System Flexibility Indicators

Operational Forum, 26 May 2010

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Introduction

- There is potential for greater volatility in gas flows in future years driven, in particular, by:
  - Growth in renewable sources of electricity generation
    - CCGTs may become the marginal source of generation
  - New sources of gas supply (more LNG, more fast cycling storage etc.)
- Greater supply, demand and linepack variation may result, both within day and across days
- A more ‘flexible’ NTS may therefore be required by our customers

Introduction

- We want to monitor ‘indicators’ of such trends to predict any requirement for change
- 2 industry workshops held in 2009 to develop ‘leading’ and ‘lagging’ indicators
- ‘Final Proposals’ on indicators presented to the February 2010 Transmission Workstream
  - Phase 1 – we can do now
  - Phase 2 – we need to do further work on
- Agreed to report on indicators to Operational Forum every 6 months
- Phase 1 today, phase 2 to be included next time

Phase 1 ‘Leading’ Indicators

Supply

1) Day on day difference in proportion of supply from the North & South
2) Day on day difference in supply by group
   - LNG
   - UKCS
   - Norway
   - ICs
   - Storage

Linepack

1) Maximum daily range of within day linepack changes
2) Frequency of linepack changes at particular thresholds
3) Within day PCLP changes

Demand

1) Within day demand variation by sector
2) Flow flexibility usage by sector
   - ICs
   - Storage
   - Power stations
   - DN offtakes

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Phase 1 ‘Lagging’ Indicators

Supply

1) Use of Operating Margins gas
2) Use of entry buybacks
3) Use of entry scalebacks

Supply & Demand

1) Residual balancing frequency
2) Residual balancing volumes
3) Residual balancing costs

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‘Leading’ Supply Indicators

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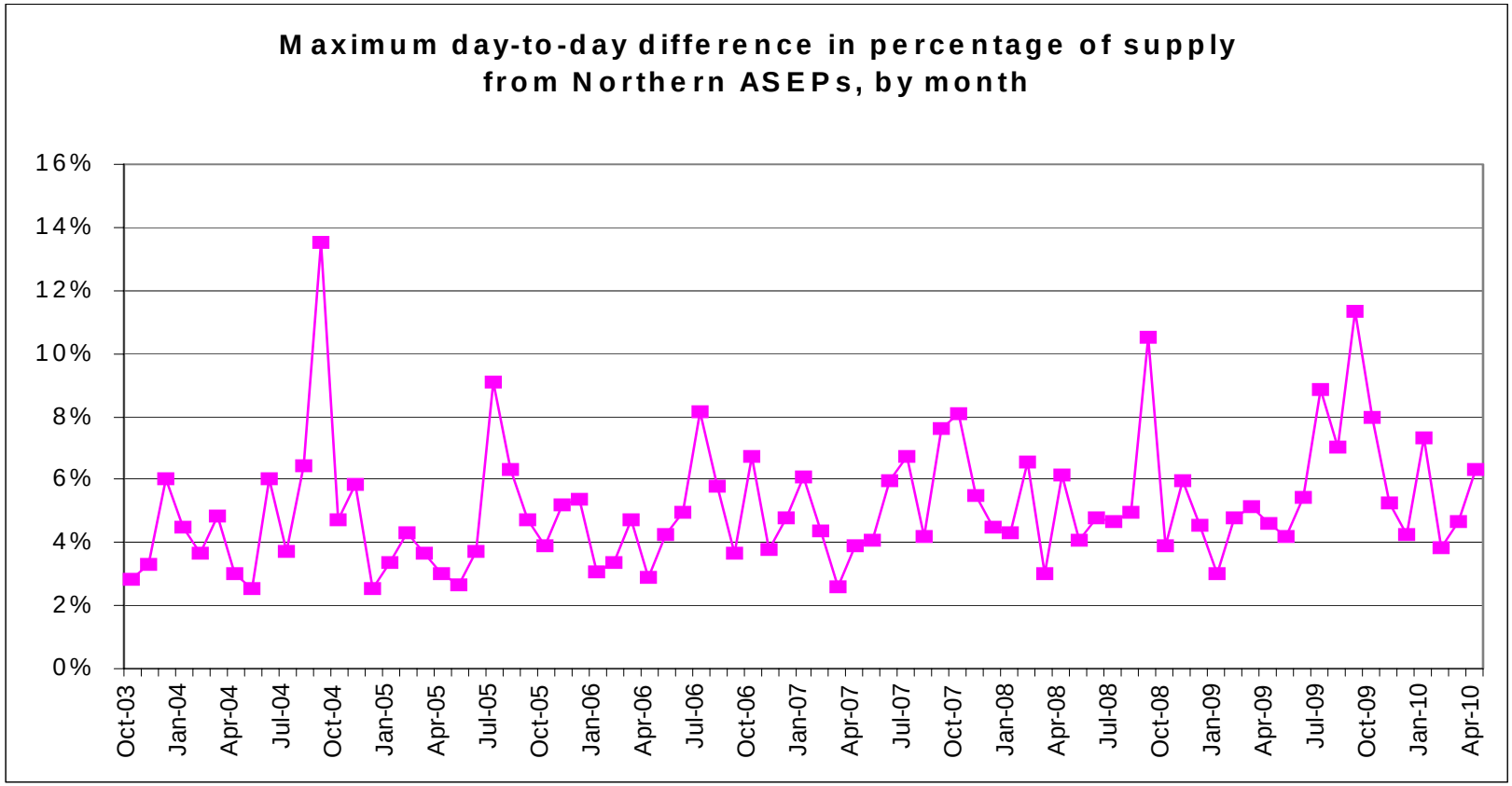
‘Leading’ Supply Indicator 1:
Day to Day North / South Supply Volatility



This graph shows the maximum day on day change per month in the percentage of total supply from Northern ASEPs. Eg. if on one day 255 mcmd came from North and 117 mcmd from South (68% from North) then on the next day 257 mcmd came from North and 102 mcmd from South (71% from North), the day to day percentage change would be 3%. If this was the highest in that month, 3% would be plotted on the graph.

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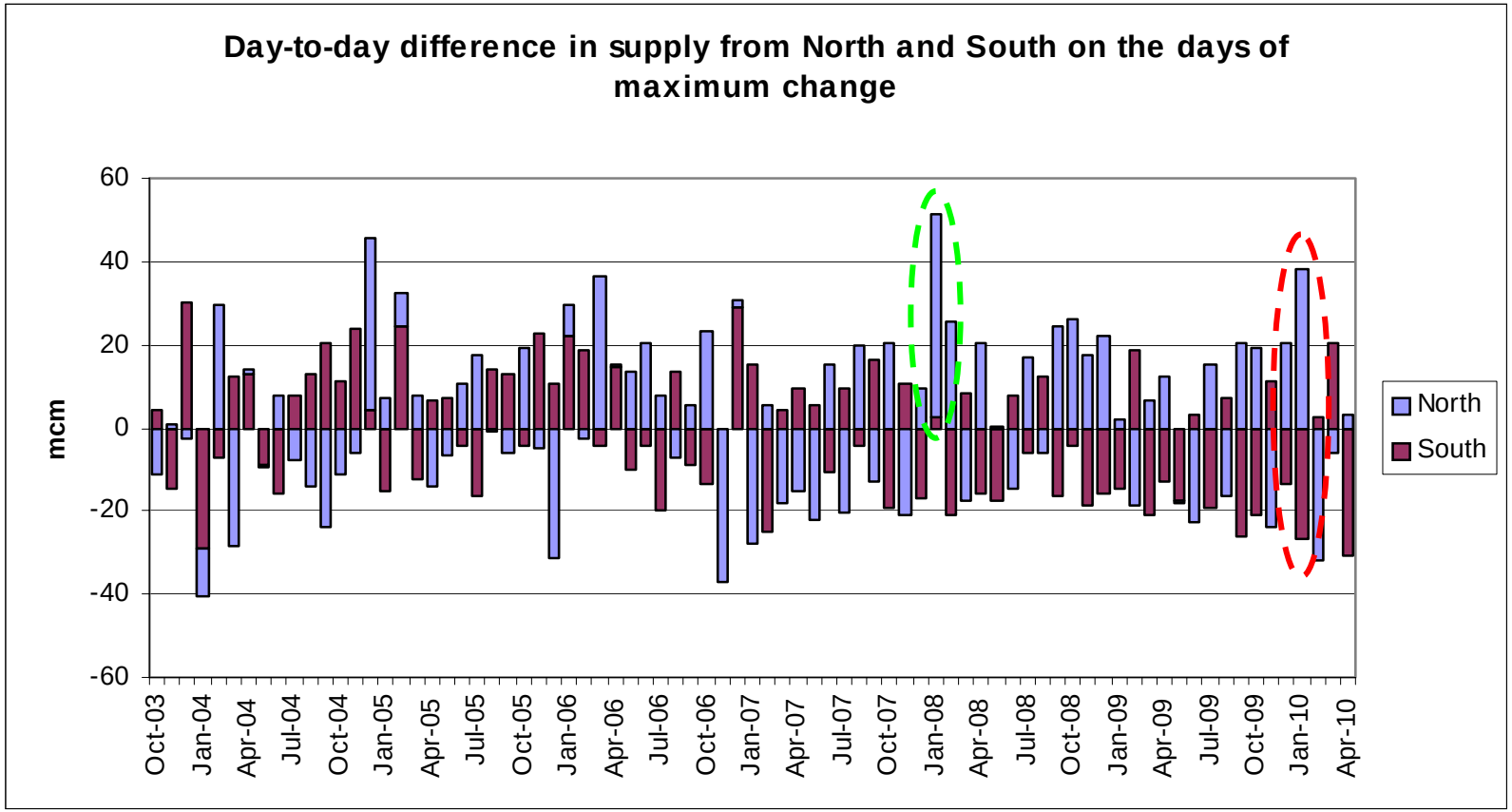
‘Leading’ Supply Indicator 1:
Day to Day North / South Supply Volatility



This graph shows the associated volume changes from the previous graph. The green ring shows Northern supply responding to an increased demand whereas the red ring shows little change in demand but a change in location of supplies. Using the example numbers quoted on the previous slide, +2 mcmd would be plotted against 'North' and -15 mcmd against 'South'.

