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Report on the individual review of the annual submission of Ireland submitted in 2016*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol, with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2016 annual submission of Ireland, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 29 August to 3 September 2016 in Bonn, Germany.

* In the symbol for this document, 2016 refers to the year in which the inventory was submitted, not to the year of publication.

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Contents

I. Introduction[1]

1. This report covers the review of the 2016 annual submission of Ireland organized by the UNFCCC secretariat, in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1, as revised by decision 4/CMP.11) (hereinafter referred to as the Article 8 review guidelines). As indicated in the Article 8 review guidelines, this review process also encompasses the review under the Convention, as described in the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" (hereinafter referred to as the UNFCCC review guidelines) and particularly part III, "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention". The review took place from 29 August to 3 September 2016 in Bonn, Germany, and was coordinated by Mr. Tomoyuki Aizawa (UNFCCC secretariat). Table 1 provides information on the composition of the expert review team (ERT) that conducted the review of Ireland.

Table 1
Composition of the expert review team that conducted the review of Ireland

Area of expertise	*Name*	*Party*
Generalist	Mr. Christopher John Dore	United Kingdom of Great Britain and Northern Ireland
	Ms. Kristina Saarinen	Finland
Energy	Ms. Tahira Munir	Pakistan
	Mr. Peter Seizov	Bulgaria
	Ms. Nina Uvarova	Russian Federation
IPPU	Ms. Pia-Kristiina Forsell	Finland
	Mr. Andrew Neal	New Zealand
Agriculture	Ms. Marci Baranski	United States of America
	Mr. Abdulkadir Bektas	Turkey
	Mr. Paulo Cornejo Guajardo	Chile
	Mr. Pa Ousman Jarju	Gambia
LULUCF	Mr. Rizaldi Boer	Indonesia
	Mr. Johannes Brötz	Germany
	Ms. Oksana Butrym	Ukraine
	Ms. Naoko Tsukada	Japan
Waste	Mr. Seungdo Kim	Republic of Korea
	Ms. Mayra Rocha	Brazil
Lead reviewers	Ms. Mayra Rocha	
	Ms. Kristina Saarinen	

[1] At the time of publication of this report, Ireland had not yet submitted its instrument of ratification of the Doha Amendment, and the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry.

2. This report contains findings based on the assessment by the ERT of the 2016 annual submission against the Article 8 review guidelines. The ERT has made recommendations to resolve those findings related to issues,[2] including issues related to problems.[3] Other findings, and, if applicable, the ERT's encouragements to resolve them, are also included.

3. A draft version of this report was communicated to the Government of Ireland, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

4. Annex I shows annual greenhouse gas emissions for Ireland, including totals excluding and including the land use, land-use change and forestry sector and indirect carbon dioxide emissions, and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and additional activities under Article 3, paragraph 4, of the Kyoto Protocol, if elected, by gas, sector and activity for Ireland.

5. Information to be included in the compilation and accounting database can be found in annex II.

6. The ERT notes that Ireland's 2015 annual submission was delayed, consistent with decision 6/CMP.9, paragraph 4. As a result, the review of the 2016 annual submission is being held in conjunction with the review of the 2015 annual submission, in accordance with decision 10/CMP.11, paragraph 1. To the extent that identical information is presented in both annual submissions, the ERT has reviewed this information only once, and, as appropriate, has replicated the findings below in both the 2015 and the 2016 annual review reports.

II. Summary and general assessment of the 2016 annual submission

7. Table 2 provides the ERT assessment of the annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5 below.

Table 2
Summary of review results and general assessment of the inventory of Ireland

Assessment		*Issue or problem ID#(s) in tables 3 and/or 5*[a]
Dates of submission	Original submission: 15 June 2016 (NIR), 15 June 2016, version 1 (CRF tables), 15 April 2016 (SEF tables) The values from the latest submission are used in this report	
Review format	Centralized	

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.

[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

Assessment				*Issue or problem ID#(s) in tables 3 and/or 5*[a]
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	Have any issues been identified in the following areas:			
	1.	Identification of key categories	No	
	2.	Selection and use of methodologies and assumptions	Yes	E.14, I.5
	3.	Development and selection of emission factors	Yes	E.15, A.3, W.8, W.9, W.10
	4.	Collection and selection of activity data	Yes	E.16, L.10
	5.	Reporting of recalculations	No	
	6.	Reporting of a consistent time series	No	
	7.	Reporting of uncertainties, including methodologies	No	
	8.	QA/QC	QA/QC procedures were assessed in the context of the national system (see below)	
	9.	Missing categories/completeness[b]	Yes	E.7, E.18, I.2, I.4
	10.	Application of corrections to the inventory	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?		No	E.7, E.18, L9
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?		No	L.2
Supplementary information under the Kyoto Protocol	Have any issues been identified in the following areas:			
	1.	National system:		
		(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	No	
		(b) Performance of the national system functions	No	
	2.	National registry:		
		(a) Overall functioning of the national registry	No	
		(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	3.	ERUs, CERs, AAUs and RMUs and on information on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations	No	

Assessment			*Issue or problem ID#(s) in tables 3 and/or 5*[a]
	contained in the SIAR		
	4. Matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission	No	
	5. LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol:		
	(a) Reporting in accordance with the requirements of decision 2/CMP.8, annex II, paragraphs 1–5	Yes	KL.4, KL.7
	(b) The Party has demonstrated methodological consistency between the reference level and reporting on forest management in accordance with decision 2/CMP.7, annex, paragraph 14	Yes	KL.8, KL.9
	(c) The Party has reported information in accordance with decision 6/CMP.9	Yes	G.9
	(d) Country-specific information has been reported to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	No	
	(e) Other issues	No	
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	No	G.8
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes	
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	
Question of implementation	Did the ERT list a question of implementation?	No	

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction unit, CPR = commitment period reserve, CRF = common reporting format, ERT = expert review team, ERU = emission reduction unit, LULUCF = land use, land-use change and forestry, NIR = national inventory report, QA/QC = quality assurance/quality control, RMU = removal unit, SEF = standard electronic format, SIAR = standard independent assessment report, UNFCCC Annex I inventory reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I:

UNFCCC reporting guidelines on annual greenhouse gas inventories", Wetlands Supplement = *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*.

[a] The ERT identified additional issues in all sectors that are not specifically listed in table 2, but are included in table 3 and/or table 5.

[b] Missing categories, for which methods are provided in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, may affect completeness and are listed in annex III to this document.

III. Status of implementation of issues and/or problems raised in the previous review report

8. Table 3 compiles all the recommendations made in the previous review report. Owing to the unique circumstances of the 2015 annual submission described in paragraph 6 above, the latest available review report was for the review of the 2014 annual submission, published on 8 April 2015. For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2016 annual submission and provided the rationale for its determination, taking into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of Ireland

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
General			
G.1	QA/QC and verification (table 3, 2014) Consistency*	Resolve the inconsistencies in the information reported in different parts of the NIR, or between the NIR and the CRF tables	Addressing. There are still some inconsistencies between the NIR and the CRF tables, especially in the LULUCF sector. The ERT recommends that Ireland correct the inconsistencies
G.2	Transparency (table 3, 2014) Transparency*	Improve the use of notation keys	Addressing. Ireland still uses some incorrect notation keys, especially in the LULUCF sector
G.3	QA/QC and verification (table 3, 2014) Transparency	Ensure that information is provided on sector-specific QA activities for all sectors (e.g. waste)	Resolved. Ireland has included sector- specific subchapters for QA/QC activities, most of which refer to standard procedures. The ERT encourages Ireland to update these chapters by including relevant details, where possible
G.4	Transparency (table 3, 2014) Transparency*	Improve the descriptions in the NIR of: (1) the use of EU ETS data in the energy sector; and (2) the assumptions and methodologies used for estimating emissions	Addressing. The ERT commends the Party for including most of the requested information, and recommends that Ireland complete the information by adding further

