

2010 Winter Outlook & a future view



Presentation to BIEE 8th October 2010

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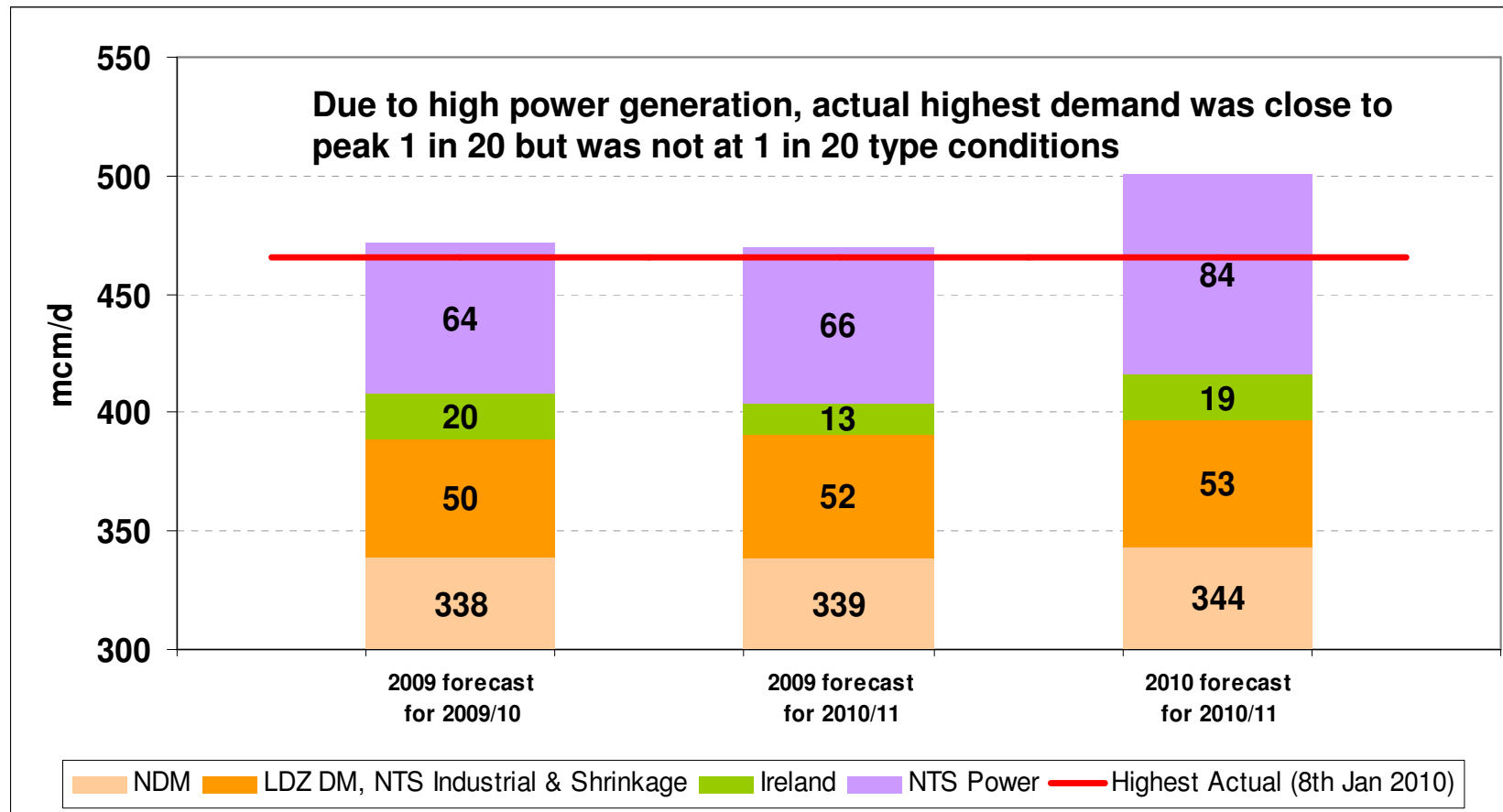
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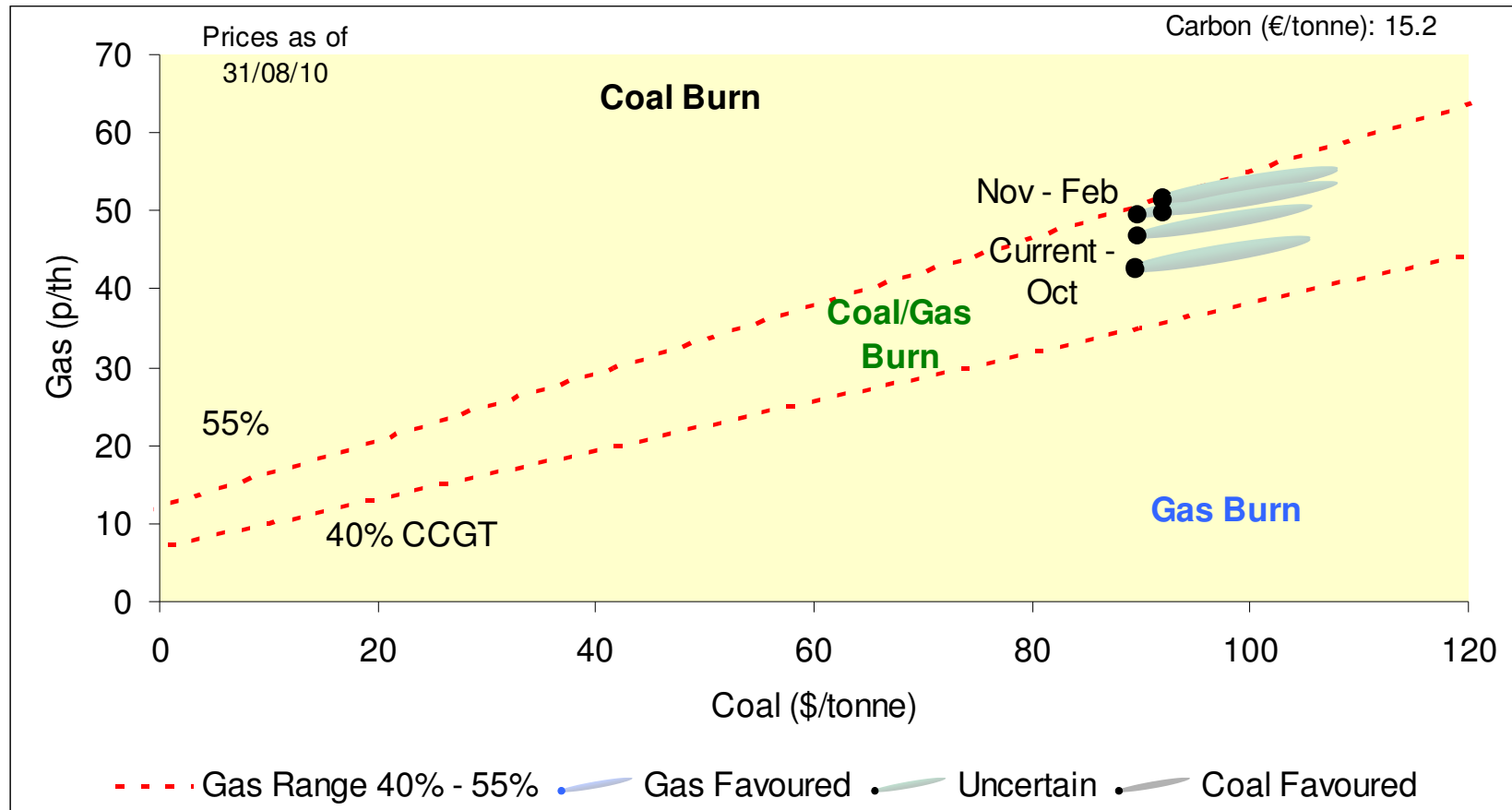
Winter 2010/11 Weather Forecast

