



## **STAGE 1 & 2 CHECKS OF AQ INVENTORIES (SELECTED EXAMPLES)**

SABINE SCHINDLBACHER , KATARINA MARECKOVA, 10 MAY 2017

## RECALCULATIONS IN THE EU-28 MS

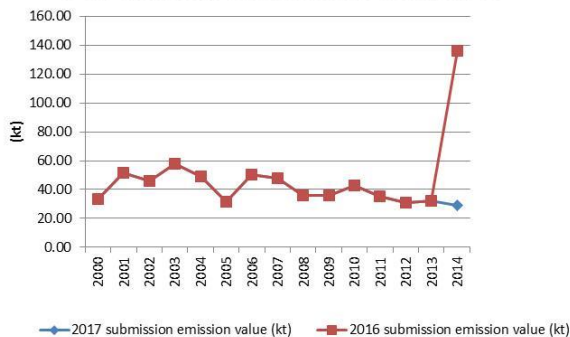
<b>Pollutant</b>	<b>Number of Recalculations for the year 2014 (over 5 tonnes and over 10%)</b>
<b>NOx</b>	<b>264</b>
<b>SOx</b>	<b>152</b>
<b>NMVOC</b>	<b>329</b>
<b>NH3</b>	<b>208</b>

# EXAMPLES FOR SUBSTANTIAL RECALCULATIONS

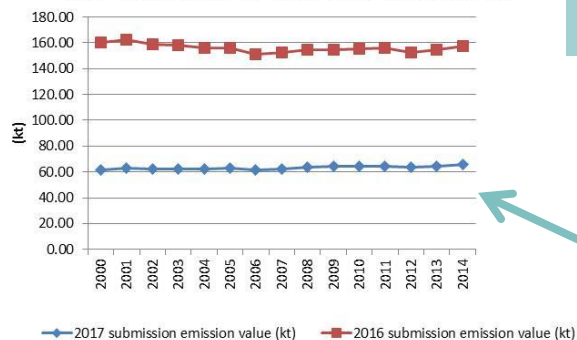
1A1a  
3B1A  
3F  
1A4bi

Public electricity and heat production  
Manure management - Dairy cattle  
Field burning of agricultural residues  
Residential: Stationary

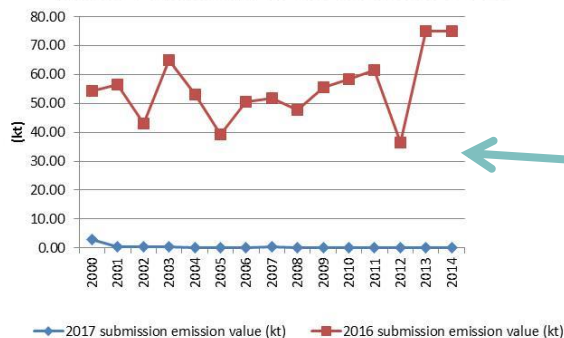
NOx emissions in the sector 1A1a for FI



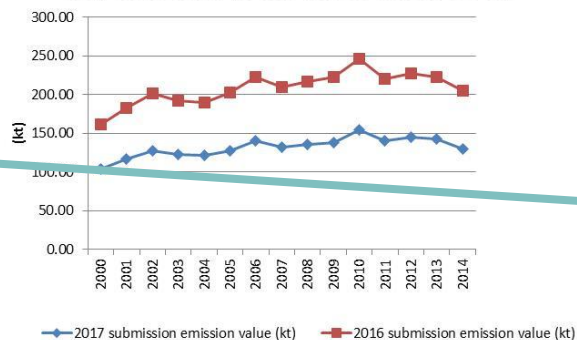
NH3 emissions in the sector 3B1a for DE



NMVOC emissions in the sector 3F for ES



SOx emissions in the sector 1A4bi for PL



DE IIR: Since emissions from application of manure to soils are reported for the first time in sector 3.D, the NH<sub>3</sub> emissions reported from sector 3.B decreased massively compared to the last submission.

