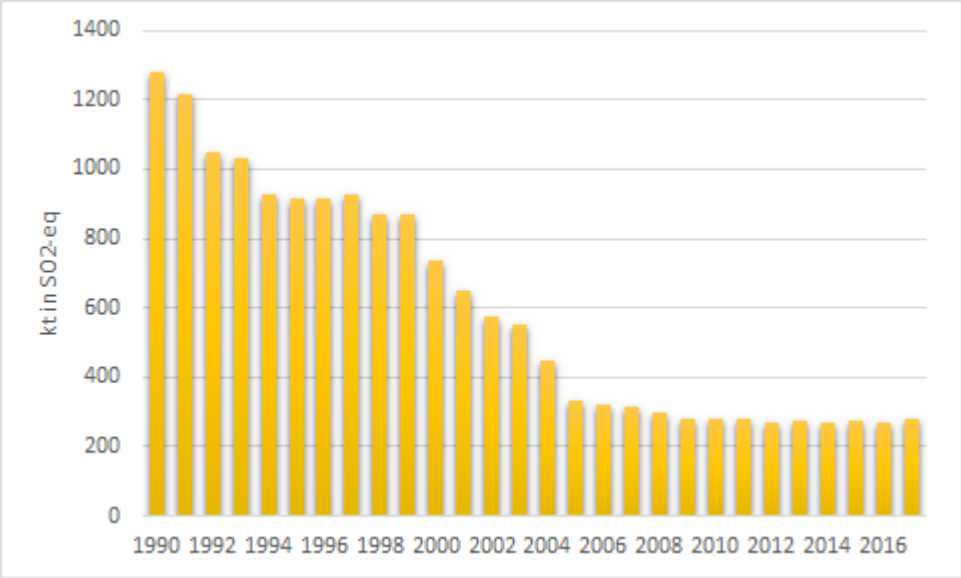
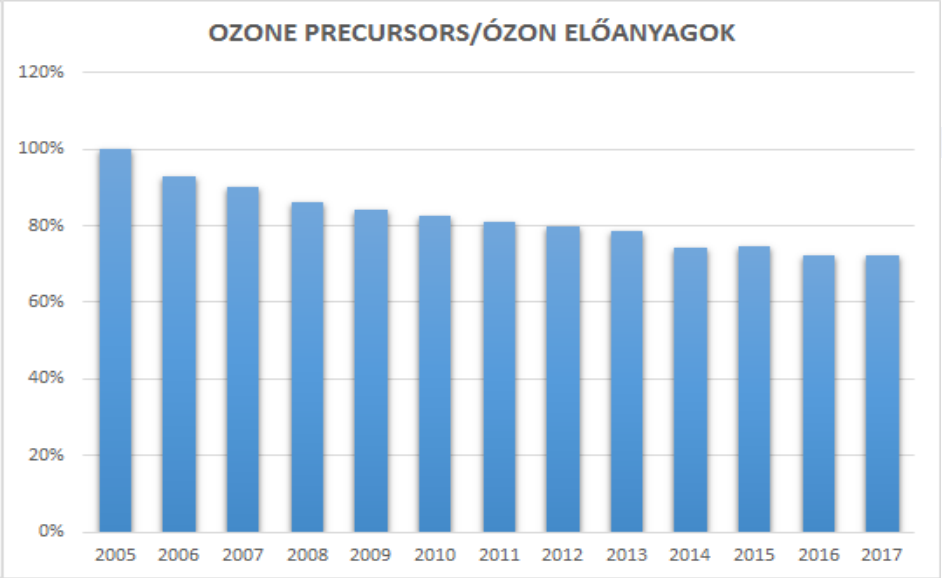
A LÉGSZENNYEZŐANYAG-KIBOCSÁTÁSOK ALAKULÁSA HAZÁNKBAN

