3. Renewables Status Update
31 March 2018 Renewable Generation Status

**NI Connected Renewable Generation Technology Mix**
- Biogas: 105 MW
- PV: 246 MW
- Wind: 1193 MW
- Other/Mixed Schemes: 3 MW
- Hydro/Tidal: 7 MW

**Total c 1554 MW**

**NI Connected + Committed Renewable Generation Technology Mix**
- Biogas: 112 MW
- PV: 262 MW
- Wind: 1406 MW
- Other/Mixed Schemes: 4 MW
- Hydro/Tidal: 8 MW

**Total c 1792 MW**

+238 MW Committed
31 March 2018 Renewable Generation Status

- **Transmission Capacity (Constraints):**
  - 1000 MW Renewable Capacity
    - Investment Required
    - Or
    - Increased Constraints

- **Generation Connected:**
  - 1554 MW Renewables Connected
    - 238 MW Committed
    - +150 MW Remaining Cluster capacity
    - c1800 MW Renewable Gen Committed

- **System Load (Curtailment):**
  - 550 MW Min Load
    - Max System Load c1800 MW
    - Curtailment
    - Heavier curtailment without demand for power
## Cluster update 31 March 2018

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Present denominator (MW)</th>
<th>Connected (MW)</th>
<th>Committed (MW)</th>
<th>Remaining Capacity (MW) - not yet committed</th>
<th>Uncommitted Applications - (Queuing for capacity or Quotation issued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magherakeel</td>
<td>138</td>
<td>119.2</td>
<td>16.5</td>
<td>2.3</td>
<td>-</td>
</tr>
<tr>
<td>Gort</td>
<td>90</td>
<td>56.5</td>
<td>11</td>
<td>22.5</td>
<td>25.74</td>
</tr>
<tr>
<td>Tremoge</td>
<td>90</td>
<td>77.15</td>
<td>-</td>
<td>12.85</td>
<td>-</td>
</tr>
<tr>
<td>Rasharkin</td>
<td>90</td>
<td>99 (89.81 MEC)</td>
<td>-</td>
<td>0.19</td>
<td>No further capacity</td>
</tr>
<tr>
<td>Curraghmulkin (Drumquin)</td>
<td>90</td>
<td>0</td>
<td>67.9</td>
<td>22.1</td>
<td>-</td>
</tr>
<tr>
<td>Garvagh</td>
<td>90</td>
<td>0</td>
<td>90</td>
<td>0</td>
<td>No further capacity</td>
</tr>
<tr>
<td>Kells</td>
<td>90</td>
<td>0</td>
<td>0</td>
<td>90</td>
<td>168.4</td>
</tr>
</tbody>
</table>

Please note that due to factors outside of NIE Networks control, this information is subject to change at any time following publication.
4. Consultation on Connecting Further Generation in Northern Ireland
Introduction

• Background

• Distribution Generation Connection Application and Offer Process
  – Summary of Responses
  – Decision Paper

• Connecting Further Generation in Northern Ireland, Next Steps Paper
  – Summary of Responses
  – Outline of Next Steps Paper
  – ToR for Connection Innovation Working Group
Background

Level of Responses

- 15 responses received from industry, with the majority representing large scale generators, one representing small scale generators and another who was a manufacturer of smart technologies.

Approach to Decision

Two stage approach has been taken to the consultation

- Decision Paper 1 – Distribution Generation Application and Offer Process
- Decision Paper 2 – Connecting Further Generation in Northern Ireland, Next Steps
Distribution Generation Offer and Application Process
Sections 5.2 to 5.4 of Consultation
Summary of Responses

Level of Responses
15 responses received from industry, with the majority representing large scale generators, one representing small scale generators and another who was a manufacturer of smart technologies.

Phase 1 Milestone
- 91% agreed with the introduction of the Planning Approval Milestones
- 67% believed the Planning Approval Milestone should be brought forward to Acceptance
- All but one agreed that there should be no extensions to this milestone other than applicants undergoing a JR

Phase 2 Milestones
- 71% did not agree with the introduction of phase 2 milestones and believed they were too onerous
- They suggested that Longstop Dates should be introduced instead
Decision Paper on Distribution Generation Connection Application and Offer Process

Queuing Principles

• As of the 18th of May 2018 at 17:00, all new generation applications received will have their queue position determined by the date and time at which their application is deemed valid
• Those who had planning permission prior to the 18th of May 2018 at 17:00 had their queue position frozen

