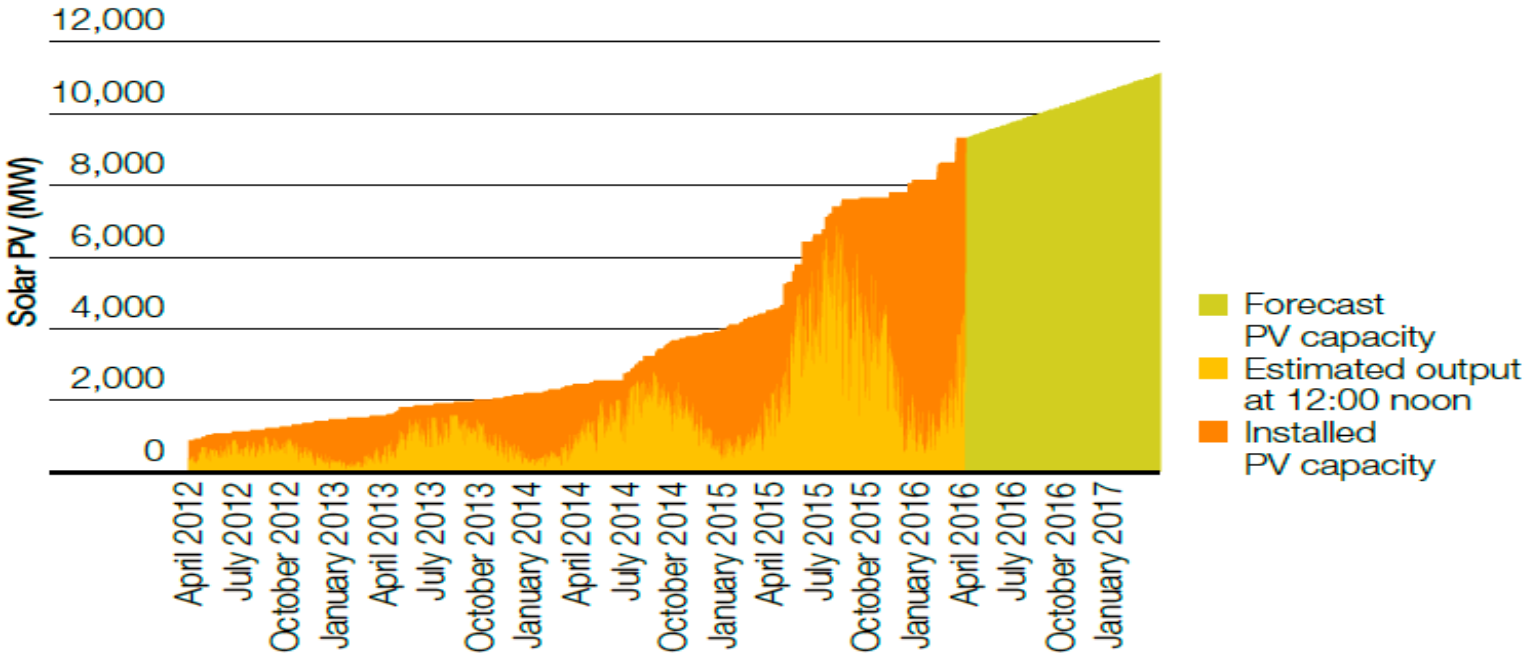
nationalgrid

Emergency Instruction of Distributed Generation

Mark Krajniewski
National Grid – System Operator
Grid Code Forum
20th July 2016

Introduction

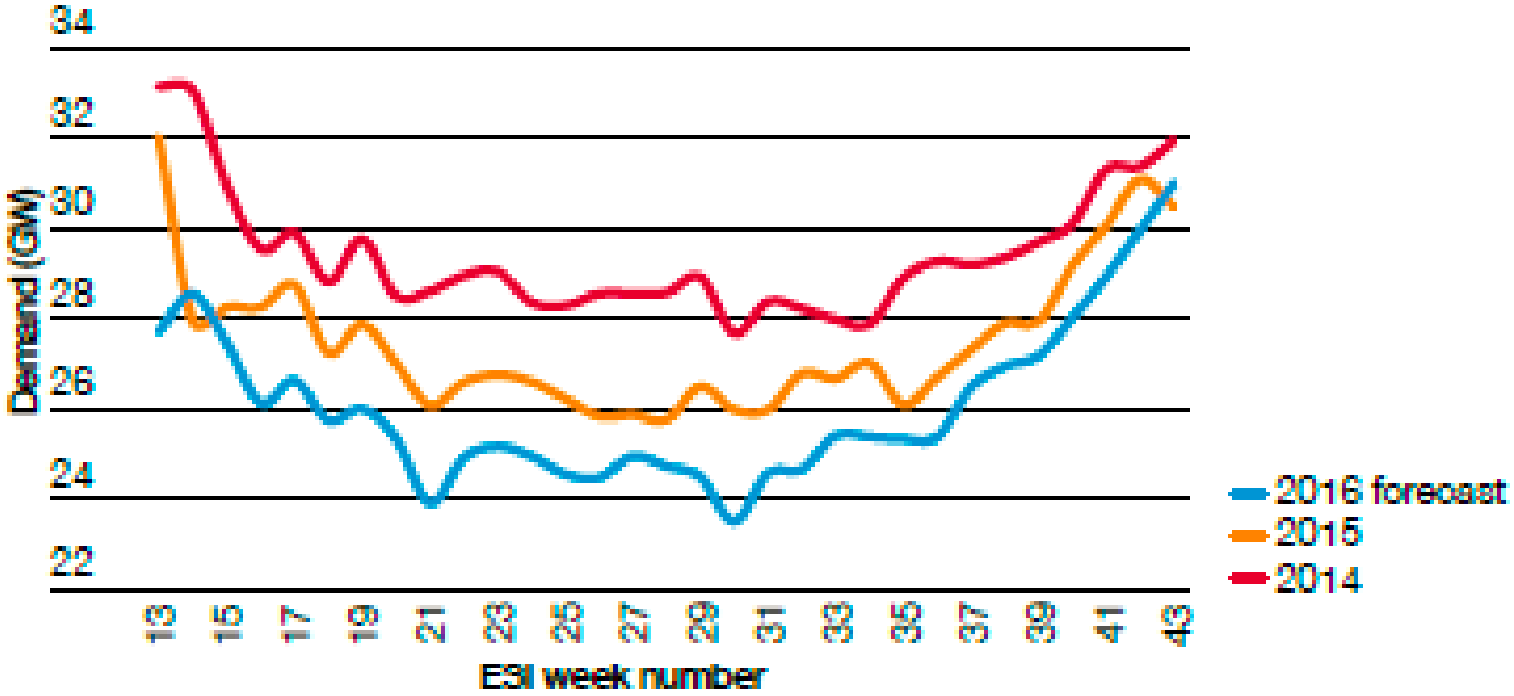
- The National Grid Summer Outlook 2016 Report states that that embedded Solar PV generation has increased from a level of 5.0 GW in April 2015 to 9.3 GW in February 2016. This level is expected to increase at a rate of 200MW a month and is expected to reach 12GW by the start of Summer 2017. The Future Energy Scenarios expects the level of embedded Solar PV to reach 18GW by 2020.