ES IIR: In this edition, residues of wooden crop pruning, such as olive or vine, although they are burned, this activity is considered as waste and for this reason, as explained in the corresponding section, the emissions derived from the burning of pruning remains are **not included in category 3F**; these are included in activity **5.C.2. Open burning of waste**

# MAJOR RECALCULATIONS IN THE SECTOR 3B1A

MS	YEAR	NFR-Code	Full Name	Pollutant	Unit	Recalculation in %
Belgium	2014	3B1a	Manure management - Dairy cattle	<b>NH3</b>	kt	<b>-28.3</b>
Germany	2014	3B1a	Manure management - Dairy cattle	<b>NH3</b>	kt	<b>-58.4</b>
Estonia	2014	3B1a	Manure management - Dairy cattle	<b>NH3</b>	kt	<b>-51.5</b>
Finland	2014	3B1a	Manure management - Dairy cattle	<b>NH3</b>	kt	<b>-53.4</b>
Lithuania	2014	3B1a	Manure management - Dairy cattle	<b>NH3</b>	kt	<b>-68.4</b>
Latvia	2014	3B1a	Manure management - Dairy cattle	<b>NH3</b>	kt	<b>33.0</b>
Poland	2014	3B1a	Manure management - Dairy cattle	<b>NH3</b>	kt	<b>38.4</b>
Sweden	2014	3B1a	Manure management - Dairy cattle	<b>NH3</b>	kt	<b>-65.0</b>
Slovakia	2014	3B1a	Manure management - Dairy cattle	<b>NH3</b>	kt	<b>-70.1</b>

# COMPLETENESS OF 2017 DATA EU-28

- For NO<sub>x</sub>, SO<sub>x</sub>, NMVOC, NH<sub>3</sub> and PM<sub>2.5</sub>
  - in **134 cases** „0“ is reported
    - Improvement for next submission: Use of Proper Notation Key
  - 21 cases of „C“ (confidential), only Sweden and Germany use this Notation Key
  - 4 844 cases of „NE“
  - 15 788 cases of „NA“
- 10 345 cases of „NO“

The use of these notation keys does not indicate that the reporting is incomplete

# RECALCULATIONS IN THE EU-28 MS

- Use of the notation key „NA“ is to be questioned if there is a method available in the EMEP/EEA Guidebook:
- often only revision of Notation Key necessary (e.g. NO instead of NA)

Pollutant	NFR	Full Name	MS that reported NA	Highest reported value
NH3	3F	Field burning of agricultural residues	CZ, IT, PL	3.6 kt (FR))
PM <sub>2.5</sub>	1B2aiv	Fugitive emissions oil: Refining / storage	AT, BG, DE, DK, FI, GB, LU, PL, SE	0.9 kt (PT)
NO <sub>x</sub>	3B1A	Manure management - Dairy cattle	BG, GB, MT, PL	1.2 kt (NL)
SO <sub>x</sub>	5C1biv	Sewage sludge incineration	EE, PL, RO	0.4 kt (GB)
NO <sub>x</sub>	2B3	Adipic acid production	GB, PL, RO	0.07 kt (FR)
PM <sub>2.5</sub>	2A5a	Quarrying and mining of minerals other than coal	BG, LU, MT, RO	1.3 (FR)
NM <sub>10</sub> VOC	1A3ei	Pipeline transport	DK, RO	0.2 kt (FR)

Source: Umweltbundesamt 2017

# TIME SERIES CONSISTENCY

- The aim of this test is to identify instances of **dips, jumps, and sudden trends** in time series.
- Reported time series data were log 10-transformed prior to analysis to reduce intra-series variability and improve general time series linearity.
- A linear regression was subsequently applied to the log-transformed values for each time series.
- An individual value within the time series was identified as a **dip/jump if the respective residual value (regression forecast value - reported value) was greater than 2 standard deviations from the mean of all residuals within the time series.**
- Only time series where the flagged **data value contributed a significant fraction (>3%)** of the **national total** for the given year are included
- Time series where sigma grow largely (i.e. larger than 20% of the time series mean value) because of extreme variation in the emission data are also flagged.