Milestones

• Planning Approval Milestone
  • 120 days from date of Terms Letter
  • No extension, other than projects undergoing a JR
• Longstop Milestone
  • 24 months after the Scheduled Completion Date
  • Extensions in case of force majeure
• Utilisation Milestone
  • For New/Modified Export – 24 months from date of connection works complete
  • For zero export/over-installs - 24 months from date of connection works complete
  • For offers with supply adequate – 24 months from date of Terms Letter
Connecting Further Generation in Northern Ireland, Next Steps
Sections 5.5 to 7.2 of Consultations
Summary of Responses

Forecast Statement Further Information Request
Respondents made a number of suggestions for further information which could be included within the SONI forecast statement, however the two main requests were:

- ATRs to make connected and committed generation firm with timelines
- Update constraint analysis which industry should be allowed to feed into

Sharing of Queue Information

- Large number of respondents in favour of a clause requiring mandatory disclosure of generation information to be published
- SONI share Transmission queue through the Connections register
- Recognition that sharing Distribution queue is outside NIE Networks’ control
- Requires further consultation, with suggestions that the consultation should be driven by those who have the power who can ultimately approve the information to be disclosed
Summary of Responses

DS3 Summary
• A number of respondents suggested prioritisation is not required as no batch in place
• Concerns around potential technology discrimination
• Need to consider how offers could be made to enable new entrants to access DS3 Tender process

Potential Capacity Solutions
• There was concerns that zero Firm Access Quantity (FAQ) offers could erode the viability of existing generators who do not have full FAQ
• Such zero FAQ offers might not be commercial viable for certain technologies
• Large support for formation of a Connection Innovation Working Group (CIWG)
• Updated constraint analysis required to allow industry to have an informed input
• Further information required on what level of capacity could be released by ANM scheme
• ANM scheme should be funded by an innovation price control allowance
Summary of Responses- Other Areas

Planning as a pre-requisite

• Stakeholders illustrated a strong wish for Planning Permission to be a pre-requisite for applying for a generation connection application and legislative changes should be made

NIAUR’s Role

• There was large support from stakeholders for NIAUR to be given additional powers to enable them to set connection policy due to the changing environment

Further Network Rebuild

• A large number of applicants believe there is no adequate substitute to network build and reinforcement and urge NIAUR, DfE, SONI and NIE Networks to work together to facilitate economic development

Rebates

• There was a call for NIE Networks to outline their proposals for facilitating rebates

Cluster Policy

• Small number of stakeholders believe there is merit in reviewing cluster policy as the commercial environment for applicants has been totally transformed
Connecting Further Generation in NI, Next Steps Paper

Minded to Position

Further Information Request

• Updated ATRs to be published on SONI’s website shortly
• An explanatory note will be published on SONI’s website to describe how best to use the different sources of information, provided by SONI, in conjunction

Sharing Queue Information

• NIE Networks agree that further consultation is required and agree that this should be consulted on by the body who can implement the change required.

DS3

• Lack of capacity in network and where capacity is available at present is locational
• No batch process to enable prioritisation
• No plan to change the connection process

CIWG

• Terms of Reference (ToR)
CIWG, ToR

Aim
To consider and as appropriate progress solutions that facilitate the connection of further Distributed Energy Resources in Northern Ireland, which are technically and commercially feasible for the System Operators and for DER developers/operators of both new and existing projects.

Initial area of investigation
• The technical feasibility of allowing distribution connections to be made on a potentially permanent basis with zero FAQ
• The commercial viability for DER operators of new and existing projects
  • Constraint/curtailment information and forecasting;
  • Network chargeability issues.

Anticipated deliverables
• Potential development of new connection policy to enable zero FAQ distribution connections
• Development of scope for further investigation of Smart schemes e.g. Active Network Management
CIWG, ToR

Membership Level
• 3 NIE Networks
• 3 SONI
• 6 Industry Representatives
• 1 UR
• 1 DfE

With the six Industry representatives selected through a nomination process similar to the Hybrid Site Working Group

Kick off meeting of the CIWG to be held at the start of September
Connecting Further Generation in NI, Next Steps Paper

What is not included within this Consultation

Rebates
• In the UR’s “Review of Distribution and Transmission Connection Policy” Decision paper, the UR stated that they had written to the Department, noting stakeholder views and that they are open to engagement on this issue
• NIE Networks and SONI are willing to engage

Cluster Policy
• NIE Networks has noted the support of stakeholders for the existing cluster methodology seen in the above UR consultation
• Further review of the cluster methodology will be considered dependent if capacity becomes available either through traditional reinforcement or findings of CIWG

Planning as a pre-requisite
• Implementation of this is outside the control of SONI or NIE Networks, to make this change it would require amendment to the primary legislation
• We therefore would formally like to pass on industry view to both DfE and UR that planning permission should be a pre-requisite for application of a generation connection for their consideration
Connecting Further Generation in NI, Next Steps Paper

