

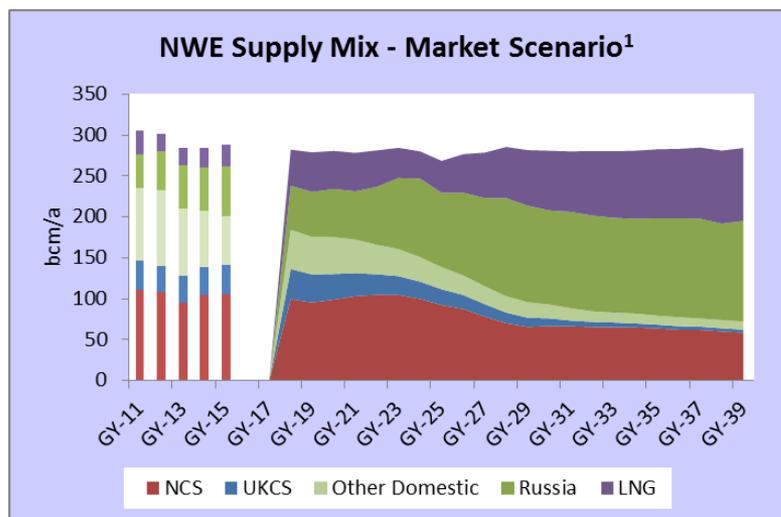
Evolution of European gas market fundamentals

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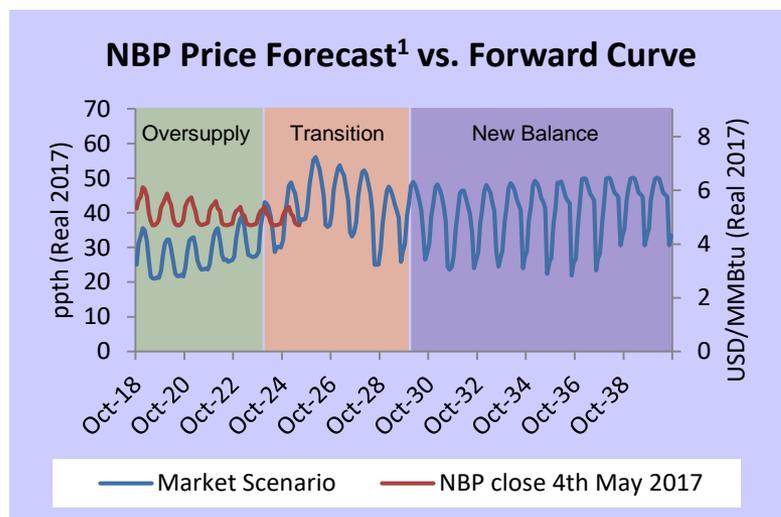
S&P Global
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Eclipse maintains long term forecasts of the NW European supply mix and outturned prices...



Our long term forecast describes 3 main phases:

- Oversupply period (to 2024)
 - robust indigenous supply in NW Europe
 - global oversupply of LNG
 - Russian imports start to pick up
 - significant UK and continental coal to gas switching provides sink
 - price forecast bearish to market forward curve
- Transition period (mid/late 2020s)
 - indigenous production in decline
 - LNG balance moving from over- to under-supplied
 - continued increase in Russian imports
 - market tighter – return of more seasonality
 - price forecast rising in real terms triggering new supply sources
- New balance period (2030s)
 - indigenous production stabilizing at lower levels, compensated by LNG and Russian imports
 - NW Europe hub prices highly exposed to US gas prices



...which are underpinned by a set of assumptions, some of which are highly uncertain

