



Global Gas Market

The path to market recovery

Oct 2016

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A major 'bust' is underway in the global gas market

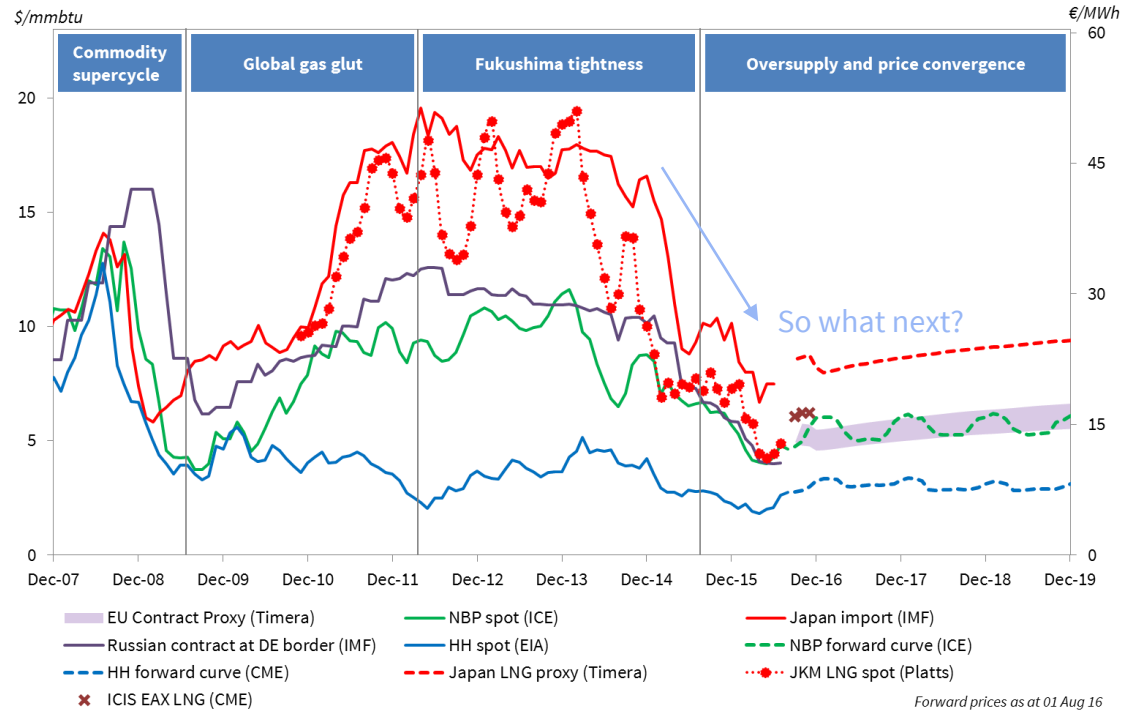
A glut of LNG is bearing down on the global gas market

Asian LNG spot prices have fallen 75% in 2 years

Regional gas prices are converging to variable transport cost differentials

Europe is absorbing surplus LNG, with ultimate support from the US below

But how does the path to recovery look? and could it be sooner than expected?



