ENVIRONMENT AGENCY AUSTRIA umweltbundesamt

Austria's Inventory Adjustment Report 2018

Austria's applications for inventory adjustment pursuant to Article 5 (1) of the NEC Directive 2016/2284 (Addendum to Austria's IIR 2018)

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1 INTRODUCTION

Following the NEC Directive Article 5 – Flexibilities, Member States may establish, in accordance with Part 4 of Annex IV, adjusted annual national emission inventories for sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds, ammonia and fine particulate matter where non-compliance with their national emission reduction commitments would result from applying improved emission inventory methods updated in accordance with scientific knowledge.

Annex IV, Part 4, includes three broad categories under which adjustments to the national emission inventories may be applied:

- New emission source categories are identified which were not included in the relevant historic national emission inventory at the time when emission reduction commitments were set;
- The emission factors used for determining emission levels for specific source categories at the time when emission reduction commitments are to be attained differ significantly from the original emission factors used when the emission reduction commitments were set;
- The methodologies used for determining emission levels for specific source categories have undergone significant changes since the time when the emission reduction commitments were set.

2 APPROVED ADJUSTMENTS

In its 2017 submission Austria applied for the following adjustments to be made to its national emission inventory, in accordance with Article 5(1), for

- NO_x emissions 2010, 2011, 2012, 2013, 2014 and 2015 from sector transport, based on significantly different methodologies, and
- NH_3 emissions 2010, 2011, 2012, 2013, 2014 and 2015 from sector agriculture, based on new emission source categories,

due to an exceedance of the national emission ceilings. Austria submitted supporting information pursuant to NEC Directive (EU) 2016/2284 Annex IV Part 4 on 15 March 2017 (report and supporting documentation "Assessment of transport emissions in Austria for the year 2015 based on emission factors from HBEFA1.2 and HBEFA3.2").

The adjustments were accepted in the 2017 review of the new adjustment application submitted by Austria in 2017 (see TERT report for EC[1])

The report *"Declaration on consistent reporting of Approved Adjustments"* (submitted on 15th February 2018) declares that Austria's criteria and methodologies used for the calculation of emissions for the years 2010 – 2016 (as submitted on 15th February 2018) for all sectors and pollutants (1.A.3.b Road transport – NO_x; 3.D.1.2.b Sewage sludge applied to soils – NH_3; 3.D.1.2.c Other organic fertilisers applied to soils – NH_3) are exactly the same as in the year the adjustments were approved (2017).

The details on the approved adjustments are included below.

2.1 NO_x emissions from sector transport

The emission ceilings laid down in Directive 2001/81/EC were derived from model calculations within the RAINS model of the International Institute for Applied Systems Analysis (IIASA) in Laxenburg, which were based on knowledge available at the end of the 1990s. Concerning the trend in vehicle specific emissions, it was assumed that emission levels would decrease at the same rate as the emission limits required under the vehicle type approval system.

In the meantime it has been found that the actually achieved reductions in vehicle specific NO_x emissions under real world driving conditions are much smaller than expected at the time when the targets were established. The findings are based on test bench measurements which were performed in the course of several studies through international co-operation. The findings apply especially to diesel passenger cars and light commercial vehicles certified according to the emission standards EURO 1 to EURO 6 as well as for heavy duty vehicles from EURO I to EURO V.

[1] http://ec.europa.eu/environment/air/reduction/implementation.htm

Austria's inland road transport emissions which are based on current (significantly higher) NO_x emission factors are more than 50% higher for recent years than the emissions based on the original emission factors. The emission factors are taken from the "Handbook of emission factors for road transport" (HBEFA): HBEFA version 1.2 (released in January 1999; basis for the definition of the NEC limits) and HBEFA version 3.3 (released in March 2017; latest reference database including all available in-use emission tests and recent forecasts for upcoming vehicle technology). The update of the emission factors in the inventory has been accompanied by an improvement in the way in which emission factors are applied to different vehicle types across the time series.

