



# **QATAR – SHELL – JAPAN DELIVERING THROUGH PARTNERSHIP**

The Joint Qatari-Japanese

Energy Forum

September 2010

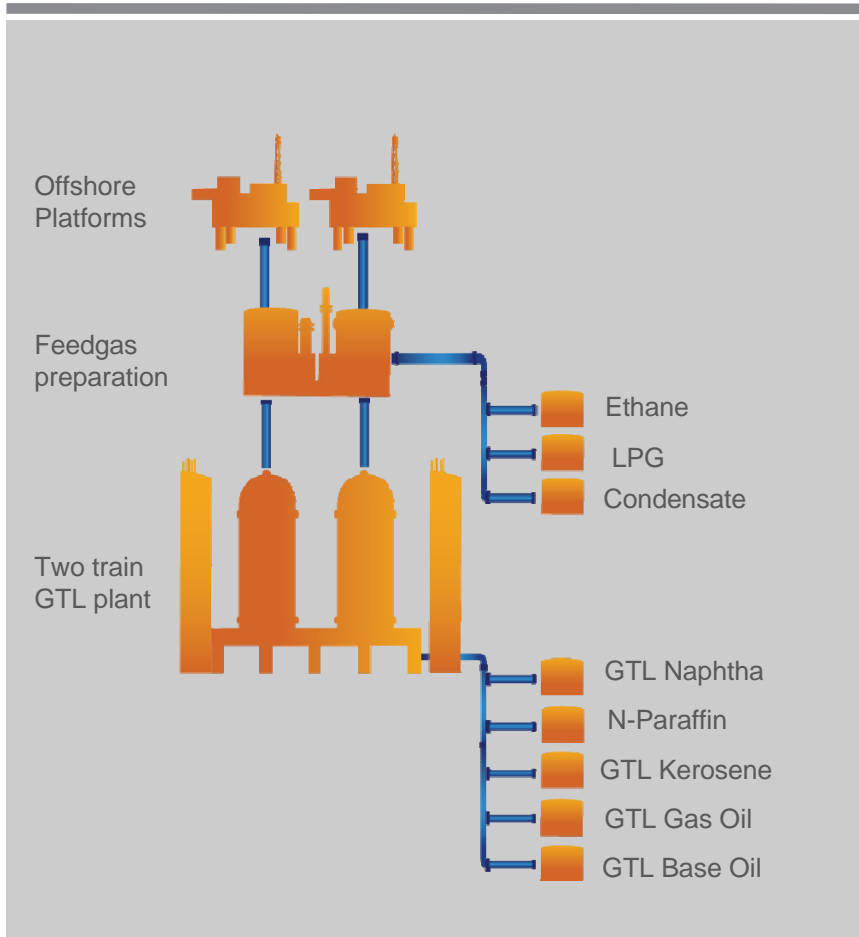


Andy Brown  
Executive Vice President

# QATAR – A GREAT PLACE TO INVEST – \$0 TO \$20BLN IN 5 YEARS



# PEARL GTL INTEGRATED GAS TO LIQUIDS PROJECT



- 1.6 Bcf/d of wet gas: 260kbbbl/d of products
  - 120 kbbbl/d NGLs/ethane
  - 140 kbbbl/d GTL products
- Major construction complete Q4 2010
- 2011 start up – 2012 full production
- ~\$18-\$19 billion development cost \*
- Profit sharing contract
- 100% Shell in partnership with Qatar Petroleum