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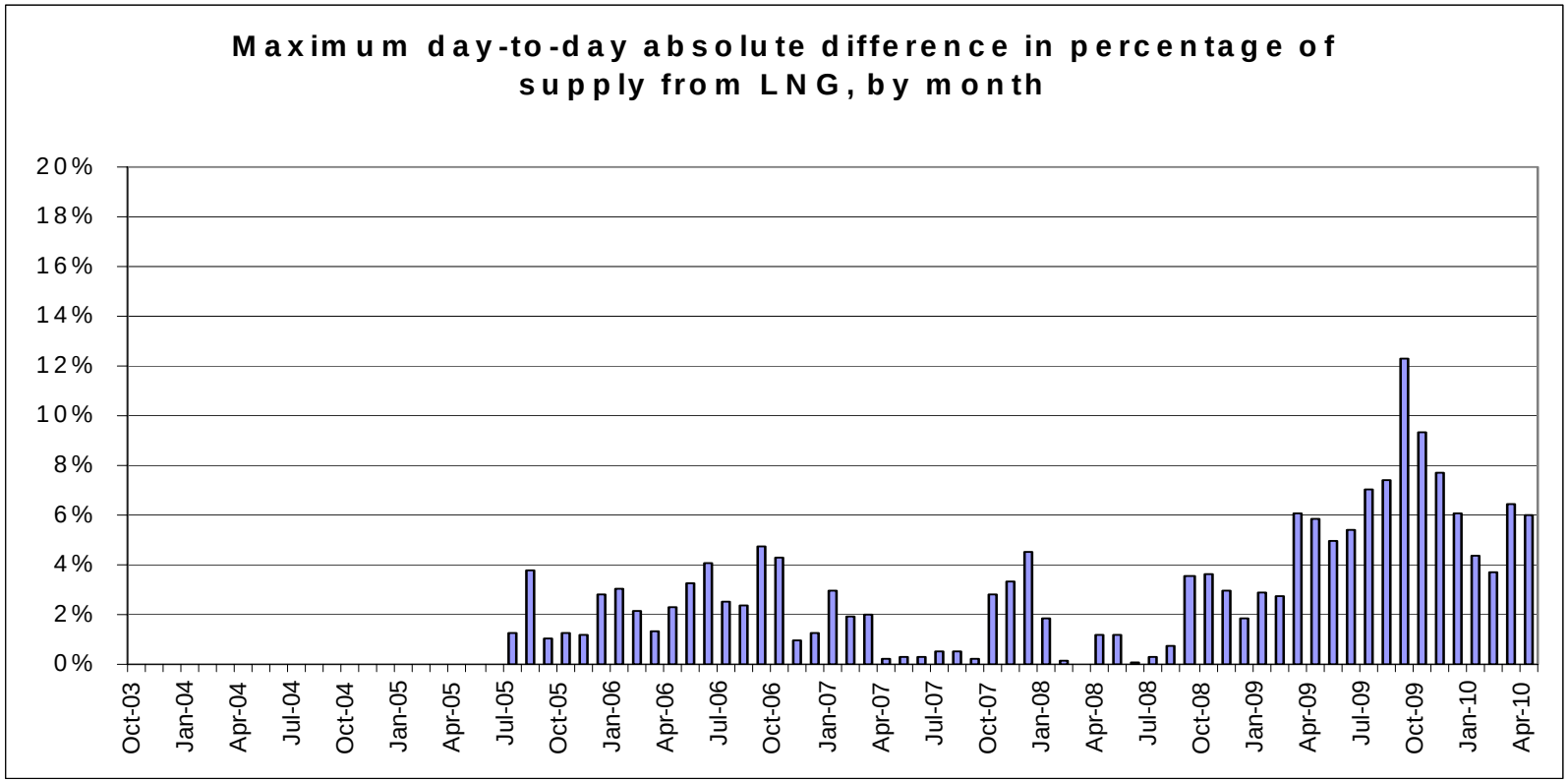
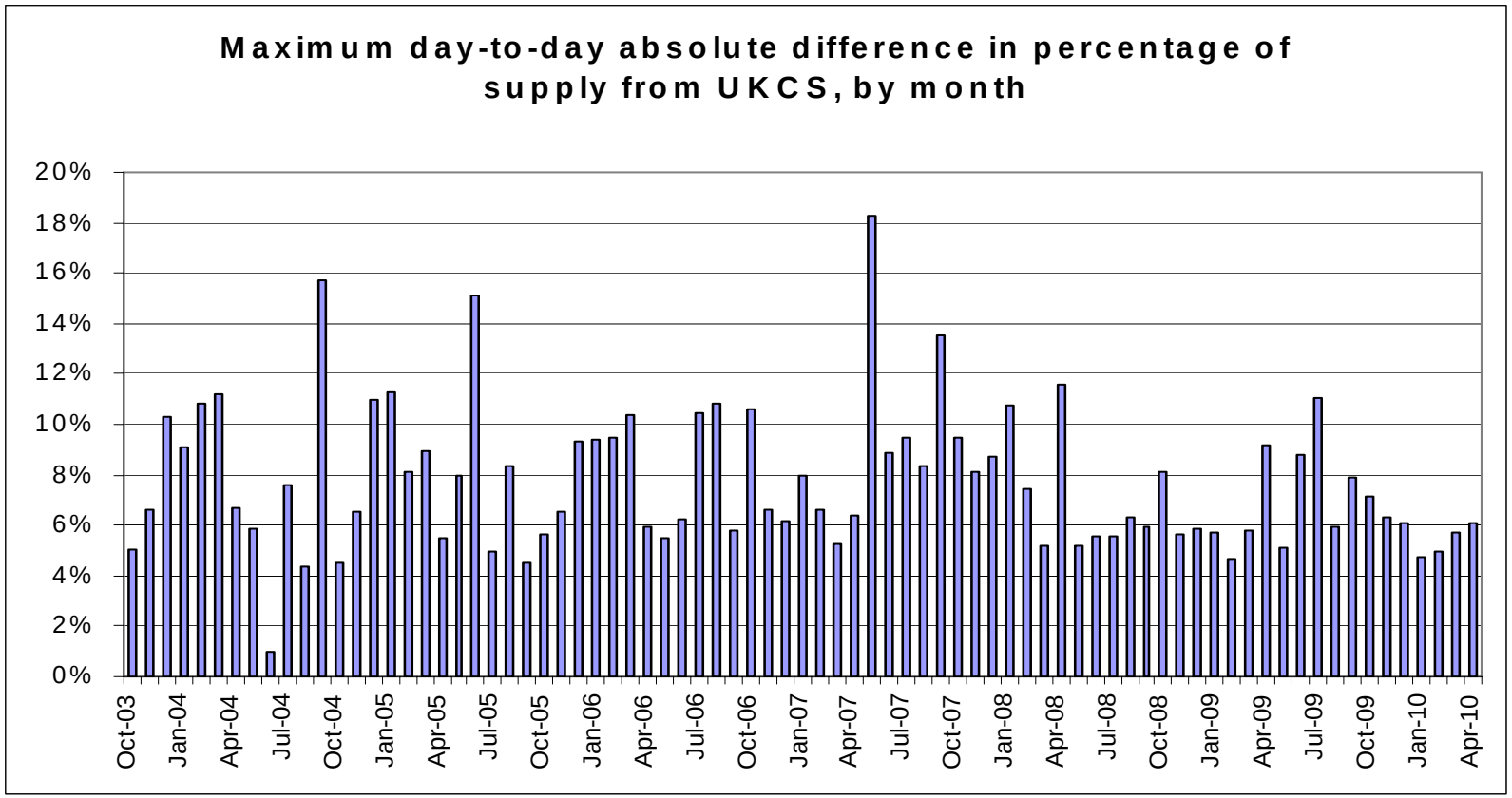
‘Leading’ Supply Indicator 2: Percentage of supply accounted for by group



This (and the following 4 graphs) shows the maximum day on day change per month in the percentage of total supply from different supply groups. Eg. if the supply from LNG was 50 mcmd on a day and 35 mcmd on the next day against total NTS supplies of 380 mcmd (13%) and 370 mcmd (9%) respectively, the day to day percentage change would be 4%. If this was the highest in that month, 4% would be plotted on the graph.

‘Leading’ Supply Indicator 2: Percentage of supply accounted for by group



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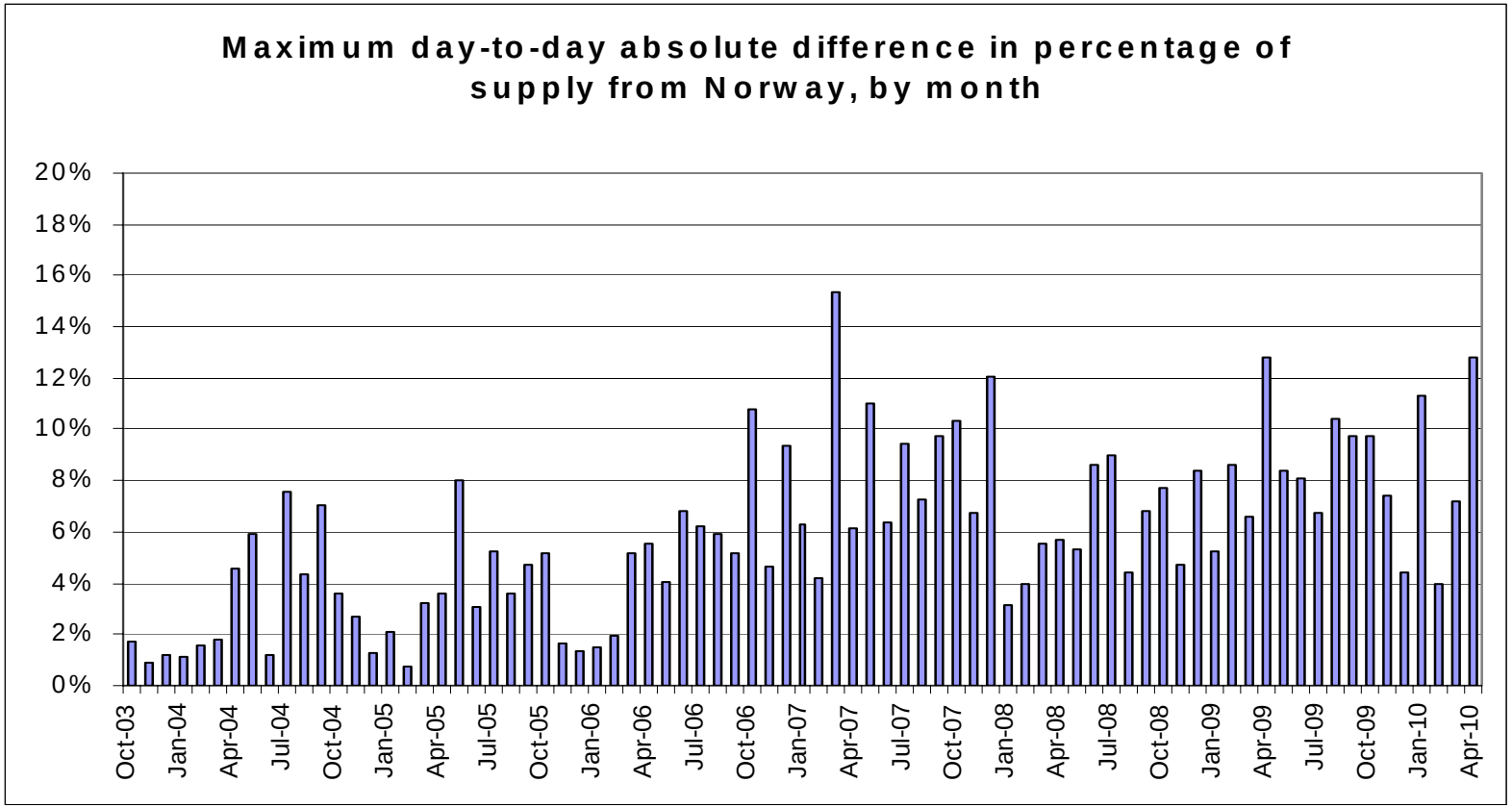
‘Leading’ Supply Indicator 2: Percentage of supply accounted for by group