Table 1 shows approved adjustments (NO_x emissions) from the source category *road transport (1.A.3.b)* submitted in 2017 and in 2018, and the difference between these two submissions:

Table 1: Approved adjustments submitted in 2017 and 2018, category road transport (1.A.3.b)

[kt NO_x]	2010	2011	2012	2013	2014	2015	2016
Submission 2017	-26.35	-27.60	-28.28	-28.74	-29.07	-27.55	-
Submission 2018	-29.19	-31.72	-32.99	-34.18	-35.67	-35.23	-33.95
Difference	-2.83	-4.12	-4.70	-5.44	-6.59	-7.68	-

Emission figures, and therefore also the adjustments, partly differ from the 2017 submission, due to revisions to the calculation of the emission inventory.

In the inventory submission 2017, as well as in the respective adjustment calculation, EFs for road transport were taken from HBEFA[2] version 3.2 (released in March 2014). In the current inventory, as well as in the adjustment calculation, EFs according to the latest HBEFA version 3.3 (March 2017) are used for the whole time series. The difference in emissions and in the adjustment is due to the updated EFs.

The latest measurements of EURO 4, 5 and 6a/b diesel passenger cars have shown higher real-driving NO_x emissions compared to the previous version. These findings were implemented in HBEFA V3.3, including the effect of different ambient temperatures on the behavior of exhaust gas after-treatment systems.

More information on the calculation methods used in the current inventory can be found in the IIR 2018 and in the supporting report "Assessment of transport emissions in Austria for the year 2016 based on emission factors from HBEFA1.2 and HBEFA3.3".

2 Handbook Emission Factors for Road Transport (HBEFA), http://www.hbefa.net/

2.2 NH_3 emissions from the agriculture sector

In Austria's NH_3 inventory for the agriculture sector the following new sources have been included after the 1999 submission:

- Sewage sludge applied to soils (3.D.1.2.b)
- Other organic fertilisers applied to soils (3.D.1.2.c)
  - Digestates applied to soils
  - Compost applied to soils

These sources of ammonia were not included in the EMEP/CORINAIR atmospheric emission inventory guidebook, second edition 1999 and third edition 2001.

These sources were not included in the considerations for establishing the emission ceiling; nor were they included in the RAINS model.

- Austria reported NH_3 emissions from sewage sludge application for the first time in its NEC submission of 31st December 2010.
- Austria reported NH_3 emissions from energy crops applied to soils as fertilisers after the digestion process (digestate) for the first time in its NEC submission of 31st December 2014.
- Austria reported NH_3 emissions from compost applied to soils for the first time in its NEC submission of 15th February 2017.

Table 2 shows approved adjustments (NH_3 emissions) from the source category *sewage sludge applied to soil (3.D.1.2.b)* submitted in 2017 and in 2018, and the difference between these two submissions:

Table 2: Approved adjustments submitted in 2017 and 2018, category sewage sludge (3.D.a.2.b)

[kt NH_3]	2010	2011	2012	2013	2014	2015	2016
Submission 2017	-0.22	-0.22	-0.21	-0.19	-0.20	-0.24	-
Submission 2018	-0.22	-0.22	-0.21	-0.19	-0.20	-0.24	-0.24
Difference	0.00	0.00	0.00	0.00	0.00	0.00	-

The figures reported in submission 2018 are identical with the approved figures from inventory submission 2017.

Table 3 shows approved adjustments (NH_3 emissions) from the source category *other organic fertilisers applied to soils (3.D.1.2.b)* submitted in 2017 and in 2018, and the difference between these two submissions:

Table 3: Approved adjustments submitted in 2017 and 2018, category other organic fertilisers (3.D.1.2.c)

[kt NH_3]	2010	2011	2012	2013	2014	2015	2016
Submission 2017	-0.67	-0.65	-0.67	-0.66	-0.66	-0.66	-
Submission 2018	-0.67	-0.65	-0.69	-0.72	-0.75	-0.76	-0.76
Difference	0.00	0.00	-0.03	-0.06	-0.09	-0.10	-

The difference in emissions is due to updated activity data in the 2018 submission (digestate from biogas plants used as fertiliser).

In 2017 new information on input materials for Austria's biogas plants became available (raw material balances for 2014 and 2015). The updated data were taken from the latest annual report of the Austrian energy regulator E-Control and resulted in revised amounts of digested manure and energy crops for 2012-2015 (the latest available raw material balance used in the previous inventory was the balance for 2011).

