System Cost Update

July 2018
World Cup and Royal Wedding
Half-time Pickup of 500 - 600 MW @ 13:45 + Injury Time.

Full Time pickup of 450 - 550 MW @ 14:45 + Injury Time.

Forecast based on previous world cup games.
World Cup 2018
Historical Data
Panama v England – Sunday 24th June 2018

- **Red line:** England v Slovenia, 3rd match, Group Stage, 23/06/2010, 19:00 GMT
- **Blue line:** England v Tunisia, 1st match, Group Stage, 18/06/2018, 19:00 GMT
World Cup 2018
Demand Outturn
Panama v England – Sunday 24th June 2018

Demand outturn for England v Panama match
Breakdown: The Royal Wedding 2018

Demand outturn for The Royal Wedding 2018

- Royal Family & Bride and Groom Arrive
- 1500 MW Drop-Off
- Ceremony begins
- 554 MW Pick-Up
- Ceremony ends Harry and Megan leave the church
- 711 MW Drop-Off
- During carriage Procession, 665 MW Drop-Off
Balancing Service Use of System (BSUoS)
March 2018: £1.96/MWh
Total Cost: £95.5m, Volume: 48.7TWh

Energy £49.4
Constraint £20.9
RoCoF £0.7
Blackstart £3.7
Reactive £5.9

Constraints
Energy
RoCoF
Blackstart
Reactive

£80.7m

£m
0 20 40 60 80 100 120
Mar-2018 Apr-2018 May-2018 Jun-2018

0 20 40 60

0 2 4 6 8 10

0 2 4 6 8 10

0 2 4 6 8 10

0 2 4 6 8 10
April 2018: £1.89/MWh
Total Cost: £76.4m, Volume: 40.4TWh

<table>
<thead>
<tr>
<th>Constraint</th>
<th>£20.9m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>£24.1m</td>
</tr>
<tr>
<td>RoCoF</td>
<td>£4.5m</td>
</tr>
<tr>
<td>Blackstart</td>
<td>£3.3m</td>
</tr>
<tr>
<td>Reactive</td>
<td>£6.1m</td>
</tr>
</tbody>
</table>

£58.9m

Graphs showing energy, constraint, RoCoF, blackstart, and reactive costs for different months.
May 2018: £1.93/MWh
Total Cost: £78.0m, Volume: 40.4TWh

Constraints

Energy

RoCoF

Blackstart

Reactive

£61.3m

Energy £26.8
Constraint £14.5
RoCoF £9.8
Blackstart £3.4
June 2018: £2.81/MWh
Total Cost: £99.0m, Volume: 35.2TWh

- Energy: £34.1m
- Constraint: £36.4m
- Blackstart: £3.7m
- RoCoF: £5.6m
- Reactive: £2.5m

Total Costs: £82.2m
Balancing Service Use of System (BSUoS) Forecasting
BSUoS 18/19 forecast – as at July 2018

Total BSUoS Costs

£1132.3 m

+ £9m

£927.8m balancing costs

+ £204.5m internal costs

BSUoS Volume

503.1 TWh

+ 5.1 TWh

BSUoS volume forecast

£2.25/MWh

+ £0/MWh
BSUoS sensitivity analysis 18/19

**HVDC in service end of October instead of end of August**

Total BSUoS Costs: £1149 m

+£17m

BSUoS Volume: 503 TWh

Costs: £2.28/MWh

+£0.03/MWh

**High wind and high embedded outturn, lower BSUoS volume, higher footroom / margin costs**

Total BSUoS Costs: £1222 m

+£90m

BSUoS Volume: 493 TWh

-10TWh

Costs: £2.48/MWh

+£0.23/MWh
# Forecast improvements and transparency

## Work programme timeline

<table>
<thead>
<tr>
<th>Task</th>
<th>2018</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication of daily balancing costs and volume summary</td>
<td></td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve the current monthly average BSUoS forecast</td>
<td></td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aim to make all underlying data available in Excel format</td>
<td></td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separate BSUoS forecast report with error bands and explanation of drivers</td>
<td></td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review the MBSS and combine with the Non-BM Services report.</td>
<td></td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop the tools required to provide a more granular BSUoS forecast</td>
<td></td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
New Reporting

Daily Balancing Cost Report (available now)

Daily Balancing Costs

BSUoS Charge Estimate: £8.11/MWh
Total Outturn: £15.85m

[Graph showing Daily Balancing Costs]

BM Cost

[Graph showing BM Cost]

BM Volume

[Graph showing BM Volume]

Commentary

Special actions were taken to cover risk of potential gas plant interactions following GNCC issuing a Gas Deficit Warning for Gas Day commencing 6am. This uncertainty compounded widespread technical issues with generating plants’ performance throughout the day, which were mainly due to the low ambient temperatures being experienced across GB. A significant volume of generation expected to synchronise for the morning pick-up failed to do so or was delayed. In the late afternoon, an interconnector was declared to be half its capability for the rest of the day following a technical fault. To address the short market, additional generation was required. Furthermore, the darkness peak was the highest recorded for this winter period, with a half hour average from 18:00 to 18:30hrs of 50.1GW. Some BM actions were taken to solve power flow restrictions between Scotland and England and to manage voltages levels. Overnight Trades on the interconnectors were taken for Rocof.
New Reporting

BSUoS Forecast Report (available now)
https://www.nationalgrid.com/uk/electricity/market-operations-and-data
New Reporting

MBSS Report (available now)

https://www.nationalgrid.com/uk/electricity/market-operations-and-data
BSUoS developments

Default tariff cap legislation – methodology for calculating cap
Ofgem consultation closed on the 25th June. Statutory consultation will likely be in August 2018

CMP250 – proposal to fix BSUoS
With Ofgem for decision

CMP281 – changes to charging of storage, removes import BSUoS charges from storage only.
At workgroup stage

CMP292 – proposed cut off date for changes to the charging methodologies
Awaiting first workgroup

CMP296 - Aligning the CUSC to the BSC post-P344 (Project TERRE) to exempt virtual lead parties from BSUoS
Going to Ofgem in July

CMP299 - new SO incentive scheme, 7 incentive principles
Going to Ofgem in July