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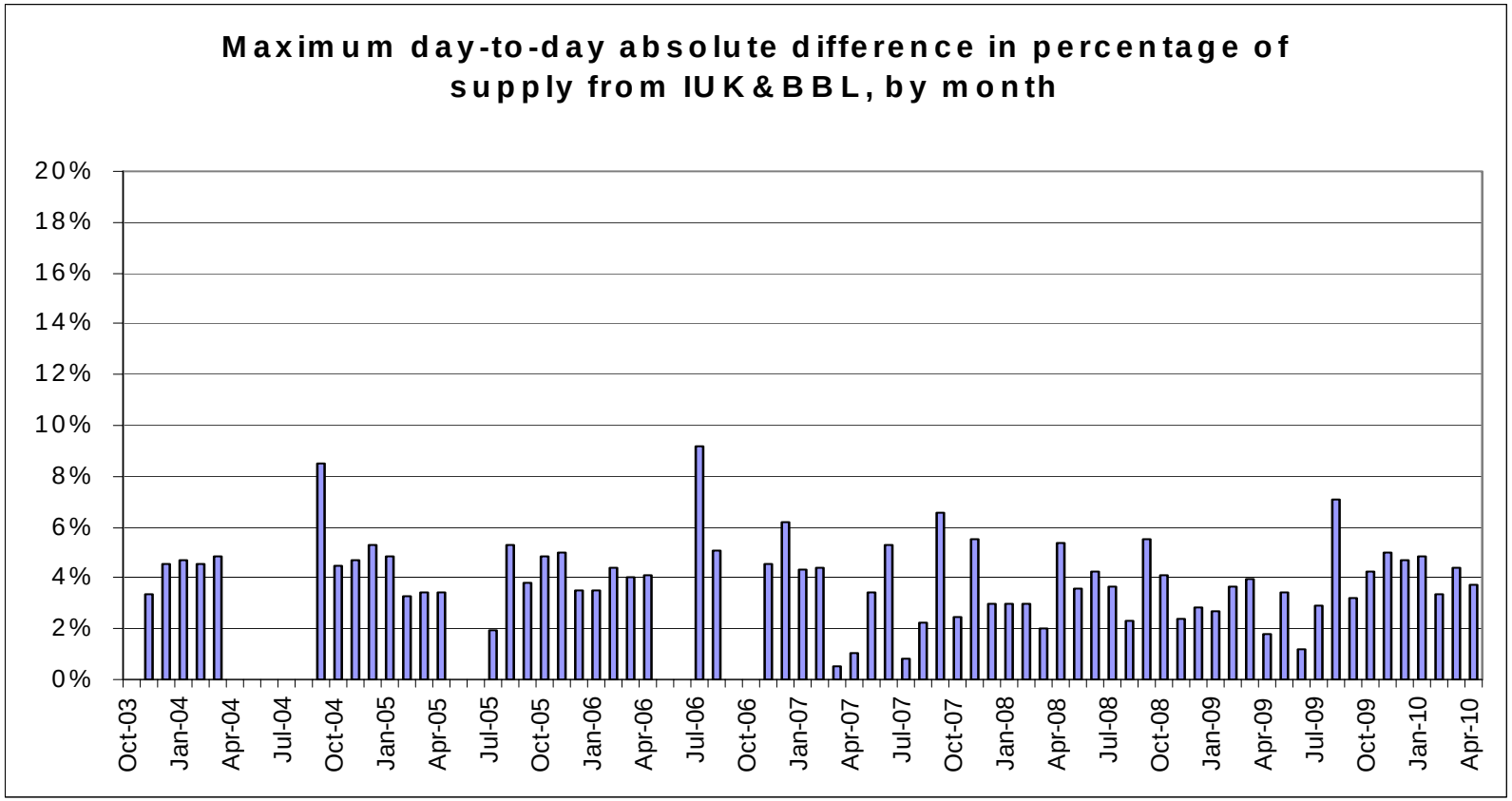

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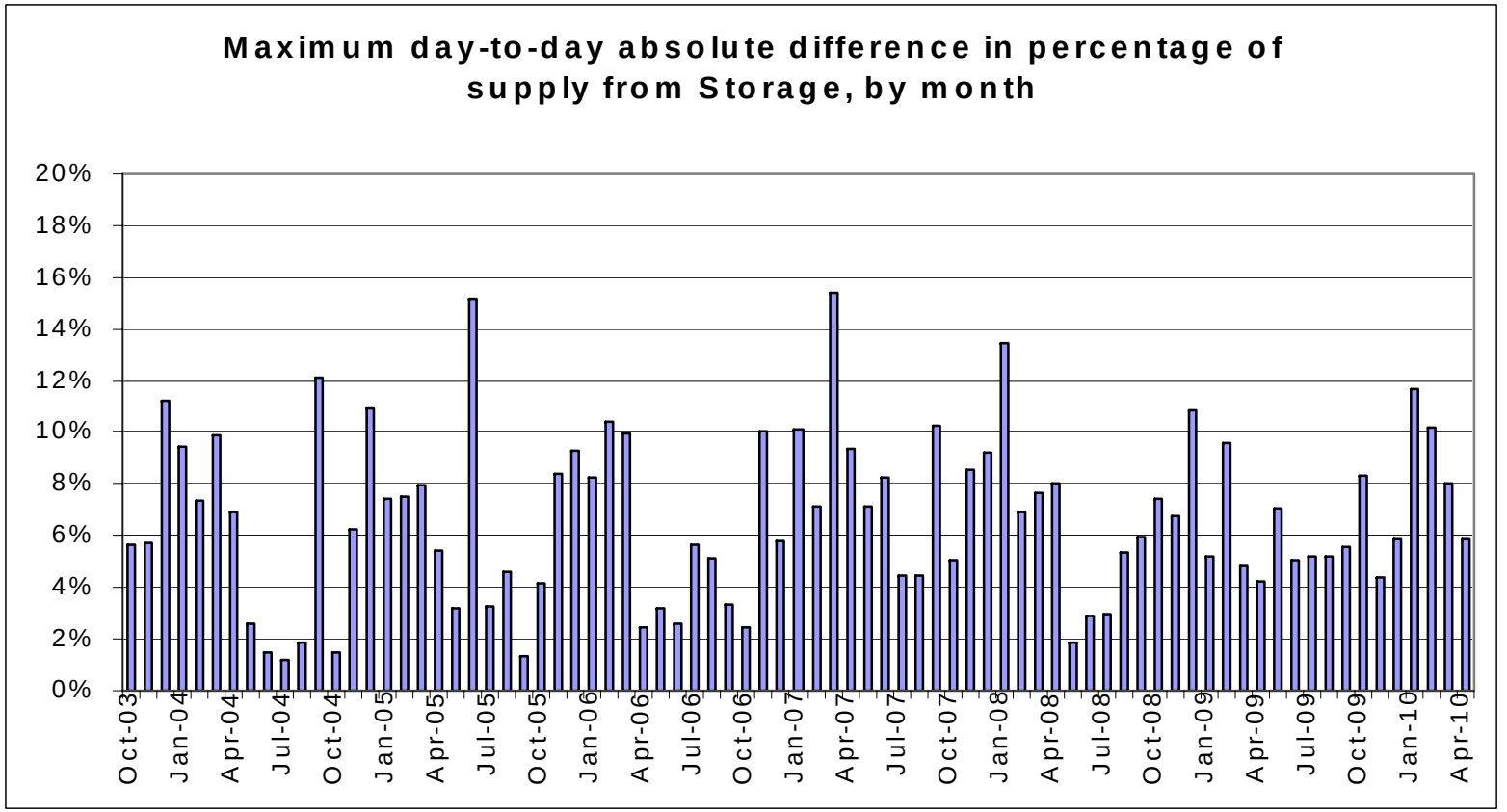
‘Leading’ Supply Indicator 2: Percentage of supply accounted for by group



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‘Leading’ Linepack Indicators

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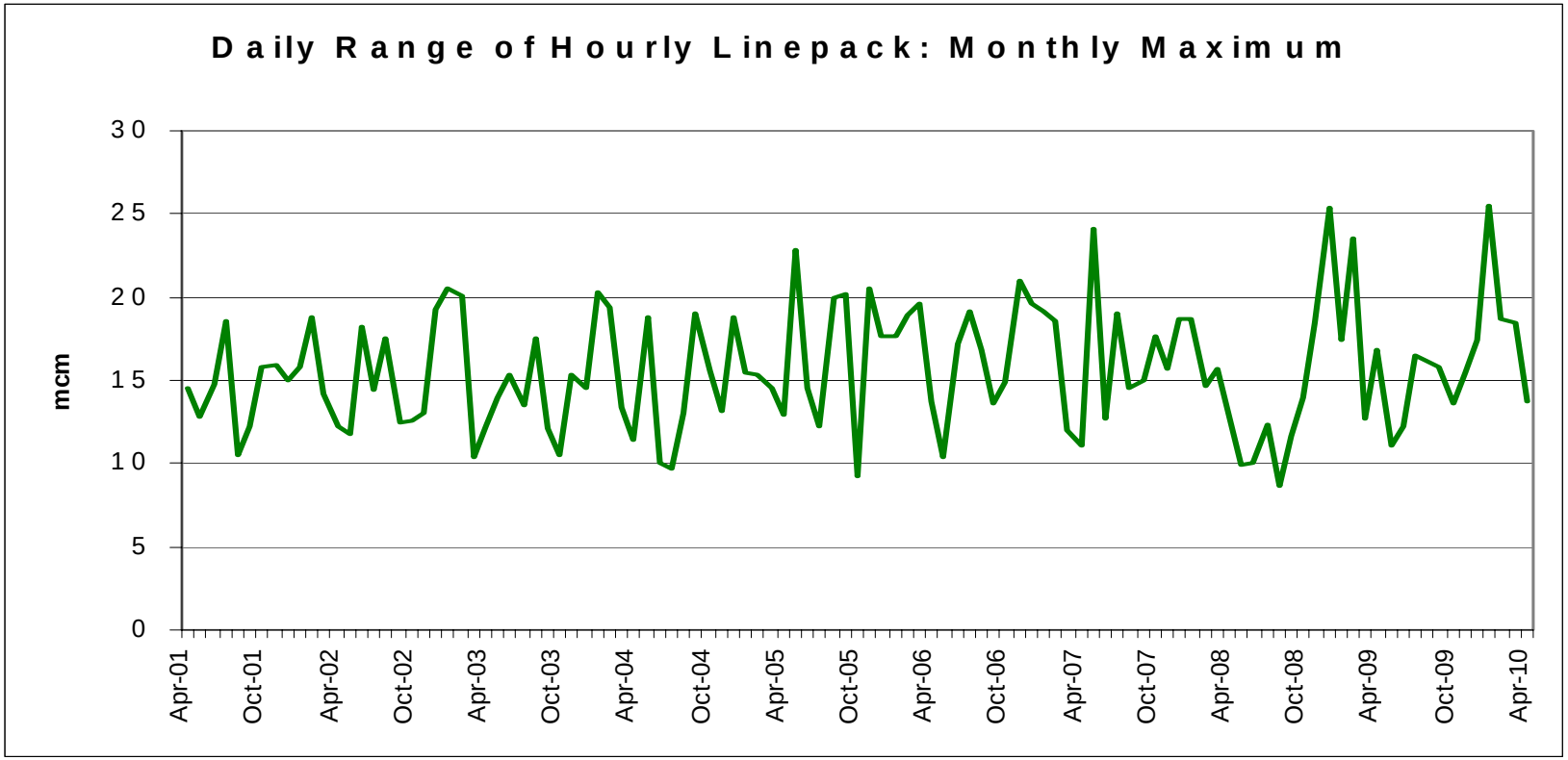
Leading Linepack Indicator 1:
Maximum daily range of within day linepack changes



This graph plots the maximum range on any day in each month between the highest and lowest hourly NTS linepack. Eg. if the highest hourly linepack recorded was 330 mcm and the lowest was 315 mcm on the same day and that constituted the largest daily range in that particular month, 15 mcm would be plotted on the graph for that month.

