Generation Connections Industry Workshop 2017

Introduction- Topics to be covered

- Background: SONI & NIE Networks
- Generation Connections Guide
- Renewable Generation Update
- Phase 1 Review
- UR Connections Consultation
- Extensions
- NIE Networks/SONI Consultation Objectives

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Background: SONI

SONI is the Transmission System Operator (TSO) in NI

- Responsible for the planning, operation and controlling the flow of electricity onto and over the Transmission System.

Connections

- offer terms to customers for new connections, or for modification of existing connections, to the Transmission System.
- responsible for defining the connection arrangements, including any reinforcement works on the Transmission System required to facilitate connection to the Transmission System and Distribution System.

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Background: NIE Networks

NIE Networks is the asset owner of both the Transmission and Distribution Systems in Northern Ireland

- NIE Networks are responsible for the planning, development, maintenance and operation of the Distribution System; and maintenance of the Transmission System.

Connections

- offer terms to customers for new connections, or for modification of existing connections, to the Distribution System.
- Responsible for defining the connection arrangements and identifying any reinforcement works on the Distribution System required to facilitate connection to the Distribution System.

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NI Legal & Policy Framework

- Government policy and renewables targets
  - 40% electricity usage from renewable sources by 2020
- Regulated Businesses - network investment subject to approval
- NIRO (ROC's) – Ended March 2017 + Grace periods
- SONI/NIE Networks Licence Obligations

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Generation Connections Guide

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Transmission Network (110kV and 275 kV)

110kV Network

G

LSG

Bulk Supply Point (110kV-33kV Substation)

33kV Network

G

LSG

Primary Substation (33kV-11kV Substation)

11kV Network

G

G

G

G

c10-20 gens

Motorway

Motorway – Dual Carriageway junction

Dual Carriageway

Dual Carriageway – A road junction

A road

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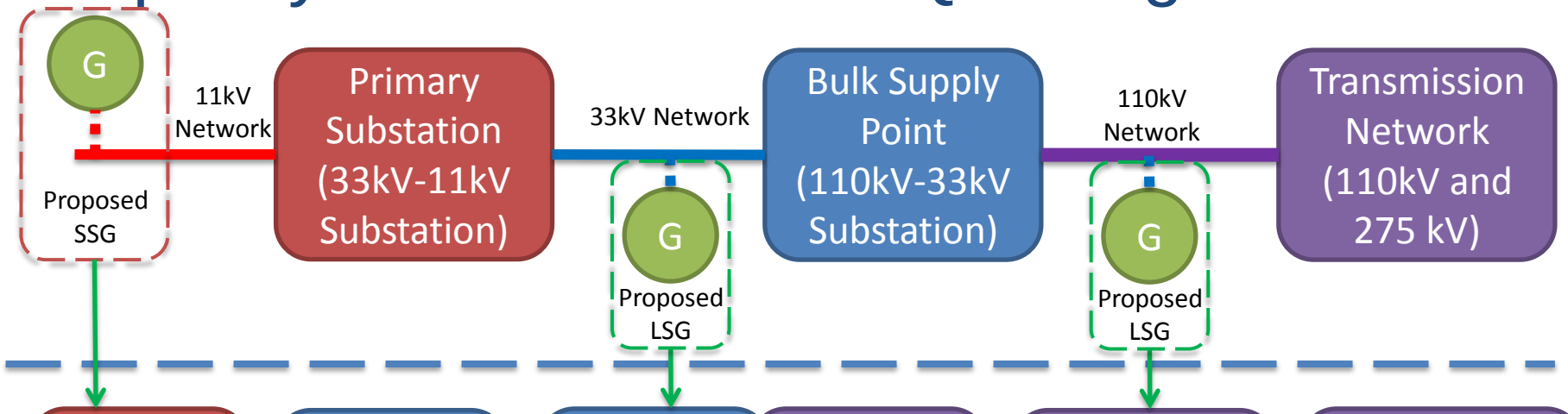
Capacity Assessment and Queuing



1. Assess Primary Substation - QUEUE 1
2. Assess 33kV Network QUEUE 2
3. Assess Bulk Supply Point QUEUE 3
3. Assess Bulk Supply Point QUEUE 3
4. Assess Transmission Network QUEUE 4
5. Assess Uncontrollable Limit QUEUE 5

Common Factors include (not limited to):

- Transformer ratings
- CB fault current ratings
- Generation Connected/Committed
- Minimum load
- Reverse power capability of S/S

i.e. Will connected generation exceed thermal capacities or voltage limitations of 33kV lines?
Technical studies required

SONI assess transmission equipment.
NIE Networks assess distribution equipment.
e.g.

