UK gas and electricity supplies

A review of the winter 2003-04

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Commercial

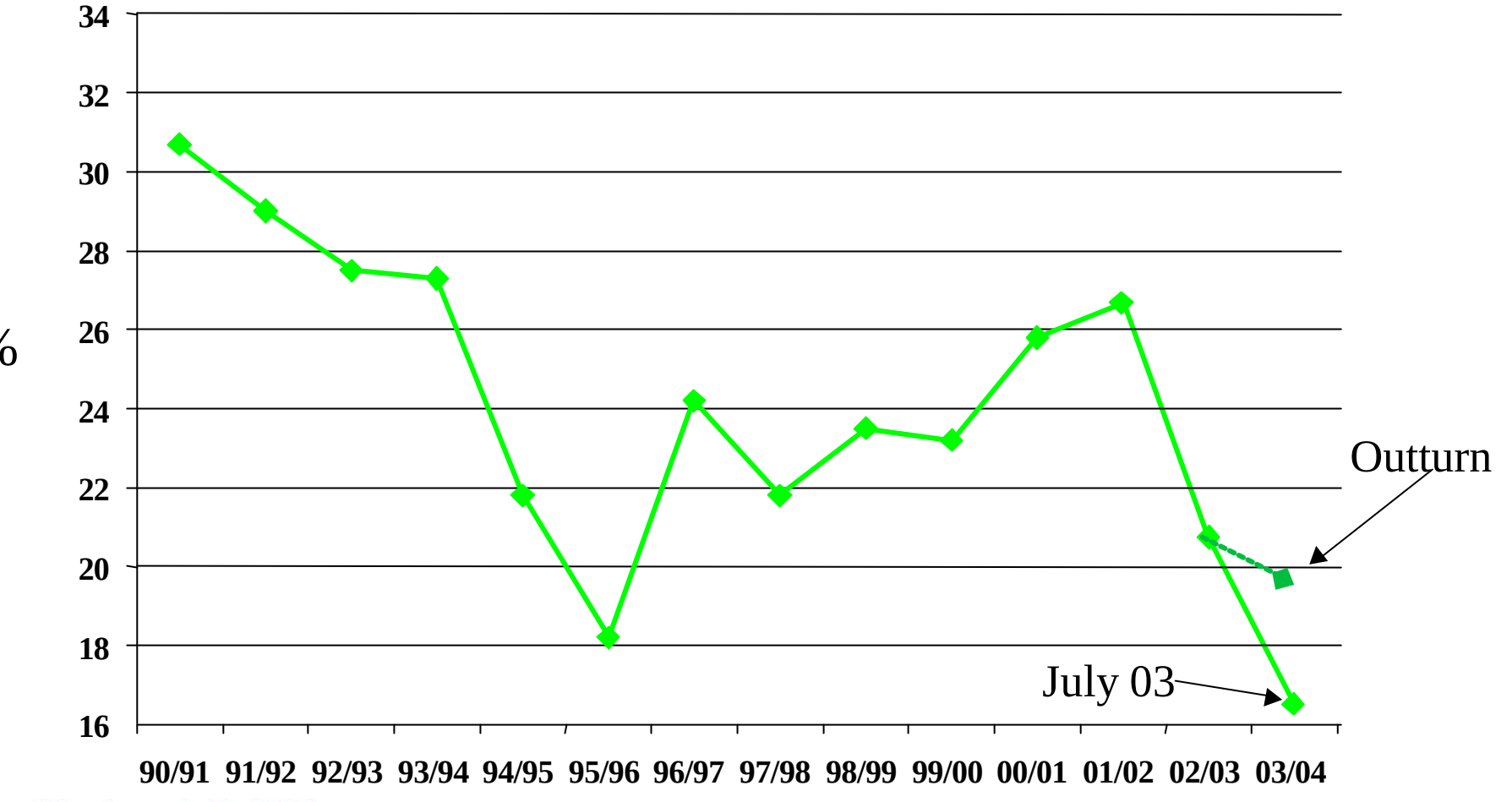
Agenda

- What were we saying before the winter?
- What happened in electricity?
- What are the interactions between gas and electricity?
- What happened in gas?
- What issues does this raise looking forward?

What did the 2003/04 winter operations report say? (October 2003)

- Transportation requirements of cold winters can be met
- Sufficient gas forecast to be available at the beach
- Some mothballed plant has returned
- We are progressing changes to market rules
- Gas/electricity interactions
  - CCGT interruptions
  - Proposals developed to mitigate impact of this
- ‘Worst case’ scenarios only realised if exceptional circumstances arise

Electricity Plant Margin Since 1990



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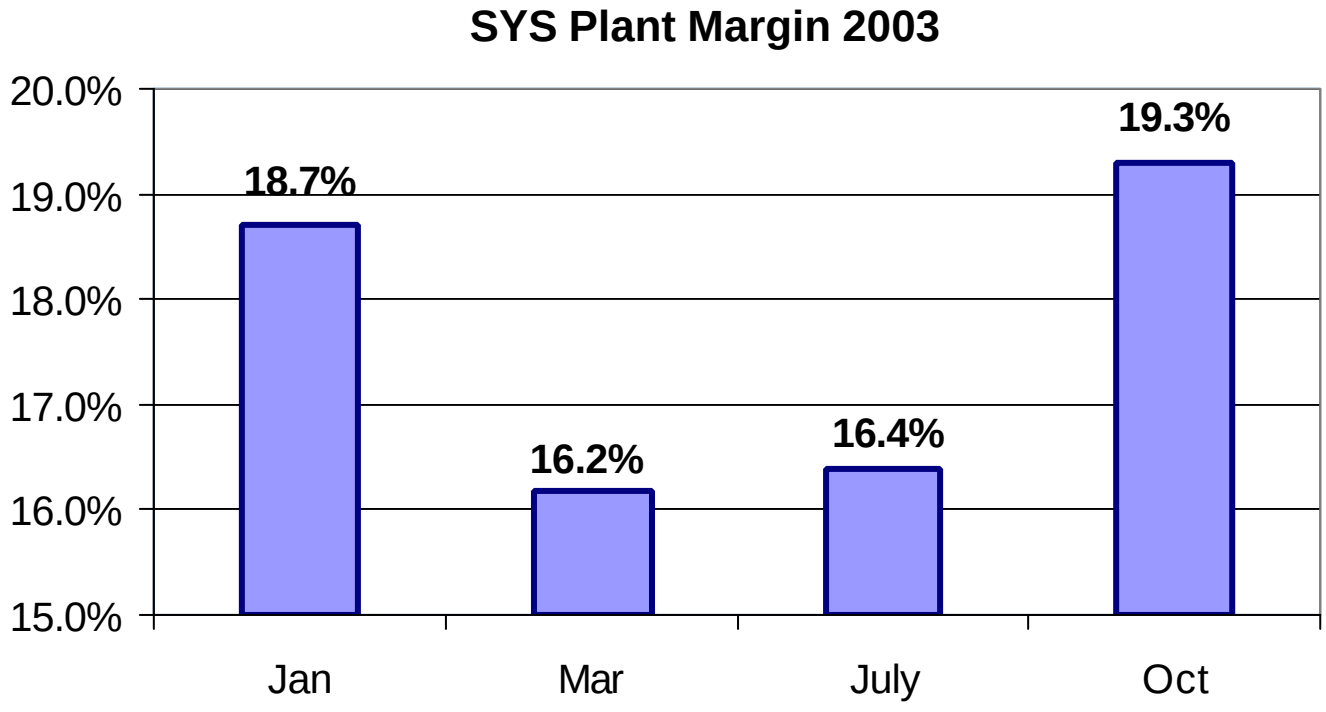
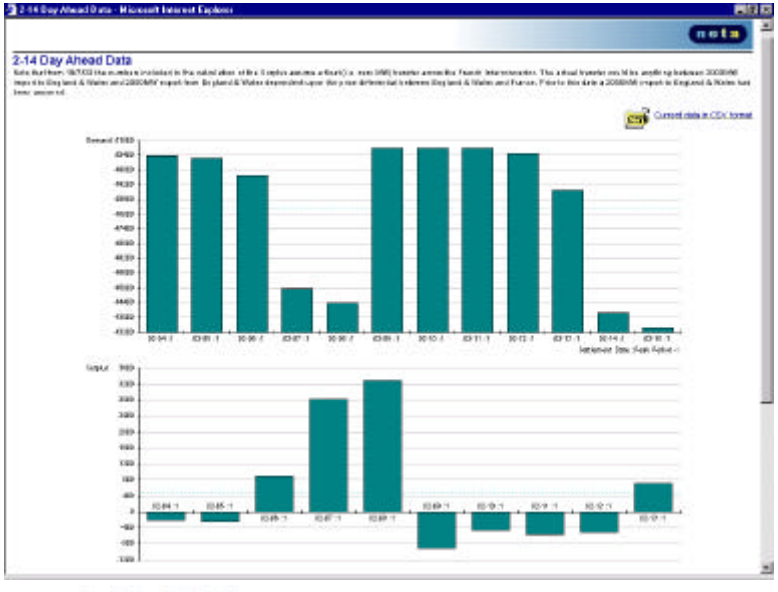
Market Signals
Seven Year Statement Plant Margin

