National Grid's Demand Side Opportunities

John Perkins

25th Jan 2007

nationalgrid

Content

- Balancing Services Background
- National Grid Products for System Operation
  - Commercial Frequency Response
  - Fast Reserve
  - STOR (replacing Standing Reserve)
  - Demand Management
- Reserve Review
- STOR (update)
- Conclusions

nationalgrid

Background to Balancing Services (1)

- Services procured to support System Operator
  - Balancing the power system
  - Provision of system security
- Achieved through purchasing services that
  - Respond to real time frequency fluctuations
    - supply / demand mismatch
  - Create a reserve margin
    - Plant breakdown
    - Actual demand being greater than forecast demand

nationalgrid

Background to Balancing Services (2)

- Further information contained in the following Transmission License Condition C16 Statements
  - Procurement Guidelines
  - Balancing Principles Statement

- http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicensestatements/

nationalgrid

Frequency Control by Demand Management (FCDM)

- Interruption of demand for 30 minutes, triggered automatically by low frequency relays (normally 49.7Hz)
- Minimum of 3MW (may be aggregated)
- Procured Bilaterally
- Statistically interruptions expected 10-30 times/annum
- Delivery within 2 seconds

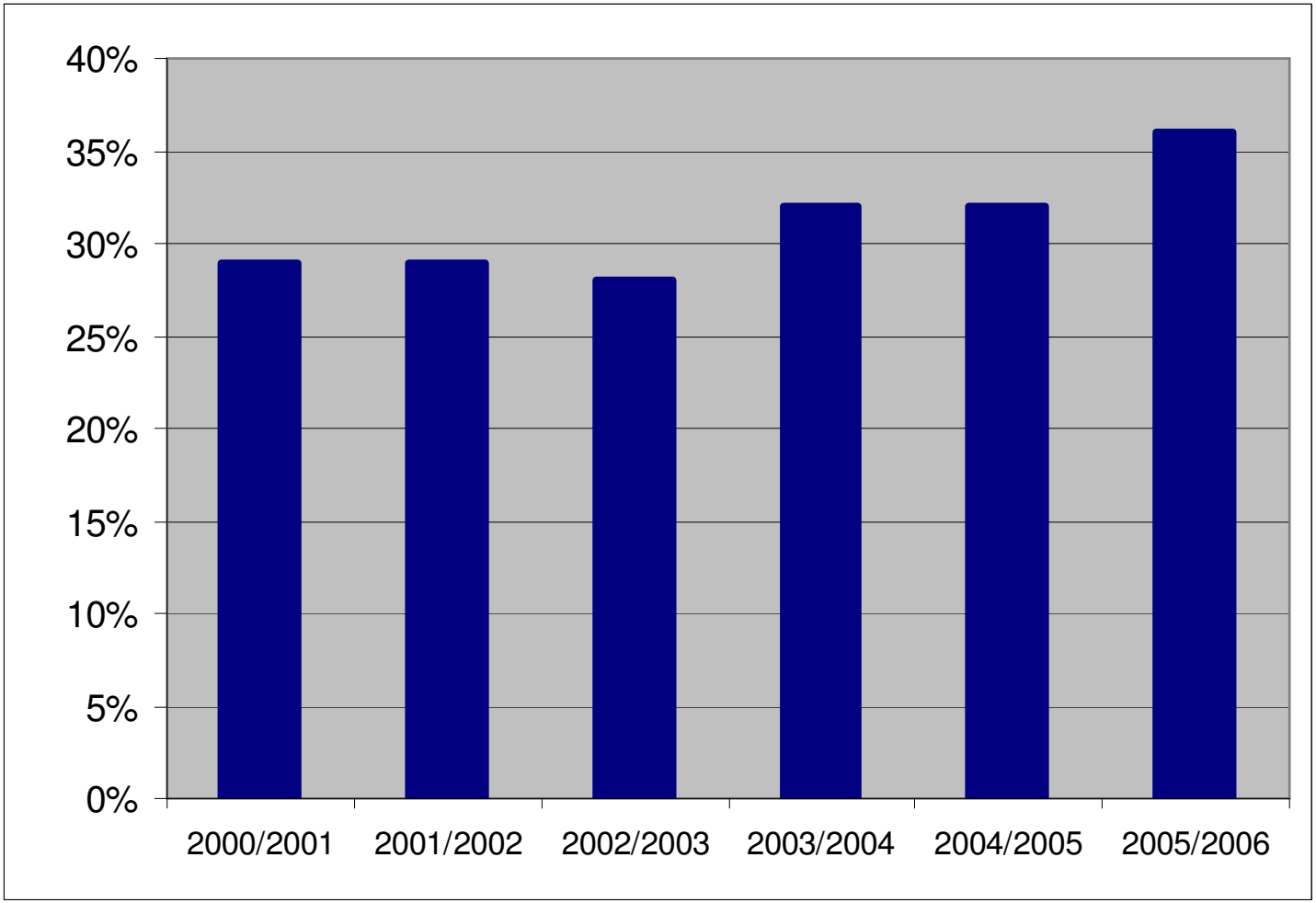
nationalgrid

Firm Frequency Response

- Firm dynamic or non-dynamic response to changes in frequency in National Grid specified windows
  - Dynamic – providers at contracted part load point during windows and responsive when instructed
  - Non-dynamic – providers at contracted load point with relays armed
- Minimum 10MW at single site with single point of control & contact
- Tendered monthly for single or multiple months