Transmission System Demand

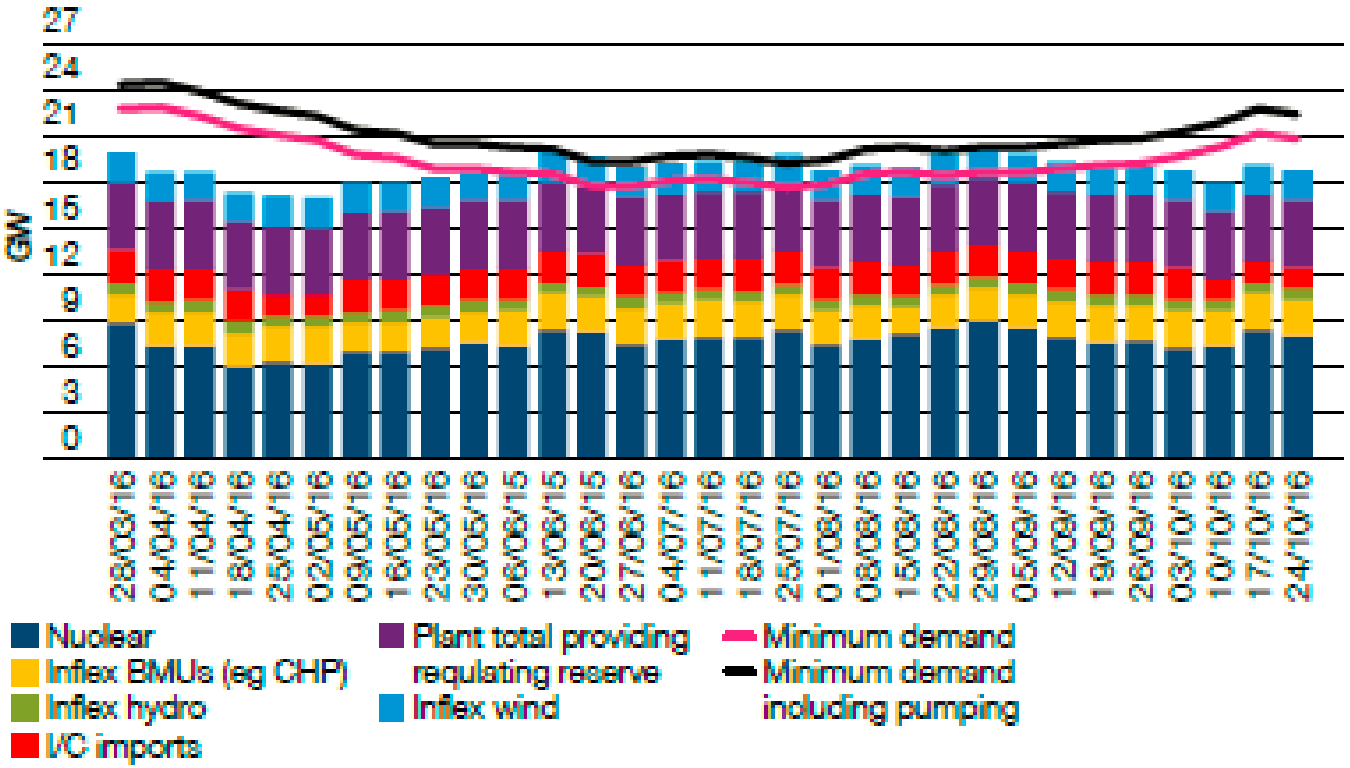
- The increase of Embedded PV Solar and other embedded generation is reducing the transmission system demand. In the future there may be more inflexible generation than there is demand.

Weather corrected weekly daytime summer minimum demand



Transmission System Demand

Figure 22
Weekly minimum demand and generation profiles



Power Responsive

- National Grid under the banner of Power Responsive, is developing commercial products to address some of these operability issues, one such product that embedded generation may wish to consider is Demand Turn Up. National Grid is currently working with WPD to deliver such a service.

nationalgrid

Emergency Instructions

- The reduction in transmission demand may lead to, in exceptional circumstances, there being more generation than there is demand.
- If after all practical actions in the Balancing Mechanism (BM) have been taken and commercial contracts have been utilised there still remains more generation than demand there will be a system wide or localised Negative Reserve Active Power Margin (NRAPM).
- The only tool left to the system operator then would be to issue an emergency instruction to the network operator to reduce the amount of embedded generation to ensure secure and safe operation of the transmission system.
- When the Grid Code was written the issue of having more inflexible generation than demand was not an issue
- In the future there may be scenarios where National Grid may need to instruct Network Operators to reduce the amount of embedded generation in their networks.

nationalgrid

BCAs for Existing GSPs

- In the short term, until the grid code can be modified the requirements have been included in the BCAs for existing GSPs. This allows more embedded generation to be connected
- Each GSP will have their BCA amended to contain clause 10.2 'Controllability' so that all generation connected after an agreed date has the ability to be disconnected by the DNO.
- New Appendix F section 13 of the BCA.
  - 'In accordance with the requirements of BC2.9.1.4, of the Grid Code, using the principles set out in Grid Code OC6.7.1, the User shall maintain a facility such that under emergency conditions on the National Electricity Transmission System, the User shall have the ability to de-energise the Embedded Generation detailed in Appendix G Part 2 & 3 of this Connection Agreement, upon instruction from The Company.
- The Network Operator would be expected to disconnect in an emergency all existing embedded generation where it's in their connection agreement and it is technically possible, and all embedded generation that is connected under Part 2 & 3 of Appendix G of the BCAs.