- The Met Office have not issued a specific winter weather forecast for winter 2010/11
- But their web site continues to provide longer term weather forecasts
- For the December to February period their data illustrates for most of the UK:
 - a 60 – 80% probability of above normal temps
 - a 20 – 40% probability of near normal temps
 - a 0 – 20% probability of below normal temps
- In terms of UK precipitation their forecasts are weighted towards above average
- For Europe average temps are typically 0.5-1.5°C above average
- For North America average temps are up to 2° above average except for a cooler west coast

Gas - Forecast Peak Demands



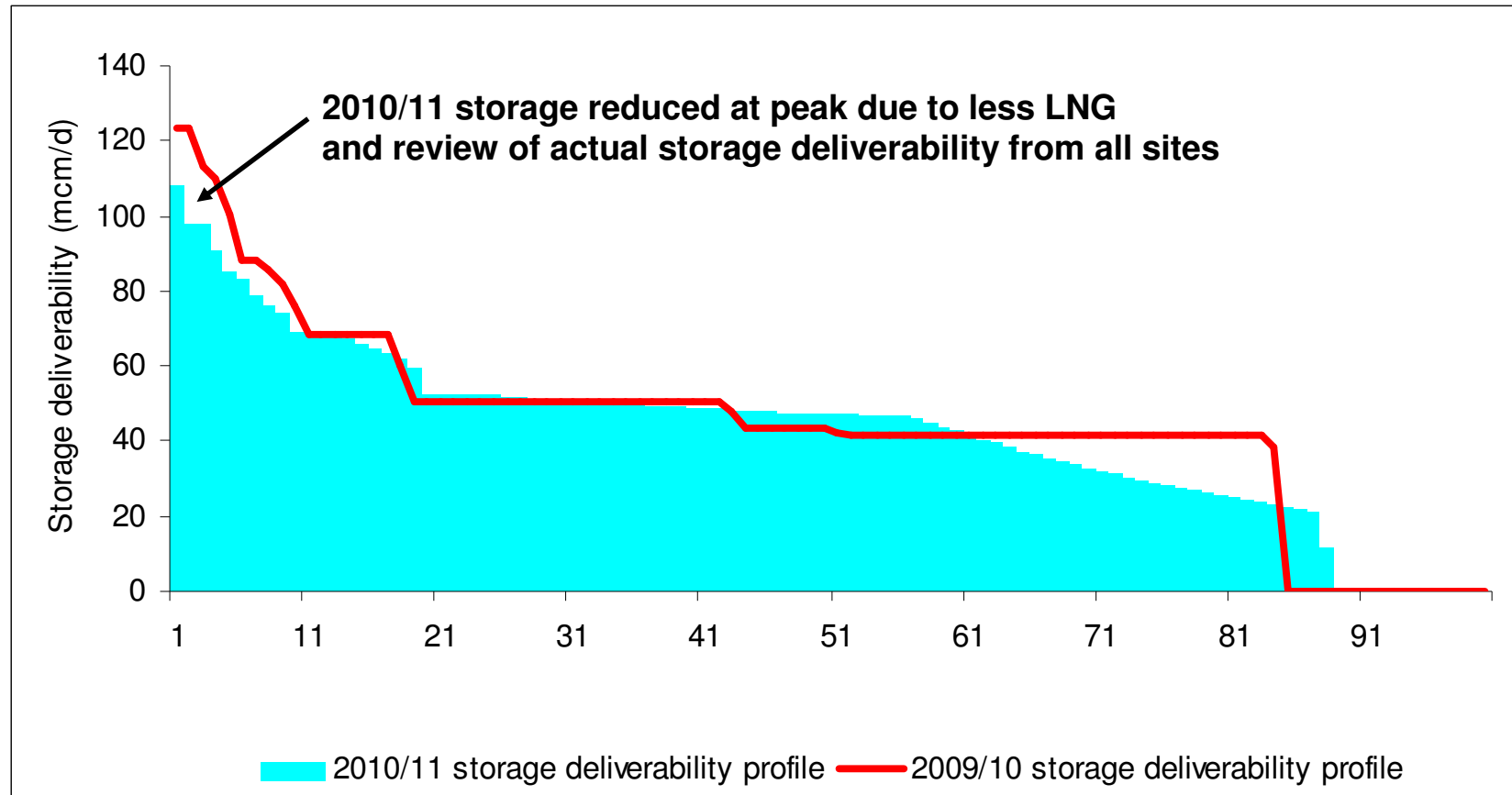
Gas – Preferred source of fuel for Electricity Generation



Winter 2010/11 Supplies

	09/10 Base	10/11 Range	Base Case
UKCS	183	166	166
Norway	100	86-116	101
BBL	20	30	30
IUK	0	30-0	10
LNG	40	30-100	60
Total NSS	343	342-412	367
Storage	124	108	108
Total	467	450-520	475
Peak Demand	472		501

Gas – Storage



Electricity – New CCGTs

- Staythorpe
 - 1700MW
- Severn Power
 - 850MW
- Grain units 6,7 and 8
 - 1200 MW
- West Burton B
 - 1300 MW