Kis-Kovács Gábor
Nemzeti Emissziós Leltárak Osztálya

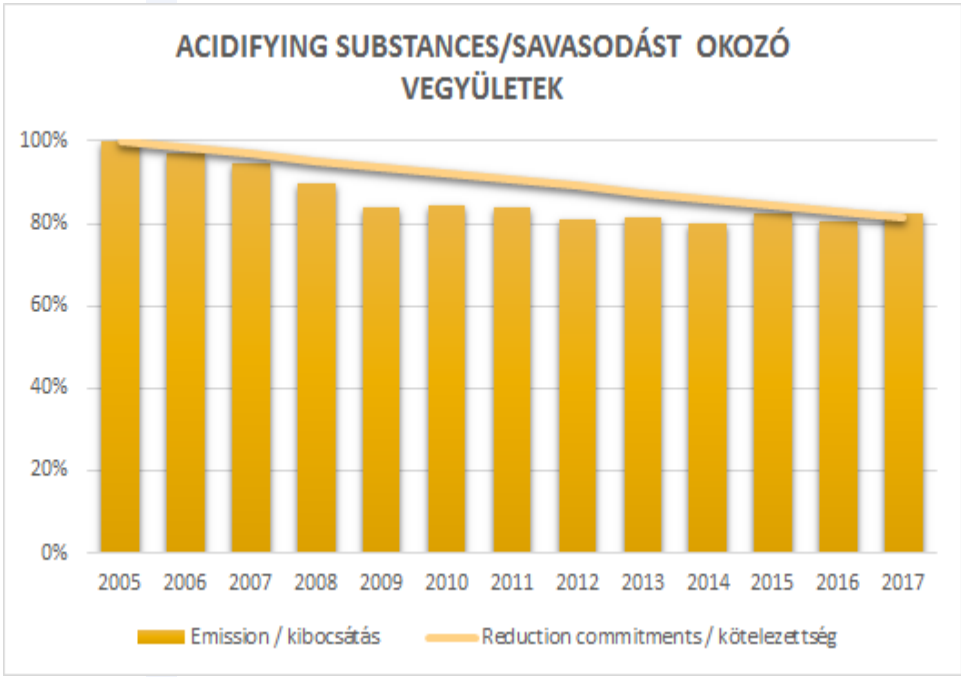
Alapítva: 1870



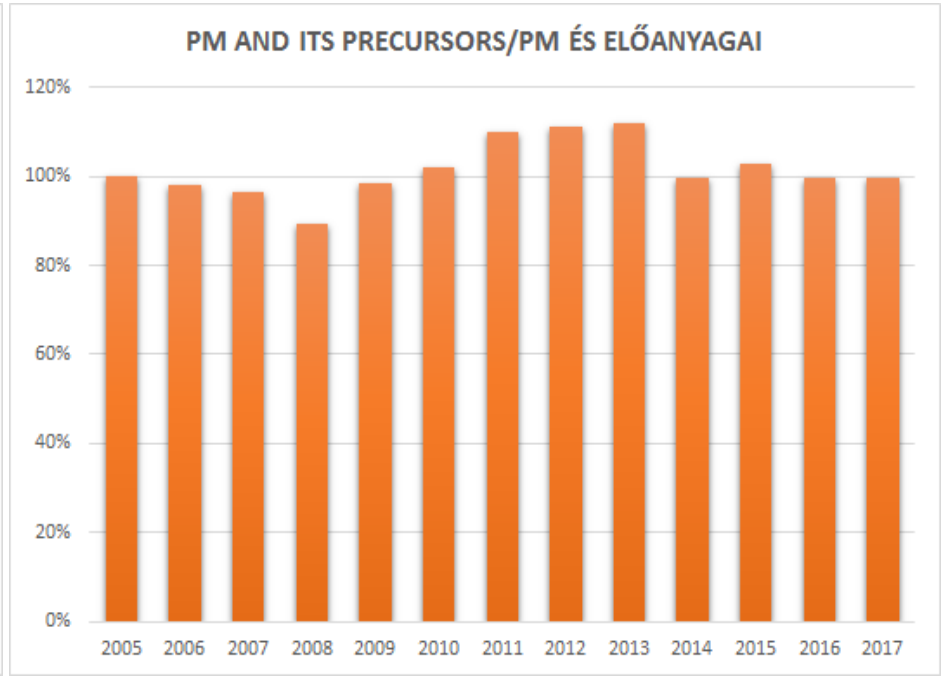
SO2, NOx, NH3



NMVOC, NOx, CO, CH4

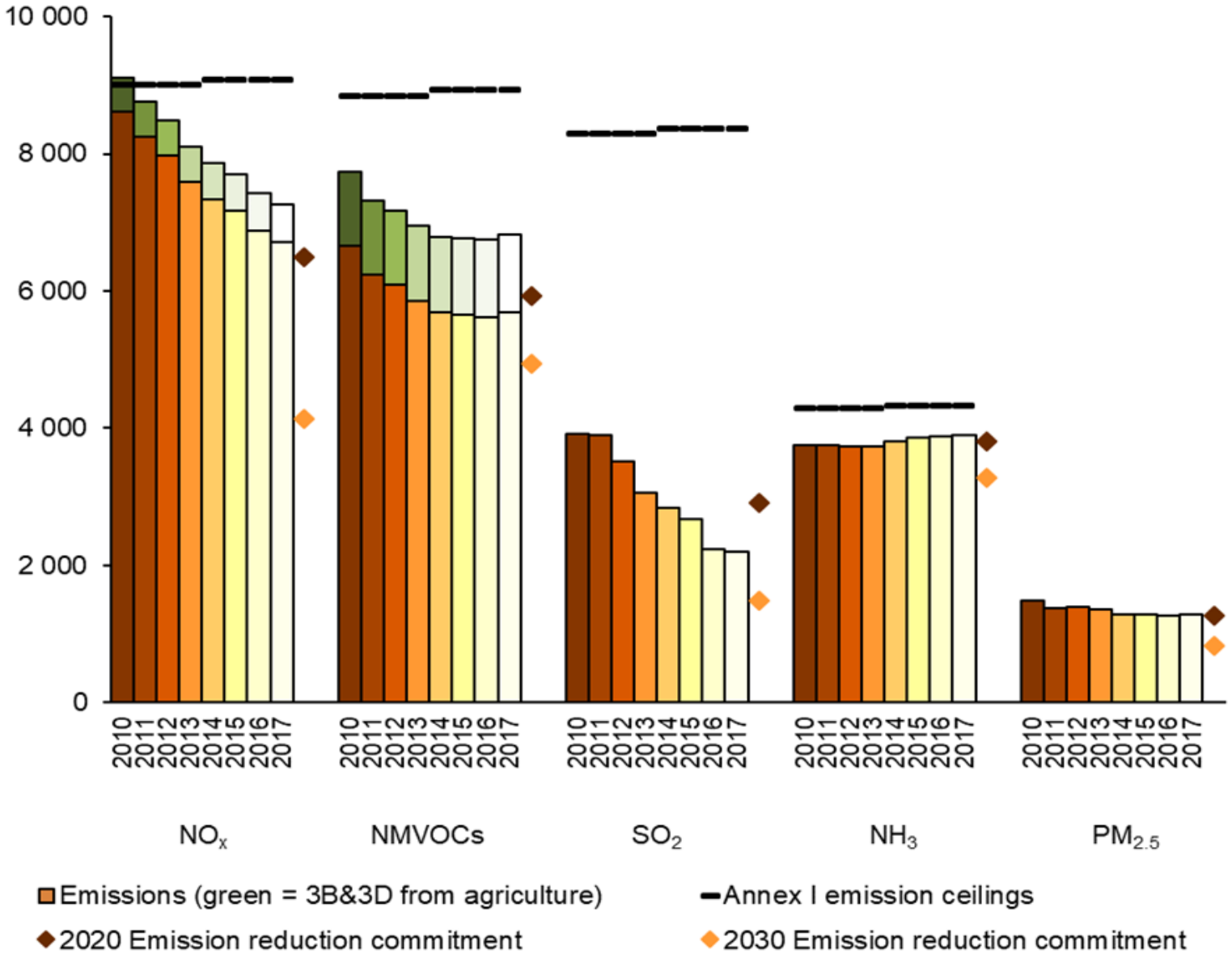


PM2.5, SO2, NOx, NH3, NMVOC



Emissions
(Gg)

Európai Környezetvédelmi Ügynökség



Egységes szerkezet

	HU: 15.02.2019: 2017	NFR sectors to be reported			Main Pollutants (from 1990)				Particulate Matter (from 2000)			
					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	Longname	Notes	kt	kt	kt	kt	kt	kt	kt	kt
14	A_PublicPower	1A1a	Public electricity and heat production		11.5627	1.2411	11.1084	0.0011	0.2170	0.2529	0.2815	0.0054
15	B_Industry	1A1b	Petroleum refining		0.8021	0.0643	0.2834	NE	0.0064	0.0064	0.0064	0.0012
16	B_Industry	1A1c	Manufacture of solid fuels and other energy industries		0.7174	0.1266	0.4474	NE	0.0372	0.0577	0.0592	0.0169
17	B_Industry	1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel		0.9675	IE	0.7925	IE	IE	IE	IE	IE
18	B_Industry	1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals		0.4301	IE	0.0871	IE	IE	IE	IE	IE
19	B_Industry	1A2c	Stationary combustion in manufacturing industries and construction: Chemicals		0.5426	0.1799	0.4198	0.0016	0.0100	0.0102	0.0103	0.0017
20	B_Industry	1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print		0.5102	0.5302	0.2131	0.0201	0.2416	0.2590	0.2738	0.0252
21	B_Industry	1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco		1.1930	1.0071	0.0443	0.0862	0.1984	0.2027	0.2121	0.0524
22	B_Industry	1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals		3.3870	0.0277	0.8393	NE	IE	IE	IE	IE
23	I_Offroad	1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)		2.8238	0.2577	0.0037	0.0015	0.1460	0.1460	0.1460	0.1086
24	B_Industry	1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)		1.8910	1.2928	0.1864	0.0952	0.2307	0.2358	0.2466	0.0591
25	H_Aviation	1A3ai(i)	International aviation LTO (civil)		0.5315	0.0471	0.0297	NE	0.0043	0.0043	0.0043	0.0021
26	H_Aviation	1A3aii(i)	Domestic aviation LTO (civil)		0.0014	0.0001	0.0001	NE	0.0000	0.0000	0.0000	0.0000
27	F_RoadTransport	1A3bi	Road transport: Passenger cars		13.4723	5.0773	0.0196	1.0205	0.5675	0.5675	0.5675	0.4270
139	J_Waste	5E	Other waste (please specify in IIR)	(d)	NE	NE	NE	NE	0.9389	0.9389	0.9389	NE
140	M_Other	6A	Other (included in national total for entire territory) (please specify in IIR)		NO	NO	NO	NO	NO	NO	NO	NO
141		NATIONAL TOTAL	National total for the entire territory (based on fuel sold)		119.2832	141.52	27.7221	87.7001	47.9881	68.8665	100.1465	6.8892

Kulcskategóriák

Key Category Analysis 2017

Component	Key categories (Sorted from high to low from left to right)														Total (%)
SOx	1A4bi (41.5%)	1A1a (40.1%)													81.6
NOx	1A3biii (15.1%)	3Da1 (13.9%)	1A3bi (11.3%)	1A3bii (10.9%)	1A4bi (10.1%)	1A1a (9.7%)	1A4cii (5.7%)	1A4ai (3.6%)							80.3
NH3	3Da2a (22.7%)	3Da1 (20.0%)	3B3 (12.2%)	3B1b (9.2%)	3B1a (8.6%)	1A4bi (5.3%)	3B4gii (4.0%)								82.1
NMVOC	1A4bi (22.8%)	2D3d (12.2%)	2D3a (8.8%)	3B1b (5.0%)	2D3g (4.9%)	3B1a (4.2%)	2H2 (4.1%)	2D3h (3.7%)	1A3bi (3.6%)	1A3bv (3.1%)	2B10a (3.0%)	3De (2.5%)	2D3f (2.1%)	1A3biv (1.8%)	81.7
CO	1A4bi (69.2%)	1A3bi (14.3%)													83.5
TSP	1A4bi (42.8%)	2A5b (28.4%)	3Dc (6.5%)	2A5a (4.0%)											81.7
PM10	1A4bi (59.2%)	2A5b (12.4%)	3Dc (9.5%)												81.0
PM2.5	1A4bi (82.8%)														82.8
Pb	1A4bi (32.9%)	1A3bvi (18.9%)	1A1a (14.9%)	2A3 (9.9%)	1A2d (5.8%)										82.3
Hg	1A1a (15.0%)	2C1 (14.2%)	2B10a (12.0%)	1A4bi (11.9%)	5C1biii (10.5%)	2K (7.3%)	1A2f (6.9%)	2D3a (4.1%)							81.8
Cd	1A4bi (61.5%)	1A1a (9.7%)	2G (4.7%)	2A3 (4.2%)											80.0
DIOX	1A4bi (69.5%)	5E (14.1%)													83.6
PAH	1A4bi (90.2%)														90.2
HCB	1A1a (32.9%)	1A4bi (23.9%)	5C1biii (22.9%)	1A4ai (10.9%)											90.6

Számolunk!

