Annex 1 to the 2024 Adjustment Review Report - CZECHIA

03/09/2024 – English ONLY

1 Statement provided from Czechia on the conclusions presented by the Expert Review Team

The Czechia is grateful to the Expert Review Team (ERT) for studying and evaluating all submitted documents related to the process of adjustment of ammonia emission values due to changes in ammonia emissions factors from the use of mineral fertilizers, category 3Da1 Inorganic N fertilisers (includes urea).

The Czechia also welcomes the conclusions of the ERT, which acknowledged the validity of the requirement to adjust the emission values and accepts the recommendations for subsequent improvement of the information provided in the IIR.

In Chapter 2.3. Assessment of the quantification of the impact of the revision, paragraph 21. based on ERT's findings, a re-revision of the sent data was carried out. The Czechia admits a certain degree of inconsistency in the reported data on the production of ammonia emissions from category 3Da1 Inorganic N fertilisers in the submitted documents. Annex I submission template, Annex IIa adjustment template, and a spreadsheet with the following conclusions.

Tab. 5-1 shows the values of ammonia emissions from category 3Da1, which were presented in Annex II, Table 1: Quantification of new or previously approved inventory adjustment applications under the amended Gothenburg Protocol (by NFR, year and pollutant) available online at https://cdr.eionet.europa.eu/cz/un/clrtap/adjustment/envzij1pa/annex_iia_to_eceeb.air130_adjustment_application_v20242301_final_CZ2024_v2.0.xlsx.

Tab. 5-1 Annex II, Table 1: Quantification of new or previously approved inventory adjustment applications under the amended Gothenburg Protocol (by NFR, year and pollutant)

Stati	No.	Title	Comment	Pollutant	NFR Code	NFR Long name	Year	Unit of activity data	Unadjusted Activity data	Adjusted activity data	AD Revision (%)	Unit of EF	Unadjusted EF (AVG)	Adjusted EF (AVG)	EF Revision (%)	Unadjusted Emissions (kt)	Adjusted emissions (kt)	Adjustment (kt)	Units
New	CC_	NH3 - Guide		NH3	3Da1	Inorgan	2005	Use of in	295.23	295.23	0%	g NH3	77.04	50.91	-34%	23.549	20.001	-3.55	ktonnes
New	CC_	NH3 - Guide		NH3	3Da1	Inorgan	2020	Use of in	323.53	323.53	0%	g NH3	77.04	50.91	-34%	27.336	19.873	-7.46	ktonnes
New	CC_	NH3 - Guide		NH3	3Da1	Inorgan	2021	Use of in	302.97	302.97	0%	g NH3	77.04	50.91	-34%	27.144	19.218	-7.93	ktonnes
New	CC_	NH3 - Guide		NH3	3Da1	Inorgan	2022	Use of in	254.96	254.96	0%	g NH3	77.04	50.91	-34%	25.338	20.299	-5.04	ktonnes

For the key reference year 2005, to which the ammonia reduction requirements apply, for 2021 and 2020, for which a reduction target has been set, the values of adjusted emissions in Annex II **are fully consistent** with the values reported in the national emission inventory in 2023 presented in ANNEX 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants (identical values are marked in orange for NFR category 3Da1, for 2005 = 20.001 kt, 2020 = 19.873 kt, 2021 = 19.218 kt). The value of emissions in this sector in 2022 is not available in this inventory. Values are available online at https://cdr.eionet.europa.eu/cz/un/clrtap/inventories/envzqqyog/CZ_Annex_I_rev18-11_1990-2021_v3.1.xlsx.

Also when reporting the values of unadjusted emissions of ammonia for 2005, 2020 and 2021, the values in Annex II are **fully consistent** with the latest values reported in the national emissions inventory from 2024 presented in ANNEX 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants (identical values are marked in blue for NFR

category 3Da1 for the year 2005 = 23.549 kt, 2020 = 27.336 kt, 2021 = 27.144 kt, 2022 = 26.531 kt) see https://cdr.eionet.europa.eu/cz/un/clrtap/inventories/envzflmhq/CZ_Annex_I_rev18-11_1990-2022_v2.0.xlsx. The discrepancy was found in the values from 2022. This discrepancy was caused by including older versions of ammonia emissions from mineral fertilizers in the tab. II than was stated in Annex I. Calculations of emission values from the application of mineral fertilizers are based on activity data from IFASTAT, i.e. for the current calculation year 2022, these data are not officially available from at least 2015 until September 2024. This means that the emissions calculations for 2022 are indicative only. These values are revised upon subsequent data submission. The Czechia accepts that formally both values should have been the same, but substantively the 2022 values are irrelevant to the current adjustment as they will certainly change.