- Transformer ratings
- Ratings of all substation equipment assessed
- CB fault current ratings also assessed
- Live power-flow data from substation analysed

Transmission Capacity?

Refer to Alternative Connection Application & Offer Process Decision Paper May 2016 (ACAOP) and SONI Transmission Assessment

Capacity Confirmed! 11kV (SSG) or 33kV (LSG) Network Design Progressed

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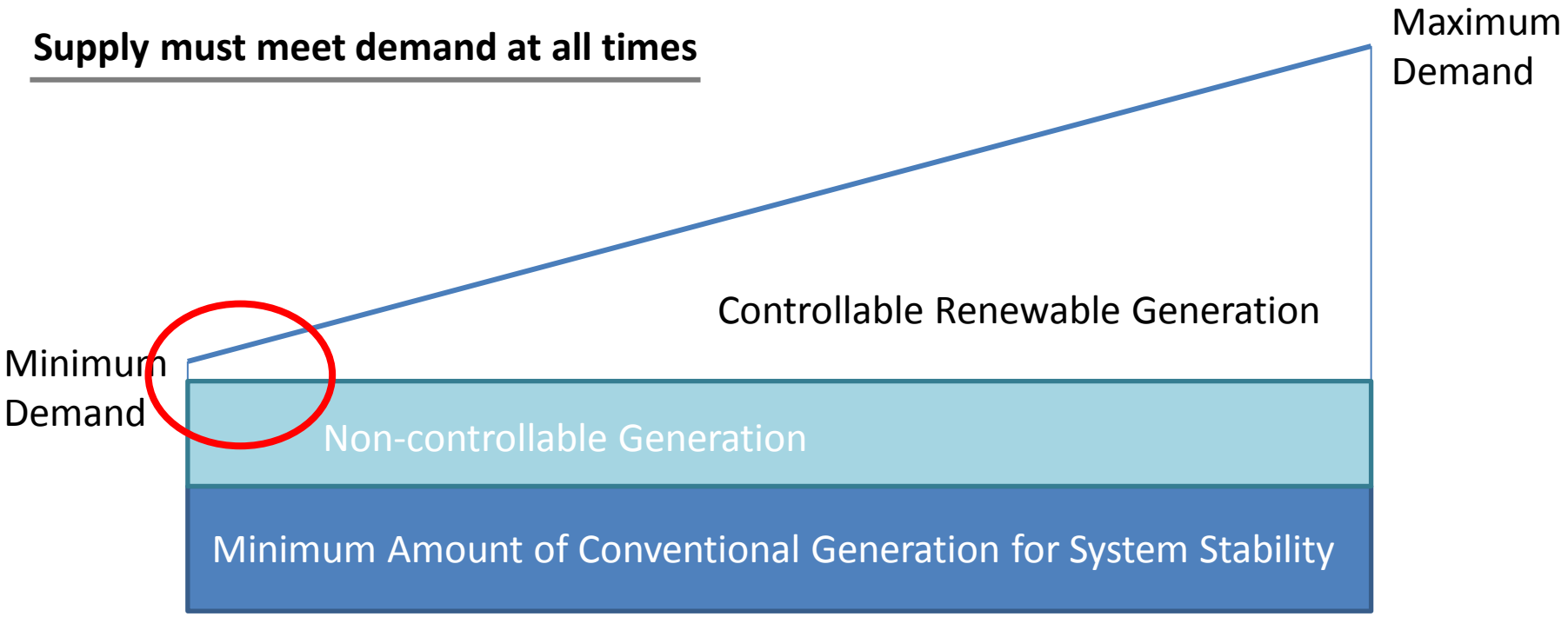
Uncontrollable Generation Limit