# TIME SERIES CONSISTENCY – EXAMPLE

MAIN (Unit = Mg)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
NOx	1A1b					3		9	5505	5193	4238	4267	4351	4548	3526	2737	1947	2573	11	9	12	11	1196	1249	969	1190	
NOx	1A3bi	31776	15743	19309	22648	22758	24936	21403	17043	20946	21395	22598	22358	23721	23543	22194	21787	22965	21678	21287	20650	19158	18061	18692	16906	18538	19755
NOx	1A3bii	12962	7015	7770	8807	8294	8784	7616	5894	7205	6966	5933	5366	5471	5766	6312	6044	5431	4734	4881	4555	4365	4401	4701	3997	4376	4788
NOx	1A3d(ii)	4679	23567	21518	20811	20972	21757	18909	706	5495	629	5024	7537	8242	10754	9028	8635	8321	4082	9590	16295	7730	5989	5039	7168	6458	6846
NOx	ADJUSTMENTS	270187	210065	181847	182689	177940	187870	183422	159366	158306	137011	148943	153843	175078	179822	177221	184989	180934	165588	166414	150656	140457	156838	142127	127311	133335	131621
NOx	NATIONALTOTAL	270187	210065	181847	182689	177940	187870	183422	159366	158306	137011	148943	153843	175078	179822	177221	184989	180934	165588	166414	150656	140457	156838	142127	127311	133335	131621
NOx	NTCOMPLIANCE	270187	210065	181847	182689	177940	187870	183422	159366	158306	137011	148943	153843	175078	179822	177221	184989	180934	165588	166414	150656	140457	156838	142127	127311	133335	131621
NMVOc	1A3bi	29936	14697	17403	20172	19425	21389	18039	12599	15402	14976	14549	13505	14286	13902	12048	12165	12743	11536	10968	10954	9862	8782	8241	7238	7774	7720
NMVOc	1A3bii	6251	3293	3924	4593	4321	4729	3928	2549	3131	2915	2471	2052	1980	1913	1722	1707	1236	977	892	811	729	670	641	508	535	545
NMVOc	1B2av	4521	2139	2541	3270	7049	3600	3107	2123	2735	2667	2964	2032	3980	2036	2319	2105	3154	2286	2368	2438	2367	2211	2153	1895	1886	1988
NMVOc	2D3e	342526	342526	342526	298735	9133	1701	1571	259	987	1076	1376	1361	993	585	615	454	448	337	100	122	157	174	234	98	127	113
NMVOc	3Da1	37892	38501	28472	28044	25581	24465	21792	22311	24456	23680	11803	21937	18435	17902	19205	18248	19534	20876	19850	27693	24877	23903	14298	13931	16306	16144
SOx	1A2a	204029	168083	125444	119860	110829	109308	105751	110229	69619	43807	86872	36221	30135	27262	23827	23194	16269	7003	6741	4127	2886	34157	11913	1172	1008	1125
SOx	1A4bi	25371	24703	30826	33232	24548	19960	24776	18731	18681	12698	9517	6286	11359	13485	10419	9482	10153	8696	8151	5867	7938	9769	9492	7820	5723	5829
SOx	2H1	6604	4731	6128	6787	6954	8737	8374	7304	5272	4073	4487	4869	4508	6648	6786	6277	6427	4571	4389	1443	5554	6973	5465	6868	7204	1993
NH3	2B7	942	804	465	234	406	716	779	757	732	622	832	1011	930	986	1028	1052	1055	1098	1129	752	1985	1256	1324	1247	1384	1328
NH3	3B3	32294	32553	28005	22262	18183	15540	15814	13962	11438	12295	9812	6453	6930	7733	7522	7180	7454	7214	6354	5756	5303	4860	4381	4267	4325	4384
NH3	3B4e	951	923	914	910	985	1137	1284	1364	1038	1098	1125	1161	1247	1287	1332	1122	1369	1389	586	1391	1372	1152	1166	1372	1372	1372
NH3	3B4f	2803	2784	2774	2591	2447	2354	2409	2434	1915	1841	1737	1623	1570	1570	1543	1138	1473	1451	9	1388	1259	1102	1109	1259	1259	1259
NH3	3B4gi	5720	5196	4111	3925	5916	4003	3543	3314	3198	3156	2948	3250	3754	3278	3425	2960	3100	3315	3225	2550	2886	2452	2345	2439	2522	2583
NH3	3B4giv	18266	11896	2824	2824	2824	5271	3164	2703	2696	2668	2423	2462	3332	4074	2165	1881	1966	2297	2235	1286	1721	1386	1309	39	39	1235
NH3	3Da1	6327	10133	5312	6855	4837	3571	3545	3441	3611	3218	54	3212	3489	3631	4117	4469	4519	5201	6102	9579	7569	7486	7392	1182	1133	1199