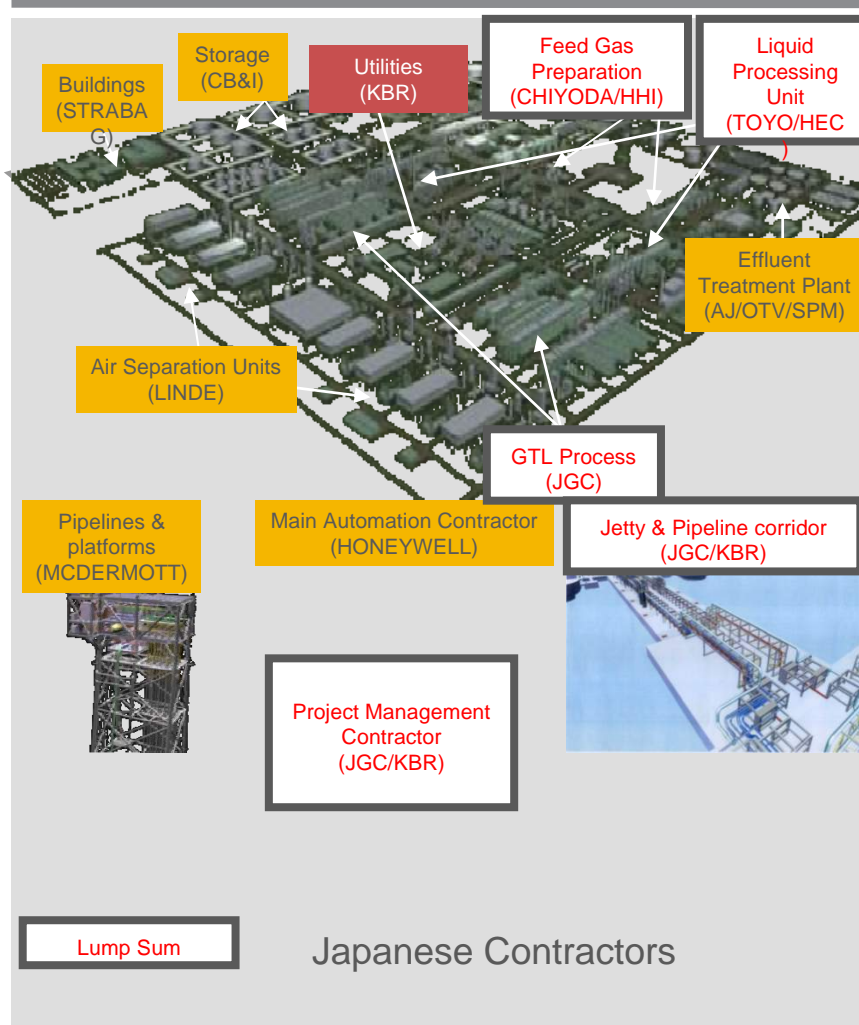
Full integration from offshore to refined products

# PEARL GTL – THE WORLD'S LARGEST OIL AND GAS CONSTRUCTION SITE



# PEARL GTL CONTRACT PARTNERS – JAPANESE ROLE

## CONTRACTOR OVERVIEW



- 50,000 workers at peak
- Unique project scale + operating environment
- Multiple lump-sum contractors
- Shell & Project Management Contractor (PMC)
- Japanese contractors involved in >50% of



## C6G – GAS TO LIQUIDS MAIN PROCESS

- GTL is constructed by JGC under an Reimbursable EPCM Contract
- GTL process plant convert natural gas and oxygen into GTL waxes, it houses 24 of the largest reactors on site, weighing 1200 tonnes each.
- Total forecasted numbers:
  - Concrete: 110,000 m<sup>3</sup>
  - Steel & Pipe: 77,000 tonnes
  - E/I cabling: 1,600km
- Spent over 1.9 million hrs in home office and 92 million hrs on site
- HSSE record of 40 million hours without an
- Lost Time Incident



## C4 – FEED GAS PROCESSING (FGP)

- FGP is constructed by CHC (Chiyoda / HHI Consortium) under a Lump Sum Contract
- Total forecasted number:
  - Concrete: 101,000 m<sup>3</sup>
  - Steel & Pipe: 44,000 tonnes
  - E/I cabling: 3,300km
- Spent over 2.3 million home office hours and 49 million hrs construction
- HSSE record of 23 million manhours without an Lost Time Incident,



## C5 – LIQUID PROCESSING UNIT (LPU)

- LPU is constructed by THC (Toyo/ Hyundai E&C) under a Lump Sum Contract
- LPU is the plant's refinery converting GTL wax to finished products, with one of the world's largest hydrocrackers and steam methane reformers
- Total forecasted number:
  - Concrete: 36,000 m<sup>3</sup>
  - Steel & Pipe: 36,000 tonnes
  - E/I cabling: 1,500 km
- Spent over 1.7 million home office hours and 35 million hrs construction
- HSSE record of 24 million hours without an Lost Time Incident





# TEAMWORK AT LEADERSHIP LEVEL

## ONE PROJECT – ONE TEAM

- Leadership commitments reaffirmed at regular CEO summits – five held so far
- Forging a “One Project – One Team” mindset
- CEOs reinforced their commitment to
  - Safety and welfare
  - Productivity
  - Cooperation and quality in finishing



Pearl GTL CEO Summit – June 2010

## COMMITMENT CHARTERS

**Pearl GTL Project**  
Incident & Injury Free

**Our Commitments**

**Shell/JK Commitment**

- We will ensure that all activities are conducted in a safe and sound manner.
- We will ensure that all activities are conducted in a safe and sound manner.
- We will ensure that all activities are conducted in a safe and sound manner.

