

Demand Side Participation in Balancing Services

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Why do National Grid need balancing services?

- ◆ Balance supply and demand over a range of timescales
- ◆ Ensure sufficient generation margin
- ◆ Maintain quality and security of supply
- ◆ Manage localised issues

- ◆ Operate in an economic and efficient manner

Who can provide Balancing Services?

- ◆ Large Generators
- ◆ Demand Side
 - ◆ Embedded generation
 - ◆ Back up generation
 - ◆ Demand reduction by large loads
 - ◆ Demand reduction through aggregation of smaller units
 - ◆ Within a companies portfolio (e.g. water companies)
 - ◆ Through Commercial aggregators

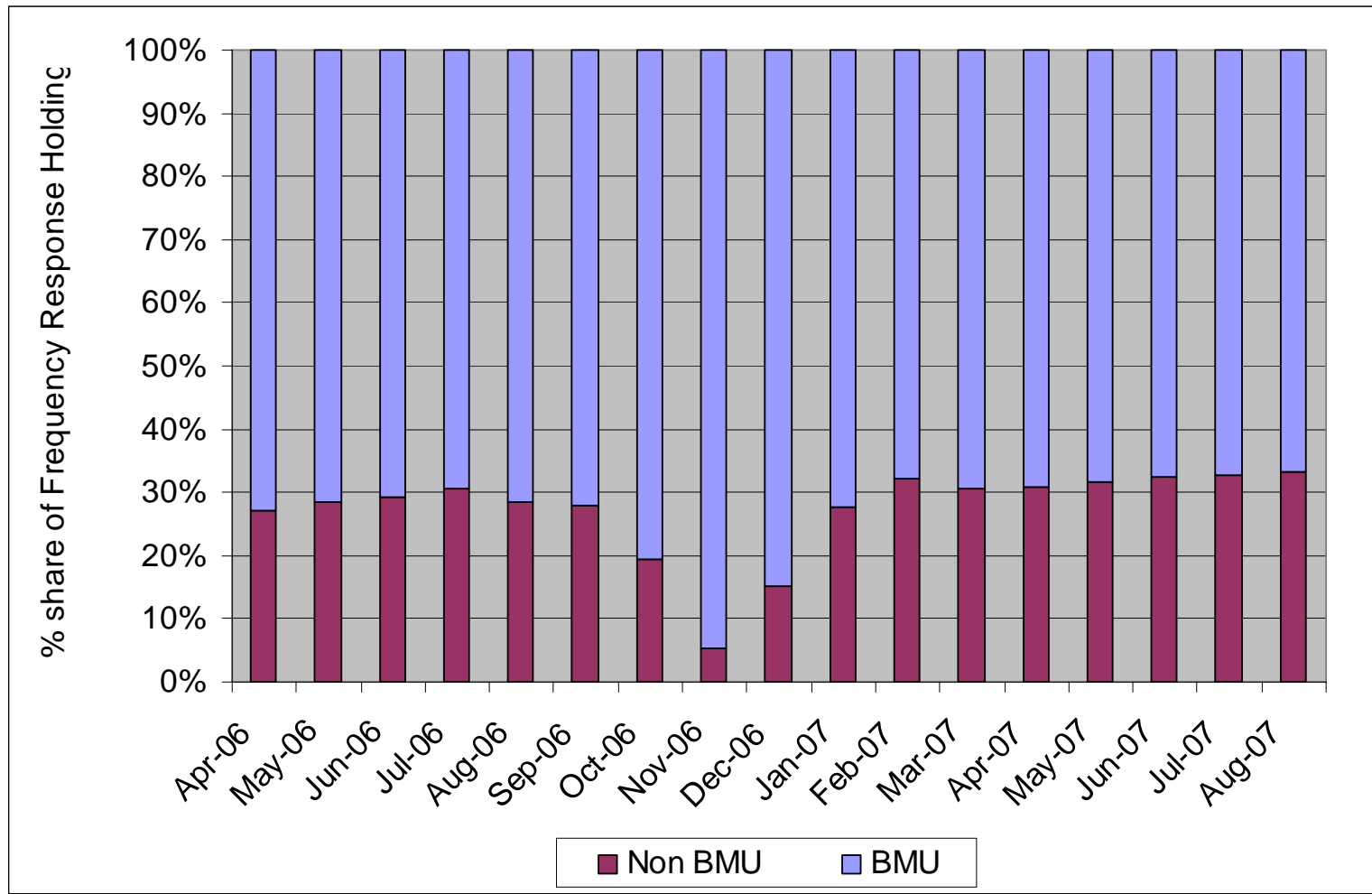
Which Services can the Demand Side Provide?