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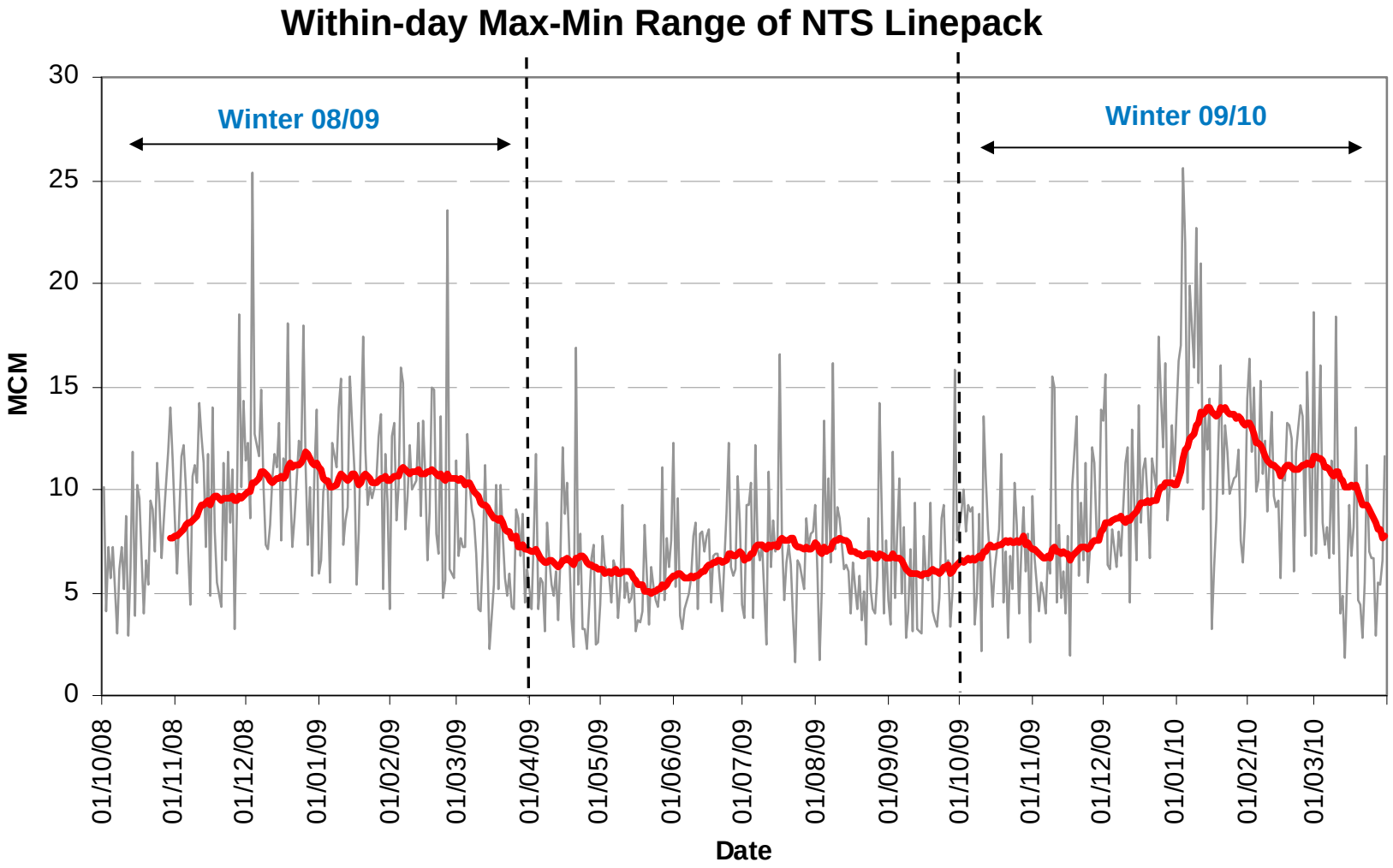
Leading Linepack Indicator 1:
Maximum daily range of within day linepack changes



Rolling Monthly Average

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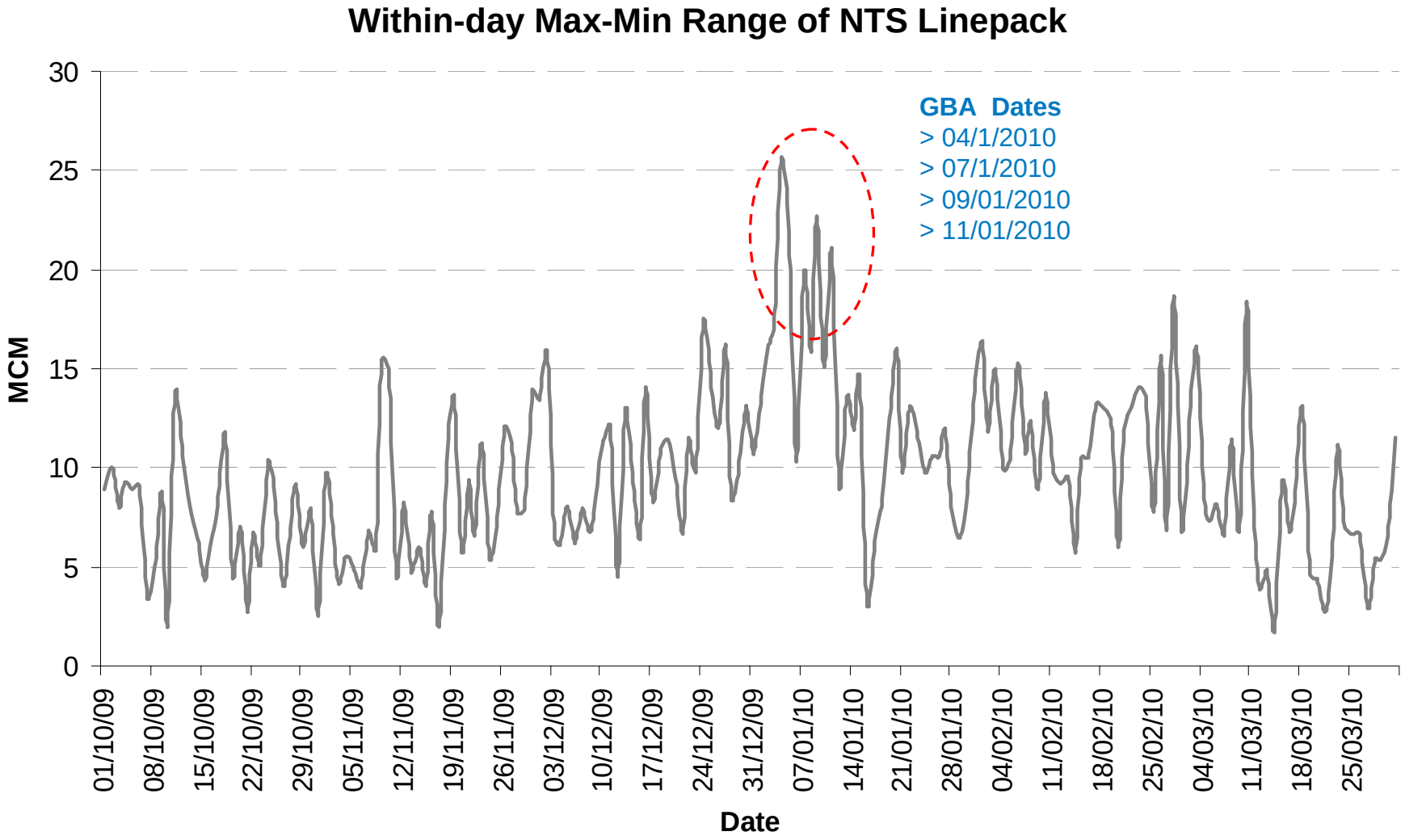
Leading Linepack Indicator 1:
Maximum daily range of within day linepack changes



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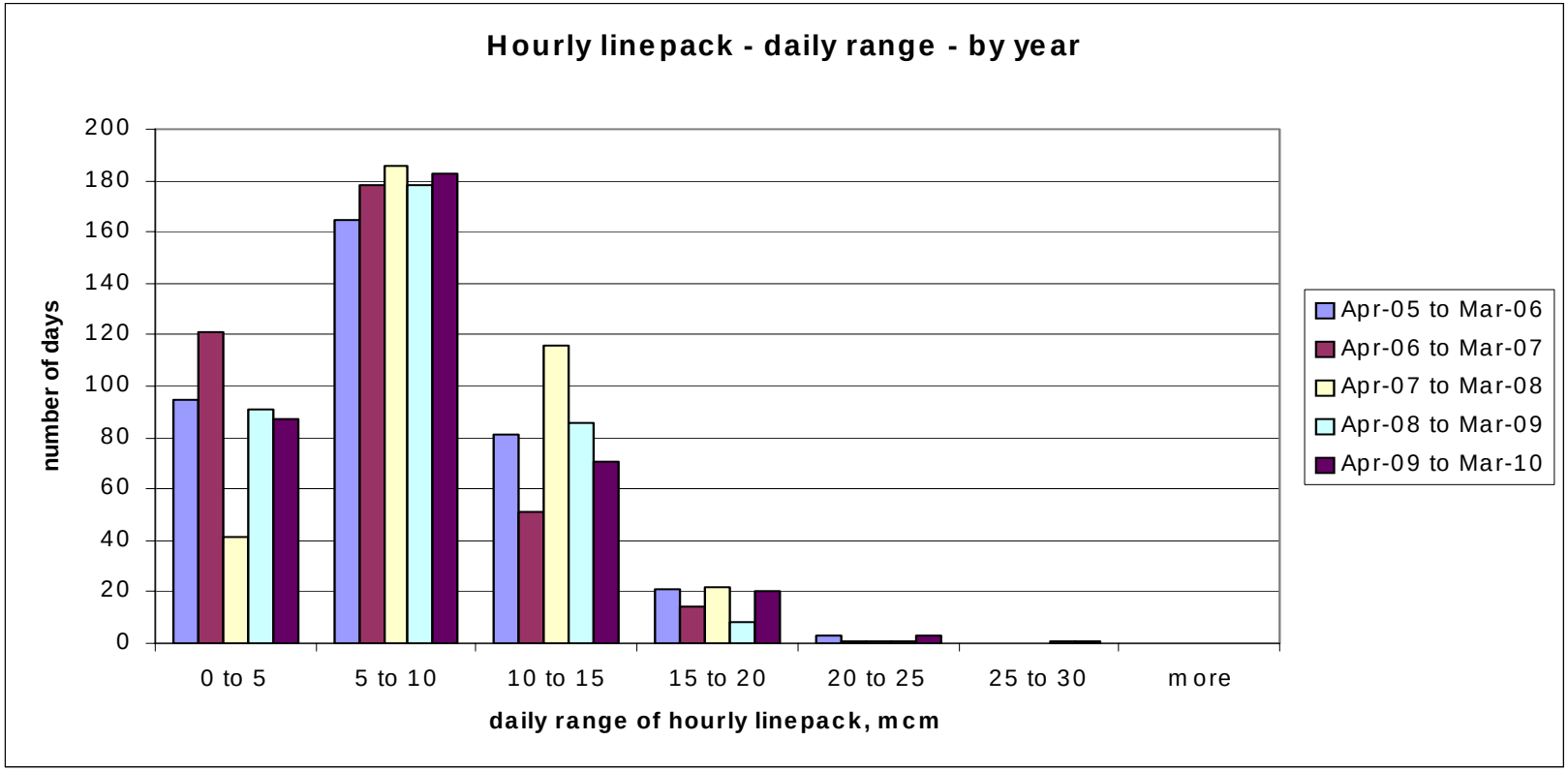
Leading Linepack Indicator 2: Frequency of within day changes



This graph shows, for the last 5 years, the distribution of the maximum daily range of hourly linepack. Eg. for Apr-05 to Mar-06, the maximum daily range was less than 5 mcm on just below 100 days, was between 5 and 10 mcm on approximately 160 days etc.