What is not included within this Consultation

Network Reinforcement

- SONI will continue to put forward networks reinforcement options to the UR alongside cost benefit analysis report of carrying out such reinforcement in line with UR guidance published March 2018
- UR has indicated previously that it is that where network reinforcement are solely for generation purposes that the cost benefit analysis will be considered in line with current energy policy for NI
- NIE will bring forward any construction/capital approvals to the UR

Connecting Further Generation in NI, Next Steps Paper to be published by the end of June 2018
9. FAQ and ATR Update

RGLG Tuesday 5th June 2018
FAQ Status - Connected and Committed

- 886 MW Firm
- Total c 1434 MW
- 548 MW Require further ATRs
## ATRs – June 2018

<table>
<thead>
<tr>
<th>Associated Transmission Reinforcement (ATR)</th>
<th>Scheduled Completion Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Omagh - Tamnamore 3 – New 110 kV Circuit</td>
<td>Complete</td>
<td>Project Complete end January 2018</td>
</tr>
<tr>
<td>2 Omagh – Dromore 110 kV Double Circuit Uprate</td>
<td>2019</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>3 Voltage Support</td>
<td>2021</td>
<td>Pre-construction outline design</td>
</tr>
<tr>
<td>4 North South 400kV Project</td>
<td>2020</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>5 Coolkeeragh – Magherafelt 275 kV Double Circuit – Asset Replacement Project</td>
<td>2021</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>6 Kells – Rasharkin 2 – New 110 kV Circuit</td>
<td>2024</td>
<td>Pre-construction outline design</td>
</tr>
<tr>
<td>7 Ballylumford – Eden – Carnmoney – Castlereagh 110 kV Double Circuit Uprate</td>
<td>2025</td>
<td>Project Definition</td>
</tr>
<tr>
<td>8 Further Reinforcement of the Western Network</td>
<td>2027</td>
<td>Project Definition</td>
</tr>
</tbody>
</table>
9. Update on TDPNI and Renewable Developments

RGLG - 5\textsuperscript{th} June 2018
Overview

• TDPNI update - inc. Strategic Environmental Assessment (SEA)
• Current status of renewables
• New SONI Grid Development Process
• Update on reinforcement projects
• Transmission issues
TDPNI

- Licence condition 40 (October 2017) – SONI requirement to produce a ten year Transmission Development Plan from 2018
- Rolling plan updated yearly – current document under preparation covers 2018-2027
- Under Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (S.R. 280/2004) a SEA must be carried out
- SEA being carried out with RPS – scoping phase about to finish; SEA will be out for consultation in July
- TDPNI will be out for consultation in Q3
SONI’s Grid Development Process – An Overview

PART 1
- Identifying the optimum solution and what area may be affected
  - Control Point
  - What is being approved
  - Approval of the TNPP Submission to the Utility Regulator

PART 2
- Identifying where the project will be built
  - Control Point 1
  - Approval of the best performing option (area and technology)
  - Sub-Control Point 2
  - Approval of the Detailed Route / Site

PART 3
- Planning Application to Project Handover to NIE Networks
  - Control Point 2
  - Agreement to lodge Planning Application
  - Control Point 3
  - Approval to Issue TPI to NIE Networks and Enter TPA
Update on Reinforcement Projects

Omagh – Dromore restring

• Currently at SONI approval stage
• To be followed by issue of functional specification to NIEN

2nd Kells – Rasharkin 110 kV circuit

• At outline design stage
Transmission Issues

Coolkeeragh – Magherafelt phase angle issues

- Under a trip of the Coolkeeragh – Magherafelt double circuit during periods of high wind, the potential exists for a large voltage phase angle to open up between both stations.
- If this angle exceeds 20° then the lines cannot be safely reclosed.
- This threatens system security as planning standards are based on rapid restoration after transient faults.
- Significant disturbance to system causing heavy loading of 110 kV network.
Studies

• Previous studies (2016) highlighted issues
• 2025 full-year analysis

Assumptions:
• North-South Interconnector in place
• 2nd Kells – Rasharkin circuit in place
• Omagh, Coleraine and Tamnamore STATCOMs operational
• Coolkeeragh runback scheme operational
• New CCGT in east of NI
Preliminary Results

2025 Coolkeeragh - Magherafelt Phase Angle, post DCT
ST tripped, GT at pre-event output

Phase Angle difference (deg)

NI Wind Generation (MW)