**Contractors Commitment**

- We will ensure that all activities are conducted in a safe and sound manner.
- We will ensure that all activities are conducted in a safe and sound manner.
- We will ensure that all activities are conducted in a safe and sound manner.

*(The charters contain extensive text and are heavily annotated with handwritten signatures and notes.)*

**Pearl GTL Productivity Charter**

Higher productivity is to our mutual benefit. Improvement of productivity requires our mutual efforts.

**Contractors will:**

- Improve productivity by...
- Improve productivity by...
- Improve productivity by...

**Shell/JK will:**

- Provide...
- Provide...
- Provide...

*(The charters contain extensive text and are heavily annotated with handwritten signatures and notes.)*

**Pearl GTL Project**  
Co-operation Statement

In support of "One Project, One Team" we commit to look for and act on opportunities to co-operate, create synergies and share ideas and resources to ensure the entire Pearl GTL Project is an outstanding success for everyone.

**Shell / JK Commitment:**

- To share more planning data, especially resources in 2009.
- Directive and supportive on interface management.
- Push commissioning resources.
- Establish an alignment framework (push out hot items First First).
- Promote Best Practice / Cross Verification (and go on site to share).
- Identify shared resources (use to be identified the right solution).
- Help create a framework (contractual / legal) where IC can co-operate with IC and provide a stronger framework for resource sharing and where necessary establish benchmark prices.

**Contractors' Commitment:**

- To align own planning against the agreed plan.
- Ensure how these resources can be jointly utilized.
- Participate in discussions around the alignment framework.
- To actively participate in the practice sharing and cross verification work.
- To ensure resources against the agreed resource program.
- To make spare resources available to other IC's and rigging teams.

**One Project - One Team**

*(The charters contain extensive text and are heavily annotated with handwritten signatures and notes.)*

# IMPROVING WELFARE IN PARTNERSHIP WITH QP BUILDING A COMMUNITY – DELIVERING PERFORMANCE



## Focus on Safety & Welfare

Pearl Village – 40,000 workers

Training Centre – 200,000 courses

Recreation, culture, well being

World class safety – 77 mln hrs LTI free



# PEARL GTL PRODUCTS OVERVIEW

## PRODUCT SLATE

NGLs + Ethane	Ethane (~30kboe/d)
	LPG (~30kbbbl/d)
	Condensate (~60 kbbbl/d)
GTL	Naphtha and Normal Paraffin (~35 kbbbl/d)
	Kerosene (~25 kbbbl/d)
	Gasoil (~50 kbbbl/d)
	Base Oil (~30 kbbbl/d)

