

Winter Outlook



BIEE October 10th 2013

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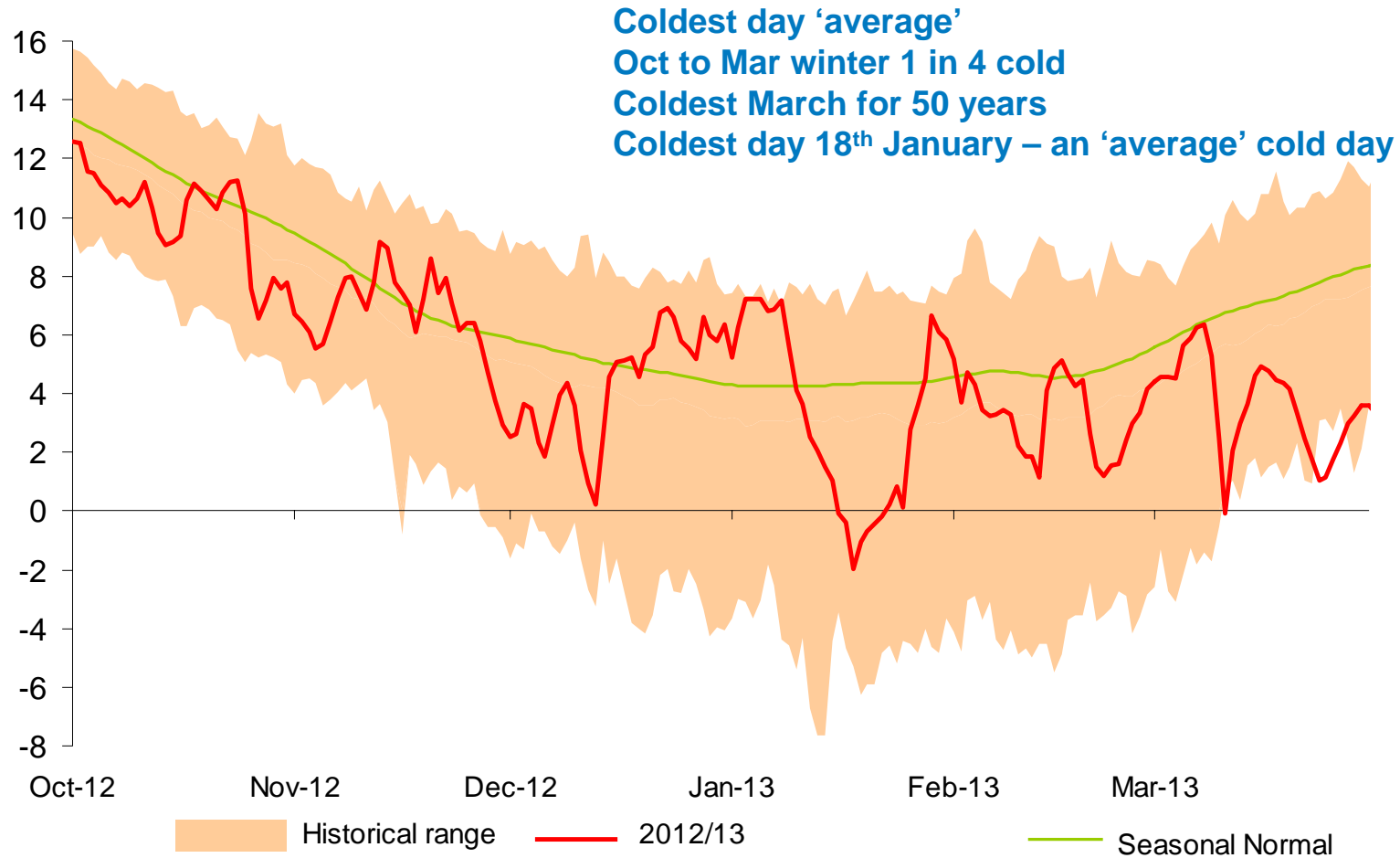
Contents

- Winter 2012/13 – a review
- Winter 2013/14 - forecasts

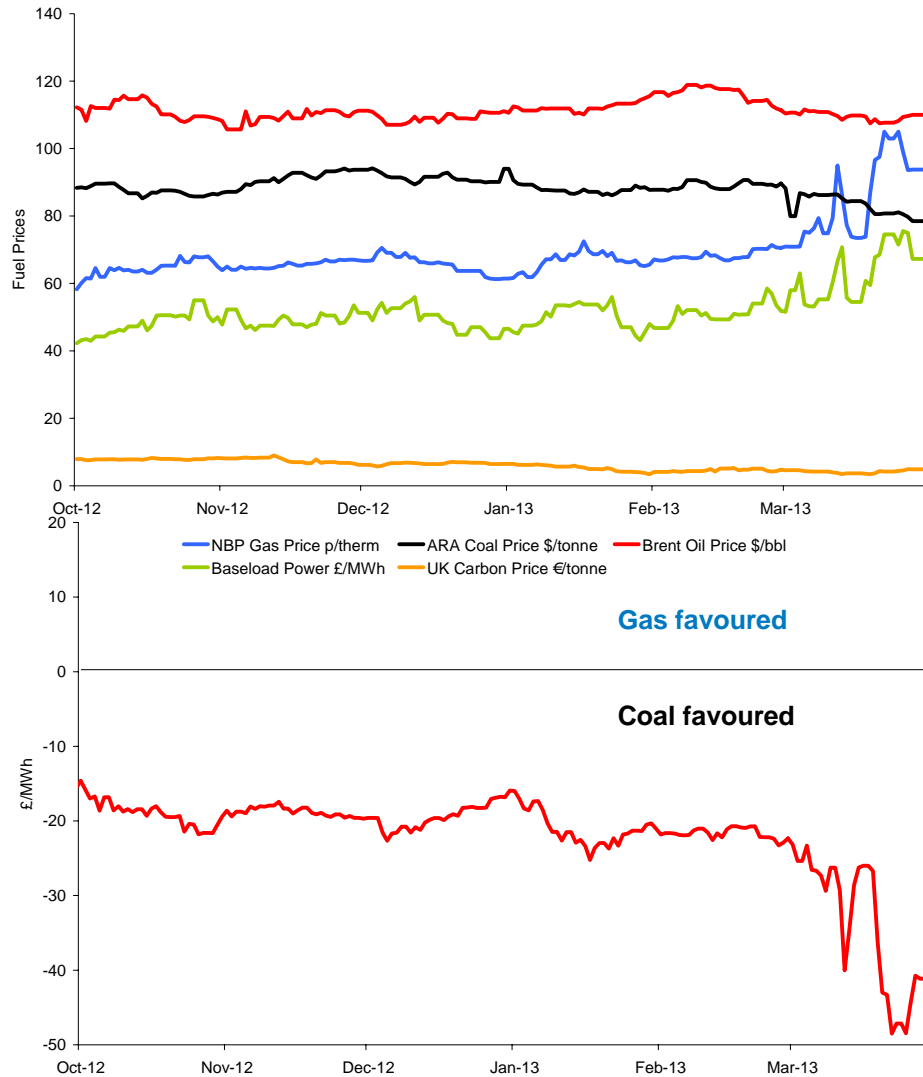
Winter Review 2012/13



Winter 2012/13 Composite Weather Variable (CWV)