Supply must meet demand at all times



Renewable Connections Update

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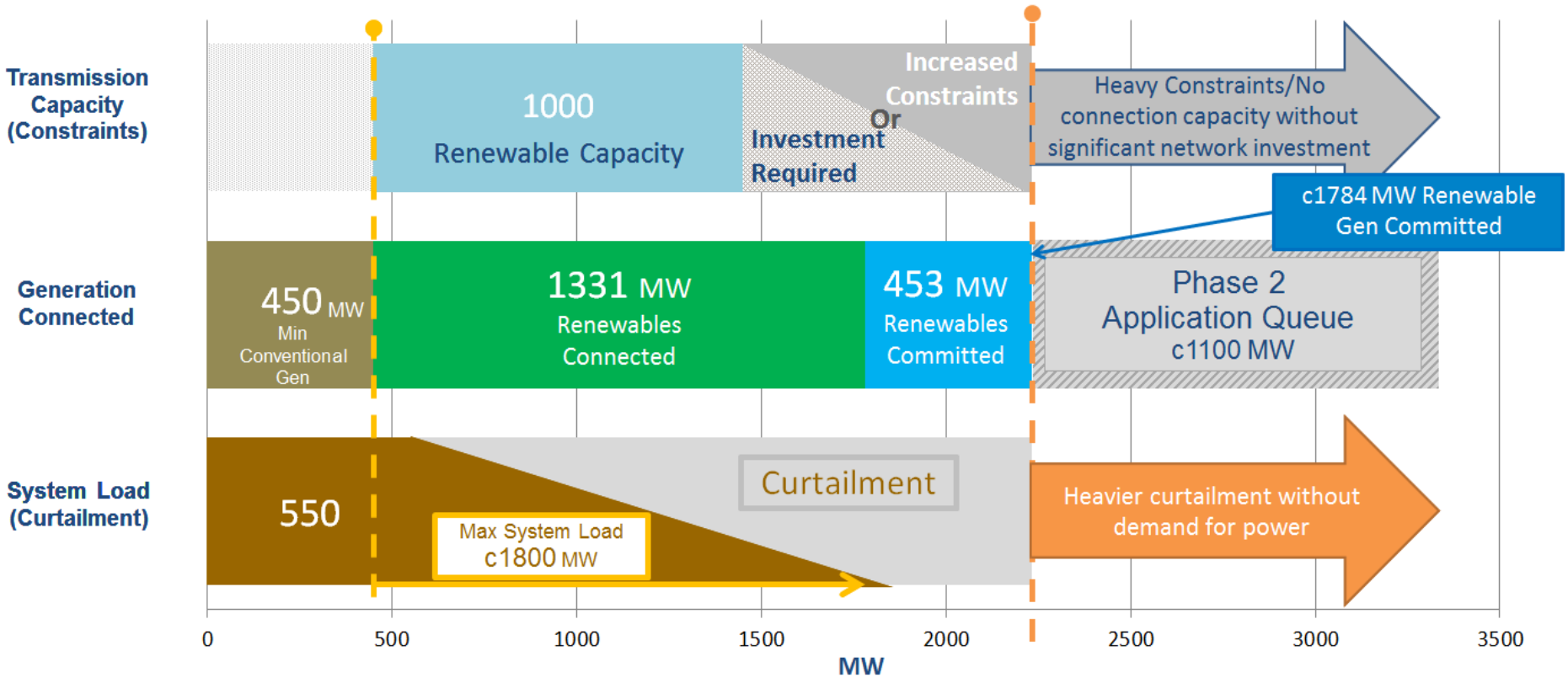
Renewable Connections Status