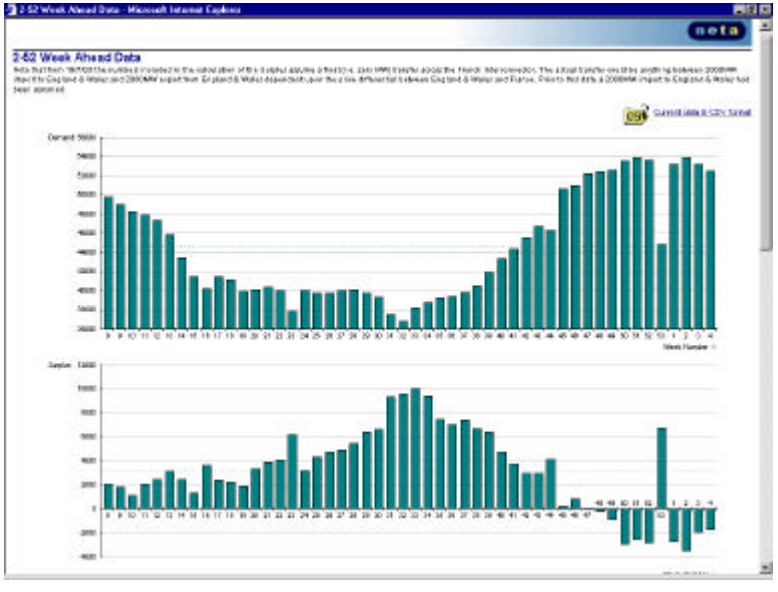
- 2003/04 SYS margin varied through the year
- Actual margin outturned at 21.6%



Market Signals
Operational Margins

- **Weekly and daily margins**
  - large negative surpluses seen in the approach to winter
  - Situation improved as more plant became available
  - Based on information provided by the generators





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Key uncertainties going into winter….

- Potential Upsides:
  - Further plant returning to service
  - Other initiatives to gain access to generation
  - Interconnector flows
- Potential Downsides
  - Interconnector flows
  - Generator performance
  - Further mothballing / unavailability?
  - Gas interruptions?
- Weather

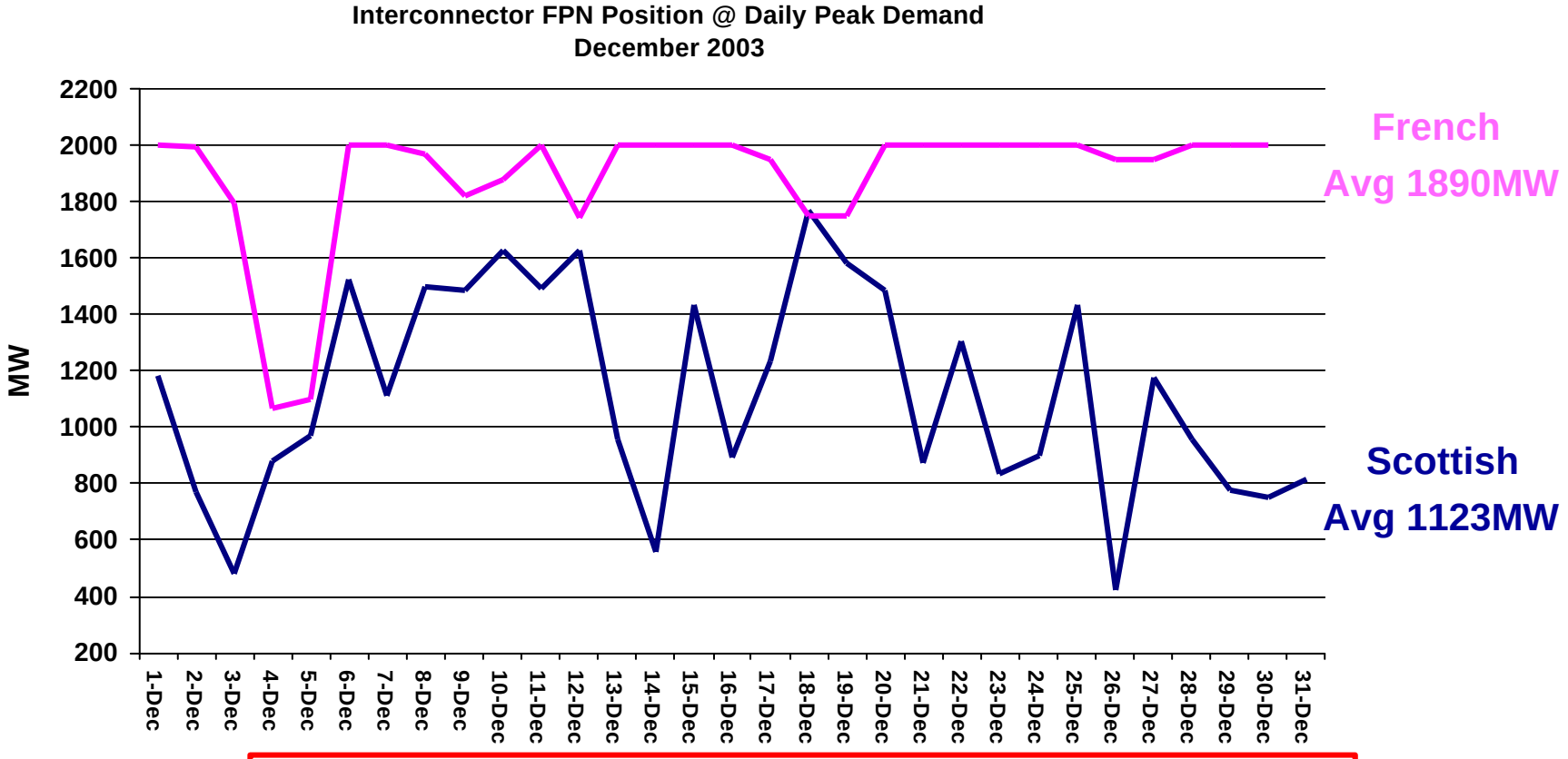
Generation availability

- The following mothballed plant returned

Dinorwig 3	288MW
Grain 1	650MW
Dinorwig 2	288MW
Ffestiniog 3	90MW
Deeside	250MW
Fifoots 13 & 14	242MW
Killingholme PG	560MW
Grain 4	650MW