Winter 2012/13 fuel prices & dark vs spark difference

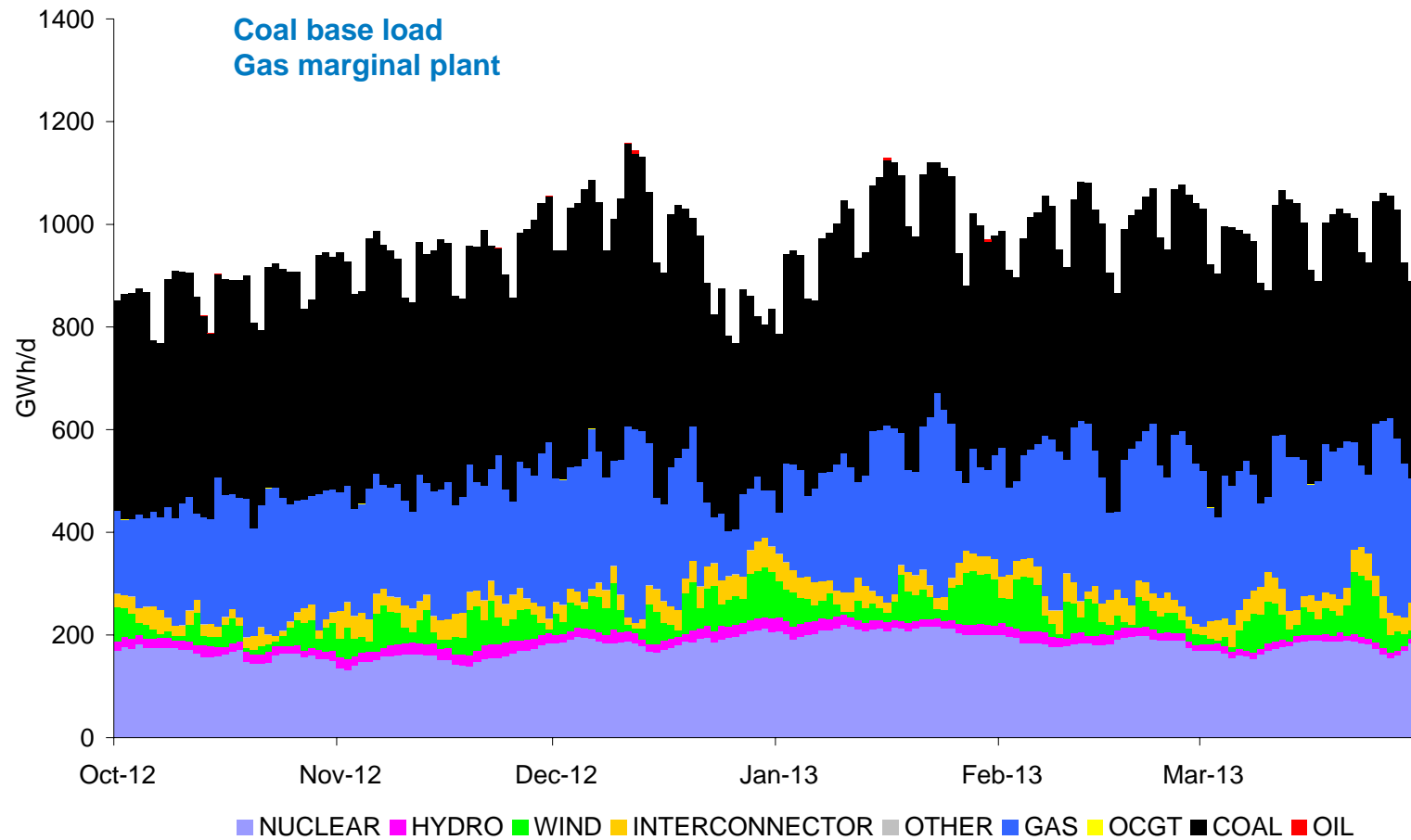


Historic Prices

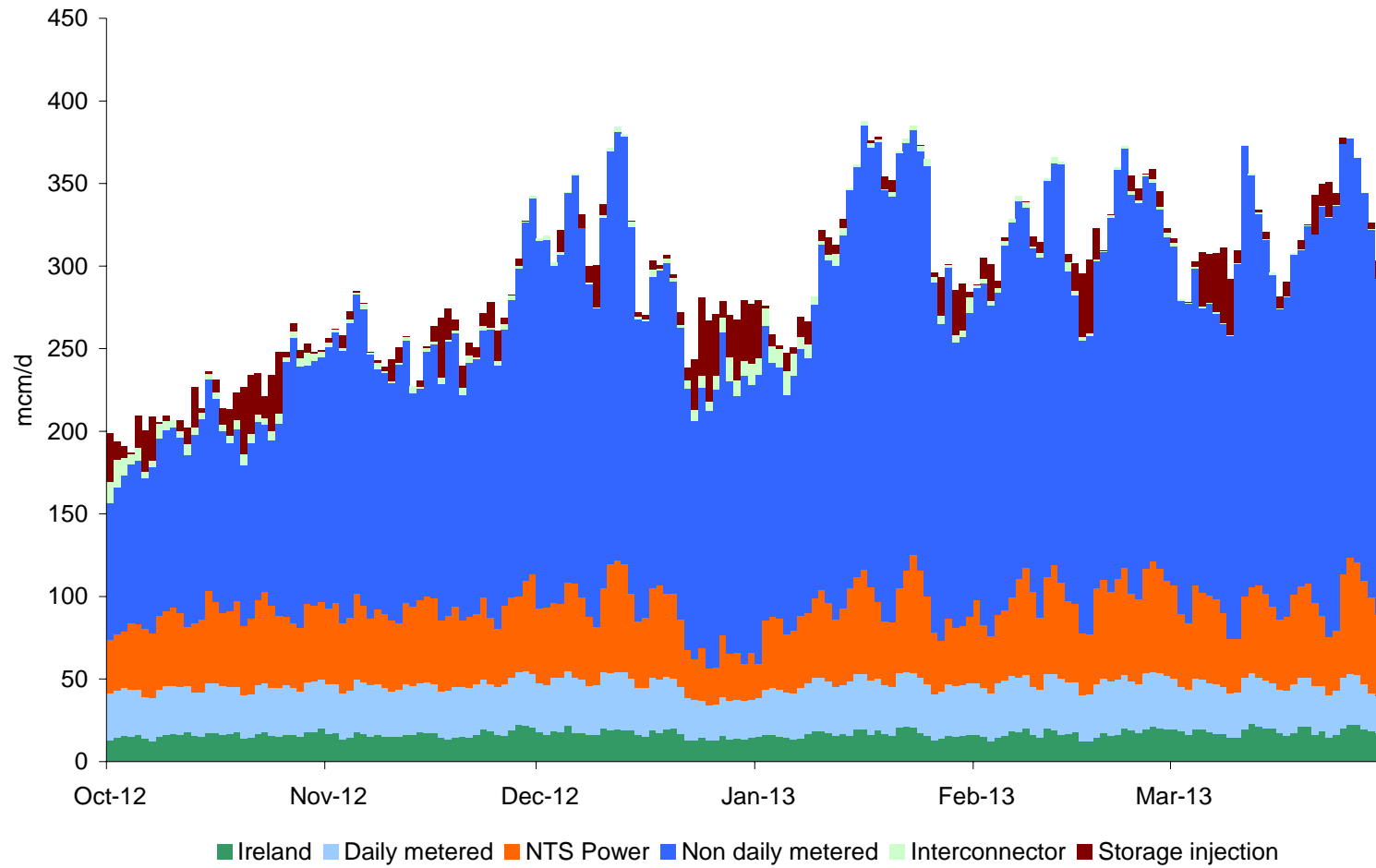
- Oil relatively flat
- Coal some decline
- Gas slight seasonal increase then significant increase in March
- Power follows gas
- Low carbon price

- Clean dark vs spark spread difference strongly favours coal burn over gas
- At times of high gas price, bias is even more pronounced