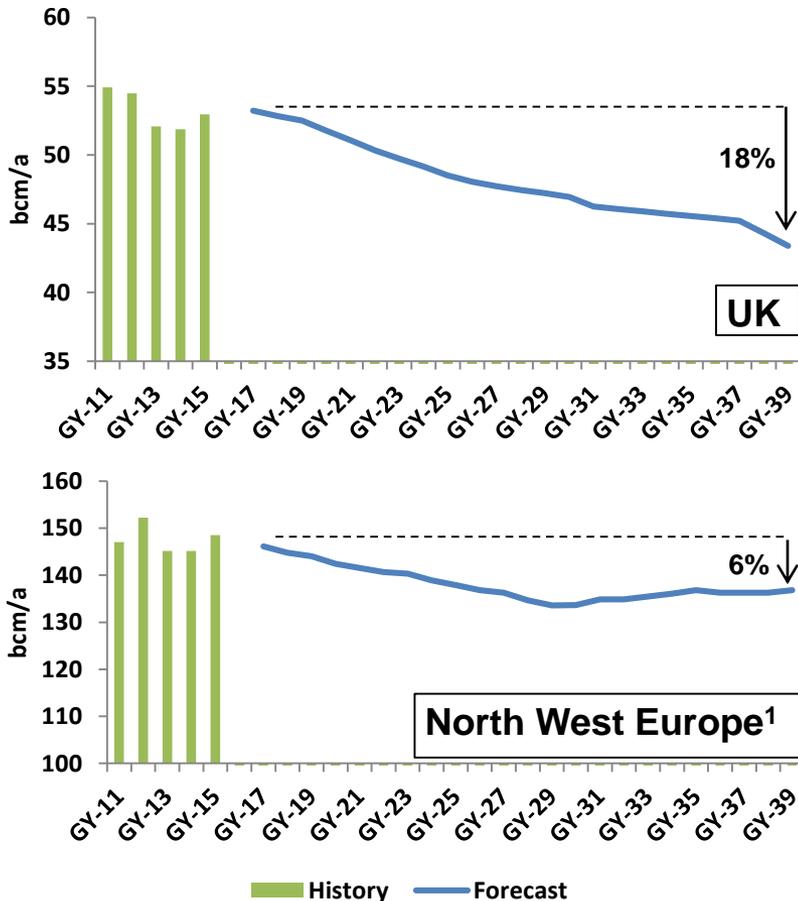
In our base case forecast, our assumptions are intended to reflect the balance of probability.

Some key questions to consider include:

1. Is LDC and grid-connected industrial demand in modest decline?
2. Is indigenous production really in terminal decline?
3. What volume of LNG oversupply will be available to Europe?
4. Do Rough's recent troubles mark the end of long range storage in the UK?
5. How will other commodity prices outturn?

1. Is LDC and grid-connected industrial demand in modest decline?

LDC and grid-connected industrial demand



- Since GY-11, UK demand has fallen by 2 bcm/a (4%)
- We forecast a ~10 bcm/a (18%) decline in demand between GY-17 and GY-39 (~1% p.a.) driven by:
 - Energy efficiency savings based on high consumer engagement (smart meters and insulation)
 - Modest penetration of other heating methods (e.g. electric heat pumps)
 - Closure of CHP plant from the late 2020s
- Since GY-11, NWE demand has remained flat:
 - Small increases in LDC demand offset by small reductions in industrial demand
- We forecast a 9 bcm/a (6%) decline in demand between GY-17 and GY-39 driven by:
 - Modest economic growth limits uptake of energy efficiency
 - New building assumed to prioritise district heating over heat pumps over gas

1. Is LDC and grid-connected industrial demand in modest decline?

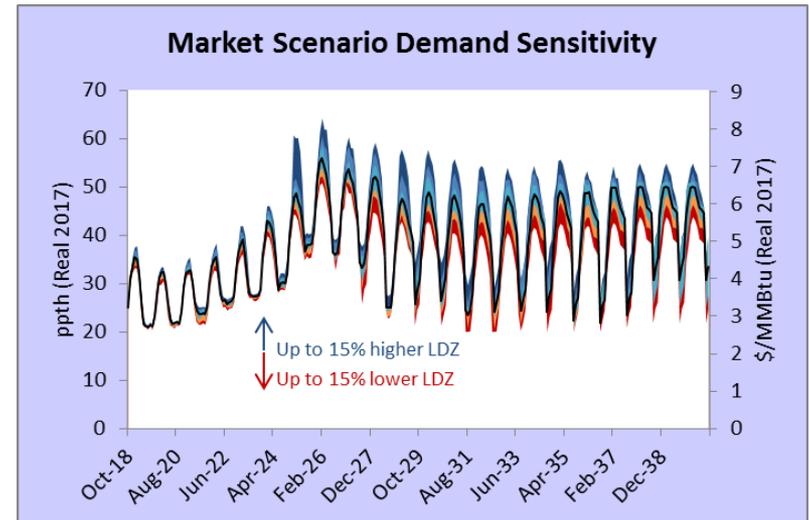
Demand could outturn very differently from our base case