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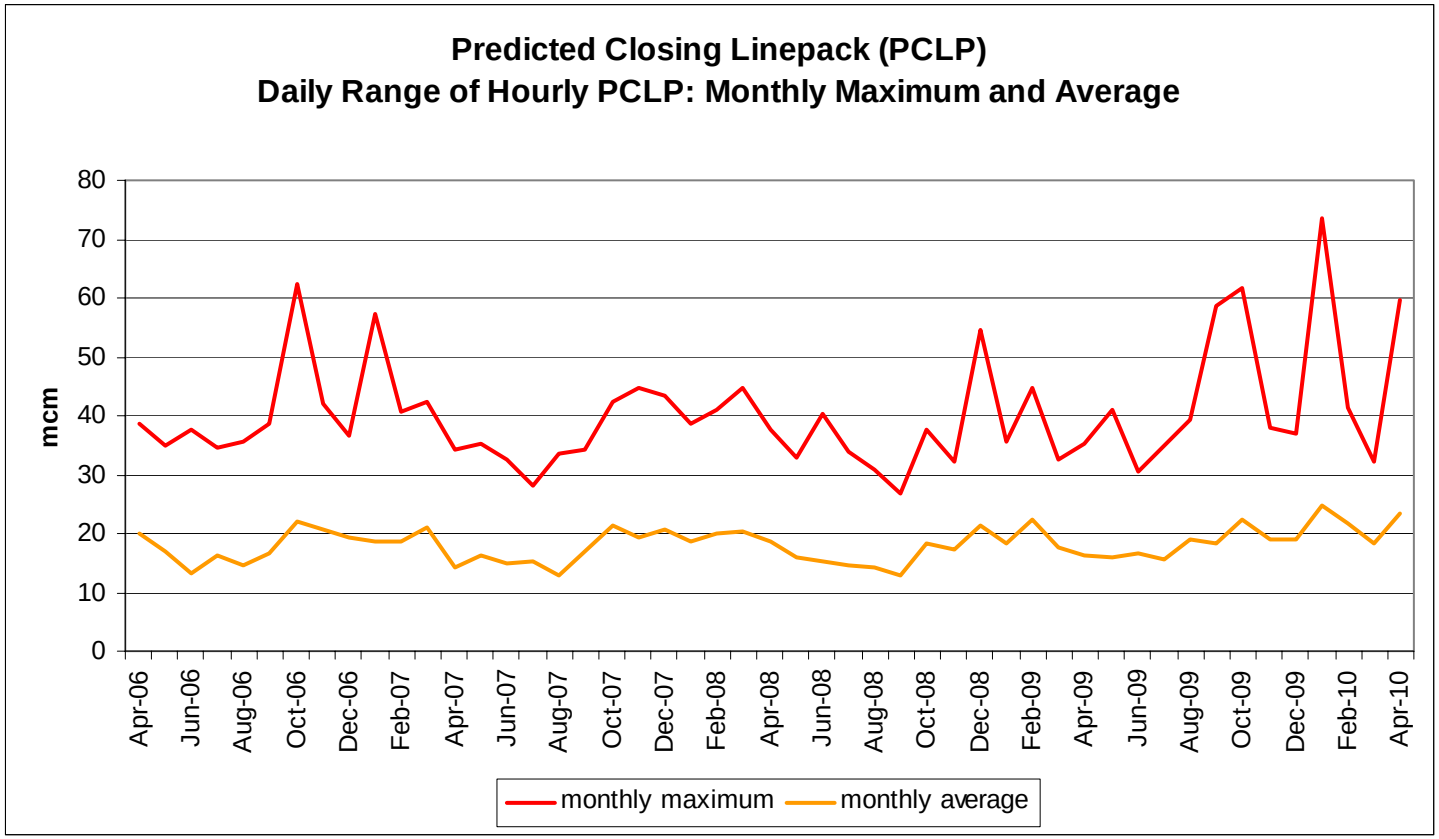
Leading Linepack Indicator 2: Within-day PCLP swings



PCLP = Opening linepack

+ System Inputs (Daily Flow Nominations and Storage Flow Nominations)

– System Demand (Offtake Profile Notifications)

This graph shows ranges of hourly PCLP values during the gas day.

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‘Leading’ Demand Indicators

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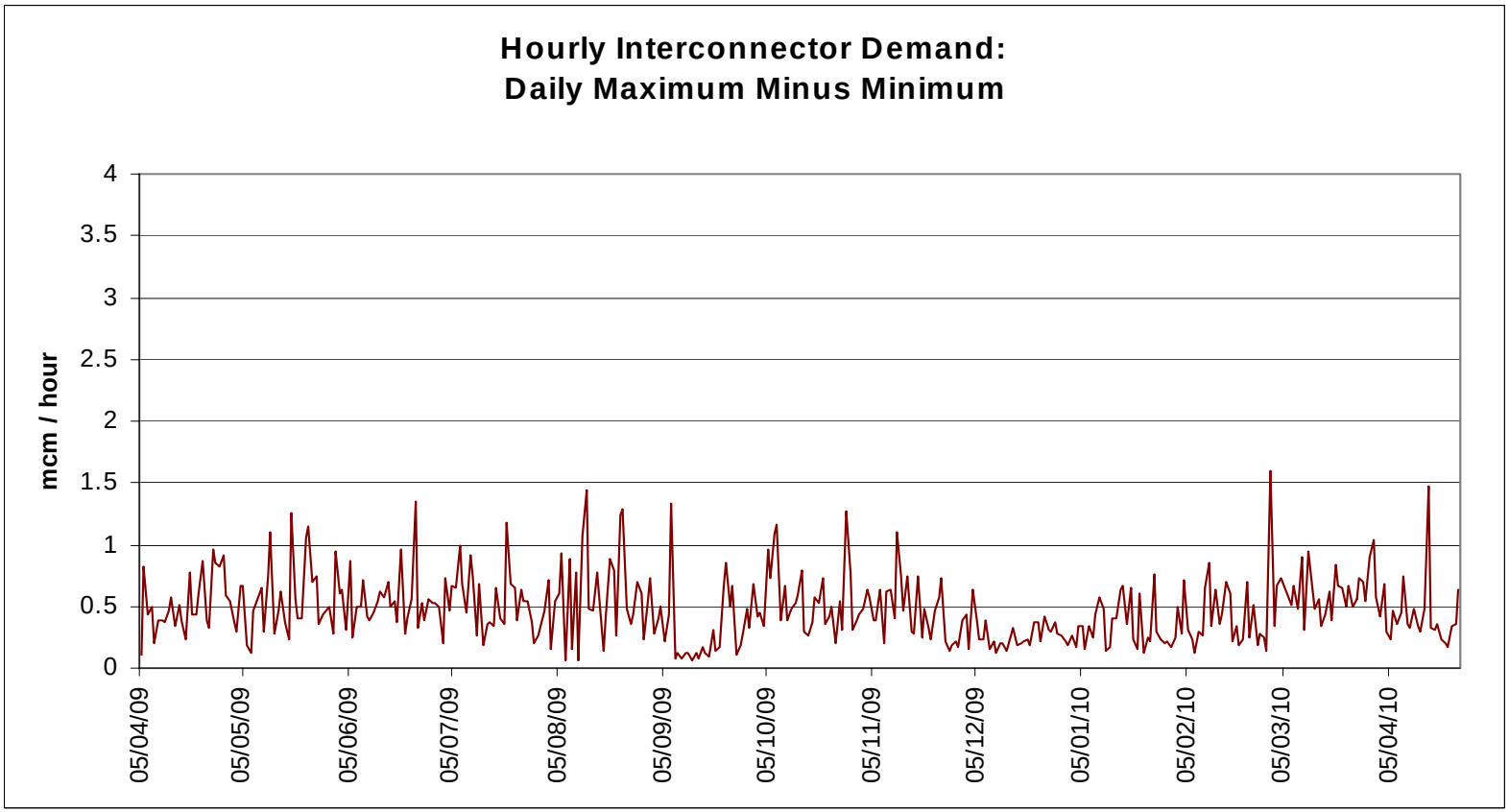
Leading Demand Indicator 1:
Within day demand variation by sector



This graph (and the next 3) shows the difference between the maximum hourly volume offtaken and the minimum hourly volume offtaken for each demand sector. This graph displays the results for the Bacton and Moffat interconnectors.

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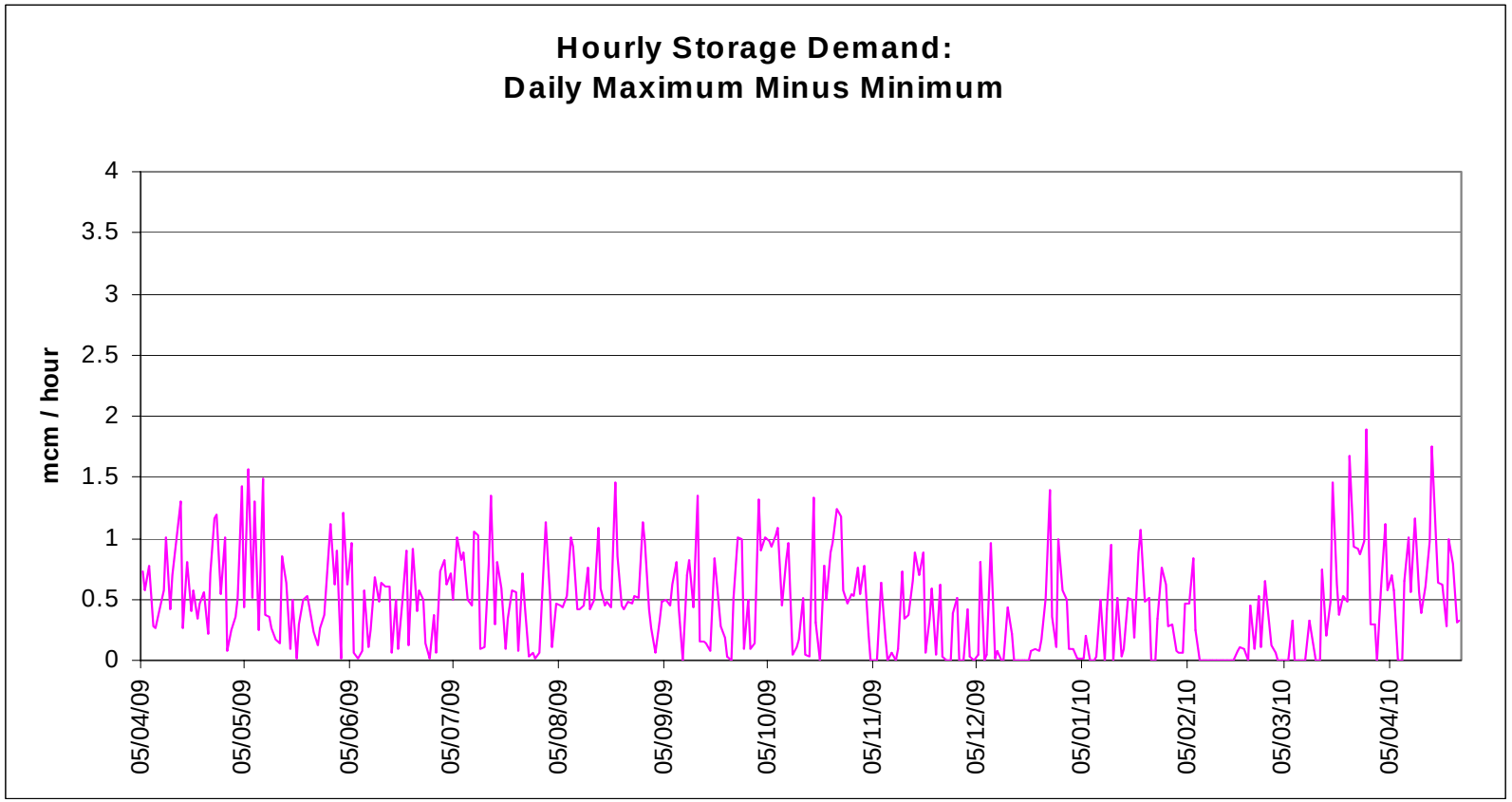
Leading Demand Indicator 1:
Within day demand variation by sector



