



# LNG glut: what's happening?

Gas market update & asset value implications

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# LNG supply glut: illusion or reality?

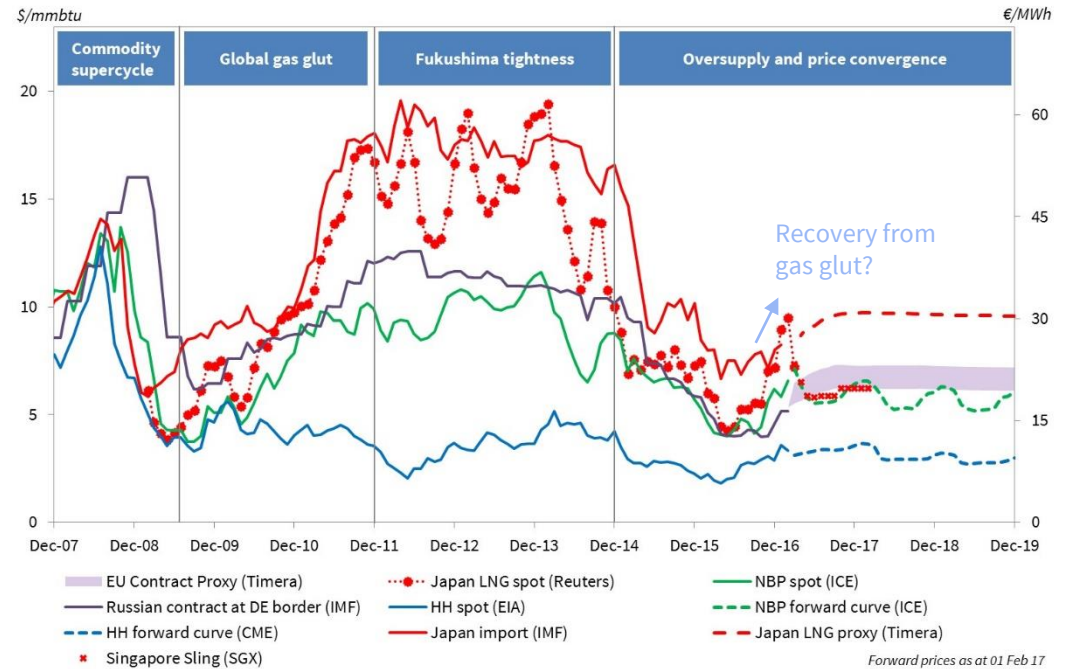
2016 saw a cyclical trough & global rally in the price of hydrocarbons (oil, coal, gas).

Gas was late to the party, but prices recovered sharply in Q4 2016. So did LNG demand in China & India.

So is the global supply glut just an illusion?

5 factors should determine the answer:

1. Asian demand recovery
2. Timing & volume of new supply
3. Coal prices
4. Role of the US gas market & exports
5. Russian market share response



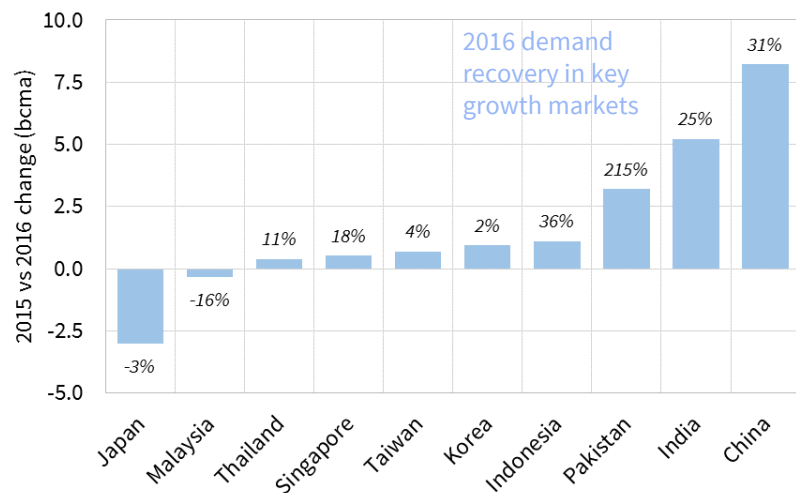
*Evolution of global gas price benchmarks*

Source: Timera Energy

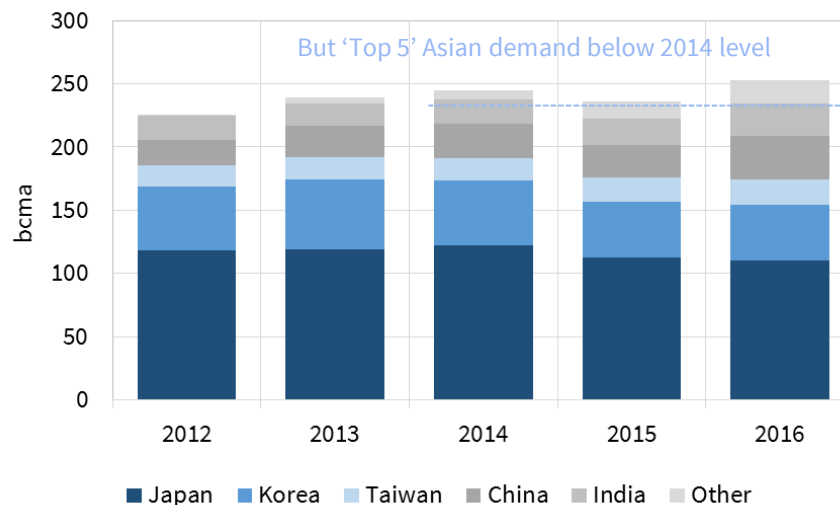
# Is Asian LNG demand making a recovery?