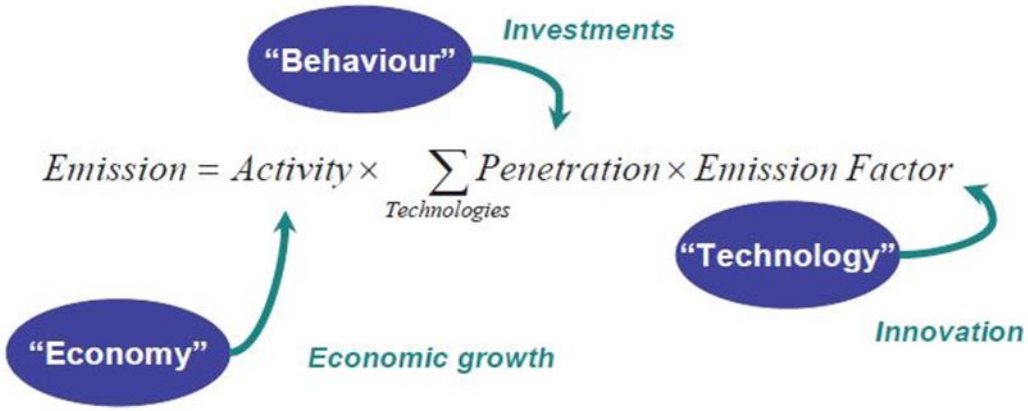
Egységes módszertani útmutatók

különböző bonyolultságú számítási módszerek és emissziós faktorok

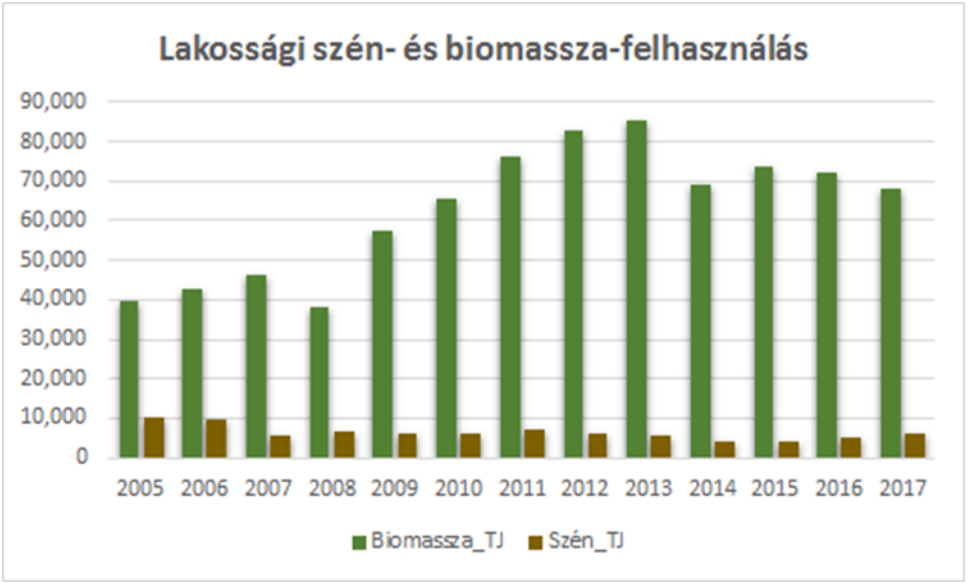
Emisszió = AD · EF

AD (activity data): az emberi tevékenység mértékét számszerűsítő mennyiség;

EF (emission factor): az adott tevékenységre eső egységnyi kibocsátás.



PM2.5 emissions of households / Háztartási tüzelés



BIOMASS BURNING / BIOMASSZA ÉGETÉS:

Fireplace / kandalló: +10%,

Conventional stove / kályha: 100%

Conventional boiler / hagyományos kazán: -36%,

High efficiency stove / energiahatékony kályha: **-50%**

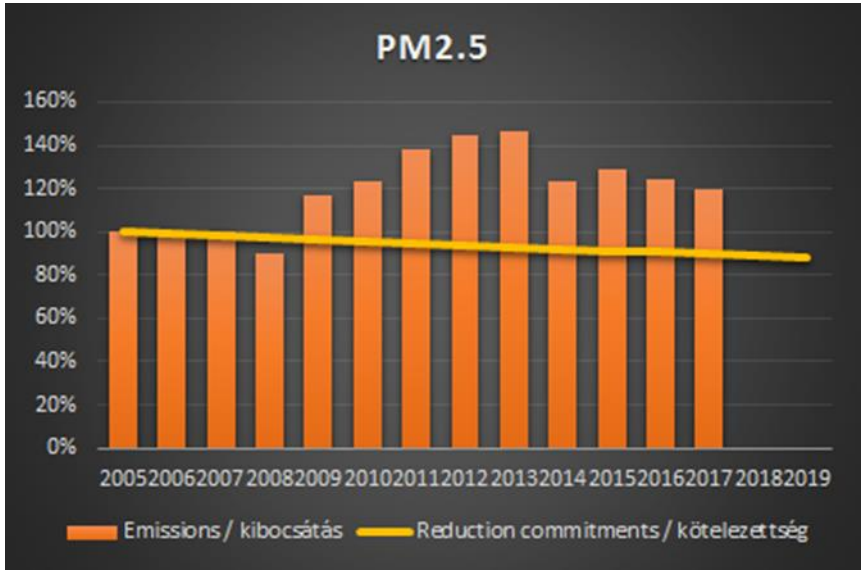
Ecolabelled stove / ökocímkés kályha, kazán: **-85%**