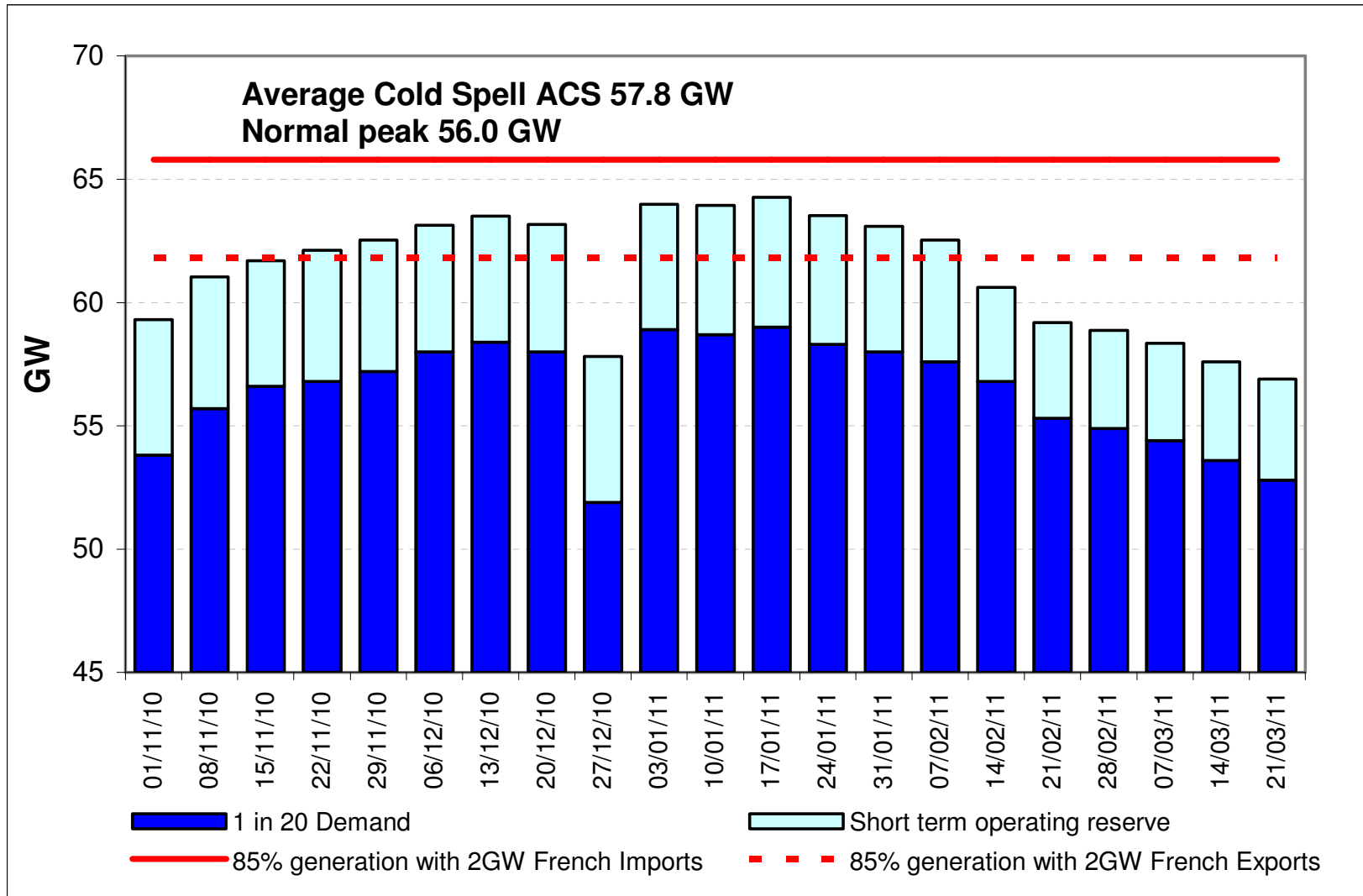


Severn Power

Electricity - Assumed Availability

Power Station Type	Full Metered Capacity (GW)	Assumed Availability	Assumed Availability (GW)
Nuclear	10.1	75%	7.6
French Interconnector	2.0	100%	2.0
Hydro generation	1.0	60%	0.6
Wind generation	2.5	10%	0.3
Coal	27.9	90%	25.1
Oil	2.7	80%	2.2
Pumped storage	2.7	100%	2.7
OCGT	1.2	90%	1.1
CCGT	27.5	90%	24.7
Total	77.7		66.3
Overall availability		85%	

Electricity - 1 in 20 Demand and Assumed Generation Availability



Winter Outlook 2010/11 - Summary

■ Gas

- Peak day demand forecast is higher than last year
- Forecast non storage supplies are higher than last year with potential upsides in LNG
- Storage deliverability is reduced due to less LNGS and a review of the actual deliverability from all storage sites
- Forecast spreads between Gas or Coal as base load fuel source for Electricity Generation is very small

■ Electricity

- Average Cold Spell Demand forecast is the same as last year
- Notified and Assumed Generation availability is close to last years figures
- Large potential upside in new CCGT commissioning during the winter

- **Even with the uncertainties the forecast indicate the winter should be manageable**

- **But events happen!**

Winter 2010/11 Supply Issues

Russia & LNG

Russian Supplies 2010/11

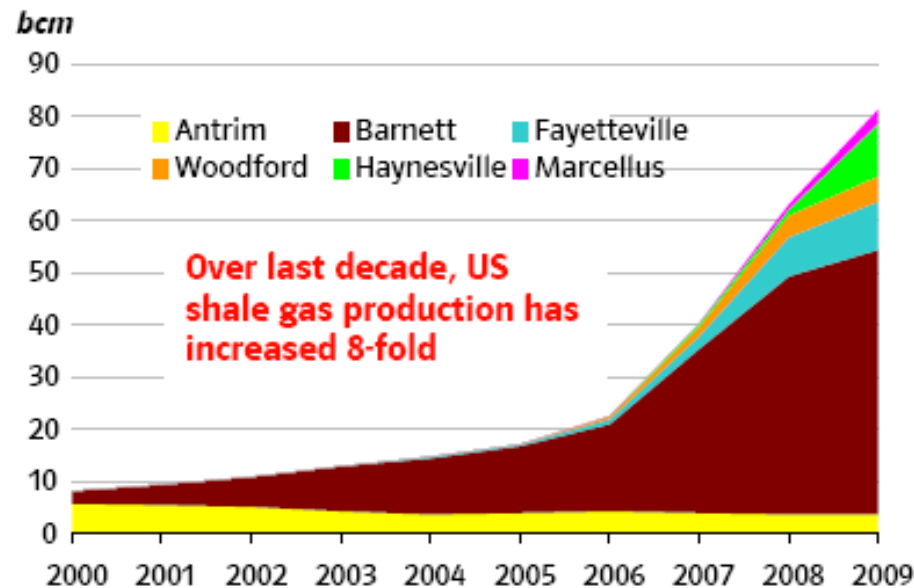
- **Ukraine** - Better relationship since election in Jan/Feb
 - 30% discount negotiated in return for 25 yr extension to use of Sevastopol
 - Price too high? but all bills paid on time
 - Emphasis as 'a reliable transit route'
 - IMF funding resumed with \$15bn loan. domestic prices raised 50% as a condition
 - 22 bcm out of 36 bcm in Ukrainian storage (2009 ~ 25 bcm)
 - Foreign minister calls South Stream project 'wasteful' and 'unnecessary'
 - Talks of joint venture to upgrade Ukraine's transit system, but parties poles apart on structure
- **Belarus** - 4 day dispute in June 2010, no issues reported since
- **Poland** - Currently does not have sufficient contracts to meet demand, ~2.5 bcm shortfall
 - Negotiations ongoing between PGNIG and Gazprom over new contract, EU monitoring

LNG & Shale – the game changer?

- US LNG import capacity developed to meet longer term US gas shortfall arising through lower indigenous production and lower pipeline imports
- **BUT** non conventional US gas developments (notably Shale) have limited US LNG import needs, despite low prices
- Global recession and low US LNG imports have provided excess LNG to alternative markets, notably UK
- UK and other spot market gas is now priced much lower than 'oil indexed' contracted gas leading to pressures to break indexation
- To change the current supply / low price position:
 - Increased global LNG demand – China & India
 - Lower US non conventional gas due to depressed US price
 - More 'managed' gas production from producers

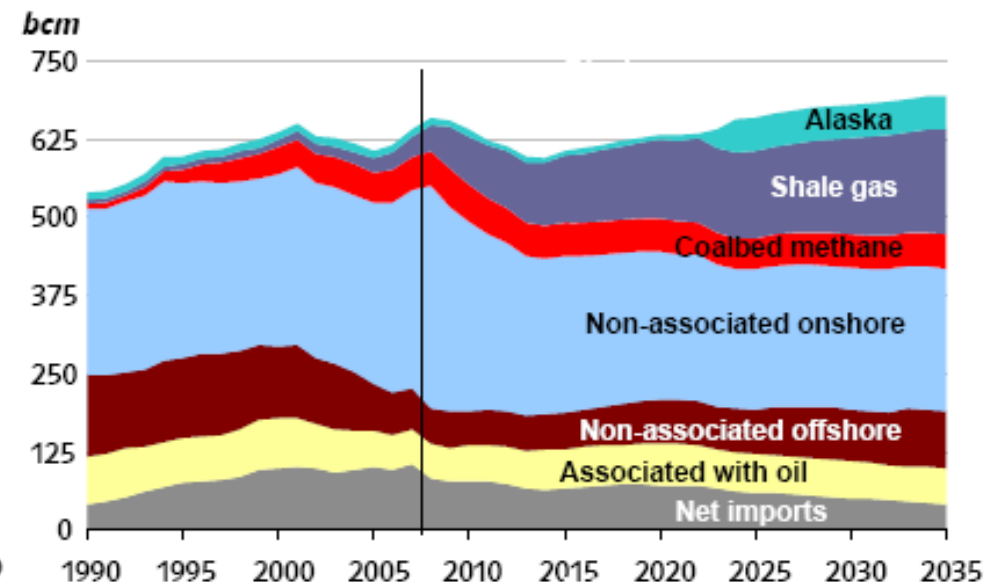
US shale & total production

Shale Gas production in the U.S.



