Control Room difficult day

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Scheduling and Real Time Operation on Easter Sunday 2019

- **How do we plan and what do we plan.**
- **Toolkit.**
- **Actions taken and Consequences**

How do we plan and what do we plan.

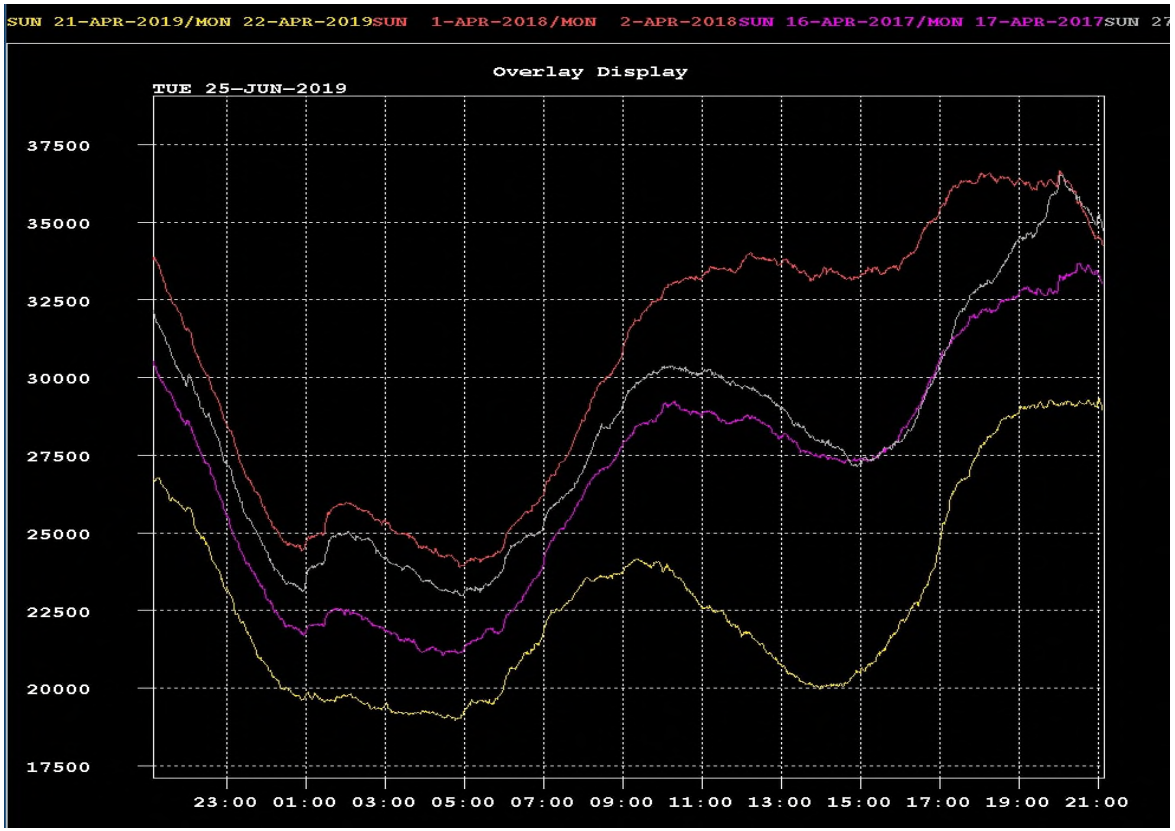
- **Energy Balancing**
  - Analysis of BMU Data (from 11:00 at Dayahead stage)
  - Analysis of contracted Ancillary Services.
  - Analysis of predicted Interconnector flows.
  - Demand Forecasting.
- **Transmission System Planning**
  - Outage Planning
  - Contingency Off-line and On-line analysis of Transmission System
  - Voltage support requirements from BMUs. (Use of MVARs)

Demand Forecasting

- **Use of historical days:**

	2019	2018	2017	2016
Good Friday	19th April	30th March	14th April	25th March
Easter Sunday	21st April	1st April	16th April	27th March
Easter Monday	22nd April	2nd April	17th April	28th March
BST Starts	31st March	25th March	26th March	27th March

Historical Demand Profiles for Easter Sunday



- Yellow – actual profile from Easter Sunday 21st April 2019.
Red – 1st April 2018
Purple – 16th April 2017
Grey – 27th March 2016

Demand Forecasting – What factors do we look at?