nationalgrid

Frequency Response from Demand Side



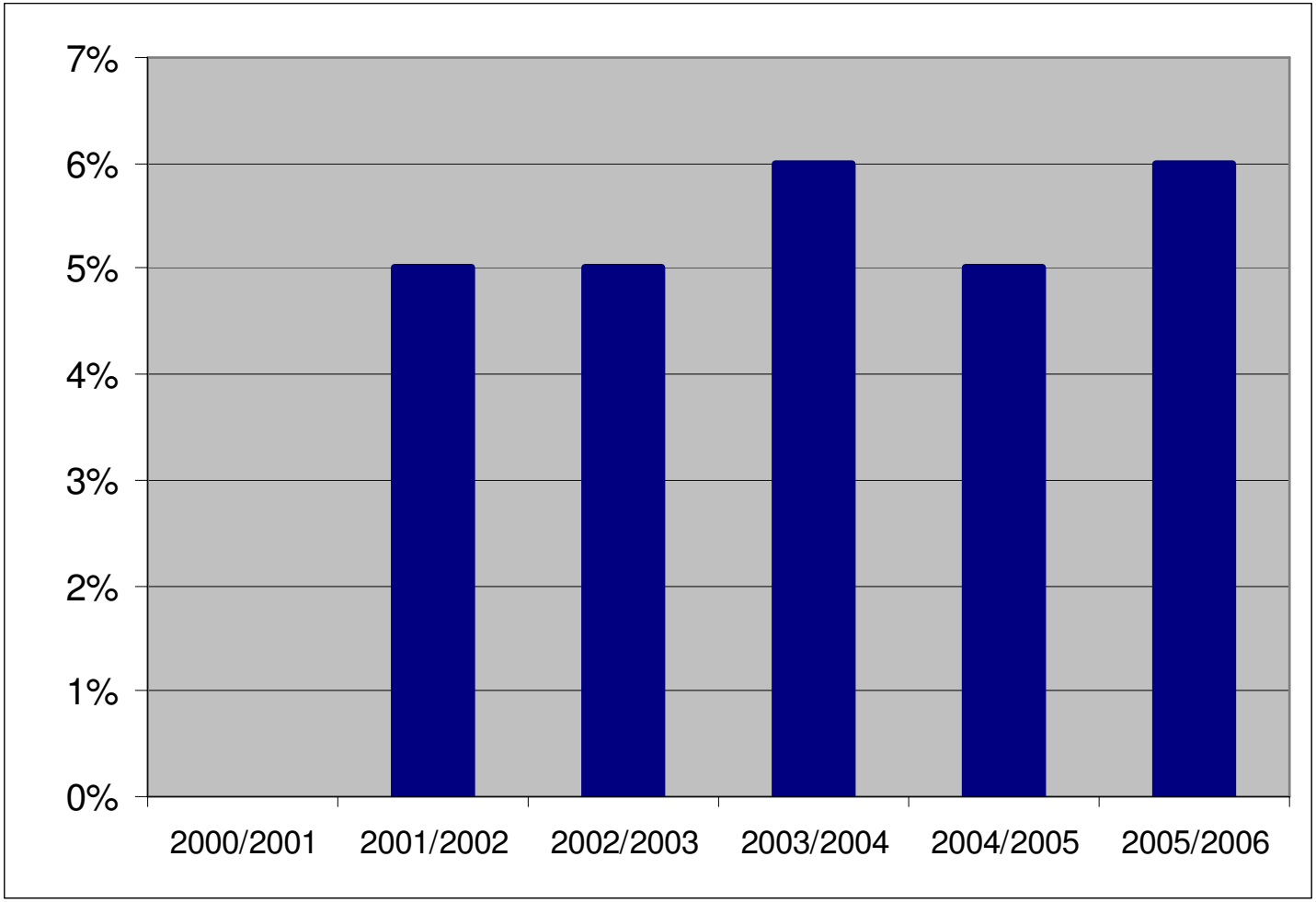
nationalgrid

Fast Reserve

- Rapid and reliable delivery of active power through increased generation or demand reduction
- Delivery must start within 2 mins of despatch and at a rate in excess of 25MW/minute
- Delivery must be sustainable for a minimum of 15 minutes
- Pre-qualification process to get a framework agreement
  - Optional service
  - Firm service (opportunity to tender monthly)