As part of the adjustment process, ERT was provided with calculation tools used by the Czechia for calculating ammonia emissions from the NFR category 3Da1 before and after the revision of the emission factors, available at https://www.chmi.cz/files/portal/docs/uoco/oez/embil/NFR-3D(recalculation2024).xlsx. The consistency of the calculated values with the values given in Annex II was also compared there. The calculated values for the key years 2005 and 2020 are **fully consistent** with the values listed in the Annex II column “adjusted” and also for the years 2005, 2020, and 2021 with the values in the column "unadjusted". A discrepancy was found in the calculation of ammonia emissions according to EF 2019 for the year 2021 and in the calculation of ammonia according to EF 2023 for the year 2022. This discrepancy was again only due to the submission of values from an older version of the calculator. Ammonia emission values were calculated using a tool applying EF 2023, are **fully consistent** with the current values of the national emission inventory listed in Annex I (year of submission 2024). The deficiencies in the submitted documents, identified by the ERT, mainly concern the current year 2022, which will also have to be modified. For the key years 2005 and 2020, no deficiencies were detected in all submitted data.

The impact of the adjustment on the NH_3 emission inventories of Czechia for the years 2020-2022 in kilotons is shown in Chapter 2.3.. These values are based on data submitted by Czechia in Annex II, Table 2: Summary of new or previously approved inventory adjustment applications under the amended Gothenburg Protocol (by NFR, year and pollutant) see Tab. 5-2.

Tab. 5-2 Annex II, Table 2: Summary of new or previously approved inventory adjustment applications under the amended Gothenburg Protocol (by NFR, year and pollutant).

Table 1a Summary of Unadjusted emission (for QA/QC purposes)

Status of Adju	Reference	Pollutant	NFR Code		units	2005	2020	2021	2022
Previously App	CZ_2024_1	NH3	3Da1	Unadjusted Em	ktonnes	23,5488	27,336	27,144	25,338

Status of Adju	Reference	Pollutant	NFR Code		units	2005	2020	2021	2022
All Adjustment	NA	NOx	total	Table 1, Table 2	ktonnes	ok	ok	ok	ok
All Adjustment	NA	SOx	total	Table 1, Table 2	ktonnes	ok	ok	ok	ok
All Adjustment	NA	NH3	total	Table 1, Table 2	ktonnes	ok	ok	ok	ok
All Adjustment	NA	NMVOC	total	Table 1, Table 2	ktonnes	ok	ok	ok	ok
All Adjustment	NA	PM2.5	total	Table 1, Table 2	ktonnes	ok	ok	ok	ok

Table 1b Summary of new or previously approved adjusted emissions estimate unde

Status of Adju	Reference	Pollutant	NFR Code		units	2005	2020	2021	2022
Previously Ap	CZ_2024_1	NH3	3Da1	Adjusted Emiss	ktonnes	20,0012	19,873	19,218	20,299

Status of Adju	Reference	Pollutant	NFR Code		units	2005	2020	2021	2022
All Adjustment	NA	NOx	total	Table 1, Table 2	ktonnes	ok	ok	ok	ok
All Adjustment	NA	SOx	total	Table 1, Table 2	ktonnes	ok	ok	ok	ok
All Adjustment	NA	NH3	total	Table 1, Table 2	ktonnes	ok	ok	ok	ok
All Adjustment	NA	NMVOC	total	Table 1, Table 2	ktonnes	ok	ok	ok	ok
All Adjustment	NA	PM2.5	total	Table 1, Table 2	ktonnes	ok	ok	ok	ok

Table 1c Summary of effect of Adjustment (for QA/QC purposes)

Status of Adju	Reference	Pollutant	NFR Code		units	2005	2020	2021	2022
Previously Ap	CZ_2024_1	NH3	3Da1	effect of adjustr	ktonnes	-3,5476	-7,463	-7,926	-5,039