On short timescales (days, weeks, months):

- Weather

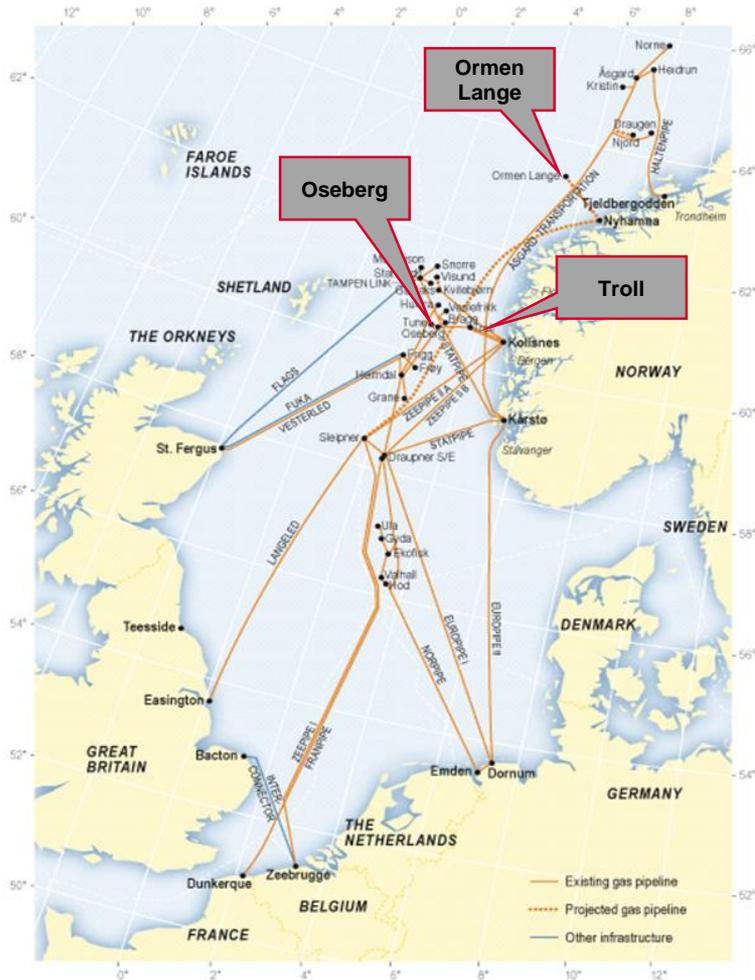
On long timescales:

- Long term economic growth
 - industrial activity
 - financial backing for the Green Agenda
- Impact of the Green Agenda
 - energy efficiency measures
 - electrification of the home
- Disruptive technologies
 - batteries – supporting enhanced electrification of industry/homes

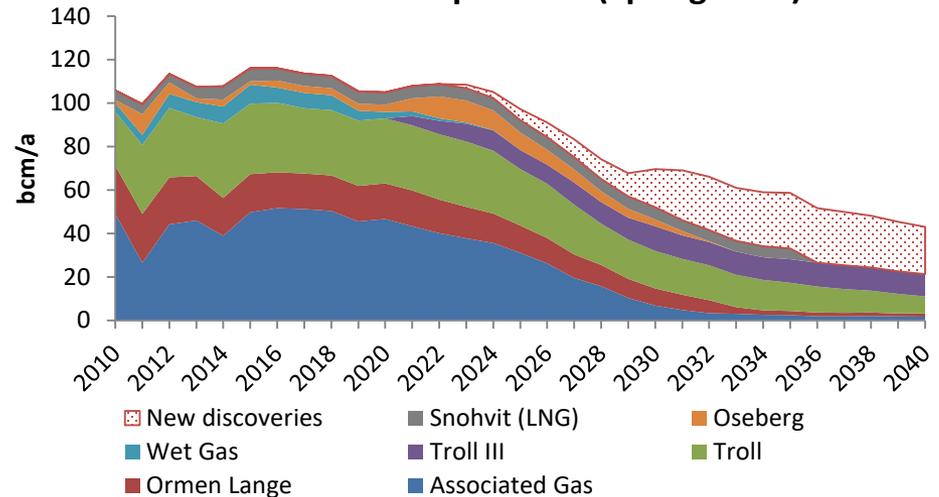


- NBP price increase on +15% LDZ greater than price reduction in -15% LDZ
- High winter prices set by need for additional Russian flexibility
- Summer price downside limited by coal to gas switching and producer optimisation (e.g. Troll flex down)