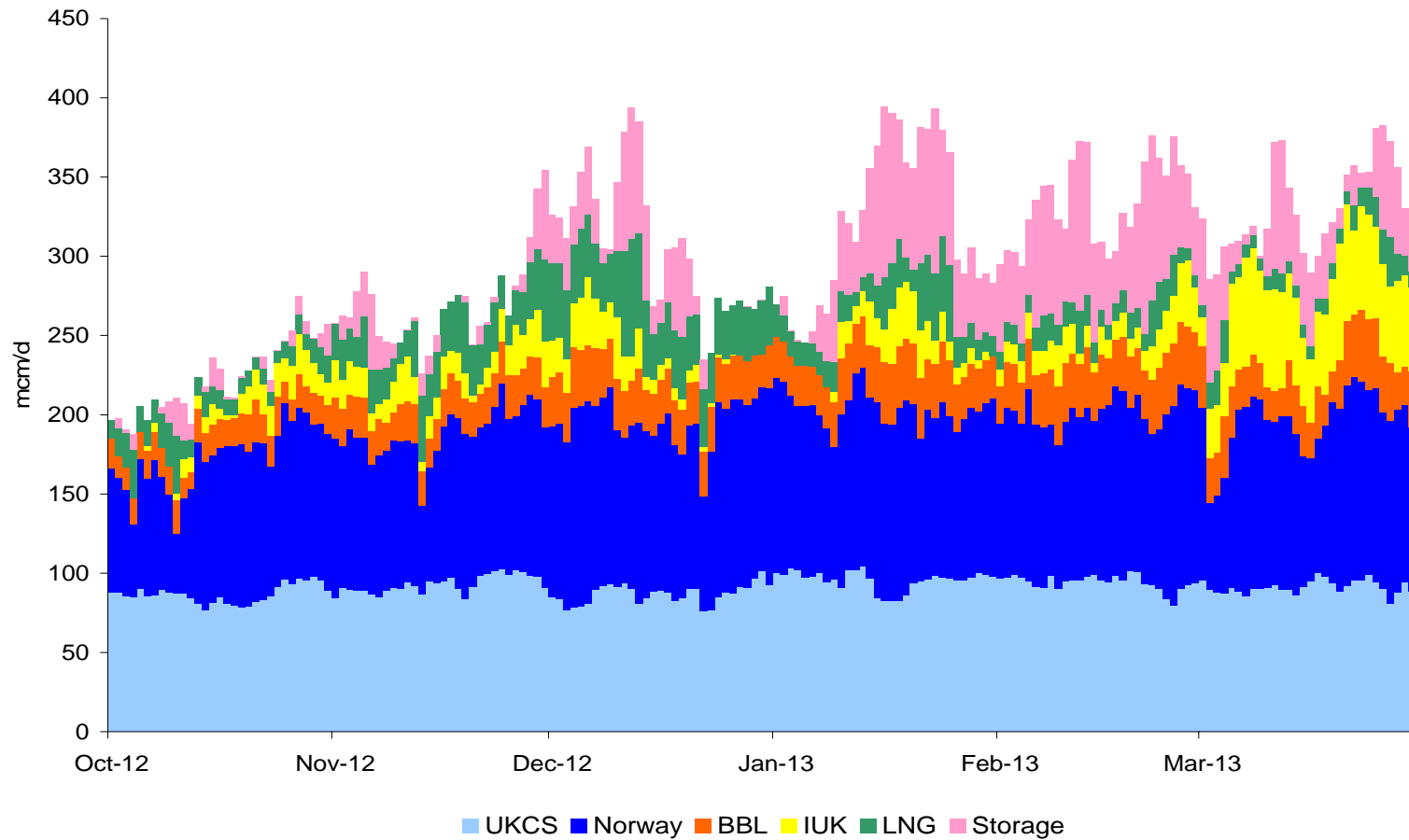
Winter 2012/13 power generation



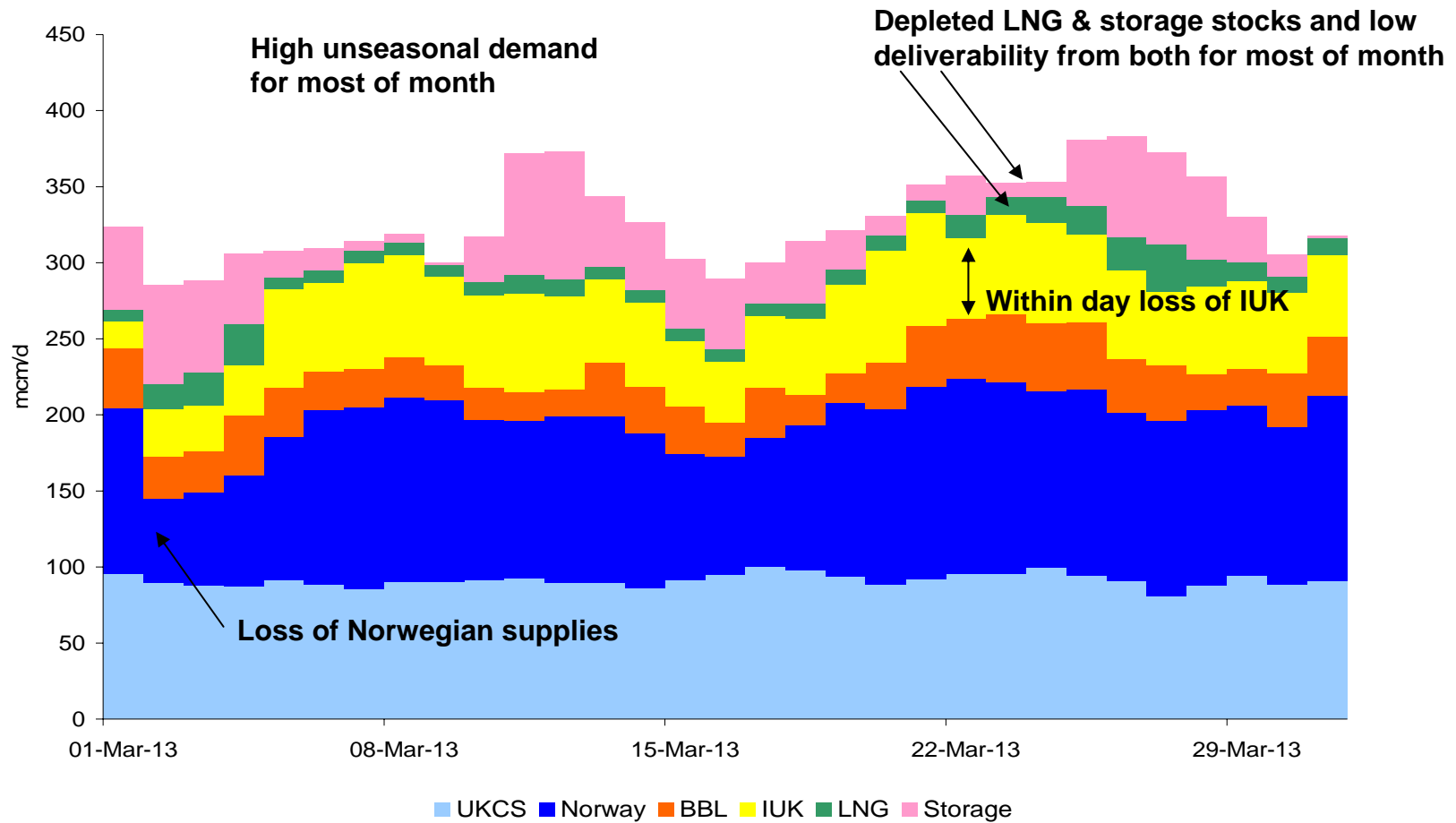
Winter 2012/13 gas demand



Winter 2012/13 gas supply

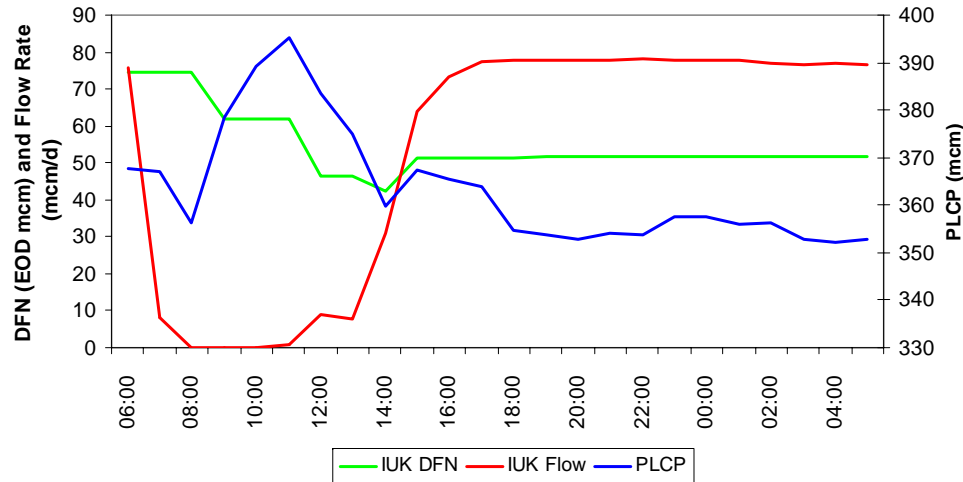


March 2013 supply issues



IUK within day supply loss 22nd March

IUK DFN, Actual Flow and PCLP



Prevailing conditions

- Above SND demands
- Forecasts for high demands to continue
- Storage depleted
- LNG stocks low, limited shipping scheduled
- Short to medium term vulnerability

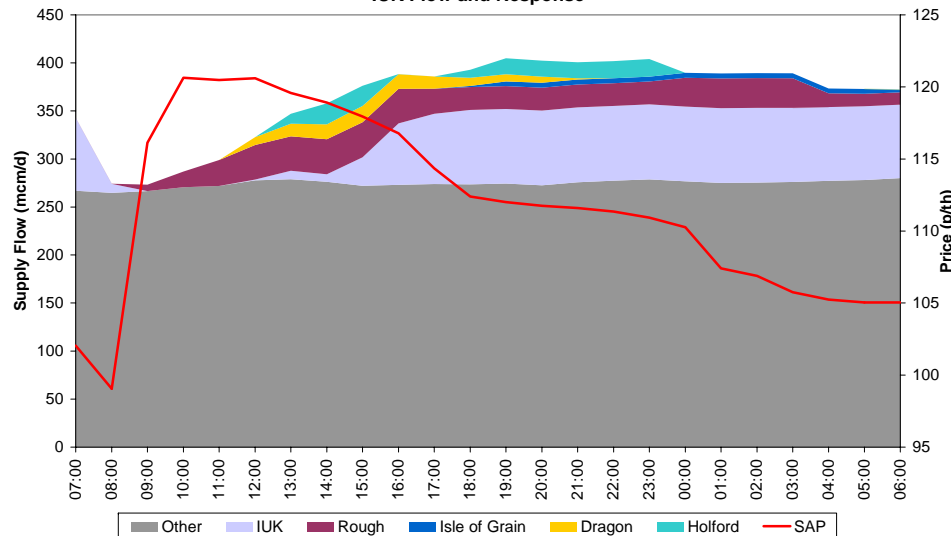
Loss of IUK

- IUK was flowing at near max ~70 mcm/d
- IUK lost from ~07:00 – 14:00, ~20 mcm

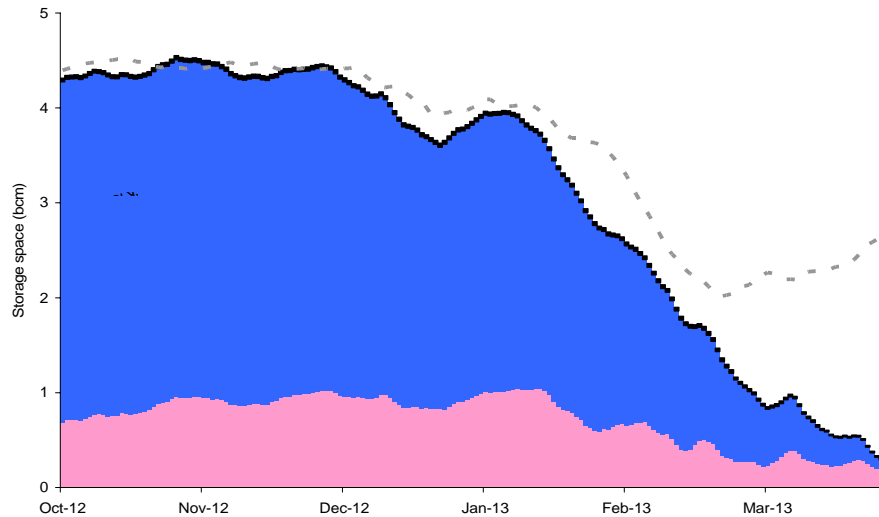
Market response

- Within day price increased to ~120 p/therm
- Storage flows from Rough and Holford
- Some LNG from Dragon