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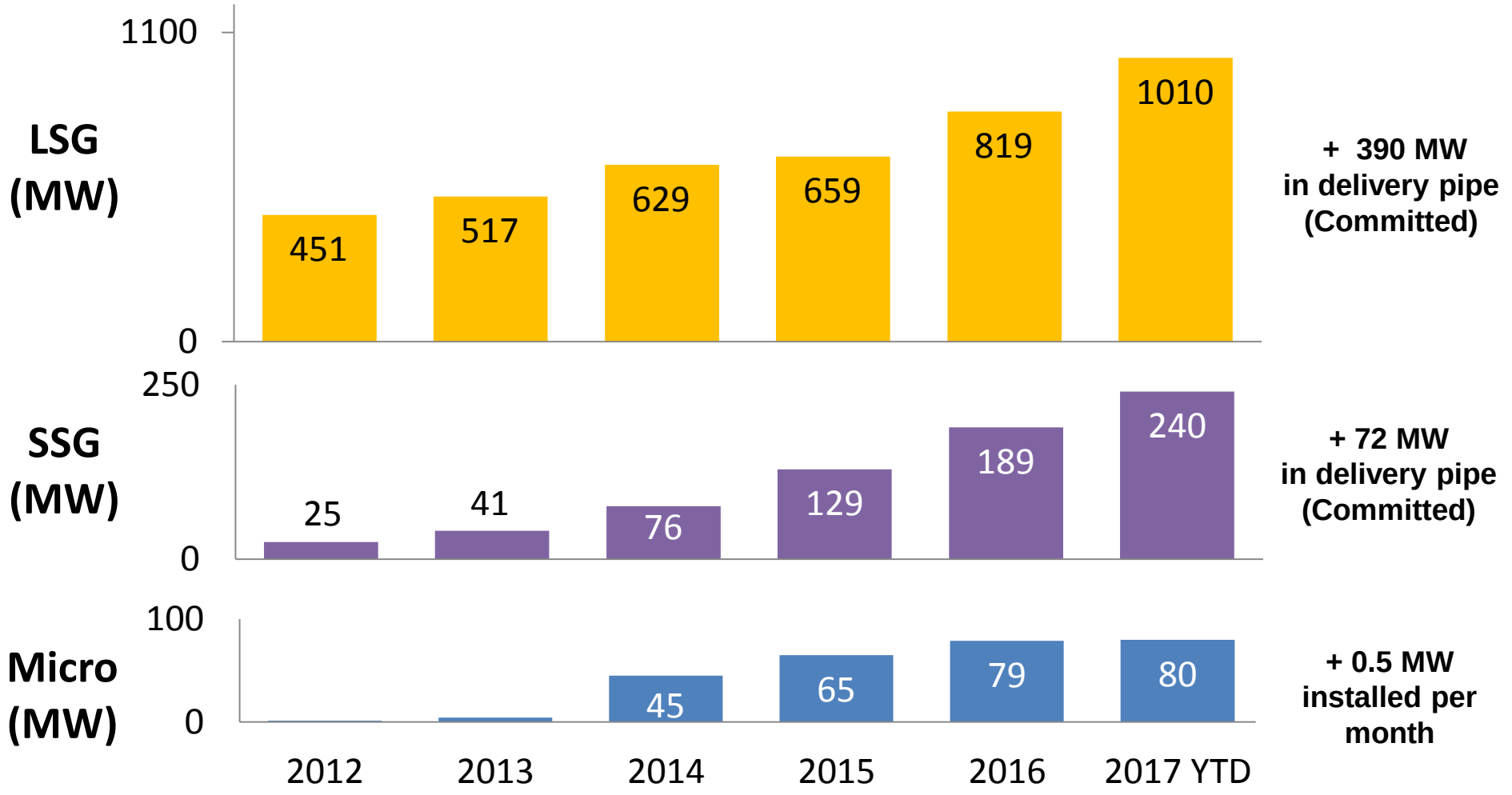
Connected Renewable Generation Growth