Evolution of global gas price benchmarks

Source: Timera Energy

The bust has been caused by a mountain of new LNG supply

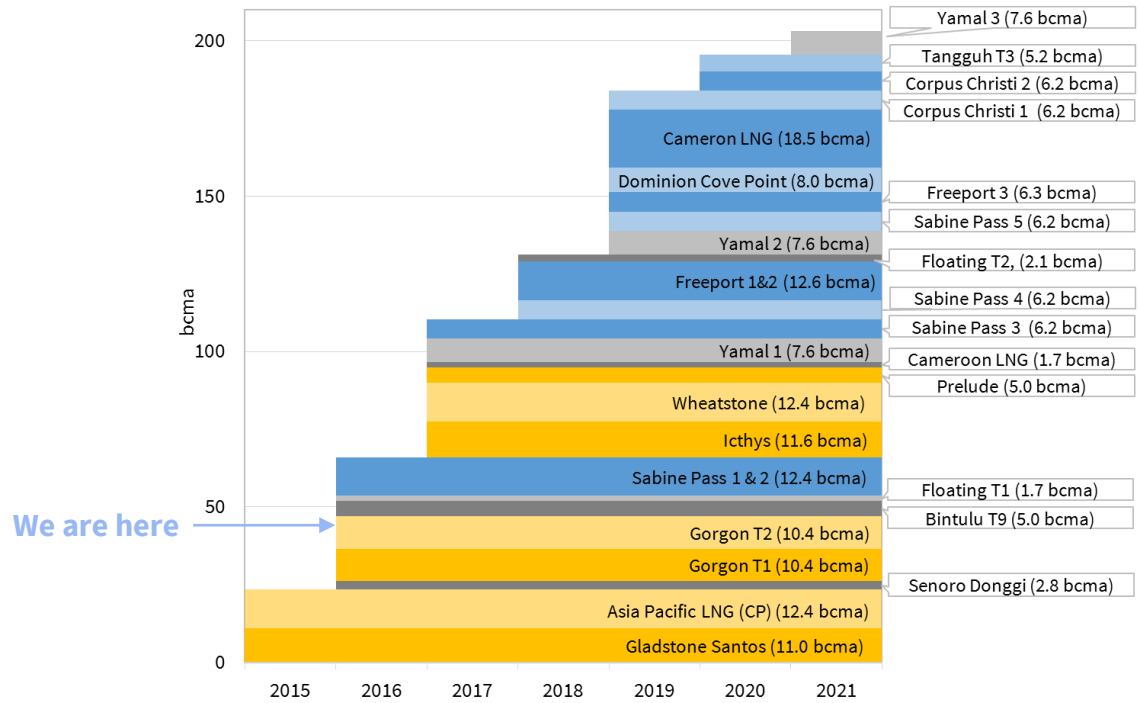
From 2015 205 bcma (149 mtpa) of liquefaction capacity has either been commissioned or is under construction

Only ~30% of this will be commissioned by the end of 2016

Leaving more than 140 bcma (101 mtpa) of capacity to come (2017-20)

New supply is outpacing demand growth, causing a growing global gas glut

But new FIDs have dried up since 2015 and this is creating the conditions for global price recovery



Global LNG liquefaction capacity past FID

Source: Timera Energy

The Result: An LNG glut

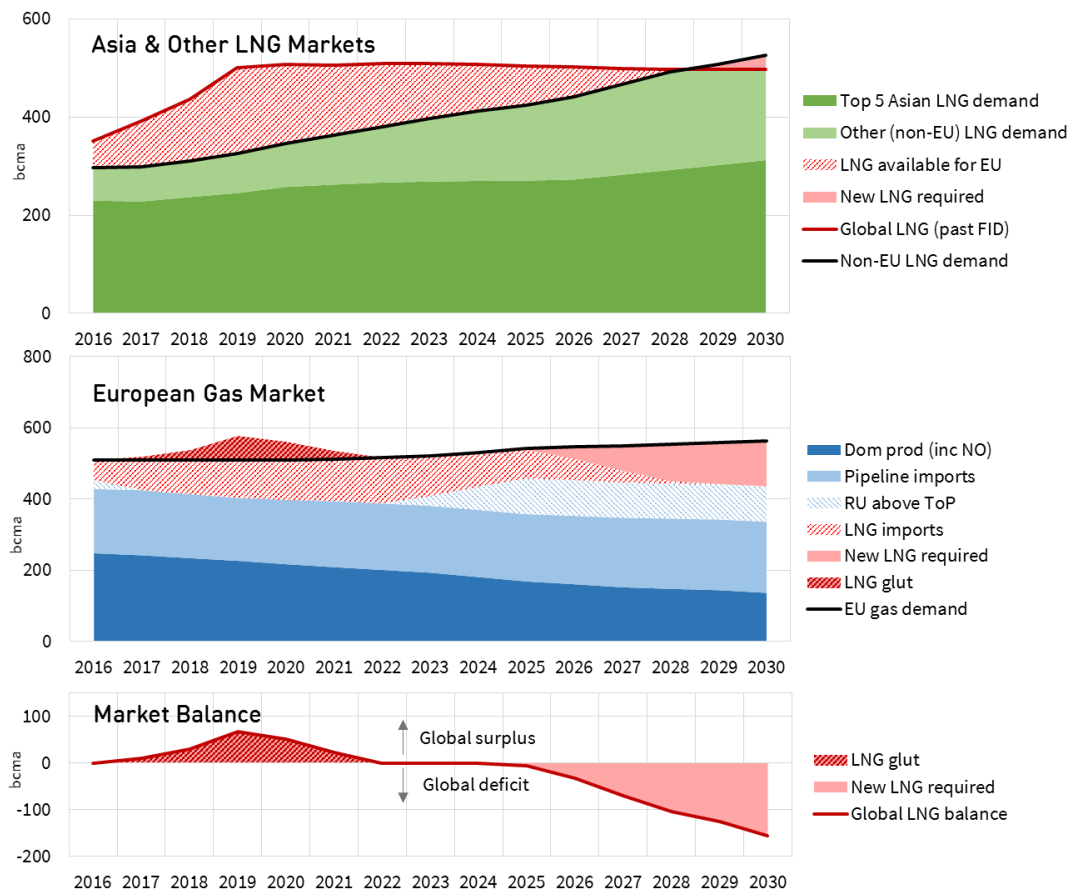
Europe is set to play a key role in absorbing surplus LNG, given liquid hubs, alternative supply sources & flexible contracts