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
			detail, as specified in table 5, ID#s E.14 and 15
G.5	Transparency (table 3, 2014) Transparency	Ensure that the LULUCF chapter of the NIR fully follows the annotated outline of an NIR, as it is challenging to find information	Resolved
G.6	NIR (4 and 55, 2014) (67, 2013) Transparency*	Include information on the key drivers of emission/removal trends for cropland, grassland, wetlands, settlements and other land in the next NIR	Addressing. The Party has included information on the key drivers of emission/removal trends for cropland in the NIR (section 2.3.4, p.59), grassland and wetlands. However, no information is included on the key drivers of emission/removal trends for settlements and other land in the next NIR
G.7	Key category analysis (table 4 and para. 77, 2014) Transparency*	Include a paragraph explaining the assessment of key categories for the KP-LULUCF activities in chapter 11 of the NIR	Not resolved. The ERT noted that the Party included a copy of CRF table NIR 3 in the NIR, but that there is no paragraph explaining the assessment of key categories for the KP-LULUCF activities
Energy			
E.1	Fuel combustion – reference approach – CO_2 (22, 2014) Transparency	Further investigate the difference between the reference approach and the sectoral approach, and report accordingly in the next NIR	Resolved. The ERT noted that the difference between the reference approach and the sectoral approach in the 2016 inventory submission ranged between –2.91% and 2.07%, which is smaller than the values contained in the 2014 inventory submission (ranging between –5.2% and 2.7%). The NIR states that the expanded energy balance sheets now record the import of some products storing carbons (e.g. paraffin wax, lubricants, bitumen and white spirits), thereby allowing for improved completeness in the reference approach estimation of CO_2 emissions and carbon storage
E.2	Feedstocks, reductants and other non-energy use of fuels	Investigate the emissions related to the non-energy use of lubricants, other than road transportation, and	Resolved. The CO_2 emissions from NEU of lubricants, other than road transportation, are

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
	– CO_2 (25, 2014) Completeness*	report accordingly in the next annual submission	reported under the IPPU sector, in the category non-energy products from fuels and solvent use (2.D.1). Ireland reports in the NIR that the IPCC default oxidation value of 0.2 is used for the estimation of CO_2 emissions from use of lubricants
E.3	1.A Fuel combustion – sectoral approach: liquid and gaseous fuels – CO_2 (26, 2014) (23, 2013) Transparency	Improve the transparency of the reporting of emission estimates for this category by providing more information in relation to the use of EU ETS data in the NIR	Resolved. Ireland provided in the NIR (section 3.2.5, p.77, and annex 3.1.A, p.466) information on the plant-specific data used to calculate CO_2 emissions in relation to the use of EU ETS data. During the review, the Party also provided a Microsoft Excel spreadsheet containing information on power plants, their energy use and the resulting CO_2 emissions
E.4	1.A Fuel combustion – sectoral approach: liquid and gaseous fuels – CO_2 (27, 2014) Transparency	Provide information on the AD and CO_2 EFs for the different types of fuel and industrial activities reported under other (manufacturing industries and construction)	Resolved. Ireland provided the energy balance sheet in the NIR (annex 4) containing information on the use of different types of fuels and industrial activities reported under other (manufacturing industries and construction). Ireland also provided CO_2 EFs in the NIR (annex 3.1.A).
E.5	1.A Fuel combustion – sectoral approach: liquid and gaseous fuels – CO_2 (28, 2014) Transparency	Investigate further the issue of the high IEF for gaseous fuels in petroleum refining and report accordingly in the next NIR	Resolved. Ireland provided the possible reason for the low IEF reported in the previous submission and revised the IEF reported in the 2016 submission. However, in the 2016 submission the IEF reported is significant lower than the IPCC defaults (see ID#E.15 in table 5)
E.6	1.A.3.e Other transportation: liquid fuels – CO_2 (30, 2014) Comparability*	Review the notation key used to report liquid fuels and, as appropriate, change the notation key from "NO" to "IE", and provide a transparent description of the basis for dividing fuel consumption between road and non-road traffic	Not resolved. Ireland continues to reported those emissions as "NO" in CRF table 1.A(a) without providing any further information on the basis for dividing fuel consumption between road and non-road traffic

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
E.7	1.B.2 Oil and natural gas and other: gaseous fuels – CO_2 and CH_4 (31, 2014) Completeness*	Provide an explanation of where fugitive emissions of CH_4 and CO_2 from natural gas exploration and transmission are reported both in the CRF tables and in the NIR, and provide a detailed description of how the emissions from each activity are estimated in the NIR	Addressing. Ireland responded as follows to the annual review report: "See section 3.3.2 of the NIR and CRF table 1.B.2. exploration and processing emissions are included elsewhere with production emissions. Transmission and storage emissions are included elsewhere with distribution emissions. CO_2 emissions are NE and considered negligible. Emissions of CO_2 have been estimated and will be reported for the time series 1990–2015 in the 2017 submission"
E.8	1.B.2 Oil and natural gas and other: gaseous fuels – CO_2 and CH_4 (32, 2014) Transparency*	Explain where fugitive CO_2 emissions from natural gas and fugitive CH_4 emissions from venting and flaring are allocated in the CRF tables	Not resolved. In the CRF tables, Ireland provided information on the allocated amount under production of natural gas (1.B.2.b.2), but did not provide adequate information in the NIR
E.9	1.B.2 Oil and natural gas and other: gaseous fuels – CO_2 and CH_4 (32, 2014) Adherence to UNFCCC Annex I inventory reporting guidelines*	Use the notation keys consistently between the NIR and the CRF tables for CO_2 emissions from natural gas and CH_4 emissions from venting and flaring ("NO" in NIR table 3.1 and "IE" in CRF table 1.B.2)	Not resolved. In the CRF tables and in the NIR, Ireland did not use the notation keys consistently. However, Ireland explained that the use of notation keys originated from a problem in the import process of the CRF Reporter tool
E.10	1.B.2.b Natural gas gaseous fuels – CO_2 and CH_4 (33, 2014) Transparency	Use the appropriate notation keys and provide a detailed description of how the emissions from each activity under other leakages are estimated in the NIR	No longer relevant. The category other leakages is not included in the current CRF tables. The Party explained during the review that leakages are accounted for under distribution
E.11	1.B.2.c Venting and flaring gaseous fuels – CH_4 (34, 2014) Transparency*	Include the information on the mobile drilling unit in the Kinsale field for 2001 in the next NIR	Not resolved. Ireland used the correct notation key ("NO") in the CRF table but did not provide adequate explanations in the NIR
IPPU			
I.1	2.A.4 Other process uses of carbonates –	Ensure consistency within the NIR and between the NIR and the CRF tables in terms of EF for lime and	Resolved. The ERT found the information in the NIR and the

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
	CO_2 (41, 2014) Consistency	dolomite use	CRF tables to be consistent, and the description of limestone use to be clear (NIR, table 3.2.D)
I.2	2.F.2 Foam blowing agents HFCs and SF_6 (40, 2014) Completeness*	Provide additional information on how the potential sources (e.g. from imported products) are considered in the emission estimates from this category to ensure a complete and accurate inventory	Not resolved. Emissions from foam blowing are reported as "NO". See also table 5, ID#I.4
Agriculture			
A.1	3.B Manure management – CH_4 and N_2O (50, 2014) (63, 2013) (66, 2012) Accuracy*	Develop dynamic N excretion rates for non-dairy cattle and use the related data in the inventory, when the data become available	Addressing. The national inventory agency is in the process of investigating the availability of new data for manure management system practices in Ireland
LULUCF			
L.1	4. General (LULUCF) (54, 2014) Comparability	Follow the structure of the NIR as shown in the annex to decision 24/CP.19	No longer relevant. The ERT noticed that the requirement to follow the structure of the NIR is not mandatory (which is expressed by the use of the modal verb "should" (decision 24/CP.19, annex I, para. 51)). However, the ERT commends Ireland because in its 2016 submission, Ireland improved the structure of chapter 6 of its NIR by following the structure of the NIR as shown in the annex to decision 24/CP.19
L.2	4. General (LULUCF) (55, 2014) (67, 2013) Transparency*	Include the information on the key drivers of emission/removal trends for cropland, grassland, wetlands, settlements and other land in the NIR	Addressing. In the 2016 submission, Ireland provided information on the key drivers of the emission/removal trends for cropland, grassland and wetlands, but information on the key drivers for settlements and other land has not yet been provided
L.3	4.A Forest land – CO_2 (56, 2014) Transparency*	Correct the typographical error regarding the value of the country-specific EF for organic forest soils	Not resolved. Ireland repeated the same typographical error in its 2016 NIR
L.4	4.A Forest land – CO_2 (57, 2014)	Report the removals for the pool, or report the pool as "NE" instead of "NO", or report the carbon stock	Addressing, The Party informed the ERT as follows:

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
	Transparency*	changes as "NA" if the carbon stock changes in the pool are assumed to be zero because the losses are balanced out by the gains	For cropland converted to forest land, the Party shows that there is a small removal of SOC but Ireland is currently developing methods to implement this in the inventory, so the Party should correctly report this category as "NE" For other land converted to forests, C stock changes for mineral soils should also be reported as "NE" as recommended. However, since Ireland assumes that conversions from forest to other land result in large emissions, Ireland should now apply the opposite assumption when other lands converted to forest For grasslands, Ireland shows that soils afforested from grasslands are neither a removal nor an emission, and hence are zero, Ireland should use notation key "NA" based on the previous recommendation in the ARR 2014
L.5	4.A Forest land – CO_2 (58, 2014) Transparency*	Delete the sentence "emissions from soils due to biomass burning resulting from forest wildfires are assumed to be negligible and do not occur (NO)" from the NIR, in order to avoid confusion	Not resolved. In section 6.3.4.4 of the 2016 NIR, the following sentence has still not been deleted: "5) Emissions from soils are assumed to negligible and do not occur (NO)"
L.6	4.D.1 Wetlands remaining wetlands – CO_2 (60, 2014) Transparency	Include information on the carbon losses in DOM removed from managed wetlands in the NIR and in the documentation box in CRF table 5.D in order to enhance transparency	Resolved. In the 2016 NIR, the Party has included information on DOM, reported as "IE" in section 6.6.4.1. Further, during the review, the Party informed the ERT that it had been considering the inclusion of the same information in the documentation box in CRF table 4.D but that it was unable to do so due to technical problems with the CRF

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
			Reporter
L.7	4.D.2 Land converted to wetlands – CO_2 (61, 2014) Transparency	Include information on mineral soils in wetlands in order to clarify what kinds of soils are included in wetlands areas	Resolved. In the 2016 CRF tables, the Party provided AD for mineral soils and organic soils separately, and provided explanations in the NIR (section 6.4.2) following the Wetlands Supplement
L.8	4.E.1 Settlements remaining settlements – CO_2 (62, 2014) Transparency*	Report the carbon stock changes in soils in settlements remaining settlements as "NA" instead of as "NO" and include an explanation for the use of the notation key in the NIR	Not resolved. In the 2016 NIR, this category is still reported as "NO" and no information for the rationale of the reporting was provided in the NIR
Waste			
W.1	5. General (waste) (67, 2014) Adherence to UNFCCC Annex I inventory reporting guidelines	Expand the discussion on uncertainty in the waste chapter to include the uncertainty estimates for wastewater handling and incineration	Resolved. Ireland reported the uncertainty estimates for the waste sector in the 2016 NIR (annex 2)
W.2	5.A Solid waste disposal on land – CH_4 (68, 2014) Consistency	Disaggregate the AD for the years up to 2003 in order to ensure time-series consistency	Resolved. Ireland reported the disaggregated AD for the time series for landfilled amounts in annex 3.5 to the 2016 NIR
W.3	5.A Solid waste disposal on land – CH_4 (69, 2014) Accuracy	Update the information on MSW generation in the NIR and the CRF tables	Resolved. Ireland revised the information on MSW generation in annex 3.5 (table 3.5.B) to the NIR and recalculated the time series for solid waste disposal
W.4	5.A Solid waste disposal on land – CH_4 (70, 2014) (88, 2013) Transparency*	Include a discussion on these FOD model parameters (time lag, oxidation and fraction of CH_4 in landfill gas) in the next NIR, including the values used and justification for their use	Not resolved. Ireland does not report the fraction of CH_4 in the landfill gas
W.5	5.C.1 Waste incineration – CO_2, CH_4 and N_2O (74, 2014) (96, 2013) Accuracy	Correct the double counting of AD in the quantity of clinical waste incinerated for 1990–1997 in the CRF tables by disaggregating the AD into biogenic and non-biogenic components	Resolved. Ireland separately reported the biogenic and non-biogenic sources of clinical waste in CRF table 5.C
W.6	5.D Wastewater treatment and discharge – CH_4 and N_2O	Provide a discussion on the methodology used for wastewater and sludge in the NIR	Resolved. Ireland reported the methodologies used in the NIR (section 7.5.1.2)

ID#	*Issue and/or problem classification*[a,b]	*Recommendation made in previous review report*[c]	*ERT assessment and rationale*
	(71, 2014) Transparency		
W.7	5.D Wastewater treatment and discharge – CH_4 and N_2O (72, 2014) Transparency*	Describe the source and derivation of the AD and the industrial sectors contributing to the BOD load	Not resolved. Ireland reported that emissions from industrial wastewater are included under domestic wastewater. However, the Party has not provided information on the AD and COD loadings from individual industries
KP-LULUCF			
KL.1	Afforestation and reforestation – CO_2 (79, 2014) Transparency	Include the information on the implied carbon stock change factors for organic soils in afforestation and reforestation in the NIR	Resolved. Relevant information was provided in chapter 6 of the NIR
KL.2	Deforestation – CO_2 (80, 2014) Transparency	Include the information on the implied carbon stock change factors for organic soils in deforestation in the NIR	Resolved. Relevant information was reported in chapter 6 of the NIR and cross-referenced in chapter 11
KL.3	Deforestation – CO_2 (81, 2014) Transparency*	Include information explaining that the sampling plot for measuring carbon stocks in above- and below-ground biomass contains regenerating young broadleaf forest/scrub, and that the stump and root biomass is greater than the stems and branch biomass in the regenerating young broadleaf forest/scrub in the NIR	No longer relevant. The Party informed the ERT as follows: The issue is no longer relevant because different reporting formats are now used. The issue of a larger below-ground biomass figure compared with the above-ground biomass is not apparent in CRF table 4(KP_1)A2. In addition, deforestation data before 2013 are not relevant for the second commitment period

Abbreviations: AD = activity data, ARR = annual review report, BOD = biochemical oxygen demand, COD = chemical oxygen demand, CRF = common reporting format, DOM = dead organic matter, EF = emission factor, ERT = expert review team, EU ETS = European Union Emissions Trading System, IE = included elsewhere, IEF = implied emission factor, IPCC = Intergovernmental Panel on Climate Change, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, MSW = municipal solid waste, N = nitrogen, NA = not applicable, NE = not estimated, NEU = non-energy use, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control, UNFCCC Annex I inventory reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories", Wetlands Supplement = *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*.

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue was raised. Issues are further classified as defined in decision 13/CP.20, annex, paragraph 81. In the review of the supplementary information reported in accordance with Article 7, paragraph 1, of the Kyoto Protocol, the ERT has applied the classification in decision 22/CMP.1, annex, paragraph 69, in conjunction with decision 4/CMP.11.

[b] An asterisk is included next to each issue type for all issues that are also problems, as defined in decision 22/CMP.1, annex, paragraphs 68 and 69, including those that lead to an adjustment or a question of implementation.

[c] The review of the 2016 annual submission is being held in conjunction with the review of the 2015 annual submission, and as such, the 2015 annual review report was not available at the time of this review. Therefore, the recommendations reflected in table 3 are from the 2014 annual review report. For the same reason, the year 2015 is excluded from the list of years in which the issue has been identified.

IV. Issues identified in three successive reviews and not addressed by the Party

9. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including the review of the 2016 annual submission of Ireland, and have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by Ireland

ID#[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*[b]
General		
	No such general issues were identified	
Energy		
	No such issues for the energy sector were identified	
IPPU		
	No such issues for the IPPU sector were identified	
Agriculture		
A.1*	Develop dynamic N excretion rates for non-dairy cattle and use the related data in the inventory, when the data become available	4 (2012–2015/2016)
LULUCF		
	No such issues for the LULUCF sector were identified	
Waste		
W.4*	Include a discussion on these FOD model parameters (time lag, oxidation and fraction of CH_4 in landfill gas) in the next NIR, including the values used and justification for their use	3 (2013–2015/2016)
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

Abbreviations: FOD = first order decay, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, N = nitrogen, NIR = national inventory report.