2. Is indigenous production really in terminal decline?

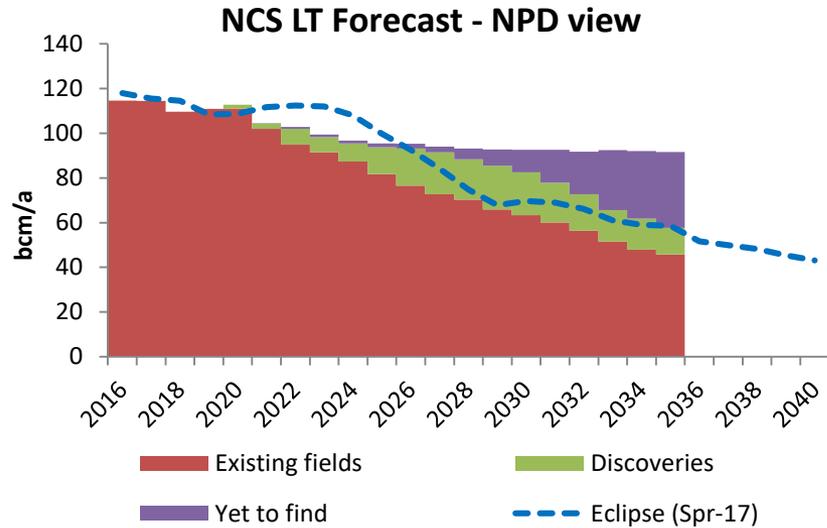


NCS LT forecast - Eclipse view (Spring 2017)

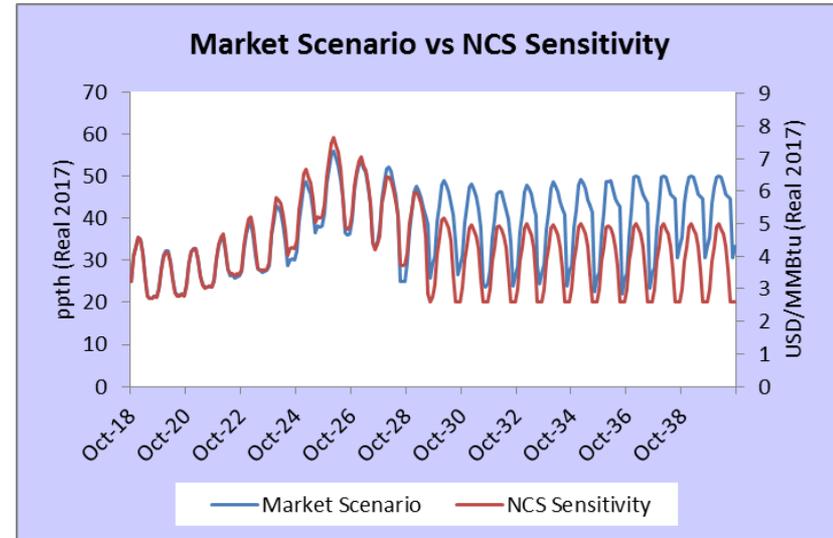


- **Total NCS** production and pipeline exports have recently hit record highs with **117.2 bcm** produced in 2015
- Our new emerging assumption for **Troll** is that Phase III starts in 2021 (FID expected 2018) lifting its production by ~10 bcm/a
- For **Ormen Lange**, we see production flat at current levels (16.4 bcm/a) until 2020 with production decline halted by the installation of compressors planned during the course of 2017
- For **Oseberg**, we forecast the field will run out of oil by 2021 when it will start blowing down all gas and we assume peak production of 10bcm reached in 2022/23, then quickly declining
- Assume **new discoveries** (notional gas) peak at **25.5** bcm/a in 2035:
 - Based upon a probability-adjusted interpretation of NPD reporting
 - Assume Barents Sea production starts from 2030

2. Is indigenous production really in terminal decline?



- NPD takes a much more bullish view with production sustained close to **100 bcm** for the next 20 years
- Would require:
 - very significant further gas discoveries in Barents Sea
 - companies willing to invest in pipeline and infrastructure development to bring this gas to market