1st chart: Asian (& other non-European) buyers have first call on global LNG supply

2nd chart: surplus LNG volumes ‘cascade’ down into the European gas market

3rd chart: LNG glut = any residual surplus volumes (vs ‘business as usual’ demand)

But the market always clears... so which market clearing mechanisms will enable the LNG glut to be absorbed?



Illustrative scenario of global LNG balance evolution

Source: Timera Energy

4 market mechanisms to clear the glut

Clearing mechanism	Volume potential	Volume dynamics	Key price relationships
1. European power switching	10-40 bcma	As gas hub prices fall, CCGT load factors rise	Relative gas vs coal price levels driving switching
2. Asian demand response	5-20 bcma	Asian buyers buy higher volumes as prices decline	LNG price terms vs other supply e.g. pipeline gas, oil
3. Shut in Aus exports	0-10 bcma	Exports may fall if spot prices < feed gas costs	Netback LNG prices vs variable cost of feed gas
4. Shut in US exports	0-80 bcma	Exports may fall if spot prices < variable costs	Europe/Asian spot prices vs US HH (+ variable cost)

History suggests limited Russian price response, as Gazprom targets stable market share in Europe (~150bcma)

→ Significant European switching demand in 2016... expect more to come

→ Less evidence (so far) of Asian demand response (2015 y-o-y fall)

→ Australian (Gladstone) 'shut in' volumes likely to be relatively low

→ US shut ins may be key global clearing mechanism 2018-20... as well as further European switching

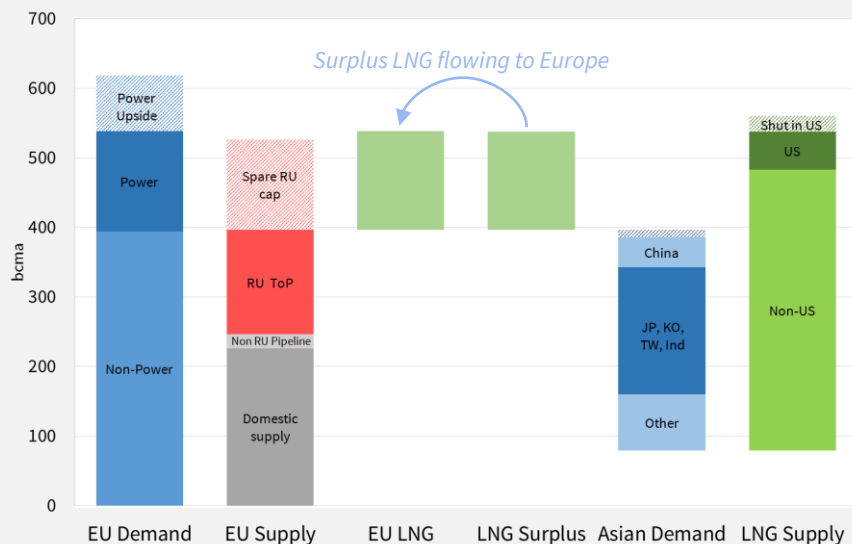
'Peak glut' conditions (2019)