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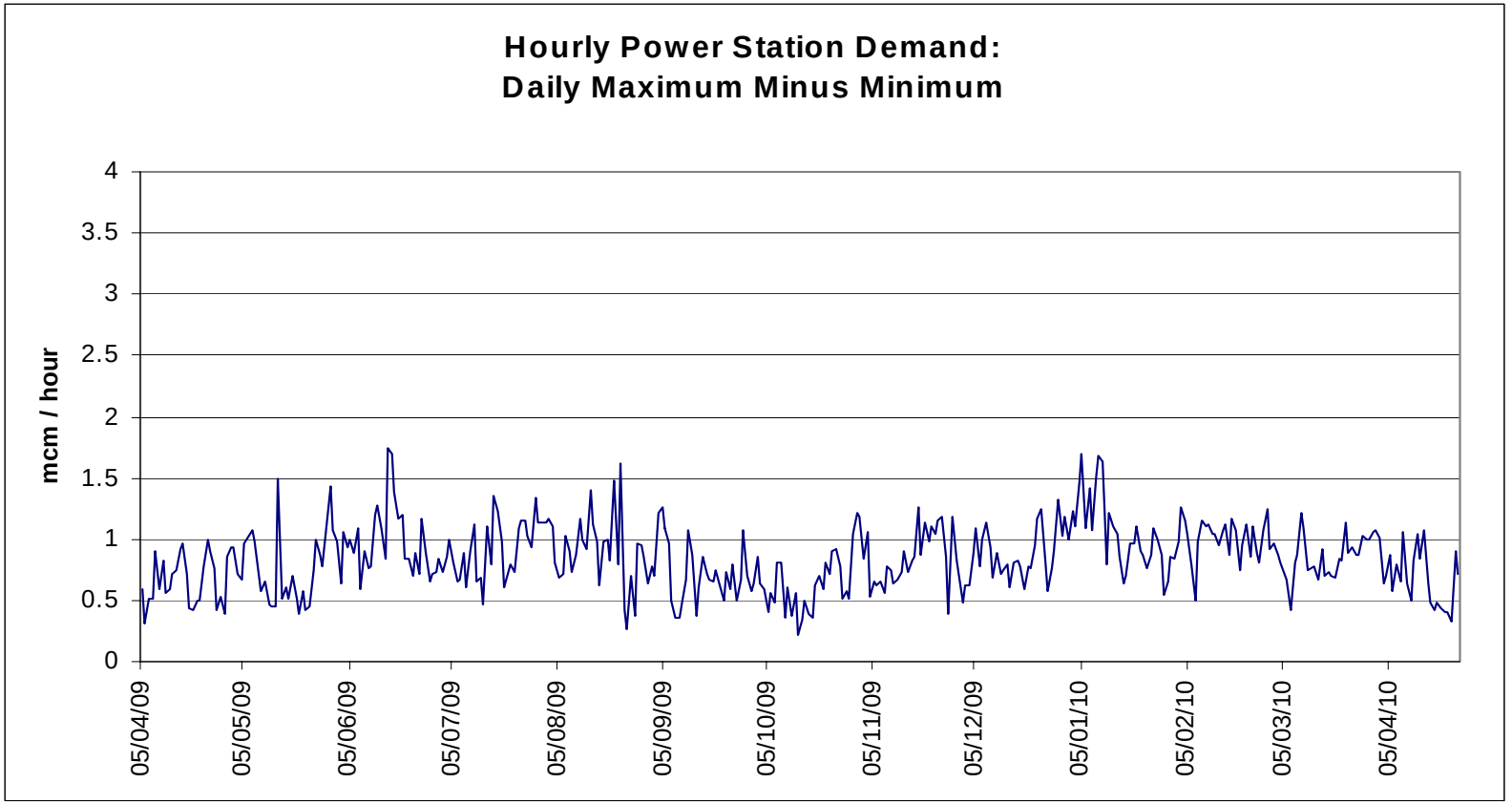

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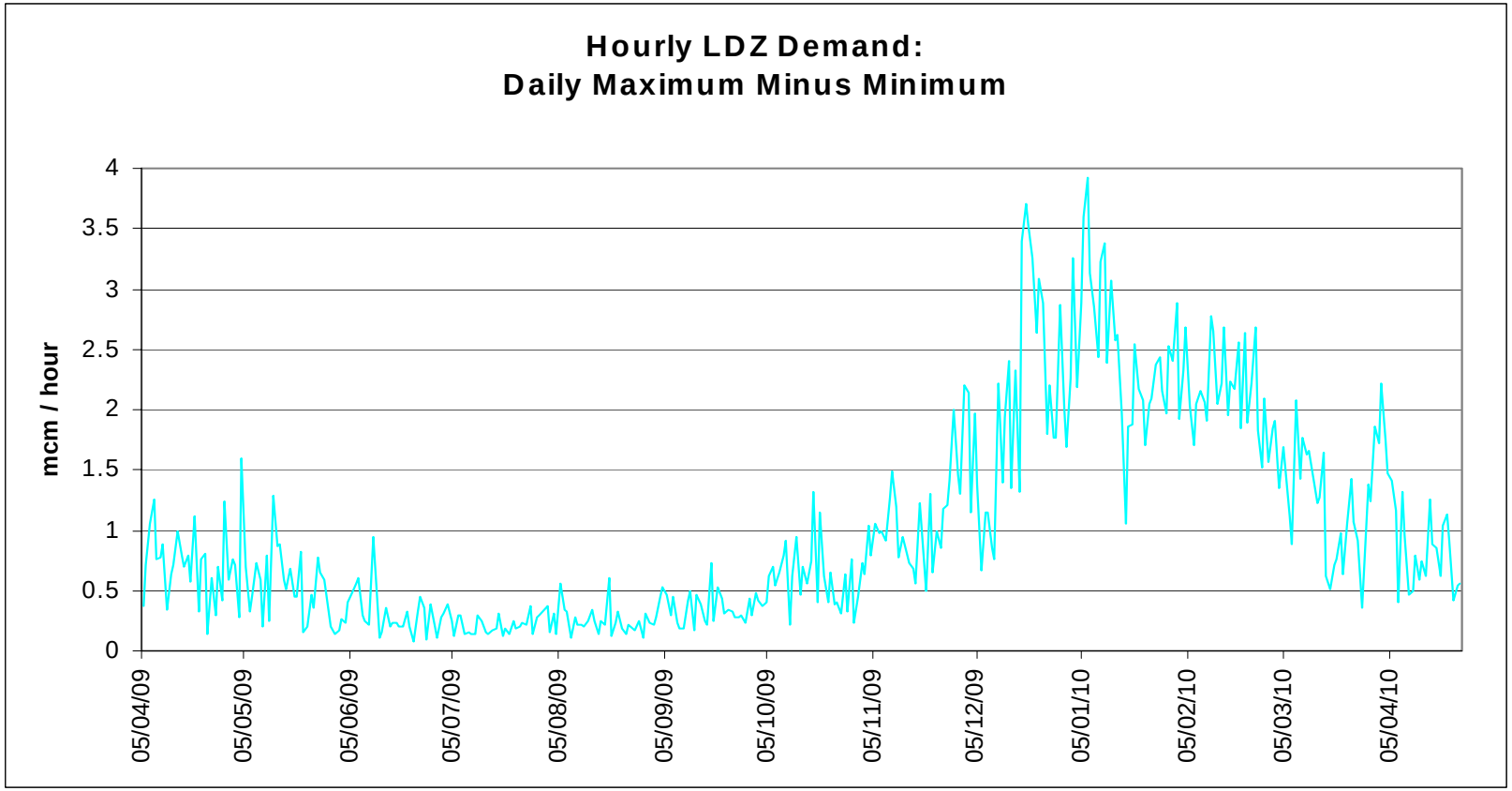

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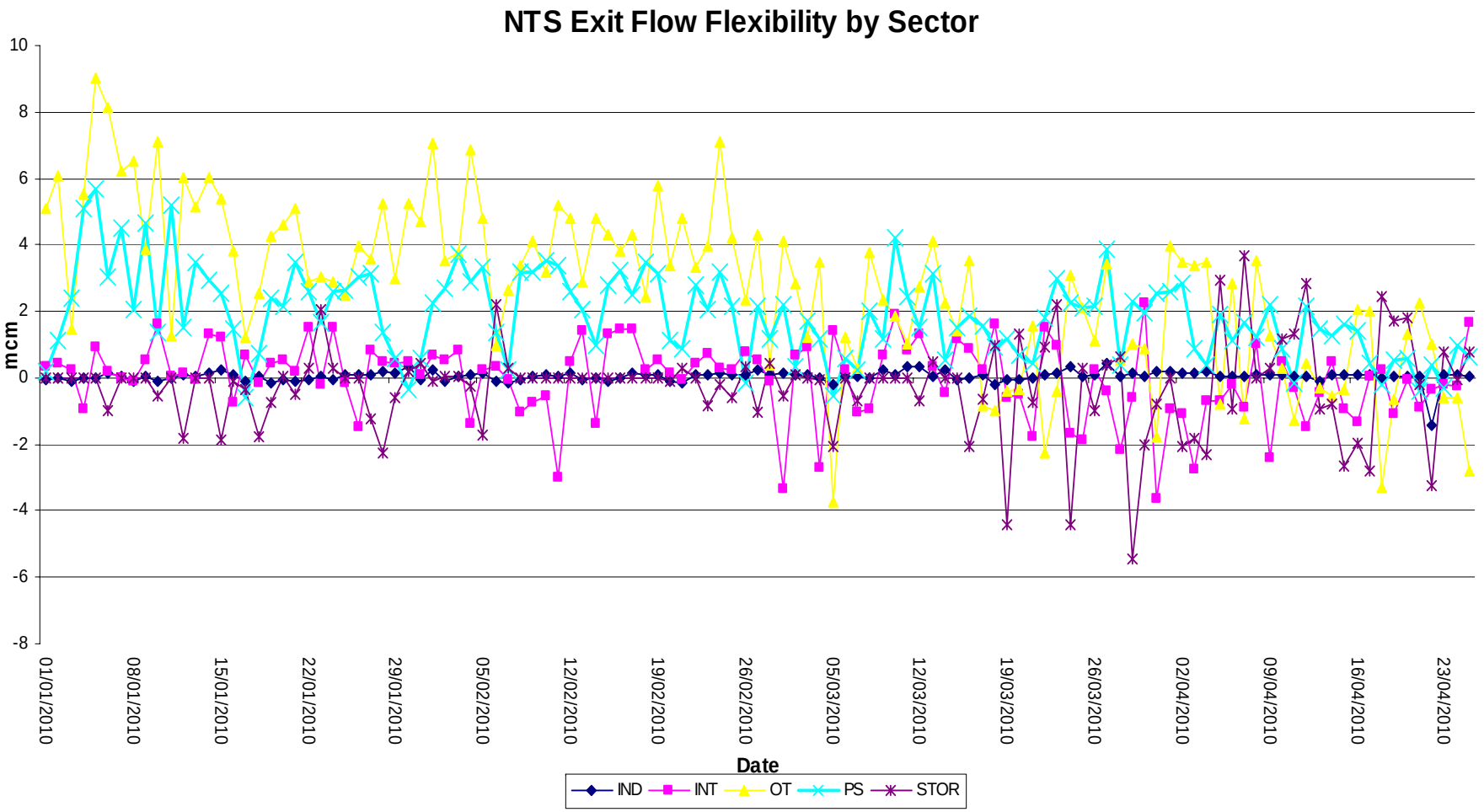
‘Leading’ Demand Indicator 2: Flow flexibility usage by sector