Source: EIA, Richard Newell (02-03-2010)

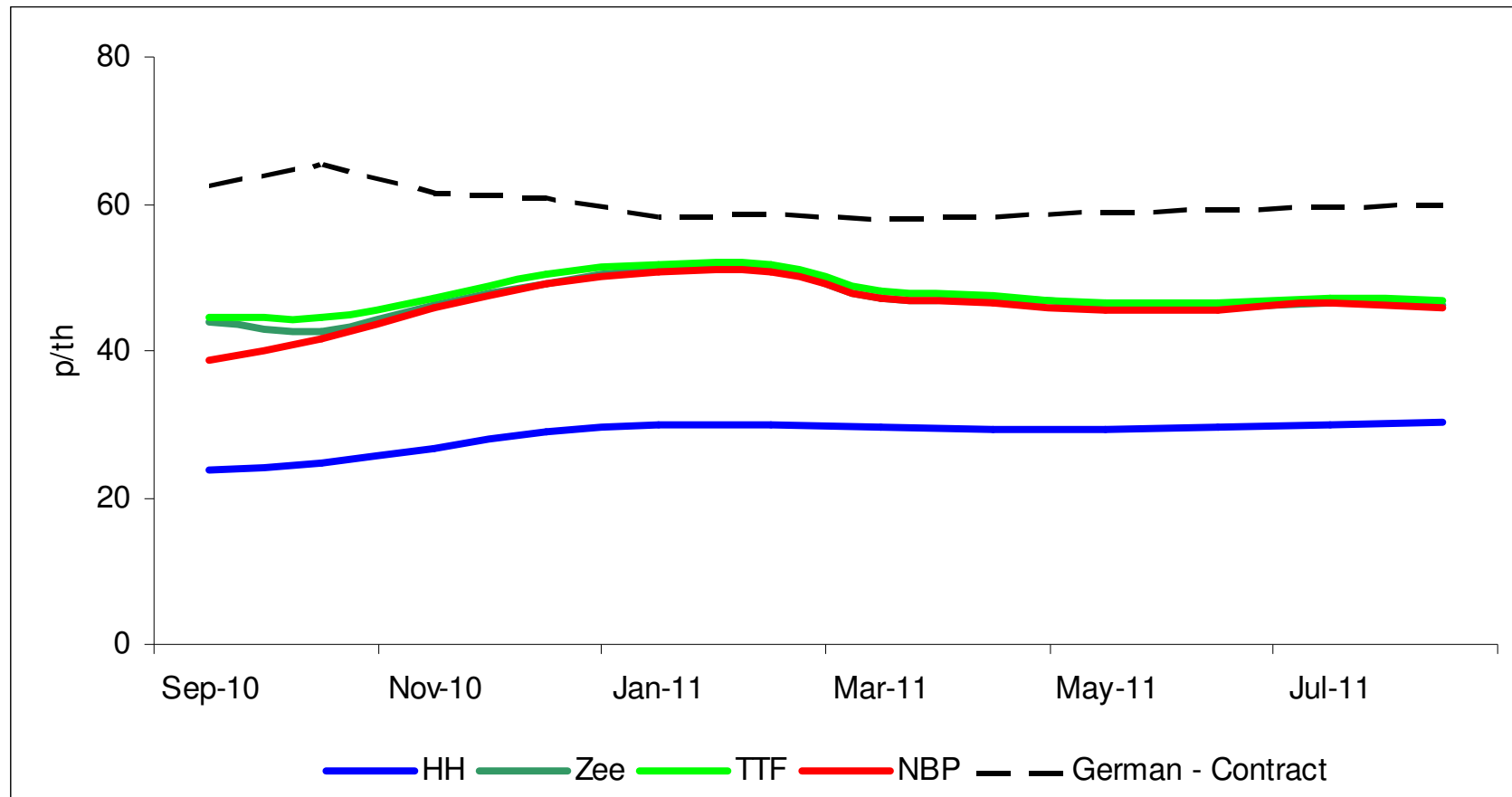
U.S. total gas production



Source: EIA, Richard Newell (02-03-2010)

Following years of little or no growth, US gas production is forecast to grow through Shale resulting in lower imports, hence anticipated less need for LNG

US vs Europe Forward Gas Prices



Security of Supply

Several supply issues over previous winters....

2007/08 Limited LNG available

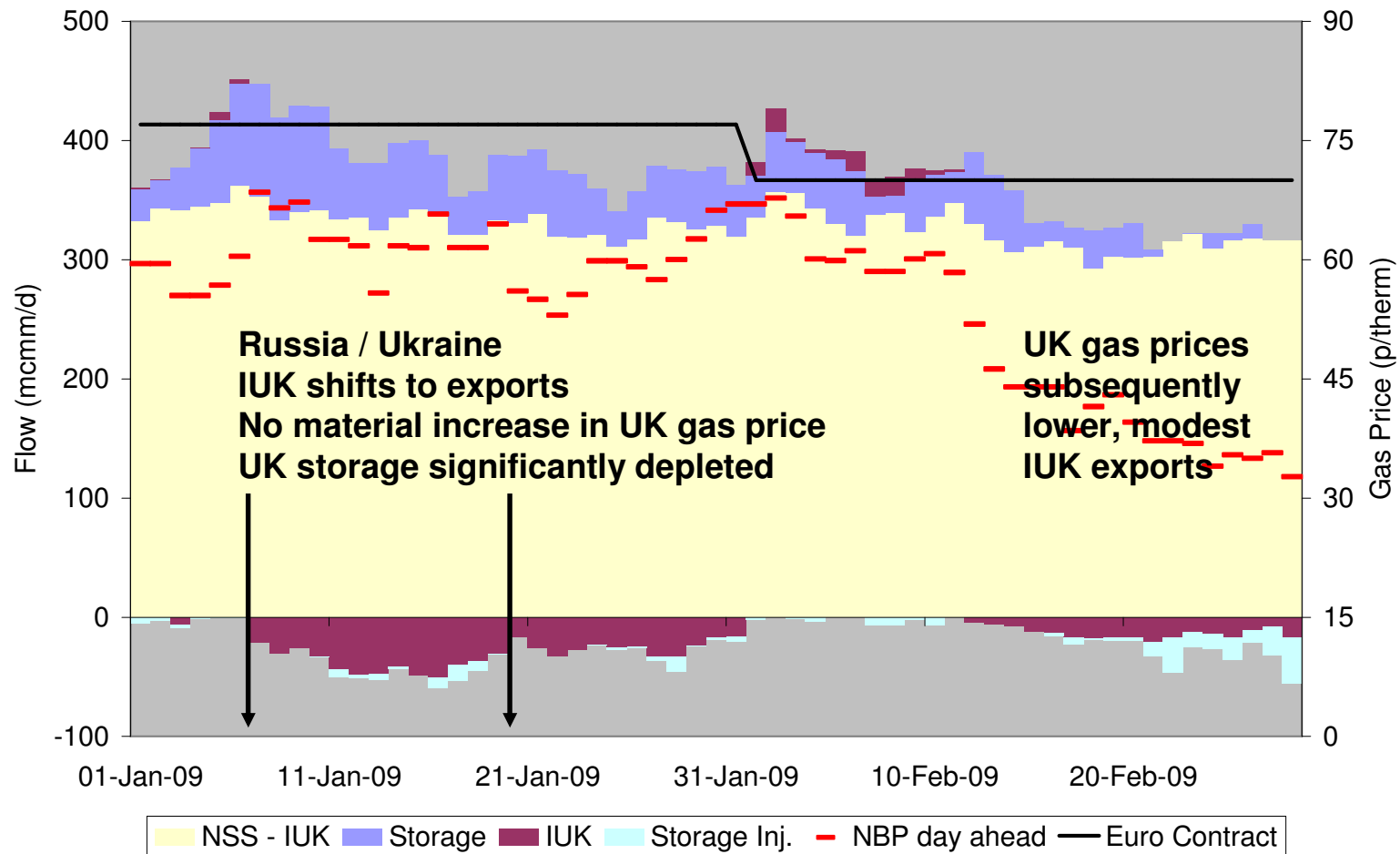
- July 2007 Magnitude 6.6 Earthquake off coast of Japan
 - 8000 MW Kashiwazaki-Kariwa Nuclear plant shutdown
 - Equivalent to about 10 bcm LNG for CCGTs
- Japan colder than average for Jan & Feb
- China started taking small volumes of LNG (3 boats per month) – Olympics?
- US volumes (contracted?) held up
- **Limited non contracted supply available. Low UK supplies despite average Dec to Feb prices of over 50 p/therm**