Plant Availability increased by ~3GW

Interconnector positions at Demand Peak



Average 3013MW import from Interconnectors

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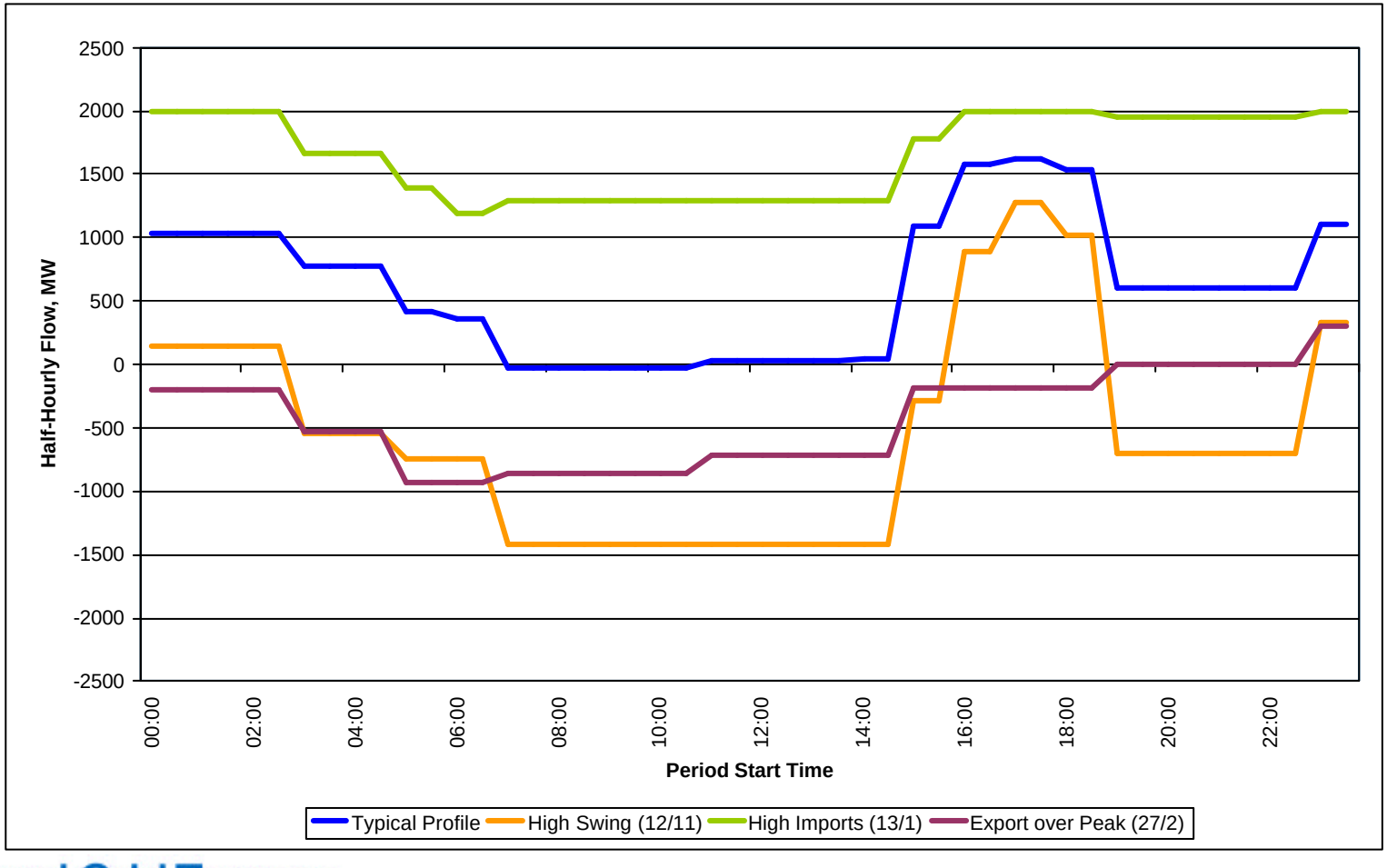
French Interconnector



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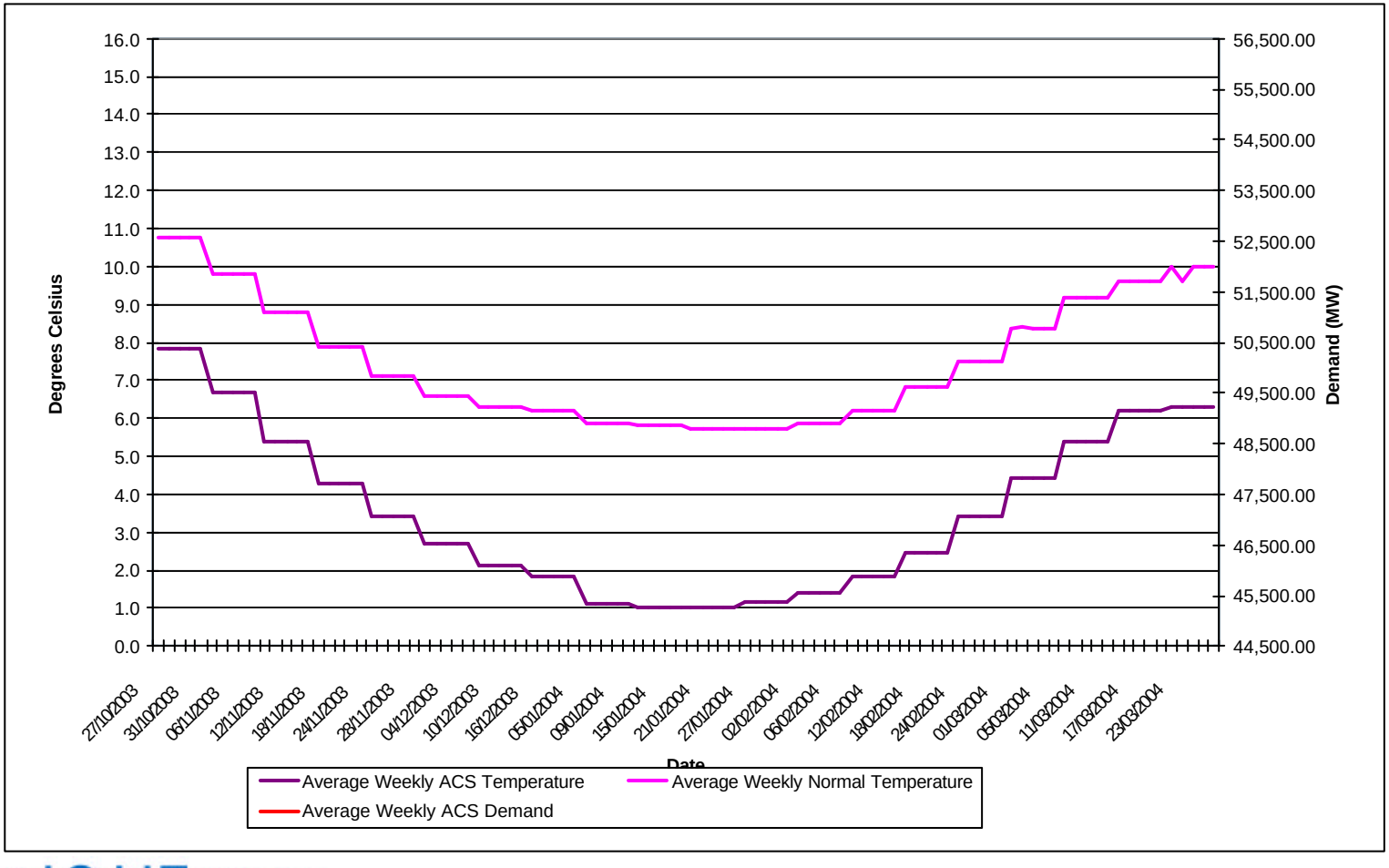
Other factors