## END PRODUCTS

Chemicals and detergent feedstock
Jet Fuel
Diesel
Finished Lubricants

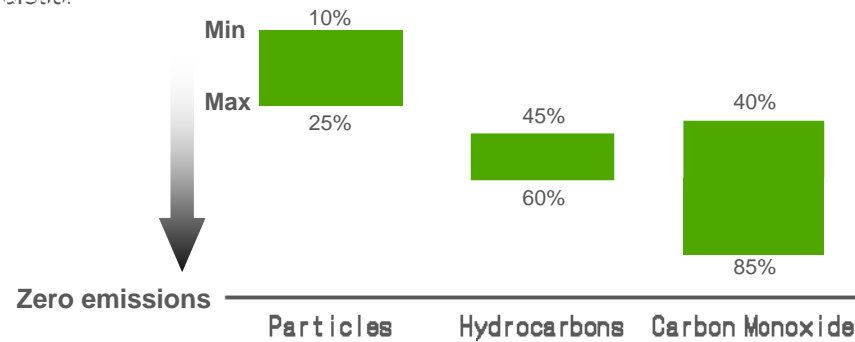
## MARKET



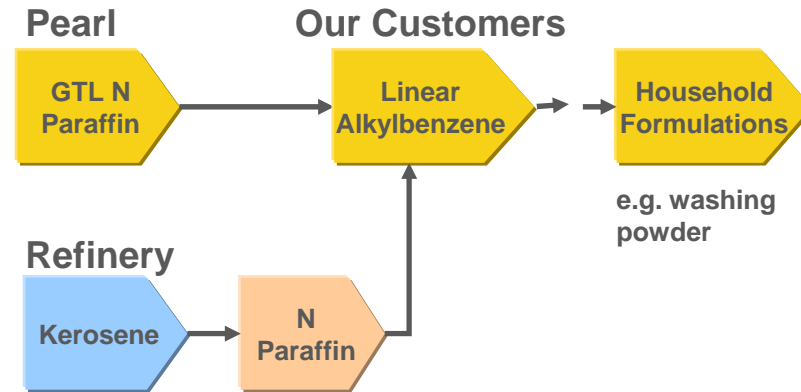
# GTL PRODUCTS ADVANTAGE

## CLEANER BURNING + SMOKELESS GTL FUELS

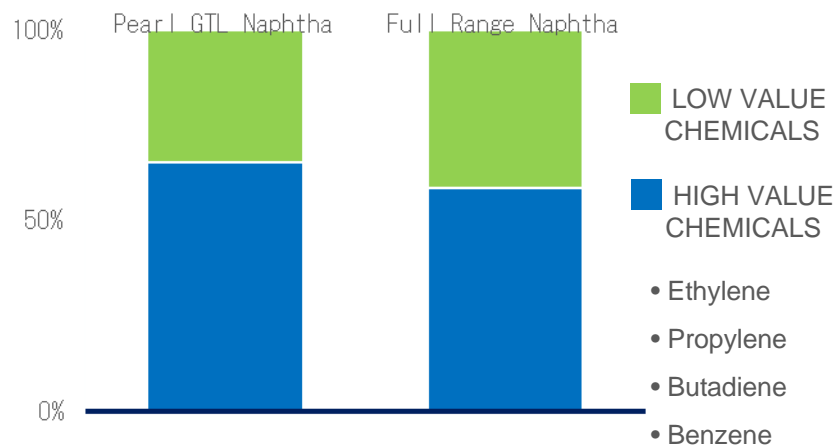
Emissions improvement range for light duty diesel engines vs. refinery diesel!



## GTL N-PARAFFIN: A COST EFFECTIVE FEEDSTOCK



## HIGHER VALUE NAPHTHA FEEDSTOCK



- GTL Fuels Cleaner Burning
- GTL N-Paraffin cost effective detergent feedstock generates premium over Kerosene
- GTL Naphtha is a higher value feedstock for chemical manufacturing

# IN MARKET PARTNERSHIP - SYNTHETIC FUEL IN TOKYO

(MOU signed between TMG, Toyota-Hino, Showa Shell & Shell on Nov 2008)



- Successful field demonstration of GTL with Hybrid buses used for public transportation services (Toei Buses) in 2009
- Local emissions benefits
- Particulate trap stress reduction
- Noise benefits on transition between electric and engine
- Semi-optimised engine
- Ease of refuelling, lower odour and better touch

Currently expanding the use of Synthetic Fuel\* in other Toei Buses with conventional engine (July 2010).

\*Synthetic Fuel is a blend of GTL & HVO fuels.