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‘Lagging’ Indicators

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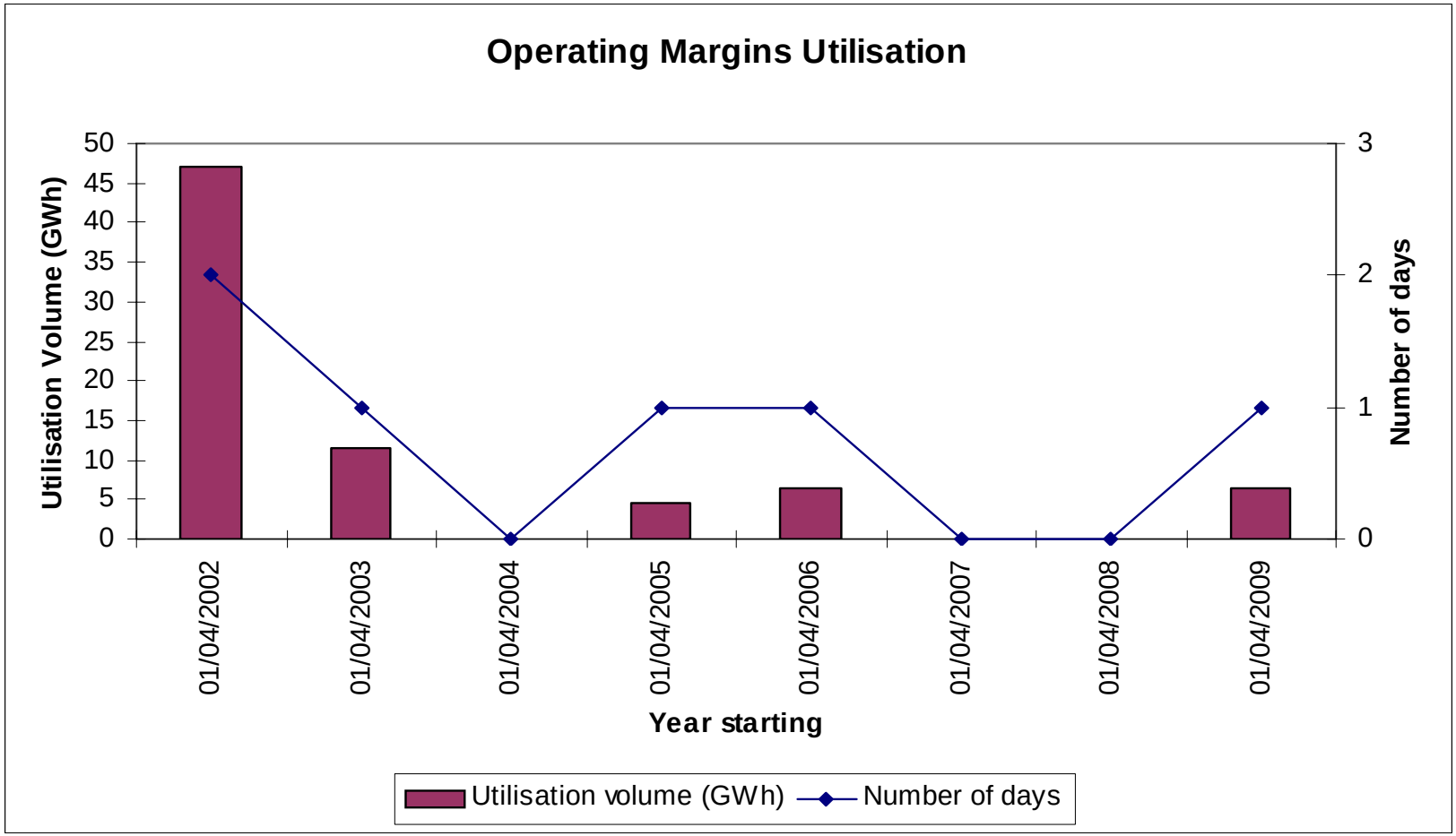
Lagging Supply Indicator 1:
Use of Operating Margins Gas



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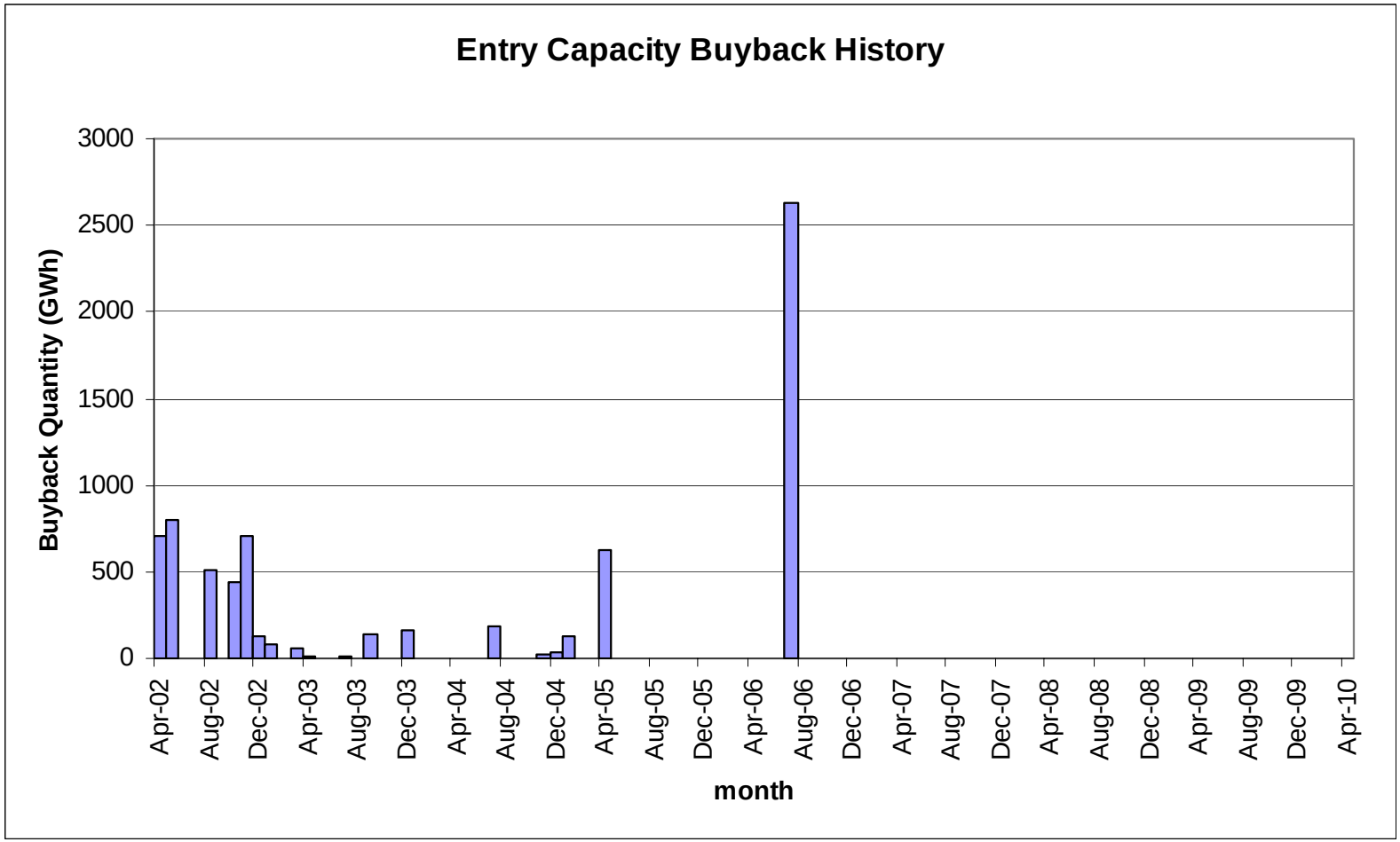
Lagging Supply Indicator 2:
Entry Capacity Buybacks



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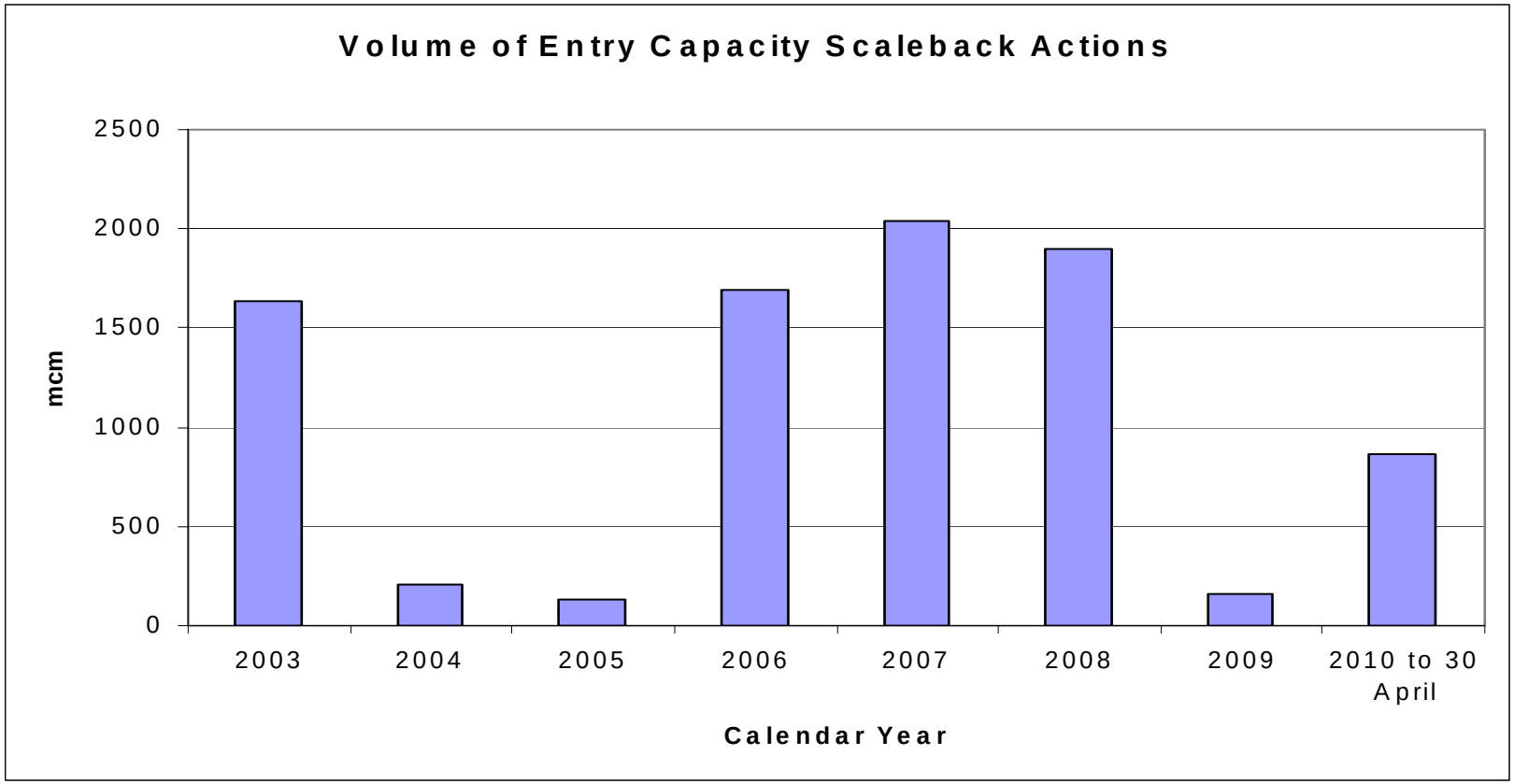
Lagging Supply Indicator 3:
Interruptible Entry Capacity Scaleback



