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16 Air Quality and Climate Change

16.1 Executive Summary

1. The assessment of air quality and climate change effects, presented in Chapter 9 of the Consolidated Environmental Statement (ES) Addendum, included consideration of local air quality and climate change effects during construction and operation of the proposed Tyrone – Cavan Interconnector. During construction the assessment qualitatively considered the effect of dust generated within construction sites and the potential effect of this dust on nearby receptors. Emissions from construction phase traffic were also assessed qualitatively. Once operational the assessment qualitatively considered the effects on climate change through the facilitation of renewable energy sources.
2. During construction, the greatest potential dust impacts were predicted to be Medium Adverse due to earthworks and construction activity at the Turleenan substation site. The potential dust-generating impacts due to construction of the overhead line towers were predicted to be low or negligible due to the distance from receptors and small size of the individual working areas.
3. Appropriate construction dust mitigation controls will be put in place and the overall effect will be ‘not significant’.
4. Greenhouse gases will be emitted during the construction phase, although these emissions are unlikely to be significant compared with the facilitated emissions reductions expected once operational. During the operational phase the proposed Tyrone - Cavan Interconnector will facilitate the uptake of renewable energy sources, such as wind, by improving access to the end market. This will have long-term beneficial greenhouse gas and climate change effects. This will support government objectives and climate change reduction commitments.
5. As stated in the Statement of Case, Air Quality is identified at Annex A to the Strategic Planning Policy Statement as a material consideration. There will be no significant adverse effects as a result of the construction or operation of the proposal and road vehicle emissions are predicted to be negligible. Mitigation measures can ensure there will be no significant effect from dust. As identified in the Statement of Case, the proposal will be beneficial in terms of climate change which will support Government objectives for climate change reduction.

16.2 About the Author

6. The air quality and climate change assessment of the proposed Tyrone – Cavan Interconnector was undertaken by Dr. Tom Stenhouse, AECOM.
7. Dr. Stenhouse has a Master of Chemistry (MChem) Degree from the University of Leeds and a PhD in Atmospheric Chemistry from the University of Cambridge. He is a member of the Institution of Environmental Sciences, a member of the Institute of Air Quality Management and he is a Chartered Environmentalist. He has over 13 years of air quality consultancy experience at AECOM since 2003.

8. Dr. Stenhouse leads a team of air quality specialists who undertake a wide range of projects across several sectors for both public and private clients. He has managed the air quality inputs for a number of large schemes in Northern Ireland such as the A6 Claudy to Dungiven Roads Scheme. He is currently the air quality technical lead for National Grid's North Wales Connection project; the latest proposals, which were consulted on towards the end of 2016, involve a new overhead line across Anglesey and a tunnel under the Menai Strait.

16.3 Policy and Guidance Informing Assessment

9. Policy and Guidance Information is contained in the Consolidated ES Addendum, Volume 2, Chapter 9 – Air and Climate Change (pages 110-114) and the Statement of Case that has been prepared for the proposed Tyrone – Cavan Interconnector.

16.4 Summary of Documents

10. This technical report summarises and incorporates by reference the content of the documents submitted in support of the planning applications for the proposed Tyrone – Cavan Interconnector in respect of air quality and climate change. The relevant documents are:
 - Consolidated ES Addendum, Volume 2, Chapter 9 - Air and Climate Change (pages 101 – 123);
 - Cumulative Impact Assessment in the Consolidated ES Addendum (page 77-78); and
 - Transboundary Impact Assessment in the Consolidated ES Addendum (page 86).
11. This technical report must therefore be read in conjunction with the Consolidated ES Addendum, and not as a standalone document.
12. In a general sense all EIA documentation is interrelated and, particularly with respect to the interaction of impacts, all the Consolidated ES documents would be relevant. For clarity the documents the author considers to be the key documents are summarised above. The reader should form his or her own view on what documents within the Consolidated ES and its Addendum are relevant, and key, to the topic under consideration.
13. In the interest of readability these documents are not reproduced in full in this technical report.

16.5 Further Environmental Information for the Purposes of the Inquiry

14. Since the publication of the Consolidated ES and its Addendum, the following environmental information has become available, and is presented for the purposes of the inquiry. Accordingly, and by virtue of Regulation 23(6) of the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2015 the requirements of paragraphs (4) and (5) of the said Regulation 23 do not apply.