European hub prices likely to further converge with US as Europe absorbs global LNG surplus

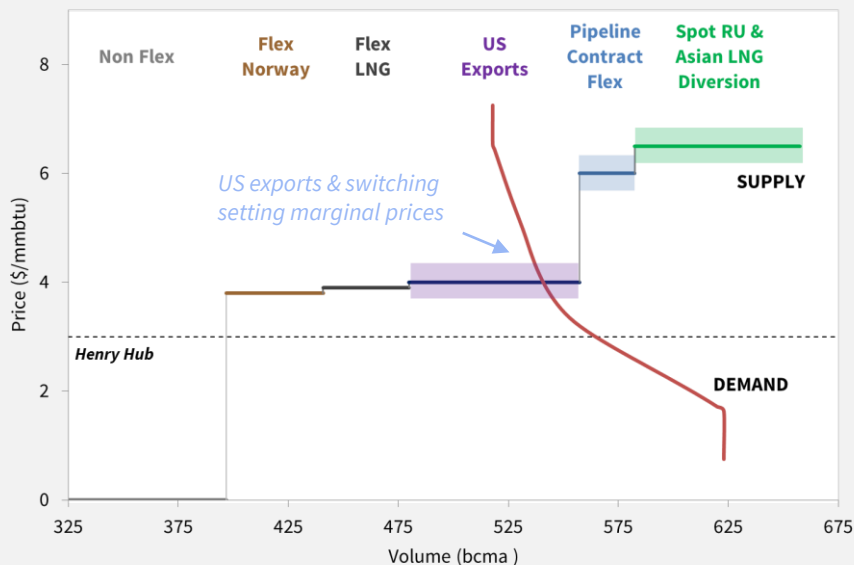
Global LNG price support role set to transition from European hubs to US Henry Hub as glut builds

Main clearing mechanisms are (i) supply side: US export shut ins (ii) demand side: European power switching

Henry Hub key driver of global prices - limited influence of Russia (& oil-indexation) and LRMC until glut clears



Global LNG market balance 2019



European gas market balance 2019

Source: Timera Energy

Are US & European hub prices already converged?

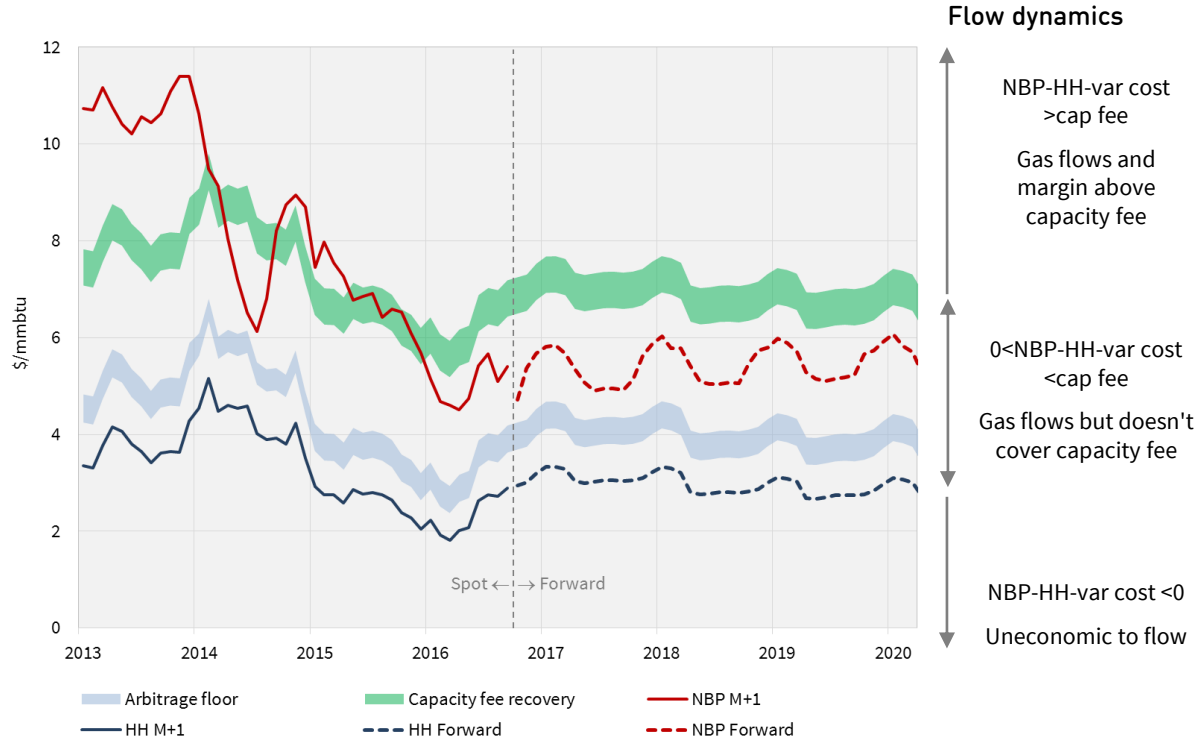
US export contracts are under water vs liquefaction capacity fee recovery

