Winter Outlook 2008/9

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Agenda

Lessons learnt from last winter

Met Office weather forecast and winter temperatures

Gas

- Demand
- Supply
- Cold weather analysis

Electricity

- Assumptions
- Winter analysis

Conclusions

Lessons learnt from last winter

Higher energy prices may be changing consumer behaviour but not necessarily 'peak' consumption

As ever, weather is the key element in determining gas demand

Impact of LCPD, namely increased gas demand and restricted power station operation / flexibility

Power station availability was lower than expected whilst wind was intermittent as expected

UK was the marginal supply for Norwegian exports

Unless contracted, LNG will seek highest priced markets

Concerns over commissioning of new facilities were realised

Events can happen!

- Bacton fire
- Grangemouth (post winter)
- Low frequency following loss of Longannet and Sizewell
- Low wind and nuclear unavailability on Continent caused power flows out of GB at time of peak demand

Consultation feedback last winter was often ambiguous

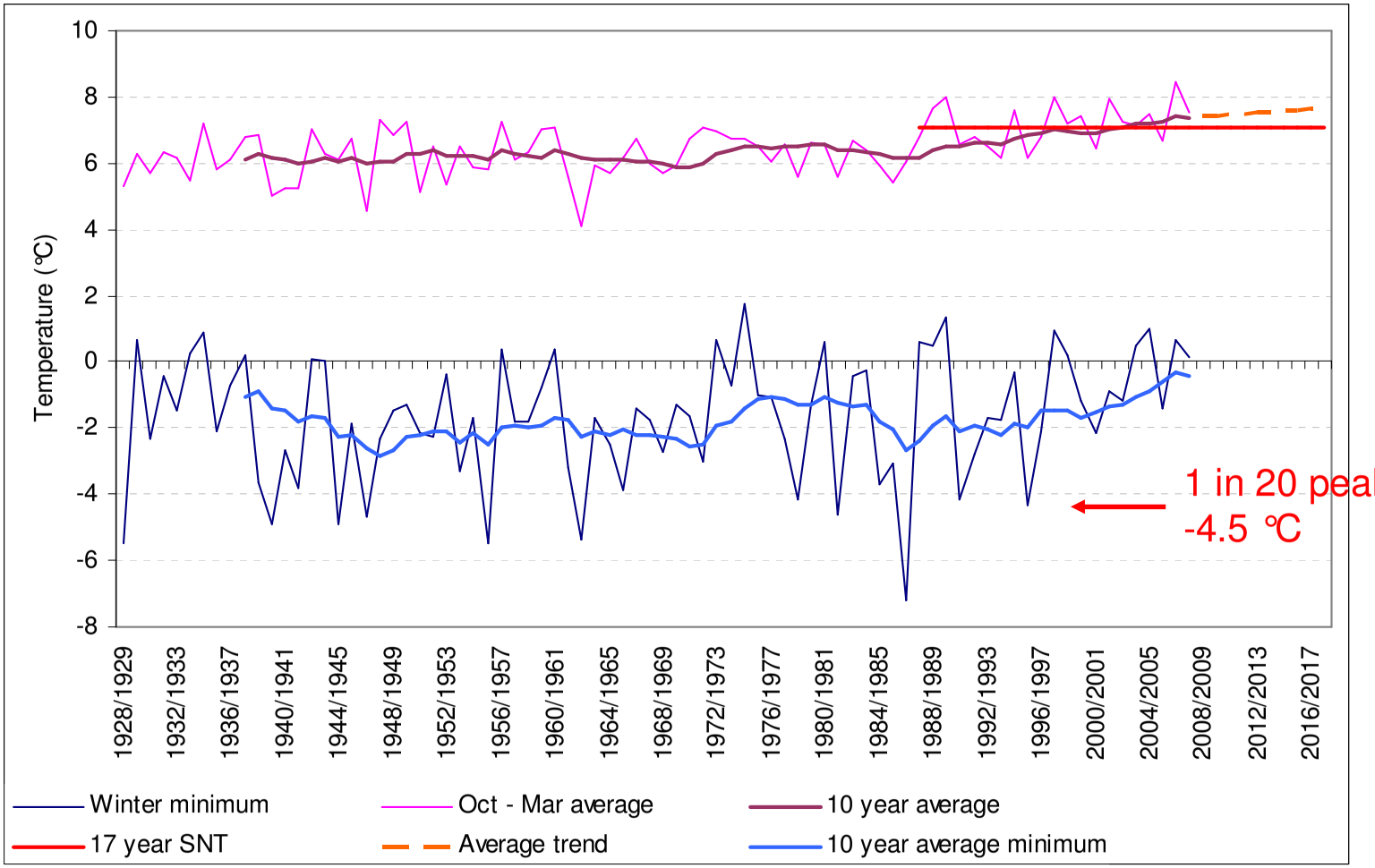
Met Office winter weather forecast (issued 25th Sept 2008)

Milder than average, colder than last year, drier than last year

- 1971 – 2000 average winter temperature for UK 3.7°C, average UK winter precipitation 332 mm
- 2007/8 average winter temperature for UK 4.9°C (9th highest since 1914), average UK winter precipitation 386 mm

Met Office winter stats is for months of December, January & February

Winter temperatures



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2008/9 Winter Demand

Gas demand remains highly sensitive to weather

Lower NDM demand in line with last winter

- Impact of higher gas prices
- Increased efficiency measures

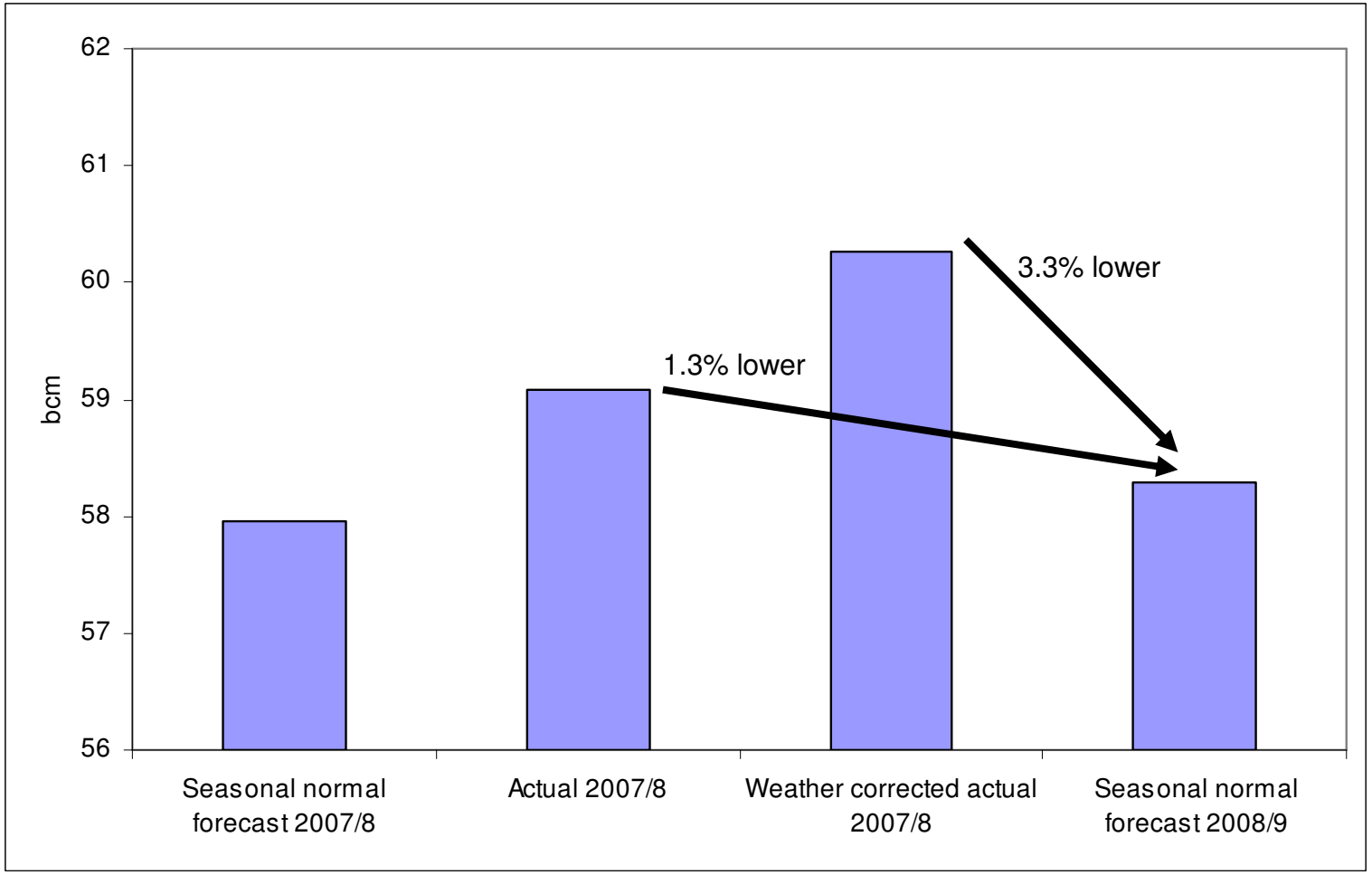
Lower power station demand than 2007/8

- Coal base load but could revert if prices change
- Lower impact of LCPD as more plants have FGD
- Nuclear non availability would increase gas