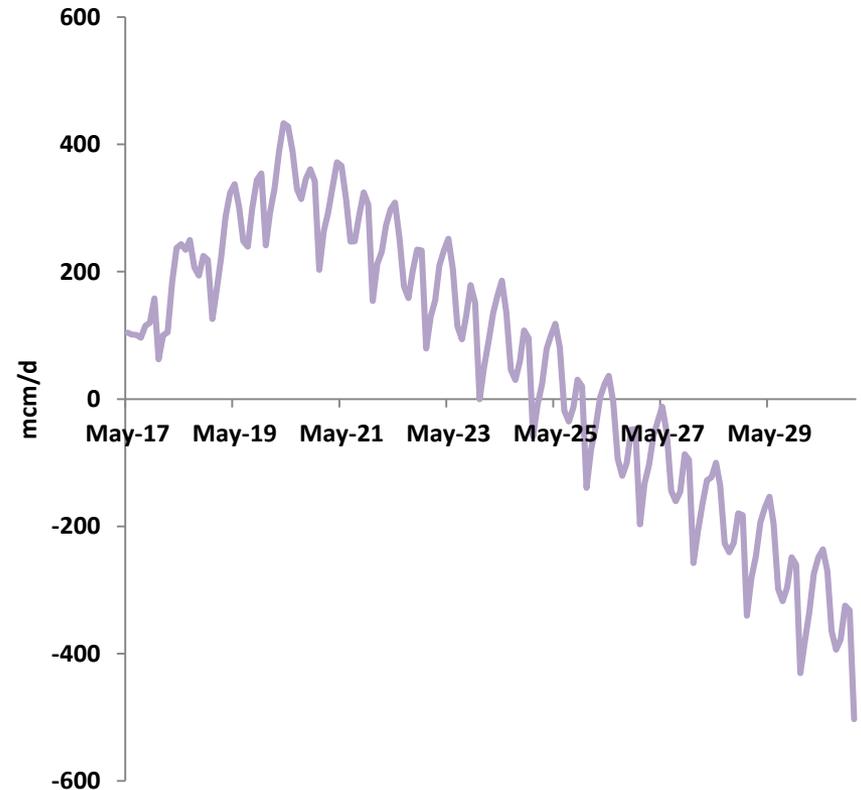
- Higher indigenous production limits exposure to higher priced global LNG supplies

3. What volume of LNG oversupply will be available to Europe?

Our view of the LNG global surplus quantifies the LNG balance offsetting supply with demand outside of Europe

- Supply:
 - We see supply growth of ~50% by the end of 2020, from 380 bcm to 570 bcm
- Demand:
 - **Decline** in 'traditional' high demand countries such as **Japan** (return nuclear plant) and **S. Korea** (buildout of new coal and nuclear capacity) offsetting LNG demand from CCGTs
 - **Declining** in **Central** and **South America** with pipeline imports from US and development of domestic production (associated gas from oil, shale)
 - **Growing** in rest of **Asia**, led by China and the Indian sub-continent
 - **Developments** in the **Mediterranean** (Zohr, Leviathan etc.) changing the gas balance in the region – reduction of imports in Jordan and Israel and return of Egyptian exports

LNG Global Surplus¹ (mcm/d)



3. What volume of LNG oversupply will be available to Europe?

Key risks/uncertainties to our view

- Timing of start up of the new LNG supply:
 - Many projects are technically highly complex, in difficult locations, using new technology (e.g. FLNG)
 - Australia most at risk, US projects simpler and less to go wrong (i.e. already tested storage tanks, jetties, power supply etc..)
- Power generation in Asia:
 - Policy in regulated markets – will they react to low gas / LNG prices?
 - Nuclear power sentiment?
 - Carbon policies
- Buildout of import infrastructure in developing demand centres:
 - e.g. Pakistan FSRU's
 - Pipeline infrastructure bringing gas from coastal areas to demand areas)
- How will supply react to low price environment:
 - Shut ins in the US, East Australia (small volumes), old LNG projects?
 - Diversion LNG feedgas to domestic markets?