[a] An asterisk is included after any issue identification number where the underlying issue is related to the accuracy or completeness of a key category, a missing category or a potential key category, as indicated in decision 13/CP.20, annex, paragraph 83.

[b] The review of the 2016 annual submission is being held in conjunction with the review of the 2015 annual submission. As the reviews of the 2015 and 2016 annual submissions are not "successive" reviews, but are rather being held in conjunction, for the purpose of counting successive years in table 4, 2015/2016 is considered as one year. The ERT noted that this table 4 is the same as that in the 2015 annual review report for Ireland, modified to reflect the combined 2015/2016 review.

V. Additional findings made during the 2016 technical review

10. Table 5 contains findings made by the ERT during the technical review of the 2016 annual submission of Ireland that are additional to those identified in table 3 above.

Table 5
Additional findings made during the 2016 technical review of the annual submission of Ireland

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
General			
G.8	Commitment period reserve	The commitment period reserve was calculated in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18 The Party reported its commitment period reserve as 309,168,535 kt CO_2 eq. However, during the review, the ERT identified that there was a calculation error that led to incorrect calculation of the commitment period reserve (see FCCC/IRR/2016/IRL, table 3, ID#1, calculation of the assigned amount). Owing to the calculation error, Ireland recalculated the commitment period reserve and determined it to be 309,167,903 kt CO_2 eq, which the ERT verified	Not an issue
G.9	KP-LULUCF supplementary information	The Party did not include information in accordance with decision 2/CMP.7, annex, paragraph 13, on the forest management cap in its NIR. Such information is also not included in the CRF table on accounting. During the review, the Party provided the value (1,974,616 t CO_2 eq) based on the base year GHG emissions excluding LULUCF. The cap over the commitment period was estimated to be 15,796,928 t CO_2 eq The ERT recommends that the Party includes the value of the forest management cap in the NIR and in the CRF accounting table, together with the information on the approach taken for its calculation	Yes. Transparency*
Energy			
E.12	1. General (energy sector): all fuels – general	In its NIR (p.67), Ireland provided information on a programme to harmonize the national energy balances in accordance with the requirements of IEA and Eurostat and to facilitate their wider use nationally. The work was conducted by the Sustainable Energy Authority of Ireland (SEAI) with the aim of improving the consistency of its national energy statistics with those reported to international bodies such as IEA and Eurostat (see also section 3.1.3 of the NIR and annex 4 to the NIR, p.562) The ERT encourages Ireland to make efforts to harmonize the national energy statistics data and the data reported to international bodies and to report on the progress made in this regard in the NIR	Not an issue
E.13	Fuel combustion: reference approach: all fuels – CO_2	The ERT noted that in the CRF tables submitted in 2014 for 2012, there was a difference of 2.48% in the energy consumption (total) estimated in the reference approach and sectoral approach, but that in the CRF tables submitted in 2016 for 2014 the difference decreases to 0.00%. The ERT noted that the column for the apparent energy consumption (excluding NEU, reductants and feedstocks) uses the same data as in the sectoral approach and not the	Yes. Transparency*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[a] and/or a problem[b]? If yes, classify by type
		data from the reference approach although in some cases CRF table 1.A(d) provides no information for NEU of fuels (e.g. gaseous fuels or peat). Regarding CO_2 emissions, the ERT noted that there is a significant difference in the value of CO_2 emissions calculated using the sectoral and reference approaches between the 2014 and 2016 submissions. In the 2014 submission for 2012, the difference between the two approaches was calculated as 2.35%, while in the 2016 submission, the difference decreases to 0.48% and is 0.18% for 2014. In response to a question raised by the ERT during the review, Ireland explained that SEAI revises the national energy statistics annually and that any revisions usually occur for the last five years of the time series, to take account of new information or the reallocation between sectors, and there are usually changes due to the statistical differences, which has an impact on the reference approach. Ireland also provided an analysis of its reference and sectoral approaches in an Excel file titled "Reference Approach_comparison_1990-2014.xlsx"	
		The ERT encourages Ireland to provide information on efforts to reduce any differences in energy consumption between the reference approach and the sectoral approach (explanations for the differences in energy consumption values between the CRF tables for 2012 and 2014) since the 2014 submission and in the NIR. The ERT further recommends that the Party ensure consistent reporting between CRF tables 1.A(b), 1.A(c) and 1.A(d)	
E.14	1.A.1.a Public electricity and heat production: other fuels – CO_2, CH_4 and N_2O	Ireland reported in the NIR (section 3.2.4) that energy use for public electricity and heat production reported in the CRF tables is taken from the national energy balance and that the EU ETS includes CO_2, CH_4 and N_2O emissions for six main fuel types (peat, coal, oil, natural gas, biomass and other fuels (MSW)). In response to a question raised by the ERT during review regarding the provision of the data obtained from the ETS for these six fuel types, Ireland explained that the ETS does not cover all the fuel types such as other fuels (e.g. there is only one MSW incinerator in Ireland since 2011 and landfill gas engines are also not included in the ETS). Therefore, the ETS does not cover all the fuel types listed in category 1.A.1.a, although a significant amount is covered	Yes. Transparency*
		During the review, Ireland explained that: (1) EU ETS emissions reporting does not include CH_4 and N_2O, (2) CH_4 and N_2O emissions are estimated using the energy data included in the national energy balance (which is consistent with EU ETS) and emission factors for subcategory 1.A.1.a from the 2006 IPCC guidelines, and (3) the explanation above is included in the NIR	
		The ERT recommends that Ireland provide the information on ETS coverage of other fuels in the NIR, as well as information on the way the completeness of the estimates for the sector is ensured. The ERT believes that this issue should be considered further in future reviews to confirm that there has not been an underestimation of emissions	