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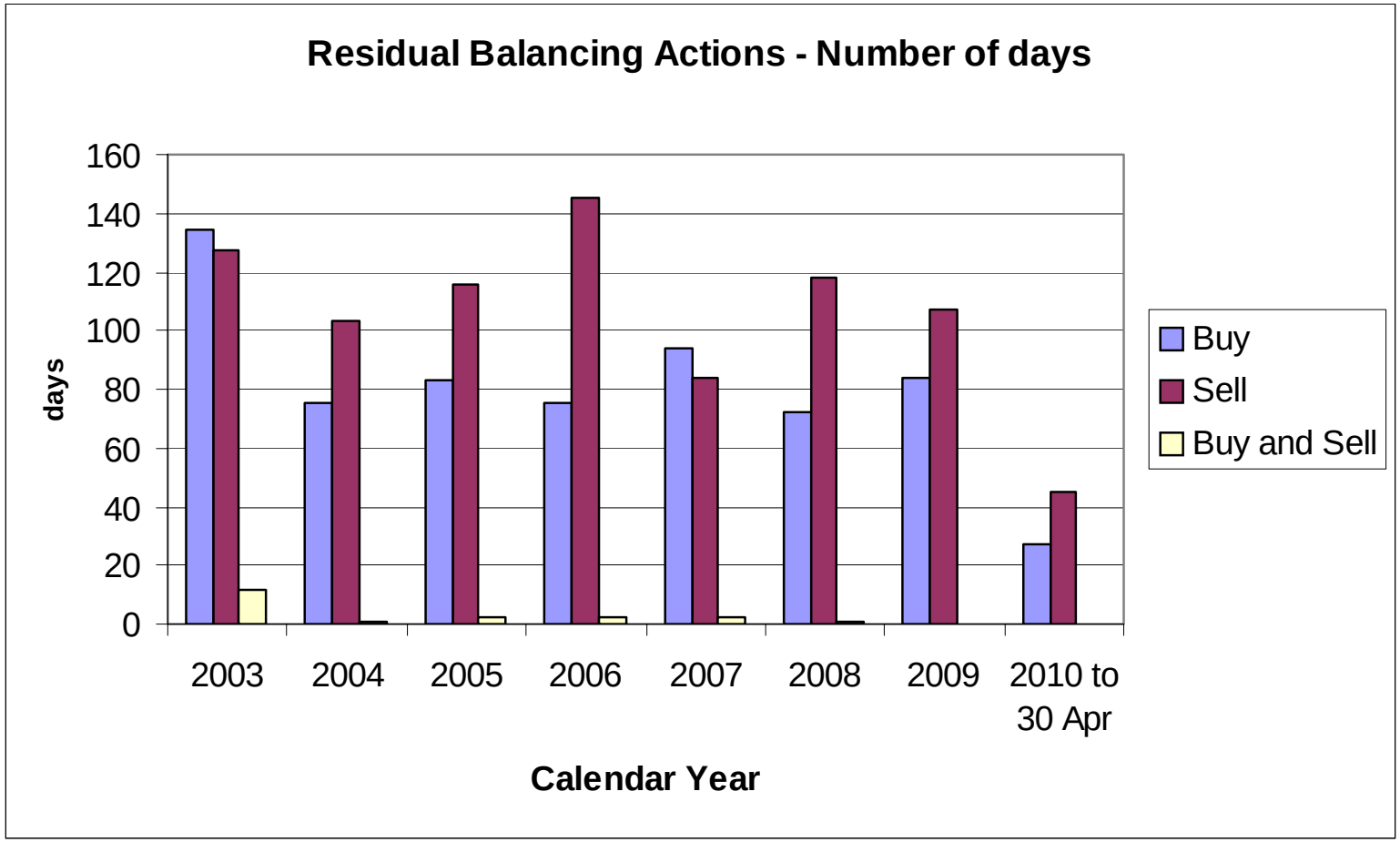
Lagging Supply & Demand Indicator 1: Number of days of residual balancing actions



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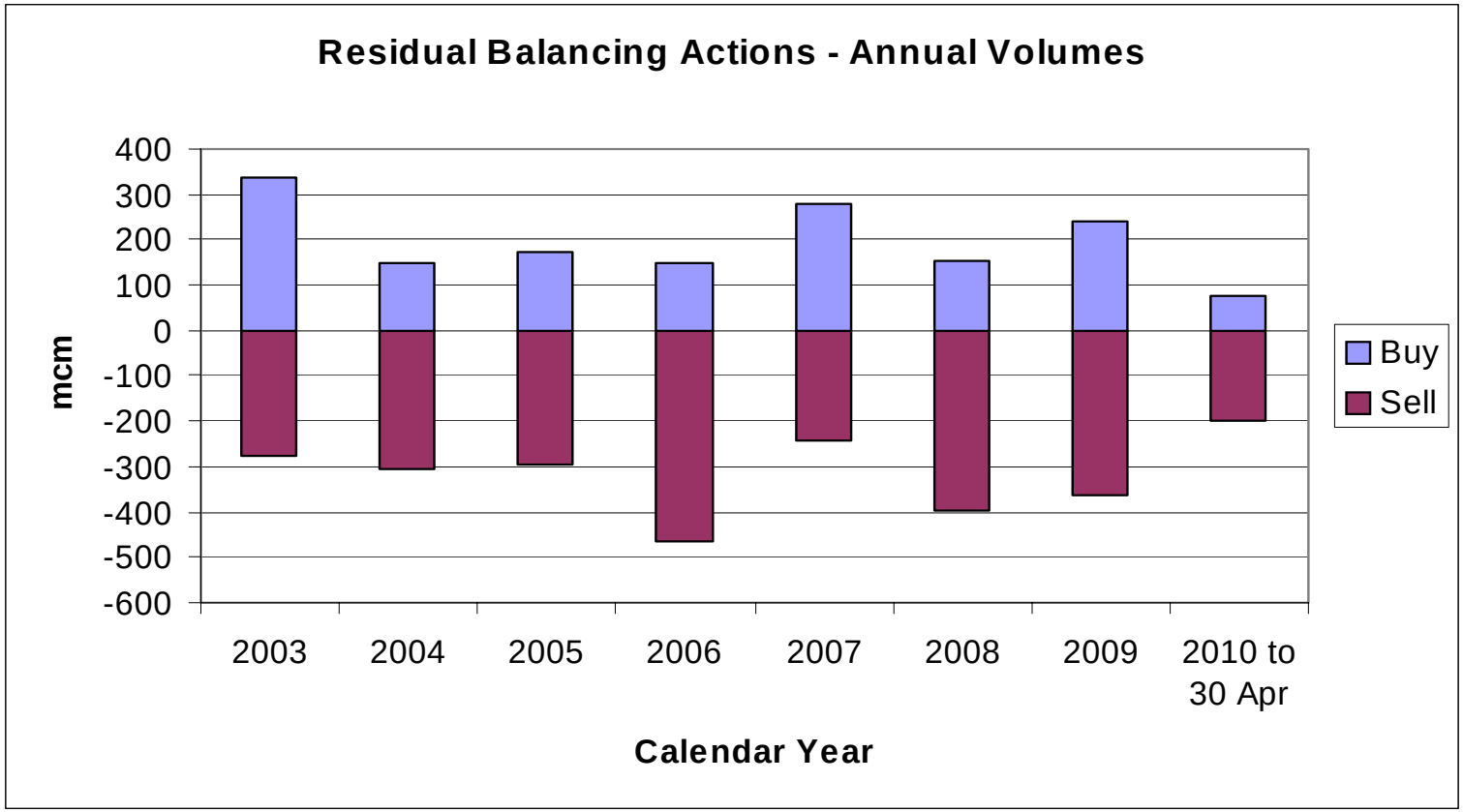
Lagging Supply and Demand Indicator 2: Residual Balancing Annual Volumes



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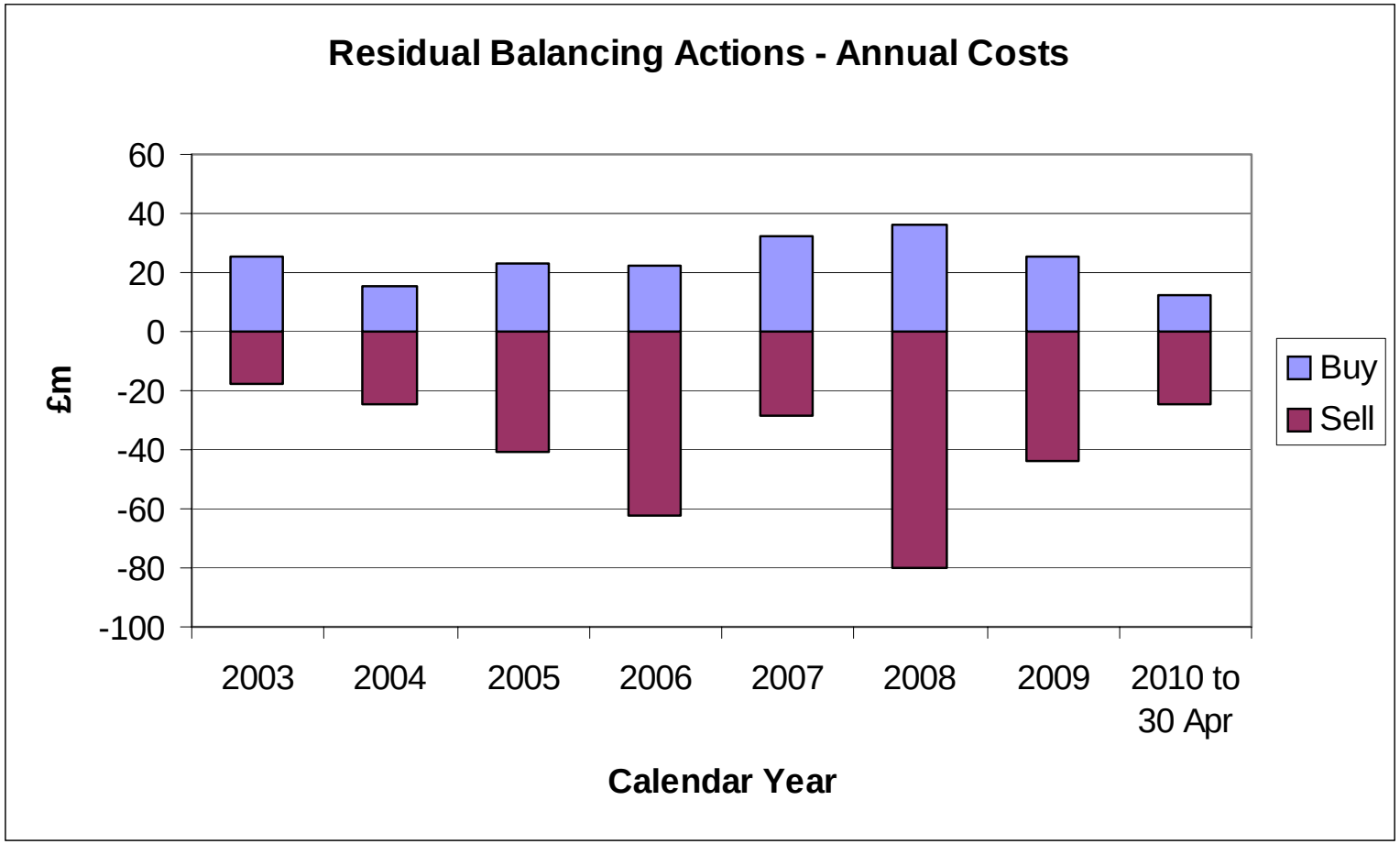
Lagging Supply and Demand Indicator 3: Residual Balancing Annual Costs



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Summary

- Clear trends of increasing volatility are hard to detect at this stage
- The majority of indicators at this stage show either:
  - flat profiles;
  - seasonal profiles; or
  - some volatility but with no underlying trend
- For some indicators, we don’t yet have enough data to make a judgement
- We will continue to add to the datasets and report to the industry
- Additional indicators are in development

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