- New service introduced to gain access to additional ‘emergency’ generation (~700 MW - Maxgen)
- Additional reserve contracted by NGT
- Generator performance was typical
- No further withdrawals of plant prior to winter
- No significant gas interruptions

Winter Demands
Temperature Profile - Normal & ACS



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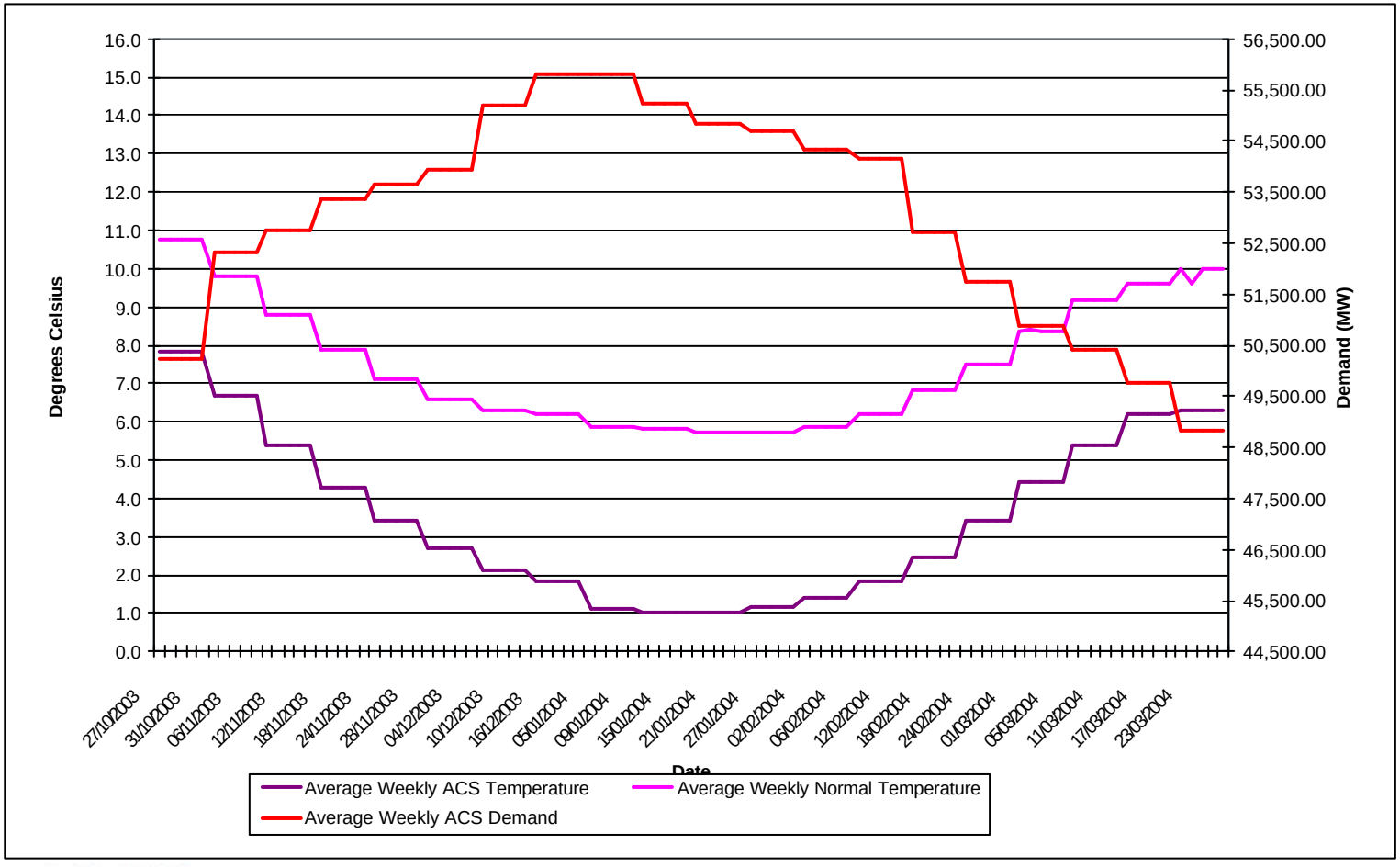
Winter Demands
Average Weekly ACS Demand



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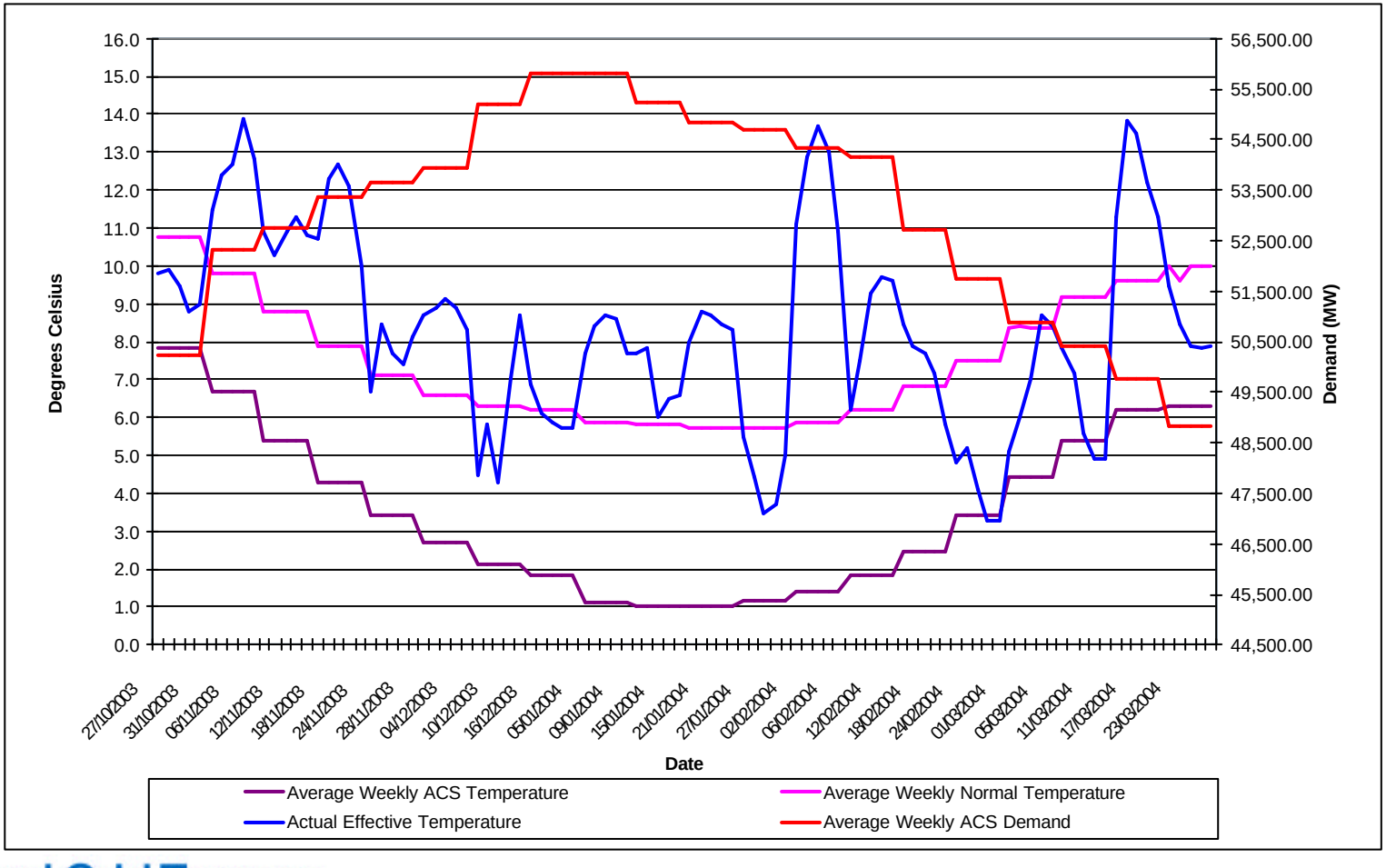
Winter Demands
Actual Temperature Profile



