

Largest Single Infeed

Update to DS3 Advisory Council
30th May 2012



Overview

- Background
- Analysis
- Results
- Conclusions
- Next Steps



Background

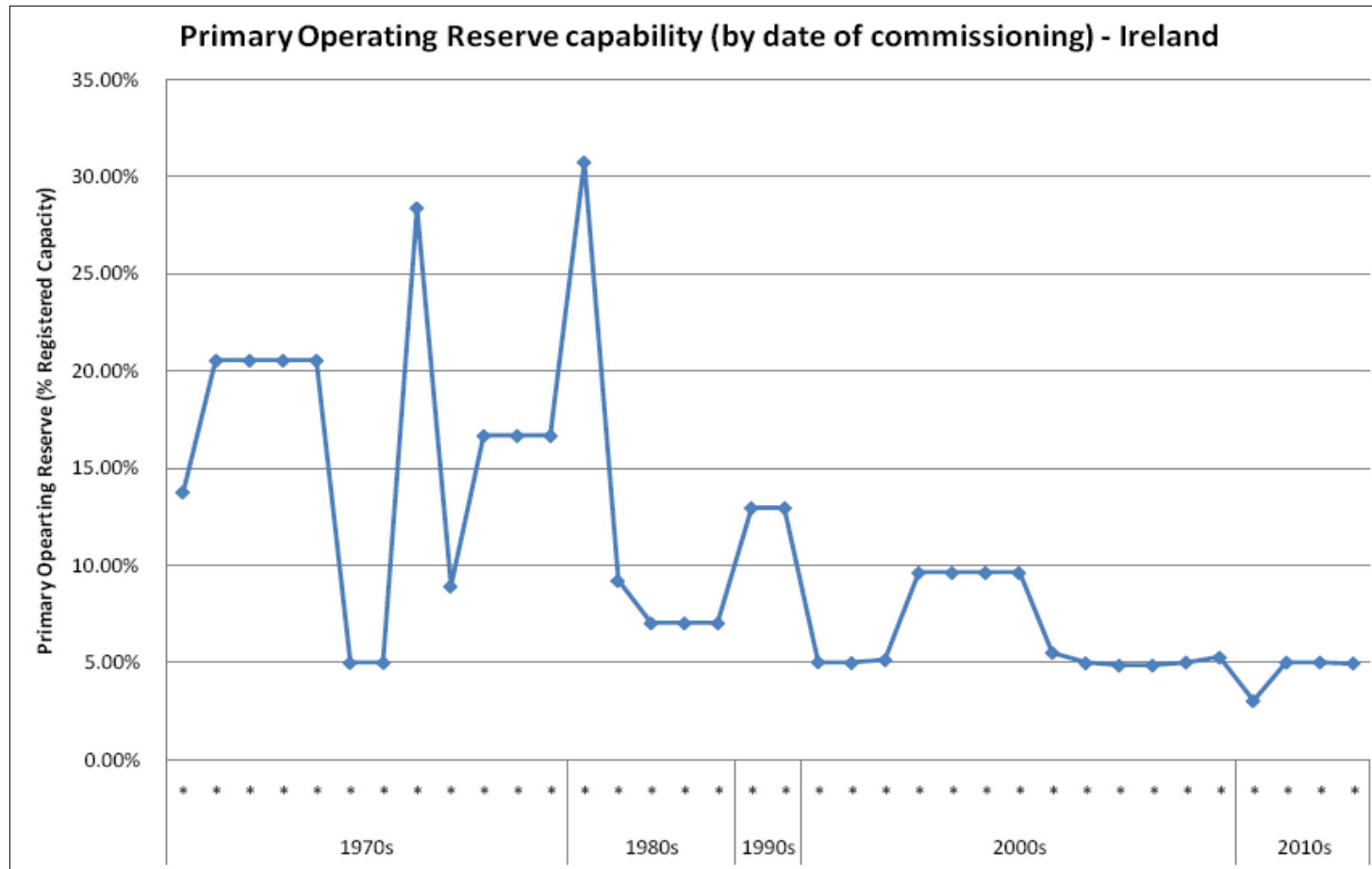
- Grid West project ~600MW of wind in a single location
 - Connected via single line would constitute a single point of failure
- **Today** Biggest Largest Single Infeed : Whitegate CCGT (445MW) or Moyle Interconnector (450MW)
- **Tomorrow** Biggest Largest Single Infeed : EWIC (500MW)
- **Future** Biggest Largest Single Infeed : new GE CCGT units (550MW) or new Interconnector (700MW-1,000MW)