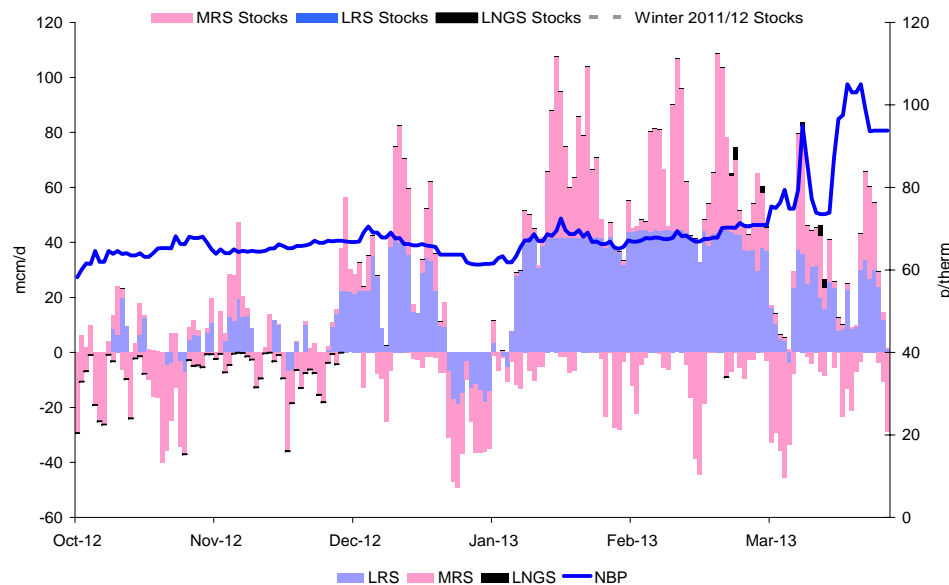
IUK Flow and Response



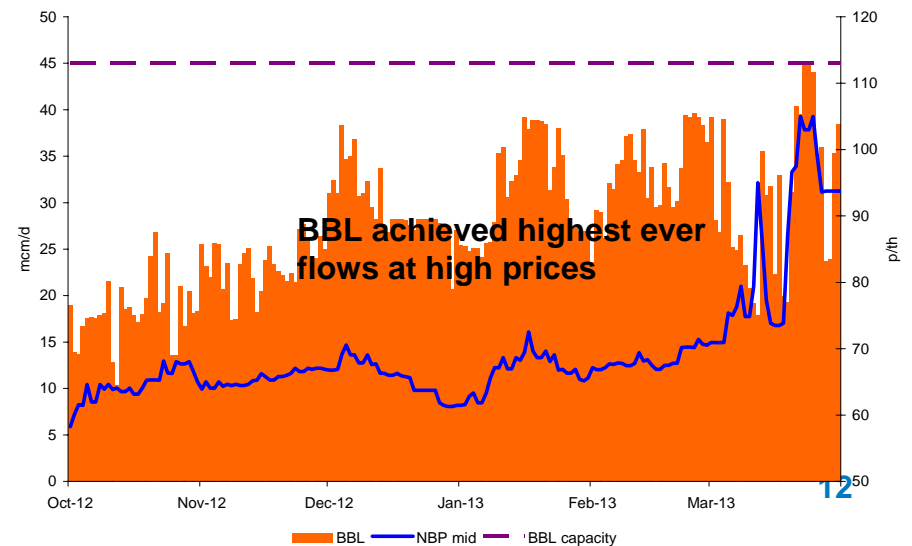
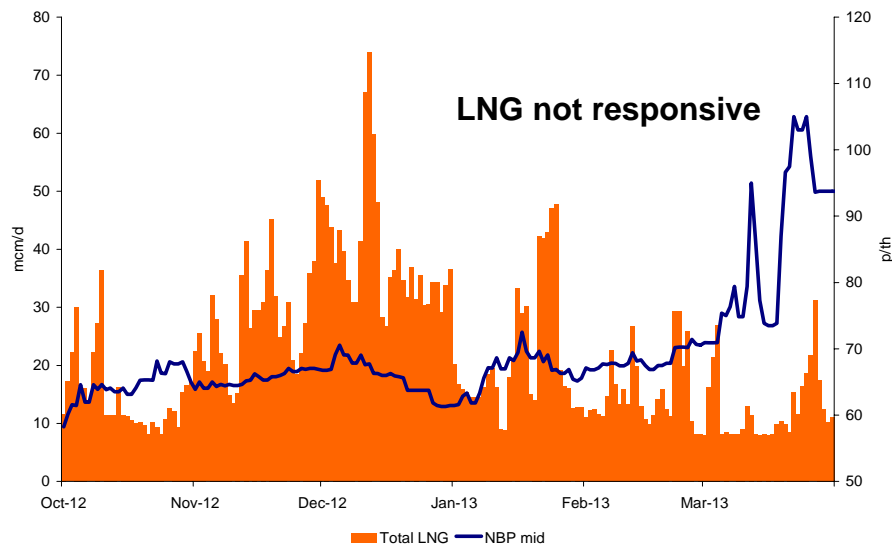
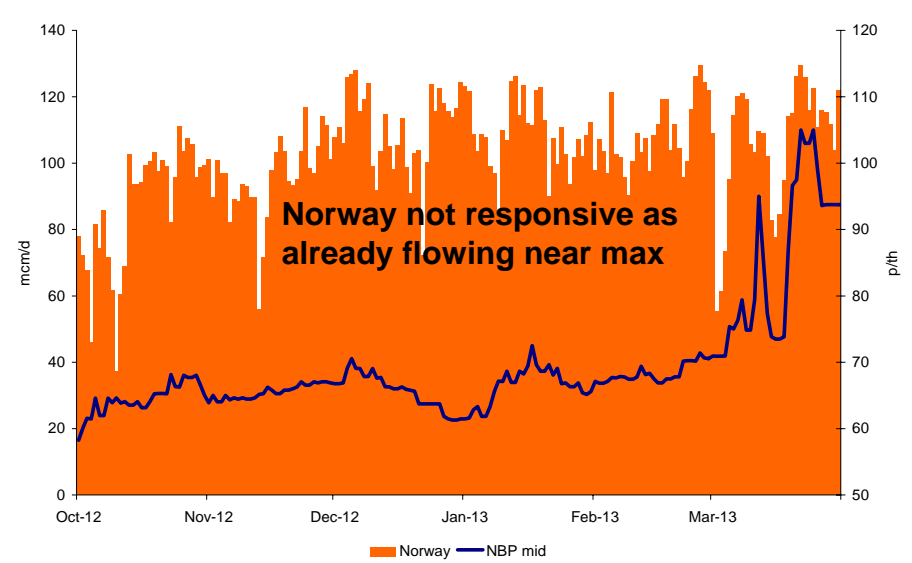
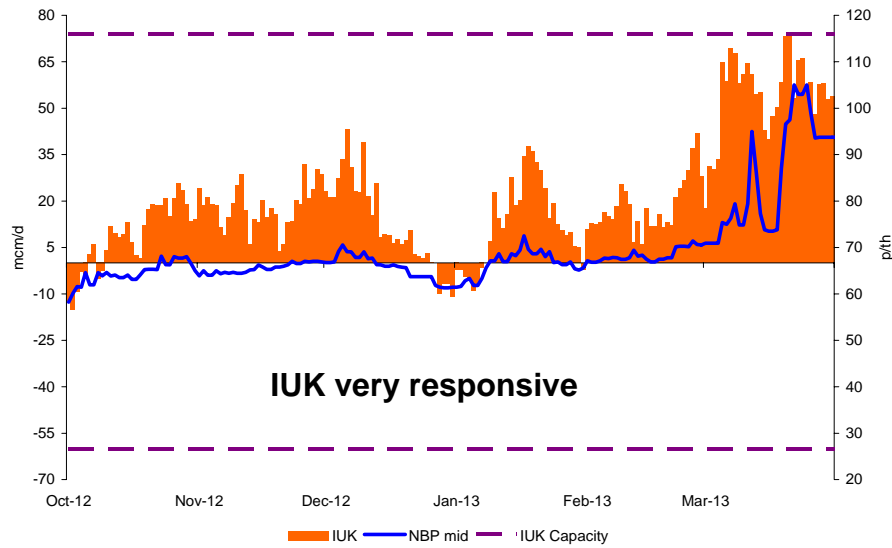
Storage use, stocks & price response winter 2012/13



- All types of storage refilled at Xmas, MRS refilled at other opportunities
- High storage use post Xmas
- Significant rundown of storage post Jan, for LRS this was not aligned to either price or demand
- LRS near fully depleted in March and could not fully respond to March demand and take advantage of high prices



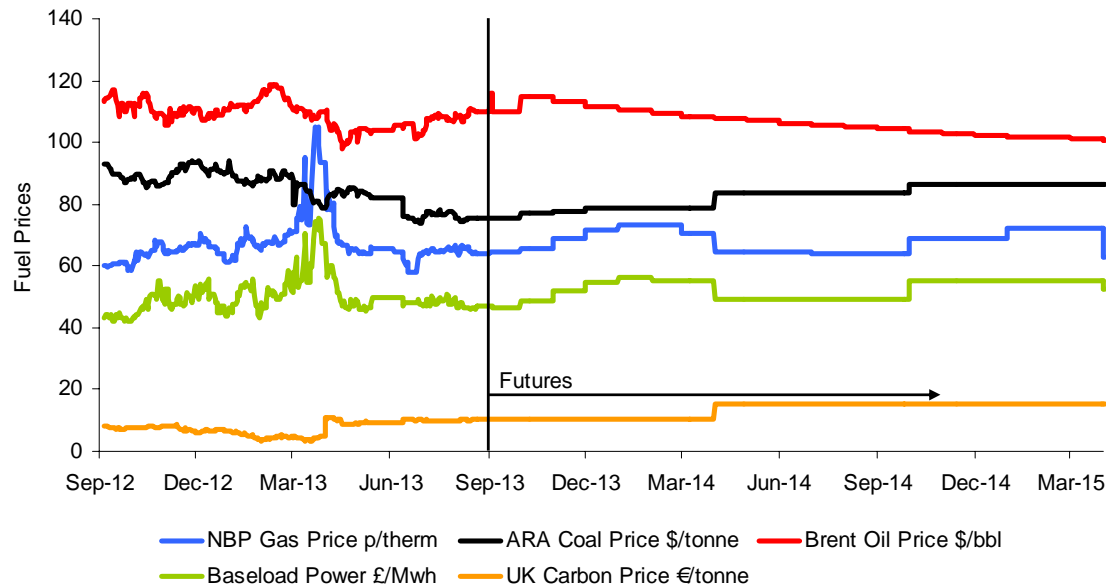
Response of other supply sources to demand / price