- ◆ Real time frequency services
 - ◆ Frequency Control By Demand Management (FCDM)
 - ◆ Firm Frequency Response (FFR)
- ◆ Longer notice Reserve Services
 - ◆ Fast Reserve
 - ◆ Short Term Operating Reserve (STOR)

Real Time Frequency Services

- ◆ Used when small mismatch between generation and demand to keep frequency at nominal 50 Hz
- ◆ Demand Side currently static response as opposed to the dynamic response from generators
- ◆ Static demand side participation via relays, which automatically trip in response to low frequency events
 - ◆ Statistically interruptions expected 10-30 times/annum

Frequency Response Holding



Response services – reporting

- ◆ Reporting on mandatory frequency response
 - ◆ Capabilities for each BM unit
 - ◆ Daily volumes delivered by each BM unit
 - ◆ Monthly holding prices for each BM unit
 - ◆ <http://www.nationalgrid.com/uk/Electricity/Balancing/services/frequencyresponse/mandatoryfreqresp/>
- ◆ Firm frequency response (FFR)
 - ◆ Monthly market information report
 - ◆ Monthly pre and post assessment tender reports
 - ◆ Prices and volume by unit
 - ◆ <http://www.nationalgrid.com/uk/Electricity/Balancing/services/frequencyresponse/ffr/>

Response services – reporting

- ◆ Commercial Agreements (non tendered)
 - ◆ Information included in Monthly Balancing Services Summary (MBSS)
 - ◆ Monthly total response holding, average prices and costs
 - ◆ <http://www.nationalgrid.com/uk/Electricity/Balancing/services/>