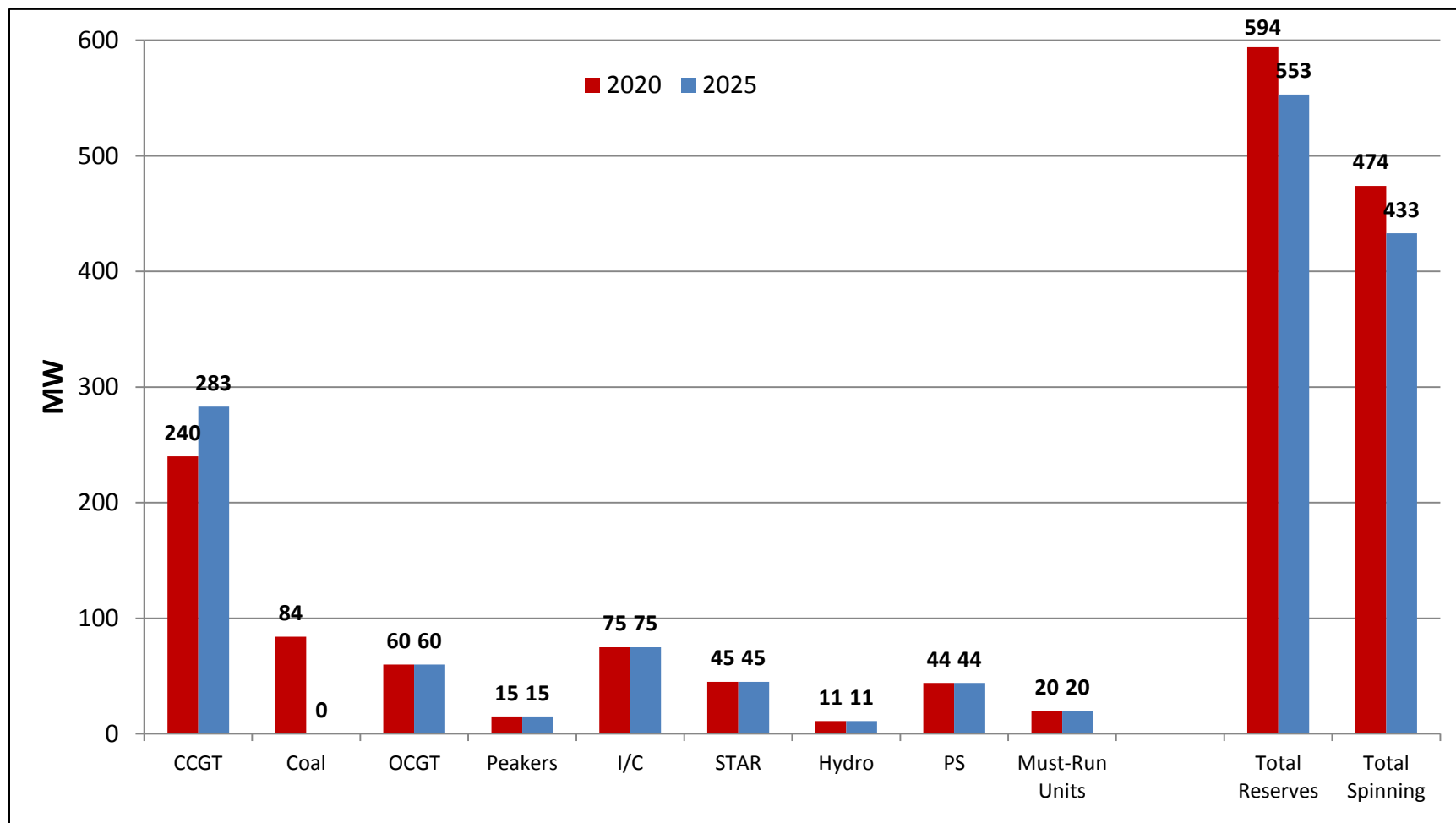
Analysis Assumptions

- Assume location/ network topology not relevant & examine impact on the synchronous island system (Ireland and Northern Ireland)
- Plant Portfolio: use current predicted generation and potential further generation units from the Grid 25 studies.
 - NI plant portfolio assumptions were provided by SONI.
- No other sources of reserve (DSM/ reserve from wind)