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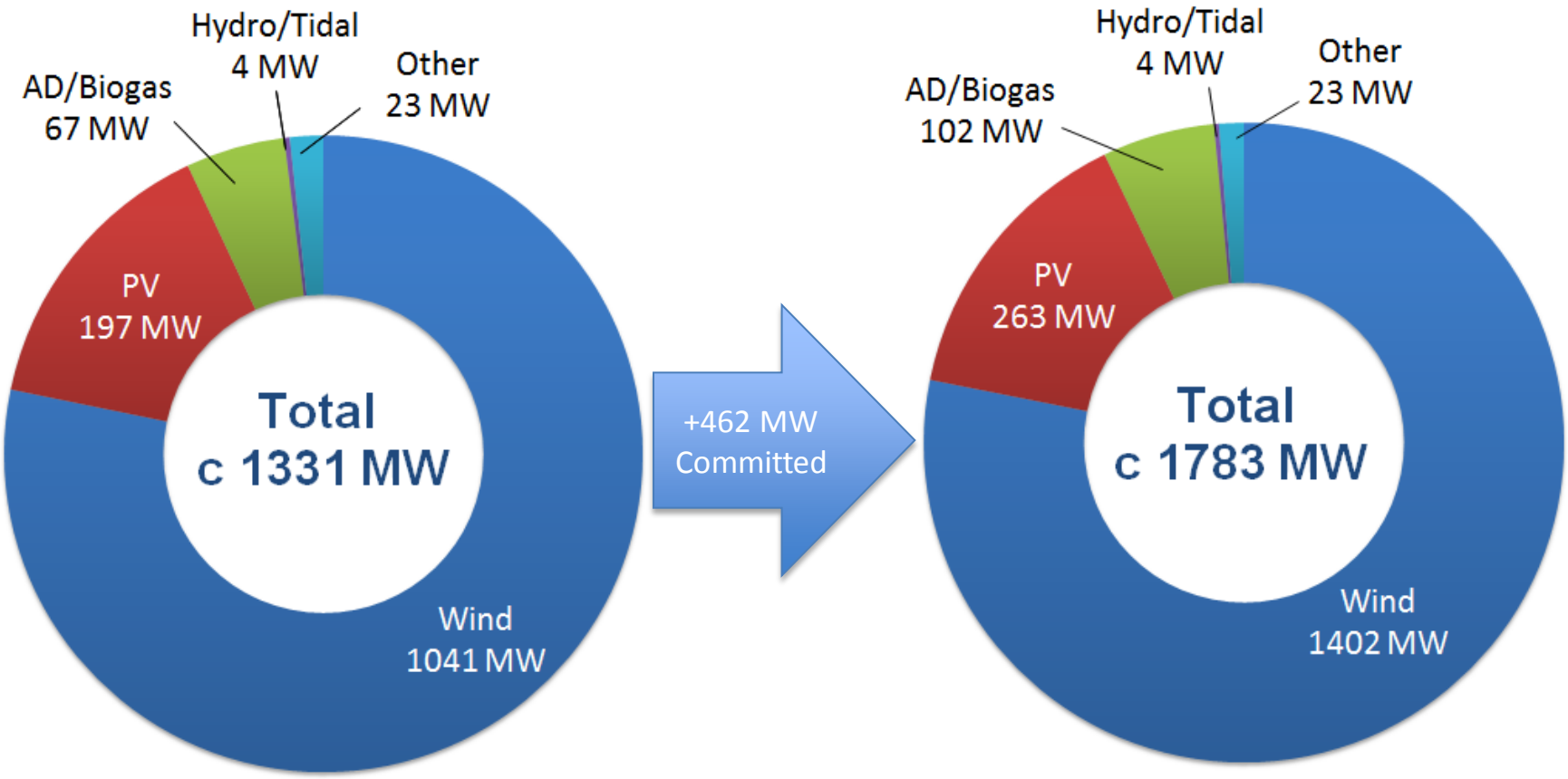
NI Renewable Generation Technology Mix



NI Connected Renewable Generation Technology Mix

NI Connected & Committed Renewable Generation Technology Mix

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Cluster update June 2017

Cluster	Present denominator (MW)	Connected (MW)	Committed (MW)	Remaining Capacity (MW) - not yet committed	Applications - (Awaiting Planning/ Quotation)
Magherakeel	138	119.2	0	18.8	23.4 (with Planning)
Gort	90	57.7	11	21.3	22.5
Tremoge	90	65	12.5	12.5	7.29
Rasharkin	90	93.7 (84.6 MEC)	5.4	0	13.2
Curraghmulkin (Drumquin)	90	0	88.6	1.4	63
Garvagh	90	0	90	0	37.4
Kells	90	0	0	90	61.4