Gas / Electricity interactions

- Highly dependent on assumptions, both upside and downside

Total Winter Demand (October to March)



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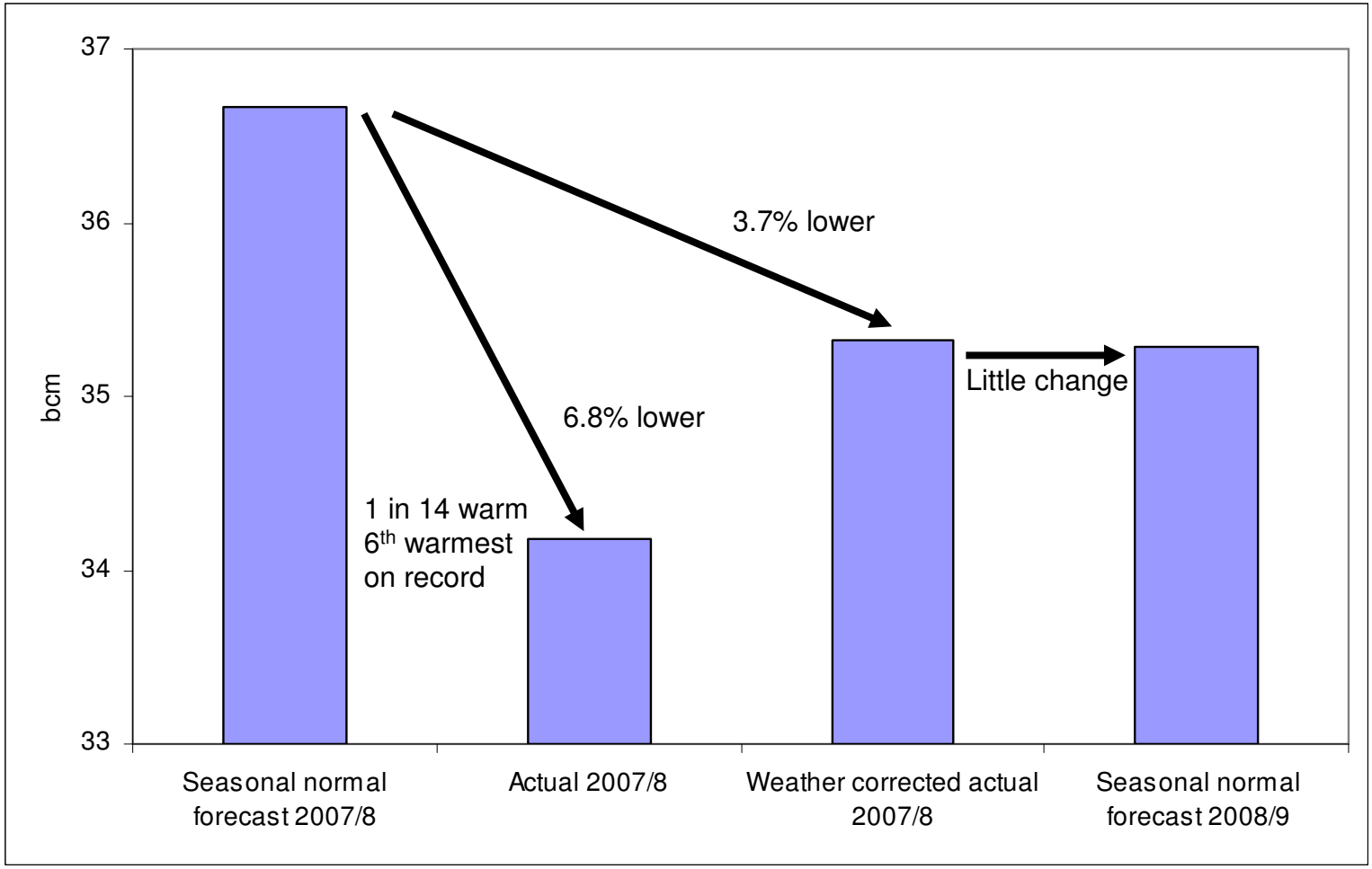
NDM Winter Demand (NDM - Non Daily Metered)



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Reasons for lower NDM demand

Higher gas prices

- Changes to consumer behaviour

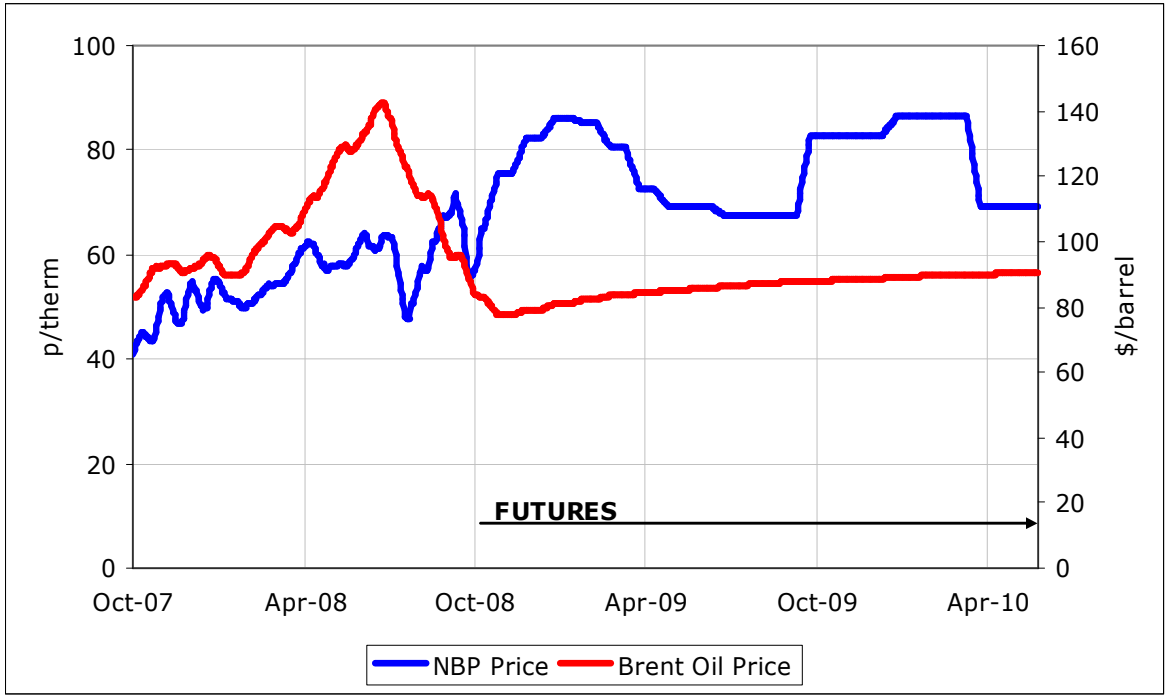
Improved efficiency measures

- Insulation
- Condensing boilers

Will these trends continue next winter?

What about at peak or cold conditions?