Winter Outlook 2013/14

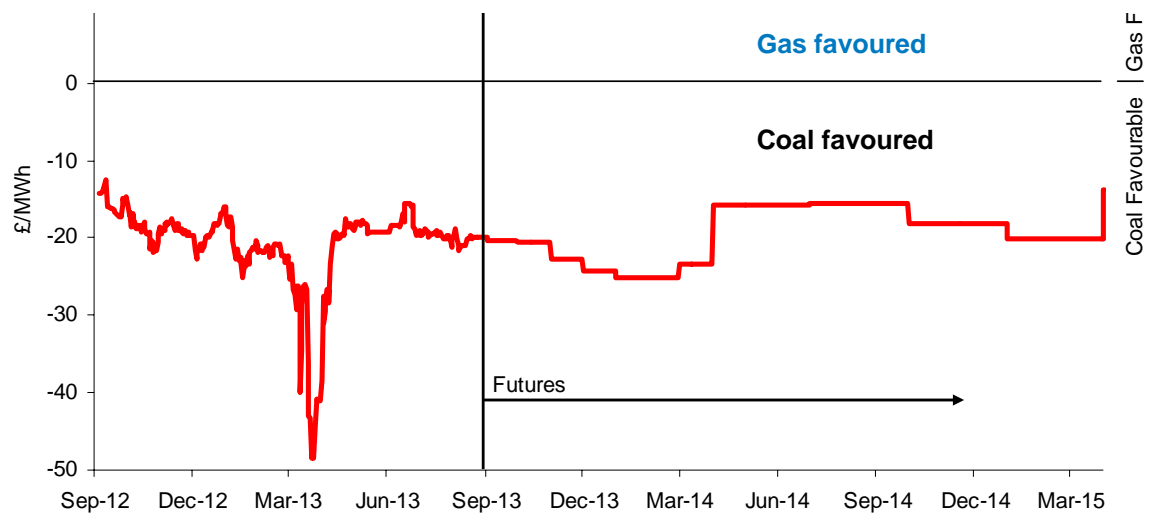


Winter 2013/14 fuel prices & dark vs spark difference



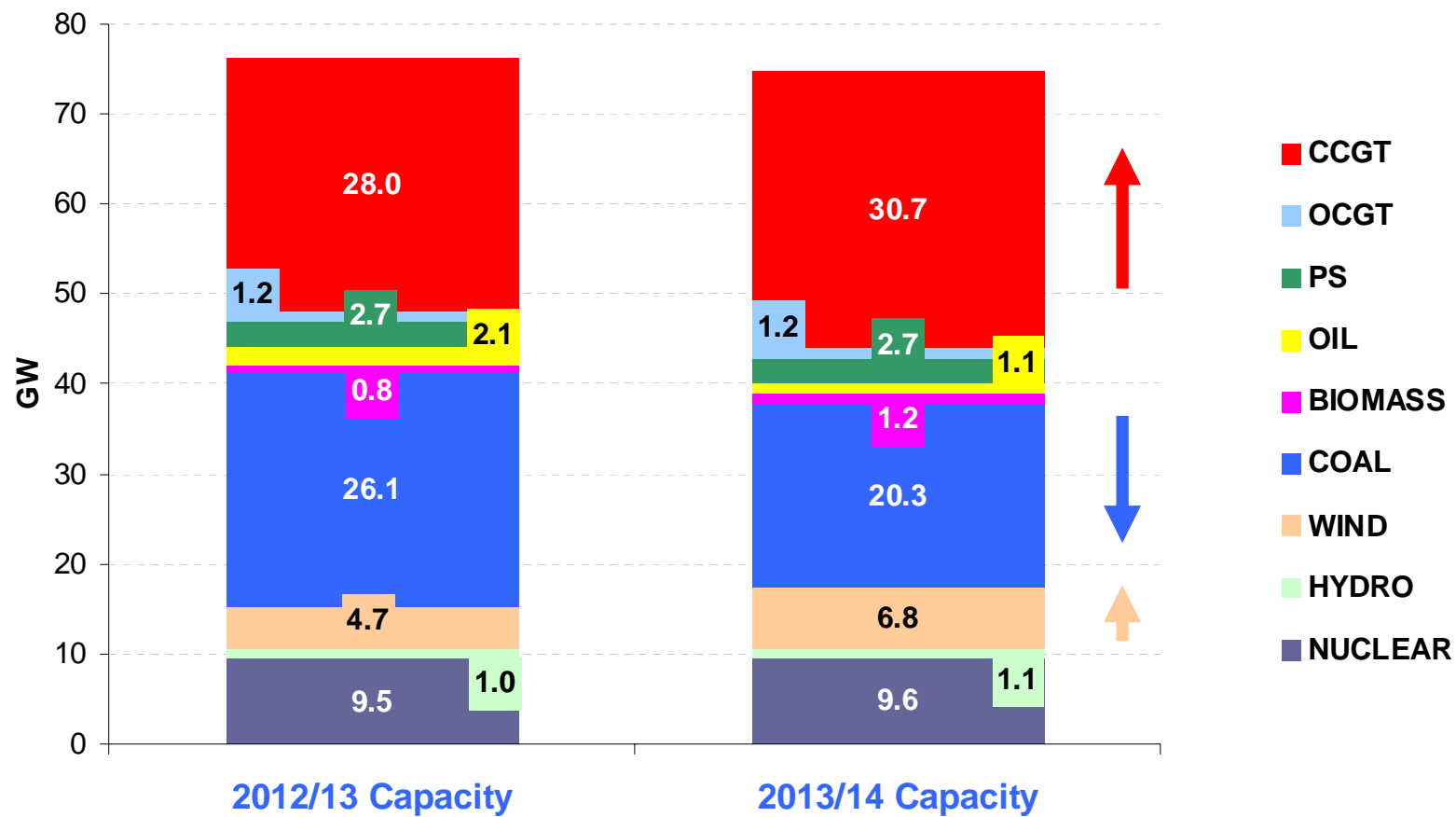
Forward Prices

- Oil declines
- Coal increases
- Gas seasonal, little change, modest summer / winter differential
- Power follows gas
- Carbon price increases through LCF



- Clean dark vs spark spread difference strongly favours coal burn over gas

Generation capacity (transmission)



Winter 2013/14 power generation

Power Station Type	Mid Winter Capacity (GW)	Assumed Availability	Assumed Capacity (GW)
CCGT	30.7	86%	26.4
Coal	20.3	85%	17.3
Nuclear	9.6	84%	8.0
Wind EFC (base case)	6.8	25%	1.7
Pumped storage	2.7	97%	2.7
Biomass	1.2	85%	1.0
OCGT	1.2	95%	1.1
Oil	1.1	87%	1.0
Hydro generation	1.1	79%	0.8
Total	74.7		60.0

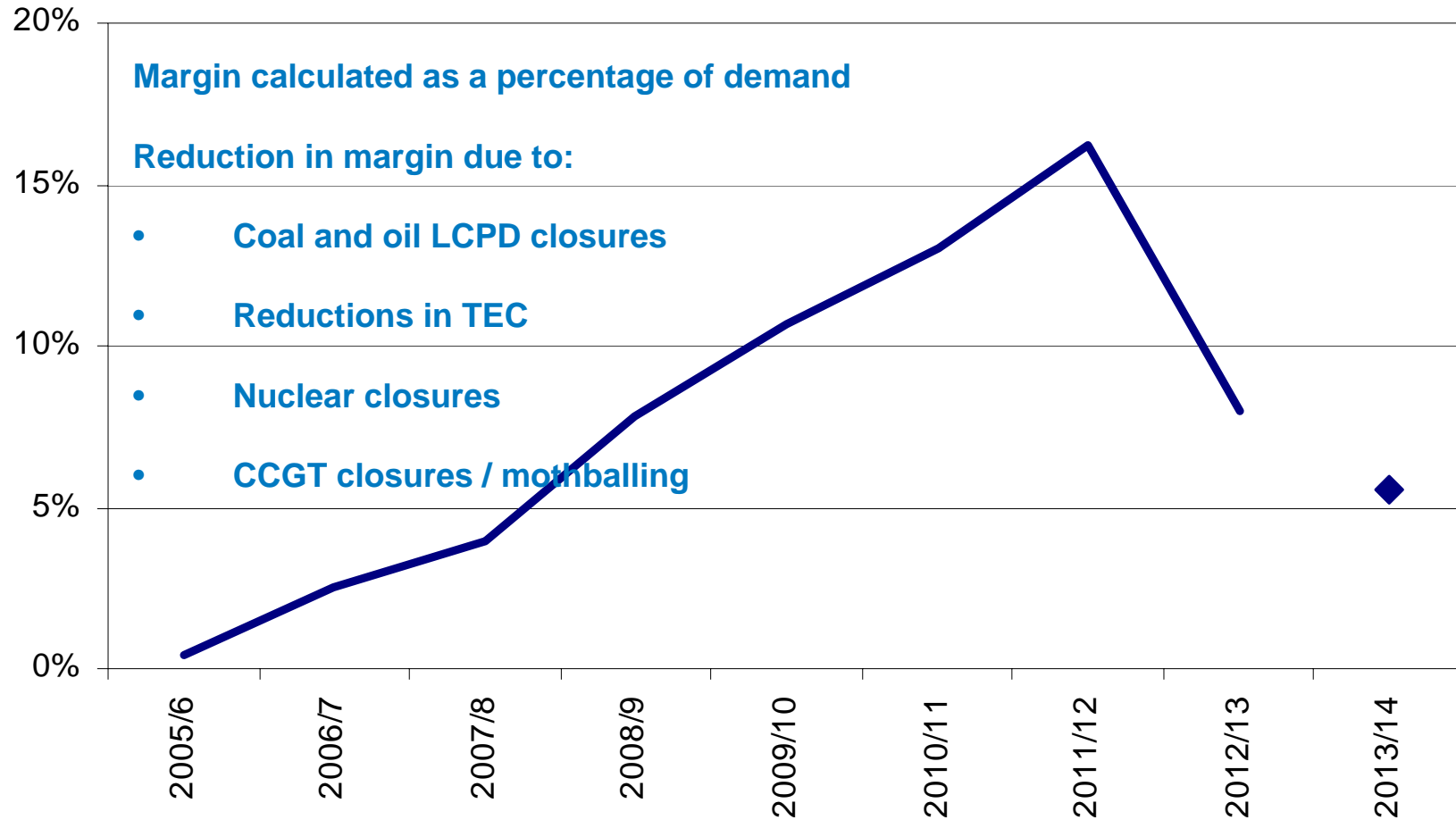
Remaining LCPD plant – Ferrybridge (coal) 1GW, Ironbridge (biomass) 0.7GW & Littlebrook (oil) 1.1GW

2.7GW of gas CCGT declared unavailable, includes Teesside & Keadby

No new CCGT this winter, next new CCGT Carrington in 2016/17 (possibly earlier)

