

# Demand Erosion and Uncontrollable Generation Limit

RGLG 3<sup>rd</sup> September 2019

# Agenda

- Overview of System issues with Uncontrollable Export
- Operational considerations
- Implications of further uncontrollable export
- Mitigation considerations
- Next Steps

# Key Principles

- SONI balances generation and demand on the system to maintain system stability.
- Min of 3 synchronous generators to be dispatched at all times.
- Excess generation results in system frequency  $> 50$  Hz.
- Generation output must be reduced - dispatch down of controllable generation.
- Reduction may also be required for operating reserve requirements, including negative reserve, voltage control requirements and System Non-Synchronous Penetration limit

# Key Principles

- SONI Control room has seen continued year on year decline in min demand - multiple occurrences of min demand  $\approx$  450 MW
  - Uncontrollable generation (Micro/SSG) energy efficiency
- Uncontrollable generation cannot be curtailed - same effect as eroding system demand.
- Presents issues at low system demand even with minimal synchronous generation
  - Reliance on ability to export surplus via N-S or Moyle
- The total capacity of uncontrollable generation export is subject to an operational limit as a result.

# Operational Considerations

System Stability Requirement	At least 3 units on load at all times B10, B31, B32, C30, K1 & K2  Min Gen Total : 249 – 486 MW
Negative Reserve Requirement	>50 MW
Uncontrollable LSG	79 MW
Min Demand	450MW
<b>Increasing reliance on export availability</b>	
Moyle Export	80 MW
North – South Export	110 – 270 MW (inertia dependent)


Above must also consider outages and availability of Gen units, Moyle and N-S

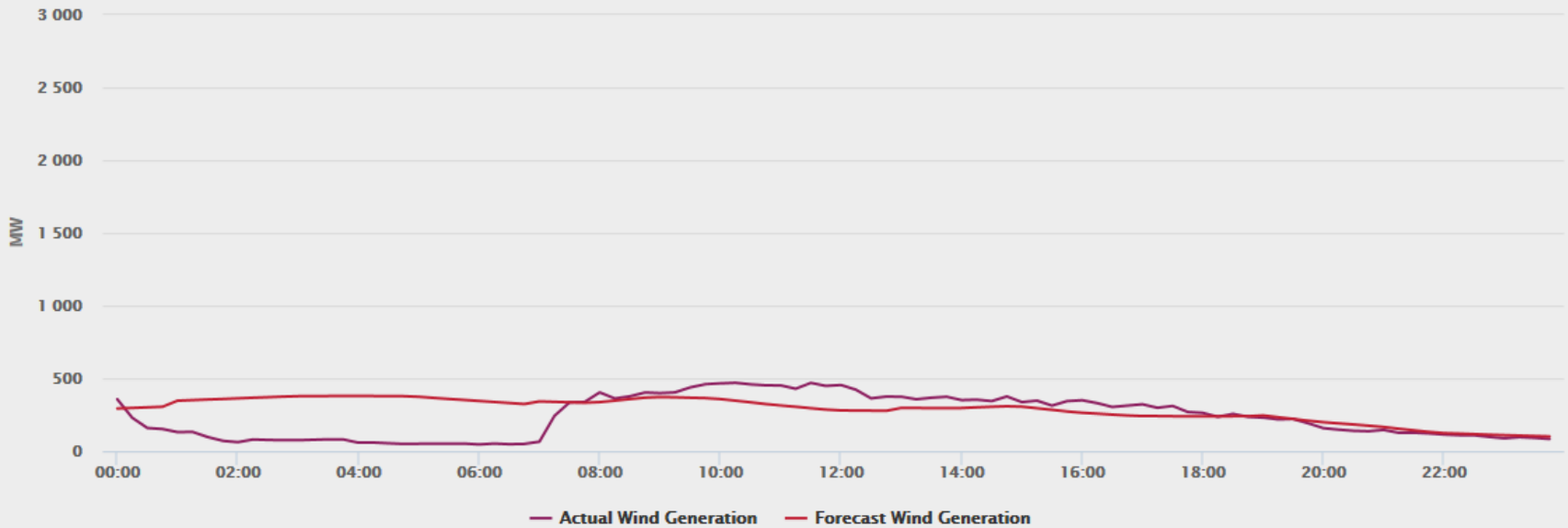
# August 11<sup>th</sup> 2019

NI Min Demand (0000 – 0900)	456 MW
Total Conventional Generation (min gen + negative reserve)	295 MW
Moyle scheduled	440 MW import
North – South Flow	300 MW export
Wind forecasted	370 MW
Wind curtailed	Approx 300 MW remaining 70 MW uncontrollable
Request to Trade back on Moyle around 0430am	Refused (all trading on interconnectors is co-ordinated and only on firm market schedule)
Formal Emergency Assistance request issued to NG	Emergency Assistance trade back of 50 MW