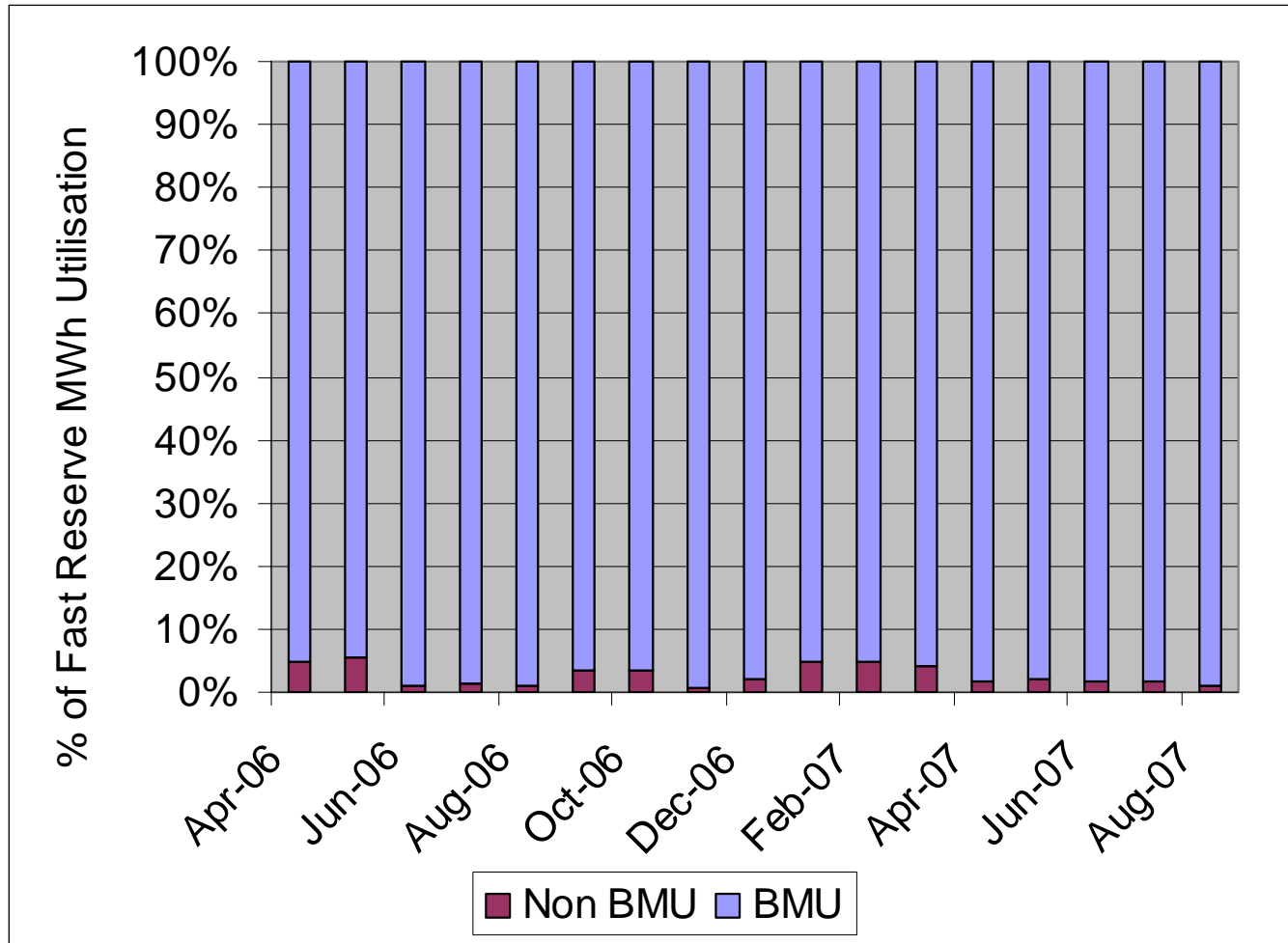
Longer notice reserve services

- ◆ Used to manage national supply/ demand balance
 - ◆ Unforeseen demand increase and/or
 - ◆ Generation unavailability
- ◆ BM and non BM providers
- ◆ Typical demand side providers - water companies, industrial units and sites with back up generators
 - ◆ Historically 50-80 STOR utilisations per year
 - ◆ dependant on tendered prices and system requirements

Fast Reserve – service description

- ◆ Used to deliver substantial volumes of energy (50MW+) at short notice (within 2 minutes) and with a fast delivery rate.
- ◆ Generation increase or Demand reduction
- ◆ Firm and optional services