2008/09 Russia – Ukraine

- Payment dispute between Russia and Ukraine led to a cut off in supplies on 7th Jan 2009
 - Cut off lasts 13 days
 - >300 mcm/d of supply
 - Freezing temperatures through much of Europe
- IUK exporting ~ 40 mcm/d
- Norwegian Flows rerouted ~ 10 mcm/d

- UK storage depletion
- No price signal to hold back UK storage

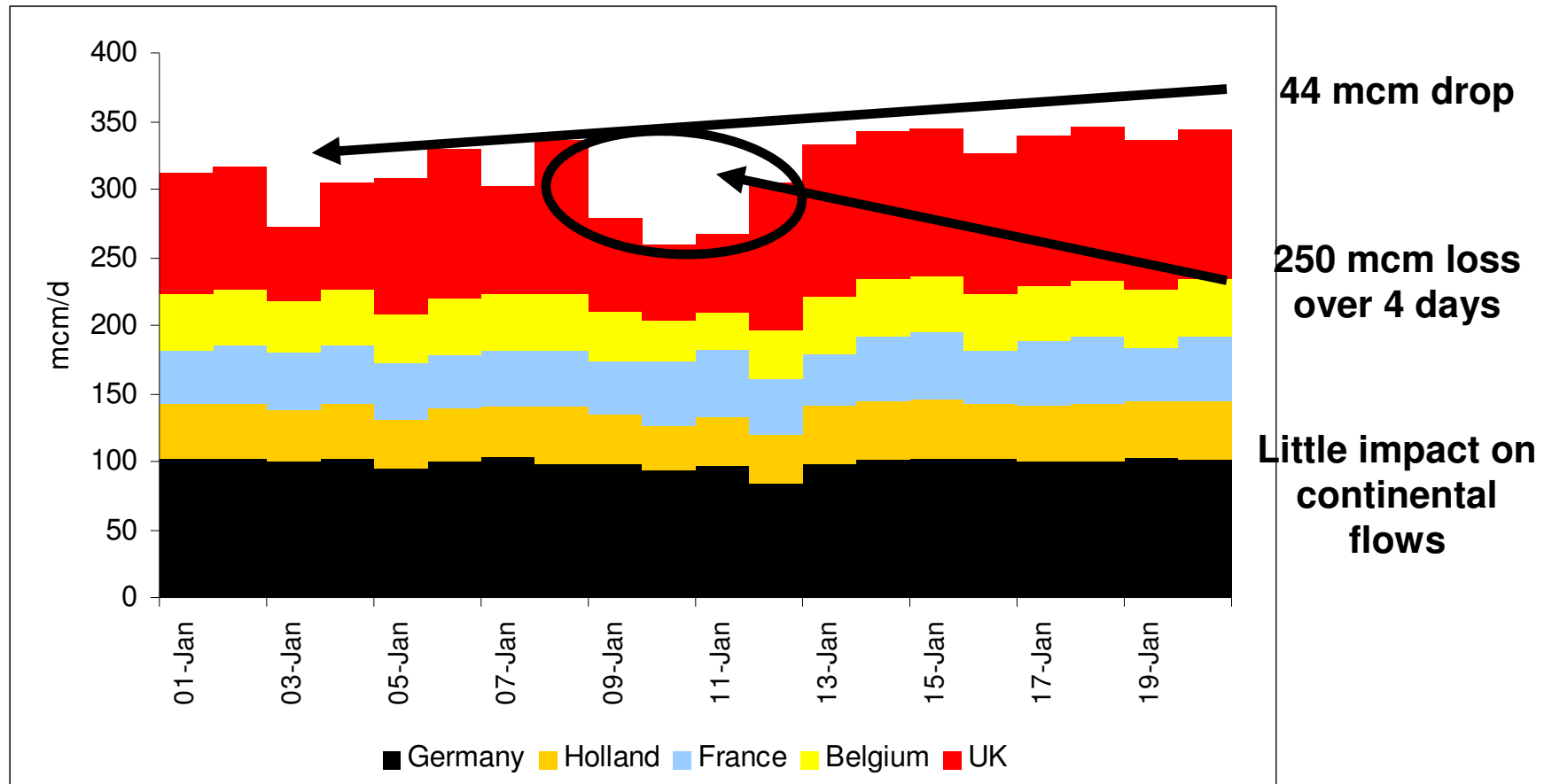
January & February 2009



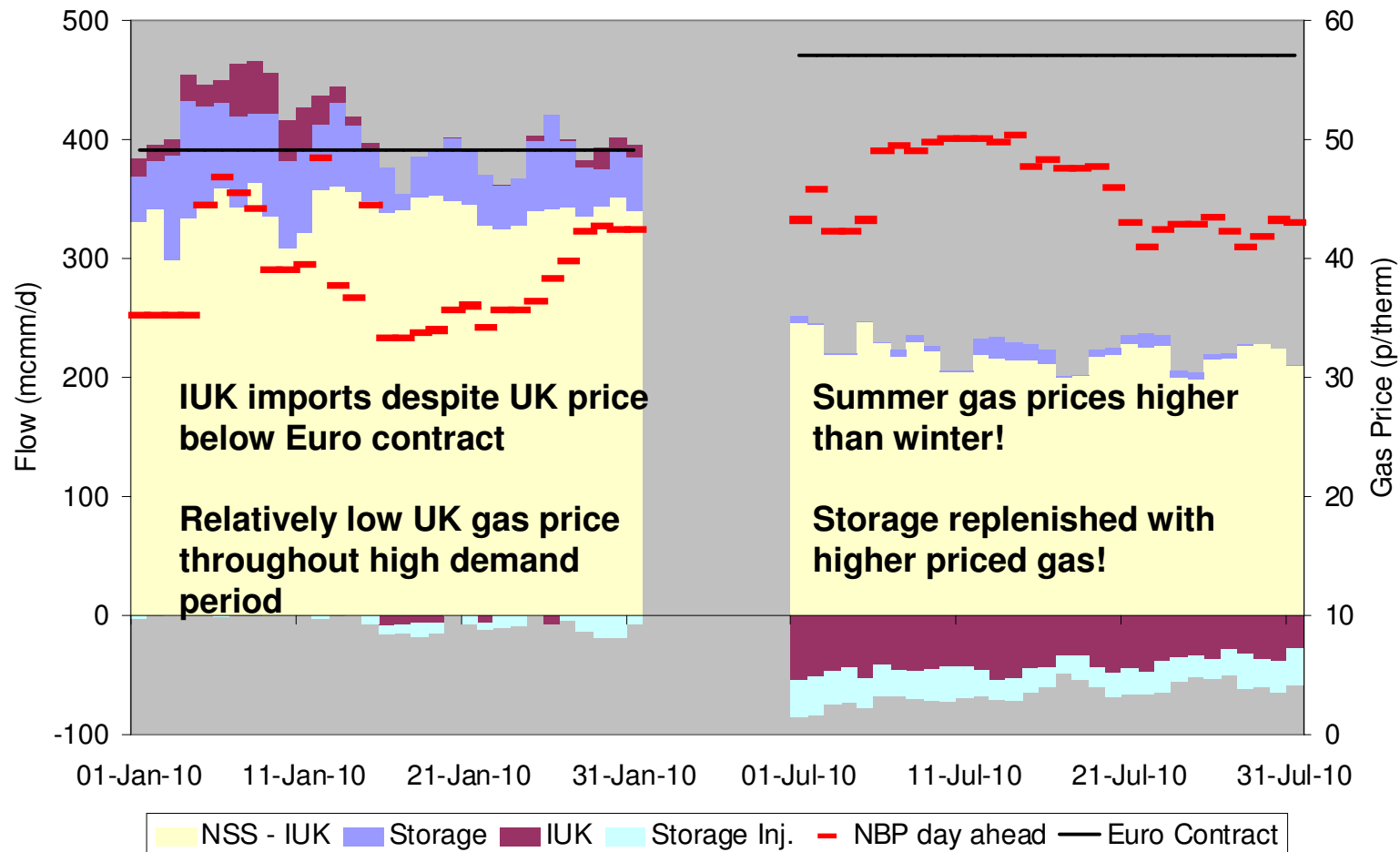
2009/10 - Norwegian Outages

- December – Feb 1 in 5 Cold
 - UK Temps -3°C
- Norwegian outages (1st – 11th January)
 - Troll/Kollsnes (~ 140 mcm/d)
 - Ormen Lange (~ 70 mcm/d)
 - Kårstø (~ 90 mcm/d)
 - Overall loss ~ 300 mcm over 5 days
- Significantly higher LNG 43 mcm/d
- Additional IUK, importing ~ 10 mcm/d