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Total= 144 MW

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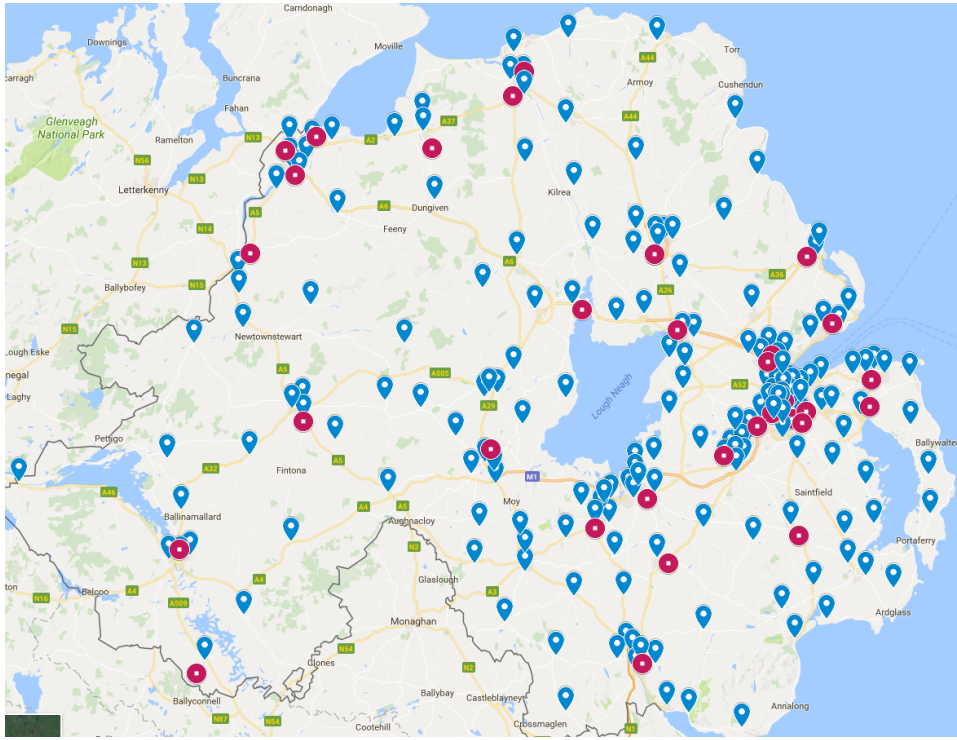
Distribution Constraints- RP6 Update

- c230 Primary substations across N.I (Blue markers on map)
- Capacity constraints became an issue from 2012 onwards, primarily in rural areas where demand for wind turbines was high
- £4.7M investment brought forward in RP5 to address c80 substations (c200+ connections)
- £10M investment now approved for RP6 to address load erosion and also facilitate zero-export
- Capacity restraints for export will have to be addressed via a different approach in absence of huge amounts of traditional investment



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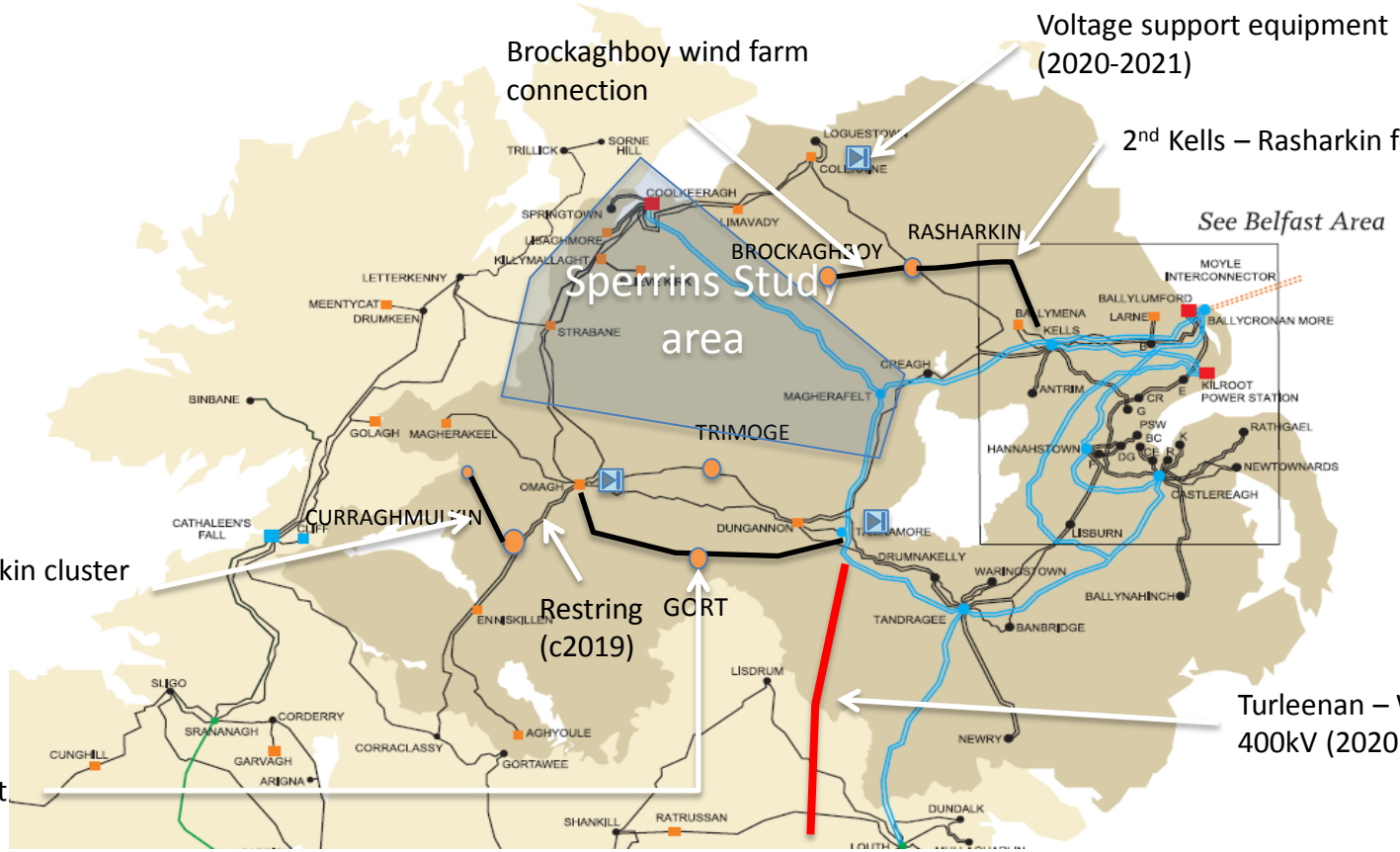
Current Transmission connection and development projects