Fast Reserve Utilisation



Fast Reserve

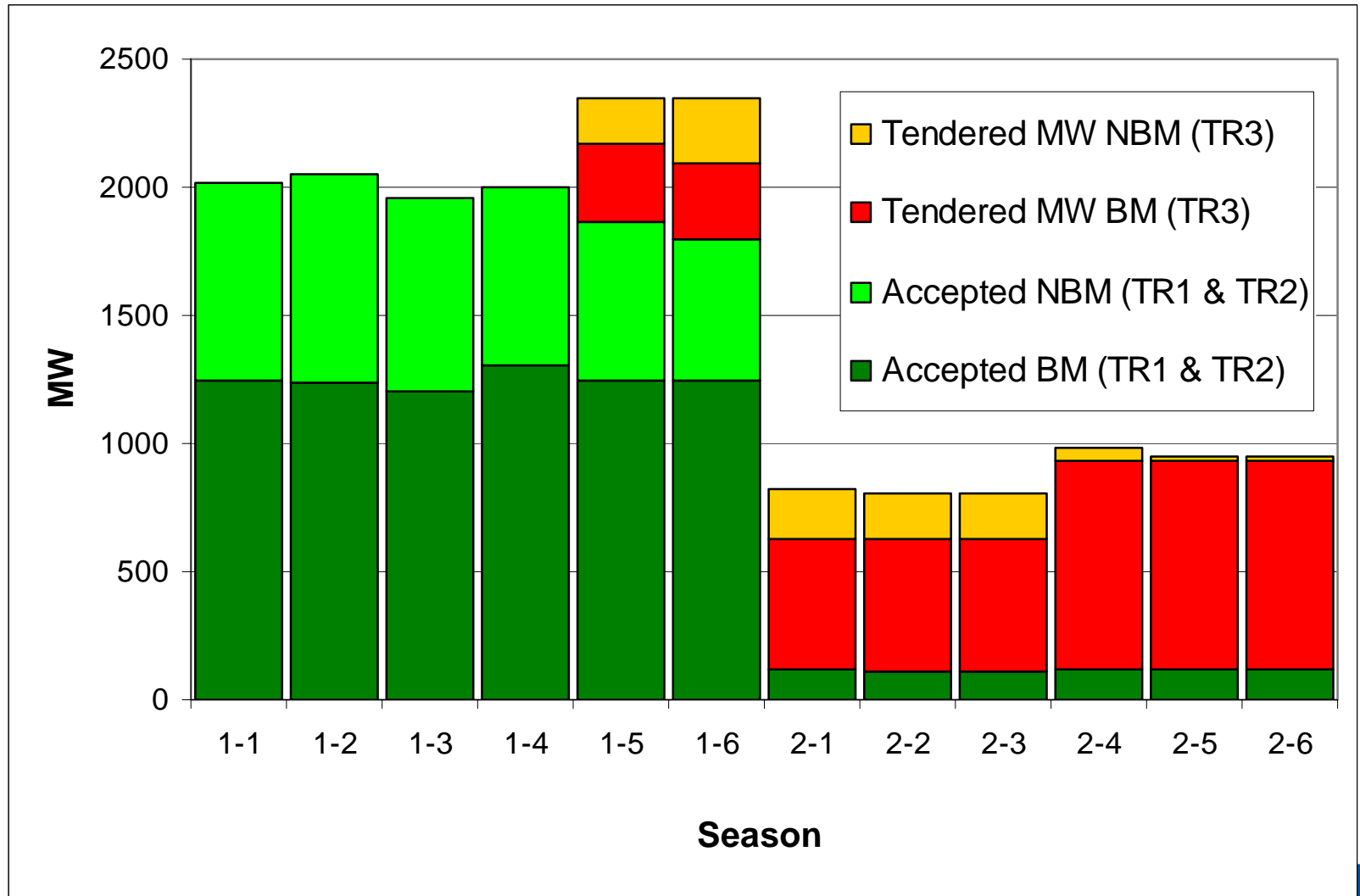
- ◆ Market Information and Market Report
 - ◆ Requirements, utilisation, prices, tender information
 - ◆ <http://www.nationalgrid.com/uk/Electricity/Balancing/services/reserveservices/fastreserve/>

- ◆ Information included in Monthly Balancing Services Summary (MBSS)
 - ◆ Monthly volume holding and costs
 - ◆ Tender information by month
 - ◆ <http://www.nationalgrid.com/uk/Electricity/Balancing/services/>

Reserve Services (STOR)

