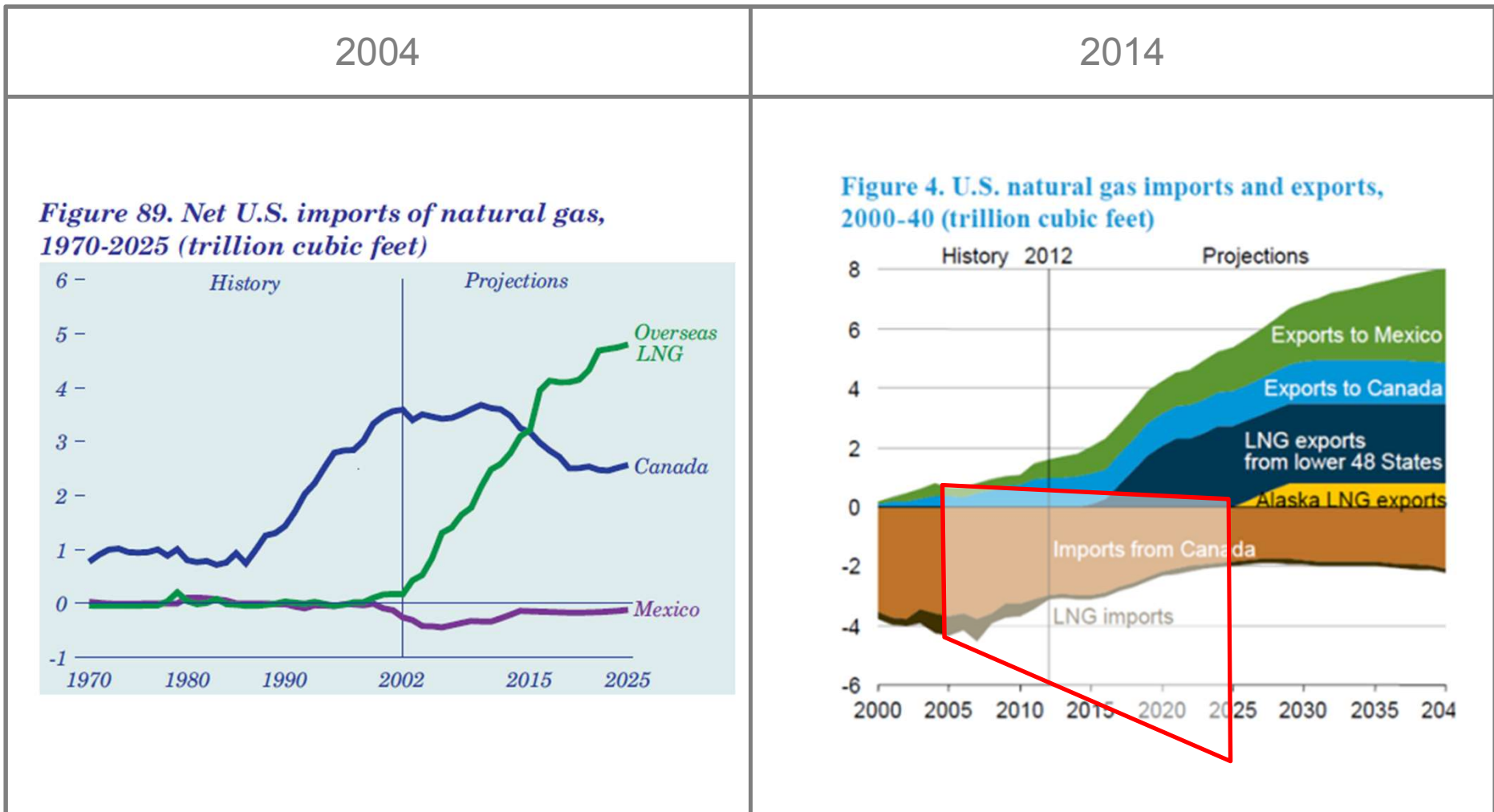
Sasol's US projects

# shale gas has changed the face of North American energy and chemical markets



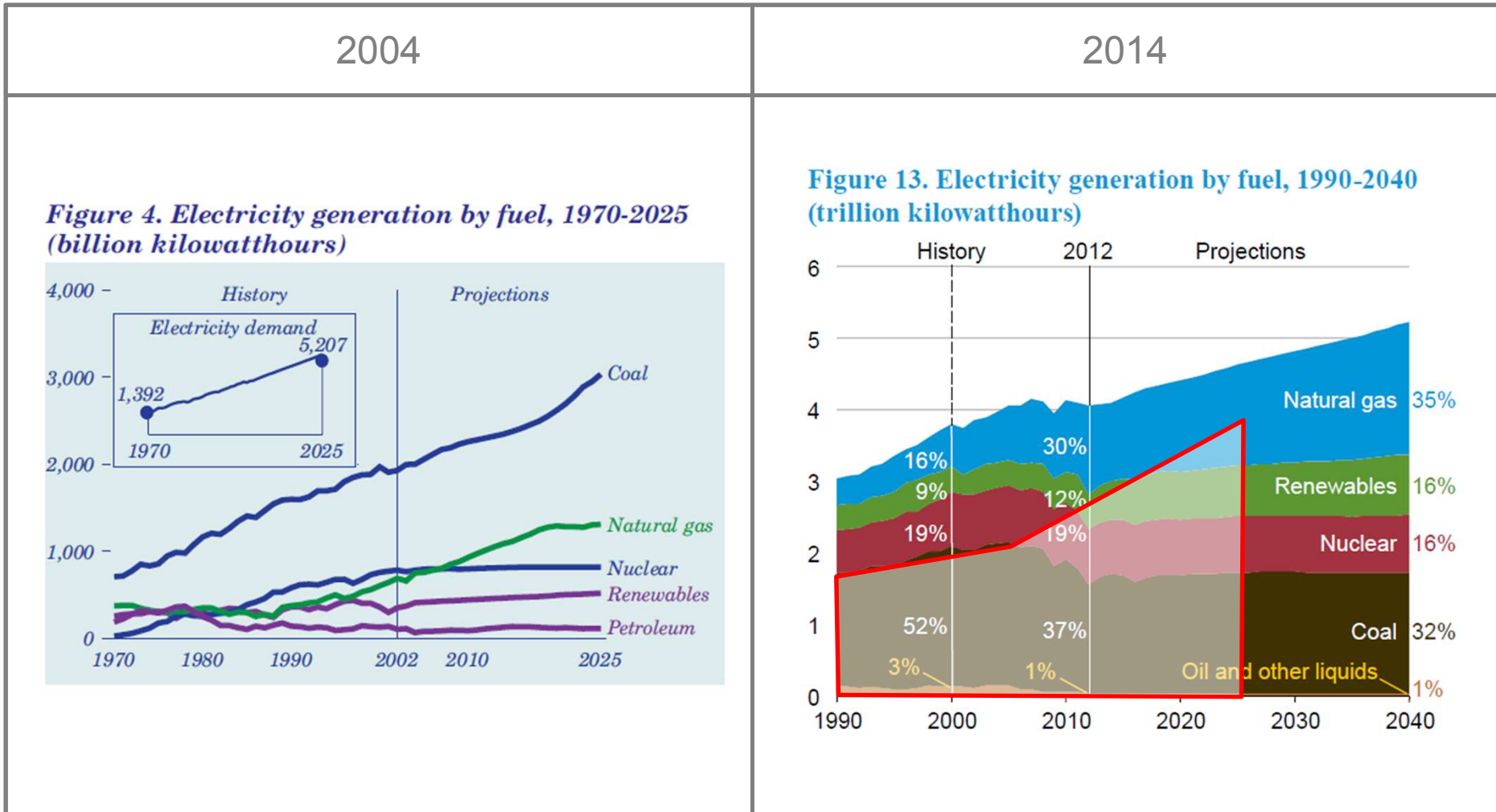
Source: EIA, Annual Energy Outlook 2011