4. Do Rough's recent troubles mark the end of long range storage in the UK?

- Jun 2015**

 - OGA agrees to CSL's application to lower capacity sales to 2.1 bcm for storage year 16/17 to limit reservoir pressure whilst testing carried out
- 22 Jun 2016**

 - CSL announces cessation of injection/withdrawals for 42 days whilst testing carried out
- 15 Jul 2016**

 - CSL announces further issues identified during testing. No injection activity until Mar/Apr-17 at the earliest. Withdrawals in W-16 subject to further study
- 9 Dec 2016**

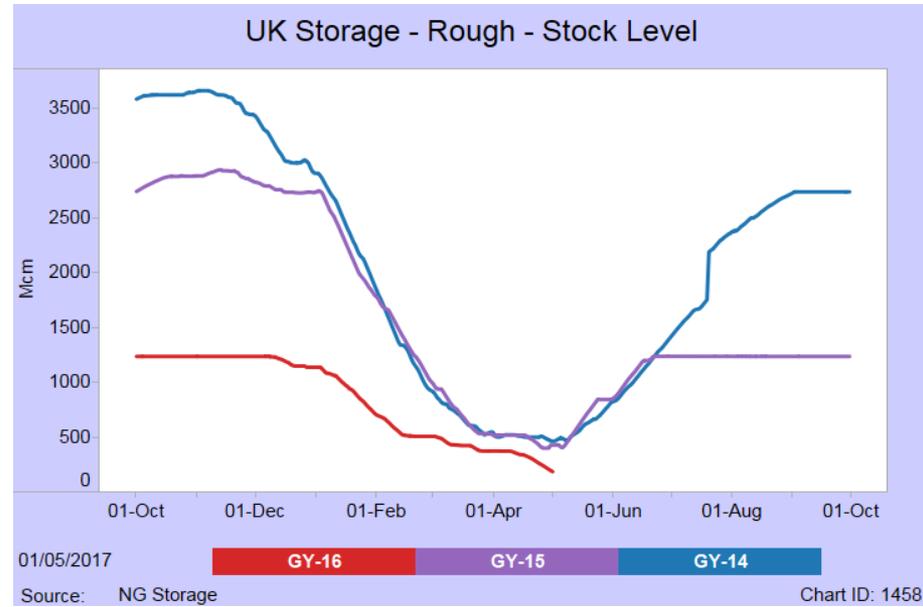
 - Withdrawals recommence, peaking at ~22mcm/d
- 16 Feb 2017**

 - CSL announces no commercial injections until 1 Jul at earliest
- 10 Mar 2017**

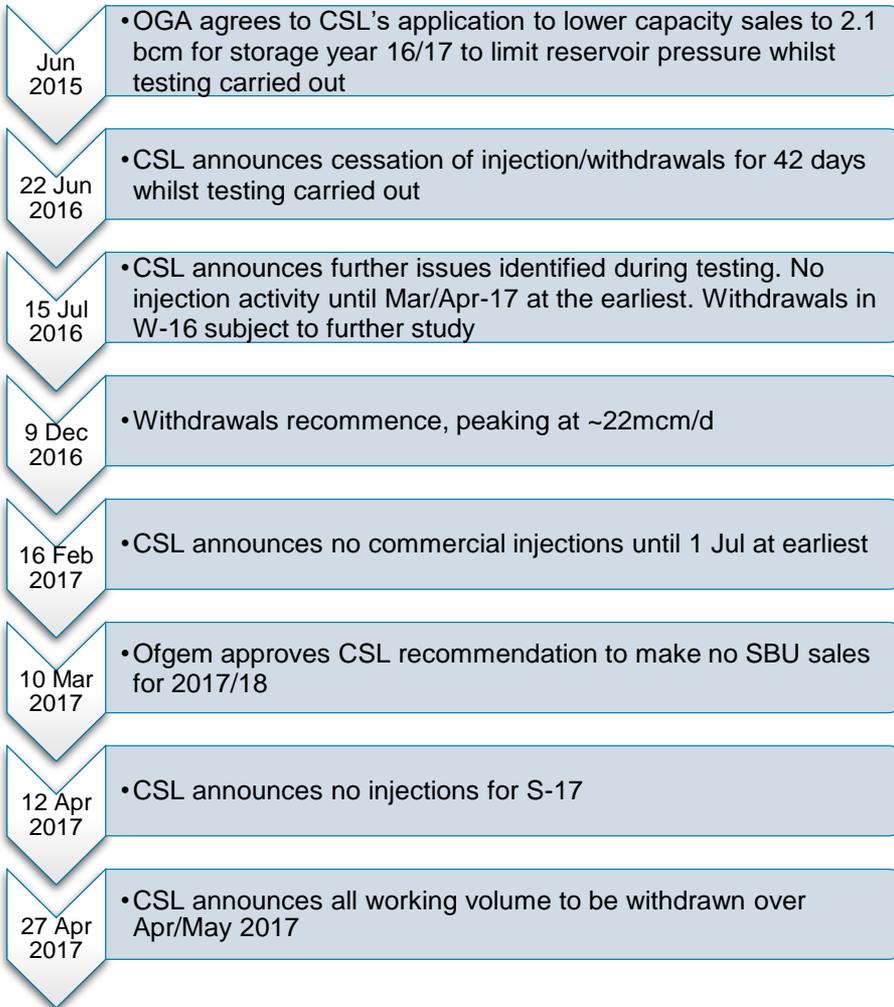
 - Ofgem approves CSL recommendation to make no SBU sales for 2017/18
- 12 Apr 2017**