NDM is highly dependent on weather, every extra °C cold increases demand by about 15-20 mcm/d



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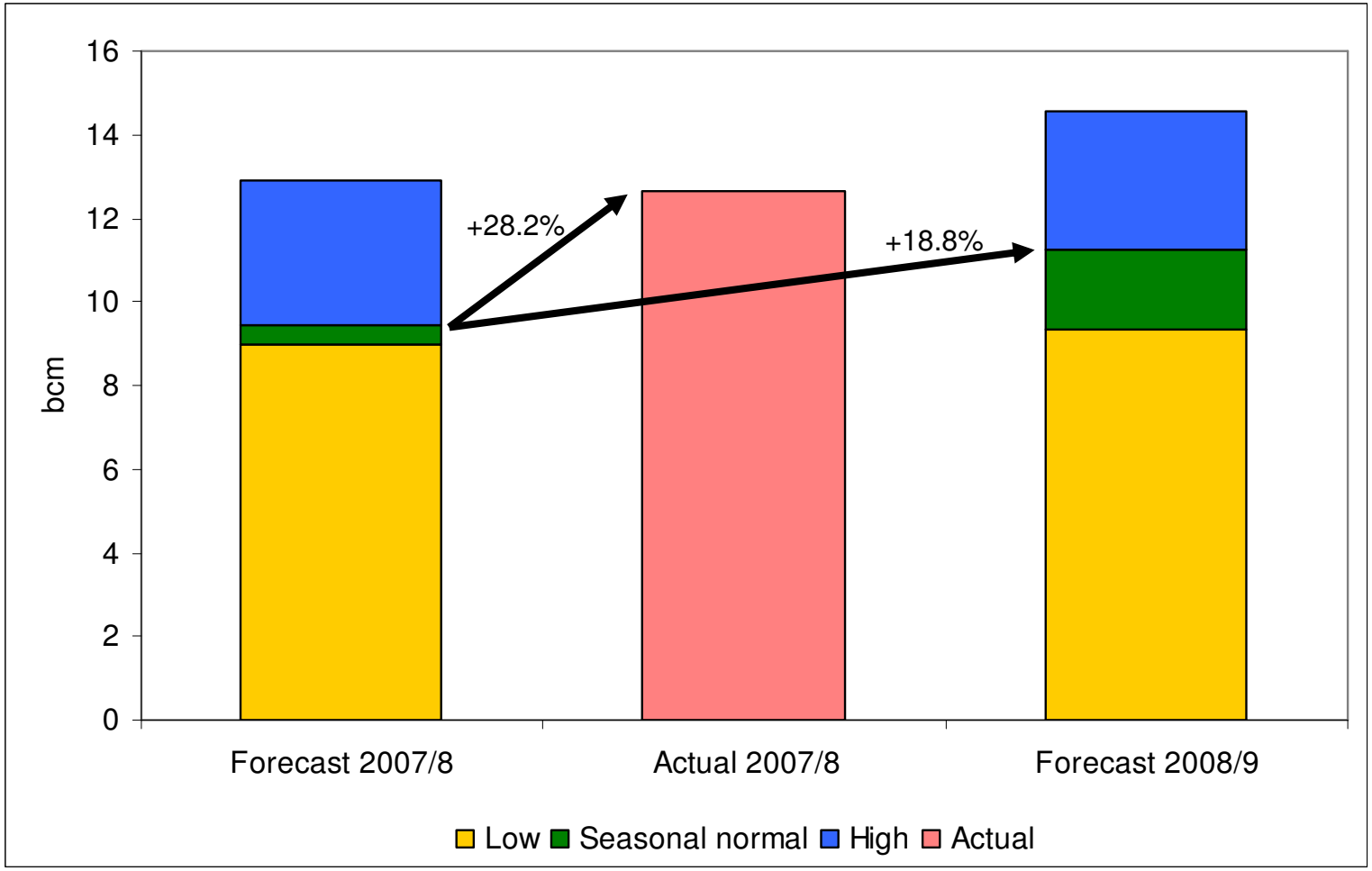
Power generation demand



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Power generation review

Last winter

- As forecast Oct – Dec
- Much higher Jan – Mar
  - Impact of LCPD
  - Higher coal prices
  - Continued problems with nuclear

LCPD (Large Combustion Plant Directive)

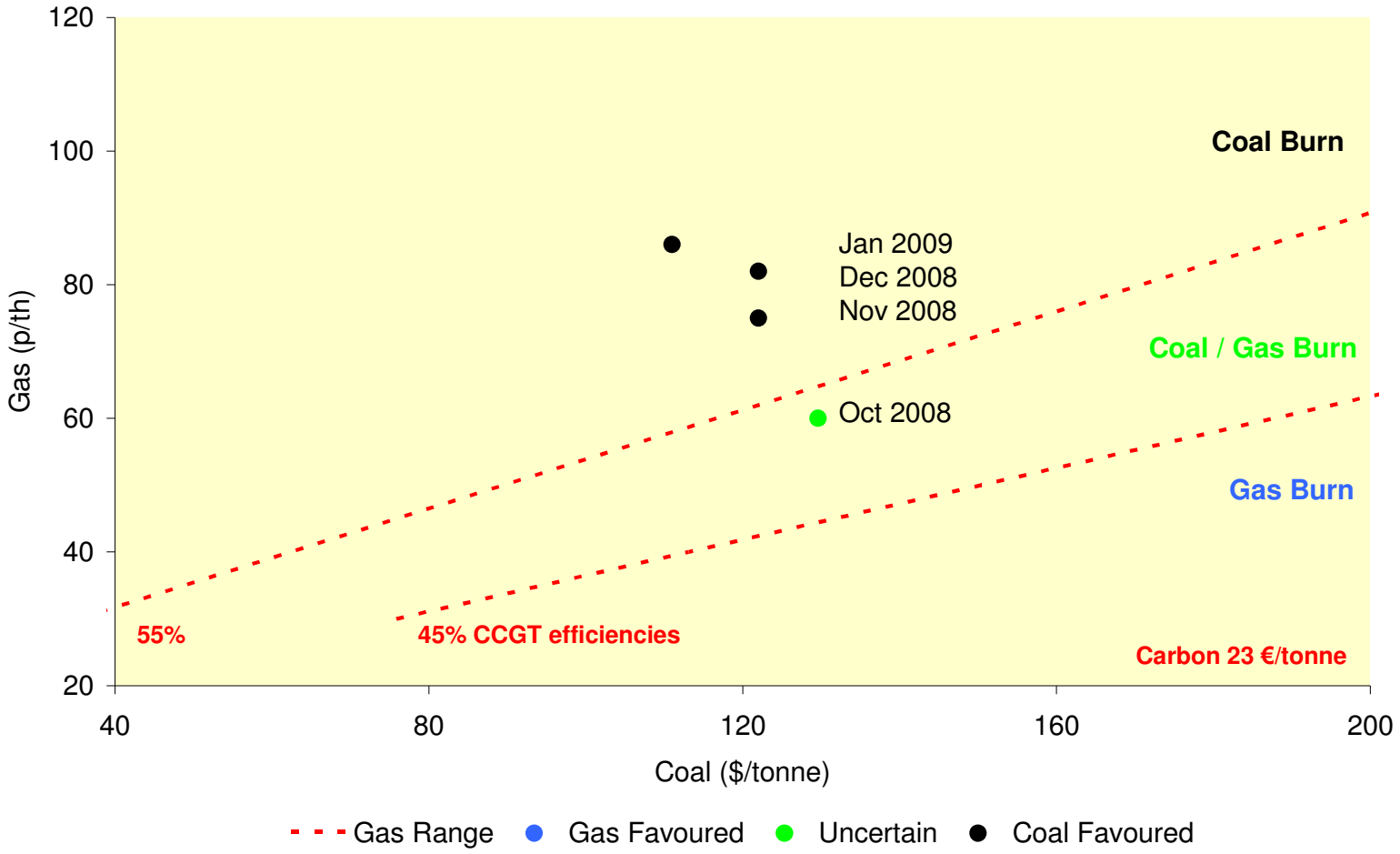
- Restrictions to operation of opted out plant
- Delays to fitting FGD to opted in plant

Next winter

- Most FGD now fitted
- Due to prices, coal burn expected for base load
- Higher nuclear availability?
- Restrictions to operations of opted out plant expected to continue