GT Running
GT Off
2025 Coolkeeragh - Magherafelt Phase Angle, post DCT
Post-runback (ST tripped, GT at 160 MW)
Tremogue - Tamnamore 110 kV circuit
Line loading, post CPS-MAG DCT
Coolkeeragh ST tripped, GT at pre-event output
Results

• Probability of phase angle issues low but heavily dependent on assumptions
• Potentially a high impact/low probability event
• Likelihood of a double-circuit fault during adverse phase angle conditions low (but faults more likely in high wind)
• Sensitivities on wind profiles and potential projects necessary (Coolkeeragh – Trillick)
Next Steps

- Investigate redispatch options post-fault
- Statistical analysis on correlation of fault risk and wind speed and probabilistic risk assessment
- Sensitivity analysis
- Engage with stakeholders
Thanks for your attention
Any questions?
11. Operational Update
RoCoF Update
LSG RoCoF Progress

MW of LSG completed against time

Week Ending

Cumulative MW

Cumulative MW
LSG RoCoF Progress

• To date 96% (914MW) has been changed to new RoCof setting
• Over 1GW of 1Hz/s RoCoF compliant generation (including sites that have connected since the programme started)
• 5 LSG sites still to change
  • All remaining sites expected to test before end of June
  • All remaining sites date back to 1990’s and require G59 relay changes
  • All owners are committed to making the changes
Consultation Response and implementation plan options submitted to UR in Feb 18

Proposed that LoM (RoCoF) amended to 1.0Hz /second (with a 500ms time delay)

D-Code amendments approved by UR and D-Code Issue 4 published 11 May 2018

Implementation plan agreed based on view from UR

c1500 SSG sites in scope (c370MW excluding micro-generation)

Letters requesting G59 changes sent out 01 June 2018

SSG owners required to make changes by 30 September 2019
SSG RoCoF Implementation

- Letters requesting G59 changes sent out 01 June 2018
- SSG owners to acknowledge receipt by 29 June 2018
  - Online or by return pre-paid envelope
- For assurance purposes SSG owners to use G59 approved contractors
  - List of approved contractors on NIE Networks website
- G59 approved contractor list established following procurement exercise
  - c20 contractors on list
- SSG owners to make the changes by 30 September 2019
- Costs associated with making the changes borne by SSG owners
SSG RoCoF Progress

- G59 contractor technical workshop completed
- Briefing sessions held with interested parties, UFU, NIRIG, RGLG..
  - UFU to include article in the Farming Life newspaper
- Further briefing sessions will be held with owners of multiple SSG sites
  - 20 companies own 25% of SSG capacity
- c1500 letters sent to SSG owners
  - SAE envelopes included for acknowledgement test results returns
- G59 changes guidance note provided to SSG owners
  - Gives the reasons and benefits for the changes and the technical detail of how to implement the changes
Dear Sir/Madam,

**G59 SETTINGS NOTIFICATION**

We are writing to advise you that following an industry consultation the Distribution Code has been amended and that this affects the connection of your generator to the Distribution Network owned and operated by NIE Networks.

As a generator which is connected to the Distribution Network, you are required to comply with the Distribution Code (Issue 4) (available at [www.nienetworks.co.uk/distributioncode](http://www.nienetworks.co.uk/distributioncode)).

**You need to take action NOW to make changes to the G59 protection settings at your generator to ensure that your generator remains compliant with the latest Distribution Code (Issue 4). Failure to make the changes may result in your generator being disconnected from the Distribution Network.**

Full technical details of the changes you need to make to your generator and the reasons why they are being implemented are explained in the attached guidance document. However, in summary, you will need to:

- Engage a qualified engineer to update the G59 protection settings at your generator. Full details of G59 contractors are available online at [www.nienetworks.co.uk/G59contractors](http://www.nienetworks.co.uk/G59contractors).
- Confirm to NIE Networks by 29th June 2018 that you have received this letter and that you have engaged a G59 contractor. This can be done online at [www.nienetworks.co.uk/G59replyform](http://www.nienetworks.co.uk/G59replyform) or by post using the enclosed acknowledgement form and return envelope.
- For generators with a connection point at 11kV and above, book an appointment for an NIE Networks' engineer to witness a protection test of the new G59 settings.
11. Operational Update
SSG SCADA Update
SSG SCADA Enforcement Timeline

Total Sites Requiring SCADA: 635
SCADA SAT Certificates Issued: 1
SCADA Reminder Letters Issued: 310
Customer Responses: 11

Total Enforcement Notices Issued: 51
Customer Responses: 12
Enforcement Notices Expiring in 6 months: 10
Enforcement Notices Expiring in 60 days: 6
Sites in progress/testing: 0

Installer Enquiries: 4

Notes