 - CSL announces no injections for S-17
- 27 Apr 2017**

 - CSL announces all working volume to be withdrawn over Apr/May 2017



4. Do Rough's recent troubles mark the end of long range storage in the UK?



Possible outcomes

1. Remedial work allows Rough to return at reduced capacity
2. Rough does not return but new LRS capacity is built in the UK – some form of Govt support?
3. Rough does not return and this is the end of LRS in the UK. MRS capacity is expanded to provide short term flexibility

Outcome #3 is the emerging Eclipse base case:

- UK entering a new world of flexibility with NCS, IUK/BBL and LNG
- Seasonal spreads insufficient in our view to make the economic case for new LRS

5. How will other commodity prices outturn?

To reflect the uncertainty in and dependence on other commodity prices, we run two scenarios

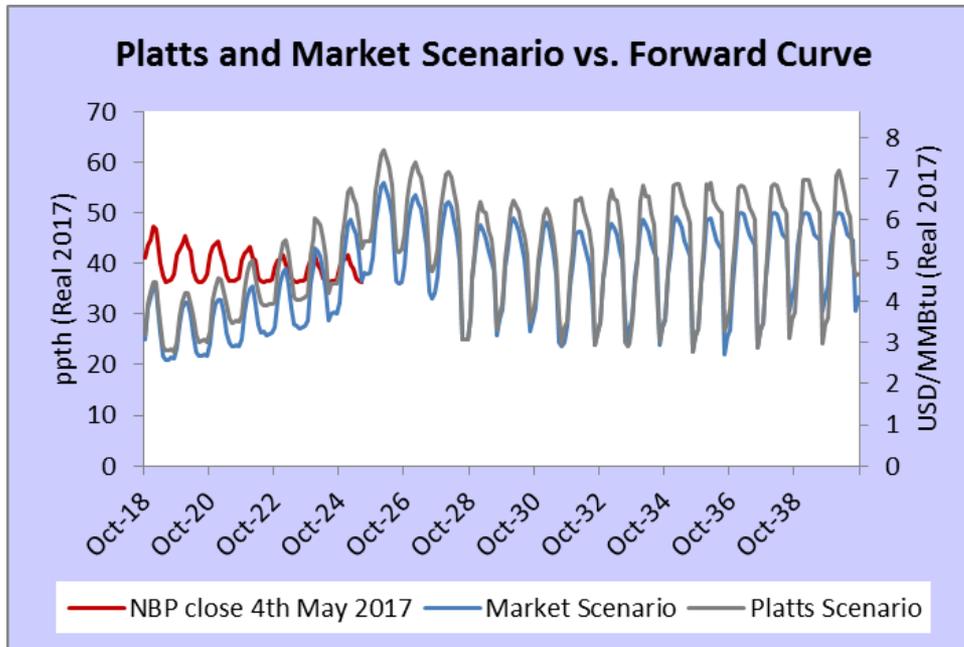
Market Scenario

The **Market Scenario** takes the forward curve prices for Henry Hub, Brent, and Coal. Carbon prices are forecasted post 2020. Beyond the forward curve, prices are kept flat in real terms

Platts Scenario

The **Platts Scenario** assumes proprietary commodity price assumptions generated across S&P Global Platts for Henry Hub, Brent and Coal. The Carbon forecast is identical to the Market Scenario