Changes to plant availability or fuel prices could readily change generation mix

Coal / gas generation preference



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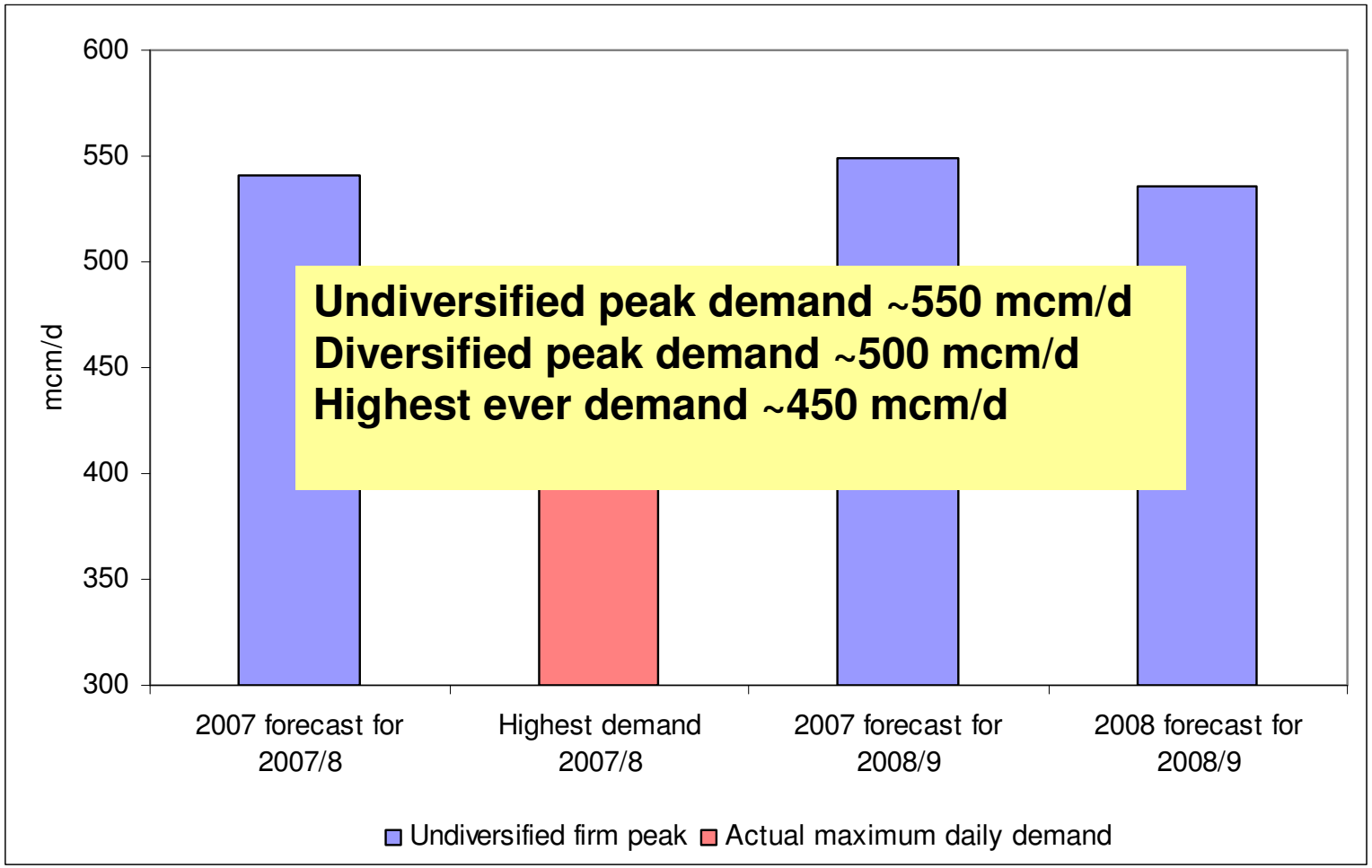
Peak winter demand



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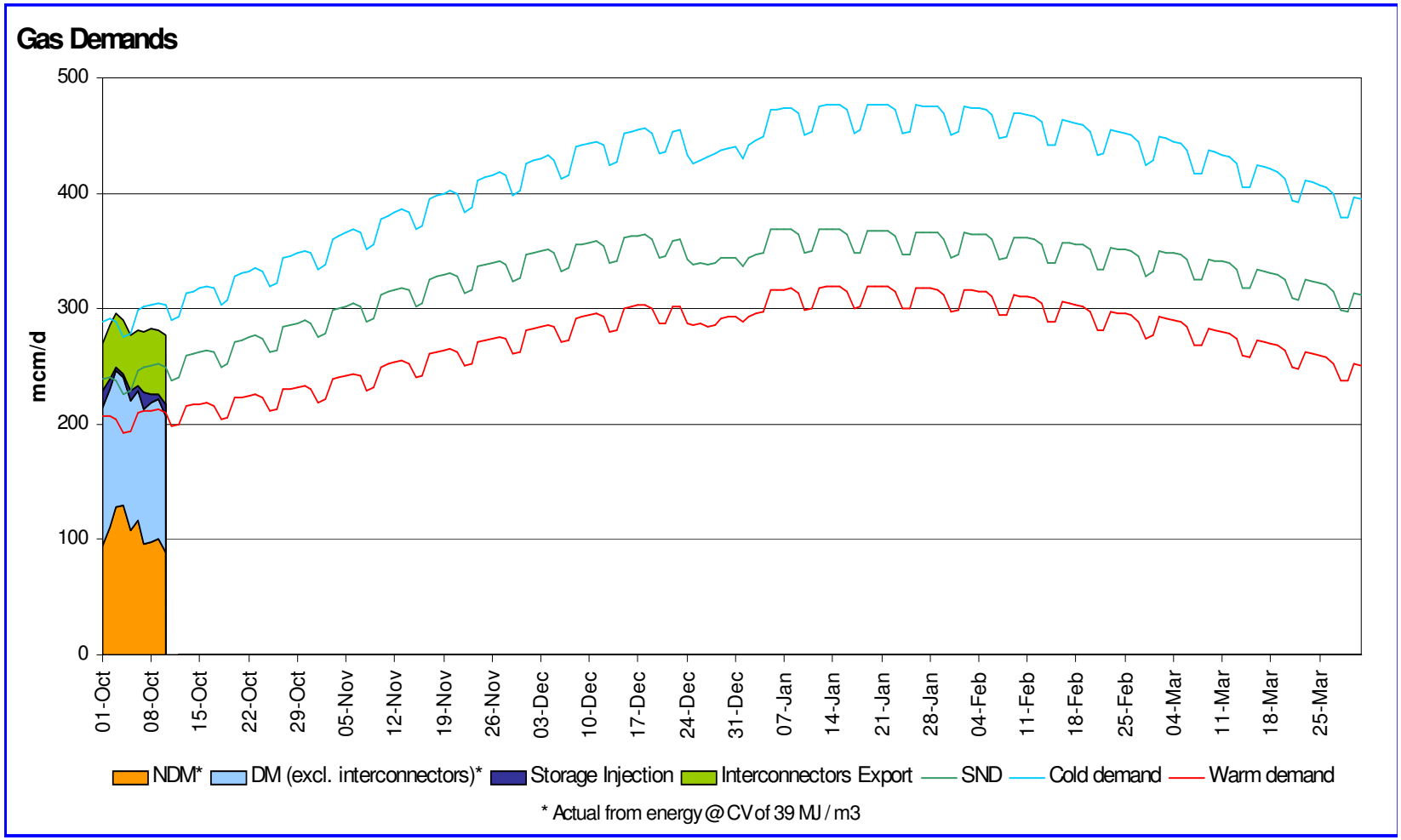
Demands so far this winter



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2008/9 winter supply

UKCS - continues to decline, but continues to under pin supply (~60% of non storage supply)

Imports – all subject to some uncertainty

Norway

- Priority to Continental contracts over UK (UK is marginal source of supply)
- Increase through Ormen Lange offset by loss of Kvitebjorn
- Expectation that flows to Continent may be used to preserve Continental storage