nationalgrid

Fast Reserve from Demand Side



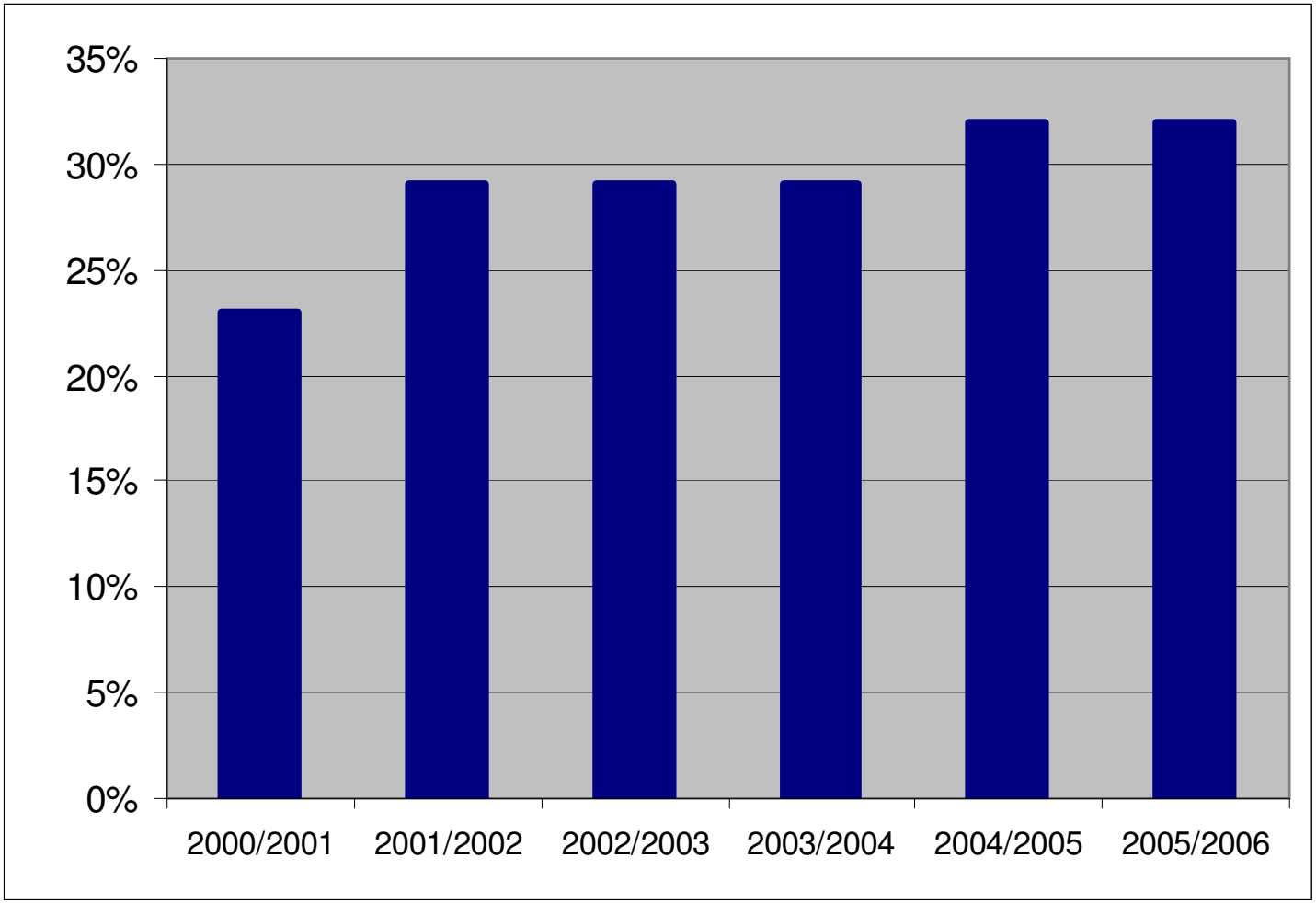
nationalgrid

STOR

- Provision of active power from synchronised and non-synchronised sources (generation and demand)
- Tenders for up to 2 years ahead, split into seasons
- Fixed availability windows, plus optional service
- Minimum 3MW (maybe aggregated)
- Response time of 240min or less
- Ability to deliver for min of 2 hours
- Tenders 3 times a year

nationalgrid

Standing Reserve from Demand Side (now STOR)



nationalgrid

Demand Management

- Provision of reserve in contingency timescales via reduction in demand or increase in power from small or back up generation
- Minimum requirement 25MW across two consecutive settlement periods
- Introduced as part of the Demand Turndown trials, subsequently no providers have taken up this service
- Some of the learning from the Demand Management trials incorporated into the new STOR service

nationalgrid

Demand Side Participation In Balancing Services 2005/6

Service	% provided by Demand Side	No of sites
Frequency Response	36% (based on actual declared availability)	2 large sites + 34 smaller aggregated sites via Frequency Control by Demand Management
Standing Reserve (now STOR)	32% (annual contracted volume basis)	35 unique contracted sites, (Note - some sites have multiple contracts or may deliver from a group of geographically dispersed locations (e.g. water companies)