Norway: Last Winter



January & July 2010



Forecasts

Meeting energy targets – Gone Green

Or moving towards energy targets – Slow progression

Energy Targets

- **2020 EU Targets**

- 20% of EU energy from renewables
 - UK target 15%
 - Limited opportunity to change heat profile hence most of the target needs to be met by renewable power generation
 - ~32% of UK power by renewables
- 20% reduction in emissions
- 20% improvement in energy efficiency

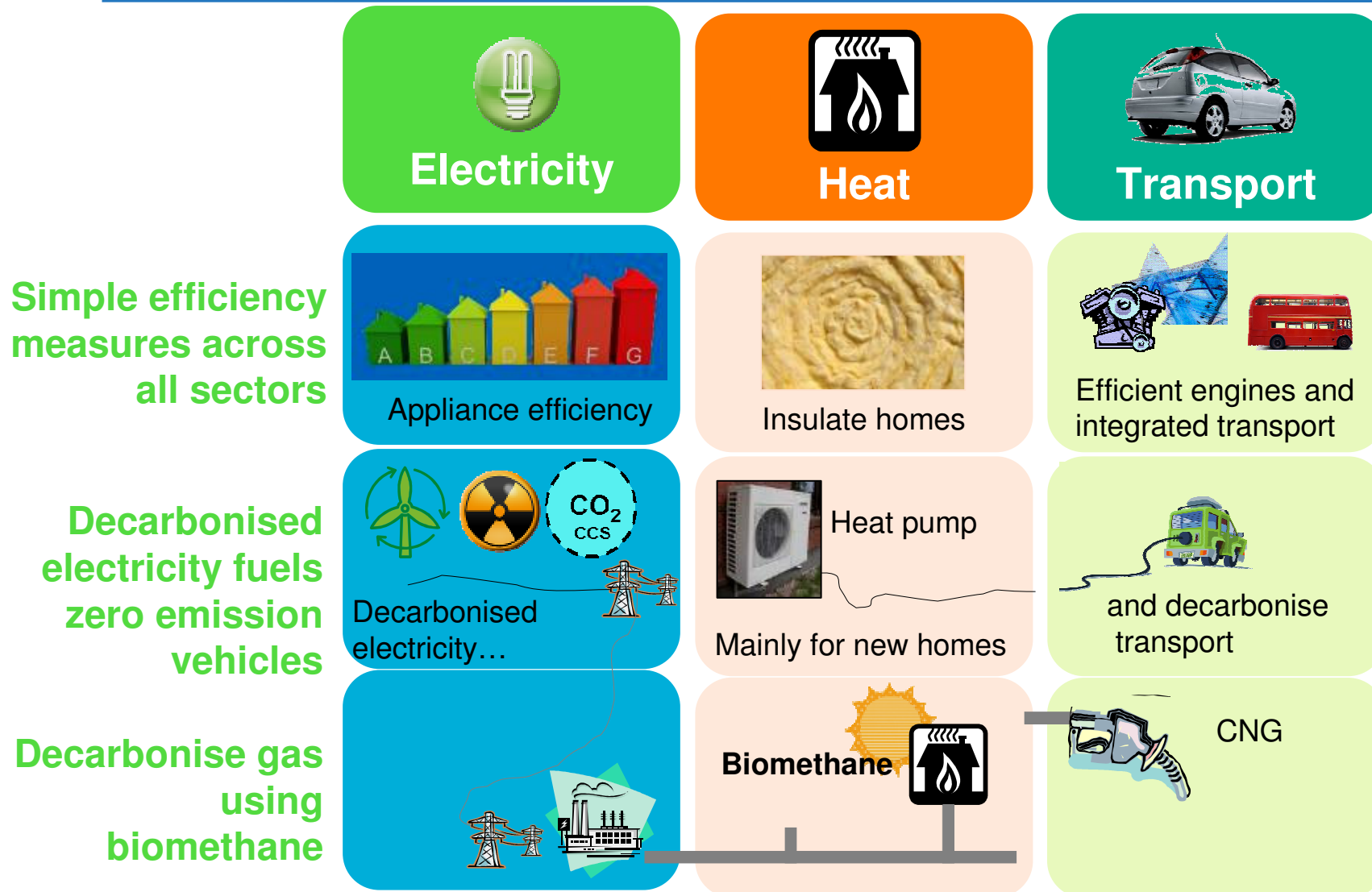
- Gone Green meets 2020

- Slow Progression moves towards 2020

- **UK 2050**

- 80% reduction in emissions, 34% by 2020
- Decarbonisation of heat

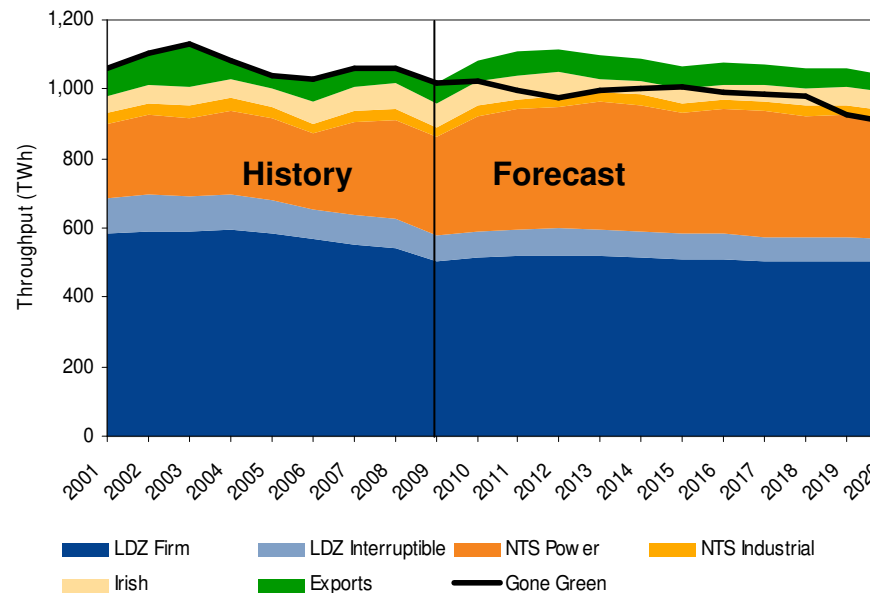
Future vision – efficiency and electrification