Asian LNG demand increased by 17 bcma [13 mtpa] in 2016, a 7.2% rise. This was led by growth in China, India and Pakistan (cold winter in China, temporary subsidies in India, demand in Pakistan unmet by domestic production). But aggregate 2016 demand from the 'top 5' Asian buyers (Japan, Korea, Taiwan, China & India) was still below 2014 levels.

Was 2016 a turning point for Asian LNG demand? Recovery in key markets was positive (e.g. China & India). But we are watching for further evidence of structural displacement of coal in power, industrial & space heating sectors.



Asian LNG demand in key markets (2015 vs 2016)



Evolution of Asian LNG demand

Source: Timera Energy

# Progress up the mountain of new LNG supply

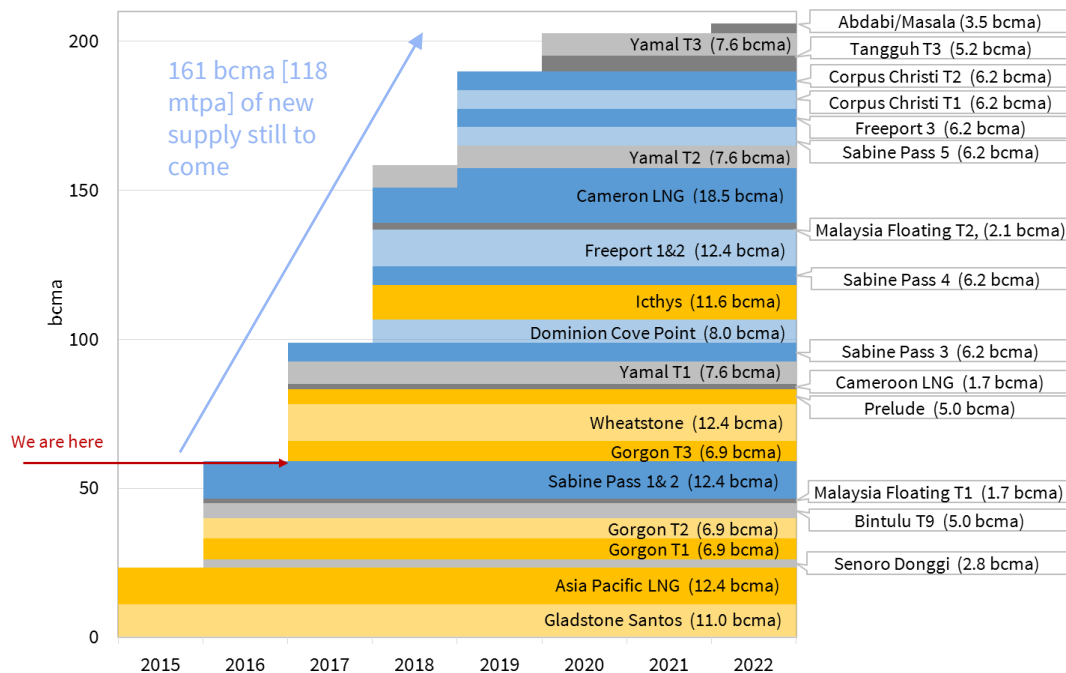
19 bcma [14 mtpa] of new liquefaction capacity came online in 2016 (6% increase in global LNG supply).

But outages, delays and commissioning problems and the normal 6-9 month ramp-up time, dulled impact of new supply.

There were also supply disruptions from existing producers (Angola, Egypt, Yemen)

14 bcma [10 mtpa] of new supply is scheduled to flow first gas in 2017 (e.g. Gorgon T3, Wheatstone, Sabine Pass T3, Yamal T1).

A net total of 161 bcma [118 mtpa] of committed new supply is still to come online between 2017-21, a further 46% increase in global supply.