Power generation

Theoretical historic margins using current methodology

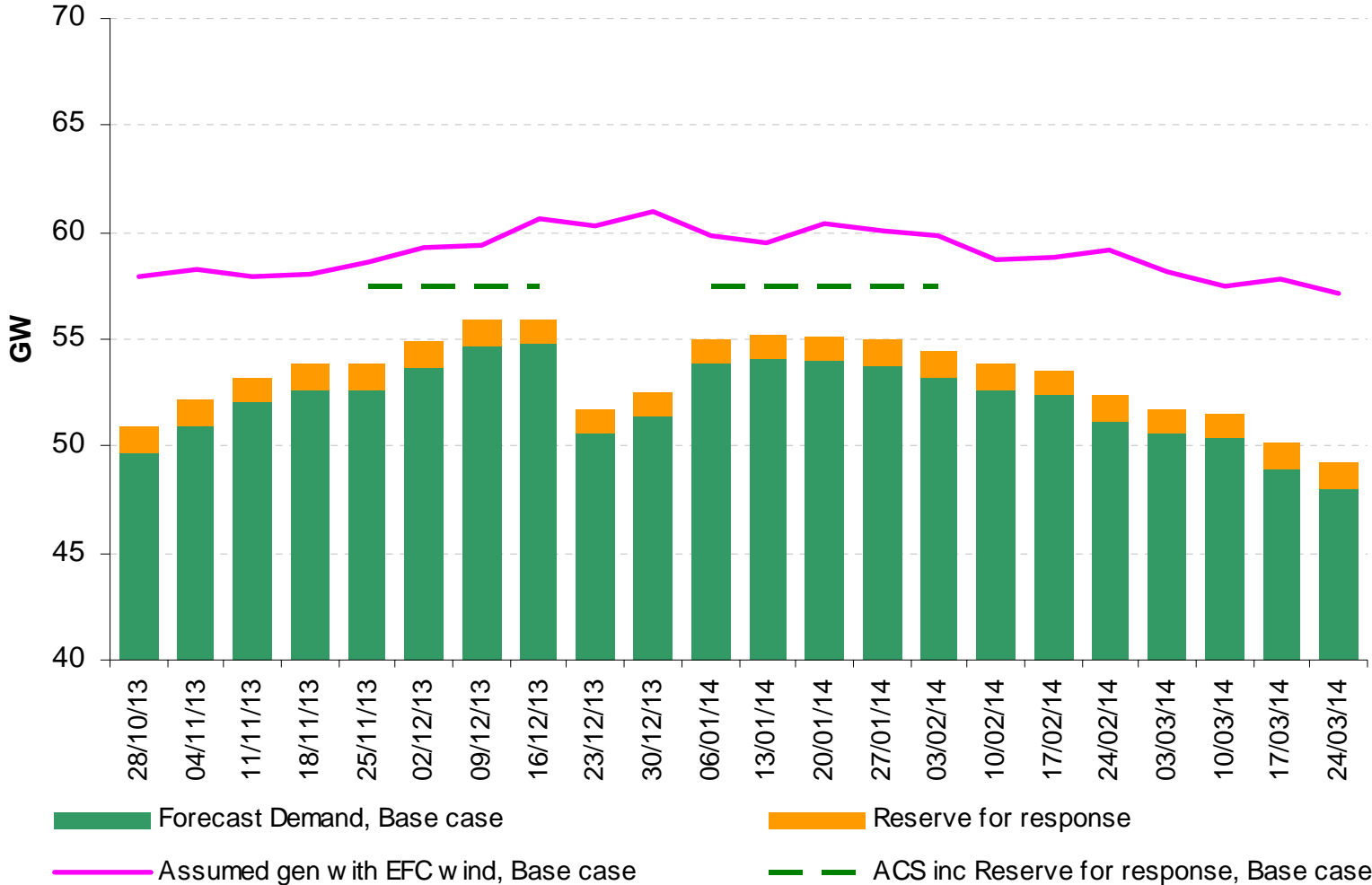


ACS peak demand 56.3 GW (last year 56.6 GW)