15. The EPUK guidance document mentioned under Section 16.3, 'Development Control: Planning for Air Quality (2010 Update)' has been superseded in England and Wales by, 'Land-Use Planning & Development Control: Planning for Air Quality' (EPUK and IAQM, 2015). Whilst the 2015 guidance does not apply to the planning system in Northern Ireland, however it has been reviewed and the new guidelines would have had no significant effect on the scope of assessment, methods, or conclusions.
16. Recent baseline conditions have been reviewed and it is confirmed that they are not significantly different to the baseline conditions reported in the Consolidated ES Addendum, summarised below under Section 16.10.

16.6 Scope of Assessment

17. This is a summary of the information contained in the Consolidated ES Addendum, Volume 2, Chapter 9 – Air and Climate Change (pages 101-109).
18. A review of all environmental aspects of the proposed Tyrone – Cavan Interconnector was undertaken by the applicant and its specialist advisers. Following consultation with the Department for Infrastructure (then known as the Department for the Environment), the scoping process applicable to the proposed Tyrone – Cavan Interconnector was confirmed; the Department for Infrastructure provided a written opinion on the topics to be covered by the EIA of the proposed Tyrone – Cavan Interconnector. Consultations were subsequently undertaken with stakeholders on the basis of the scoping process.
19. Further details are provided in the Consolidated ES, Volume 2, Chapter 6 (Scoping and Consultation).
20. The assessment of air quality and climate change effects, presented in Chapter 9 of the Consolidated ES Addendum, included consideration of local air quality and climate change effects during construction and operation. During construction the assessment qualitatively considered the effect of dust generated within construction sites and the potential effect of this dust on nearby receptors. Emissions from construction phase traffic were also assessed. Once operational the assessment qualitatively considered the effects on climate change through the facilitation of renewable energy sources.
21. Further details are provided in the Consolidated ES Addendum, Volume 2, Chapter 9, Section 9.2 (Assessment Methodology – pages 101-114).

16.7 Consultation Responses

22. The pre-submission consultation for the assessment is presented in detail in the Consolidated ES Chapter 6 Scoping and Consultation (pages 151 - 156).
23. No specific comments were made in relation to air quality and climate by the statutory consultees.

16.8 Methodology and Surveys

24. This is a summary of the information contained in the Consolidated ES Addendum, Volume 2, Chapter 9 - Air and Climate Change (pages 101 – 114).

25. During construction, potential local air quality effects will be primarily associated with the generation of dust and road vehicle emissions. The potential for effects has been assessed with reference to Institute of Air Quality Management (IAQM) published guidance¹. Effects have been considered with regards to the construction of the substation and the construction of the overhead line with reference to IAQM descriptors.
26. The potential air quality impacts have been assessed for the traffic generated by the construction phase with reference to the DMRB, Volume 11, Section 3, Part 1 HA 207/07 (HA, 2007). However traffic generation was sufficiently low that no quantitative assessment was necessary.
27. Climate change effects associated with construction (through the transportation of construction materials and the consumption of raw materials) and operation (through facilitation of renewable energy sources) were assessed qualitatively with reference to the UK and Northern Ireland climate change commitments.
28. The operation and maintenance of the proposed Tyrone – Cavan Interconnector will not result in the potential for an impact upon local air quality.
29. No specific surveys were required for air quality and climate.
30. Further details are provided in the Consolidated ES Addendum, Volume 2, Chapter 9, Section 9.2 (Assessment Methodology – pages 101-114).

16.9 Assessment Overview

31. This is a summary of the information contained in the Consolidated ES Addendum, Volume 2, Chapter 9 - Air and Climate Change (pages 101 – 123), which considers the potential for local air quality and climate change effects resulting from construction activities, construction traffic, and once operational.
32. The nearest extant residential dwelling to the Tyrone - Cavan Interconnector is 54m from the centreline of the overhead line. The nearest extant residential dwelling to a working area (tower base) is approximately 85m. There is also a consented residential planning application near to Tower 47. If constructed as consented, this dwelling would be 49m from the centreline of the overhead line and 80m from the working area of Tower 47. No residential receptors, existing or consented, will experience a significant effect.
33. No other sensitive receptors, such as hospitals or schools, were identified within 200m of the proposed Tyrone – Cavan Interconnector. Certain habitats and designated sites can be sensitive to impacts from dust. However there are no sensitive habitats within 200m that could be affected by dust soiling or have that a statutory national or international designation.
34. Proposed access routes to some of the associated construction sites pass through two Air Quality Management Areas (Moy AQMA & Armagh AQMA), Lough Neagh and Lough Beg Ramsar and Special Protection Area (SPA) as well as passing within 200m of Drumcarn Area of Special Scientific Interest (ASSI). Impacts due to emissions from vehicle movements are considered insignificant.