Table 1d Aggregated sum of Effect of PREVIOUSLY APPROVED INVENTORY ADJUS

Status of Adju	Reference	Pollutant	NFR Code		units	2005	2020	2021	2022
Previously App	NA	NOx	total	effect of adjustr	ktonnes	0	0	0	0
Previously App	NA	SOx	total	effect of adjustr	ktonnes	0	0	0	0
Previously App	NA	NH3	total	effect of adjustr	ktonnes	-3,5476	-7,463	-7,926	-5,039
Previously App	NA	NMVOC	total	effect of adjustr	ktonnes	0	0	0	0
Previously App	NA	PM2.5	total	effect of adjustr	ktonnes	0	0	0	0

Calculated values indicating the Impact of adjustments on NT for Compliance in kt for the years 2020-2022 in kilotons amounting to -3.55 kt for the year 2005, -7.46 kt for the year 2020, -7.93 kt for the year 2021 and – 5.04 kt are listed in Table 2 on page 8 of this document.

Table 2: Impact of adjustments on the NH_3 emission inventories of Czechia for the years 2020-2022 in kilotons

	Unit	2005	2020	2021	2022
ERC	**% of 2005**		**7%**	**7%**	**7%**
ERC unadjusted	(kt)		77.20	77.20	77.20
NT for Compliance unadjusted	(kt)	83.01	80.02	79.65	77.95
Gap to ERC unadjusted.	**(%)**		**-4%**	**-3%**	**-1%**
ERC adjusted	(kt)		73.90	73.90	73.90
Adjusted NT for Compliance	(kt)	79.46	72.56	71.72	72.91
Gap to ERC adjusted.	**(%)**		**2%**	**3%**	**1%**
Impact of Adjustment on NT for Compliance	(kt)	-3.55	-7.46	-7.93	-5.04

The Czechia confirms that the source data for the calculation of 2005, 2020 and 2021 values are correct and that the calculation method is also correct.

However, the Czech Republic requests an assessment as to whether the fulfilment of emission obligations for 2020 compared to 2005 would be possible by adjusting the 2005 data according to the following steps.

Tab. 5-3 shows the values of ammonia emissions listed in the national emission balance from 2023, i.e. **before** the EF change (calculated based on EF 2019) and the calculation of emission reduction compared to 2005. Tab. 5-4 shows the values of ammonia emissions listed in the national emission balance from 2024, i.e. **after** the EF change (calculated based on EF 2023) and calculation of emission reduction compared to 2005.

Tab. 5-3 Calculation of ammonia emissions from mineral fertilisers according to EF 2019

Year	**2005**	**2020**	**2021**
Emission inventory 2023 (kt NH_3)	20.001	19.873	19.504
Reduction/increase in emissions compared to 2005 (%)		-0.64	-2.48

Tab. 5-4 Calculation of ammonia emissions from mineral fertilisers according to EF 2023

Year	**2005**	**2020**	**2021**
Emission inventory 2024 (kt NH_3) before update	23.549	27.336	27.144
Reduction/increase in emissions compared to 2005 (%)		+16.08	+15.26
Emission inventory 2024 (kt NH_3) after update	27.512	27.336	27.144
Reduction/increase in emissions compared to 2005 (%)		-0.64	-1.3

As can be seen from the comparison of both tables, before the change in EF, a **reduction** in emissions from the production of mineral fertilizers of 0.64% was achieved for 2020, after the change in EF there was an **increase** of ammonia emissions by approx. + 16.08%. The Czechia is aware that this is an unusual case. Regarding the fulfilment of future emission ceilings under Directive 2016/2284/EU on national emission ceilings, it must insist on maintaining the existing and already achieved reduction of ammonia emissions from mineral fertiliser application of at least 0.64% for 2020 compared to 2005. This indicates that in the current national emission inventory (Annex I from 2024) in the category 3Da1 inorganic fertilizers N (including urea) it is necessary to change the value in 2005 from the current value of 23.549 to 27.512 kt. It is shown in Tab. 5-4. Updated Annex II to include this value, see Tab. 5-5 and Tab. 5-6 (value marked in yellow).