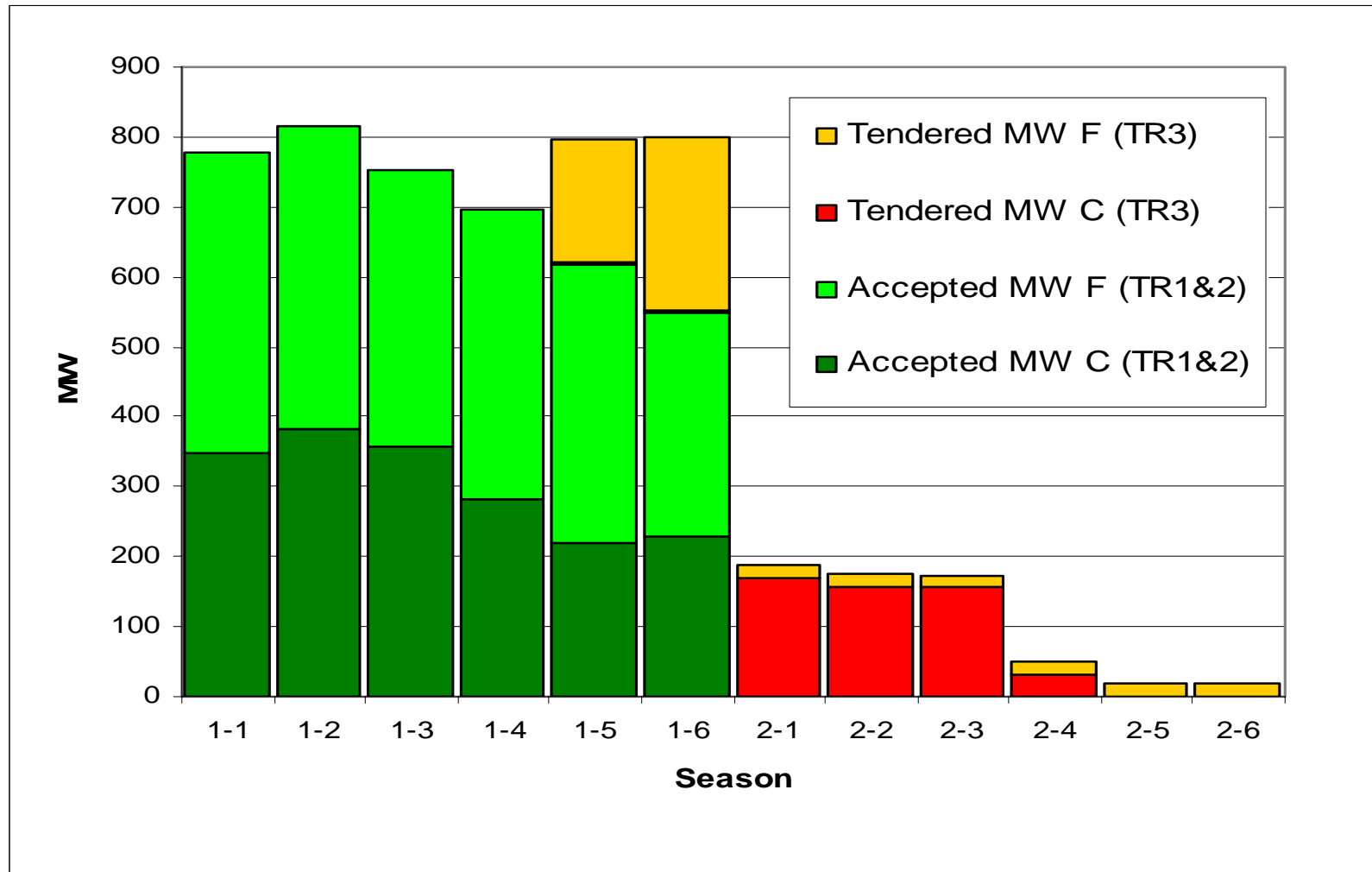
- ◆ Provision of reserve in availability windows
 - ◆ Generation increase or demand reduction
 - ◆ Delivery from instruction in 2 - 240 minutes
 - ◆ Availability and Utilisation payments
- ◆ BM committed service only
- ◆ Non BM committed and flexible service
 - ◆ Weekly declarations of flexible availability by provider
 - ◆ National Grid can reject or accept flexible service

STOR Capacity (BM and Non-BM)