3 NEW ADJUSTMENT PROPOSALS

Following NEC Directive 2016/2284 Article 5 (5), Members States that intend to apply paragraph 1, 2, 3 or 4 shall inform the Commission thereof by 15 February of the reporting year concerned. That information shall include the pollutants and sectors concerned and, where available, the magnitude of the impacts upon national emission inventories.

3.1 Notification

Austria informed the Commission on 15th February 2018 (file *Information_to_EC_Art-5.1.pdf*) that it was proposing an adjustment to its national emission inventory in accordance with Article 5(1) for NO_x emissions 2010, 2011, 2012, 2013, 2014, 2015 and 2016 from sector 3 Agriculture, source categories

- 3.B Manure management,
- 3.D.1.2 Organic fertilisers,

based on new emission source categories, due to an exceedance of the national emission ceilings.

Austria reported NO_x emissions from the application of inorganic fertilisers at the time when the emission reduction commitment was set. Thus, Austria does not propose adjustments for source category 3.D.1.1.

However, Austria notes that NO_x emissions from the agriculture sector were not included in the considerations for establishing the emission ceiling because they were not taken into account in the RAINS/GAINS model (neither in the 1999 RAINS version, nor in the current 2015 GAINS version).

The following chapters include supportive information pursuant to the NEC Directive (EU) 2016/2284 Annex IV Part 4.

3.2 Evidence that the relevant national emission reduction commitments are exceeded

The 2010 emission ceiling for nitrogen oxides emissions for Austria, which is based on the National Emission Ceilings Directive (EU) 2016/2284 repealing Directive 2001/81/EC, is 103 kilotonnes. According to Austria's latest NEC inventory submitted on 15th February, national total NO_x emissions for compliance purposes were 124.79 kt in 2010, 121.16 kt in 2011, 116.24 kt in 2012, 113.84 kt in 2013, 107.35 kt in 2014, 107.33 kt in 2015 and 105.62 kt in 2016. These figures were calculated on the basis of fuels used (cf. paragraph 16 of ECE/EB.AIR/97), subtracting Austria's approved adjustments.

3.3 Evidence of the extent to which the adjustment reduces the exceedance and contributes to compliance

For nitrogen oxides emissions Austria intends to apply adjustments based on new emission source categories to its agriculture inventories from 2010 onwards for the categories

- 3.B Manure management,
- 3.D.1.2 Organic fertilisers
  - 3.D.1.2.a Animal manure applied to soils,
  - 3.D.1.2.b Sewage sludge,
  - 3.D.1.2.c Other organic fertilisers applied to soils (including compost).

Table 1 and Table 2 show the impact for the inventory years 2010 to 2016:

Table 1: Impact of proposed adjustments on Austria's NO_x inventory (non-rounded data)

[kt NO_x]	2010	2011	2012	2013	2014	2015	2016
3.B Manure Management	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37
3.D.1.2.a Animal manure applied to soils	-5.38	-5.31	-5.28	-5.28	-5.29	-5.29	-5.30
3.D.1.2.b Sewage sludge	-0.07	-0.07	-0.06	-0.06	-0.06	-0.07	-0.08
3.D.1.2.c Other organic fertilisers applied to soils	-0.34	-0.32	-0.35	-0.36	-0.37	-0.38	-0.38
Proposed Adjustments (Total)	**-6.16**	**-6.07**	**-6.06**	**-6.07**	**-6.10**	**-6.11**	**-6.13**

3.4 Estimation of whether and when the relevant emission reduction commitments are expected to be attained

Austria's emission scenario "with existing measures (WEM)" shows emissions below 103 kt in the year 2021 (calculation based on "fuels used").

Table 2: Impact of approved and proposed adjustments on Austria's compliance with its NO_x emission ceilings under Directive (EU) 2016/2284 (non-rounded data)

[kt NO_x]	2010	2011	2012	2013	2014	2015	2016
Emissions according to the best available science (submission 2017)	153.98	152.88	149.23	148.01	143.02	142.56	139.57
Approved Adjustments	-29.19	-31.72	-32.99	-34.18	-35.67	-35.23	-33.95
Proposed adjustments (seeTable 1)	-6.16	-6.07	-6.06	-6.07	-6.10	-6.11	-6.13
Emissions including approved and proposed adjustments	**118.63**	**115.09**	**110.19**	**107.77**	**101.25**	**101.22**	**99.49**

In applying approved and proposed adjustments, Austria will achieve compliance with its NO_x emission ceilings from 2014 onwards.