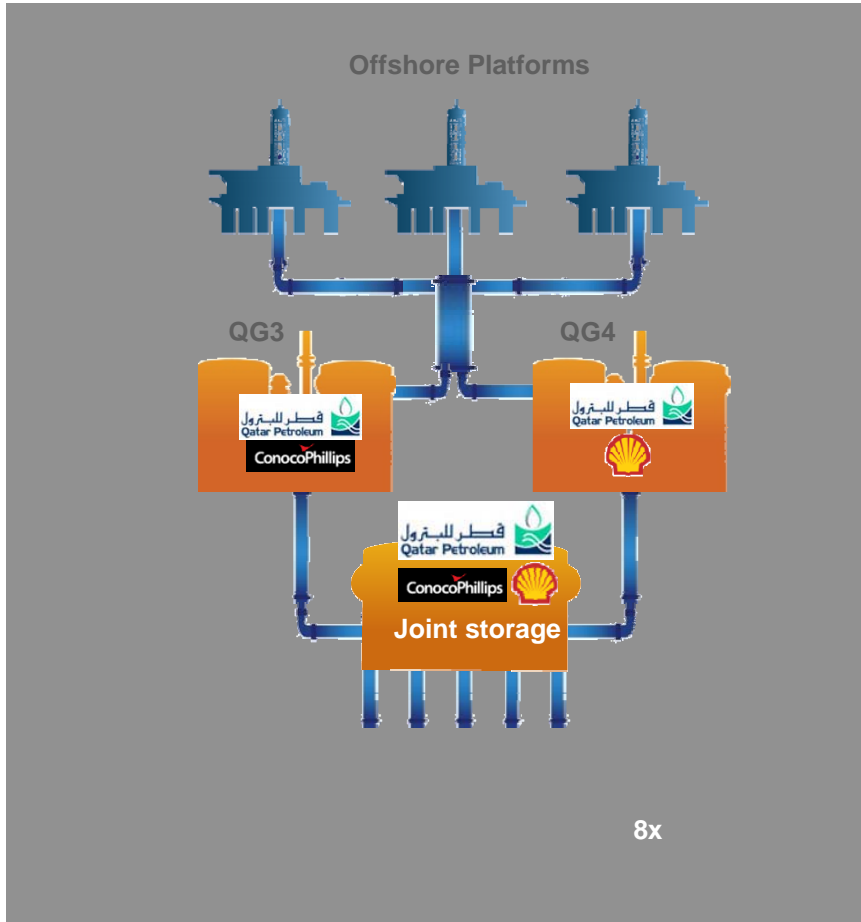


**TOYOTA** Royal Dutch Shell Plc



**TOKYO  
METROPOLITAN  
GOVERNMENT**

# QATARGAS 4



1.4 Bcf/day Wet gas : ~280 kboe/d

- 7.8 mtpa LNG
- ~70 kbb/d NGLs/Ethane

Construction complete Q4 2010

2011 ramp-up

~\$2 billion development cost\*

Tax & royalty contract

30% Shell, 70% Qatar Petroleum

Full integration from offshore to LNG offtake

# WORKING IN PARTNERSHIP WITH QATARGAS



## Joint Asset Development Team

- 40 Shell secondees supplementing Qatargas capabilities



## Helping Qatargas Operating Company

- COO Operations
- Maintenance Manager
- Engineering Manager
- Terminal Manager
- > 30 secondees



## Nakilat

- Qatar Gas Transport company
- 25 LNG Tankers under Shell operational management
- 1200 Officers and crew recruited and trained



## SPA Delivery

- Dubai
- China
- Further opportunities

Pictures by courtesy of Qatargas

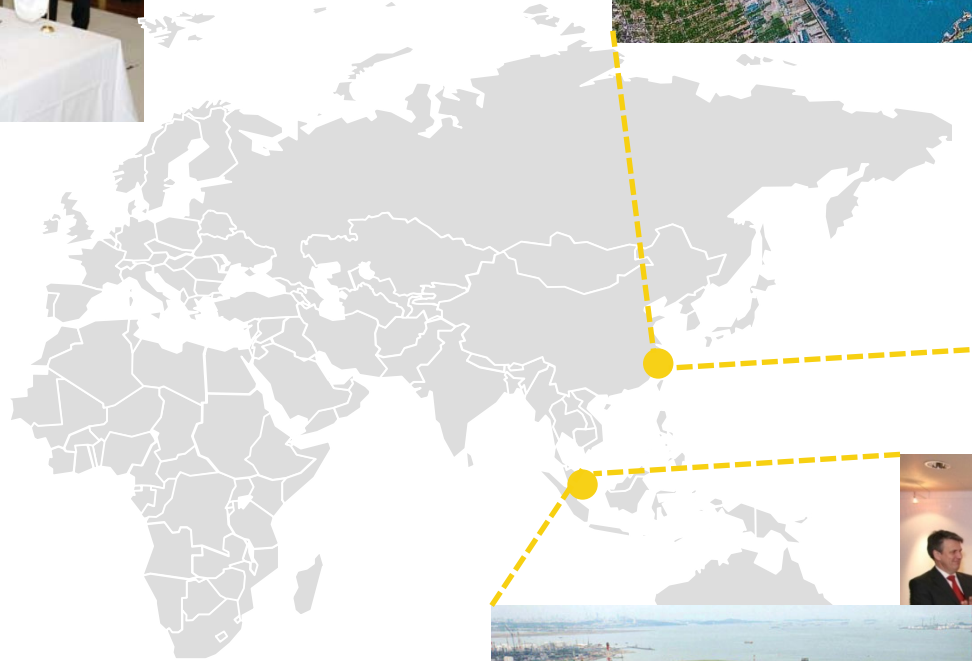
# QATAR (QPI) & SHELL TAKING THE PARTNERSHIP GLOBALLY...