# August 11<sup>th</sup> 2019

## Northern Ireland - Actual and Forecast Wind

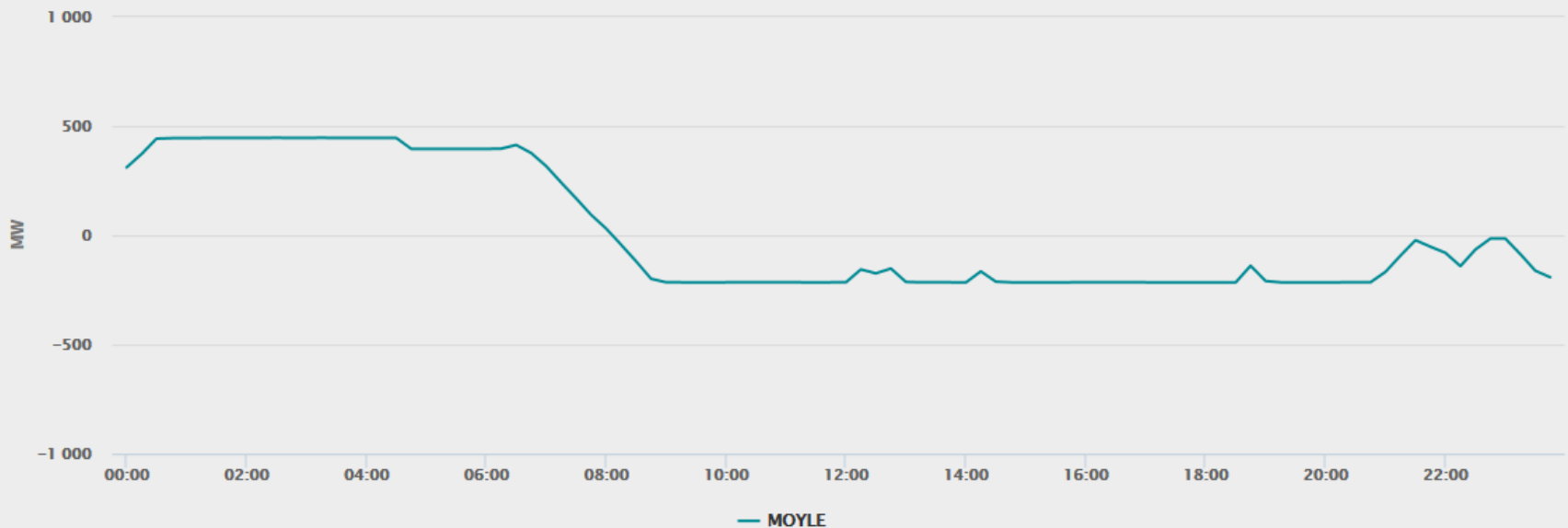
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# August 11<sup>th</sup> 2019

## Northern Ireland - Interconnection

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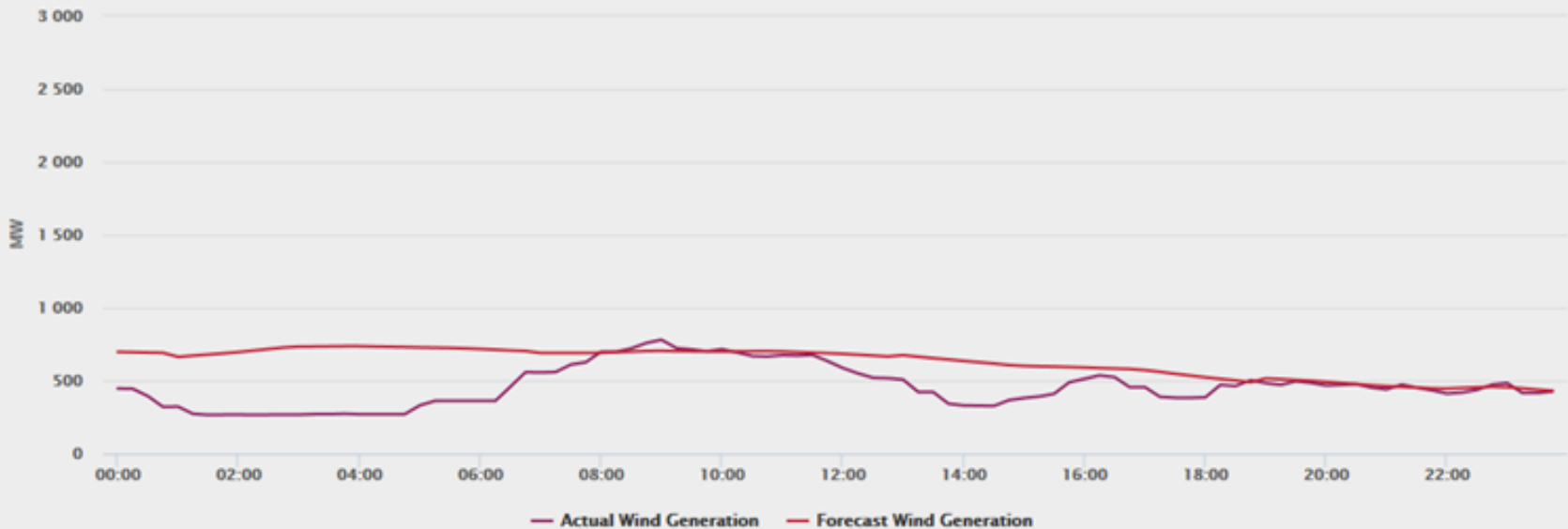
# 22<sup>nd</sup> July 2019