3.5 Evidence that the adjustment is consistent with the circumstances specified in the NEC Directive, Annex IV

Evidence of consistency with the circumstances defined in the NEC Directive Annex IV Part 4 is documented in Chapter 4.

4 MANURE MANAGEMENT (3.B)

Category 3.B Manure management is considered to be a new source for NO_x emissions according to the NEC Directive, Annex IV Part 4.

Evidence that the new emission source category is acknowledged in scientific literature and/or the EMEP/ EEA Guidebook

The first EMEP/EEA emission inventory guidebook providing specific Tier 1 NO_x emission factors for source category *3.B Manure management* was the version of 2009.

Evidence that this source category was not included in the relevant historic national emission inventory at the time when the emission reduction commitment was set

Chapter "Manure management regarding organic compounds" of the first, second and third editions of the EMEP/CORINAIR emission inventory guidebook (SNAP code 100500, Chapter 10 agriculture) did not provide calculation methodologies for nitric oxide (NO_x) emissions allocated to source categories 3.B "Manure management from livestock" and 3.D.1.2.a "Animal manure applied to soils". As a result, the sectors 3.B and 3.D.1.2.a (see Chapter 5.1) can be considered as new emission sources.

NO_x emissions from manure management were not included in the considerations for establishing the emission ceiling, nor were they included in the RAINS model.

NO_x emissions from manure management were not included in Austria's national emission inventory at the time when the emission reduction commitment was set.

Austria reported NO_x emissions from manure management for the first time in its 2003 submission (NO_x from manure application, see Chapter 5.1). Austria reported NO_x emissions from the storage of manure for the first time in its 2009 submission.

Evidence that emissions from a new source category contribute to a Member State being unable to meet its emission reduction commitments, supported by a detailed description of the methodology, data and emission factors used to arrive at that conclusion

In its NEC submission of 31st December 2009 (time series 1990-2008), Austria included NO_x emissions from manure management for the first time by applying the default Tier 1 emission factors for NO as outlined in the EMEP/EEA air emission inventory guidebook 2009. In Austria's 2018 submission, the default Tier 1 EFs for NO from stored manure according to the EMEP/EEA emission inventory guidebook 2016, Table 3.3, were used.

Table 3: NO_x emissions [kt] from manure management, submission 2018.

[kt NO_x]	2010	2011	2012	2013	2014	2015	2016
3.B Manure management	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Total for Compliance (including approved adjustments)	**124.79**	**121.16**	**116.24**	**113.84**	**107.35**	**107.33**	**105.62**

National NO_x emissions exceed the emission limit set out in the NEC Directive in all years from 2010 onwards (103 kt). The proposed adjustments for inventory submission 2018 regarding manure management would reduce the total annual emissions by 0.37 kt NO_x (see Table 3).

Compliance will be achieved from 2014 onwards if further adjustments as proposed for the source category *Organic fertilisers* are taken into account (see below).

5 ORGANIC FERTILISERS (3.D.1.2)

Source category "Organic fertilisers" (3.D.1.2) includes the following sub-categories:

- Animal manure applied to soils (3.D.1.2.a)
- Sewage sludge applied to soils (3.D.a.2.b)
- Other organic fertilisers applied to soils (3.D.1.2.c)

Detailed information on proposed adjustments is included in the following sub-chapters.

5.1 Animal manure applied to soils (3.D.1.2.a)

NO_x emissions from animal manure applied to soils are considered to be a new source according to the NEC Directive, Annex IV Part 4.

Evidence that the new emission source category is acknowledged in scientific literature and/or the EMEP/ EEA Guidebook

The source category "Animal manure applied to soils" was introduced to the emission reporting template "NFR14" as a new source for 2015 submissions (→ new NFR source category 3.D.1.2.a). The first EMEP/EEA air pollutant emission inventory guidebook providing specific NO_x emission factors for N applied in manures was the version of 2016.

Evidence that this source category was not included in the relevant historic national emission inventory at the time when the emission reduction commitment was set

Chapter "Manure management regarding organic compounds" of the first, second and third edition of the EMEP/CORINAIR emission inventory guidebook (SNAP code 100500, chapter 10 agriculture) did not provide calculation methodologies for nitric oxide (NO_x) emissions to be allocated to source categories 3.B "Manure management from livestock" and 3.D.1.2.a "Animal manure applied to soils". As a result, the sectors 3.B (see Chapter 4) and 3.D.1.2.a can be considered as new emission sources.