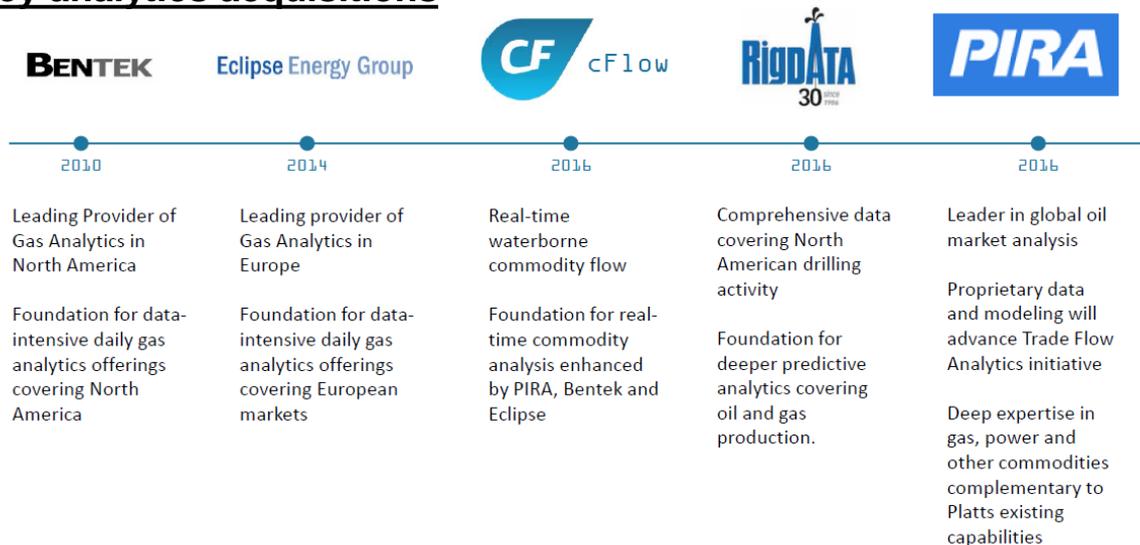
5. How will other commodity prices outturn?



- Gas price forecast and seasonality higher in the Platts scenario:
 - in winters on the back of higher HH gas
 - in the near term summers on the back of higher coal via switching

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The combination of Platts, PIRA, Bentek, Eclipse, cFlow and Rig Data provides the most robust analytics offering available in the market

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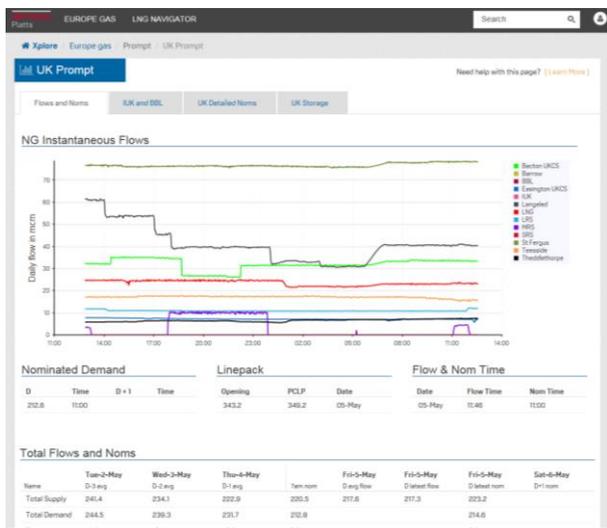
THE MOST INTEGRATED VIEW

Our analysis integrates a rich set of fundamental data and our expert judgement to help make the best decisions possible.

Analysis and insights from Eclipse and Platts Analytics navigates through these and many more uncertainties

Thank you!

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This block contains a collage of reports and charts from Eclipse Energy Group and Platts. Key elements include:

- UK Power: Pilot**: A report with sections like 'The List' and 'PricePilot'.
- Eclipse Flow Track**: A report titled 'ECLIPSE FLOW TRACK PRODU' with an image of an offshore oil rig.
- Long Term Pri**: A report titled 'Long Term Pri' with a chart showing 'UK Coal Estimation'.
- UK Coal Estimation**: A report titled 'UK Coal Estimation' with a chart showing 'UK Coal Estimation'.
- August Analysis of HCS Field's production and July total provision**: A report with an image of a flag.
- Documentation of assumptions for balance of Summer 2016 and a look ahead to Winter 16**: A report with a date of '10th May 2016'.