Demand view to 2020

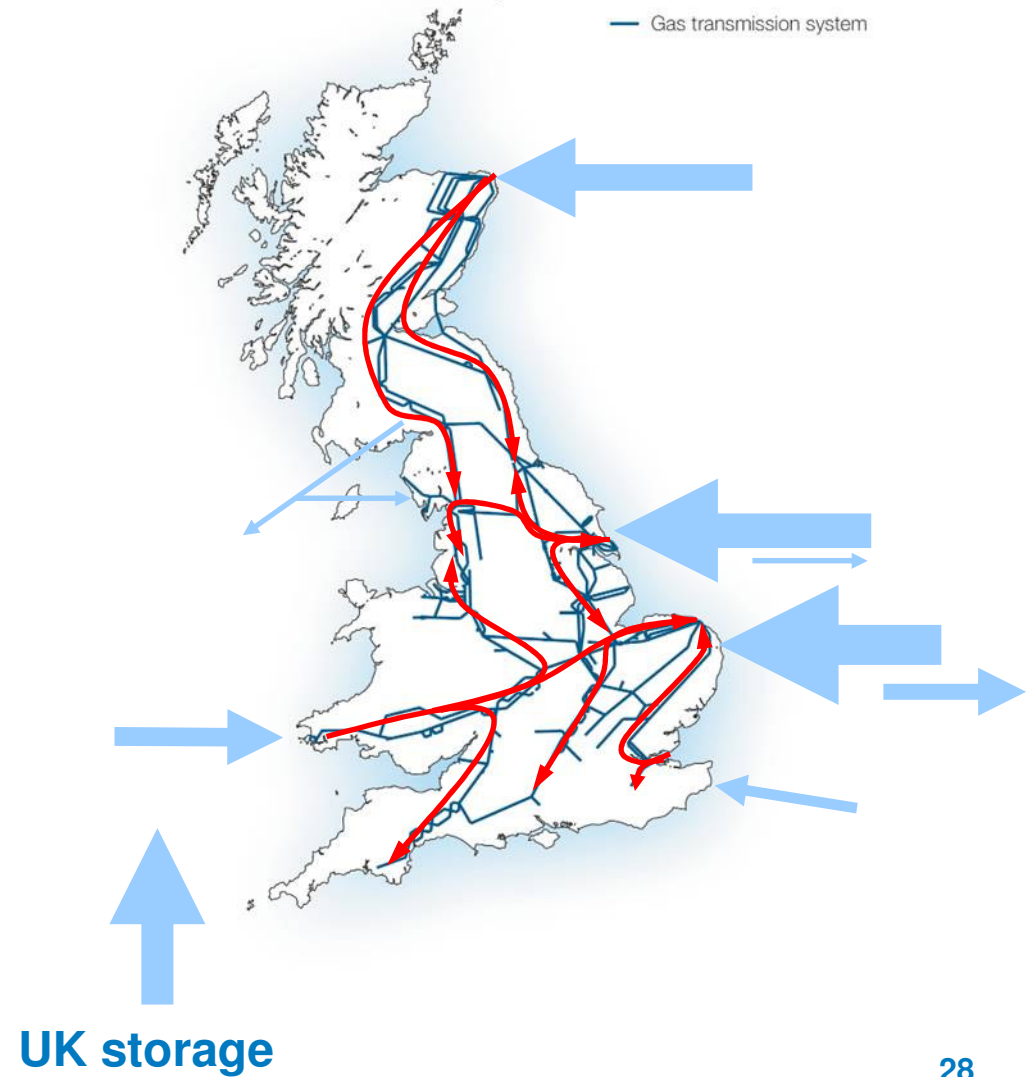
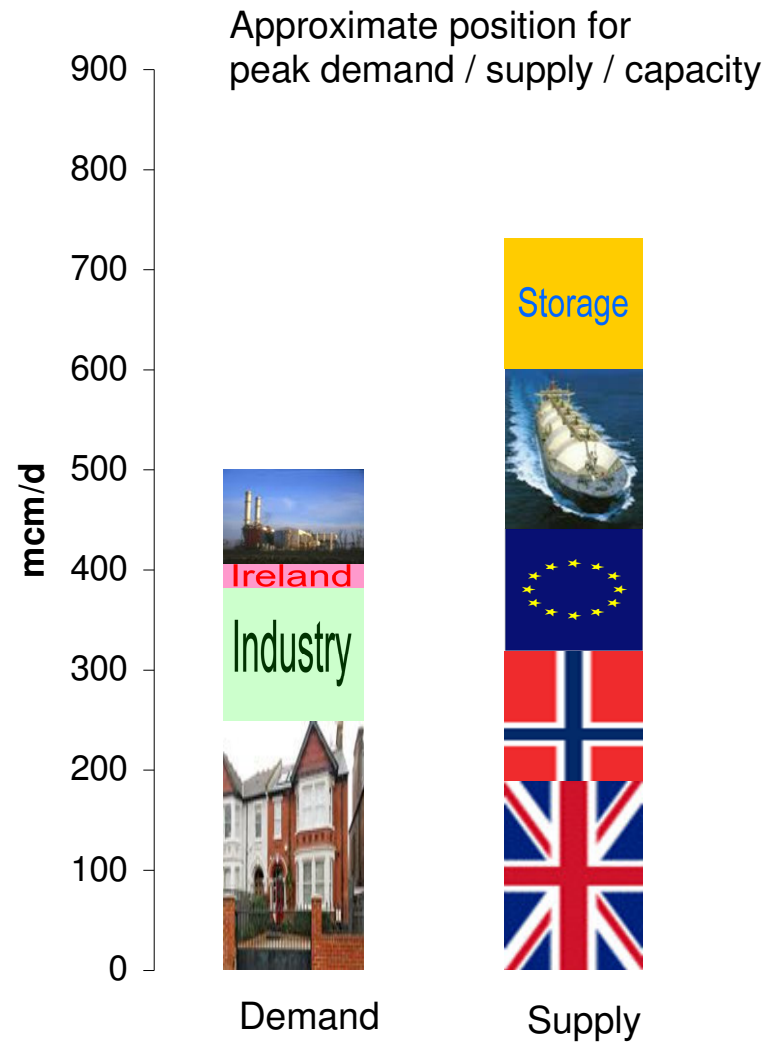