Global LNG liquefaction capacity past FID

Source: Timera Energy

# European gas/coal switching now a reality

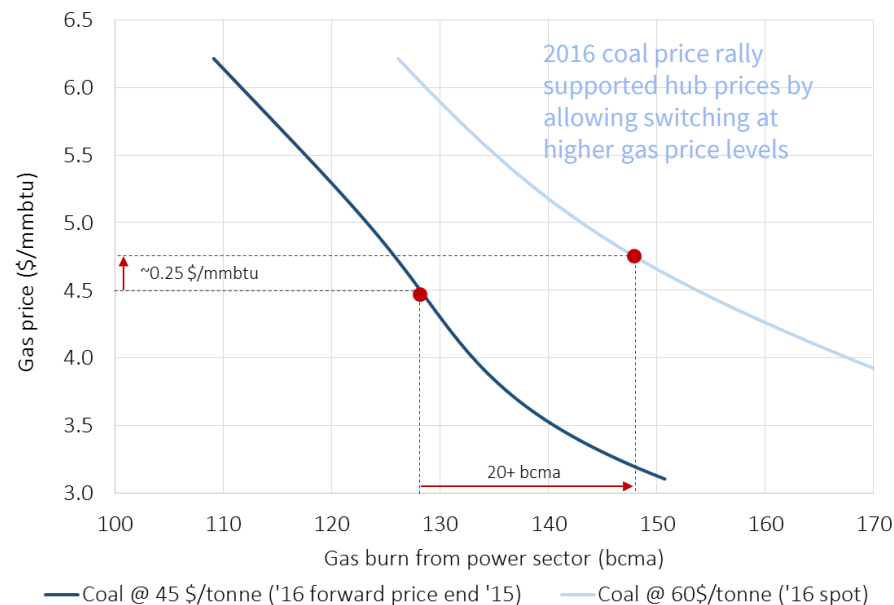
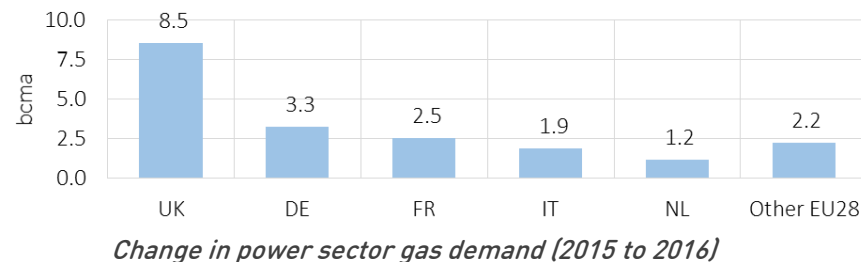
European gas demand rose 27 bcma in 2016 (5.4%). 20 bcma of this was driven by higher power sector demand.

Gas for coal switching was the key driver behind higher demand. More than 40% of incremental gas demand came from the UK (a consequence of the UK carbon price floor).

Coal prices doubled between Q1 and Q4 2016. This increased the gas price levels at which switching took place, providing key support for European hub prices.

European switching is currently the primary mechanism for absorbing surplus global LNG but .

Watch coal prices and power sector demand closely in 2017 as a driver of (i) European hub prices (ii) spot LNG prices (see relationship in bottom chart).



2016 European power sector gas demand curves Source: Timera Energy

# US gas market reconnects

US exports commenced in 2016, but are so far limited to Sabine Pass T1 & T2. Only 4.2 bcma [3 mtpa] exported in 2016 due to delays & outages.

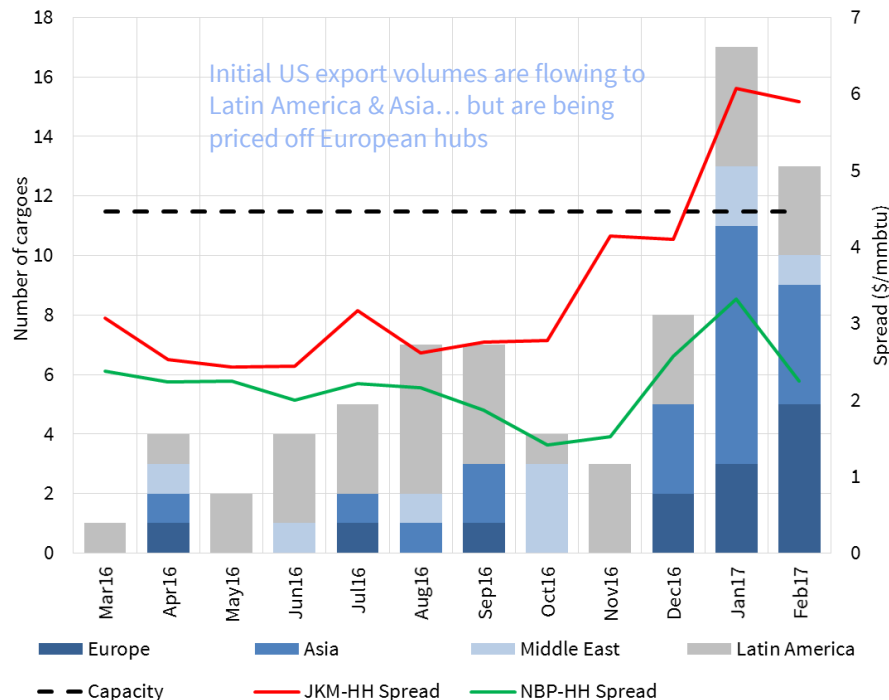
Europe has received low volumes to date (12% to end Jan 2017), with Latin America the dominant cargo destination (47%).

But US export volumes are being priced and hedged based on European hub price signals.

A total of 89 bcma [65 mtpa] of committed new US export supply is due online by 2021, most in 2018/19.

As US export volumes grow, significant volumes are likely to land in Europe, or to displace cargoes that flow to Europe from elsewhere.

Watch for increasing influence of Henry Hub price signal on global gas prices as US exports rise.