Demand has been declining at about 1% per year

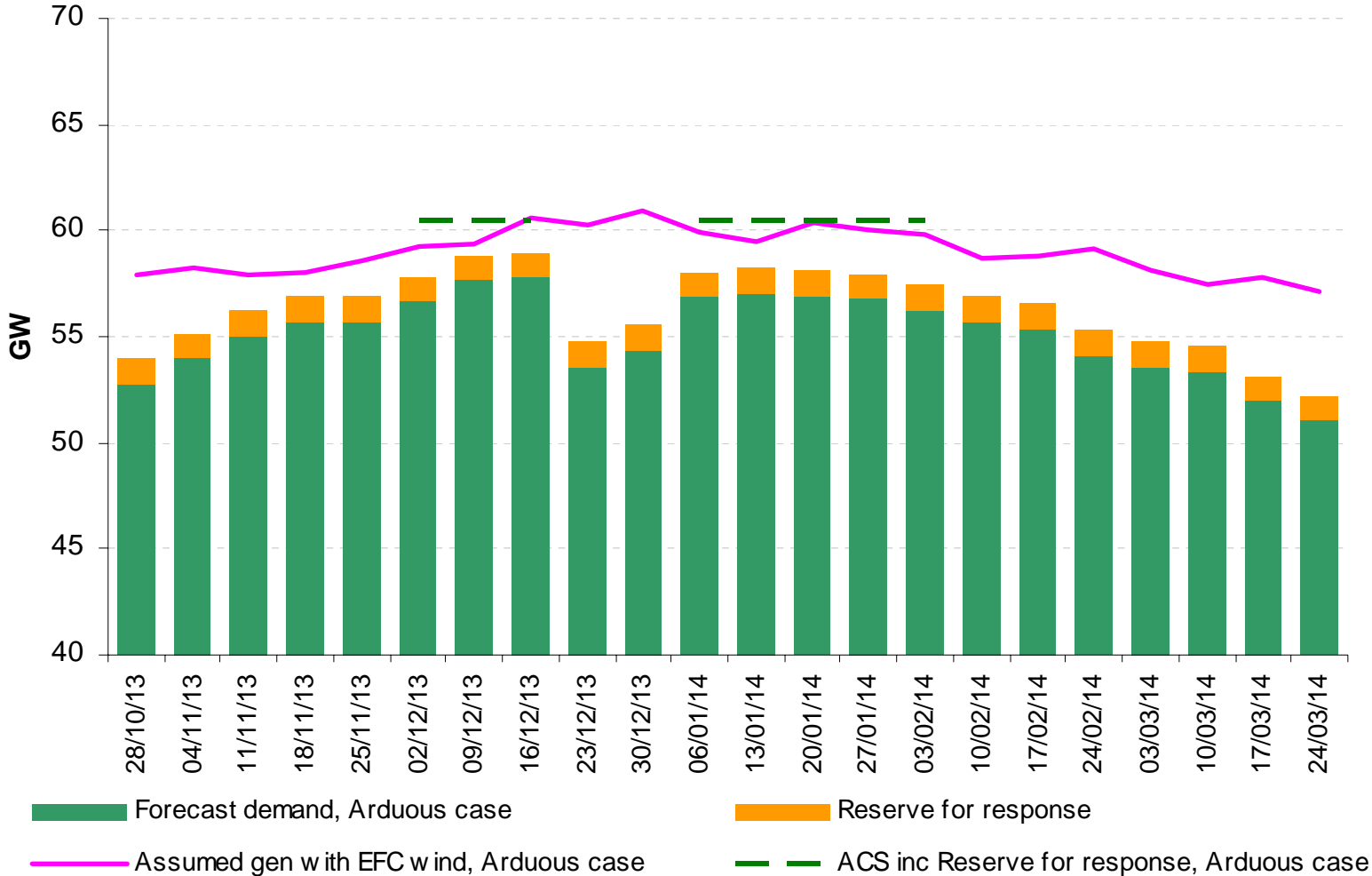
Electricity

Base case forecast – EU imports = Irish exports

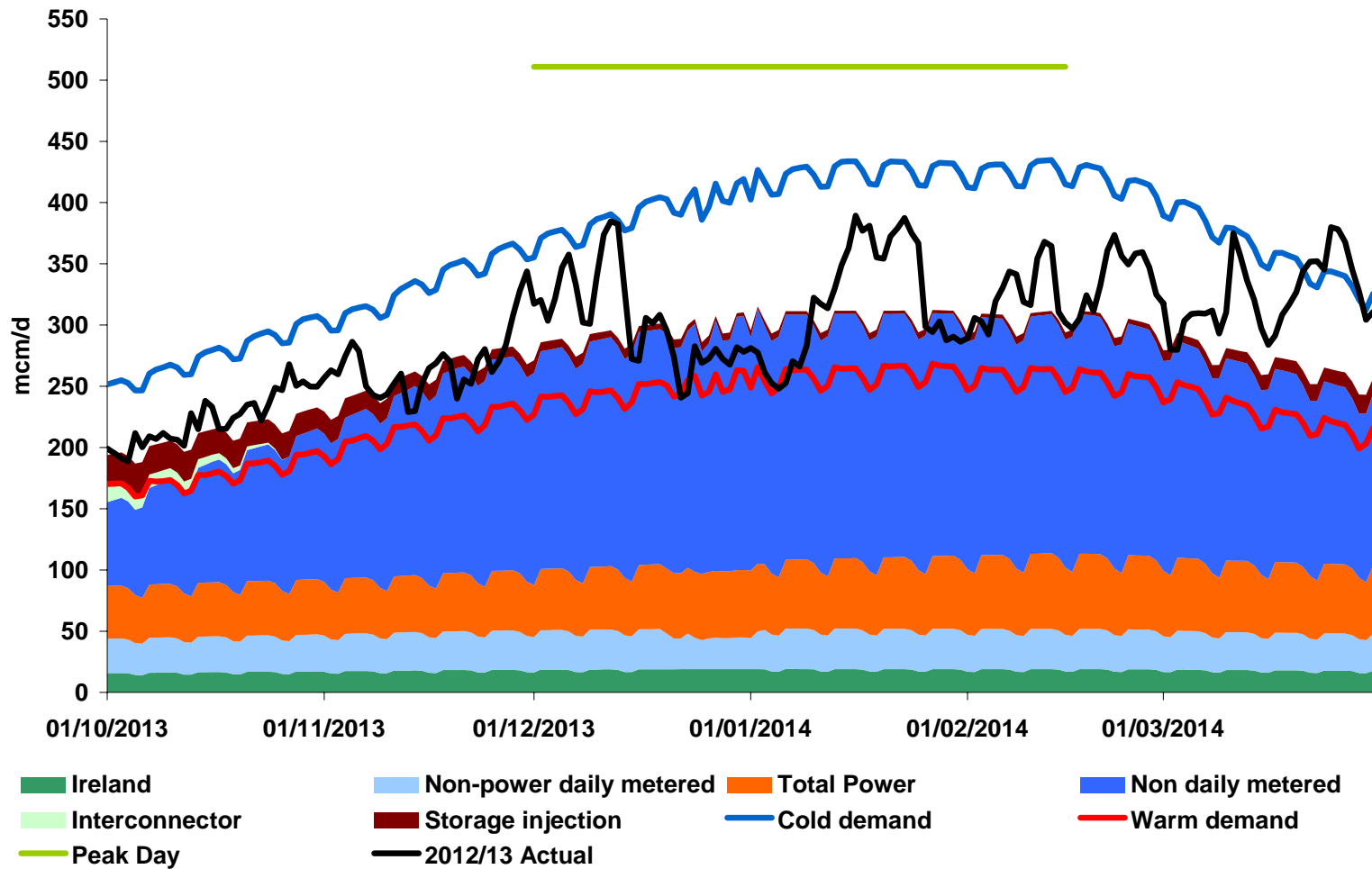


Electricity

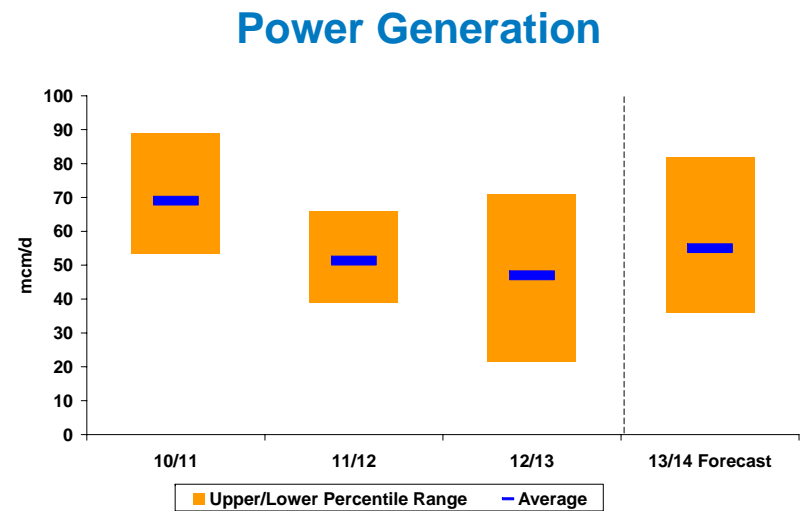
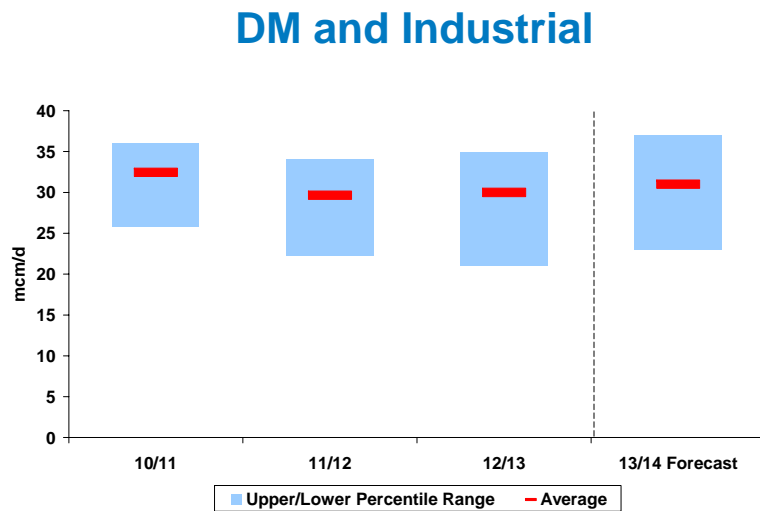
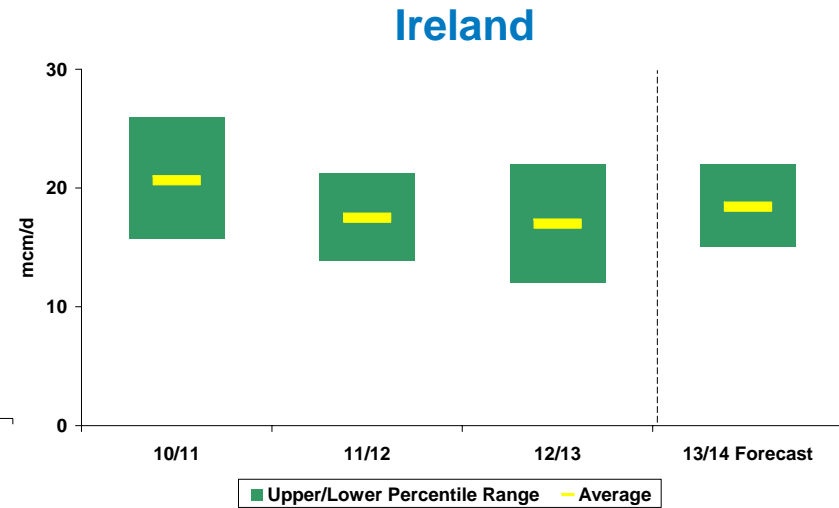
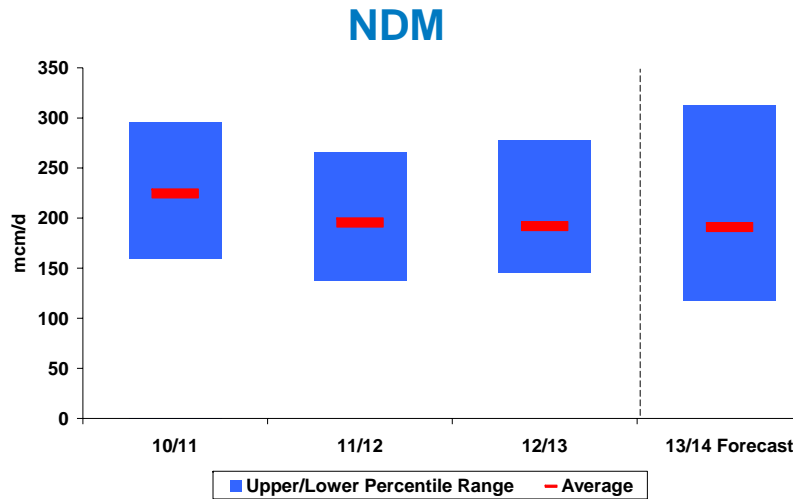
Arduous forecast – full interconnector exports



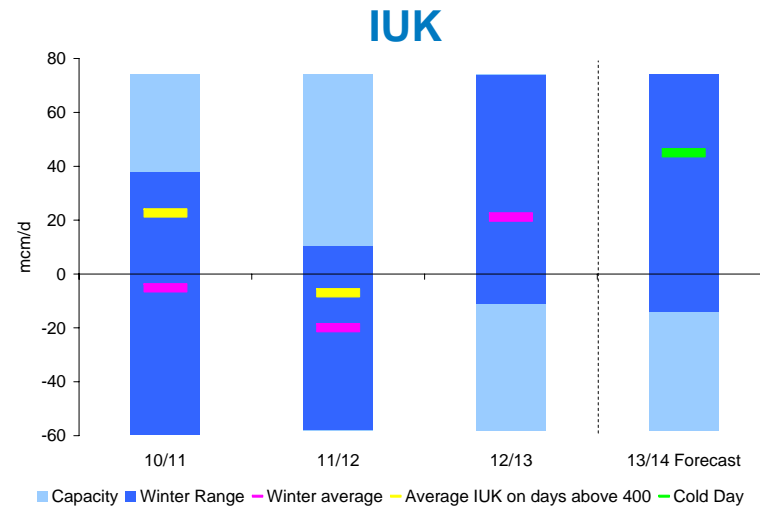
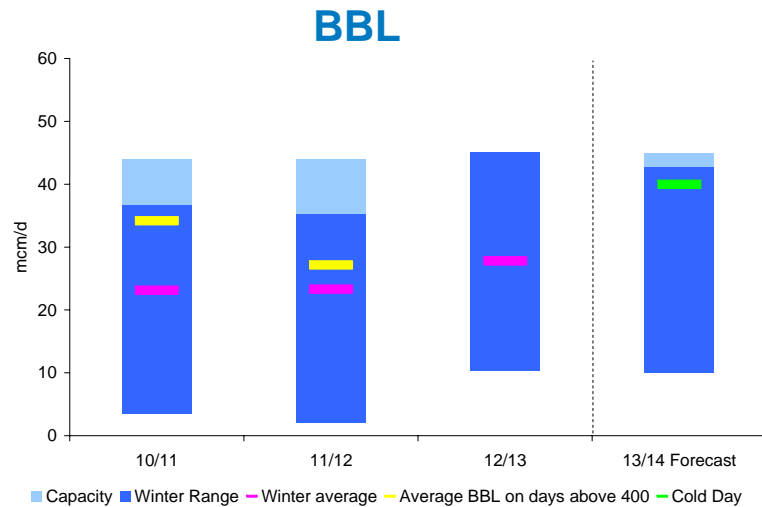
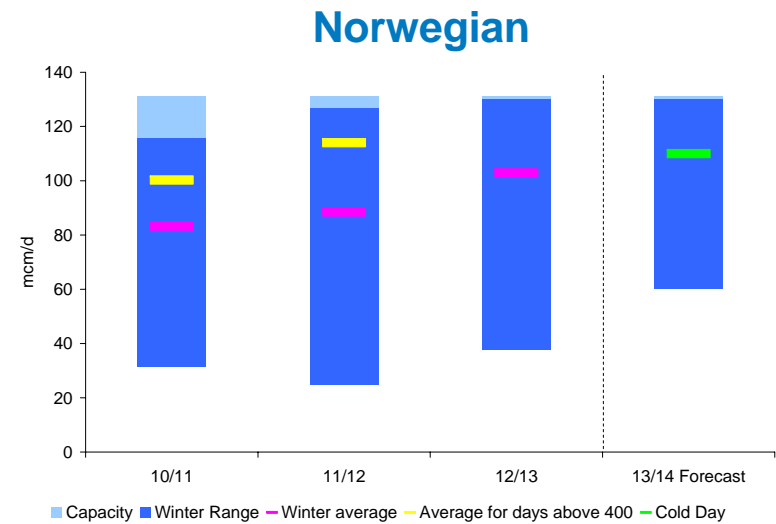
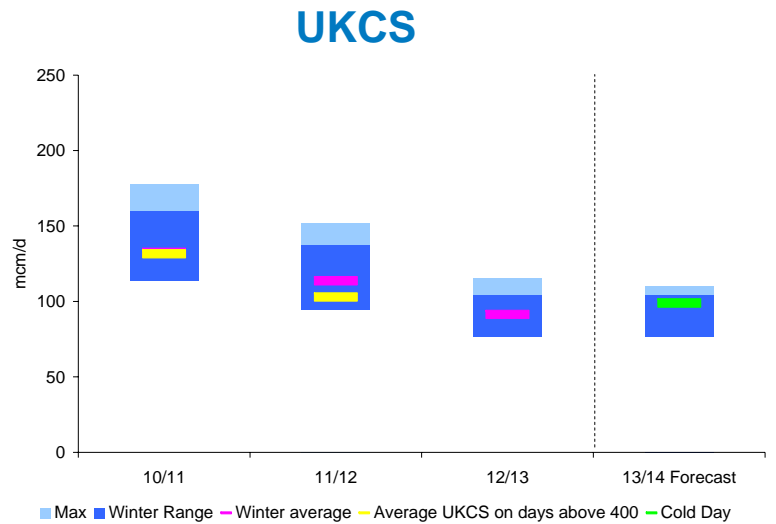
Winter 2013/14 seasonal normal gas demand (SND)