Ireland
Industry

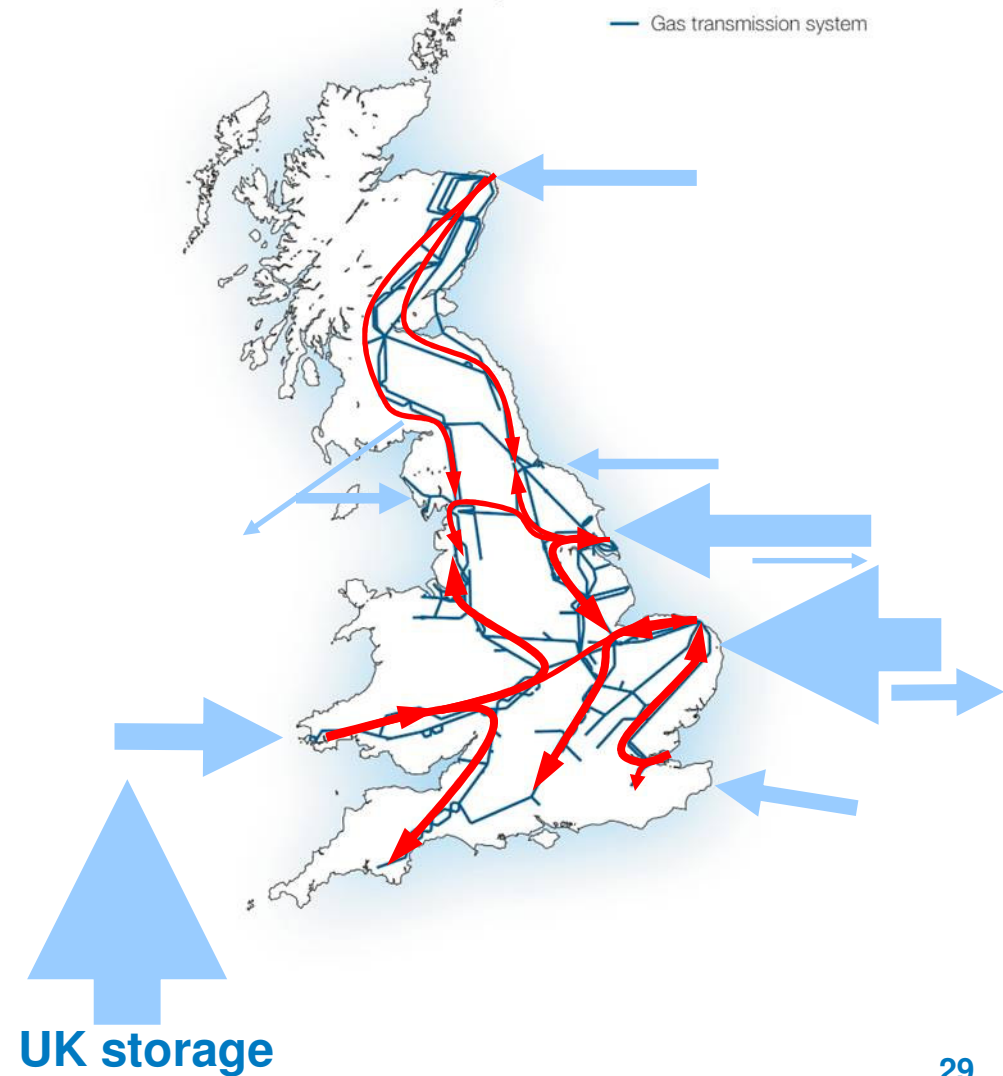
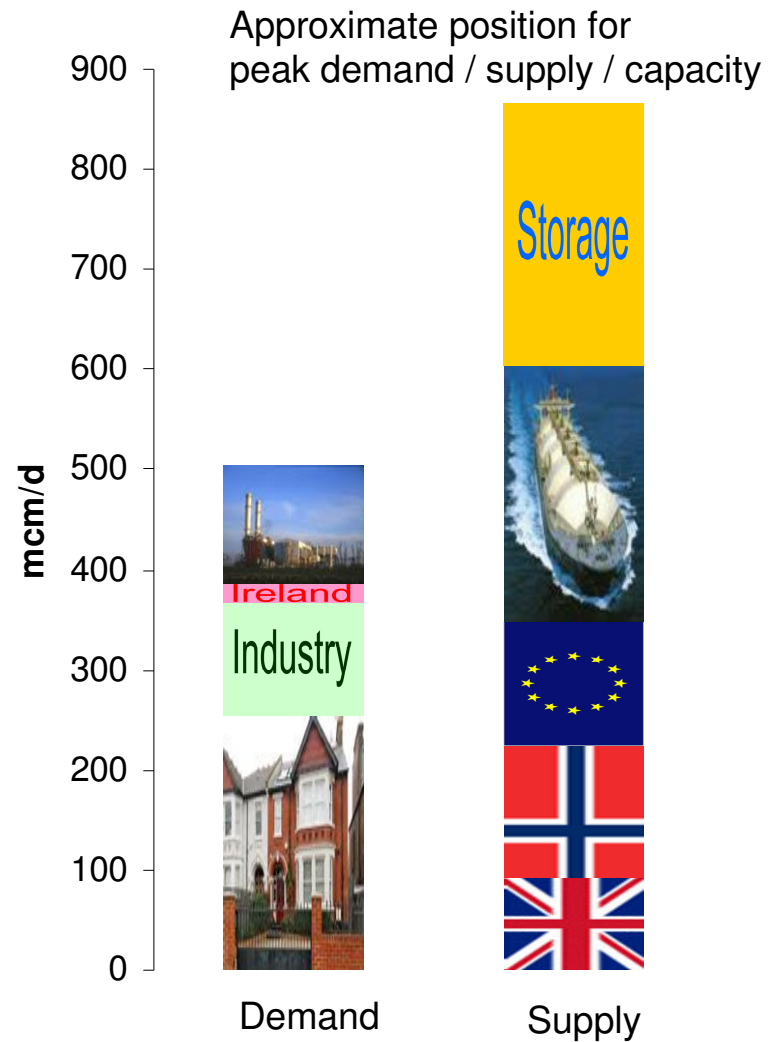


Little or no demand growth over next decade

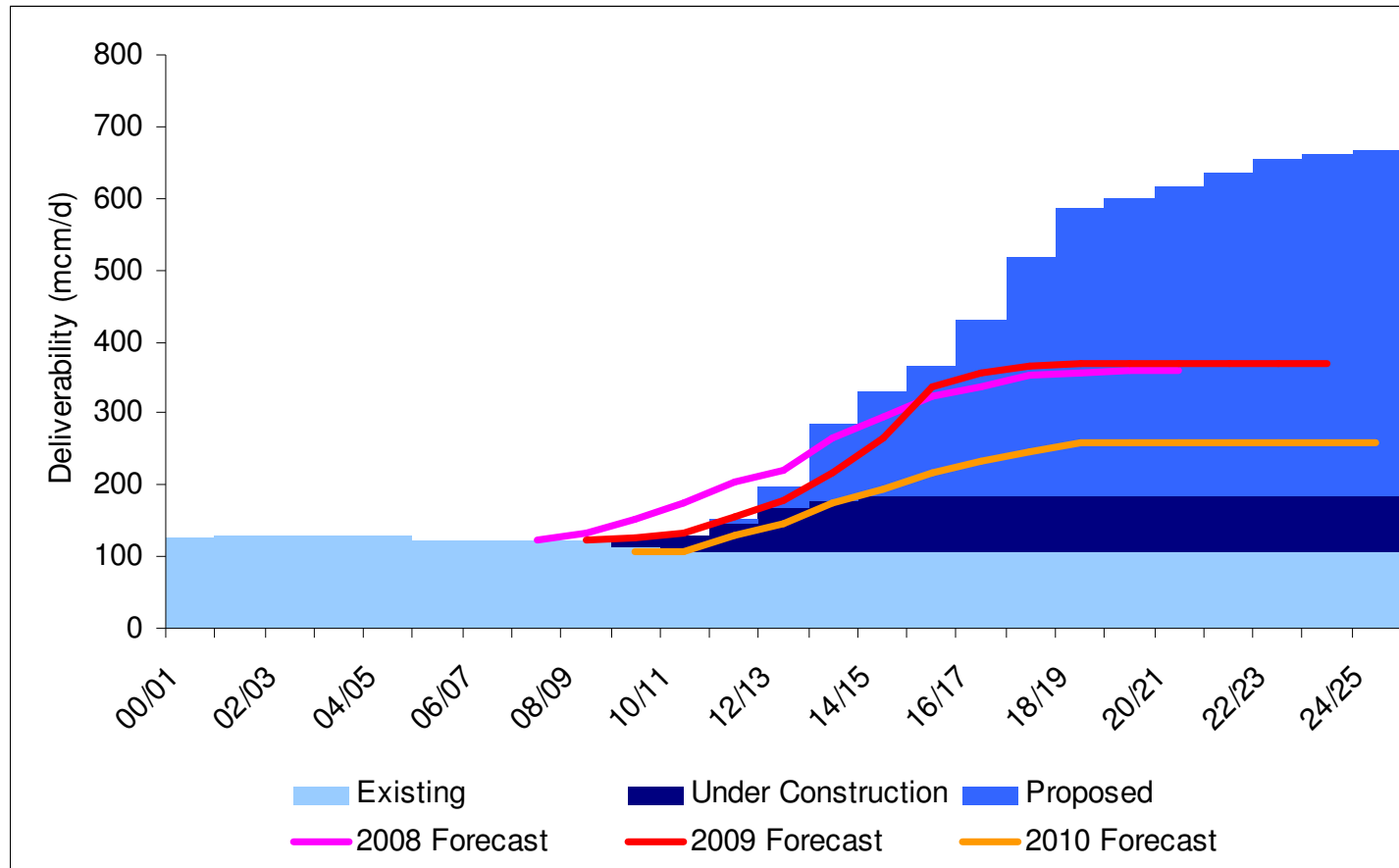
2010



2020



Storage



Supply forecasts (Slow Progression)