US export cargoes by destination

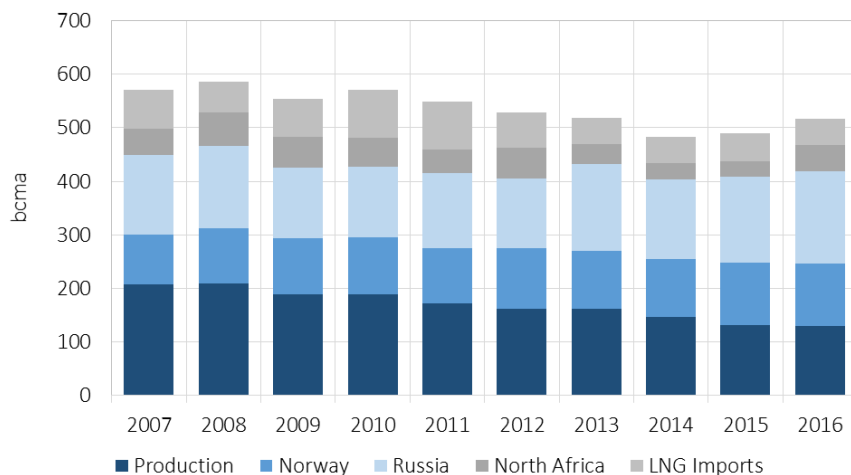
Source: Timera Energy

# European supply sources: LNG vs Russian imports

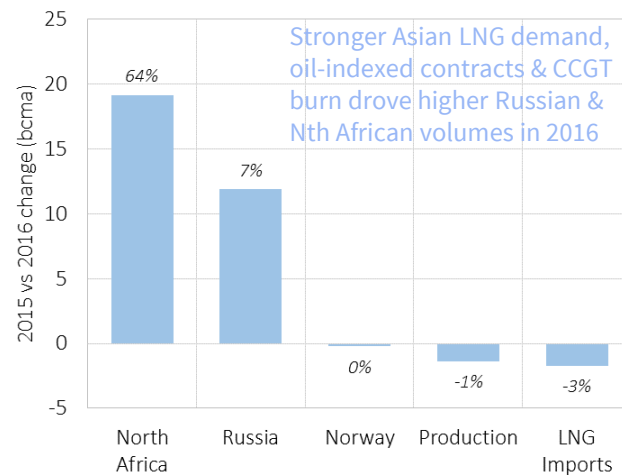
2016 saw lower than expected European LNG imports given (i) strong Asian and Middle East demand & (ii) LNG project delays/outages.

Russia and North Africa filled the gap. But increase in Russian volumes was primarily driven by supplier contract nominations not Gazprom flow decisions. Strong Q4 2016 Russian volumes driven by lagged oil indexed contract prices falling below hub prices.

Extent of (i) surplus LNG & (ii) oil price recovery, will strongly influence Russia's market share ambitions going forward.



Evolution of European supply



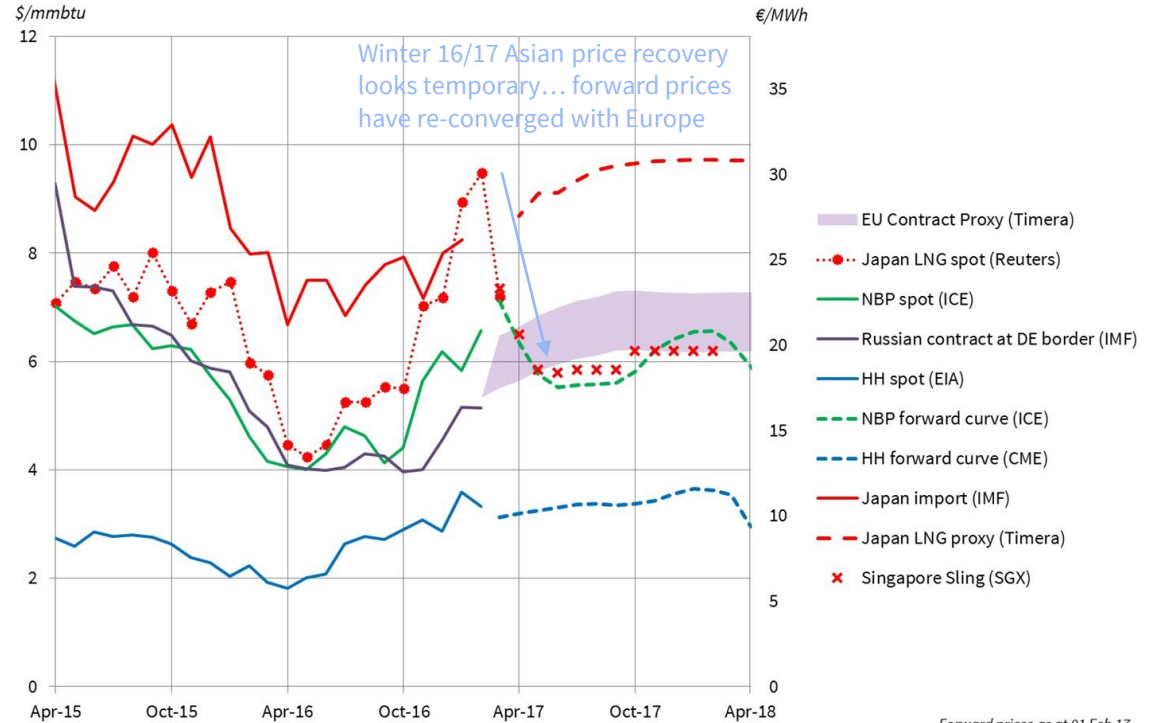
Change in supply (2015 vs 2016)