MOU signing,  
June 2007



Proposed  
complex, China



Nov 2009



# SHELL IN QATAR - A STRONG & LASTING PARTNERSHIP WITH QP



Pearl GTL - DPSA signing – Jul 2004



Pearl GTL – Stone Laying – Feb 2007



Minister in London – May 2010



QSRTC Inauguration – Apr 2009



QPI/Shell Petrochemical JV – Nov 2009



H.E. Abdulla bin Hamad Al-Attiyah & delegation – Visit to The Hague – Jun 2009



May 2010 - House of Lords

May 2010 - Block D - Signing



Abdulla Salatt Rig Visit – Jun 2009



First commercial flight on GTL fuel – Oct 2009



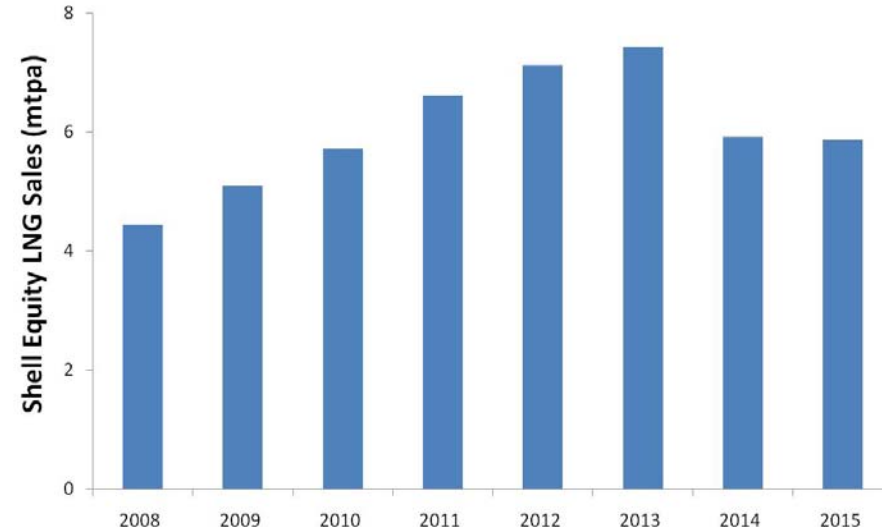
Pearl GTL - Start of Commissioning – Oct 2009

# SHELL PARTNERSHIP IN GLOBAL LNG – JAPAN

## SHELL GLOBAL LNG PORTFOLIO



## SHELL EQUITY LNG SALES: JAPAN

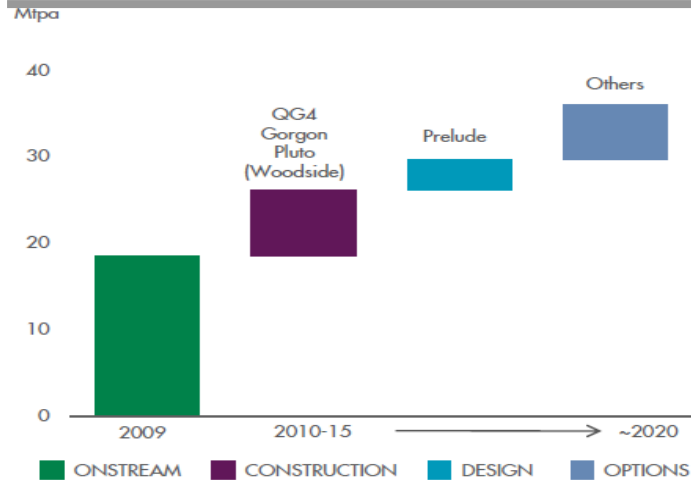


Source: Woodmac (Long term sales only)