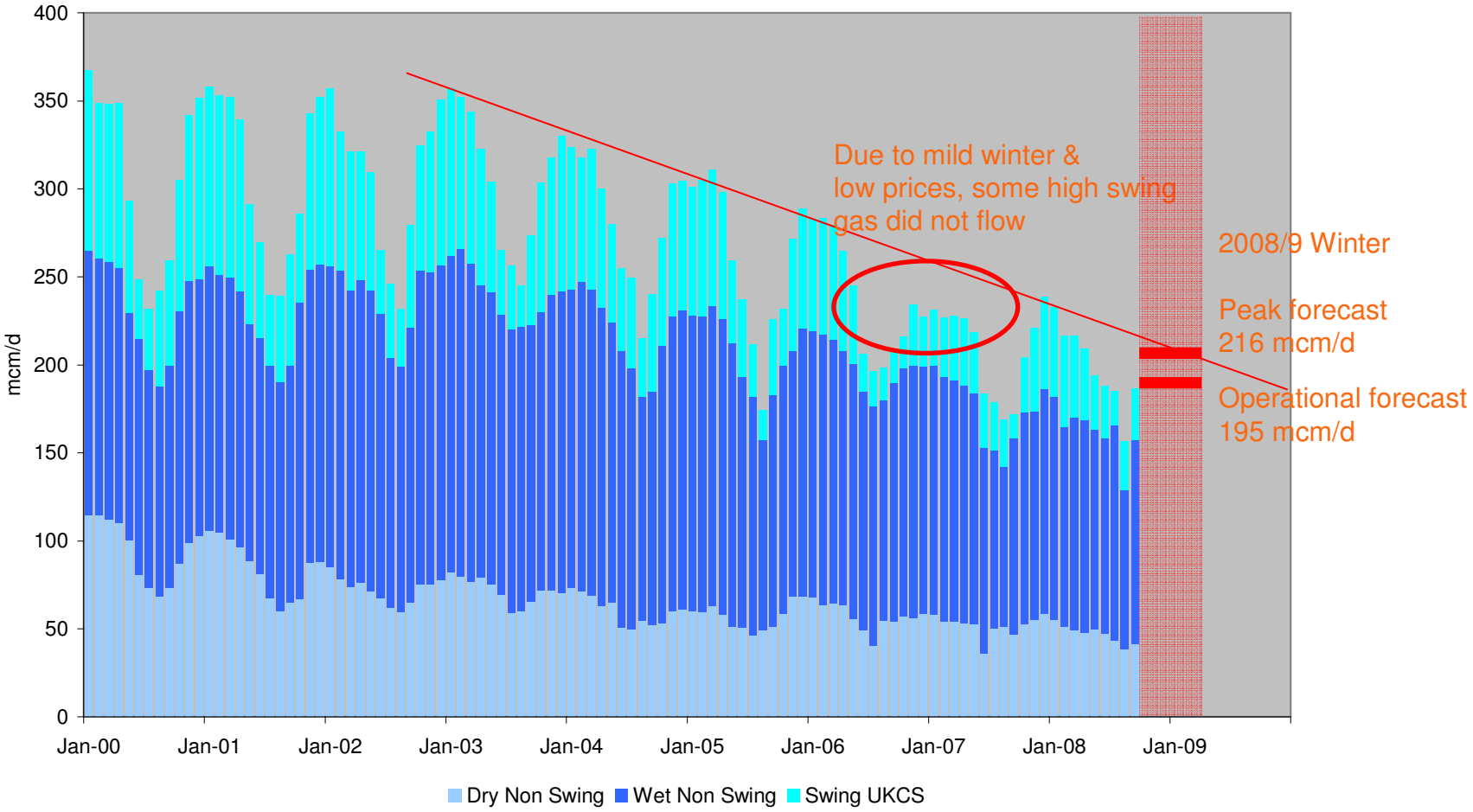
Continent

- Lower BBL? through possibility of non-physical reverse flows
- IUK subject to market differentials and access to gas / storage / transmission capacity

LNG – cargoes subject to global LNG market, concerns over commissioning of new plant continue

Storage – higher space and deliverability if Aldbrough becomes operational

UKCS (highest monthly flows by supply type)



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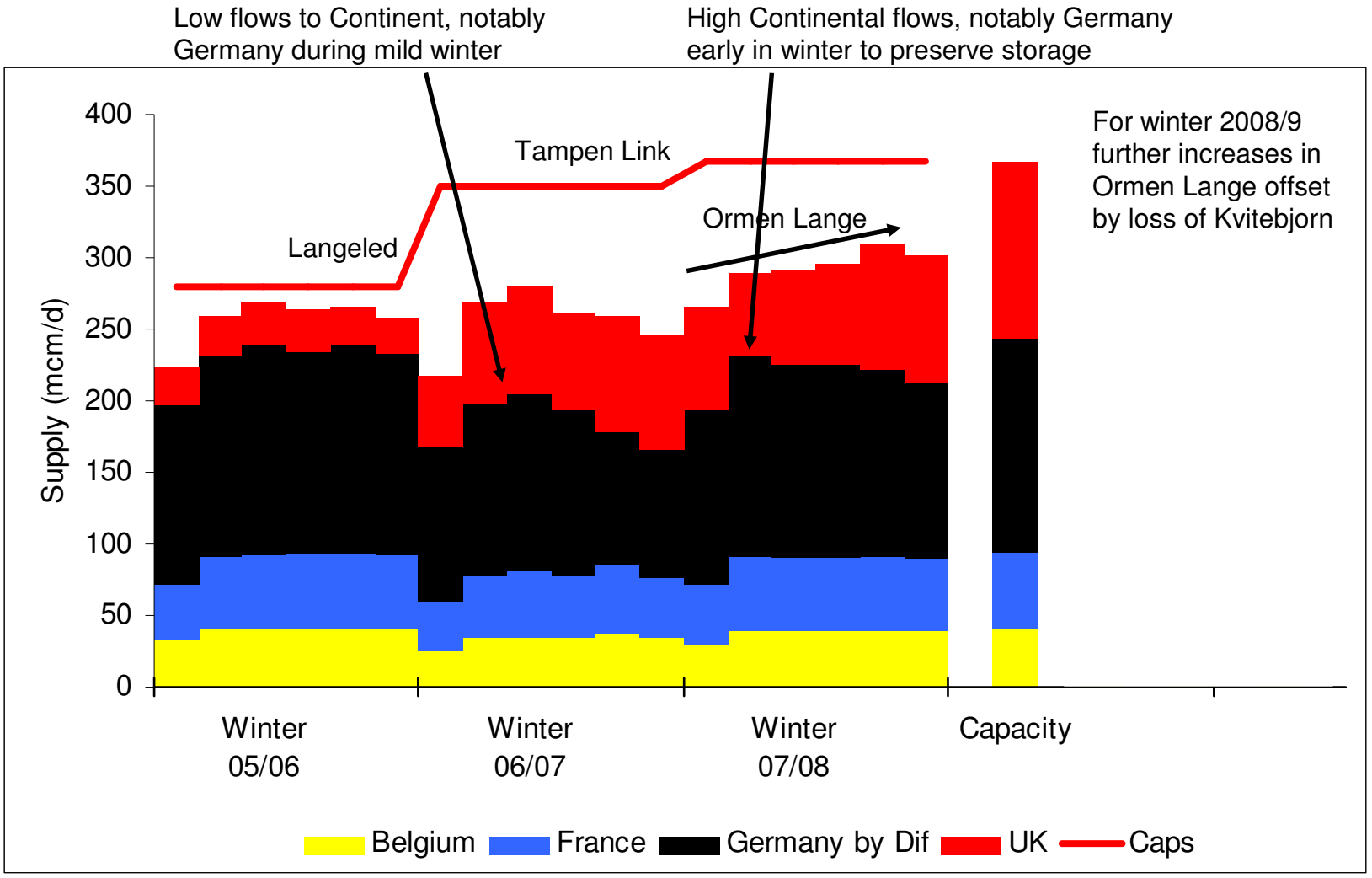
Norway



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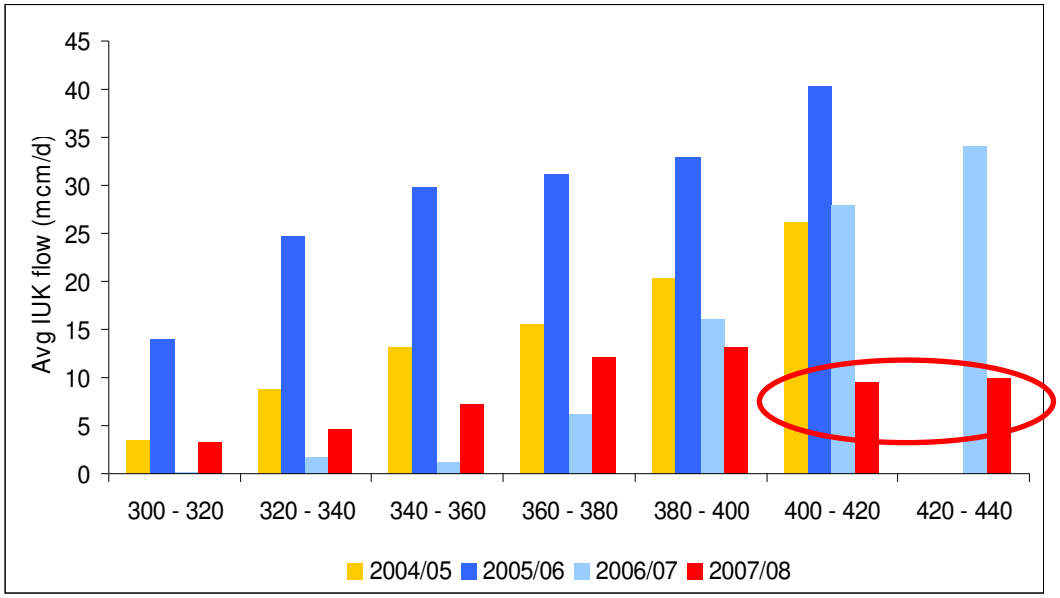
Continent

IUK

- High import capacity ~70 mcm/d, bi-directional flow
- Highest ever import flow ~50 mcm/d (Feb 2006)
- Marginal source of non-storage supply
- Flow dependent on UK / Continent price differentials
- Imports subject to access to Continental transmission and 'cover' for remainder of winter
- Recent winters have resulted in lower imports

BBL

- Capacity ~40 mcm/d, import flows only
- New commercial arrangement for non-physical reverse flow
- Relatively steady flows, related to 8 bcm/yr Centrica contract
- Last winter flows ~36 mcm/d