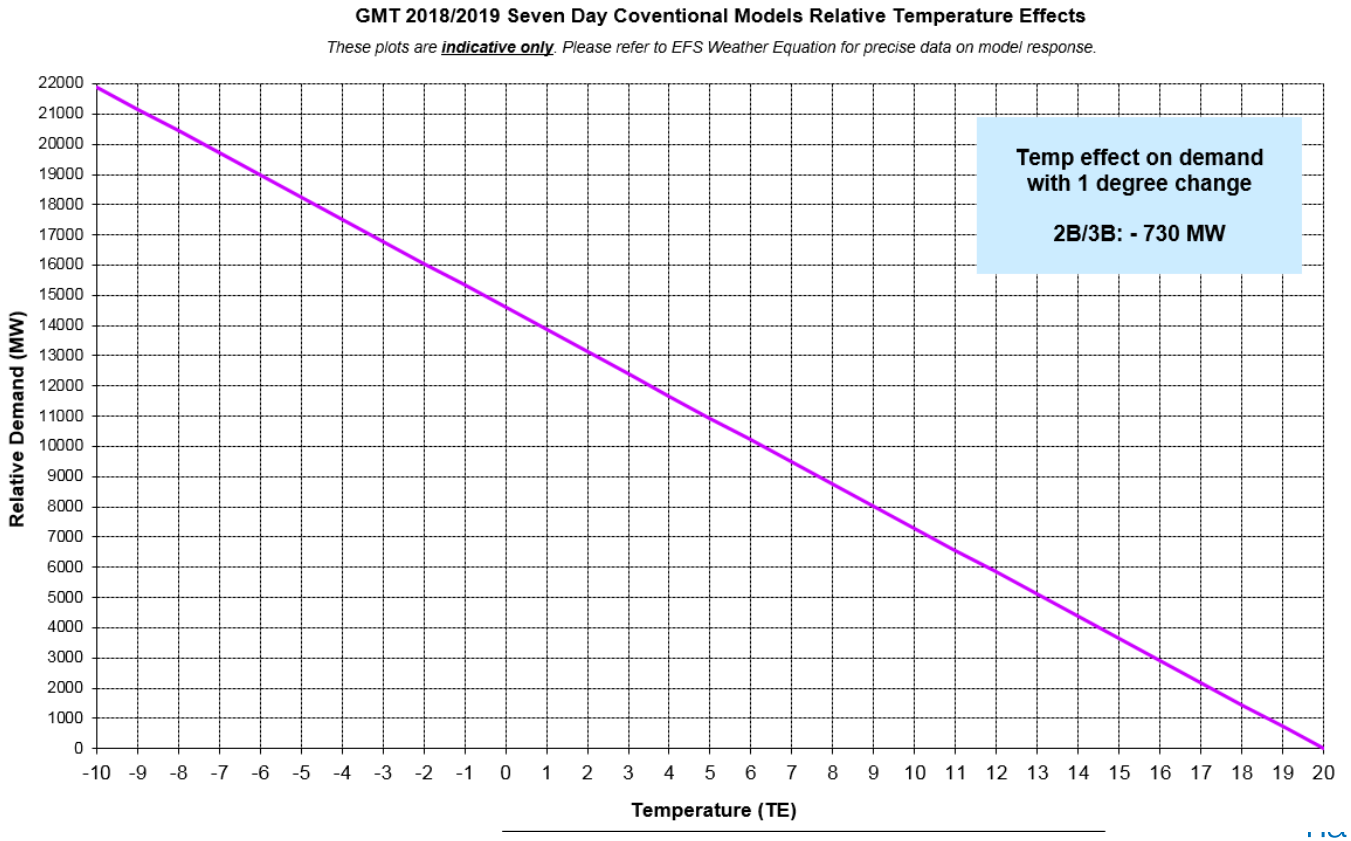
- **Weather**
- How does this effects people's behaviour and actions.
  - Temperature.
  - Illumination.
  - Wind Speed and direction.
  - Precipitation type and amount.
- Wind output (Embedded and BMU Wind).
- PV output.
- **Other factors:**
- Effect of change to British Summer Time.
- Special events.

Demand Forecasting – What factors do we look at?

	2019	2018	2017	2016
PV Max (GW)	8.1	3.1	4.3	3.8
Wind Emb	3.1	1	1	2.2
Av GB Temp – C Degrees	20	6	10	9
Illumination	-10	-25	-25	-30

Illumination: -5 change equates to 70MW change during the daytime.
Temperature: 1 degree equates to 730MW during the daytime.

Demand Forecasting – What factors do we look at?



Toolkit

- **Information from Transmission System analysis to determine most effective BMUs to give system security support.**
- Use of Trading.
- BMUs utilised through Balancing Mechanism.
- **Demand Forecast output:**
- Production of demand profile with confidence levels and continuous reassessment.
- Energy Balancing Requirements – meet demand and margin requirements.
- Frequency Response.
- Largest loss assessment (response and RoCoF)
- Potential requirements for trading on Interconnectors.

Actions taken and Consequences

- **Actions taken on Easter Sunday 2019**
- Units acquired through Trading and BM for system security
- Congestion through Transmission system out of Scotland
- Trading on Interconnectors
- **Consequences**
- Lowest demand was afternoon trough and not the overnight trough.
  - Daytime demand – 18.2GW
  - Sunday morning demand – 19.2GW
  - Demand Forecast errors of upto 1GW seen throughout the daytime.