But current forward curves show positive arbitrage value (SRMC basis)

Trans-Atlantic variable cost differential range of 0.7-1.2 \$/mmbtu, depending on sunk cost treatment

Current NBP vs HH spread of ~2 \$/mmbtu can narrow

Expect further convergence as LNG glut grows & European hubs push gas back into US market



Atlantic basin arbitrage economics

Source: Timera Energy

Post glut recovery

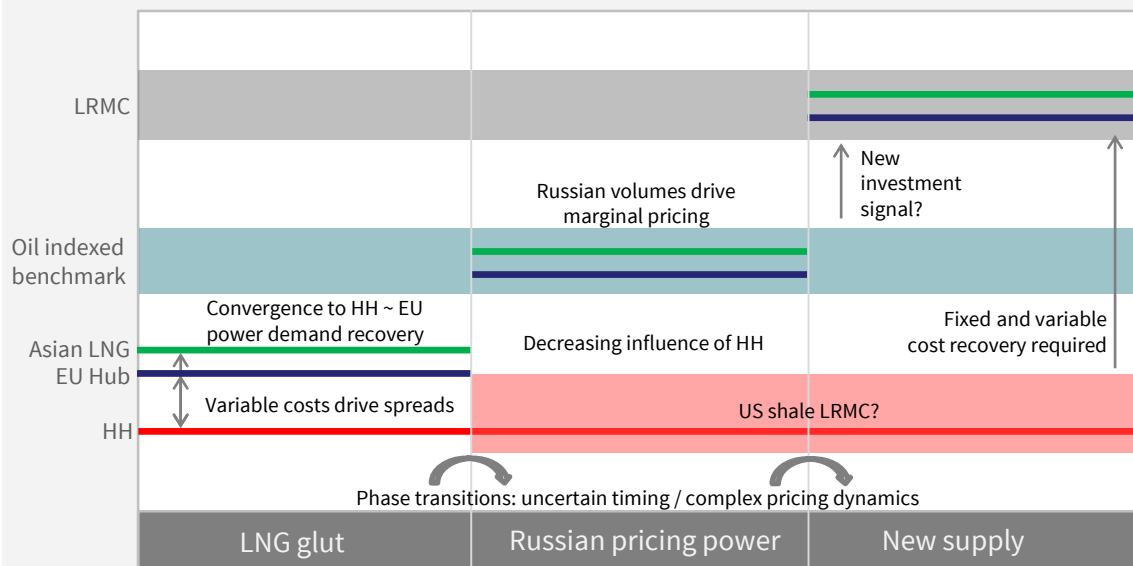
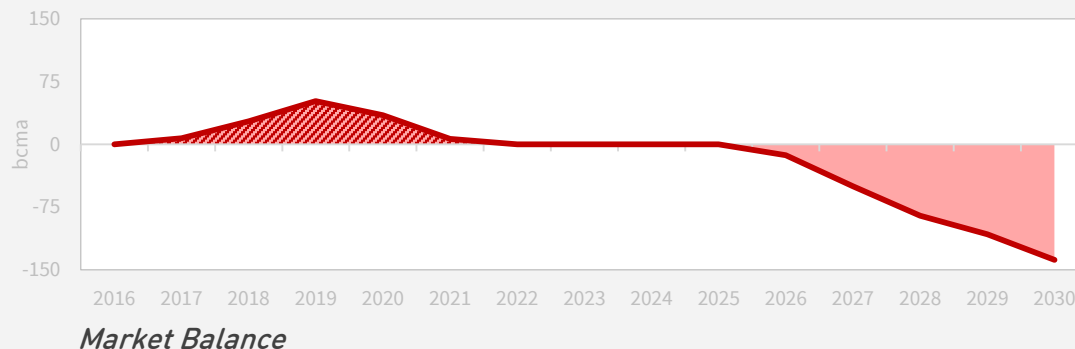
Phase 1 – LNG glut (see previous slides)