2008/9 forecasts

IUK up to 20 mcm/d

BBL 30 mcm/d

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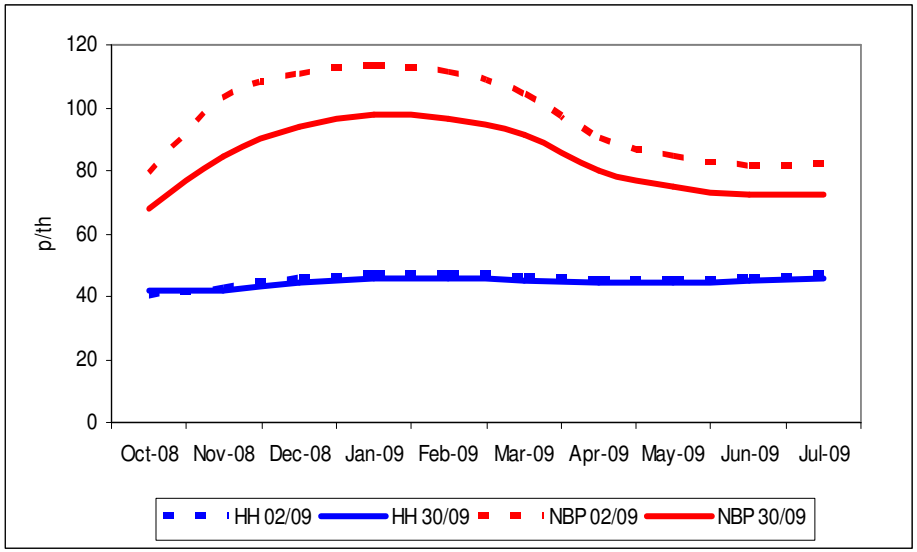
LNG

New facilities

- Grain II – reported to be commissioning Q4 2008
- Milford Haven – South Hook & Dragon due last winter. Now reported for winter 2008/9
- Commissioning may take time!



Global availability of LNG:

- Most LNG is contracted rather than 'spot'
- 85% of LNG is imported by Far East, USA, Spain & France
  - USA imports now materially lower due to lower gas prices through development of non-conventional gas sources
  - Japan needs extra LNG for continued loss of 8 GW nuclear reactor
- High prices believed to be paid last winter by Far East buyers, this trend is expected to continue
- New LNG production has been delayed and there have been problems with older plant

Forecast flow of LNG to UK just 10 mcm/d, with potential for considerable upside

Storage

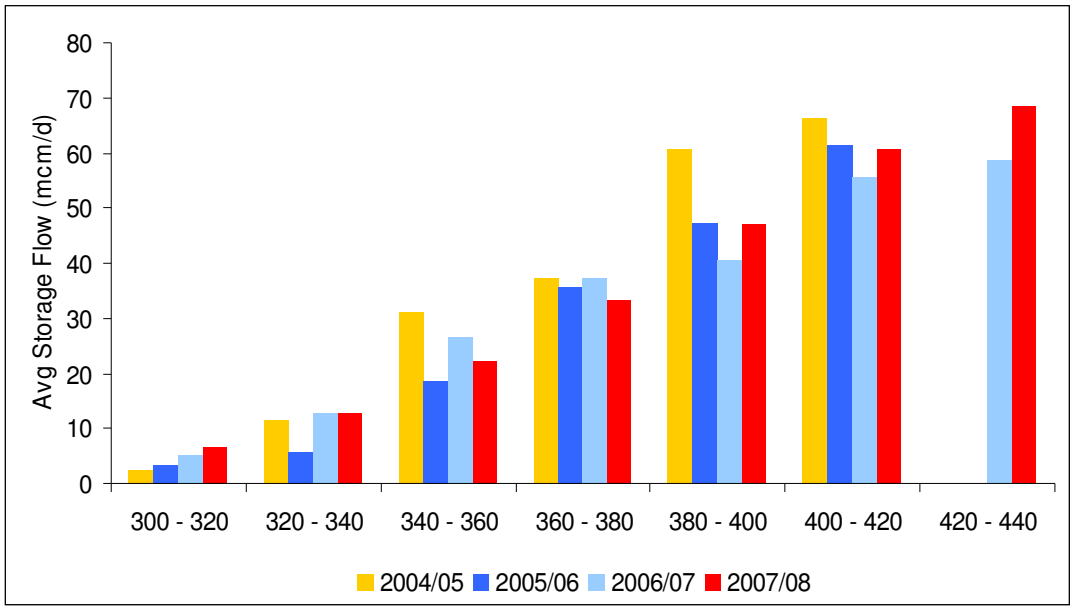
Storage plays a key roll in meeting higher levels of demand

For next winter commencement of Aldbrough expected

UK storage space is dominated by Rough (75%)

Most storage facilities can only operate for limited periods before the need to refill

2008/9 Winter Storage			
Storage Type	Space bcm	Deliv. mcm/d	Duration days
Long (Rough)	3.3	42	78
Medium (MRS)	0.9	49	19
Short (LNG)	0.2	49	4
Total	4.4	140	



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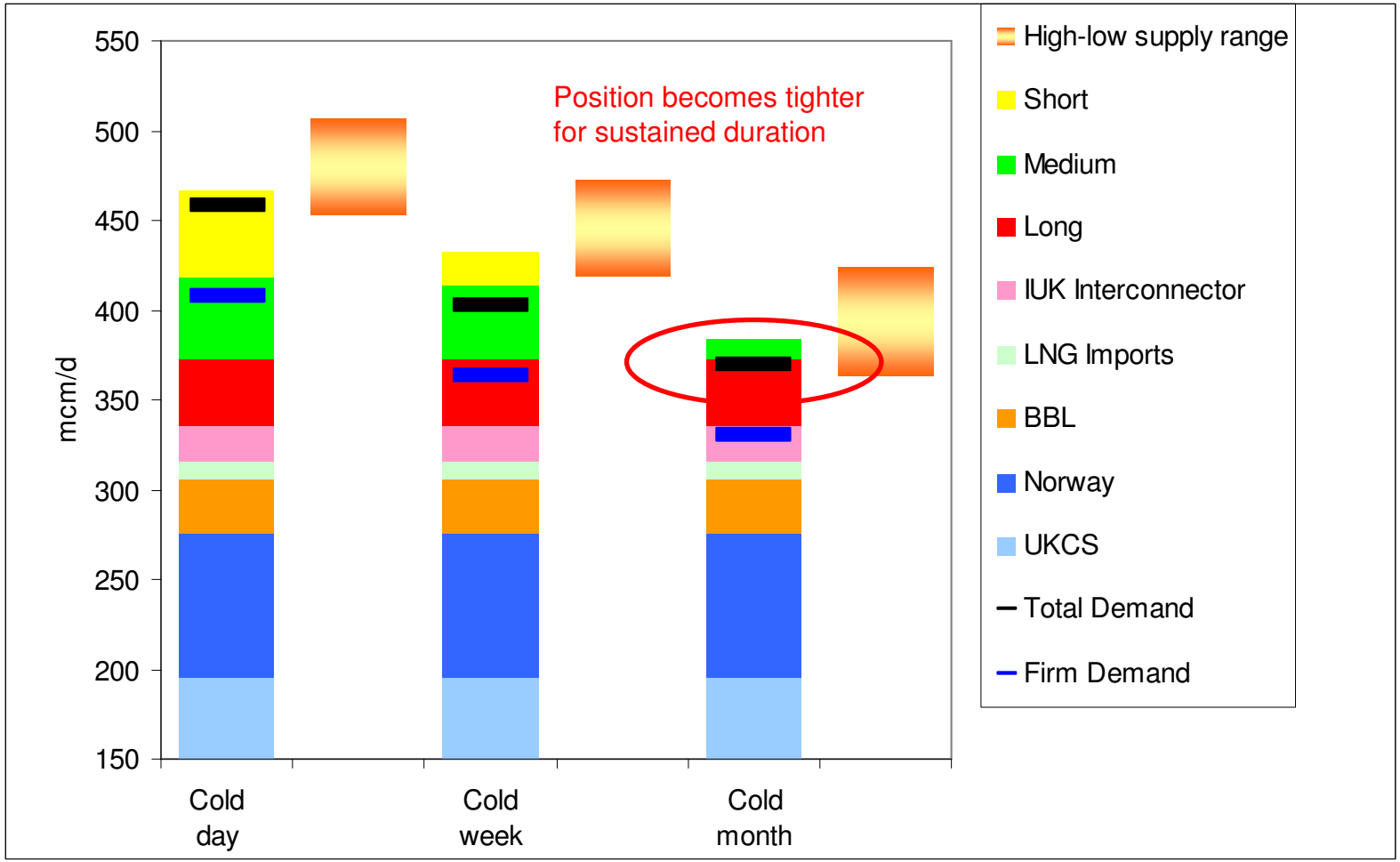
Cold spell analysis – average conditions