Source: Timera Energy



# Key factors to watch in 2017

1. **Asian demand:** ongoing recovery & displacement of coal? Watch Europe vs Asia spot price spread as 'glut barometer 1'
  2. **New supply:** further slippage/outages?
  3. **Coal prices:** European hub price levels linked to coal prices via switching
  4. **US market:** Watch US vs European hub price spread as a 'glut barometer 2'
  5. **Russia:** Maintain market share? Likely to depend on LNG surplus & oil prices
- Winter 16/17 price jump is consistent with inherent volatility from LNG supply chain.
  - Forward market pricing points to glut conditions reasserting in 2017.



Evolution of global gas price benchmarks

Source: Timera Energy

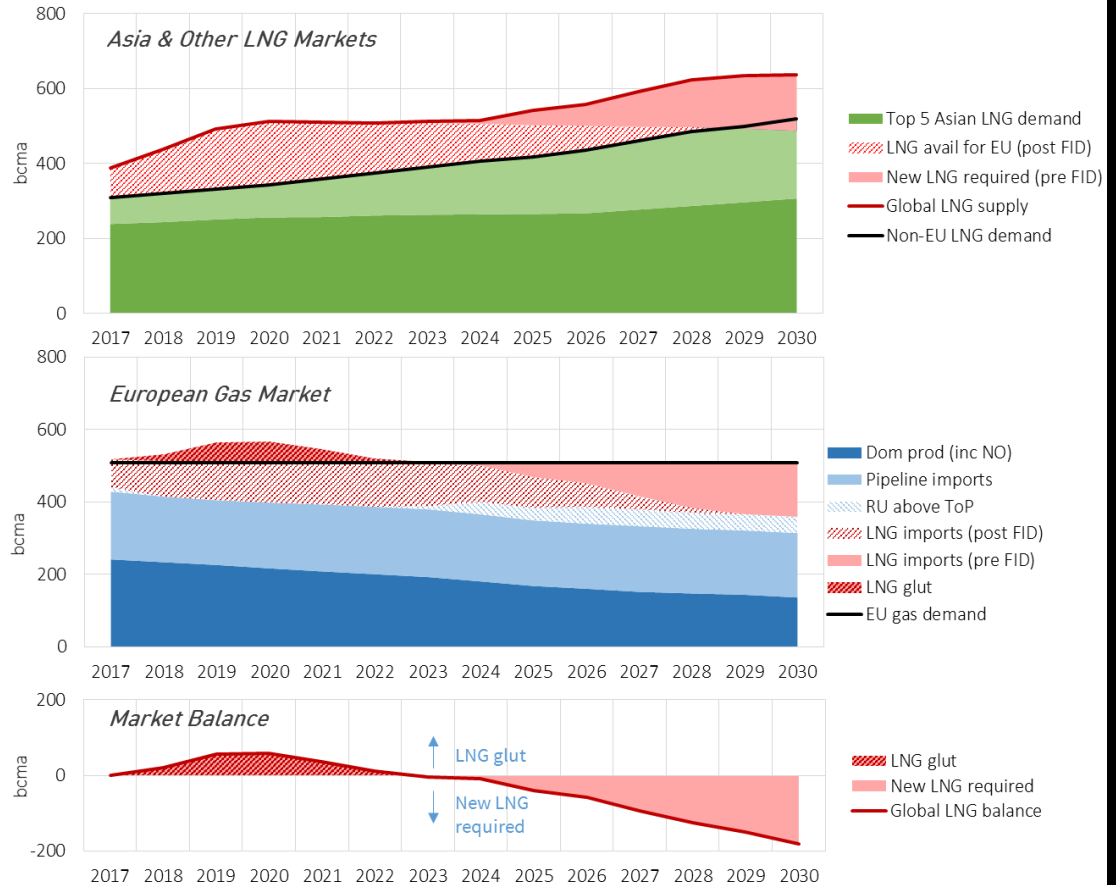
# Global supply & demand: what has changed?

Evidence to date points to moderate (rather than rapid) Asian demand recovery. This is the biggest driver of glut resolution.

100 bcma of 'shut in' Russian gas remains a competitive threat to new LNG in early 2020s. But the need to utilise this will likely be reduced by new LNG supply. Early FID decisions (e.g. 'wave 2' US exports) may displace this Russian gas in Europe.

The global supply glut remains a reality. But as we set out in 2016, it is a 5 year not a 10 year phenomenon.

Importantly, FIDs on new LNG supply are required this decade to avoid a tight market in 2020s, given 5 year delivery lead times.