Phase 2 – Russian pricing power:

- ~100 bcma of existing ‘shut in’ Russian production capacity (to Europe)
- This can flow based on SRMC price signals i.e. can block new LNG supply
- Russian gas can service Asia via diversion of flex LNG (e.g. US exports)
- Result → price recovery & revival of oil-linkage

Phase 3 – New supply:

- Requirement for incremental new production capacity
- Price recovery driven by LRMC competition to provide new supply



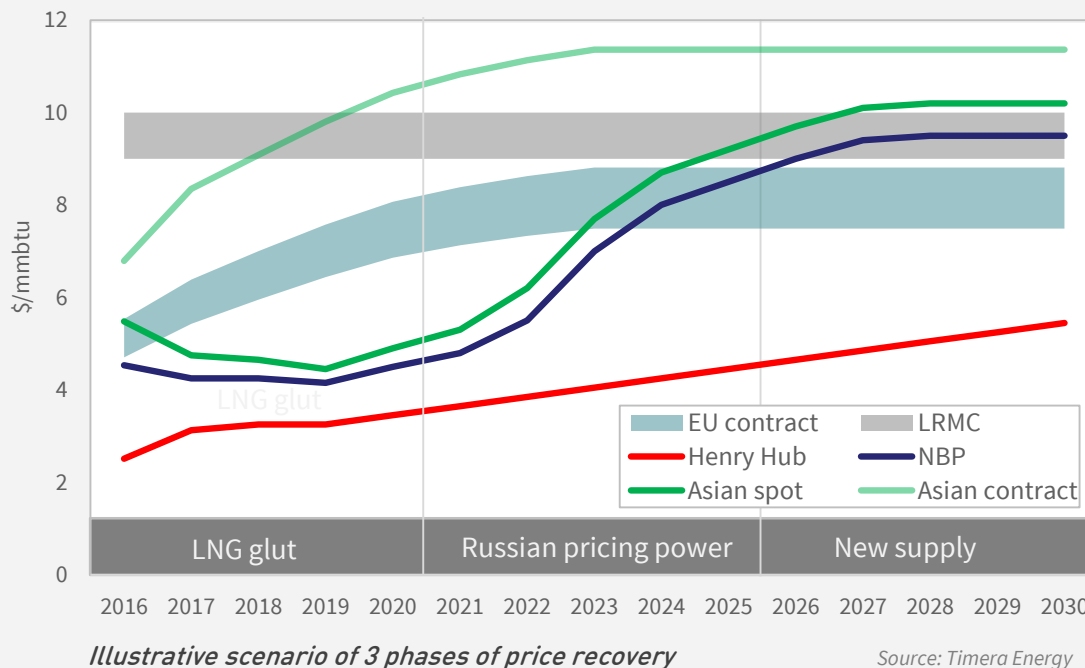
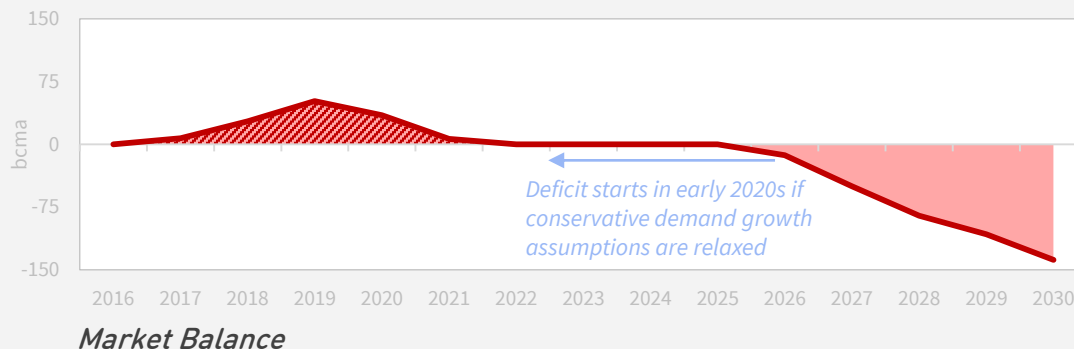
3 global pricing phases