The Evolution of Reserve



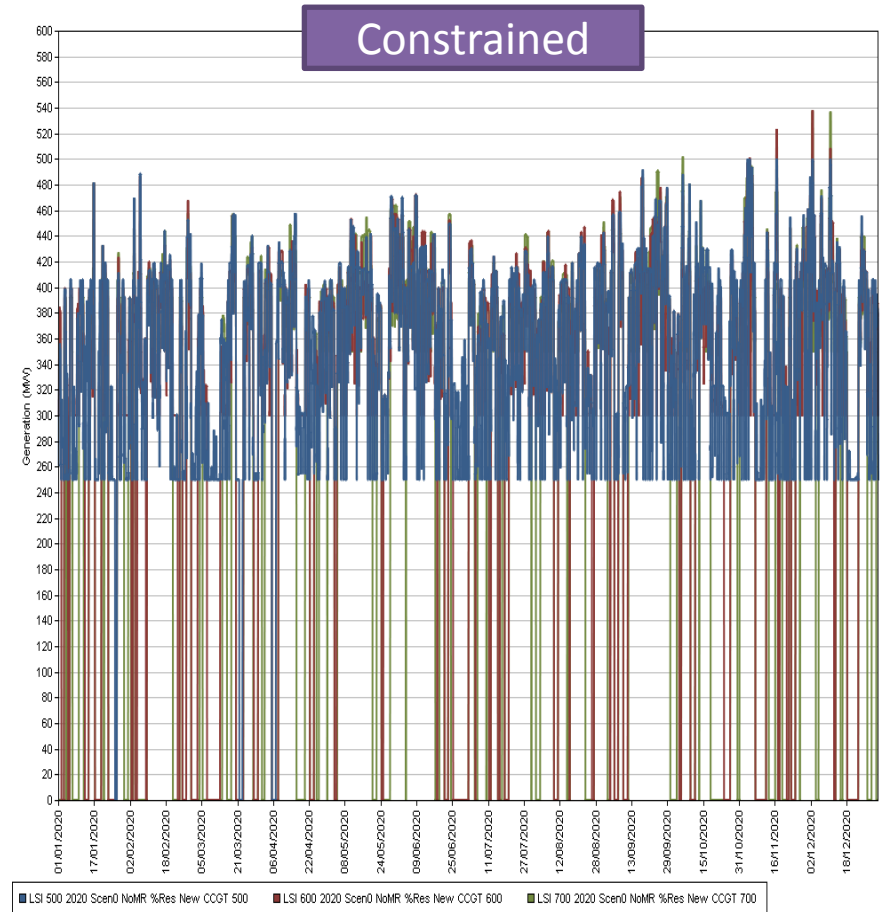
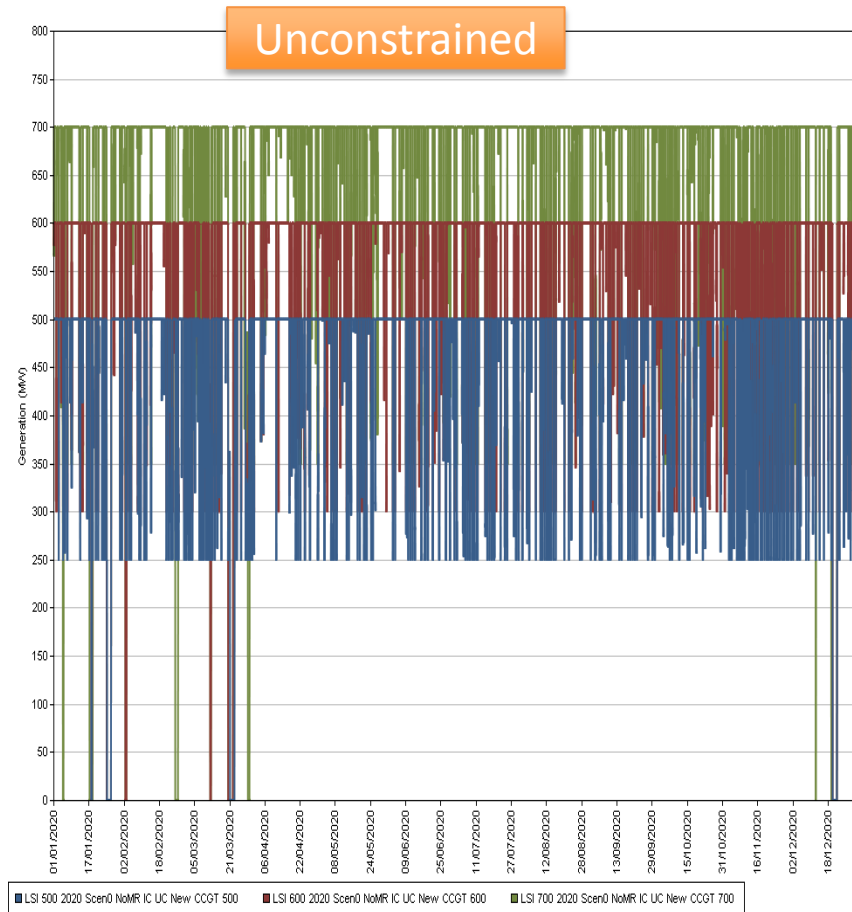
‘Conventional’ POR on the system in the future