...e.g. natural gas imports/exports



Source: EIA Annual Energy Outlook 2004/2014

# ...e.g. fuel mix for electricity generation



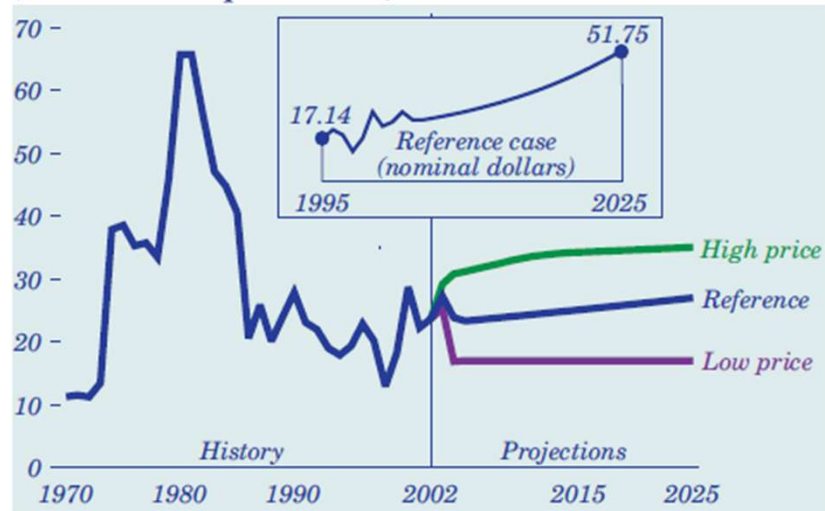
Source: EIA Annual Energy Outlook 2004/2014