# REPORTING IN 6A AND 6B

- **Reporting of 6A** : Other (included in national total for entire territory) (please specify in IIR) for 2015
  - GB
  - HU
  - LV
  - NL
  - SE
- **Reporting of 6B**: Other **not** included in national total of the entire territory (please specify in the IIR) for 2015:
  - FR

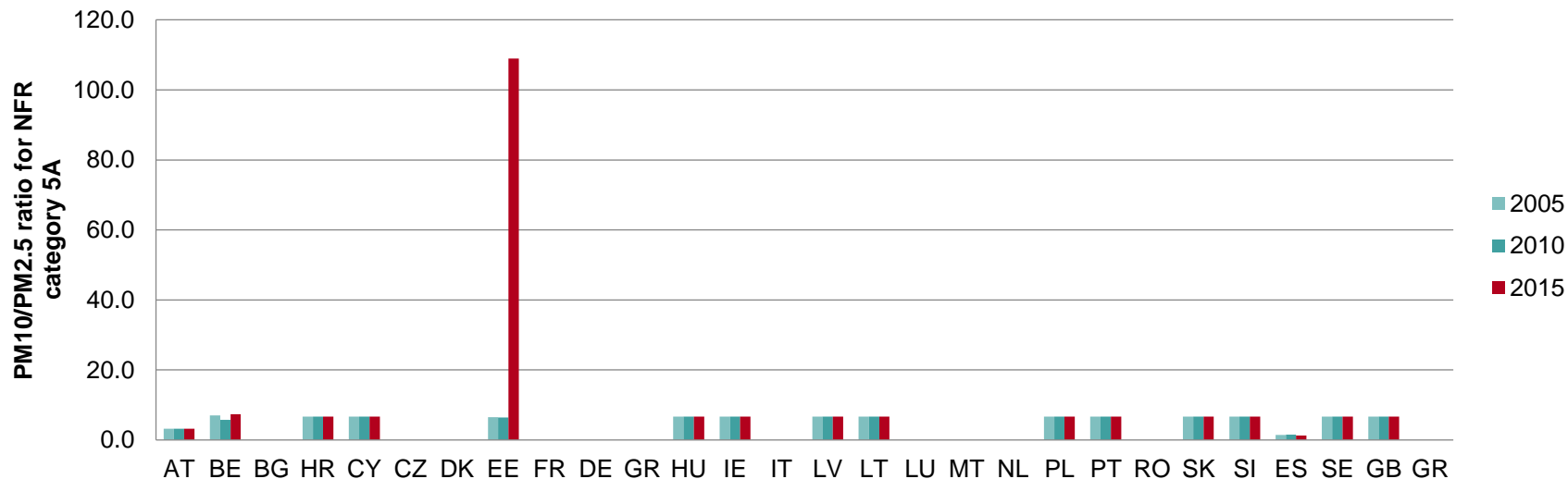
# PM2.5 > PM10

- Approx: **350 cases** for the year 2015 where  $PM_{2.5} = PM_{10}$  (for all 28 EU-MS)
- **6 cases** for the year 2015 where  $PM_{2.5}$  emission are bigger than  $PM_{10}$  (for all 28 EU-MS)

#ISO2	Year	Sector	Sector Description	unit	PM10	PM2.5	PM10-PM2.5
LT	2015	1A1b	Petroleum refining	kt	0.0125	0.0132	-0.0007
LT	2015	1A3dii	National navigation (shipping)	kt	0.0061	0.0065	-0.0004
LT	2015	3B2	Manure management - Sheep	kt	0.0000	0.0025	-0.0025
LU	2015	3De	Cultivated crops	kt	0.0079	0.2043	-0.1964
MT	2015	3B4giv	Manure management - Other poultry	kt	0.000020	0.000027	-0.000007
NL	2015	1A4ai	Commercial/institutional: Stationary	kt	0.027054	0.027079	-0.000025