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
E.15	1.A.1.b Petroleum refining: Gaseous fuels – CO_2	The previous ERT noted in the 2014 ARR that the CO_2 IEF for gaseous fuels in petroleum refining for 2012 (83.21 t/TJ) is the highest compared with other reporting Parties (53.81–58.66 t/TJ). The current ERT noted that the CO_2 IEF for gaseous fuels in the category petroleum refining (1.A.1.b) for 2012 reported in the 2016 submission was 6.69 t/TJ, which is 10 times lower than the IPCC default values for gaseous fuels (54.3–58.3 t/TJ). During the review, Ireland explained that "the issue with the IEFs arise due to reporting by the Refinery to SEAI which is different than via ETS mainly due to Refinery Gas, Natural Gas and LPG. The total of these 3 fuels to ETS is 121.33 ktoe and to SEAI is 119.30 ktoe. The main issue is SEAI receives the breakdown as 74.22 ktoe of Refinery Gas, 44.56 ktoe of natural gas and 0.52 ktoe of LPG. In ETS this breakdown is 113.96 ktoe Refinery Gas, 7.37 ktoe Natural Gas and 0.00 ktoe of LPG. Since Refinery Gas and LPG are under liquid fuels and natural gas is under gaseous fuels, this distorts the IEFs for the both liquid and gaseous fuels. This issue has arisen since the refinery installed a natural gas field to fuelled CHP plant in 2010. The inventory agency (EPA, also responsible for ETS) is working closely with the SEAI and the Refinery to harmonize the reporting of natural gas to both EPA and SEAI" The ERT noted that there are significant differences in the breakdown for refinery gas (the amount reported under the ETS is 53.5% higher than that reported to SEAI) and natural gas (the amount reported under the ETS is 83.5% lower than that reported to SEAI). According to table 3.1.1 of the NIR, the EFs of the refinery gas and natural gas are 82.976 and 9.375 t CO_2/TJ, respectively, for this subcategory. Further, the ERT noted that the relationship between the AD used and the estimation of CO_2 emissions is not transparently described in the NIR The ERT recommends that Ireland provide an explanation on the low IEF for gaseous fuels in the category petroleum refining. The ERT also recommends that Ireland investigate the reason for the differences in the breakdown of fuels, especially for refinery gas and natural gas, used in refining between the ETS and SEAI data and report the results of the investigation in its NIR together with the proper allocation of fuels among fuel categories. The ERT further recommends that Ireland transparently describe the AD and method used for the estimation of CO_2 emissions in its NIR. The ERT believes that this issue should be considered further in future reviews to confirm there has not been an underestimation of emissions	Yes. Transparency*
E.16	1.A.3.a Domestic aviation: liquid fuels – CH_4 and N_2O	The ERT noted that the CH_4 and N_2O emissions from domestic aviation (aviation gasoline) are reported as "IE" and although table 9 explains that the emissions are reported under jet kerosene, the comment box for those cells in the CRF table is empty and there is no relevant information on the allocation of the emissions in the NIR. In response to a question raised by	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
		the ERT during the review, Ireland explained that during the import process into the CRF Reporter tool, the explanations for the notation keys are sometimes deleted, so it was not always possible to check if all the notation keys had the correct flagged explanations The ERT recommends that Ireland provide information on which category includes CH_4 and N_2O emissions from aviation gasoline in its NIR	
E.17	1.A.5 Other (fuel combustion activities): all fuels – CO_2, CH_4 and N_2O	The ERT noted that Ireland reported CO_2, CH_4 and N_2O emissions from category 1.A.5.b (mobile) as "IE", stating in the description box: "emissions from 1.A.5.a are included in 1.A.4.a" and "emissions from 1.A.5.b military are included elsewhere in 1.A.3". In response to a question raised by the ERT during the review regarding the provision of a brief description of the allocation of these emissions and the value of the AD and resulting emissions for these two subcategories, Ireland explained that it was not able to quantify the amount of fuel used specifically for military purposes. Ireland's national energy statistics do not specify amounts of fuel for military, stationary or mobile uses. The fuel associated with military vehicles is included in the fuel used for transport in CRF category 1.A.3. The fuel associated with stationary combustion at military bases is included in the fuel for CRF category 1.A.4.a (commercial/institutional) and there are currently no plans to further disaggregate the energy statistics for this purpose, as the fuel use from these activities is small The ERT recommends that Ireland include the information on the description of the allocation of emissions and the value of the AD and resulting emissions from subcategories 1.A.5.a (stationary) and 1.A.5.b (mobile) provided during the review of its NIR	Yes. Transparency*
E.18	1.B.2 Oil and natural gas and other: Gaseous fuels – CO_2	The ERT noted that the CO_2 emissions from natural gas exploration and processing are reported as "NO" while CH_4 emissions from these categories are reported as "IE" in the CRF tables. During the review, Ireland informed the ERT that the proper notation key is "NE" considering these emissions as insignificant according to paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines. Further, Ireland informed the ERT that emissions of CO_2 have been estimated and will be reported for the time series 1990–2015 in the 2017 submission The ERT commends Ireland's efforts to estimate and report CO_2 emissions from this category and recommends that Ireland report these emissions in its 2017 submission The ERT believes that this issue should be considered further in future reviews to confirm there has not been an underestimation of emissions	Yes. Completeness*
IPPU			

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
I.3	2.A.2 Lime production – CO_2	In the 2016 NIR (section 4.2.2.4), Ireland provided a transparent discussion on the plant-specific methodology and comprehensive QA/QC procedures Where fluctuations (or, over recent years, a decreasing trend) occur in the IEF, the Party is encouraged to provide an expected reason for this	Not an issue
I.4	2.F.2 Foam blowing agents – F-gases	Ireland reports that no foam blowing manufacture is carried out in the country and thus emissions from this category are reported as "NO". Imported closed-cell foams could still contribute to the Party's emissions The ERT recommends that Ireland report the emissions from foam blowing agents from stocks and disposal of imported closed-cell foams in the next inventory using national data or based on expert judgments. If impossible, the ERT recommends that the Party use the appropriate notation key and provide relevant justification for its use (e.g. the level of significance) in the NIR The ERT believes that this issue should be considered further in future reviews to confirm there has not been an underestimation of emissions	Yes. Completeness*
I.5	2.G.1 Electrical equipment – SF_6	The ERT noted that the NIR provides an explanation on the method applied including information on number of cylinders, which seems to be a country-specific method, while the NIR states that tier 1 method is applied. In response to the question raised by the ERT, Ireland explained that broad estimates from the company involved in the maintenance of electrical equipment. Further, the Party informed the ERT that the inventory agency will endeavour to review the approach used by the Electricity Supply Board (ESB) to estimate the quantity of SF_6 used for maintenance with a view to clarifying its appropriateness as a tier 1 or higher tier method. Moreover, the Party informed the ERT that the Party will investigate using tier 1 as a verification process The ERT recommends that Ireland provide in its NIR the result of its endeavours to review the approach used by ESB to estimate the quantity of SF_6 used for maintenance with a view to clarifying its appropriateness as a tier 1 or higher tier method	Yes. Transparency*
Agriculture			
A.2	3.D.a Direct N_2O emissions from managed soils – N_2O	The previous annual review report stated that Ireland used country-specific values for the fraction of N (nitrogen) that volatilizes as ammonia (NH_3) and nitrogen oxides (NO_X) from animal manure ($Frac_{GASM}$) that is associated with the fraction of sewage sludge N that volatilizes as NH_3 and NO_X during housing, manure storage, landspreading and grazing; and a default value for $Frac_{GASM}$ that is associated with the fraction of sewage sludge N. During the previous review, the Party explained that it was in the process of investigating the	Not an issue

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
		applicability of estimating NH_3 emissions from the spreading of sewage sludge on agricultural land. In response to a question raised by the previous ERT, Ireland stated that, to date, no country-specific data have been identified to replace the use of the default value and that the default value is only used for sewage sludge, accounting for less than 1% of the amount of N applied to soils. As a next step, the Irish inventory agency will engage with similar reporting Parties to identify appropriate parameters to allow for the estimation of a country-specific value. The current ERT also encourages the Party to replace the default $Frac_{GASM}$ for sewage sludge N data with country-specific data when they become available	
A.3	3.G Liming – CO_2	The ERT noted that Ireland is using a tier 1 method to estimate emissions from liming, even though this category is a key category of Ireland. In response to a question raised by the ERT during the review, Ireland informed the ERT that a tier 2 method cannot be applied because of a lack of country-specific data Noting that the use of tier 1 is a conservative estimate, the ERT recommends that the Party makes the effort to collect country-specific data and to apply a tier 2 method to this category in future submissions	Yes. Accuracy*
LULUCF			
L.9	4.A.2 Land converted to forest land – CO_2	In section 6.3.5.2 of the NIR on mineral soils, the country reports the emissions as "NO" and justifies this by stating that the emissions from mineral soils in land converted to forest land are demonstrated not to be a source Ireland responded as follows to a question raised by the ERT during the review: "Grasslands to forests: As outlined in section 11.3.2 our country specific methods and data show that there is no significant difference in the SOC stock when grasslands are converted to forest and vice versa. Hence, this is not significant so the stock change is zero (i.e. NO). We do not report this as NE because we did estimate the stock change (zero cannot be entered in the CRF) Croplands to forest: Cropland conversion to forest on mineral soils will significantly increase the SOC stock (see figure 11.4). In this case we do not report the stock change for CL-FL conversion, this is a conservative underestimation of the sink. In this case NE may be appropriate. Ireland has developed the models to estimate SOC stock changes due to transitions from crop to forest land but still need to develop appropriate activity data (i.e. land tracking methodology to characterize previous land use and soil matrices for forestry) to apply model to. This is currently being undertaken in a DAFM funded research program (CForRep) due for completion in 2017. Ireland envisages that tier 3 or 2 methods for crop and grassland	Yes. Transparency*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[a] and/or a problem[b]? If yes, classify by type
		transitions to and from forestry will be implemented in the 2018 submission Deforestation: To grasslands: see section above on grasslands to forest lands (NO notation is applied) To croplands: No deforestation to croplands occur, so NO is the correct notation To settlements and other land: Mineral SOC stock changes for conversion of forest land to settlement and other land is estimated and reported (see CRF 4E and F)" However, the ERT noted that reporting these emissions as "NO" if it is not a source can only be applied for the reporting under the Kyoto Protocol. Therefore, the ERT recommends that the Party provide an estimate or, if it is considered to be insignificant, use the notation key "NE" and provide justification for the exclusion in terms of the likely level of emissions In response to the list of preliminary findings, Ireland provided the following comments: "Regarding Grassland converted to forest land: Ireland intends to use NA for reporting of emissions as allowed for by paragraph 37(c) of decision 24/CP.19. The activity does occur in Ireland, but we have demonstrated that the emission is zero. This will be reported in Chapter 6 of the NIR Regarding Cropland converted to forest land: Ireland intends to use NE for reporting of emissions as allowed for by paragraph 37(b) of decision 24/CP.19. The activity does occur in Ireland, but we have demonstrated that the emission/removal is always a removal. This will be reported in Chapter 6 of the NIR. However, paragraph 37(b) only requires justification of the level of emissions not the level of removals. The entire paragraph 37 always refers to emissions or removals until this issue of significance is raised. Then it only refers to emissions. See footnote 8 to 37(b). '*The Party should in the NIR provide justifications for exclusion in terms of the likely level of emissions. An emission should only be considered insignificant if the likely level of emissions is below 0.05 per cent of the national total GHG emissions8, and does not exceed 500 kt CO_2 eq.*'" Taking into account the comments provided by the Party in response to the list of preliminary findings, the ERT recommends that Ireland use the notation key "NA" for grassland converted to forest land and use the notation key "NE" for cropland converted to forest land, as proposed in the comments above. Further, the ERT recommends that Ireland demonstrate that emissions from cropland converted to forest land are insignificant in its NIR, when the	