# paradigms have shifted...

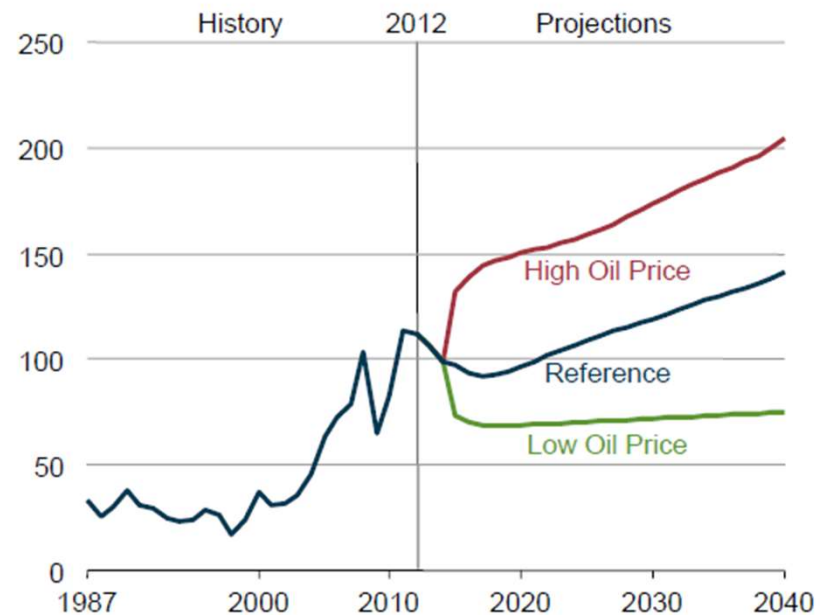
2004

2014

**Figure 43. World oil prices in three cases, 1970-2025 (2002 dollars per barrel)**

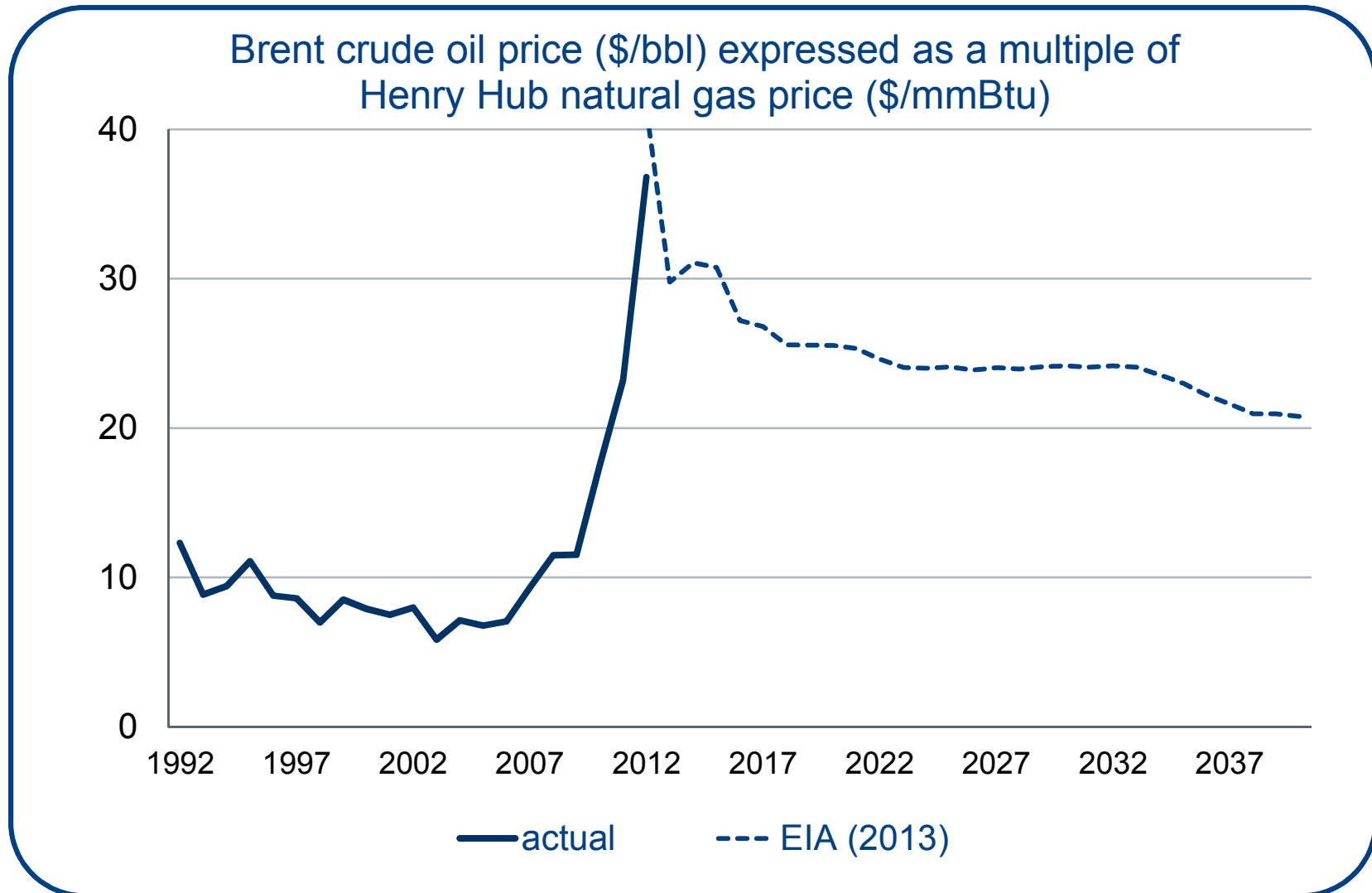


**Figure 6. Average annual Brent spot crude oil prices in three cases, 1987-2040 (2012 dollars per barrel)**

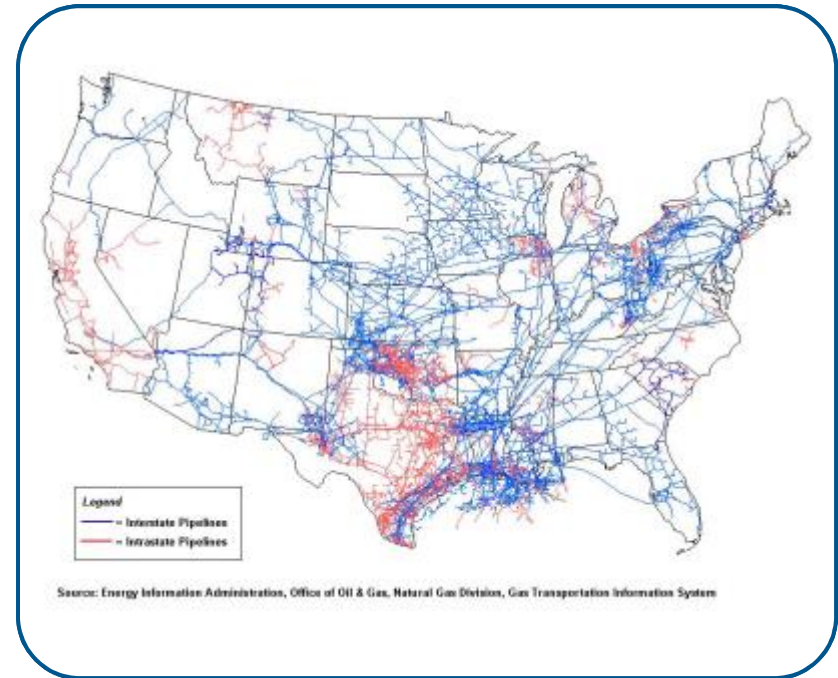
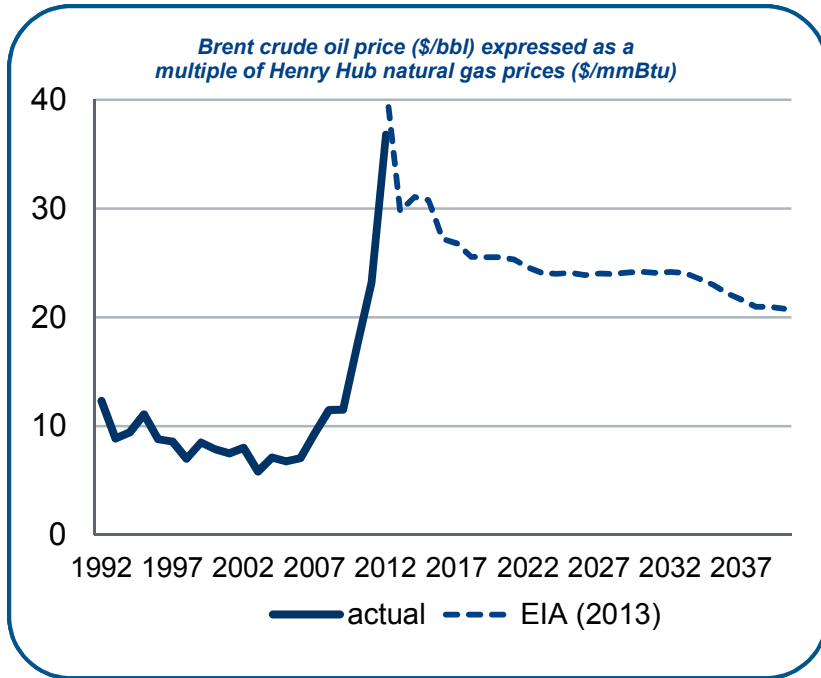


Source: EIA Annual Energy Outlook 2004/2014

## *GTL exploits the differential between gas and liquids pricing*



# North America... the new frontier for GTL



divergence between  
oil and gas prices

established gas pipeline  
network



attractive investment environment for GTL

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***in December 2012 Sasol announced its decision to proceed with FEED for world scale cracker and GTL projects in Louisiana, USA***



***Louisiana Governor Bobby Jindal  
& Sasol CEO David Constable  
FEED Announcement (December 3, 2012)***

*Sasol North America  
Lake Charles Chemical Complex*



## *chemicals facility*



- a world scale ethane cracker will produce approximately 1.5 million tons of ethylene per year which will be converted on-site by seven downstream to a range of high-value derivatives
- **estimated project capital investment:** US\$ 5 billion to US\$ 7 billion
- **final investment decision:** 2014
- **construction phase:** 2014-2017