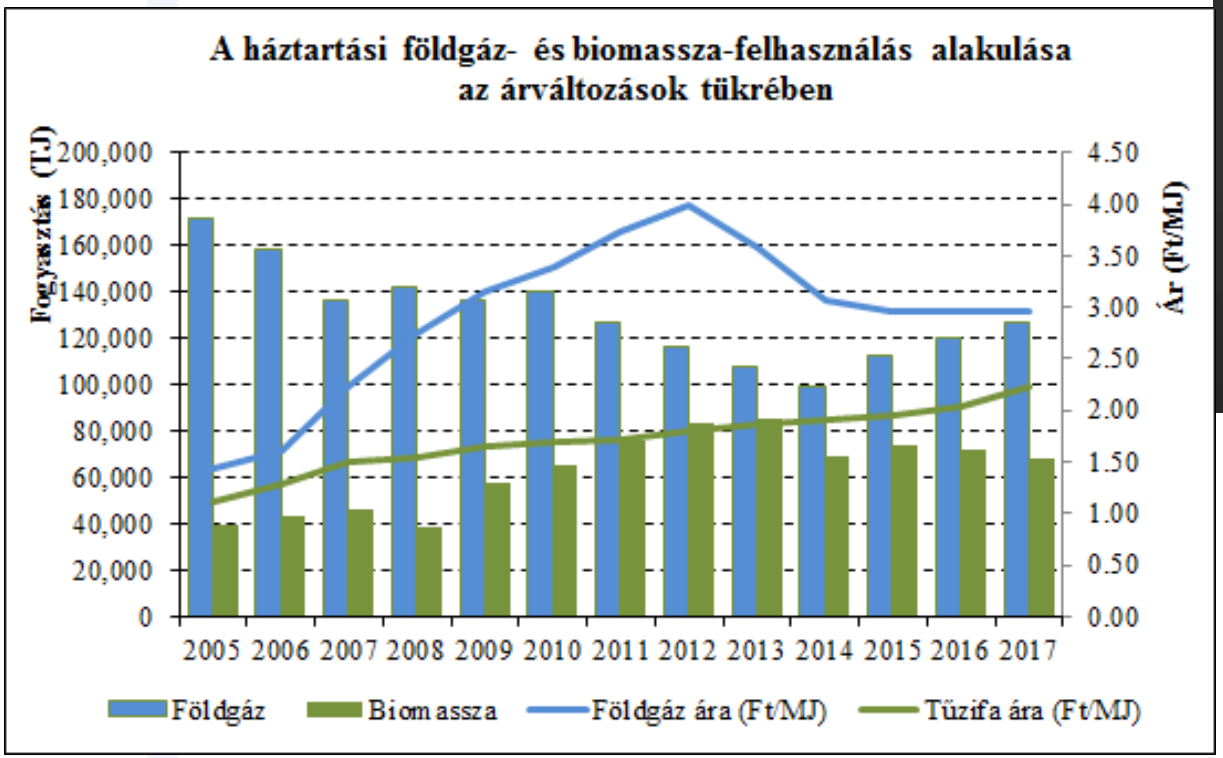
Pellet stoves and boilers / Pellettüzelés: **-92%**