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
		land tracking methodology is available from the CForRep research project at the end of 2017	
L.10	4.E. Settlements – N_2O	The ERT noted that the N_2O emissions from N organic fertilizers (both under categories 4.E.1 (settlements remaining settlements) and 4.E.2 (land converted to settlements)) in 1990 and 2014 are reported as "NE". In the NIR, the Party stated that it has not been possible to identify a source of robust data to generate a complete time series of organic fertilizer use for settlements	Not an issue
		The ERT encourages the Party to improve the data for this category and include information on organic fertilizer use for settlements in future submissions	
L.11	4(V) Biomass burning – CO_2, CH_4 and N_2O	The ERT noted an inconsistency in the application of notation keys in category 4(V) (biomass burning), especially for the cropland category. Emissions from controlled burning are reported as "IE" for cropland remaining cropland, but as "NO" for land converted to cropland. Responding to a question raised by the ERT during the review, the Party explained that Ireland's assumption is that all occurrences of biomass burning on cropland are accidental with small exceptions. The ERT encourages the Party to report all emissions from controlled burning as "NO" if there is no practice of controlled burning on cropland in the county	Yes. Transparency*
		The ERT noted that Ireland reported the wildfires in land converted to cropland as "IE", but that no information is provided to explain where the emissions are included. Responding to a question raised by the ERT during the review, the Party explained that the emissions from wildfires in land converted to cropland are included under cropland remaining cropland. The ERT recommends that the Party include this information in the NIR to explain the use of this notation key, as well as in the documentation box of the CRF table in the next annual submission	
L.12	4(V) Biomass burning – CO_2, CH_4 and N_2O	The ERT noted that Ireland reported the wildfires in land converted to cropland as "IE", but that no information was provided on where the emissions are included. Responding to a question raised by the ERT during the review, the Party explained that the emissions from wildfires in land converted to cropland are included under cropland remaining cropland	Yes. Transparency*
		The ERT recommends that the Party include this information in the NIR to explain the use of this notation key, as well as in the documentation box of the CRF table in the next annual submission	
Waste			

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
W.8	5.A Solid waste disposal on land – CH_4	The ERT noted that the NIR does not specify whether Ireland determines annual MCF values from the information on landfill types and their residual landfill amounts. The ERT recommends that Ireland provide complete information in the NIR on how the annual MCF values are derived	Yes. Transparency*
W.9	5.A Solid waste disposal on land – general	In the NIR (p.321), Ireland explains that the paper content of waste for 1980 and previous years is assumed to be fixed at 40%; however, no justification for the assumption is provided. The ERT recommends that Ireland justify the assumption on the paper content of waste in the period before 1980 in the next annual submission	Yes. Transparency*
		The ERT believes that this issue should be considered further in future reviews to confirm there has not been an underestimation of emissions	
W.10	5.A.1 Managed waste disposal sites – CH_4	Ireland describes in the NIR that the DOC_F values (0.75) for two major landfills in Ireland are much higher than the values used for other landfills (0.6) because of the formation of conditions that are conductive to the decomposition of waste. These DOC_F values are higher than the IPCC default (0.5)	Yes. Accuracy*
		The ERT recommends that Ireland provide supporting data and information on the high DOC_F values in the NIR	
KP-LULUCF			
KL.4	Afforestation and reforestation – CO_2	The ERT noted that in table 11.12 of the NIR and also in CRF table 4(KP-1)A1.1, the estimated value of the background level (0.09 kt CO_2 eq) and the margin of natural disturbance (0.17 kg CO_2 eq) for afforestation and reforestation were erroneous since the ERT could not replicate these values. In response to a question raised by the ERT, the Party acknowledged the error, and provided a corrected value for the background level (23.95 kt CO_2 eq) and the natural disturbance (46.67 kt CO_2 eq). The ERT verified the new calculation and agreed with the values	Yes. Accuracy
		The ERT recommends that the Party include the correct values for the background level and the margin of natural disturbance in table 4(KP-I)A.1.1 and in the NIR	
KL.5	Afforestation and reforestation – CO_2	In CRF table NIR 2.1, the Party reported additional information on the area of natural forest converted to planted forest as "NO". However, no explanation was provided on how the Party defines natural forest in the NFI. Responding to a question raised by the ERT during the review, the Party explained that there are no natural forests in the country but only semi-natural forests, which are all managed to some extent	Yes. Transparency*
		The ERT acknowledges the Party's explanation and recommends that the Party include clarification on the classification of forest (natural forest) in the country in the next annual	

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
		submission	
KL.6	Deforestation – CO_2	In CRF table 4(KP-I)A.2, no value is indicated for the net carbon stock change in HWP in row "A.2", while the net carbon stock change in HWP as a total for activity A.2 is indicated as "IE". Responding to a question raised by the ERT during the review, the Party stated that both these cells should be reported as "IO". However, "IO" can only be reported in CRF table NIR 1 as an information item and should not be reported in the other CRF tables. The ERT recommends that the Party report the appropriate notation key with explanation or estimated values in CRF table 4(KP-I)A.2 in the next annual submission	Yes. Transparency*
KL.7	Grazing land management – general	The ERT noted that the information regarding the land identification system for grazing land management under Article 3, paragraph 4, of the Kyoto Protocol in Ireland was not provided in accordance with decision 2/CMP.7, annex, paragraph 25. In the NIR, information on how the Party identifies the land subject to grazing land management was not clearly described, and the total land area subject to grazing land management is larger than the areas of managed grassland reported under the Convention. Responding to a question raised by the ERT during the review, the Party explained that in Ireland, all grassland is deemed to be managed in line with IPCC categories, and all land subject to grazing land management is included under managed land (managed grassland and grassland converted to settlements). The Party also provided further information on the land identification system for grazing land management. The ERT acknowledged the Party's explanation and understood that confusion had arisen from the Party's mixed use of "unmanaged grassland" under the national definition and under the definition of the Convention and its Kyoto Protocol The ERT recommends that the Party include detailed information on the land identification system for grazing land management in the NIR, and revise the land transition matrix to include all grassland under managed grassland	Yes. Transparency
KL.8	FMRL – general	In the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol and the NIR and CRF tables for 2016, Ireland reported its FMRL as –142.07 kt CO_2 eq. The ERT noted that this value is not accordance with the appendix to decision 2/CMP.7 (the FMRL for Ireland is –0.142 Mt CO_2 eq/year), and is not in accordance with the requirements set out in decision 2/CMP.8, annex I, paragraph 1, and the appendix to the annex to decision 2/CMP.7. In response to a question on this matter raised by the ERT during the review week, Ireland agreed to correct the FMRL in the two reports and the CRF tables mentioned above to –0.142 Mt CO_2 eq/year. The ERT recommends that Ireland use the corrected FMRL (–0.142 Mt CO_2 eq/year) for its NIR and CRF tables in its next annual submission	Yes. Accuracy