## gas-to-liquids facility

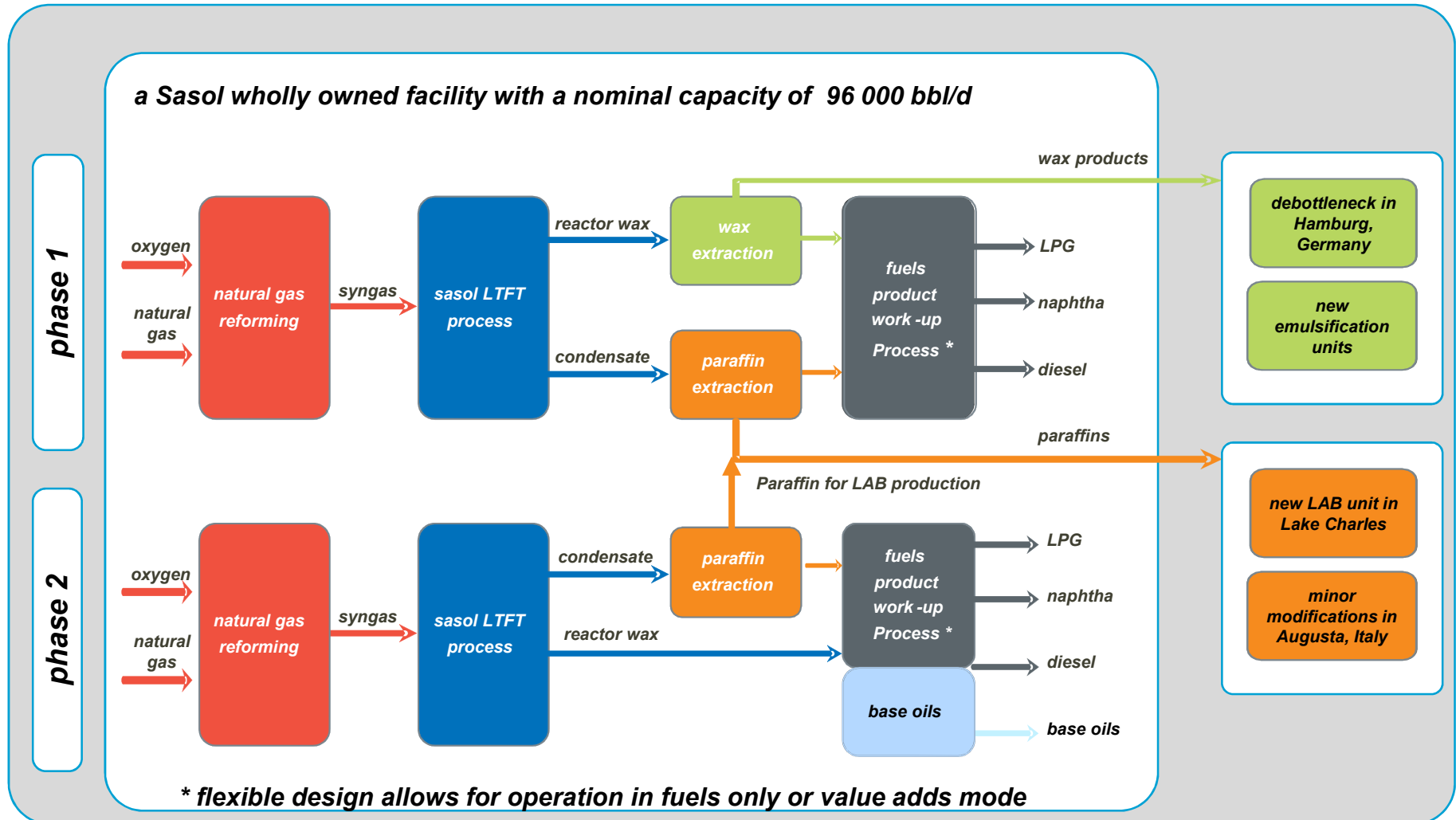


- ~1 billion cubic feet per day of natural gas will be converted to 96,000\* barrels per day of liquid fuels and chemicals including GTL diesel, GTL naphtha, liquefied petroleum gas, paraffin, GTL base oils and medium and hard waxes
- **estimated project capital investment:** US\$ 11 billion to US\$ 14 billion
- **final investment decision:** 2016
- **construction phase:** 2016-2020

\*nominal capacity



# US GTL product marketing



a balanced product portfolio of 29% chemicals and 71% fuels (by mass)

## *in summary*

### *GTL value proposition*

- Arbitrating gas and oil - shale gas revolution
- Technology enhancements - extending our lead
- World class products
- Chemical value adds
- Integrated value chain



### *Lake Charles*

- World class infrastructure
- Supportive government
- Access to multiple markets
- Competitive labour and contractor market
- Abundant feedstock



compelling  
investment  
opportunity

*Thank you*