Manure application was not included in the considerations for establishing the emission ceiling, nor was it included in the RAINS model.

Austria reported NO_x emissions from manure application for the first time in its 2003 submission (under source category *manure management*, see Chapter 4). From submission 2014 onwards emissions have been allocated to source category *animal manure applied to soils* (3.D.1.2.a).

Evidence that emissions from a new source category contribute to a Member State being unable to meet its emission reduction commitments, supported by a detailed description of the methodology, data and emission factors used to arrive at that conclusion

Austria applies the Tier 1 methodology according to the EMEP/EEA GB 2016, using the default emission factor of 0.04 kg NO per kg of organic fertiliser-N spread on agricultural soils (EEA 2016, Table 3.1).

The proposed adjustments for inventory submission 2018 will reduce emissions annually by about 5.3 kt NO_x (see Table 1). With the proposed adjustment, compliance will be achieved from 2014 onwards.

5.2 Sewage sludge applied to soils (3.D.a.2.b)

Sewage sludge applied to soils is considered to be a new source according to the NEC Directive, Annex IV Part 4.

Evidence that the new emission source category is acknowledged in scientific literature and/or the EMEP/ EEA Guidebook

The source category "Sewage sludge applied to soils" was introduced to the emission reporting template "NFR14" as a new source for 2015 submissions (→ new NFR source category 3.D.1.2.b). The first EMEP/EEA air pollutant emission inventory guidebook providing specific Tier 1 NO_x emission factors for sewage sludge application was the version of 2016.

Evidence that this source category was not included in the relevant historic national emission inventory at the time when the emission reduction commitment was set

This source of nitric oxide was not included in the second edition (1999) and third edition (2001) EMEP/CORINAIR atmospheric emission inventory guidebook.

Sewage sludge application was not included in the considerations for establishing the emission ceiling; nor was it included in the RAINS model.

This source was not included in Austria's national emission inventory at the time when the emission reduction commitment was set. Austria reported NO_x emissions from sewage sludge application for the first time in its NEC submission of 31st December 2010 (reported under 4.G Agriculture Other).

Evidence that emissions from a new source category contribute to a Member State being unable to meet its emission reduction commitments, supported by a detailed description of the methodology, data and emission factors used to arrive at that conclusion

Austria estimates NO_x emissions from sewage sludge applied to soils according to the EMEP/EEA GB 2016 (EEA 2016, Annex 2), using the default Tier 1 EF of NO for sewage sludge of 0.04 kg NO_2/kg of sewage sludge N.

The proposed adjustments for inventory submission 2018 regarding sewage sludge application would reduce emissions annually by about 0.1 kt NO_x (see Table 1). With the proposed adjustment, compliance will be achieved from 2014 onwards if the other proposed adjustments are taken into account.

5.3 Other organic fertilisers applied to soils (3.D.1.2.c)

Under the source category "Other organic fertilisers applied to soils" Austria reports nitric oxide emissions from the following sub-sources:

- N from anaerobically digested energy crops
- Compost application

Table 4: Emissions from other organic fertilisers applied to soils, submission 2018.

[kt NO_x]	2010	2011	2012	2013	2014	2015	2016
Application of anaerobically digested energy crops	0.28	0.27	0.28	0.30	0.31	0.32	0.32
Compost application	0.05	0.06	0.06	0.06	0.06	0.06	0.07
Other organic fertilisers (Total)	**0.34**	**0.32**	**0.35**	**0.36**	**0.37**	**0.38**	**0.38**

Both sub-sources are considered to be new sources according to the NEC Directive, Annex IV Part 4.

5.3.1 Anaerobically digested energy crops

This sub-source includes N inputs from energy crops that are digested in biogas plants and applied to soils as fertilisers after the digestion process.