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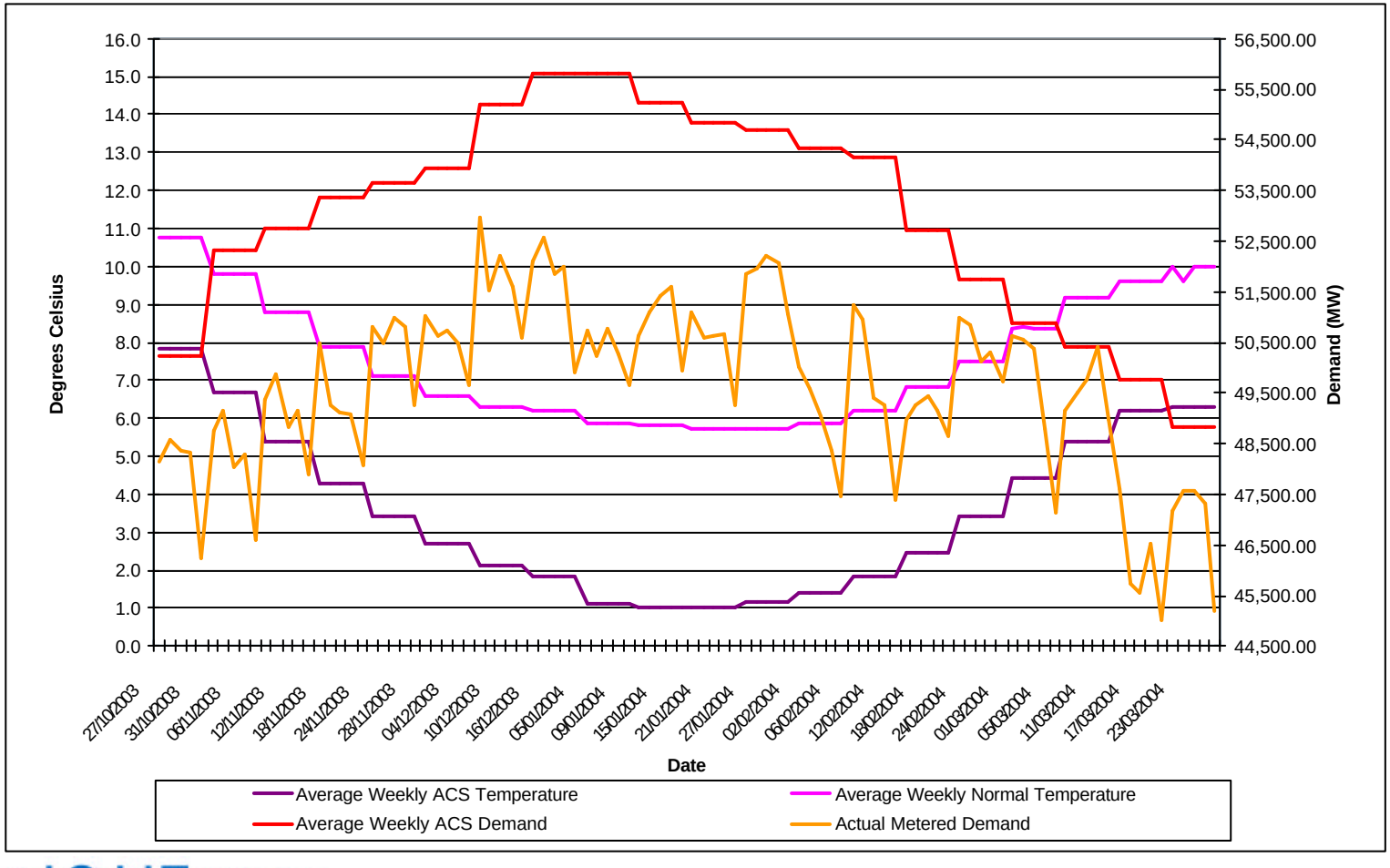
Winter Demands
Actual Metered Demand



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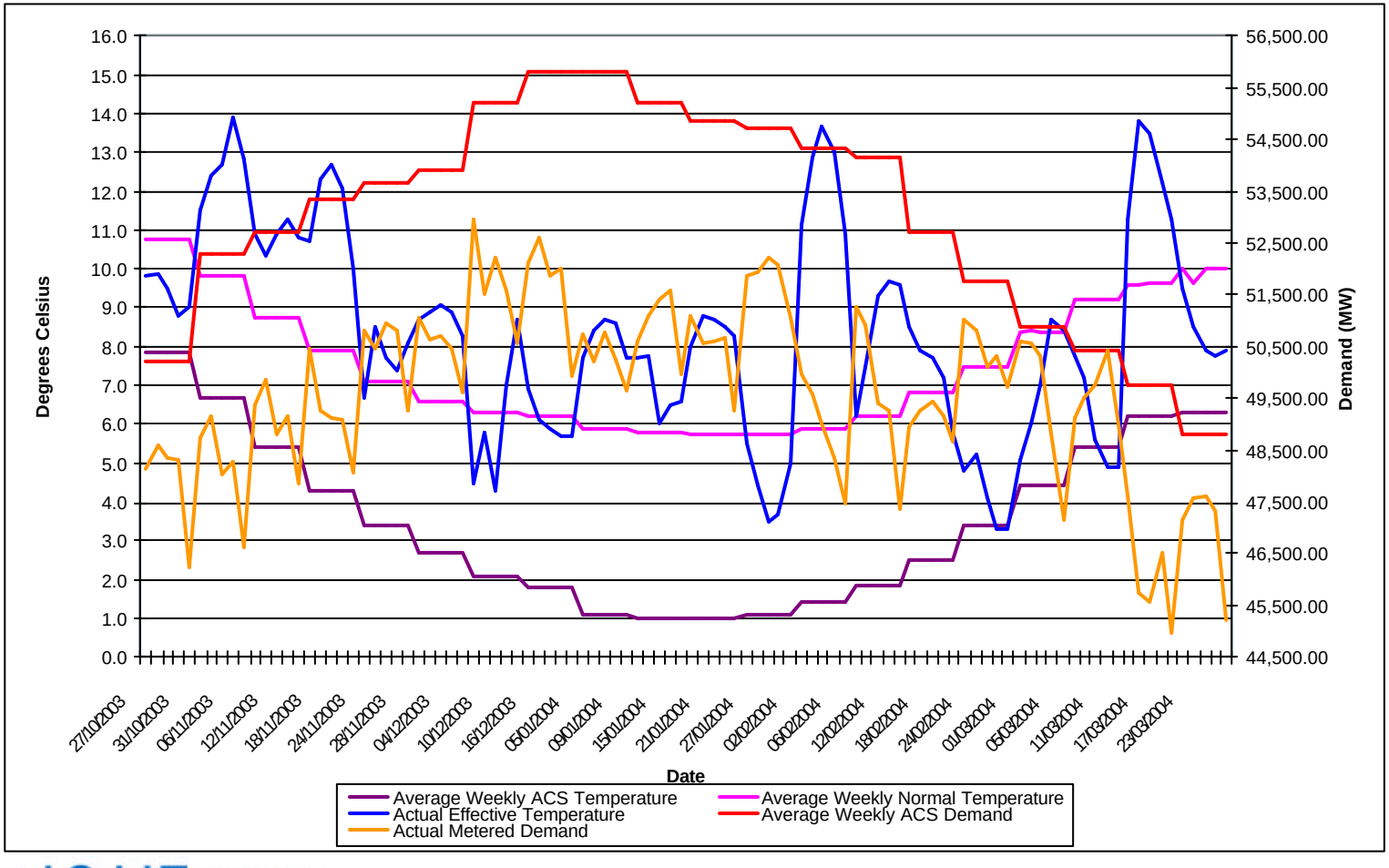
Winter Demands
Temperature Profile