*Illustrative scenario of global LNG balance evolution*

Source: Timera Energy

# Path to price recovery

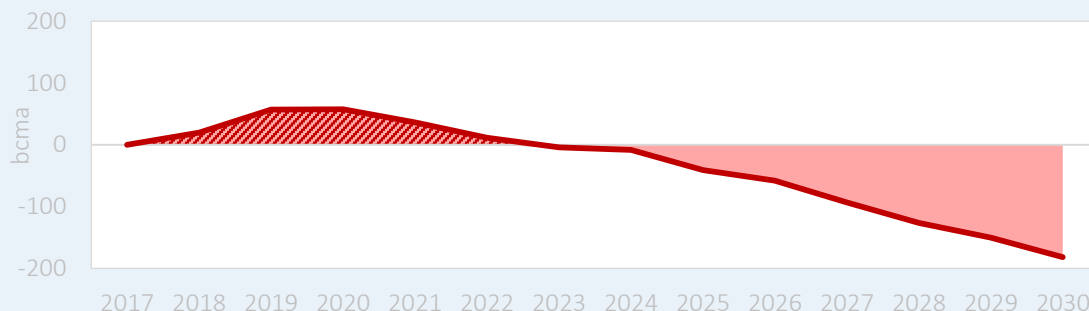
Global gas prices looked to have bottomed in 2016 alongside coal & oil.

But the LNG supply glut is likely to drive further Asian/European convergence towards US Henry Hub prices.

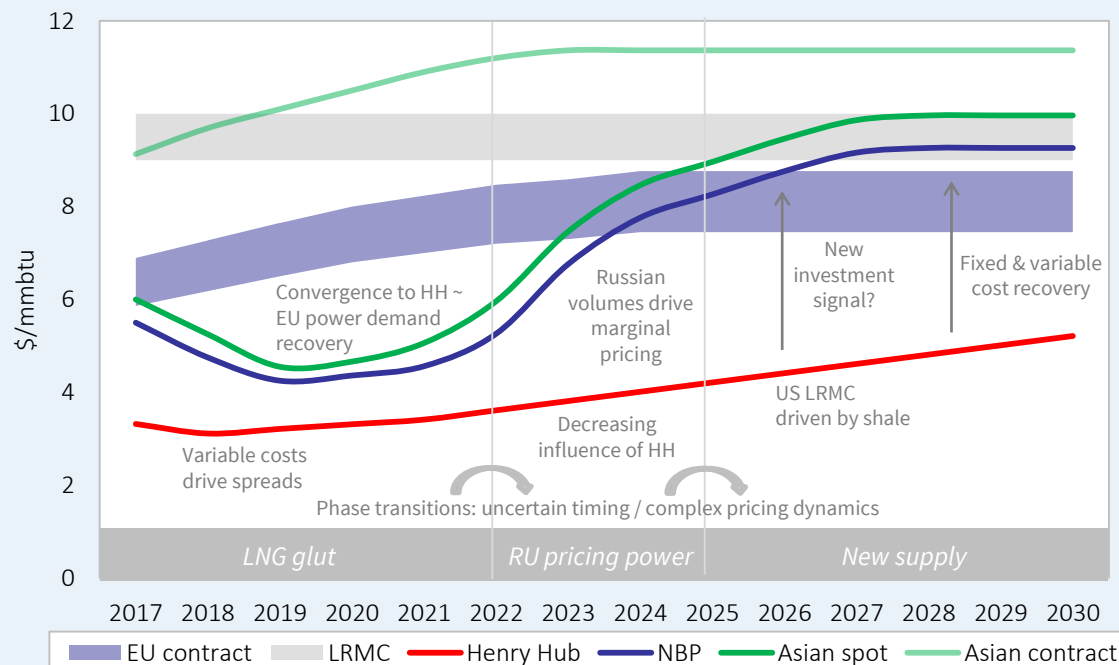
Short term regional price volatility will remain, given inherent delays in LNG supply chain response (e.g. Winter 16/17).

Long term contract dominance to be eroded by maturing hubs & growth in LNG spot market liquidity.

Price recovery into next decade is set to be driven by transition from SRMC to LRM based price signals.



*Market Balance*



*Illustrative scenario of 3 phases of price recovery*

Source: Timera Energy

Further details: <http://www.timera-energy.com/content/uploads/2016/10/Timera-path-to-recovery-101016.pdf>