Evidence that the new emission source category is acknowledged in scientific literature and/or the EMEP/ EEA Guidebook

The source category "Other organic fertilisers applied to soils (including compost)" was introduced to the emission reporting template "NFR14" as a new source for 2015 submissions (→ new NFR source category 3.D.1.2.c). The first EMEP/EEA air pollutant emission inventory guidebook providing specific Tier 1 NH_3 emission factors for other organic wastes was the version of 2016. Following the EMEP/EEA guidebook 2016, digestates produced as a result of anaerobic digestion of organic wastes may contribute to the amount of N applied in "Other organic wastes (3.D.1.2.c)".

Evidence that this source category was not included in the relevant historic national emission inventory at the time when the emission reduction commitment was set

This source of nitric oxide was not included in the second edition (1999) and third edition (2001) EMEP/CORINAIR atmospheric emission inventory guidebook,.

N inputs from digestates produced as a result of anaerobic digestion of energy crops were not included in the considerations for establishing the emission ceiling; nor were they included in the RAINS model.

This source was not included in Austria's national emission inventory at the time when the emission reduction commitment was set. Austria reported NO_x emissions from energy crops applied to soils as fertilisers after the digestion process (digestate) for the first time in its NEC submission of 31st December 2014.

Evidence that emissions from a new source category contribute to a Member State being unable to meet its emission reduction commitments, supported by a detailed description of the methodology, data and emission factors used to arrive at that conclusion

Austria estimates emissions according to the EMEP/EEA 2016 Tier 1 methodology, using the default NO emission factor for other organic wastes of 0.04 kg NO/kg waste N applied (EEA 2016, Table 3.1).

Proposed adjustments for Austria's inventory submission 2018 regarding the new source "Other organic fertilisers/digestates" would reduce nitric oxide emissions annually by about 0.3 kt NO_x (see Table 4). With the proposed adjustment, compliance will be achieved from 2014 onwards if the other proposed adjustments are taken into account.

5.3.2 Compost application

Compost application is the second sub-source contributing to the N amounts considered in nitric oxide calculations under the source category "Other organic fertilisers applied to soils (3.D.1.2.c)".

Evidence that the new emission source category is acknowledged in scientific literature and/or the EMEP/ EEA Guidebook

The source category "Other organic fertilisers applied to soils (including compost)" was introduced to the emission reporting template "NFR14" as a new source for 2015 submissions (-> new NFR source category 3.D.1.2.c). The first EMEP/EEA air pollutant emission inventory guidebook providing specific Tier 1 NO_x emission factors for other organic wastes was the version of 2016.

Evidence that this source category was not included in the relevant historic national emission inventory at the time when the emission reduction commitment was set

This source of nitric oxide was not included in the second edition (1999) and third edition (2001) of the EMEP/CORINAIR atmospheric emission inventory guidebook.

N inputs from compost application on agricultural soils were not included in the considerations for establishing the emission ceiling, nor were they included in the RAINS model.

This source was not included in Austria's national emission inventory at the time when the emission reduction commitment was set. Austria reported NO_x emissions from compost applied to soils for the first time in its NEC submission of 15th February 2017.

Evidence that emissions from a new source category contribute to a Member State being unable to meet its emission reduction commitments, supported by a detailed description of the methodology, data and emission factors used to arrive at that conclusion

Austria estimates emissions according to the EMEP/EEA 2016 Tier 1 methodology, using the default NO emission factor for other organic wastes of 0.04 kg NO/kg waste N applied (EEA 2016, Table 3.1).

Proposed adjustments for the inventory submission 2017 regarding the new source "organic fertilisers/compost" would reduce nitric oxide emissions annually by about 0.1 kt NO_x (see Table 4). With the proposed adjustment, compliance will be achieved from 2014 onwards if the other proposed adjustments are taken into account (application of sewage sludge and digestates).

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Following the NEC Directive Article 5 – Flexibilities, Member States may submit adjusted annual national inventories for SO_2-, NO_x-, NMVOC-, NH_3- und $PM_{2.5}$ emissions, in case of non compliance with their national emission reduction commitments due to improvements in emission inventory methods over time.

As Austria identified new emission source categories, a proposal for adjustments to the Austrian emission inventory related to NO_x emissions from the agricultural sector was submitted to the European Commission.

This report includes the proposed adjustments for 2018 and a short description of the adjustments already accepted by the European Commission in 2017.

This report is an addendum to "Austria's Informative Inventory Report 2018" and includes supportive information pursuant to the NEC Directive (EU) 2016/2284 Annex IV Part 4.

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