Fast Reserve	6% (annual contracted volume basis)	2 large sites + distributed provision from a large number of domestic premises via radio tele-switch

nationalgrid

Reserve Review

- Balancing Services established when Energy Market rules changed (NETA go-live - 2001)
- Change to Gate Closure of 1 hour
  - Pre-Gate BMU Transaction's introduced
- Reviews of PGBT's and Transparency
  - Conclusions that wider review of reserve products would be better than specific smaller changes
- Industry Feedback
- National Grid decided to carry out a reserve review and engage industry in consultation

nationalgrid

Short-Term Operating Reserve (STOR)

- Key Change
  - Call off in 240 minutes or less (previously 20 mins for Standing Reserve)
  - Aligns with Operating Reserve Requirement
    - held from 4hrs ahead to real time
  - Still a requirement for faster more flexible providers
    - i,e. less than 20 minutes
  - Reduces barrier to participation identified during Demand Turndown trial

nationalgrid

STOR Procurement

- Tender rounds three times/yr
  - Increased opportunity to participate
- Contracts for seasons for up to 2 years ahead
  - Providers can choose between certainty of income vs flexibility
- Standard set of contract terms
  - Providers sign up once (i.e. like a pre qualification)
  - Successful tenders become contractually binding
  - Reduces time/workload/legal resource for both National Grid and Providers
  - Reduces time between tender and contract go live
    - Reduces providers price risk