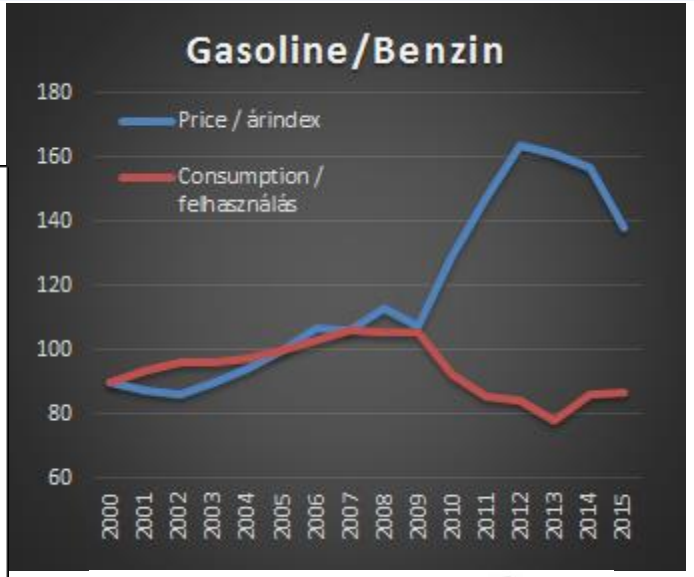
WRONG PRACTICES / ROSSZ GYAKORLAT

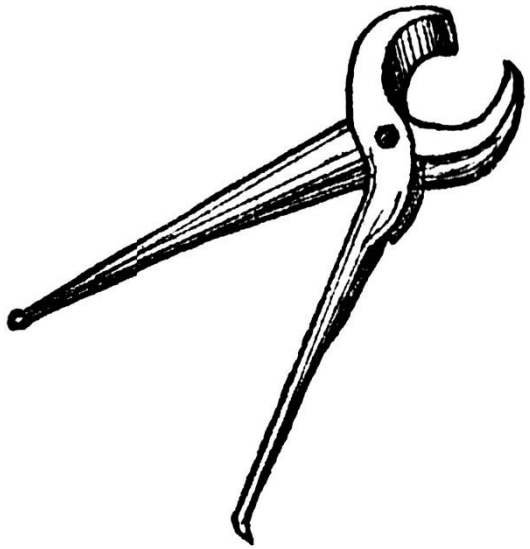
Part load / Részleges megrakás : **4X**

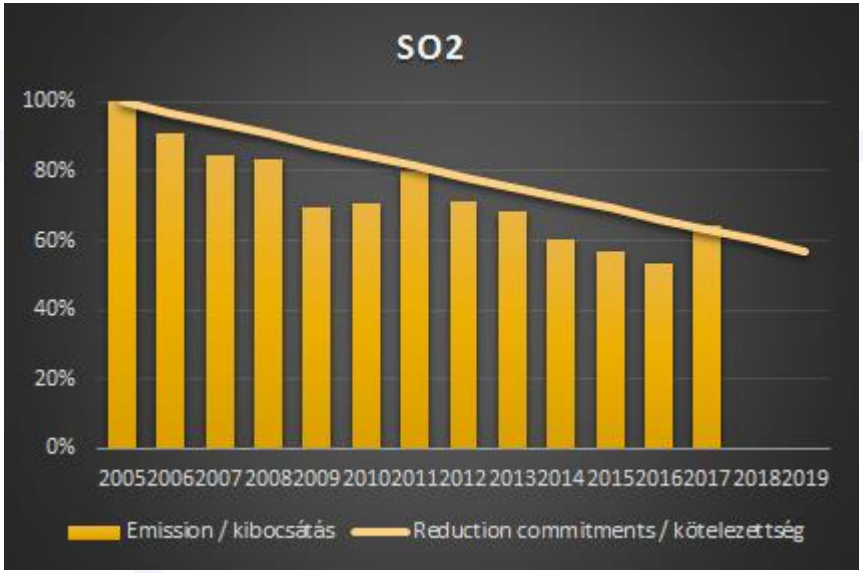
Moist fuel / Nedves fa tüzelése: **5X**

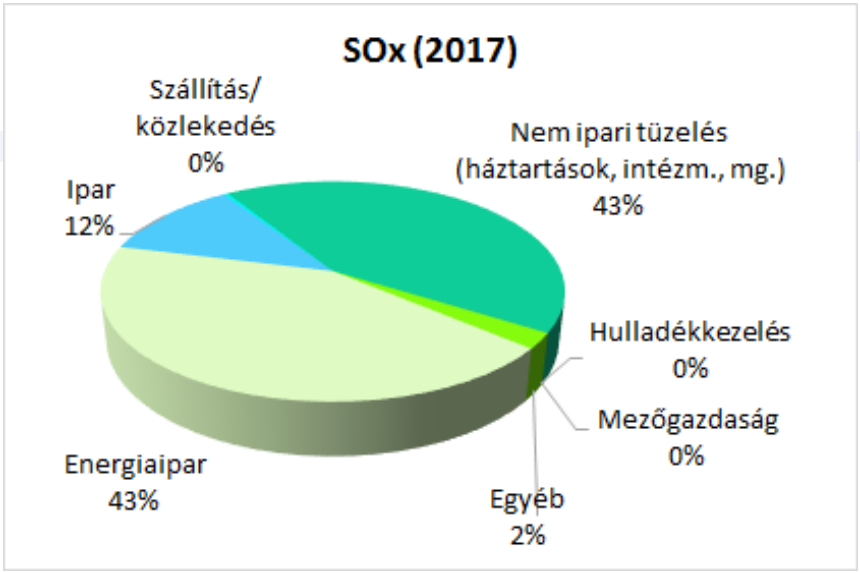


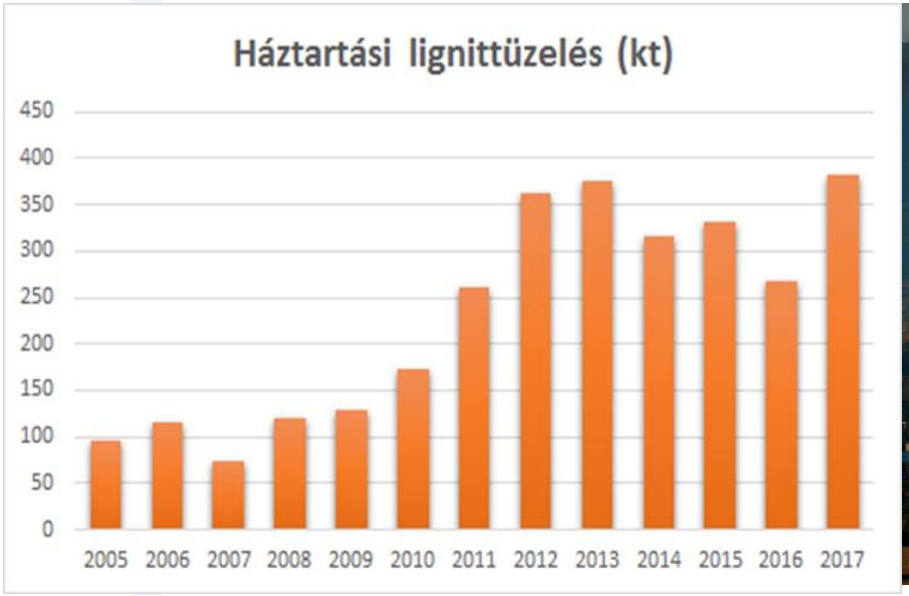

A háztartási földgáz- és biomassza-felhasználás alakulása
az árváltozások tükrében
Fogyasztás (TJ)
Ár (Ft/MJ)
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
Földgáz
Biomassza
Földgáz ára (Ft/MJ)
Tüzifa ára (Ft/MJ)

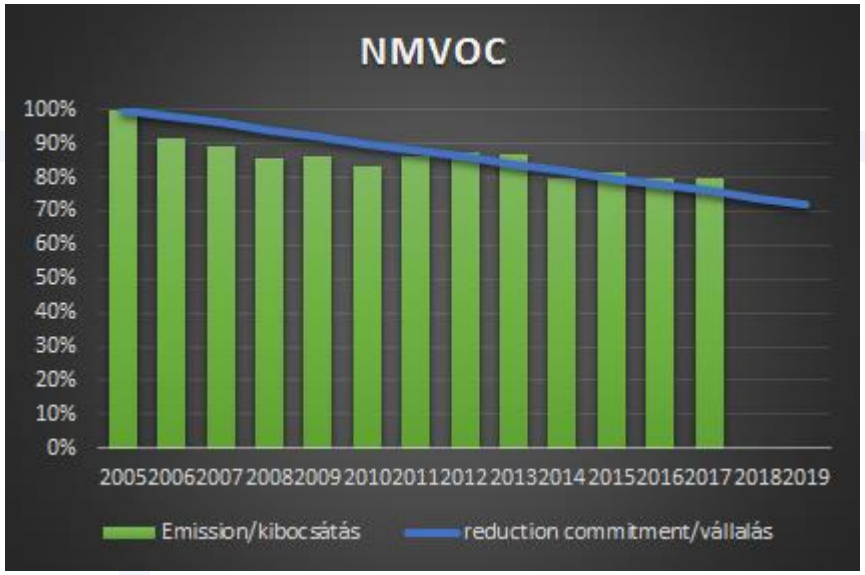

Gasoline/Benzin
180
160
140
120
100
80
60
Price / árindex
Consumption /
felhasználás
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

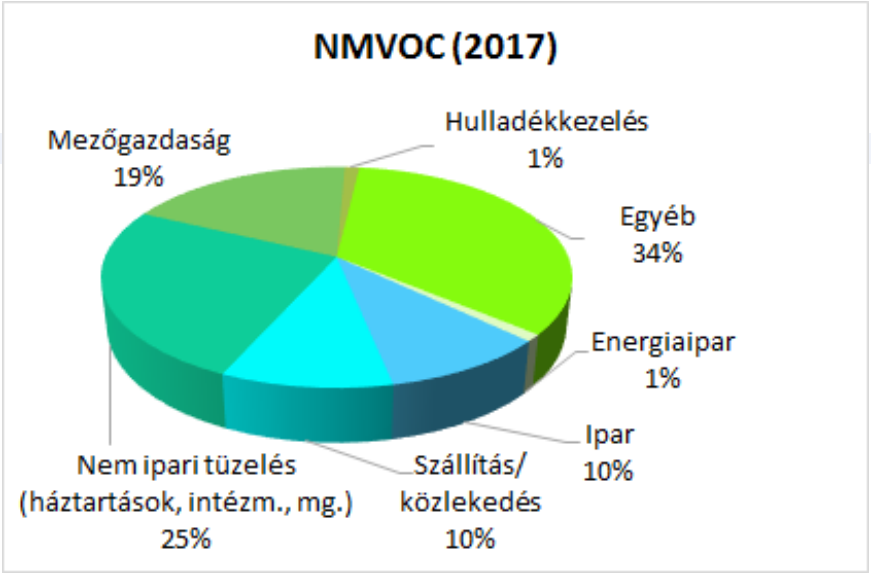



SO2
100%
80%
60%
40%
20%
0%
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Emission / kibocsátás
Reduction commitments / kötelezettség

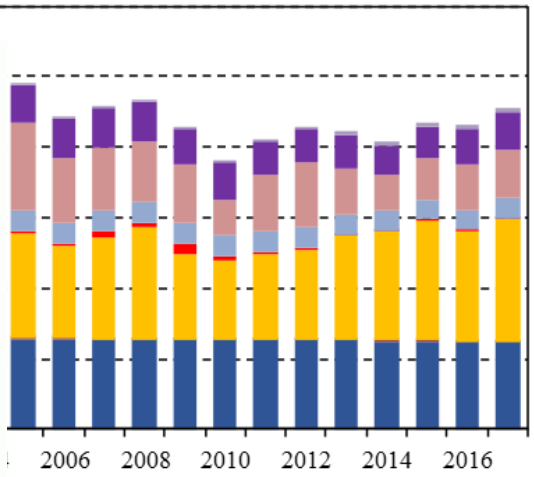

SOx (2017)
Szállítás/ közlekedés 0%
Nem ipari tüzelés (háztartások, intézm., mg.) 43%
Ipar 12%
Hulladékkezelés 0%
Mezőgazdaság 0%
Energiaipar 43%
Egyéb 2%

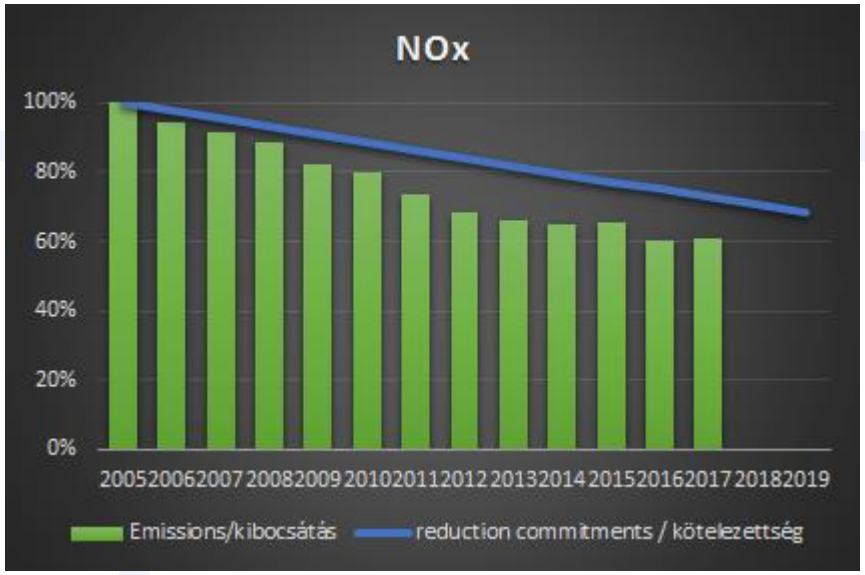

Háztartási lignittüzelés (kt)
450
400
350
300
250
200
150
100
50
0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