-2℃ 1℃ 3℃

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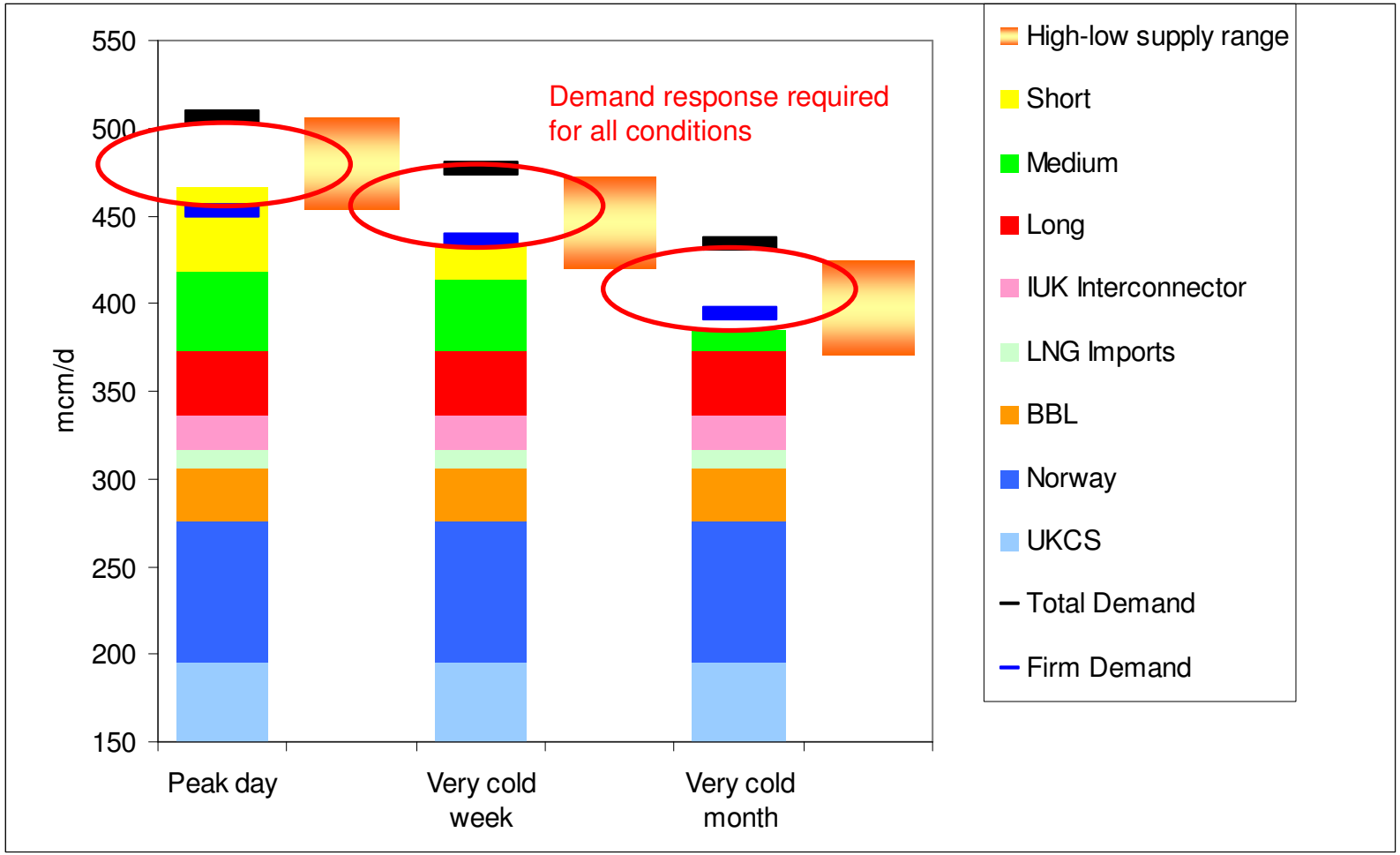
Cold spell analysis – severe conditions



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Gas / Electricity interactions

2008/9 generation capacity = 75 GW, assumed availability = 65 GW, ACS demand = 60 GW

1 GW base load power generation = ~5 mcm/d

+ve Response

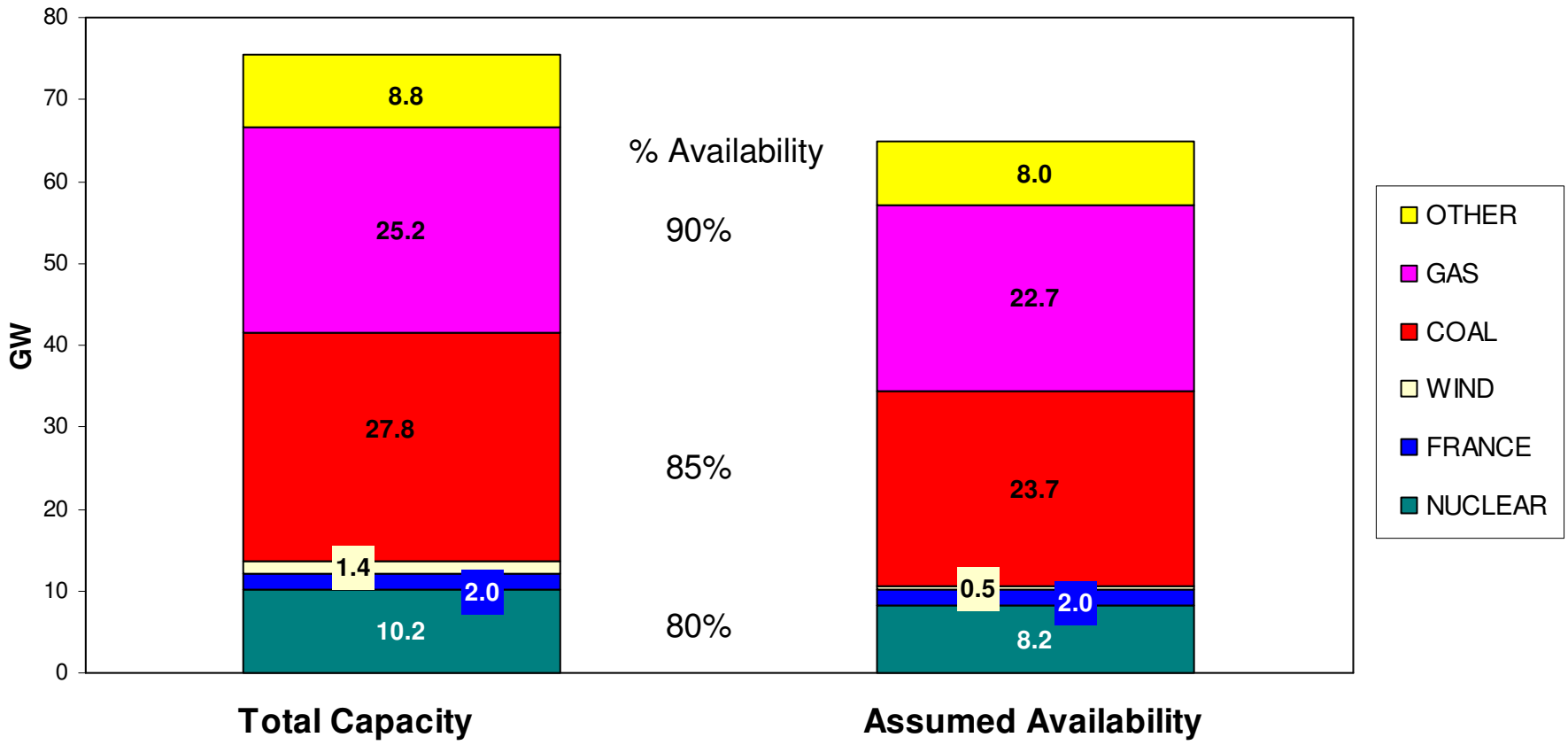
- Max CCGT gas response for peak day ~20 mcm/d
- Nuclear = 10 GW, hence change from 80 to 90% availability = 1 GW = 5 mcm/d
- Power stations with distillate = 5 GW, but operation assumed to be only 12 hours per day = 12 mcm/d
- Wind 1.4 GW at 35%, hence change to 100% = 5 mcm/d
- Coal 28 GW, hence change from 85 to 90% = 7 mcm/d
- 1°C change in **all** house thermostats ~25 mcm/d
- Low wattage light bulb savings of 80 watts for 5 hours in **all** houses ~2 mcm/d

-ve Response

- French Interconnector = 2 GW import for 17 hours per day, switch to 2 GW export = -17 mcm/d
- Nuclear = 10 GW, hence change from 80 to 70% availability = 1 GW = -5 mcm/d
- Wind 1.4 GW at 35%, hence no wind = -2 mcm/d
- Coal 28 GW, hence change from 85 to 80% = -7 mcm/d

Generation Capacity & Assumed Availability

2008/9 generation capacity = 75 GW, assumed availability = 65 GW, ACS demand = 60 GW