Tab. 5-5 Updated Annex II Table 1: Quantification of new or previously approved inventory adjustment applications under the amended Gothenburg Protocol (by NFR, year and pollutant)

Status of A	No.	Title	Comment	Pollutant	NFR Code	NFR Long name	Year	Unit of activity data	Unadjusted Activity data	Adjusted activity data	AD Revision (%)	Unit of EF	Unadjusted EF (AVG)	Adjusted EF (AVG)	EF Revision (%)	Unadjusted Emissions (kt)	Adjusted emissions (kt)	Adjustment (kt)	Units
New Applic	CC_YYYY	NH3 - revised Tie	Guidebook20:	NH3	3Da1	Inorganic N-fe	2005	Use of inc	295,23	295,23	0%	g NH3 (k	77,04	50,91	-34%	27,512	20,001	-7,51	ktonnes
New Applic	CC_YYYY	NH3 - revised Tie	Guidebook20:	NH3	3Da1	Inorganic N-fe	2020	Use of inc	323,53	323,53	0%	g NH3 (k	77,04	50,91	-34%	27,336	19,873	-7,46	ktonnes
New Applic	CC_YYYY	NH3 - revised Tie	Guidebook20:	NH3	3Da1	Inorganic N-fe	2021	Use of inc	302,97	302,97	0%	g NH3 (k	77,04	50,91	-34%	27,144	19,218	-7,93	ktonnes
New Applic	CC_YYYY	NH3 - revised Tie	Guidebook20:	NH3	3Da1	Inorganic N-fe	2022	Use of inc	254,96	254,96	0%	g NH3 (k	77,04	50,91	-34%	25,338	20,299	-5,04	ktonnes

Tab. 5-6 Updated Annex II, Table 2: Summary of new or previously approved inventory adjustment applications under the amended Gothenburg Protocol (by NFR, year and pollutant)

Table 1d Aggregated sum of Effect of PREVIOUSLY APPROVED INVENTORY ADJ								
Status of Ac	**Referenc**	**Pollutant**	**NFR Code**	**units**	**2005**	**2020**	**2021**	**2022**
Previously A	NA	NOx	total	effect of adjus	ktonnes	0	0	0	0
Previously A	NA	SOx	total	effect of adjus	ktonnes	0	0	0	0
Previously A	NA	NH3	total	effect of adjus	ktonnes	-7,5108	-7,463	-7,926	-5,039
Previously A	NA	NMVOC	total	effect of adjus	ktonnes	0	0	0	0
Previously A	NA	PM2.5	total	effect of adjus	ktonnes	0	0	0	0

Table 2 modified: Impact of adjustments on the NH_3 emission inventories of Czechia for the years 2020-2022 in kilotons.

	Unit	2005	2020	2021	2022
ERC	**% of 2005**		**7%**	**7%**	**7%**
ERC unadjusted	(kt)		80.88	80.88	80.88
NT for Compliance unadjusted	(kt)	86.97	80.02	79.65	77.95
Gap to ERC unadjusted.	**(%)**		**-4%**	**-3%**	**-1%**
ERC adjusted	(kt)		73.90	73.90	73.90
Adjusted NT for Compliance	(kt)	79.46	72.56	71.72	72.91
Gap to ERC adjusted.	**(%)**		**2%**	**3%**	**1%**
Impact of Adjustment on NT for Compliance	(kt)	-7.51	-7.46	-7.93	-5.04

The value of NT for Compliance unadjusted in the amount of 86.97 kt represents the value of the total national emissions inventory of ammonia after changing the value in 2005 from 23.549 kt to 27.512 kt in the NFR category 3Da1, see Tab. 5-7.

Tab 5-7 Revised value of ammonia emissions in the NFR category 3Da1 in 2005 (Annex I)

ANNEX 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pc

NFR 2019-1

COUNTRY:	CZ	(as ISO2 code)
DATE:	14.03.2024	(as DD.MM.YYYY)
YEAR:	2005	(as YYYY, year of emissions and activity data)
Version:	v2.0	(as v1.0 for the initial submission)