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
KL.9	Technical correction	The ERT noted an inconsistency in the technical correction of the FMRL in the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol and the NIR and CRF tables (for 2013 and 2014). The report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol and the NIR show a technical correction for the FMRL as –381.13 kt CO_2 eq, while the CRF tables for 2013 and 2014 show it as –785.12 and –357.71 kt CO_2 eq, respectively. The ERT recommends that Ireland maintain consistency regarding the technical correction of the FMRL between the NIR and the CRF tables	Yes. Consistency

Abbreviations: AD = activity data, ARR = annual review report, CHP = combined heat and power, CL = cropland, CRF = common reporting format, DAFM = Department of Agriculture, Food and the Marine, DOC_F = fraction of degradable organic carbon, EPA = Environmental Protection Agency of Ireland, ERT = expert review team, ETS = Emissions Trading System, EU ETS = European Union Emissions Trading System, F-gases = fluorinated gases, FL = forest land, FMRL = forest management reference level, $Frac_{GASM}$ = fraction of sewage sludge N that volatilizes as ammonia and nitrogen oxides, GHG = greenhouse gas, HWP = harvested wood products, IE = included elsewhere, IEA = International Energy Agency, IEF = implied emission factor, IO = instantaneous oxidation, IPCC = Intergovernmental Panel on Climate Change, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LPG = liquefied petroleum gas, LULUCF = land use, land-use change and forestry, MCF = methane correction factor, MSW = municipal solid waste, NA = not applicable, NE = not estimated, NEU = non-energy use, NFI = national forest inventory, NIR = national inventory report, NO = not occurring, QA/QA = quality assurance/quality control, SOC = soil organic carbon, UNFCCC Annex I inventory reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories", 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

[a] Recommendations are related to issues as defined in decision 13/CP.20, annex, paragraph 81, or problems as identified in decision 22/CMP.1, annex, paragraph 69, identified by the ERT during the review. Encouragements are made to the Party to address all findings not related to issues.

[b] An asterisk is included next to each issue type that is also a problem, as defined in decision 22/CMP.1, annex, paragraphs 68 and 69, including those that lead to an adjustment or a question of implementation.

VI. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

11. Ireland has elected commitment period accounting and therefore the issuance and cancellation of units for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are not applicable for the 2016 review.

VII. Questions of implementation

12. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for Ireland for submission year 2016 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

1. Tables 6–9 provide an overview of total greenhouse gas emissions and removals as submitted by Ireland.

Table 6
Total greenhouse gas emissions for Ireland, 1990[a] –2014[b]
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[c]*		*Land-use change (Article 3.7bis as contained in the Doha Amendment)[d]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[e]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								–142.00
Base year	62 559.32	56 336.89	62 640.03	56 417.60	8.2299		7 072.11	
1990	62 310.27	56 087.84	62 390.98	56 168.55				
1995	66 924.71	59 791.07	67 006.38	59 872.75				
2000	75 658.34	69 251.35	75 731.94	69 324.96				
2010	67 495.50	62 235.15	67 559.36	62 299.01				
2011	62 821.50	58 130.30	62 885.87	58 194.67				
2012	63 526.36	58 622.80	63 588.78	58 685.21				
2013	63 419.91	58 481.61	63 485.03	58 546.73		–3 519.11	5 960.03	–435.55
2014	63 410.53	58 189.15	63 475.05	58 253.67		–3 480.89	5 963.02	–256.60

Abbreviations: CM = cropland management, FM = forest management, FMRL = forest management reference level, GHG = greenhouse gas, GM = grazing land management, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, RV = revegetation, WDR = wetland drainage and rewetting.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs, SF_6 and NF_3. The base year for cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[c] The Party has reported indirect CO_2 emissions in common reporting format table 6.

[d] The value reported in this column refers to 1990.

[e] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation.

Table 7

Greenhouse gas emissions by gas for Ireland, excluding land use, land-use change and forestry, 1990–2014[a]

(kt CO_2 eq)

	CO_2[b]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF_6*	*NF_3*
1990	32 849.24	14 881.83	8 402.25	1.23	0.12	NO	33.88	NO
1995	35 800.42	15 129.79	8 658.24	103.19	97.61	NO	79.11	4.37
2000	45 196.94	14 532.20	8 640.47	456.66	397.76	NO	51.76	49.17
2010	41 622.14	12 632.79	7 032.35	932.08	46.58	NO	33.08	NO
2011	37 959.57	12 594.40	6 624.15	955.22	15.88	NO	45.45	NO
2012	38 094.03	12 891.04	6 703.77	948.64	9.56	NO	37.39	0.78
2013	37 114.54	13 224.50	7 084.87	1 070.05	8.32	NO	43.53	0.90
2014	36 623.59	13 433.35	6 985.06	1 155.42	9.00	NO	46.29	0.96
Per cent change 1990–2014	**11.5**	**–9.7**	**–16.9**	**93 524.9**	**7 417.8**	**NA**	**36.6**	**NA**

Abbreviations: NA = not applicable, NO = not occurring.

[a] Emissions/removals reported in the sector other (sector 6) are not included in total greenhouse gas emissions.

[b] CO_2 emissions include indirect CO_2 emissions reported in common reporting format table 6.

Table 8
Greenhouse gas emissions by sector for Ireland, 1990–2014[a,b]
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1990	31 118.46	3 280.73	20 123.65	6 222.43	1 645.71	NO
1995	33 893.12	3 280.88	20 722.75	7 133.64	1 975.99	NO
2000	42 526.07	4 746.85	20 300.42	6 406.99	1 751.62	NO
2010	40 358.42	2 450.65	18 315.27	5 260.34	1 174.67	NO
2011	36 871.68	2 327.11	17 729.52	4 691.20	1 266.35	NO
2012	36 911.88	2 527.14	18 060.13	4 903.56	1 186.07	NO
2013	35 726.89	2 568.52	18 905.48	4 938.30	1 345.84	NO
2014	35 000.11	3 006.81	18 754.32	5 221.38	1 492.43	NO
Per cent change 1990–2014	**12.5**	**–8.3**	**–6.8**	**–16.1**	**–9.3**	**NA**

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry, NA = not applicable, NO = not occurring.

[a] Emissions/removals reported in the sector other (sector 6) are not included total greenhouse gas emissions.

[b] Totals include indirect CO_2 emissions reported in common reporting format table 6.

Table 9

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a, b] – 2014, for Ireland

(kt CO_2 eq)

	Article 3.7bis as contained in the Doha Amendment[c]	*Article 3.3 of the Kyoto Protocol*		*Forest management and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*Afforestation and reforestation*	*Deforestation*	*Forest management*	*Cropland management*	*Grazing land management*	*Revegetation*	*Wetland drainage and rewetting*
FMRL				–142.00				
Technical correction				–381.13				
Base year	8.2299				–4.30	7 076.41	NA	NA
2013		–3 708.62	189.51	–435.55	20.71	5 939.32	NA	NA
2014		–3 702.66	221.77	–256.60	–1.46	5 964.47	NA	NA
Per cent change Base year–2014					**66.1**	**–15.7**	**NA**	**NA**

Abbreviations: FMRL = forest management reference level, NA = not applicable.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs SF_6 and NF_3. The base year for cropland management and grazing land management under Article 3, paragraph 4, of the Kyoto Protocol is 1990 for Ireland. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Values in this table include emissions on lands subject to natural disturbances, if applicable.

[c] The value reported in this column refers to 1990.