Capacity Factor analysis

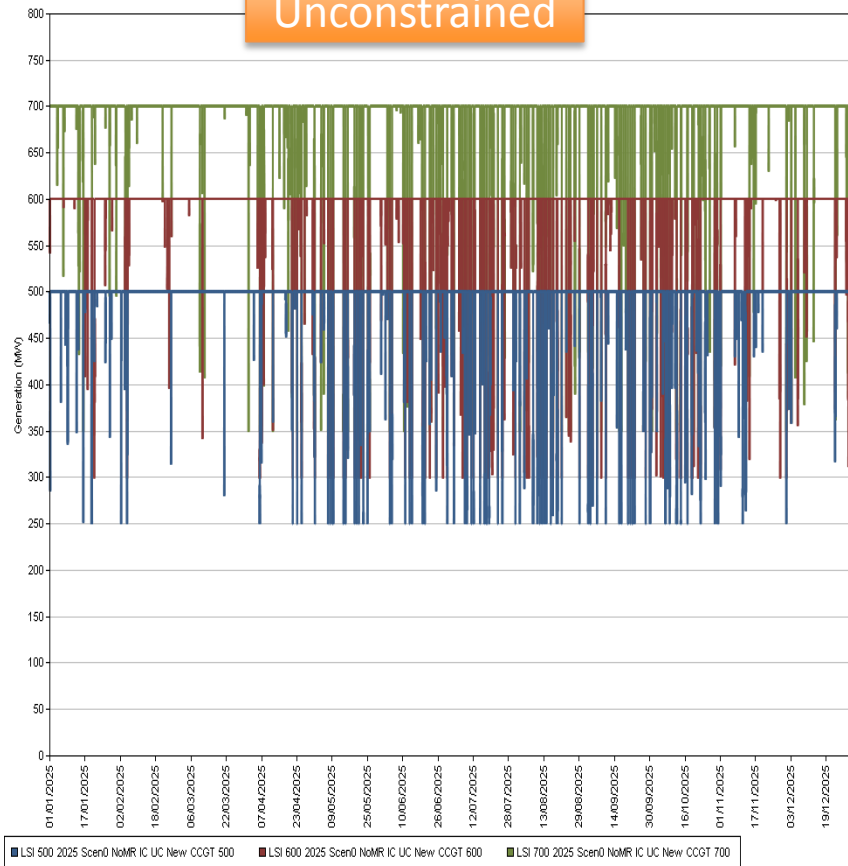
- Carry out unconstrained and constrained run
- Unconstrained gives the MARKET view
 - Performs only economic analysis
 - Does not consider unit characteristics (start-up/ ramp rates etc)
- Constrained gives the SYSTEM view
 - Performs economic analysis while considering system and unit constraints
 - Ensures that reserve is provided