CZ: 45365: 2005	NFR sectors to be reported			Main Pollutants				Particulate Matter			
				NOx (as NO_2)	NMVOC	SOx (as SO_2)	NH_3	$PM_{2.5}$	PM_{10}	TSP	BC
NFR Aggregation for Gridding and LPS (GNFR)	NFR Code	Long name	Notes	kt	kt	kt	kt	kt	kt	kt	kt
K_AgriLivestock	3B4d	Manure management - Goats		0,00	0,00	NA	0,00	0,00	0,00	0,00	NA
K_AgriLivestock	3B4e	Manure management - Horses		0,00	0,01	NA	0,01	0,00	0,00	0,01	NA
K_AgriLivestock	3B4f	Manure management - Mules and asses		NO	NO	NO	NO	NO	NO	NO	NO
K_AgriLivestock	3B4gi	Manure mangement - Laying hens		0,01	0,25	NA	1,40	0,02	0,24	1,15	NA
K_AgriLivestock	3B4gii	Manure mangement - Broilers		0,11	2,35	NA	2,26	0,04	0,36	0,72	NA
K_AgriLivestock	3B4giii	Manure mangement - Turkeys		0,01	0,22	NA	0,35	0,02	0,09	0,09	NA
K_AgriLivestock	3B4giv	Manure management - Other poultry		0,00	0,03	NA	0,06	0,01	0,07	0,07	NA
K_AgriLivestock	3B4h	Manure management - Other animals (please specify in IIR)		NO	NO	NO	NO	NO	NO	NO	NO
L_AgriOther	3Da1	Inorganic N-fertilizers (includes also urea application)		11,81	NE	NA	27,51	NA	NA	NA	NA
L_AgriOther	3Da2a	Animal manure applied to soils		4,08	11,99	NA	14,48	NA	NA	NA	NA
M_Other	6A	Other (included in national total for entire territory) (please specify in IIR)		NO	NO	NO	NO	NO	NO	NO	NO
	NATIONAL TOTAL	National total (based on fuel sold)	(a)	305,42	379,13	208,47	86,97	73,84	93,39	116,33	8,6
	1A3bi(fu)	Road transport: Passenger cars (fuel used)	(b)	NR	NR	NR	NR	NR	NR	NR	NR
	1A3bii(fu)	Road transport: Light duty vehicles (fuel used)	(b)	NR	NR	NR	NR	NR	NR	NR	NR
	1A3biii(fu)	Road transport: Heavy duty vehicles and buses (fuel used)	(b)	NR	NR	NR	NR	NR	NR	NR	NR
	1A3biv(fu)	Road transport: Mopeds & motorcycles (fuel used)	(b)	NR	NR	NR	NR	NR	NR	NR	NR
	1A3bv(fu)	Road transport: Gasoline evaporation (fuel used)	(b)	NR	NR	NR	NR	NR	NR	NR	NR

... | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | **2005** | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013

If this procedure is not possible, then Czechia requests an exemption for the calculation of ammonia emissions from the use of mineral fertilizers based on the EMEP 2019 emission factors.

The Czechia understood that the emission factors of individual mineral fertilizers can change over time based on new scientific knowledge and studies, however, it is unexpected that these factors can change significantly in 10 years. The historical change of emission factors is shown in Tab. 5-8, where the inconsistency of these factors is evident.

Tab. 5-8 Development of EF for individual mineral fertilisers

	EF from EMEP/EEA air pollutant emission inventory guidebook - 2013	EF from EMEP/EEA air pollutant emission inventory guidebook - 2016	EMEP/EEA Air Pollutant Emission Inventory Guidebook 2019	EMEP/EEA air pollutant emission inventory guidebook 2023
	g NH_3 volatilized per kg of N in fertilisers applied	g NH_3 volatilized per kg of N in fertilisers applied	g NH_3 volatilized per kg of N in fertilisers applied	g NH_3 volatilized per kg of N in fertilisers applied
Anhydrous ammonia (AH)	11	19	19	20
Ammonium nitrate AN	37	15	15	24
Ammonium phosphate (AP)	113	50	50	84
Ammonium sulphate (AS)	13	90	90	84
Calcium ammonia nitrate (CAN)	22	8	8	24
NK mixtures	37	15	15	24
NPK mixtures	37	50	50	84
NP mixtures		50	50	84
N solutions	125	98	98	87
Other straight N compounds		10	10	84
Urea	243	155	155	195

If this procedure cannot be applied, Czechia expects the EMEP Steering body to propose another solution to this issue. It is important to note that, in such an unpredictable environment and with such radical changes in emission factors, it is not possible to take any future reduction measures.