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Phase 1 Review

(Alternative Connection Application and Offer Process)

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Phase 1 Decision Paper May 2016

- Phase 1 Aim: Exhaust all remaining transmission capacity (where further transmission system upgrades would not be required)
- Clusters capacity reserved- *Ongoing*
- Over install limit of up to 20% of MEC- *Ongoing*
- Zero-export limit of 25MW due to system stability- *Extended to 35MW*

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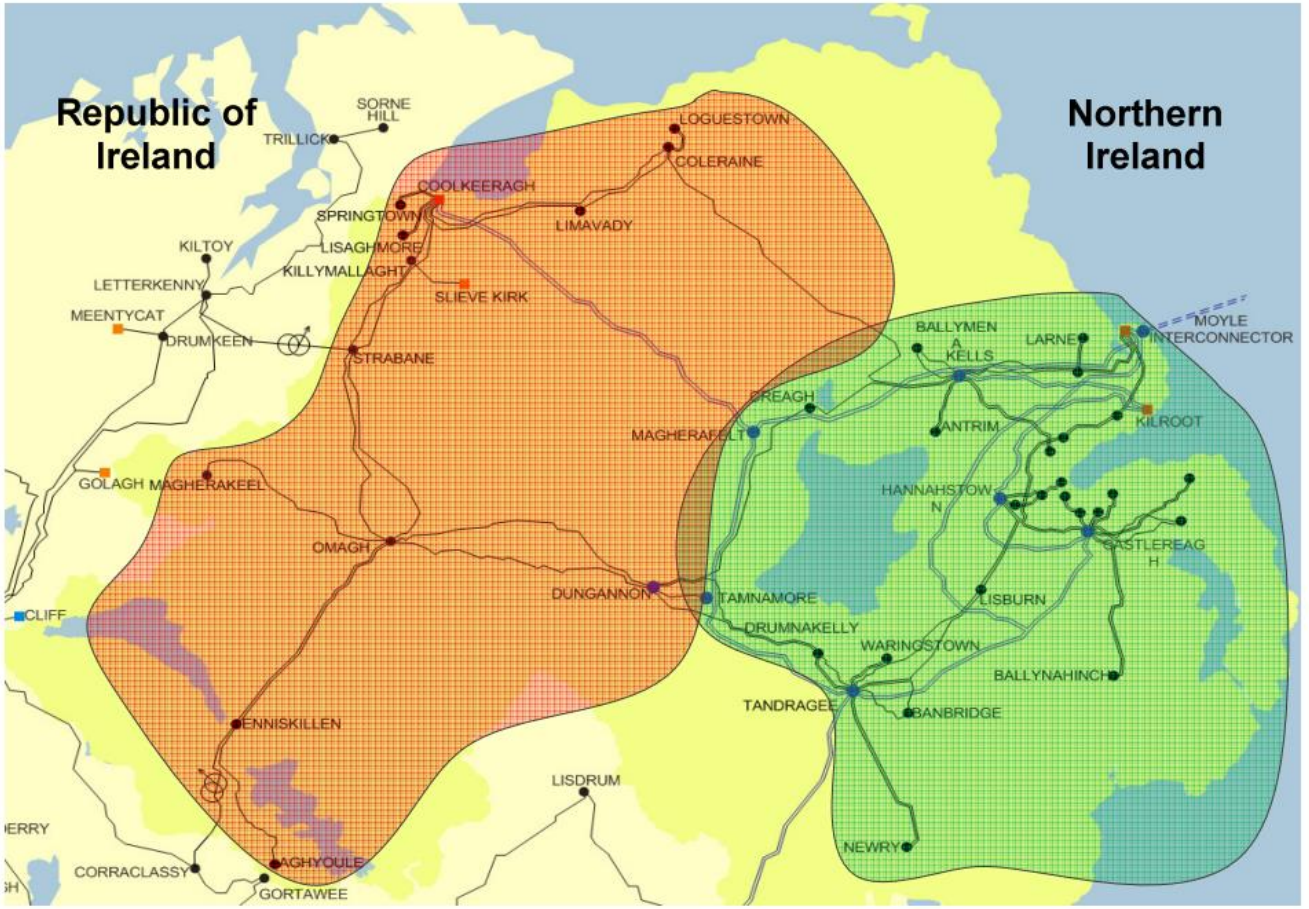
Phase 1 Update