nationalgrid

STOR – Tender round 1

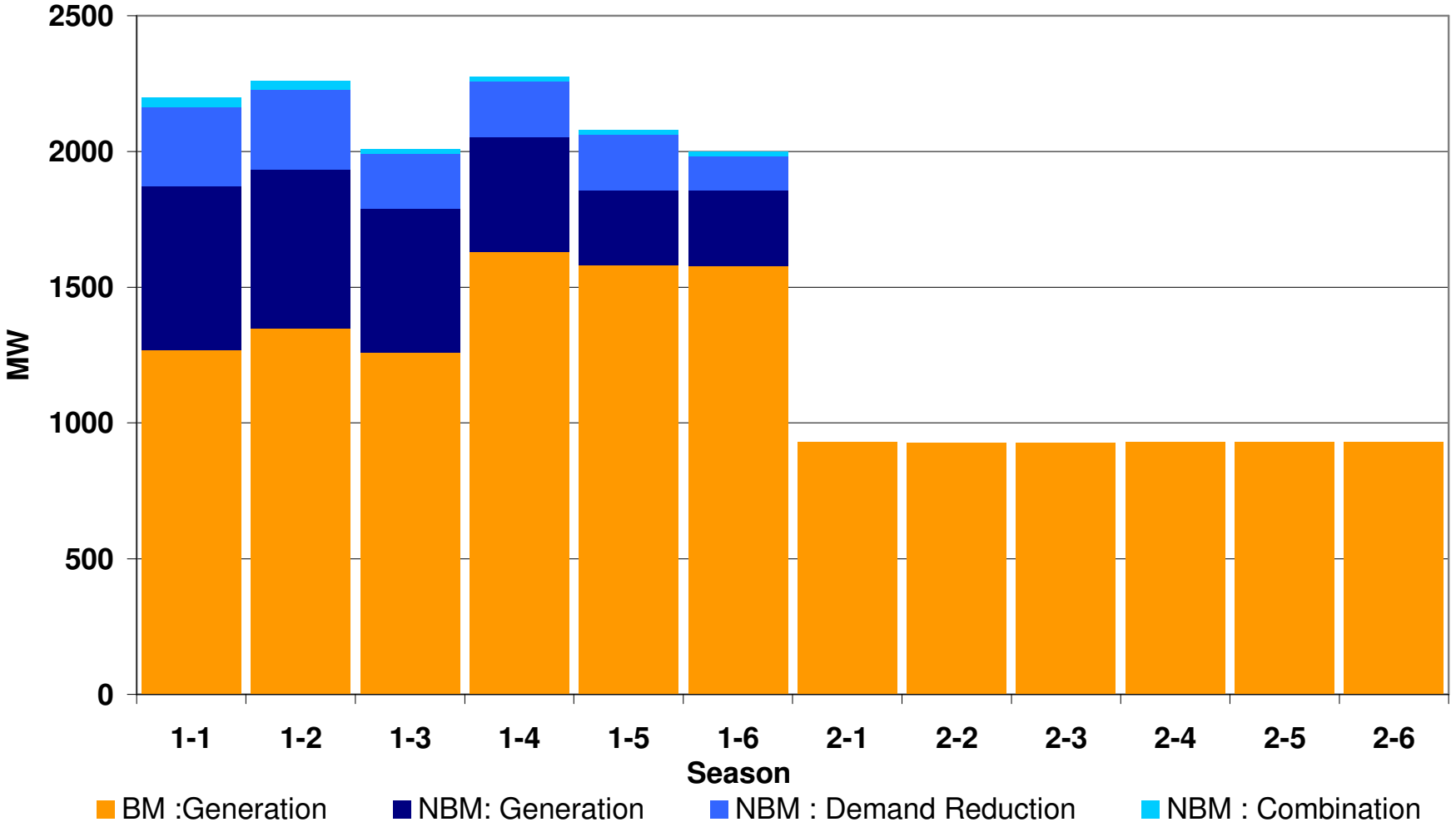
- First Tender round held on 19th January 2007
- Tender period split into 12 seasons
  - 1st April 2007 - 31st March 2009
- Tenders received from 31 companies for 109 sites

- http://www.nationalgrid.com/uk/Electricity/Balancing/tenderreports/stor2/index.htm

- Note: data on tender round, subject to further checks

nationalgrid

STOR Tendered MW per Season



nationalgrid

Key Tender Round Dates

Tender Round	Tender sheets available by	Market Day	Results Day	Market Report Published by
2007 TR1	11/12/2006	19/01/2007	02/03/2007	13/04/2007
2007 TR2	18/05/2007	22/06/2007	20/07/2007	03/08/2007
2007 TR3	27/07/2007	31/08/2007	28/09/2007	05/11/2007

nationalgrid

Conclusions (1)

- Multiple opportunities for Demand Side participation in Balancing Services
- Demand side participation growth since NETA
- National Grid are keen to continuing working with providers and the DSWG to increase provision of services by the demand side

nationalgrid

Conclusions (2)

- Residual balancing is only a small part of the traded energy market, we encourage the DSWG to also look at other market opportunities

- For further information on balancing services
  - John Perkins - 01926 656337
  - john.perkins@uk.ngrid.com

nationalgrid