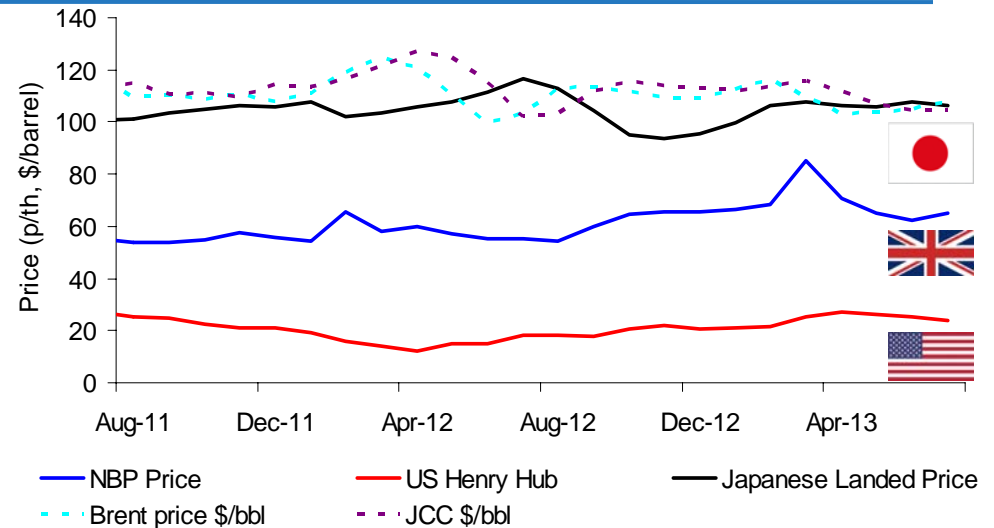
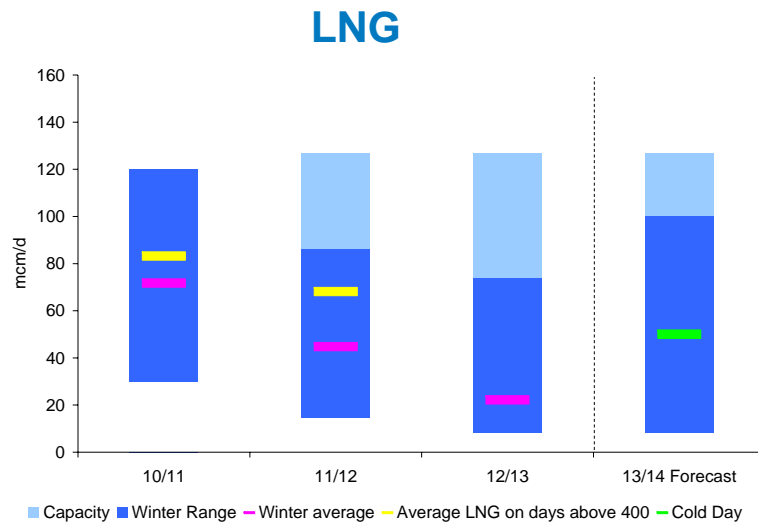
Winter 2013/14 gas demand forecasts by sector



Winter 2013/14 gas supply forecasts by sector



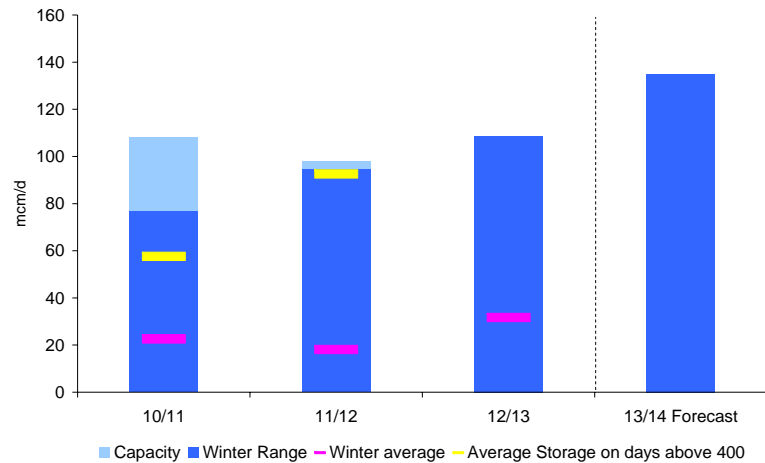
Winter 2013/14 LNG



Greater LNG availability (Potentially higher UK imports)	Less LNG availability (Potentially lower UK imports)
Increased global production capacity	Additional demand inc. new imports (Singapore / Israel)
Increased coal burn in Japan with the commissioning of new power stations	Shutdown of all nuclear capacity in Japan
Possibility of limited Japanese nuclear restarts over winter 2013/14	Strong demand in Asia, primarily Japan, China and South Korea
Possibility of higher reloads from Spain	Decline in LNG available for export, for example Egypt, Indonesia & Yemen
Start of Qatargas – Petronas contract at Dragon for 1.6bcm/y equates to 4mcm/d or 1 boat per month)	

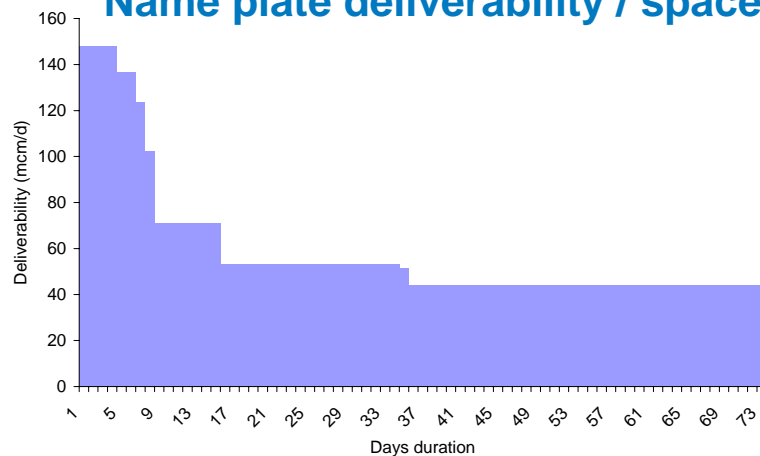
Winter 2013/14 Storage

Storage



- Storage about 75% full, Rough over 80%, expectation of near full by early November
- Increased deliverability and space at Aldbrough and Holford
- Commercial operations to commence at Hill Top
- Stublach commissioning late winter but commercial operations not expected

Name plate deliverability / space



- UK storage can meet about 30% of peak demand
- Claims that UK has x days of storage are misplaced
- 4.5bcm of storage space dominated by Rough (~3.2bcm)
- Storage deliverability could be significantly depleted are about 1 week

We have a range of tools...

Electricity

- Communication (NISMs)
 - Market provision of capacity
- Access additional capacity
 - Non BM STOR
 - Max gen service
- Improve Interconnector flow
 - Trading
 - Emergency arrangements
- Reduce demand
 - Voltage reduction

Gas

- Information provision
 - Margins Notice (MN)
 - Gas Deficit Warning (GDW)
- Operational Tools
 - Reconfigure network / optimise compressors
 - Enforce rules in UNC / NEXAs
- Commercial Tools
 - Local / National Energy Actions
 - Capacity
 - Scale back Buy Back

Summary

Gas

2013/14 demand comparable to 2012/13 (but subject to weather)

Diverse range of supply capacity, in excess of peak demand, subject to market forces

Electricity

Average Cold Spell demand forecast 56.3 GW

Central forecast margin of 5%: actual margins will depend on actual demand, generation availability and interconnector flows

No room for complacency, but market has the capability to deliver, and National Grid has the right mix of physical assets, operational and commercial tools to ensure consumers receive the energy they need reliably, efficiently and safely