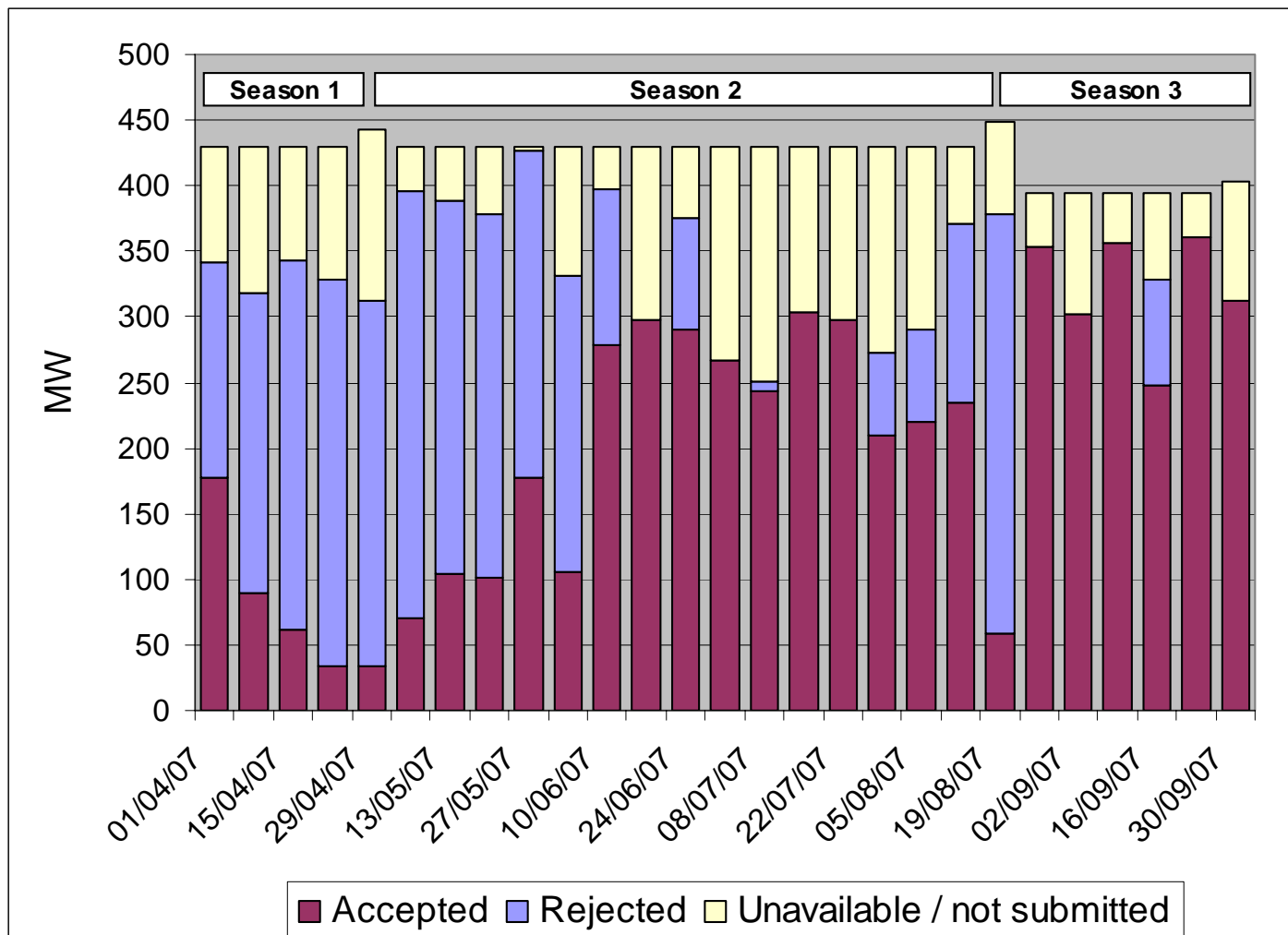


NBM STOR Capacity

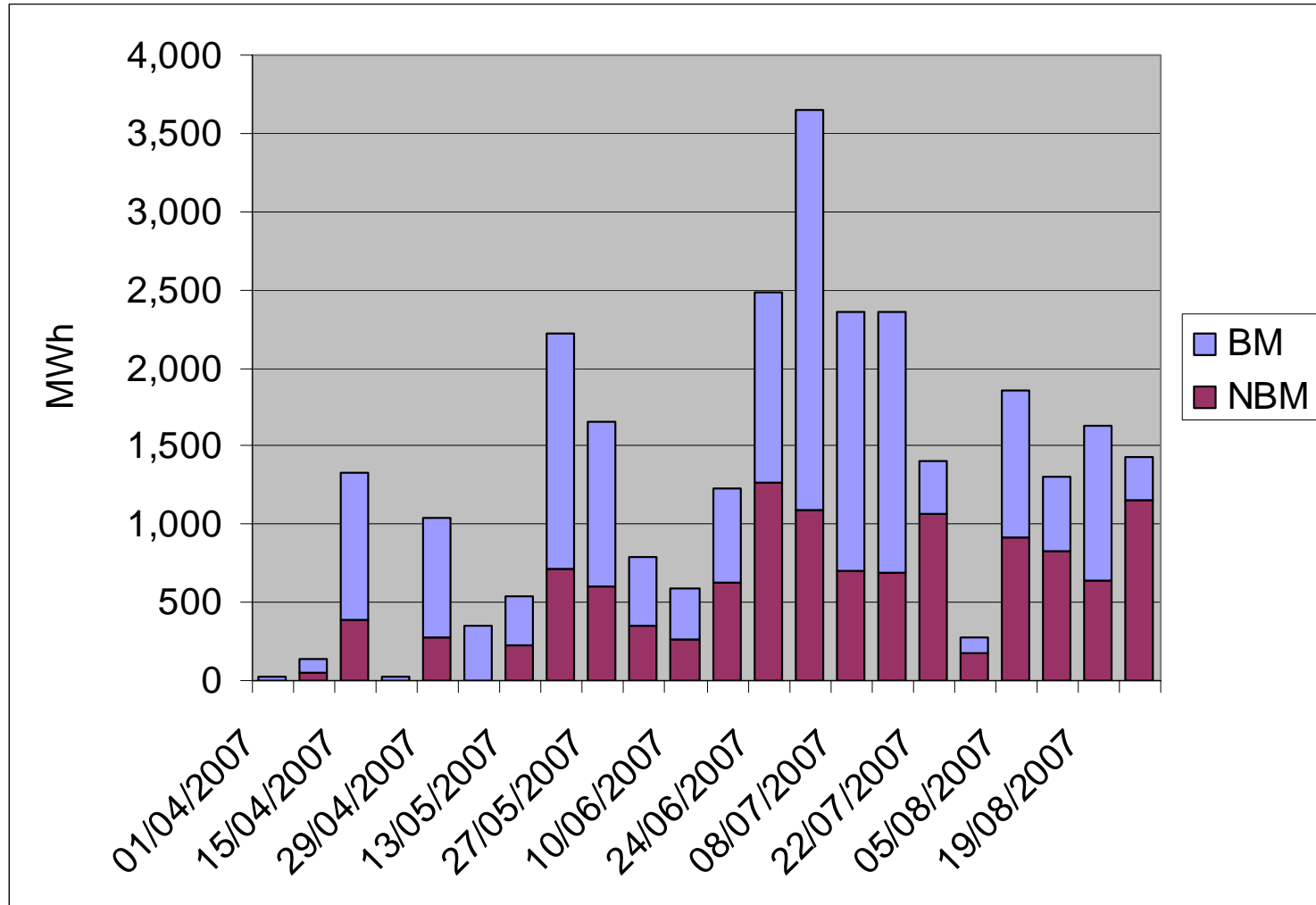
Flexible (F) /Committed (C)



Flexible STOR Reject / Accept



STOR usage graph




STOR reporting

- ◆ STOR market report after each tender round, including volume and price information
 - ◆ <http://www.nationalgrid.com/uk/Electricity/Balancing/services/reserveservices/STOR/>
- ◆ Monthly Balancing Services Summary (MBSS)
 - ◆ Monthly utilisation (BM / NBM)
 - ◆ Monthly availability and utilisation costs (BM / NBM)
 - ◆ Being improved to introduce flexible accept/reject information
 - ◆ <http://www.nationalgrid.com/uk/Electricity/Balancing/services/>

Future Developments

- ◆ Several Demand Side parties have approached National Grid with a view to participation with a wide range of technologies
- ◆ Aggregation will play a role for consumers for whom energy is a large cost but not core business
 - ◆ e.g. industrial refrigeration, heating and cooling
- ◆ National Grid is actively pursuing additional participation by the Demand Side where economic



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National Grid Energy Operations

Tel: 01926 654611 Email: energy.operations@uk.ngrid.com

More info at www.nationalgrid.com/demandside

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Where can I find out more?

- ◆ www.nationalgrid.com/demandside
 - ◆ Summary service descriptions
 - ◆ links to main Balancing Services page for detailed descriptions
 - ◆ National Grid Contact details
 - ◆ Contact details for commercial aggregators
 - ◆ Archive of Supporting Activities
 - ◆ Presentations, reports etc.
- ◆ Contact National Grid Energy Operations
 - ◆ Tel: 01926 654611
 - ◆ energy.operations@uk.ngrid.com

Conclusions

- ◆ Demand Side already play a significant role in providing a range of Balancing Services
- ◆ National Grid is actively pursuing additional participation by the Demand Side where economic
- ◆ If you are interested in any of the services or could offer an alternative service, come and talk to us