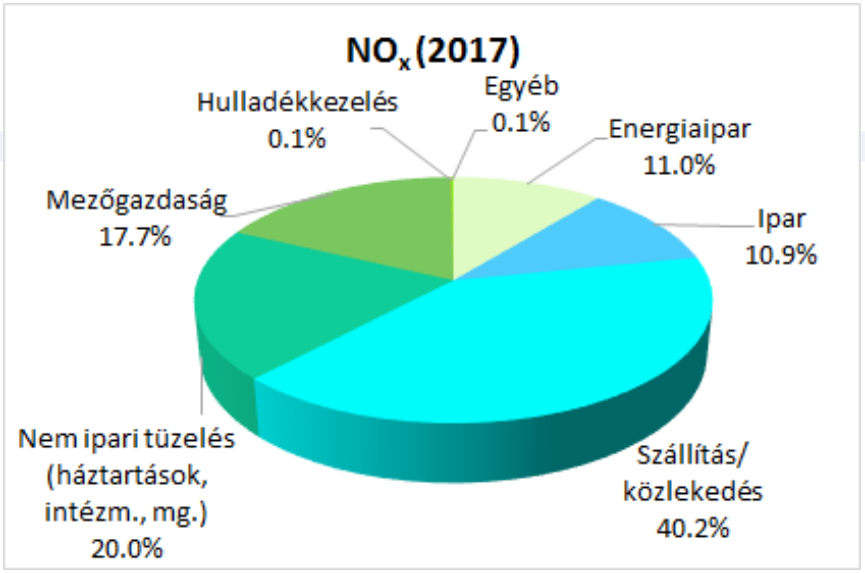


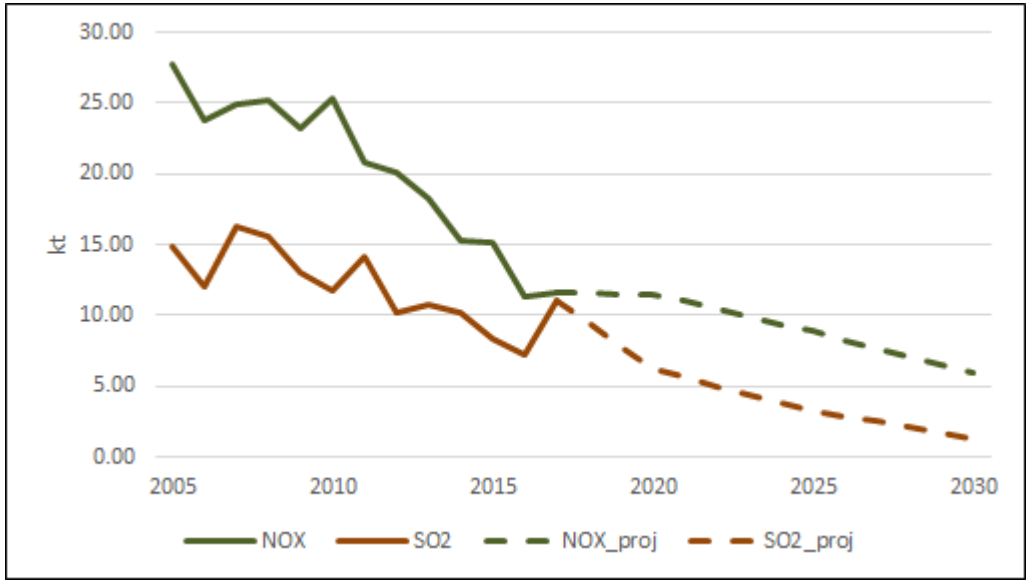


Domestic solvent use including fungicides
Asphalt roofing
Degreasing
Chemical products
Other solvent use (please specify in the IIR)
Road paving with asphalt
Coating applications
Dry cleaning
Printing

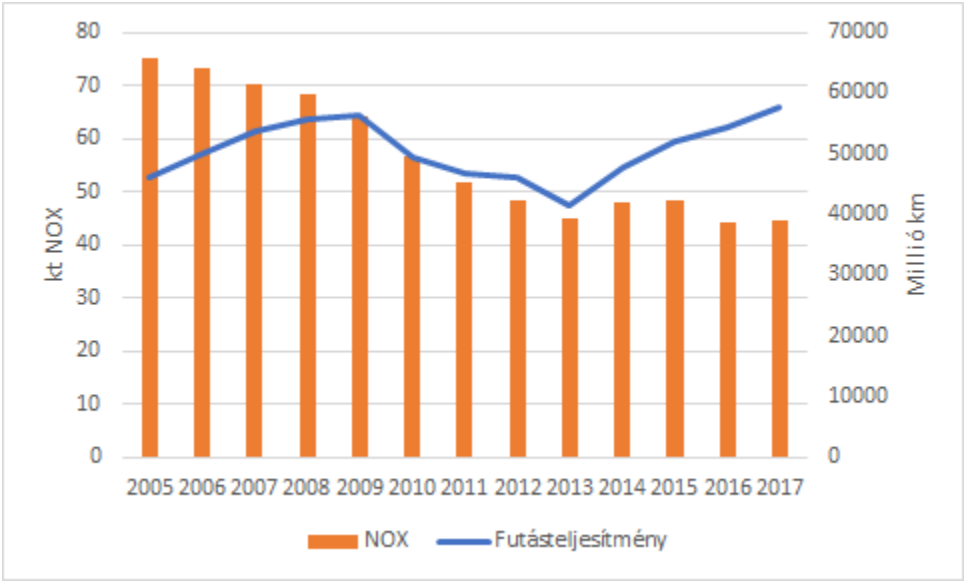


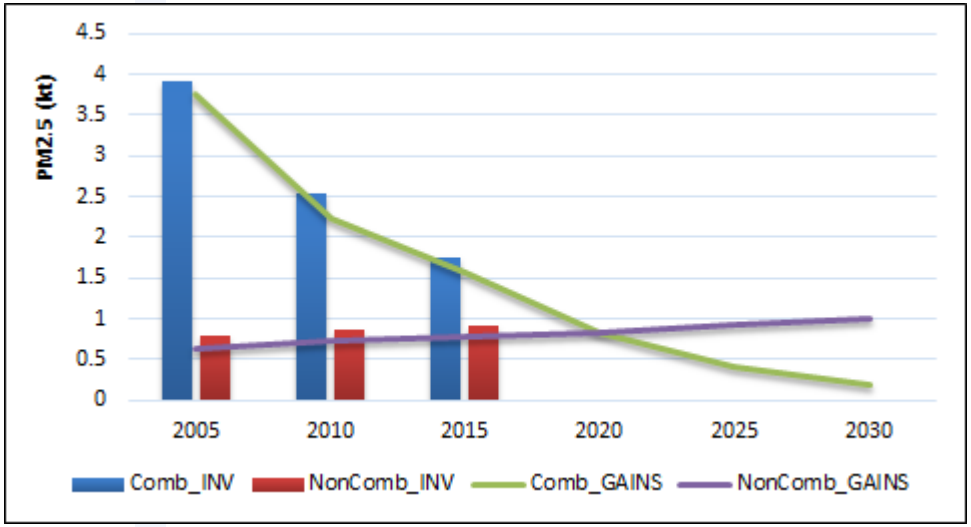

NOx
100%
80%
60%
40%
20%
0%
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Emissions/kibocsátás
reduction commitments / kötelezettség