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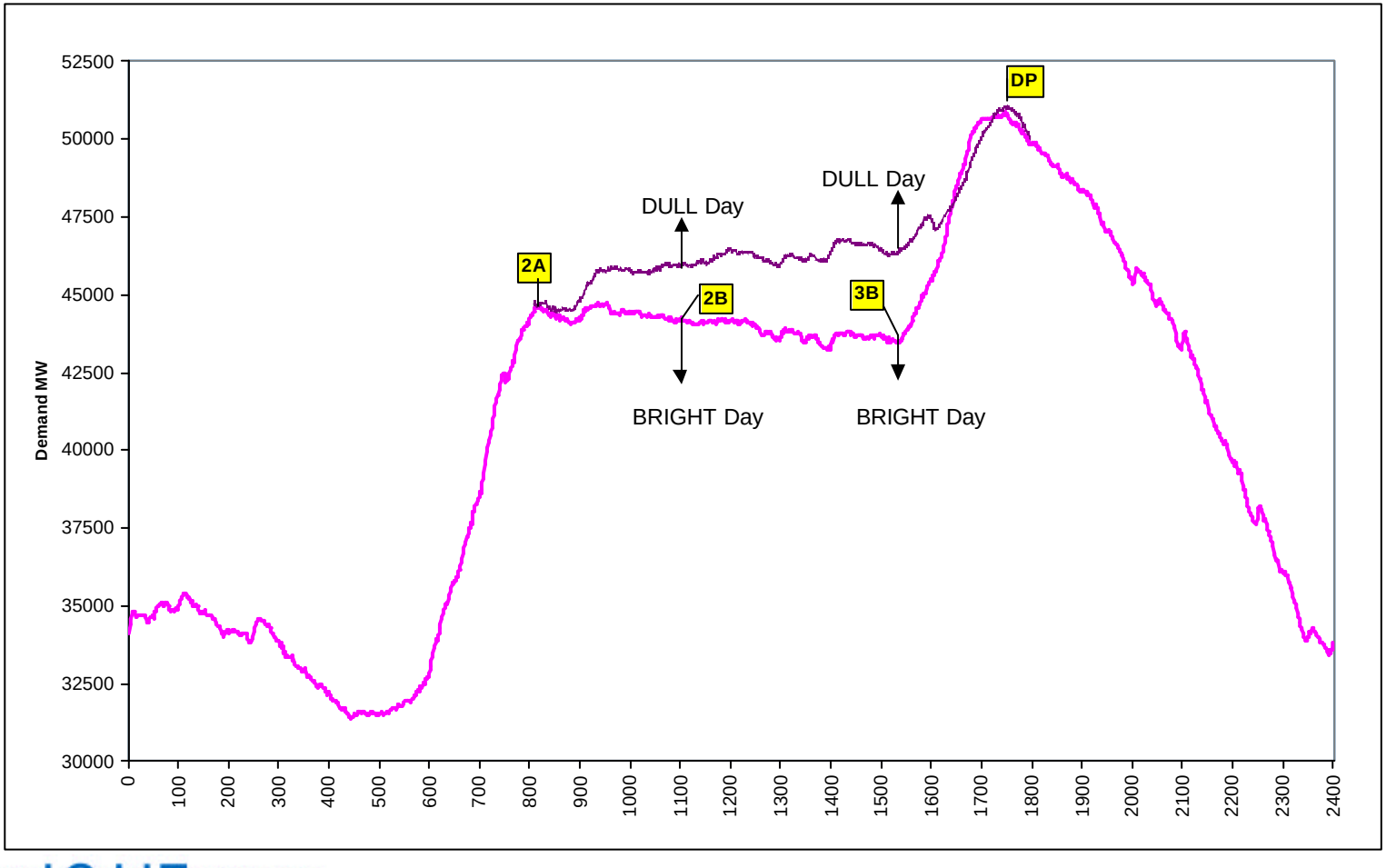
Impact of weather on demand



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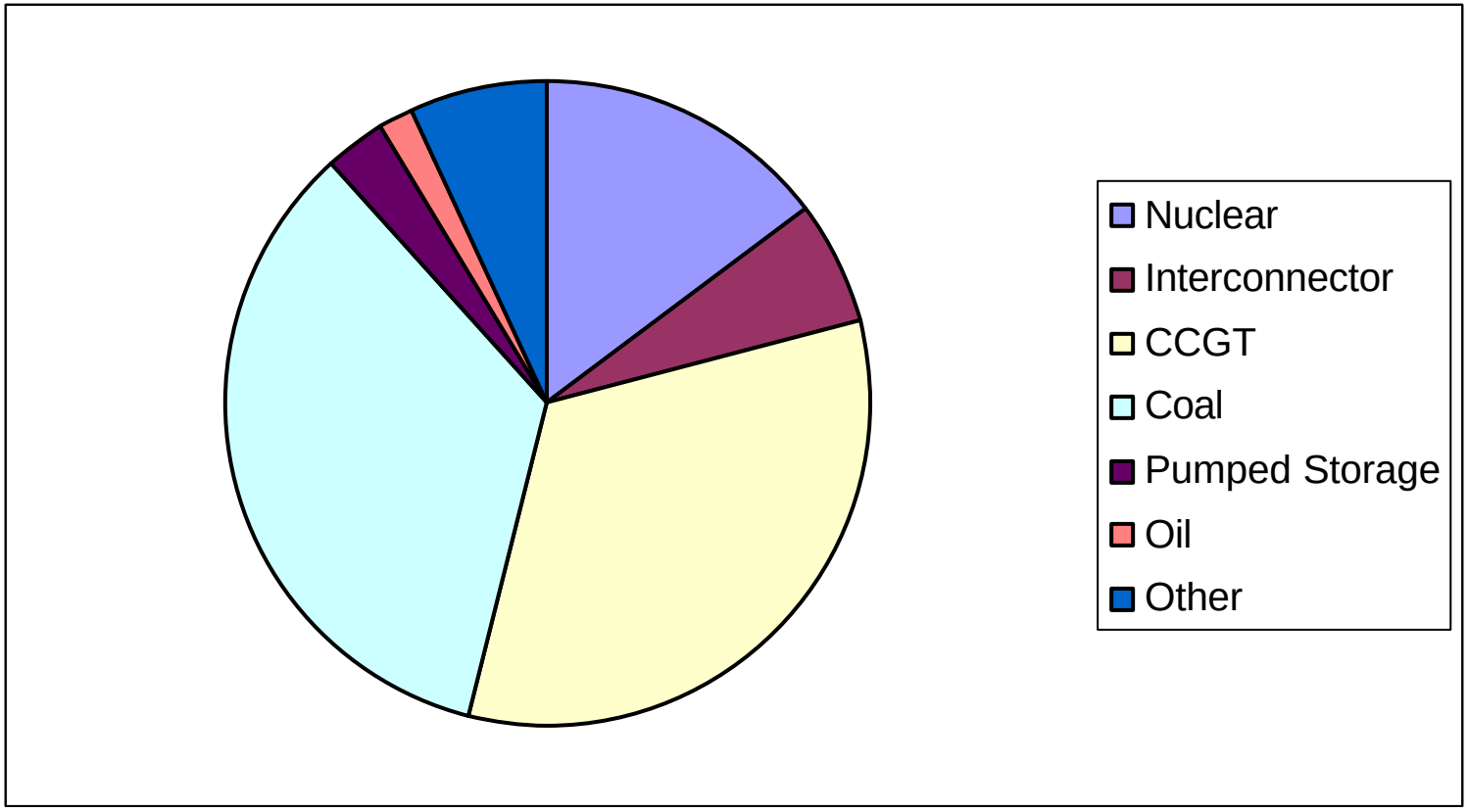
Gas/electricity interactions
Plant mix 2003/04