¹ Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014)

35. One residential property and some agricultural sheds at the proposed substation site will be demolished to facilitate the proposed Tyrone – Cavan Interconnector, but the impact of this component on air quality, due to dust generation, is classified as negligible.
36. The potential dust-generating impacts due to the construction of the overhead line towers and associated works were predicted to be low or negligible due to the distance from residential and ecological receptors from the construction areas and small size of the individual sites.
37. The construction of the substation has the potential to generate significant dust due the earthworks. However in-line with the IAQM guidelines, mitigation will be put into place to control the impacts and overall it is considered that the impacts during the construction phase will be of ‘Negligible’ significance.
38. Greenhouse gases will be emitted during the construction phase through the consumption of materials and energy; however these emissions are unlikely to be significant compared with the facilitated emissions reductions expected once operational.
39. Once operational, any effects will be restricted to the consequence of the proposed Tyrone – Cavan Interconnector on the facilitation of renewable energy sources. This will have long-term beneficial greenhouse gas and climate change effects, and will support government objectives and climate change reduction commitments.
40. The operation and maintenance of the proposed Tyrone – Cavan Interconnector will not result in an impact upon local air quality. There will be no emissions from the towers or overhead lines, and associated maintenance traffic will be very low (two to four vehicles per day to facilitate the operation and maintenance of the substation).
41. The decommissioning of the proposed Tyrone – Cavan Interconnector is assessed in Chapter 1 of Volume 2 of the Consolidated ES Addendum (page 5). The effects of decommissioning would be temporary and of a similar scale to or less than the construction phase, as described and assessed in the Consolidated ES. Similar mitigation measures as described for the construction stage in the Consolidated ES should be again implemented to ensure the minimisation or elimination of any environmental impacts.

16.10 Baseline Conditions

42. This is a summary of the information contained in the Consolidated ES Addendum, Volume 2, Chapter 9 - Air and Climate Change (page 114-115).
43. Armagh City, Banbridge and Craigavon Borough Council has declared two Air Quality Management Areas (AQMA) in the city of Armagh, whilst Mid Ulster District Council has declared four AQMA (two in Dungannon, one in Coalisland and one AQMA in Moy).
44. The Tyrone - Cavan Interconnector is not located within any existing AQMA, and is not within 200m of any ecological designated sites (the proposed substation is 3.6km from the Lough Neagh and Lough Beg Ramsar boundary).
45. The proposed haul routes for traffic accessing some of the tower construction sites (see Chapter 18 Transport of the Consolidated ES) associated with the Tyrone - Cavan Interconnector will pass through two AQMA and within 200m of two designated ecological sites. These are:

- Moy AQMA (In the Mid Ulster District Council area);
 - Armagh AQMA – A29/A3 (In the Armagh City, Banbridge and Craigavon Borough Council area);
 - Lough Neagh and Lough Beg Ramsar and Special Protection Area (SPA) (immediately adjacent to the M1, which will be used as a haul route) ; and,
 - Drumcarn Area of Special Scientific Interest (ASSI).
46. The nearest extant residential dwelling to the Tyrone - Cavan Interconnector is 54m from the centreline of the overhead line. However the nearest extant residential dwelling to a working area (tower base) is approximately 85m. Section 1 of this Addendum identifies a consented residential planning application near to T47. If constructed as consented, this dwelling would be 49m from the centreline of the overhead line and 80m from the working area of T47.
47. There are no other sensitive receptors (such as hospitals, schools, residential care homes, etc.) within 200m of the centreline of the Tyrone - Cavan Interconnector. There is a day nursery approximately 900m from the Tyrone - Cavan Interconnector and a primary school approximately 700m away.
48. No air quality monitoring is undertaken by the Councils near the Tyrone - Cavan Interconnector. Modelled estimations of background air quality concentrations are provided by Defra (Defra 2014) for each 1 km square in the UK for each year between 2010 and 2030.
49. The data provided by Defra are broadly representative of background concentrations throughout the route as it is rural for the whole length, and generally similar to the area around the proposed substation. The annual mean concentrations estimated by Defra were very low and well below the annual mean objectives.
50. Further details are provided in the Consolidated ES Addendum, Volume 2, Chapter 9, Section 9.3 (Baseline Conditions – pages 114-115).