# 1. Value view: upstream & midstream LNG assets

## Upstream assets

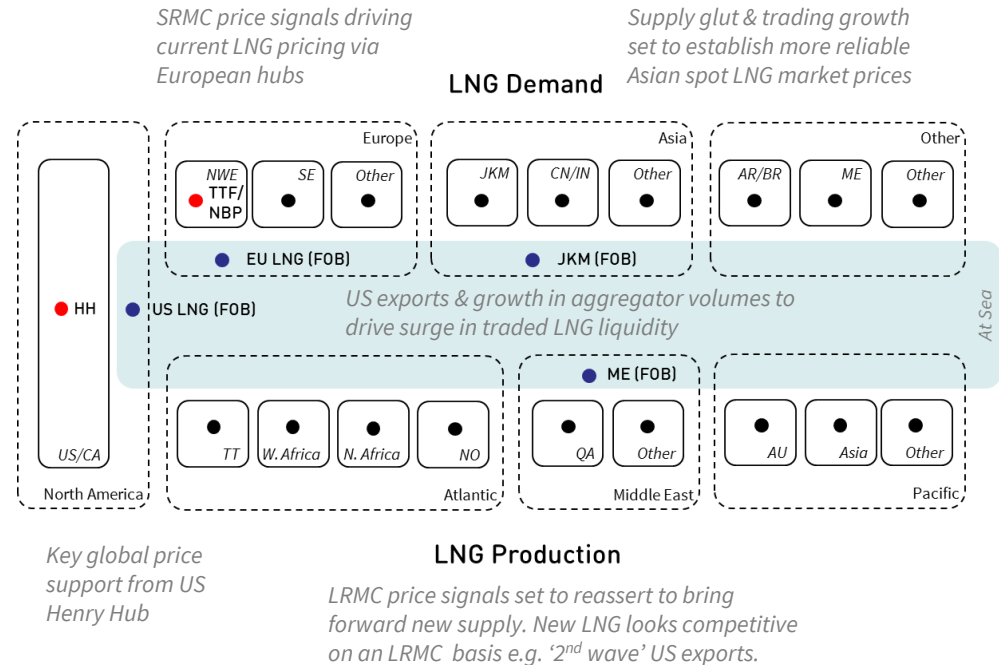
**Market drivers:** LNG glut temporarily depressing global gas prices. But new supply needed in 2020s. US gas market (HH) provides downside price support.

**Value opportunity:** Buy distressed upstream gas equity or supply at SRMC driven prices, before LRMC driven price dynamics reassert.

## LNG midstream flex

**Market drivers:** Midstream flex value depressed by glut, but inherent LNG market volatility remains. US exports to drive surge in traded LNG liquidity.

**Value opportunity:** Buy well located flex midstream LNG supply chain assets, to service growth in LNG trading and recovery in spot price volatility.



Nodal map of LNG market & evolution dynamics

Source: Timera Energy

## 2. Value view: regas terminal & pipeline assets

### European regas terminals

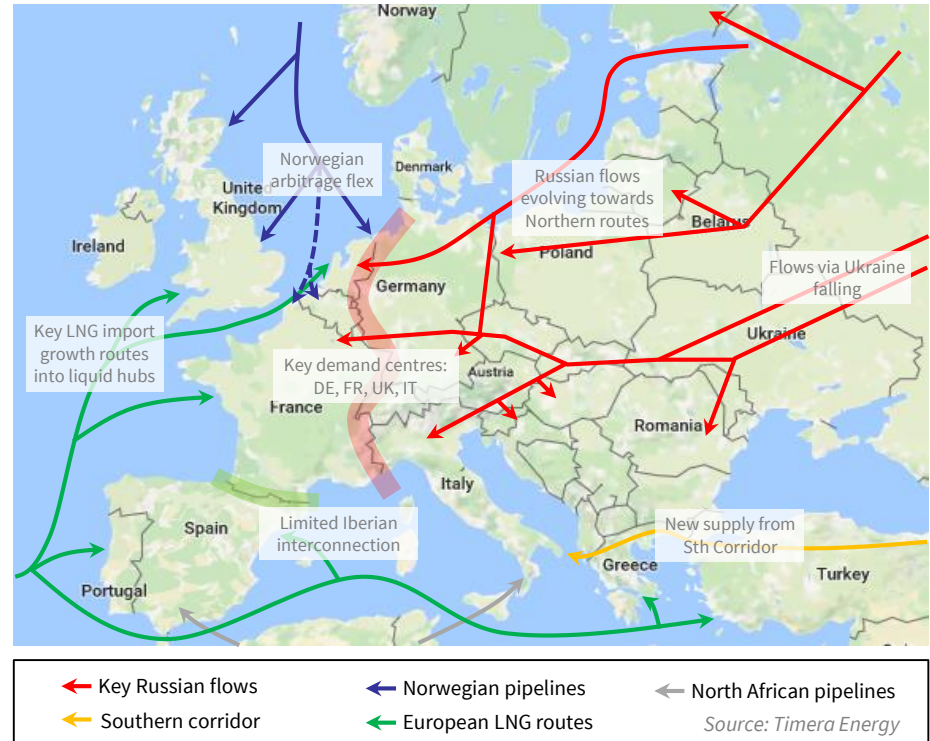
Market drivers: Structural rise in LNG imports as domestic production declines and US exports grow. LNG competitive vs Russia on a LRMC & SRMC basis.

Value opportunity: Buy regas terminal equity or capacity at prices that reflect recent low utilisation, with a view to imminent glut driven value recovery.

### European pipelines

Market drivers: European flows to structurally change as (i) LNG imports replace domestic production (ii) Russia gas routing shifts & (iii) Sth Corridor gas enters.

Value opportunity: Divergent views on future flows, routes & supply mix create value opportunities. Key to map supplier needs onto different supply sources.