## HIGHLIGHTS: JAPAN

- Shell equity LNG accounts for 8 to 9% of the current Japanese imports

## SHELL EQUITY LNG GROWTH



# GAS AFFORDABILITY ATTRACTIVE ECONOMICS FOR ELECTRICITY PRODUCERS

Gas plants more energy efficient than coal plants

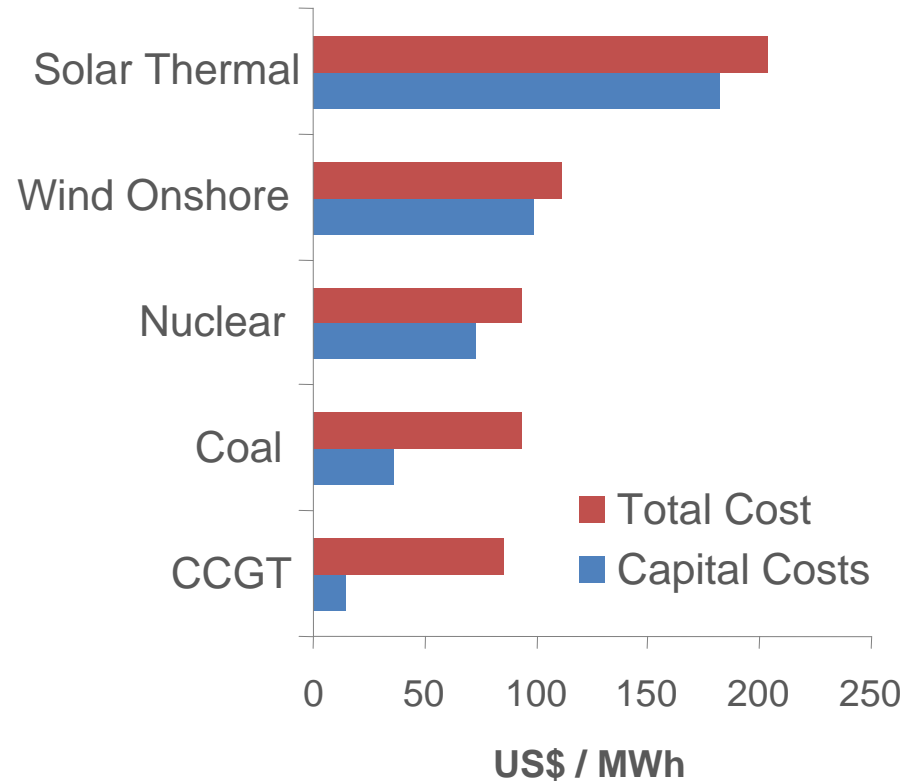
- 55-60% vs. 34-42%

Gas has much lower capital costs per MW installed:

- 50% of coal
- 20% of nuclear
- 15% of wind

key for cash-strapped economies!