16.11 Assessment of Impacts Without Proposed Mitigation

51. This is a summary of the information contained in the Consolidated ES Addendum, Volume 2, Chapter 9 - Air and Climate Change (pages 115 - 119).
52. It is considered that there will be no significant air quality effects due to construction vehicle emissions.
53. Without any mitigation, the effects due to dust soiling were considered to be at worst 'low risk', both in the vicinity of the Turleenan Substation, and in the vicinity of the overhead line towers. Effects on human health, were considered to be at worst 'medium risk' in the vicinity of Turleenan Substation, but no worse than 'low risk' elsewhere.
54. Greenhouse gases will be emitted during the construction phase through the consumption of materials and energy; however these emissions are unlikely to be significant compared with the facilitated emissions reductions expected once operational.
55. Once operational, any effects will be restricted to the consequence of the proposed Tyrone – Cavan Interconnector on the facilitation of renewable energy sources. This will

have long-term beneficial greenhouse gas and climate change effects, and will support government objectives and climate change reduction commitments.

56. The operation and maintenance of the proposed Tyrone – Cavan Interconnector will not result in an impact upon local air quality. There will be no emissions from the towers or overhead lines, and associated maintenance traffic will be very low (two to four vehicles per day to facilitate the operation and maintenance of the substation). The level of vehicle emissions from the operation and maintenance traffic will not result in any likely significant air quality effects.
57. Further details are provided in the Consolidated ES Addendum, Volume 2, Chapter 9, Section 9.4 (Predicated Impacts – pages 115-119).

16.12 Proposed Mitigation

58. The full mitigation measures are outlined in the Consolidated ES Addendum, Volume 2, Section 9.5, (Mitigation and Enhancement Measures - pages 119-122).
59. Construction vehicle routing will be implemented to further minimise the effect of construction vehicle emissions on receptors.
60. Appropriate construction dust mitigation controls will be implemented as good practice to ensure the minimisation or elimination of potential impacts, and the residual effect will be 'not significant'. Appropriate mitigation measures are suggested by IAQM, and include the use of water sprays and enclosure, the correct storage of materials, wheel washing (within the planning application boundaries), vehicle routing plans, and regular monitoring. The measures suggested by IAQM will be implemented.

16.13 Residual Impacts With Proposed Mitigation

61. Further details are provided in the Consolidated ES Addendum, Volume 2, Chapter 9, Section 9.6 (Residual Impacts – pages 122-123).
62. It is considered that there will be no significant air quality effects due to construction vehicle emissions because of the relatively limited numbers and the scale of the impacts.
63. Appropriate construction dust mitigation controls will be implemented and the residual effect will be of 'Negligible' significance (not significant).
64. The operation and maintenance of the proposed Tyrone – Cavan Interconnector will not result in an impact upon local air quality.
65. The operation of the Tyrone - Cavan Interconnector is expected to be beneficial on a long-term national and regional scale in terms of climate change effects.

16.14 Cumulative Impacts

66. This is a summary of information that is contained in Chapter 5 of the Consolidated ES Addendum (pages 77-78). A further assessment of cumulative effects is outlined in the Joint Environmental Report for the proposed Interconnector project (i.e. the project in Northern Ireland and Ireland). This is contained in Volume 3 Appendix 2.1 of the Consolidated ES Addendum.

67. In considering the effect of the Tyrone - Cavan Interconnector, in terms of air quality, and potential interactions and cumulative effects associated with other development proposals, it is concluded that the potential cumulative air quality impacts are 'Imperceptible'.
68. With regard to cumulative climate change and greenhouse gas effects, the emissions associated with construction work are unlikely to be significant compared with the facilitated emissions reductions expected once the Tyrone – Cavan Interconnector is operational. During the operational phase the Tyrone – Cavan Interconnector will increase transmission capacity and facilitate the uptake of renewable energy sources, such as wind, by improving access to the end market, which will have overall long-term beneficial greenhouse gas and climate change effects.

16.15 Transboundary Impacts

69. This is a summary of information that is contained Chapter 6 of the Consolidated ES Addendum (page 86). A further assessment of transboundary effects is outlined in the Joint Environmental Report for the proposed Interconnector project. This is contained in Volume 3 Appendix 2.1 of the Consolidated ES Addendum.
70. The construction works within Northern Ireland will have limited dust generating potential and with the proposed mitigation measures, there will be no transboundary effects in terms of air quality. Additionally, construction traffic will not generate significant emissions.
71. During the operational phase the Tyrone – Cavan Interconnector will increase transmission capacity and facilitate the uptake of renewable energy sources, such as wind, by improving access to the end market, which will have overall long-term beneficial greenhouse gas and climate change effects. This will result in beneficial transboundary effects.