European gas flows: key routes and the battle for market share

### 3. Value view: storage & gas-fired power assets

#### European gas storage

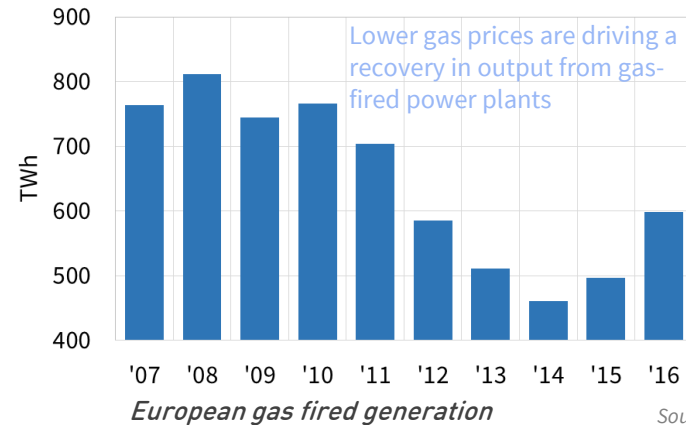
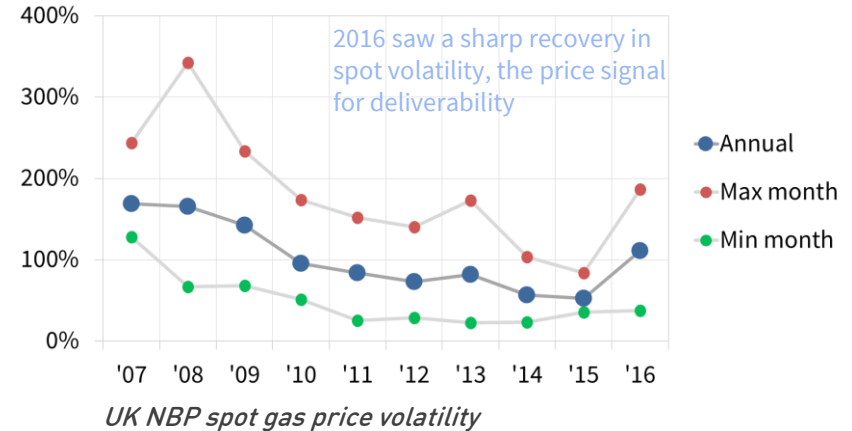
Market drivers: Europe needs gas deliverability not seasonal flex. Cyclical recovery in price volatility began in 2016 & is supported by structural drivers.

Value opportunity: Asymmetric upside return for right storage assets. But this means faster cycling, low variable & fixed costs and access to liquidity.

#### European gas-fired power assets

Market drivers: 2016 CCGT load factor & margin recovery driven by low gas prices vs coal. Structural shift to CCGTs in 2020s as nuclear & coal plant close.

Value opportunity: Buy equity in CCGT assets, with value recovery driven by new capacity payments, lower gas prices and shift to gas in capacity mix.



Source: Timera Energy

# 10 recent Timera Energy credentials

| Project                  | Client     | Summary  |
|--------------------------|------------|--|
| 1. Storage acquisition   | Infra Fund | Commercial advisory & due diligence to support purchase of CEE storage portfolio   |
| 2. Pipeline sale         | Infra Fund | Valuation analysis to support sale of large Central European pipeline transaction  |
| 3. LNG asset investment  | SW Fund    | Analysis of impact of evolving global gas market dynamics on LNG portfolio value   |
| 4. Storage/regas build   | Developer  | Commercial advisor to developer of a UK fast cycle storage & LNG regas project     |
| 5. Pipeline monetisation | Utility    | Advice on capacity sales strategy, product structuring and capacity value          |
| 6. Supply flex value     | PE Fund    | Analysis of gas flexibility value (price spreads, volatility) at European hubs     |
| 7. LNG contract advice   | Producer   | Advice/analysis of pricing & exposure management of LNG supply contracts           |
| 8. CCGT acquisition      | Fund       | Commercial & valuation advice to support acquisition of a CCGT asset               |
| 9. Portfolio management  | Utility    | Commercial & risk management advice on large portfolio of gas & power exposures    |
| 10. LNG supply contract  | Oil major  | Advice/analysis to support restructuring of long term European LNG supply contract |

# Timera Energy offers expertise on value & risk in energy markets

## Specialist energy consultancy

*Focus on LNG and European gas & power assets*

## Extensive industry expertise

*Practical knowledge from senior industry roles*

## Pragmatic commercial focus

*Investment, valuation, contracting & mkt analysis*

## Strong client base

*leading energy companies (producers, utilities, funds)*

## Leading industry blog

*15,000+ regular readers, publications, conferences*

*Our clients include*





# Timera Energy key team members

Our team members have extensive senior industry experience and practical commercial knowledge

## Olly Spinks

*20 years energy industry experience  
Expert in commercial and risk analysis  
Ran BP's gas & power commercial analytics function*

## Howard Rogers

*30+ years gas industry experience (BP, OIES)  
Expert in fundamental analysis of energy markets  
Chairman of Gas Research Programme at OIES*

## Sonia Youd

*25+ years of energy industry experience.  
Expert in gas commercialisation, regulation and trading.  
Commercial Director for Centrica Storage.*

## David Stokes

*20 years energy/commodity market experience  
Expert in value/risk management of flexible assets  
Industry roles with Origin, Williams, JP Morgan*

## Nick Perry

*30+ years industry experience (Amoco, Exxon, Enron)  
Expert in commercial & risk management strategy  
Board level experience (Director Enron Europe)*

## Emilio Viudez-Ruido

*15 years experience in European gas & power markets  
Strong expertise in valuation, hedging & risk analysis  
Expert in deconstruction & analysis of asset exposures*



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