2020 Capacity Factor

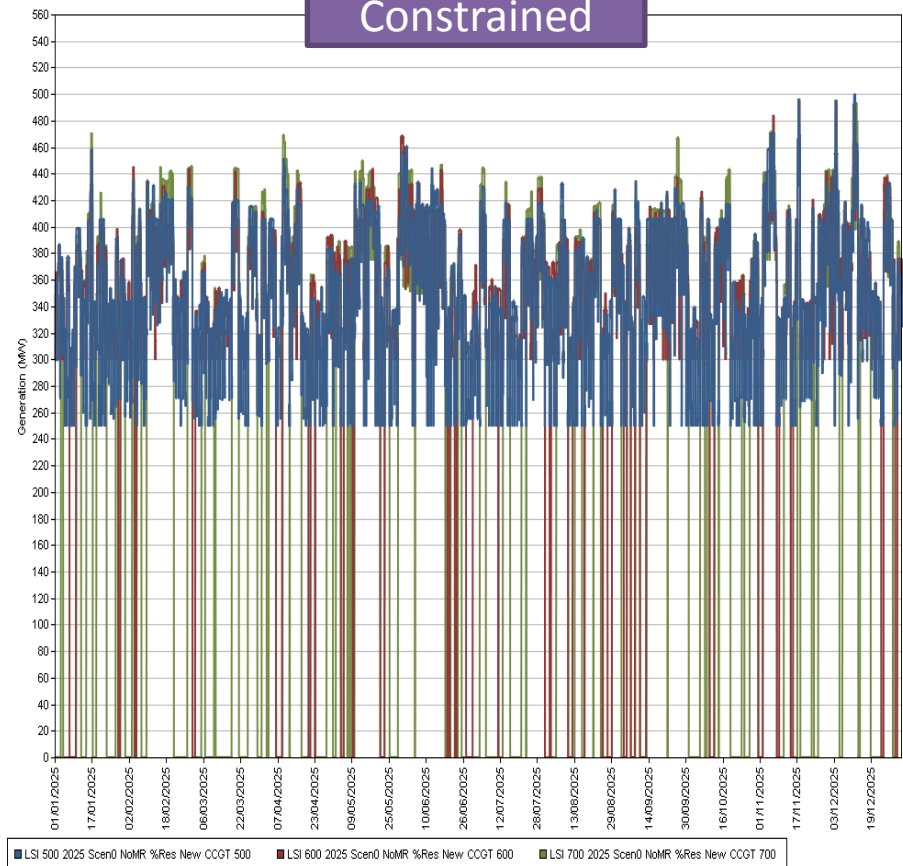


2025 Capacity Factor

Unconstrained



Constrained



Results from Preliminary Analysis

1. The size of the maximum Largest Single Infeed is proportional to demand
2. The size of the maximum Largest Single Infeed decreases as the percentage wind generation increases, relative to system demand.
3. The cost of reserve provision increases sharply as the size of the Largest Single Infeed increases.
4. The capacity factor of the Largest Single Infeed decreases as the size increases.
5. Developments in demand-side response, advancements in interconnector control technologies and smart grids will increase the TSOs capability to manage the system under the above scenarios.

Next Steps

- System Services review under the DS3 programme
 - Operating Reserve provision and procurement is being investigated.
 - Wind generation in Northern Ireland is currently being tested to provide a form of reserve.
- Smart Grids & Demand-Side Management
 - Investigate the potential of both demand-side participation and new smart grid technologies to assist in the provision of system services.
 - EirGrid & SONI have recently launched a demonstration project initiative to support the development in this area.



Summary

- A preliminary analysis of the impact of increasing Largest Single Infeed on the All-Island Power System has been undertaken
- There are challenges - both technical and economical
 - Provision of reserve & cost of provision
 - Capacity factor for new LSI
 - Facilitation of Renewables
- Work in ongoing in a number of broad areas to further investigate the issues.