Total cost for gas is the cheapest



Price Assumptions:  
 Gas - \$8/MMBtu  
 Coal: \$60/t  
 CO<sub>2</sub>: \$40/t

CCGT: Combined Cycle Gas Turbine  
 Total Cost = Capital + Fuel + Operating

# GAS - ENVIRONMENTAL ACCEPTABILITY

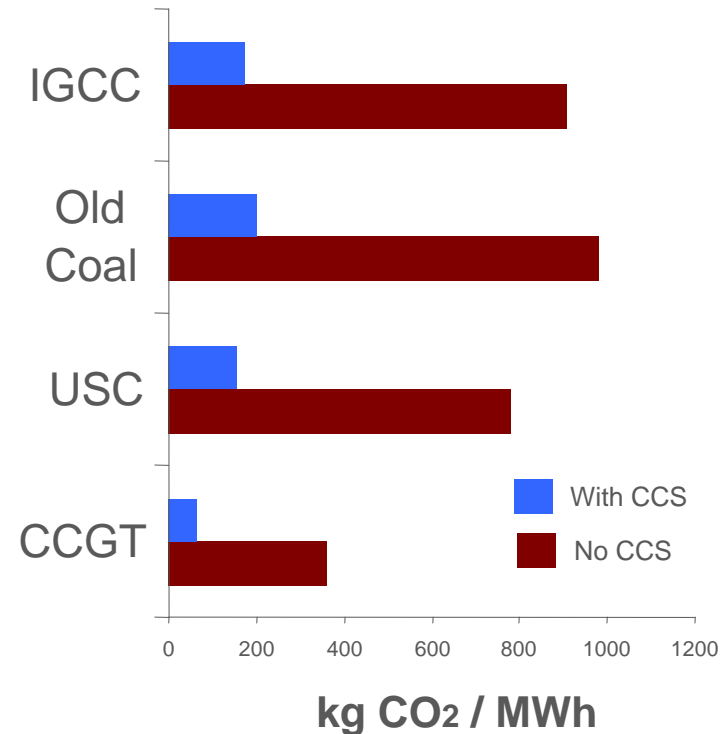
Gas is the cleanest-burning fossil fuel

Gas plants emit:

- 50% less CO<sub>2</sub> than a modern coal plant
- 60-70% less CO<sub>2</sub> than an old coal plant

There are still hundreds of old coal plants in operation today

Gas CCS cost  $\leq$  coal per MWh



IGCC: Integrated Gasification Combined Cycle

Coal

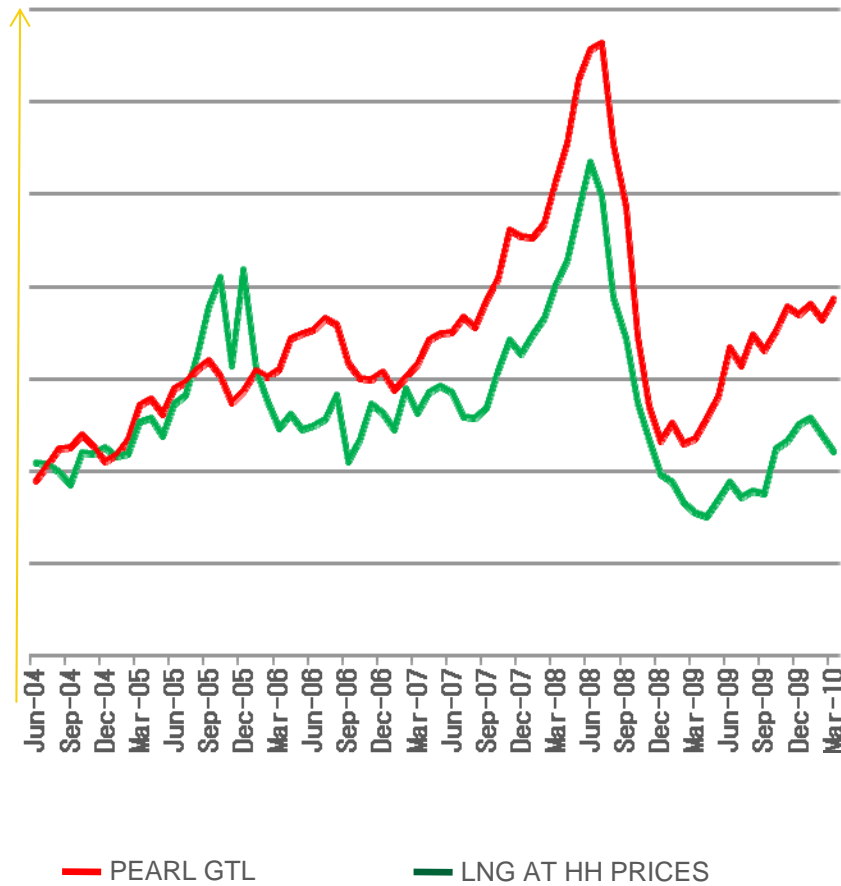
USC: Ultra Super Critical Coal

CCGT: Combined Cycle Gas Turbine

Source: Shell Internal Analysis

# GTL AN ALTERNATIVE BENEFITING RESOURCE HOLDER AND CONSUMER

## GTL AND LNG FINANCIAL PERFORMANCE



- Qatari Government wise decision to invest in GTL production
- GTL provides Qatar with a natural hedge to gas markets