Gas/electricity interactions
(all figures approximate)

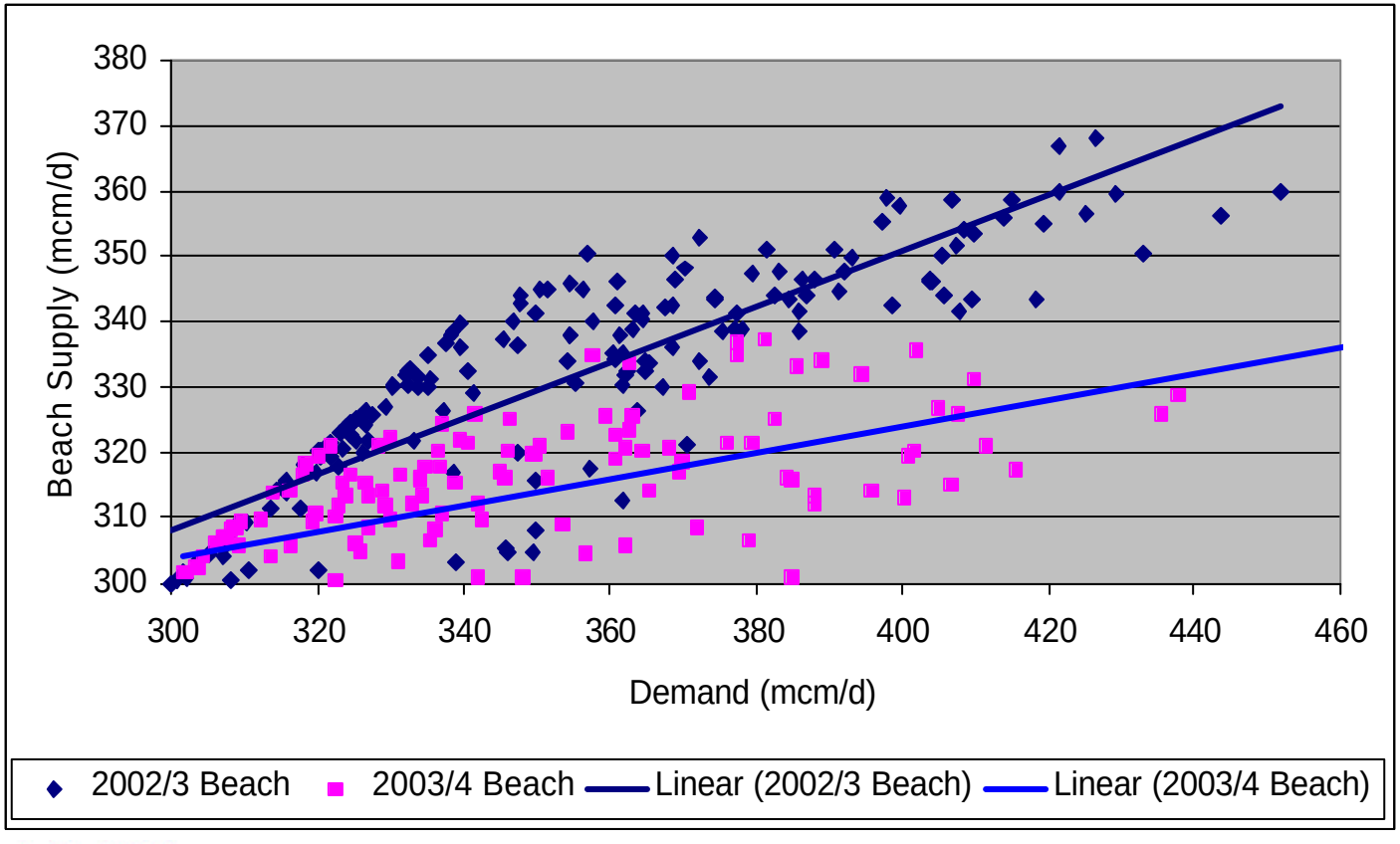
- GB gas-fired power stations
  - 24 GW output capacity
  - 7 GW have alternative fuel capability
  - 4 GW have back-up gas connection
- Interruptible arrangements
  - 9 GW on some form of interruptible contract
  - Majority have back-up fuel capability
    - typical distillate capacity around one week
- Potential for firm CCGTs to arbitrage
  - Spark spread key measure in determining commercial behaviour

Overview of 2003/04 in gas

- Another mild winter: 1 in 7 warm
  - 9 out of the 10 mildest winters since 1928 have occurred in the last 20 years (and 7 of these in the last 10 years)
- Highest demand day was 28 January
  - 444 mcm compared with 450 mcm in 2002/03
  - Roughly 90% of diversified firm peak demand
- Unexpectedly low deliveries of beach gas
  - Corresponding increase in Interconnector imports
- Well-publicised offshore outages
  - Jittery market sentiment
  - System average price exceeded 50p/therm on 29 January
- Some evidence of demand-side response in CCGT sector

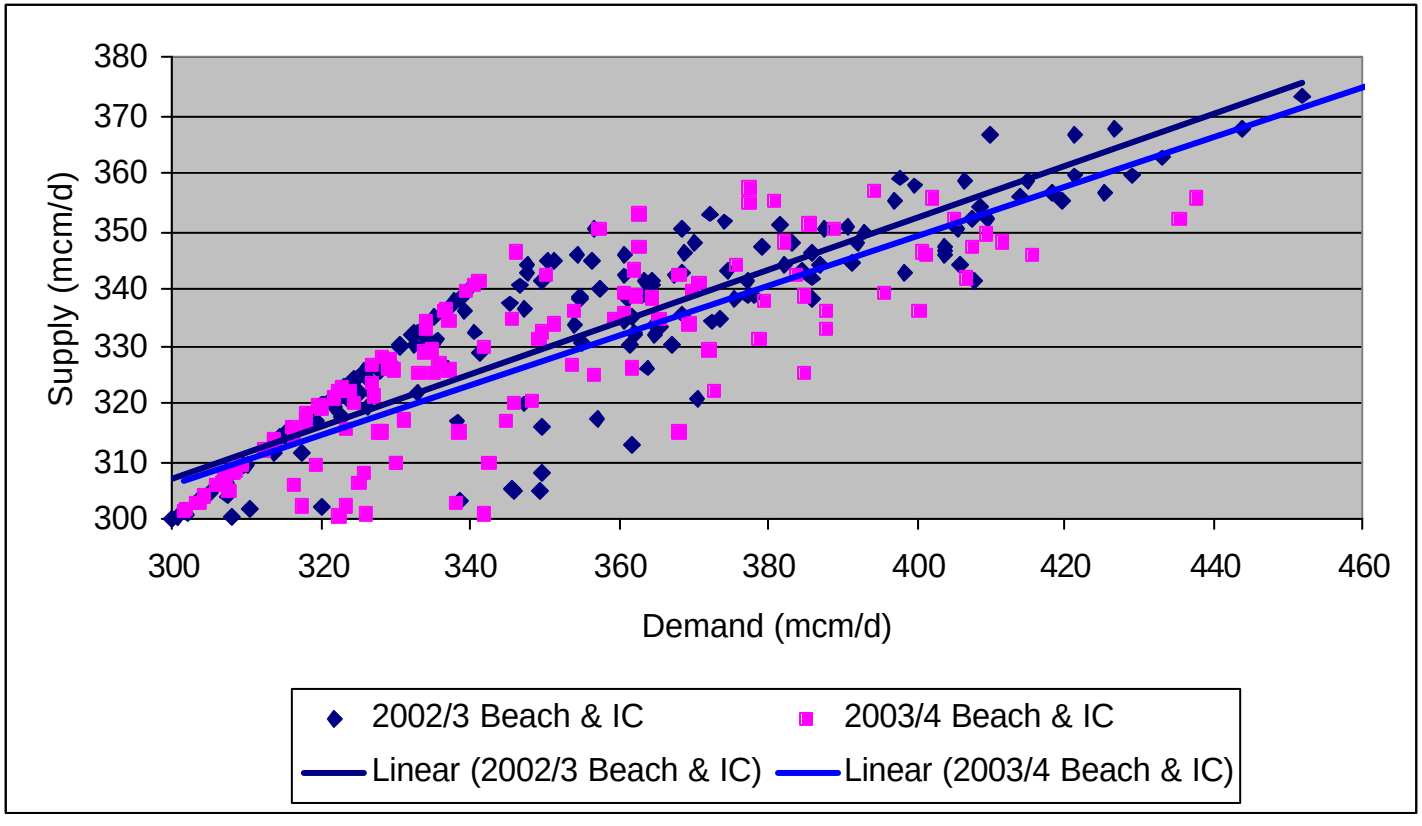
Beach deliveries
Comparison of 2002/03 and 2003/04