Wind availability 35%, French interconnector assumed to import when required to meet demand
Markets react to meet demand
LCPD restrictions do not limit availability at peak
Availability of gas is not constrained, periodic use of distillate available

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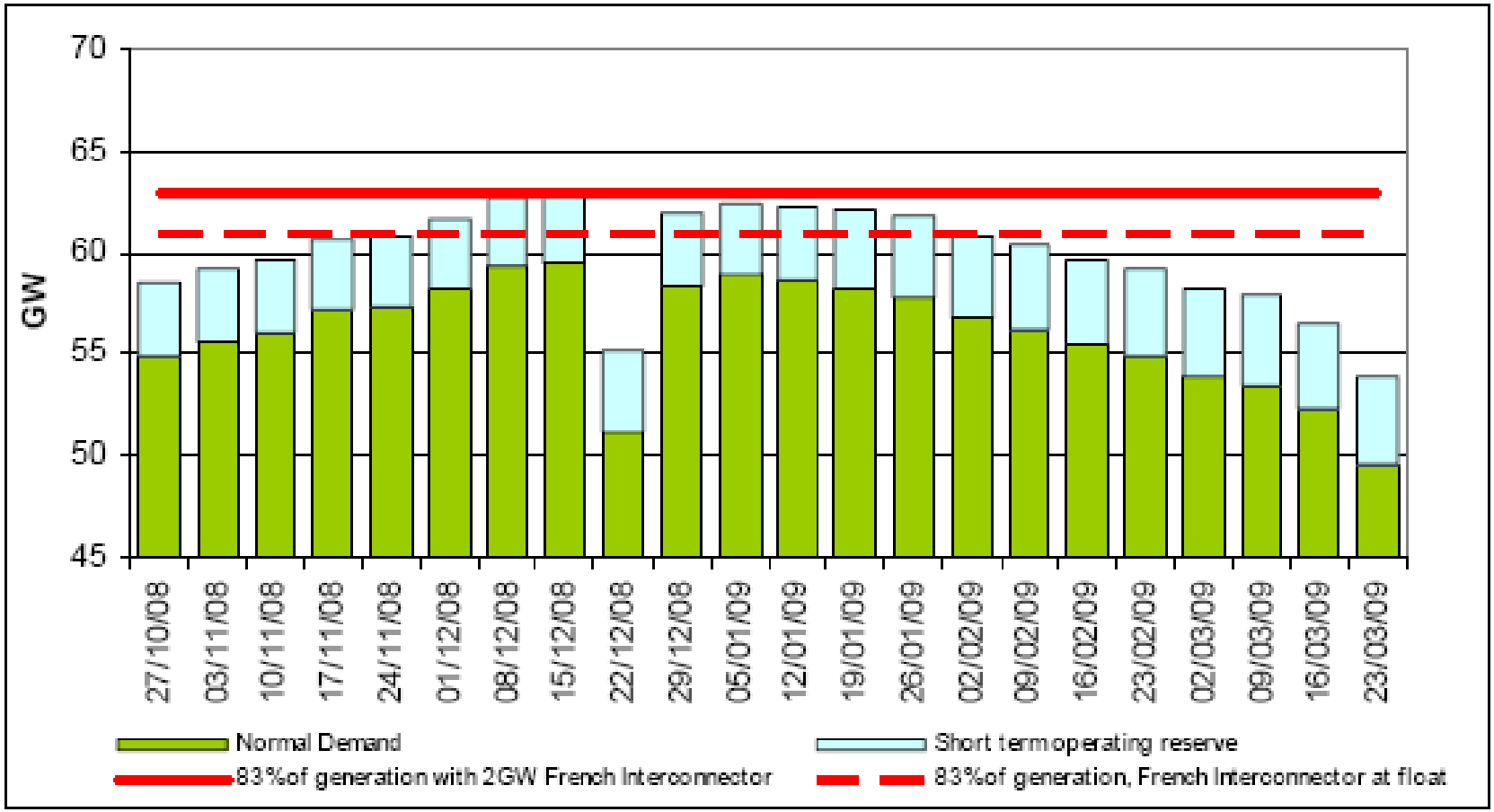
Normal Demand and "Low" Generation Availability Assumption Scenario



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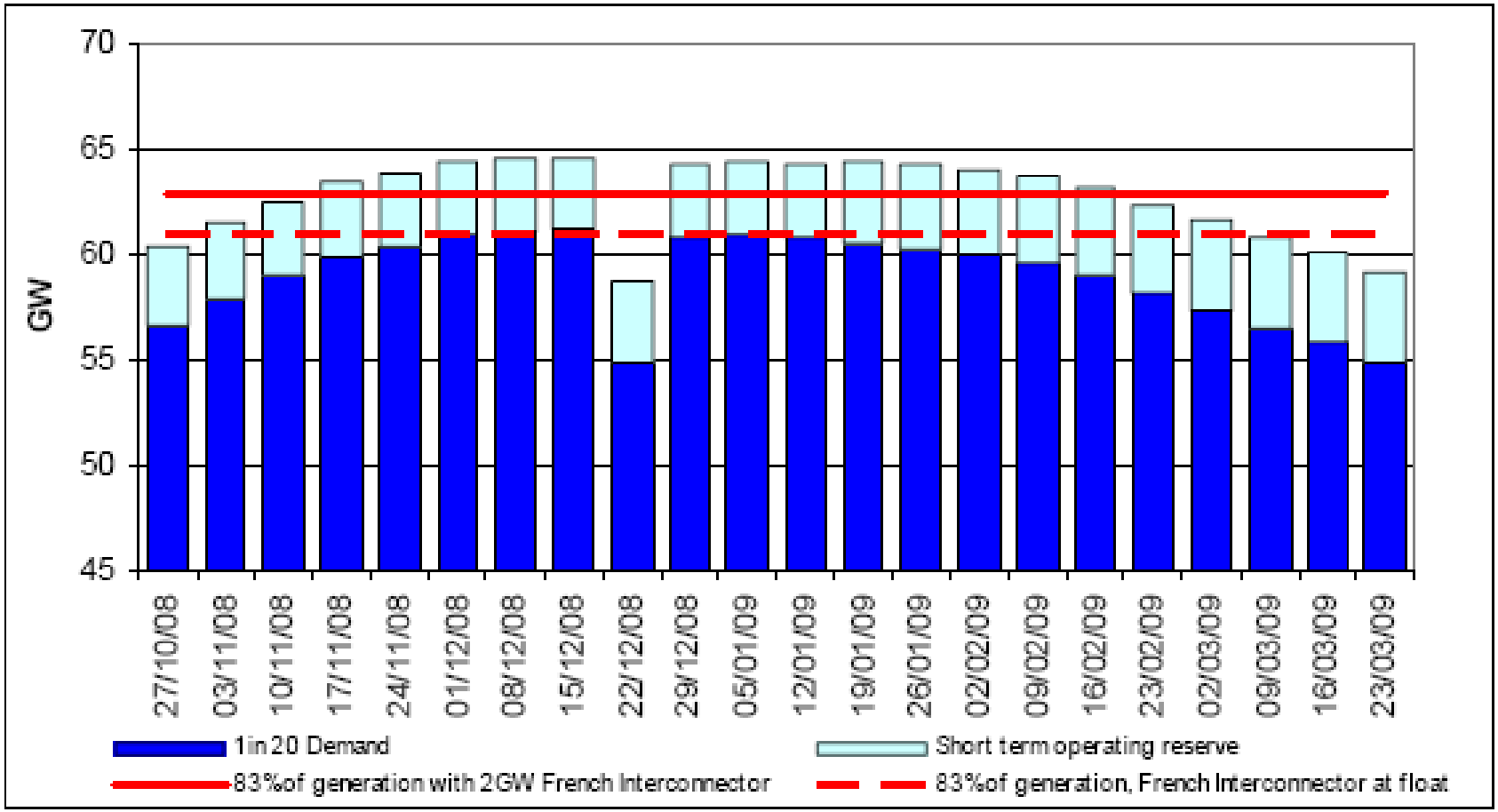
1 in 20 High Demand and “Low” Generation Availability Scenario



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Conclusions

Basis for gas and electricity demand similar to that experienced last winter. High dependency on weather for gas

Gas demand uncertainties continue, notably impact of gas prices, efficiency measures, LCPD, availability of generating plant

Gas supply position provides biggest uncertainty, notably all imports:

- Norway – Continental priorities
- LNG – global market competition and commissioning of new plant

Severe or prolonged period of cold weather could necessitate a demand response. Numerous gas / electricity interactions possible

Power generation subject to plant availability and LCPD

Coal assumed to be base load but could switch on fuel prices

Should be adequate generation to meet demand but subject to credible risks

'Events' for both gas and electricity happen!!