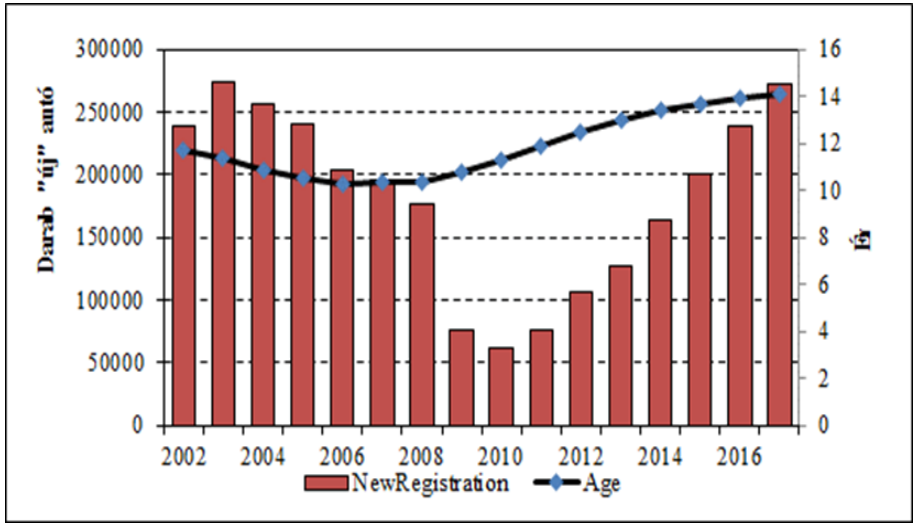

NOx (2017)
Hulladékkezelés 0.1%
Egyéb 0.1%
Energiaipar 11.0%
Mezőgazdaság 17.7%
Ipar 10.9%
Nem ipari tüzelés (háztartások, intézm., mg.) 20.0%
Szállítás/ közlekedés 40.2%

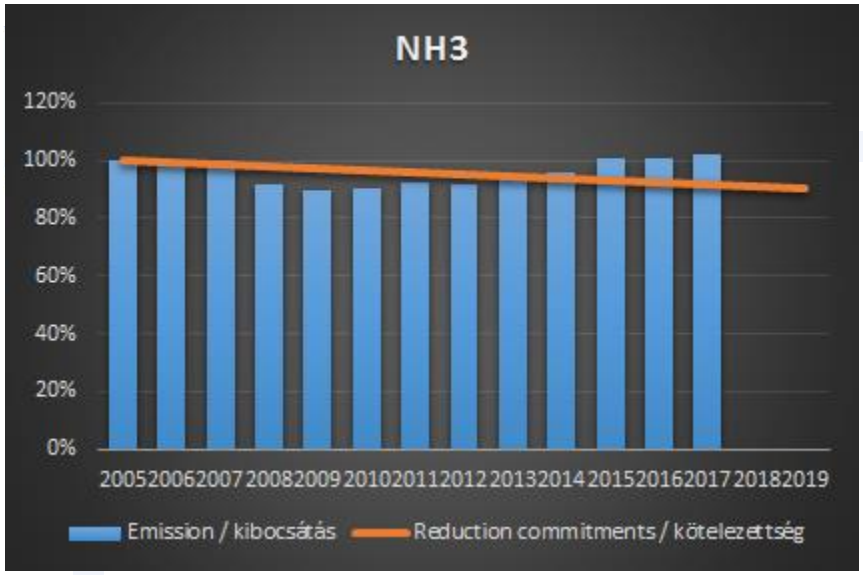

30.00
25.00
20.00
15.00
10.00
5.00
0.00
kt
2005
2010
2015
2020
2025
2030
NOX
SO2
NOX_proj
SO2_proj