16.16 Response to Third Party and Statutory Consultee Submissions

72. Between 2009 and 2012, there were approximately 6,000 third party submissions made in relation to the proposed Tyrone – Cavan Interconnector. These were reviewed and taken into account in the writing of the Consolidated ES. Following the publication of that document in 2013, from May 2013 to May 2015, 2957 third party submissions were made, none of which related to air quality and climate issues. All submissions that were made and have been taken into account in the writing of the Consolidated ES Addendum.
73. Between June 2015 and November 2016, there have been 594 third party submissions and of these 19 submissions made reference to air quality and climate issues. The general issues raised by objectors relate to air quality impacts associated with emissions from construction traffic and the overall effect of the Proposed Development on greenhouse gas emissions. The submissions did not raise any material considerations or any issues that were not addressed within the Consolidated ES and Addendum. The issues raised by the submissions are examined, analysed and evaluated in Chapter 9 of the Consolidated ES Addendum.

74. No statutory consultee has identified any issues with air quality and climate change. Armagh City, Banbridge and Craigavon Borough Council, in a letter dated 23rd September 2015, acknowledge the main air and climate conclusions presented by the applicant, but do not express any concerns.

16.17 Events since the Addendum

75. Since the publication of the Consolidated ES and its Addendum, the following environmental information has become available, and is presented to the inquiry for the purposes of the inquiry. Accordingly, and by virtue of Regulation 23(6) of the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2015 the requirements of paragraphs (4) and (5) of the said Regulation 23 do not apply.
76. No consultation responses have been received regarding air quality or climate change since the submission of the last addendum.
77. There have been no policy or legislative changes since the submission of the last addendum that affect the assessment.
78. There has been no change to relevant guidance since the submission of the last addendum, with the exception of an update to EPUK guidance document, 'Development Control: Planning for Air Quality (2010 Update)'. However the updated document (EPUK and IAQM, 2015) does not apply to the planning system in Northern Ireland, and even if it had been followed, it would have had no significant effect on the scope of assessment, methods, or conclusions.
79. There has been no significant change to baseline conditions since the submission of the last addendum.
80. As outlined in the Statement of Case and in Construction Technical Report (No. 4), alternative access is required to Tower 40 because of the construction of a chicken shed. Two alternative access tracks are described and assessed in the Construction Technical Report (No. 4). An assessment in terms of air quality and climate change for the alternative access tracks is included in that Technical Report.
81. Confirmatory aerial surveys of the entire proposed Tyrone – Cavan Interconnector (proposed substation area and 500m either side of the overhead line centreline, which includes the proposed access tracks) were undertaken in October 2016. This photography was reviewed in terms of the air quality baseline conditions and nothing of note was detected.

16.18 Summary and Conclusions

82. The assessment of air quality and climate change effects, presented in Chapter 9 (page 123) of the Consolidated Environmental Statement (ES) Addendum, included consideration of local air quality and climate change effects during construction and operation.
83. During construction the assessment qualitatively considered the effect of dust generated associated with the construction of the proposed Turleenan substation and overhead line towers and the potential effect of this dust on nearby receptors. Emissions from

construction phase traffic were also assessed qualitatively. Appropriate construction dust mitigation controls and construction vehicle routing will be implemented and the residual effect will be 'not significant'.

84. During the operational phase the proposed Tyrone – Cavan Interconnector will increase transmission capacity and facilitate renewable energy sources, such as wind, by improving access to the end market. This will support government objectives and climate change reduction commitments. Technical Report 1, which addresses the Need for the Proposed Development, explains in greater detail how it will facilitate renewable energy sources, and specifically how it removes the risk of system separation and ensures that Rate of Change of Frequency issues specific to Northern Ireland are avoided.
85. Greenhouse gases will be emitted during the construction phase, although these emissions are unlikely to be significant compared with the facilitated emissions reductions and climate benefits expected once operational.
86. The operation and maintenance of the proposed Tyrone – Cavan Interconnector will not result in any significant local air quality impacts.
87. As stated in the Statement of Case - Air Quality is identified at Annex A to the Strategic Planning Policy Statement as a material consideration. There will be no significant adverse effects as a result of the construction or operation of the proposed Tyrone – Cavan Interconnector and road vehicle emissions are predicted to be negligible. Mitigation measures will ensure there will be no significant effect from dust. As identified in the Statement of Case, the proposal will be beneficial in terms of climate change which will support Government objectives for climate change reduction.