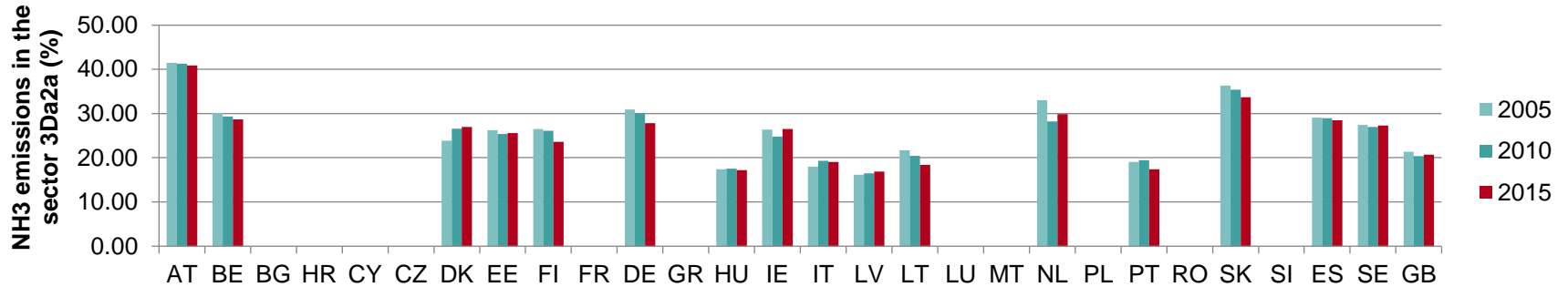
# PM2.5/PM10 RATIO

## 5A: Biological treatment of waste - Solid waste disposal on land

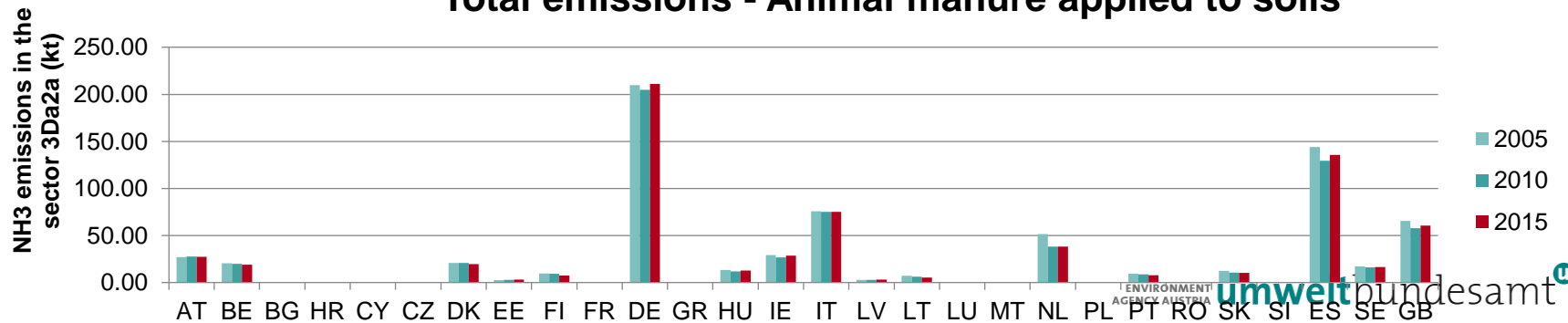


# NH3 KEY CATEGORIES - COMPARISON

## % contribution to National Total - Animal manure applied to soils



## Total emissions - Animal manure applied to soils



# FUEL SOLD/FUEL USED EXAMPLES

#ISO2	Year	Pollutant	Unit	1A3(template row 152) <b>used</b>	Sum 1A3b(template row 27 to 33) <b>sold</b>	Difference
AT	2015	NOx	kt	59.25	73.16	-13.91
BE	2015	NOx	kt	90.81	91.52	-0.71
CZ	2015	NOx	kt	39.10	35.62	<b>3.47</b>
IE	2015	NOx	kt	39.82	37.51	<b>2.31</b>
LU	2015	NOx	kt	5.17	13.25	-8.07
NL	2015	NOx	kt	106.84	84.82	<b>22.02</b>

# CONTACT & INFORMATION

Sabine Schindlbacher, Katarina Mareckova  
0043-31304-5978, 0043-31304-5948,

[Sabine.schindlbacher@umweltbundesamt.at](mailto:Sabine.schindlbacher@umweltbundesamt.at)

[Katarina.Mareckova@umweltbudnesamt.at](mailto:Katarina.Mareckova@umweltbudnesamt.at)

Umweltbundesamt  
[www.umweltbundesamt.at](http://www.umweltbundesamt.at)

TFEIP Meeting - Workshop  
Krakow ● 10.05.2017

ENVIRONMENT  
AGENCY AUSTRIA **umweltbundesamt**<sup>U</sup>