NI Min Demand (0000 – 0600)	456 MW
Total Conventional Generation (min gen + negative reserve)	459 MW
Moyle scheduled	83 MW export
North – South Flow	250 MW export
Wind forecasted	700 MW
Wind curtailed	Approx 376 MW
Wind post curtailment	324 MW remaining including approx 70 MW uncontrollable

# 22<sup>nd</sup> July 2019

## Northern Ireland - Actual and Forecast Wind

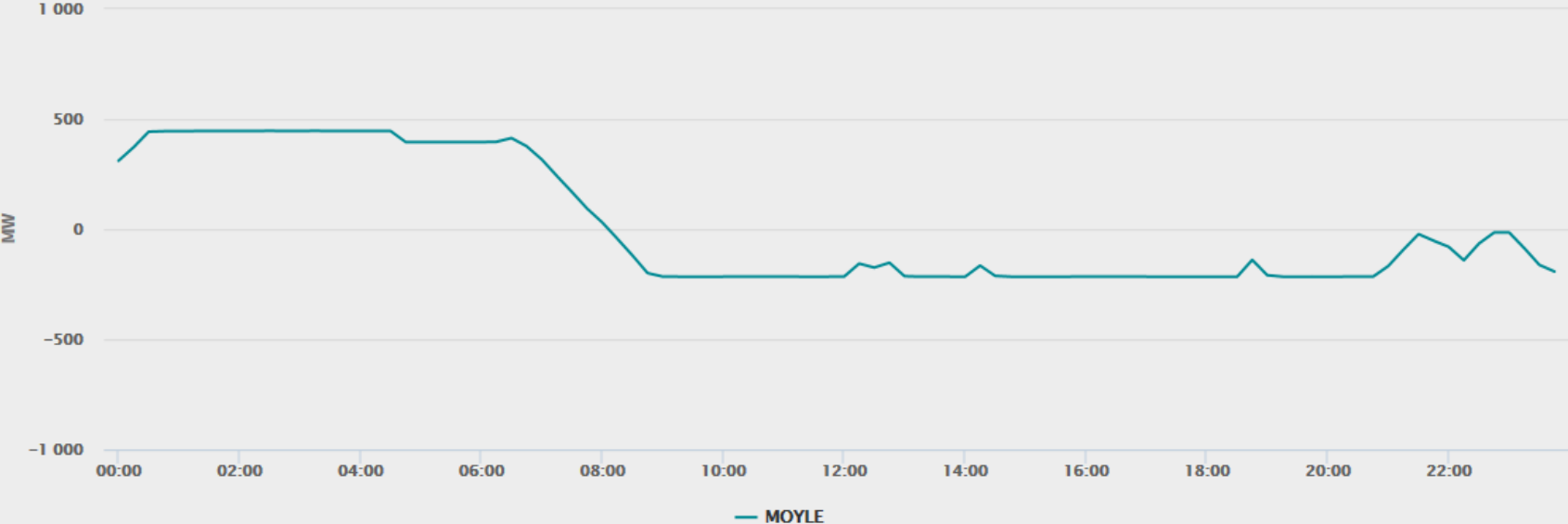
< 22 Jul 2019  >



# 22<sup>nd</sup> July 2019

## Northern Ireland - Interconnection

< 11 Aug 2019  >



# Impact of Further SSG export

- Increased potential for system instability
- Increased likelihood of trade backs on Moyle – Cost to NI customer
- Deviation from priority dispatch rules
- Increased curtailment of LSG - may also undermine project commercials and future investment

# What would help?

- SSG and LSG export becomes controllable
- Min demand growth
- Conventional plant min gens reduce
- Ability to reduce to 2 sets in NI achieved
- 2<sup>nd</sup> N-S
- Additional Interconnector in NI

# What will make issue worse?

- Connection of further uncontrollable SSG export
- Continued reduction in min demand (including impact of self consumption)
- Replacement of ageing conventional generation fleet with high min gen plant

# Next Steps

- SONI to complete impact assessment and decision on uncontrollable
- Rationale and any restrictions will be included in CIWG consultation paper