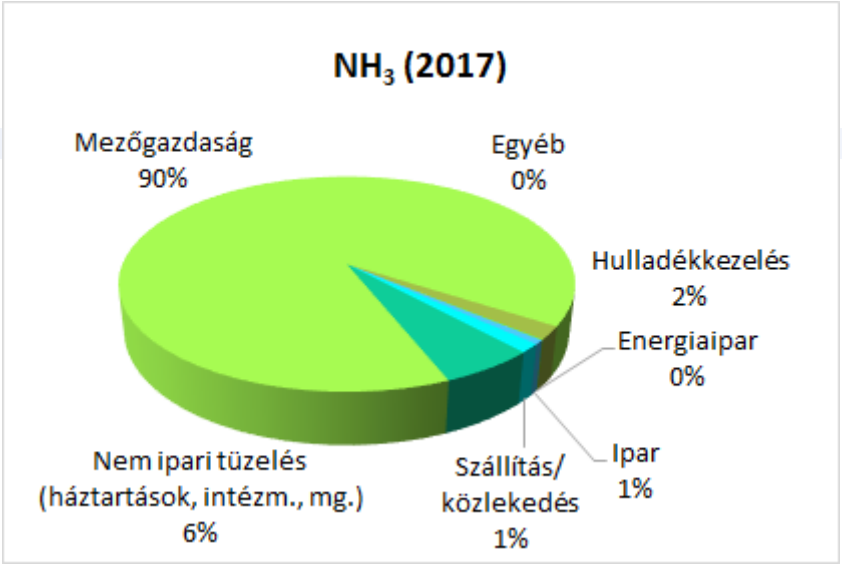
Road transport / Közúti szállítás

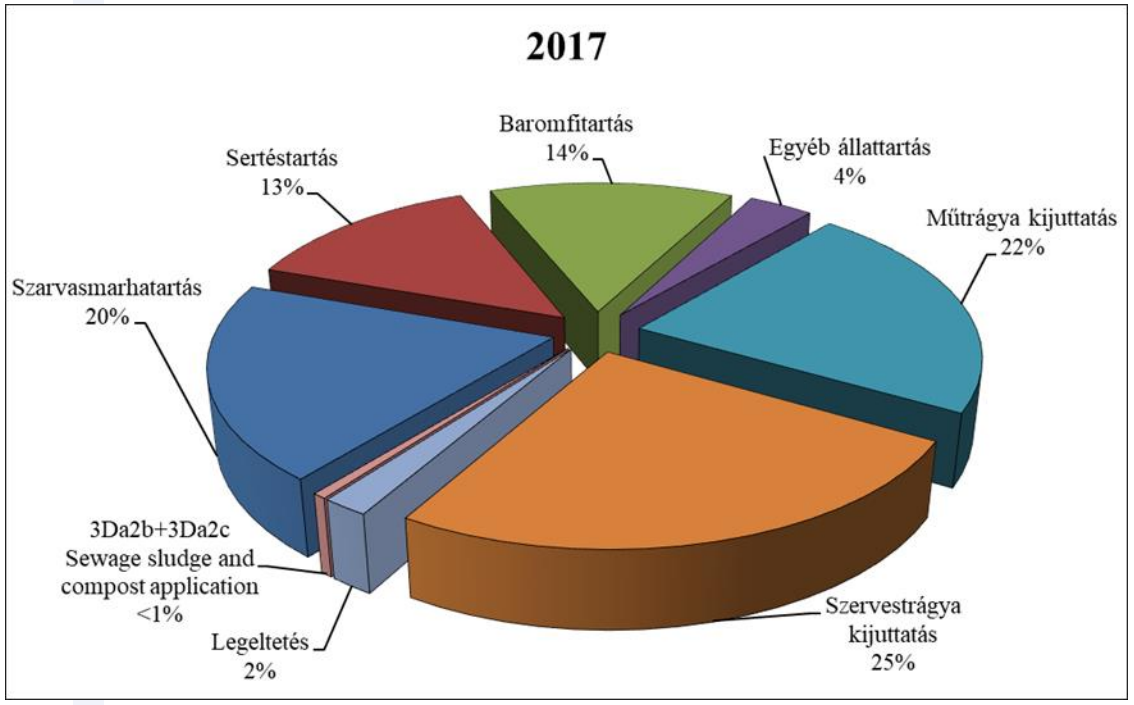






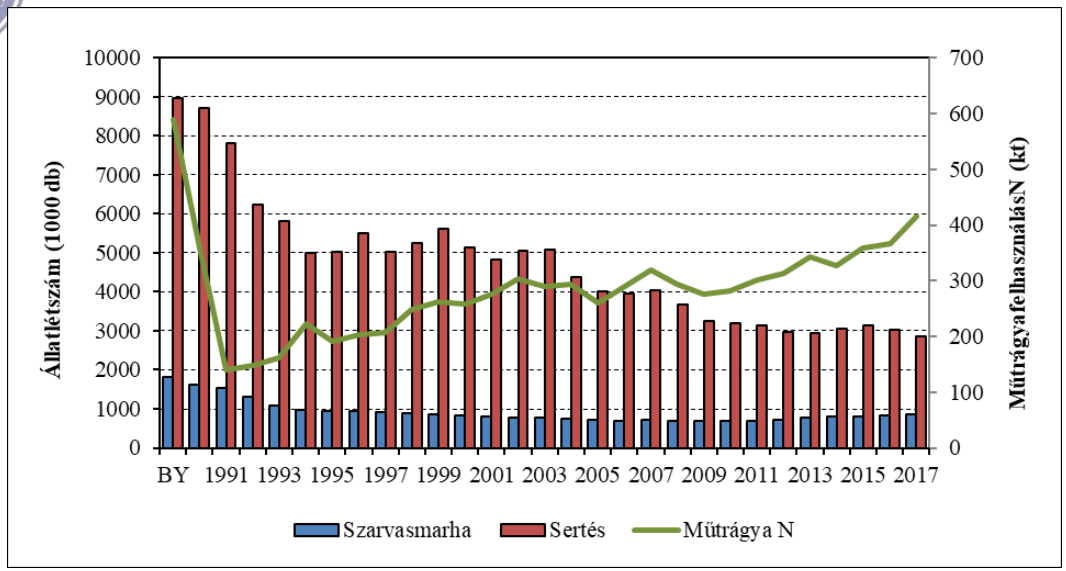






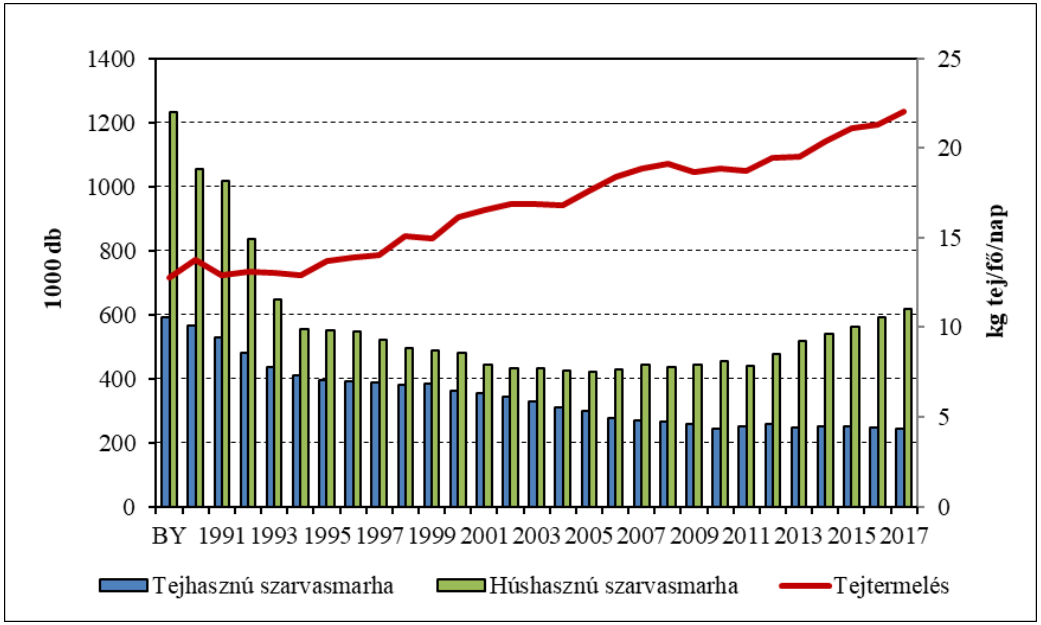
A mezőgazdasági eredetű NH3 kibocsátás legfontosabb forrásai: a szerves és műtrágya kijuttatás, a szarvasmarha-, baromfi- és sertéstartás.

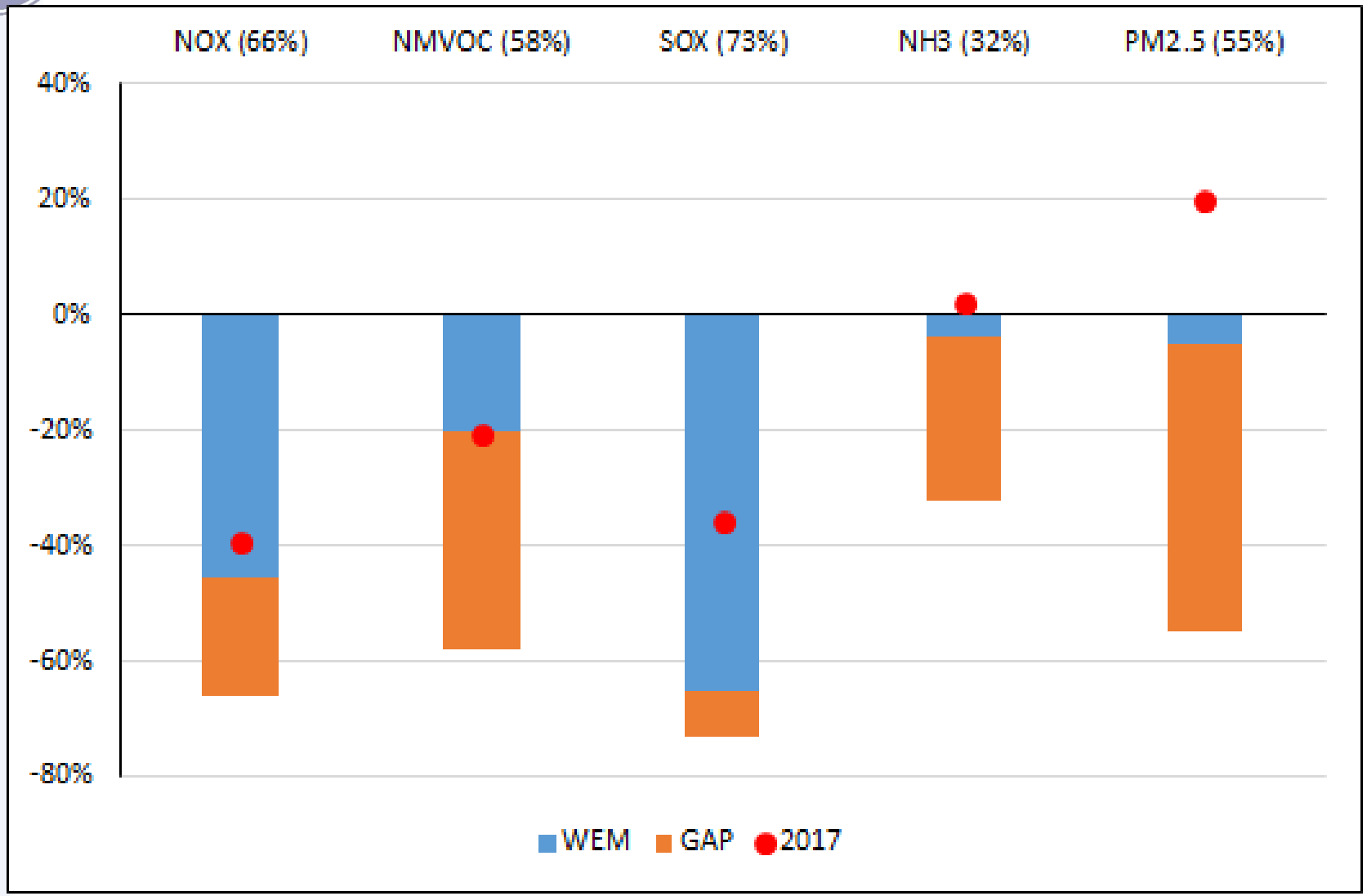
Az NH_3 kibocsátás növekedés okai



Az NH_3 kibocsátás trendjét leginkább a szarvasmarha állatlétszám és tejtermelés; a műtrágya felhasználás, a sertés és a baromfi állomány nagysága határozza meg.

A felhasznált műtrágya N-tartalma, a tejtermelés és a húshasznú szarvasmarha állomány az elmúlt években folyamatosan nőtt.




NOX (66%)
NMVOC (58%)
SOX (73%)
NH3 (32%)
PM2.5 (55%)
40%
20%
0%
-20%
-40%
-60%
-80%
WEM
GAP
2017