2. Table 10 provides an overview of relevant key data for Ireland's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 10
Key relevant data for Ireland under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) Afforestation/reforestation: commitment period accounting
	(b) Deforestation: commitment period accounting
	(c) Forest management: commitment period accounting
	(d) Cropland management: commitment period accounting
	(e) Grazing land management: commitment period accounting
	(f) Revegetation: not elected
	(g) Wetland drainage and rewetting: not elected
Election of activities under Article 3, paragraph 4	Cropland management and grazing land management
Election of application of provisions for natural disturbances	Yes, for afforestation and reforestation, and forest management
3.5% of total base year GHG emissions, excluding LULUCF and including indirect CO_2 emissions	1,974.616 kt CO_2 eq (15 796.928 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. Afforestation and reforestation in 2014	NA
2. Deforestation in 2014	NA
3. Forest management in 2014	NA
4. Cropland management in 2014	NA
5. Grazing land management in 2014	NA
6. Revegetation in 2014	NA
7. Wetland drainage and rewetting in 2014	NA

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction unit, ERU = emission reduction unit, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable, RMU = removal unit.

Annex II

Information to be included in the compilation and accounting database

Tables 11 and 12 include the information to be included in the compilation and accounting database for Ireland. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable), as well as the final data to be included in the compilation and accounting database.

Table 11
Information to be included in the compilation and accounting database for 2014, including the commitment period reserve, for Ireland
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Commitment period reserve	309 168 535			309 167 903
Annex A emissions for 2014				
CO_2 [c]	36 623 585			36 623 585
CH_4	13 433 354			13 433 354
N_2O	6 985 060			6 985 060
HFCs	1 155 418			1 155 418
PFCs	9 004			9 004
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	46 290			46 290
NF_3	961			961
Total Annex A sources	**58 253 671**			**58 253 671**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 Afforestation and reforestation	–3 702 659			–3 702 659
3.3 Deforestation	221 767			221 767
Forest management and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 Forest management for 2014	–256 596			–256 596
3.4 Cropland management for 2014	–1 457			–1 457
3.4 Cropland management for the base year	–4 302			–4 302
3.4 Grazing land management for 2014	5 964 473			5 964 473
3.4 Grazing land management for the base year	7 076 409			7 076 409
3.4 Revegetation for 2014	NA			NA
3.4 Revegetation in the base year	NA			NA
3.4 Wetland drainage and rewetting for 2014	NA			NA
3.4 Wetland drainage and rewetting in the base year	NA			NA

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NA = not applicable, NO = not occurring.

[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).

[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

[c] CO_2 emissions include indirect CO_2 emissions reported in common reporting format table 6.

Table 12

Information to be included in the compilation and accounting database for 2013, for Ireland

(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2013				
CO_2 [c]	37 114 544			37 114 544
CH_4	13 224 500			13 224 500
N_2O	7 084 872			7 084 872
HFCs	1 070 051			1 070 051
PFCs	8 324			8 324
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	43 535			43 535
NF_3	901		s	901
Total Annex A sources	**63 419 909**			**63 419 909**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 Afforestation and reforestation	–3 708 616			–3 708 616
3.3 Deforestation	189 510			189 510
Forest management and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 Forest management for 2013	–435 552			–435 552
3.4 Cropland management for 2013	20 710			20 710
3.4 Cropland management for the base year	–4 302			–4 302
3.4 Grazing land management for 2013	5 939 317			5 939 317
3.4 Grazing land management for the base year	7 076 409			7 076 409
3.4 Revegetation for 2013	NA			NA
3.4 Revegetation in the base year	NA			NA
3.4 Wetland drainage and rewetting for 2013	NA			NA
3.4 Wetland drainage and rewetting in the base year	NA			NA

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NA = not applicable, NO = not occurring.

[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).

[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

[c] CO_2 emissions include indirect CO_2 emissions reported in common reporting format table 6.

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the Intergovernmental Panel on Climate Change (IPCC) *2006 IPCC Guidelines for National Greenhouse Gas Inventories* were reported as "NE" (not estimated) or for which the expert review team otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

Hydrofluorocarbon and/or perfluorocarbon emissions from foam blowing agents (2.F.2) (see finding ID# I.4 in table 5 above).

Annex IV

Documents and information used during the review

A. Reference documents

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at <http://unfccc.int/resource/webdocs/agi/2015.pdf>.

Annual status report for Ireland for 2016. Available at <http://unfccc.int/resource/docs/2016/asr/irl.pdf>.

FCCC/ARR/2014/IRL. Report on the individual review of the annual submission of Ireland submitted in 2014. Available at <http://unfccc.int/resource/docs/2015/arr/irl.pdf>.

FCCC/ARR/2013/IRL. Report of the individual review of the annual submission of Ireland submitted in 2013. Available at <http://unfccc.int/resource/docs/2014/arr/irl.pdf>.

FCCC/ARR/2012/IRL. Report of the individual review of the annual submission of Ireland submitted in 2012. Available at <http://unfccc.int/resource/docs/2013/arr/irl.pdf>.

"Guidelines for national systems for the estimation of anthropogenic greenhouse gas emissions by sources and removals by sinks under Article 5, paragraph 1, of the Kyoto Protocol". Decision 19/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories". Annex to decision 24/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf#page=4>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 13/CP.20. Available at <http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf#page=6>.

"Implications of the implementation of decisions 2/CMP.7 to 4/CMP.7 and 1/CMP.8 on the previous decisions on methodological issues related to the Kyoto Protocol, including those relating to Articles 5, 7 and 8 of the Kyoto Protocol, part I: implications related to accounting and reporting and other related issues". Decision 3/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf#page=5>.

"Implications of the implementation of decisions 2/CMP.7 to 4/CMP.7 and 1/CMP.8 on the previous decisions on methodological issues related to the Kyoto Protocol including those relating to Articles 5, 7 and 8 of the Kyoto Protocol, part II: implications related to review and adjustments and other related issues". Decision 4/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf#page=30>.

Intergovernmental Panel on Climate Change. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>.

Intergovernmental Panel on Climate Change. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. Available at <http://www.ipcc-nggip.iges.or.jp/public/kpsg>.

Intergovernmental Panel on Climate Change. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. Available at <http://www.ipcc-nggip.iges.or.jp/public/wetlands/index.html>.

Standard independent assessment report, part 1, for Ireland for 2016. Available at <http://unfccc.int/files/kyoto_mechanisms/application/pdf/siar_2016_irl_1_2.pdf>.

Standard independent assessment report, part 2, for Ireland for 2016. Available at <http://unfccc.int/files/kyoto_mechanisms/application/pdf/siar_2016_irl_2_2.pdf>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Duffy (Environmental Protection Agency, Ireland), including additional material on the methodology and assumptions used.

Annex V

Acronyms and abbreviations

AAU	assigned amount unit
AD	activity data
Annex A sources	sources included in Annex A to the Kyoto Protocol
ARR	annual review report
BOD	biochemical oxygen demand
CER	certified emission reduction unit
CH_4	methane
CHP	combined heat and power
CL	cropland
CM	cropland management
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
COD	chemical oxygen demand
CPR	commitment period reserve
CRF	common reporting format
DAFM	Department of Agriculture, Food and the Marine
DOC_F	fraction of degradable organic carbon
DOM	degradable organic carbon
EF	emission factor
EPA	Environmental Protection Agency of Ireland
ERT	expert review team
ERU	emission reduction unit
ESB	Electricity Supply Board
ETS	Emissions Trading System
EU ETS	European Union Emissions Trading System
F-gases	fluorinated gases
FL	forest land
FM	forest management
FMRL	forest management reference level
FOD	first order decay
$Frac_{GASM}$	fraction of managed manure nitrogen that volatilizes as NH_3 and NO_x
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3, without GHG emissions and removals from LULUCF
GM	grazing land management
HFC	hydrofluorocarbon
HWP	harvested wood products
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IO	instantaneous oxidation
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
kg	kilogramme
KP-LULUCF	LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
kt	kilotonne

ktoe	kilo tonnes oil equivalent
LPG	liquefied petroleum gas
LULUCF	land use, land-use change and forestry
MCF	methane correction factor
MSW	municipal solid waste
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NE	not estimated
NEU	non-energy use
NF_3	nitrogen trifluoride
NFI	national forest inventory
NH_3	ammonia
NIR	national inventory report
NO	not occurring
NO_X	nitrogen oxide
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SEAI	Sustainable Energy Authority of Ireland
SEF	standard electronic format
SIAR	standard independent assessment report
SOC	soil organic carbon
UNFCCC	United Nations Framework Convention on Climate Change
WDR	wetland drainage and rewetting