May 2016: No capacity left in red area, c200MW left in green area.

August 2017: Capacity in the green area (Phase 1) has now been allocated.



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UR Connections Consultation

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UR Connections Consultation

Scope of consultation

- NIE Networks/SONI Licence
- Extensions to NIE Networks/SONI Licence standard
- Connections Process and Queue
- Provision of Network and Generator information
- Recovering Network Capacity
- Chargeability

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UR Connections Consultation Decision Paper
(May 2017)

- Extensions now to be the exception rather than the norm
- New process to agree extensions with UR
- NIE Networks and SONI to develop an approach to Phase 2

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Extensions

- Until now extensions have been sought from UR and granted until 30th November 2017
- Extensions are necessary to facilitate the generation connection queue
- Extensions granted by UR on basis of allocating remaining Phase 1 transmission capacity as defined in ACAOP.
- Further discussion on ‘block’ extensions at RGLG 27 June looking towards Phase 2
- Further clarification on extension process provided by UR 15 August
  - UR confirmed no further ‘block’ extensions beyond 30 November

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NIE Networks Options

Under NIE Networks Licence:

a) 90 day period in which to issue a connection offer (subject to available capacity)

or

b) Obtain an extension to the licence standard

or

c) Issue refusal to connect due to lack of capacity (or non-compliance with safety regulations)

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Summary-

What does this mean for applicants in the queue?

- For most applications - Refusal to Offer Connection prior to 30 November (subject to licence conditions)
- Refund will also be issued

With exception to the following smaller groups that comply with new extension process:

- Zero-export schemes
- Cluster connections (where capacity is available)
- Over installs
- Short-term parallel generators
- Applicants where there is an imminent chance of someone ahead in the queue dropping out that would release capacity

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Overall Summary

- 1.3GW+ Renewables Connected
- Almost 0.5GW still to connect
- Over 1/3 of our electricity now comes from renewable sources
- Successful exhaustion of capacity through Phase 1
- Challenges ahead beyond Phase 1

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Consultation objective- How can we move forward with generation connections?

- Consultation to inform and potentially work towards alternative solutions that:
  - Are within the current legal remits of NIE Networks and SONI
  - Are viable for generators
  - Solve the technical challenges faced
- Gain Industry feedback on approaches that should be considered

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Discussion Areas

Under the circumstances:

- What solutions might permit further access to the grid?
- What criteria should be applied to applicants seeking grid access?
- What is viable for applicants post phase 1?

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