Source: Timera Energy

The Path to price recovery

5 factors to consider

1. **Europe key role in clearing the global market** given liquid hubs, alternative supply flex, switching
2. **European & Asian prices structurally converged** with 80+ bcma of price responsive US exports
3. **Short term regional price volatility will remain** given delays in LNG supply chain response
4. **Long term contract dominance to be eroded** by maturing hubs & LNG spot market liquidity
5. **Investors must convince themselves of an LRMC price signal** 5 yrs in advance of delivering new LNG



10 commercial implications of gas glut & recovery

Consideration	Commercial implication
1. Careful being structurally short	Most of the move down in prices may have happened (i.e. upside > downside)
2. LNG is a buyer's market	Opportunity to lock in supply at sub LRMC prices, with good indexation/flex terms
3. Renegotiate existing contracts	Market stress can open up pricing/indexation, volume and diversion flex terms
4. Recovery of oil prices before gas	Shale oil investment cycle shorter than LNG → watch for oil vs gas price divergence
5. Risk from oil-indexed contracts	Oil-linked contracts may diverge from hub prices (= supplier pain, producer gain)
6. Shift in LNG pricing terms	A maturing LNG market is set to drive increased hub linkage & contract flexibility
7. Investment in new supply	Market may evolve from LT oil-indexed contracts to underpin new capacity
8. Turning gas investment cycle	Buyers market for distressed upstream & midstream LNG assets
9. Look for specific value ops	e.g. cheap LNG supply chain flexibility; undervalued European regas capacity
10. Look for new LNG price drivers	Shift from oil-linkage to Atlantic Basin hub price signals – European hubs key

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

10,000+ 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

David Stokes

20 years energy/commodity market experience

Expert in value/risk management of flexible assets

Industry roles with Origin, Williams, JP Morgan

Howard Rogers

30+ years gas industry experience (BP, OIES)

Expert in fundamental analysis of energy markets

Director of Gas Research Programme at OIES

Nick Perry

30+ years industry experience (Amoco, Exxon, Enron)

Expert in commercial & risk management strategy

Board level experience (Director Enron Europe)

Arran Kitson

16 years industry experience (RWE, BP, Deloitte)

Expert in energy asset investment & transactions

Strong gas & power trading/origination background

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

Recent Timera Energy advisory work

We provide commercial advice to many leading energy companies (e.g. Statoil, E.ON, Rasgas, Osaka Gas & BP)

Project	Client	Summary
LNG supply contract	Oil major	Advice/analysis to support restructuring of long term European LNG supply contract
LNG asset investment	SW Fund	Analysis of impact of evolving global gas market dynamics on LNG portfolio value
LNG contract advice	Producer	Advice/analysis of pricing & exposure management of LNG supply contracts
Portfolio management	Utility	Commercial & risk management advice on large portfolio of gas & power exposures
Supply flex value	PE Fund	Analysis of gas flexibility value (price spreads, volatility) at European hubs
Pipeline sale	Infra Fund	Valuation analysis to support sale of large Central European pipeline transaction
Storage purchase	Infra Fund	Commercial advisory and due diligence to support purchase of CEE storage portfolio
Storage/regas	Developer	Commercial advisor to developer of a UK fast cycle storage & LNG regas project

Further reading

Links below to some relevant recent articles we have published

Article	Link
Clearing the glut	http://www.timera-energy.com/gas-rebalancing-1-clearing-the-global-gas-glut/
Path to recovery	http://www.timera-energy.com/gas-rebalancing-2-the-path-to-price-recovery/
Europe vs US hub price convergence	http://www.timera-energy.com/us-exports-and-the-trans-atlantic-cost-question/
LNG imports & European hubs	http://www.timera-energy.com/lng-imports-european-gas-pricing-dynamics/
Europe gas vs coal switching potential	http://www.timera-energy.com/european-gas-vs-coal-switching-numerical-analysis/

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