Beach deliveries consistently lower in 2003/04 than in 2002/03…….



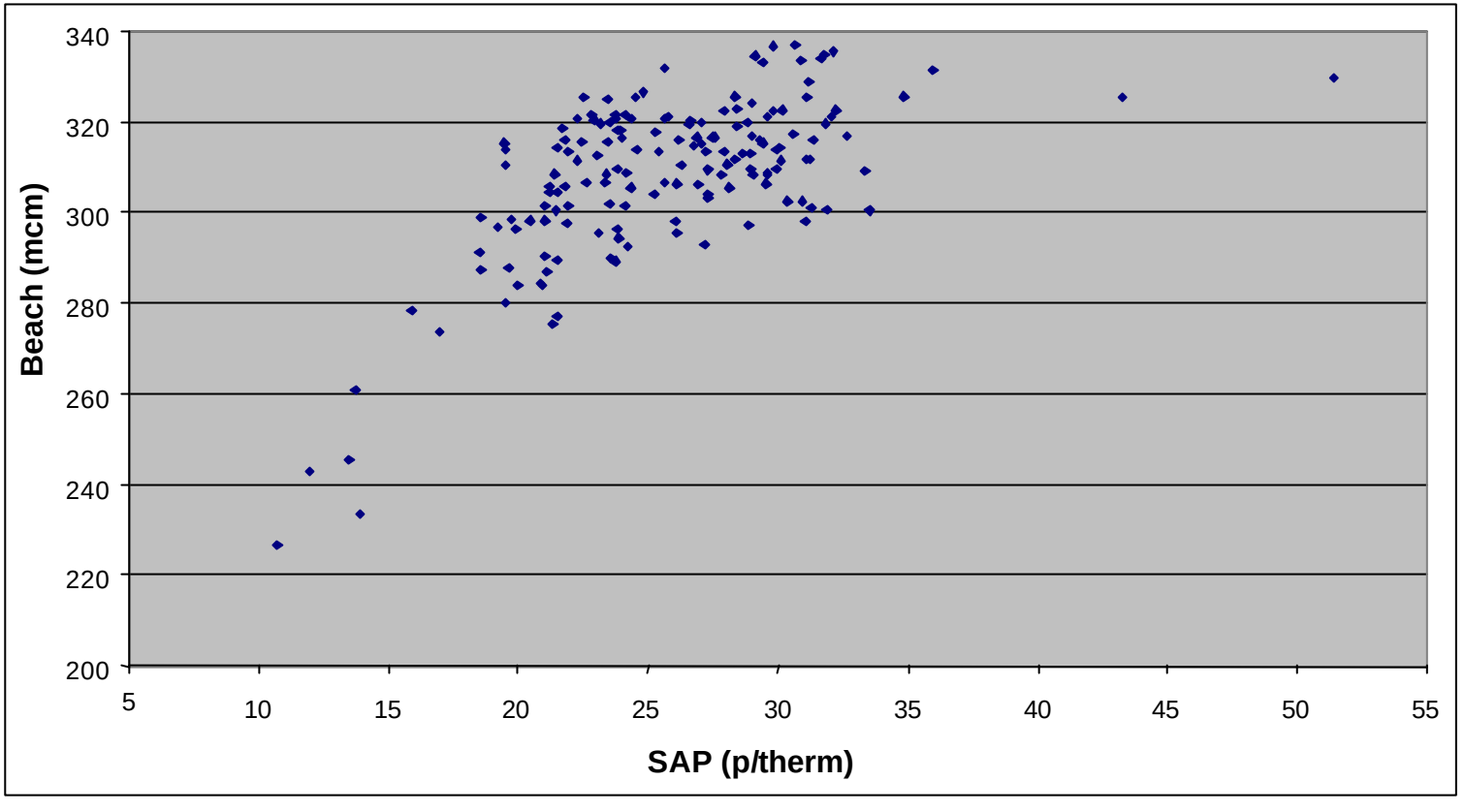
Beach and Interconnector deliveries
Comparison of 2002/03 and 2003/04

Interconnector filled the gap, but extent of commercial v physical drivers unclear….



Daily beach gas deliveries against price

Little apparent response to price above 30p/therm…….



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Beach performance against maximum forecast

Highest beach deliveries well below maximum beach forecast…….

	12-Mar-2004	Terminal max	Sub-terminal max	2003 Forecast
Bacton excl. IC	82	88	93	103
Barrow	40	45	45	48
Easington	16	26	28	30
St. Fergus	135	139	142	143
Teesside	33	38	41	37
Theddlethorpe	28	30	30	36
Point of Ayr	3	5	5	4
Total Beach	**338**	**371**	**384**	**401**

NB (Excluded from above) Interconnector has flowed up to 29 mcm/d compared with forecast of 22 mcm/d

Interruption and firm demand-side management

- Evidence of CCGT response, particularly on 29 Jan
  - System Average Price in gas market was 51p/therm
  - Spark spread fell close to zero
  - Estimated reduction in CCGT gas demand of around 125 GWh
    - Represents around 3% of total system demand
    - ¾ from interruptible CCGTs, replaced by coal and French imports
    - ¼ from firm CCGTs switching to distillate back-up
    - Total response less than total forecast interruptible CCGT demand
- Low levels of LDZ interruption
  - Highest level of shipper-initiated interruption around 24 GWh (28/29 Jan)
  - Consistent with move by customers to 'Transco-only' interruptible contracts
  - Highest level of NGT-initiated interruption around 15 GWh (28 Jan)
- No clear evidence of customer-led response in LDZs

Issues raised by 2003/04 experience

- Is mothballing/de-mothballing to become the norm?
  - Nearly 1.5 GW of plant has mothballed since the winter
- How do we give market participants appropriate signals and incentives to procure sufficient generation capacity and gas supplies?
- What beach performance can we expect in the coming winters?
- Which of the importation and storage projects under development will deliver (and when)?
- Are we taking appropriate account of climate change in our demand forecasts?
- What level of gas demand-side response can be expected?
  - From CCGTs?
  - From the non-power sector?
- Looking further ahead, should new CCGTs be required to have an alternative fuel capability?