

Ireland's Greenhouse Gas and Air Pollutant Emission Inventories 1990-2016

Royal Irish Academy

31st May 2018

Overview - GHG

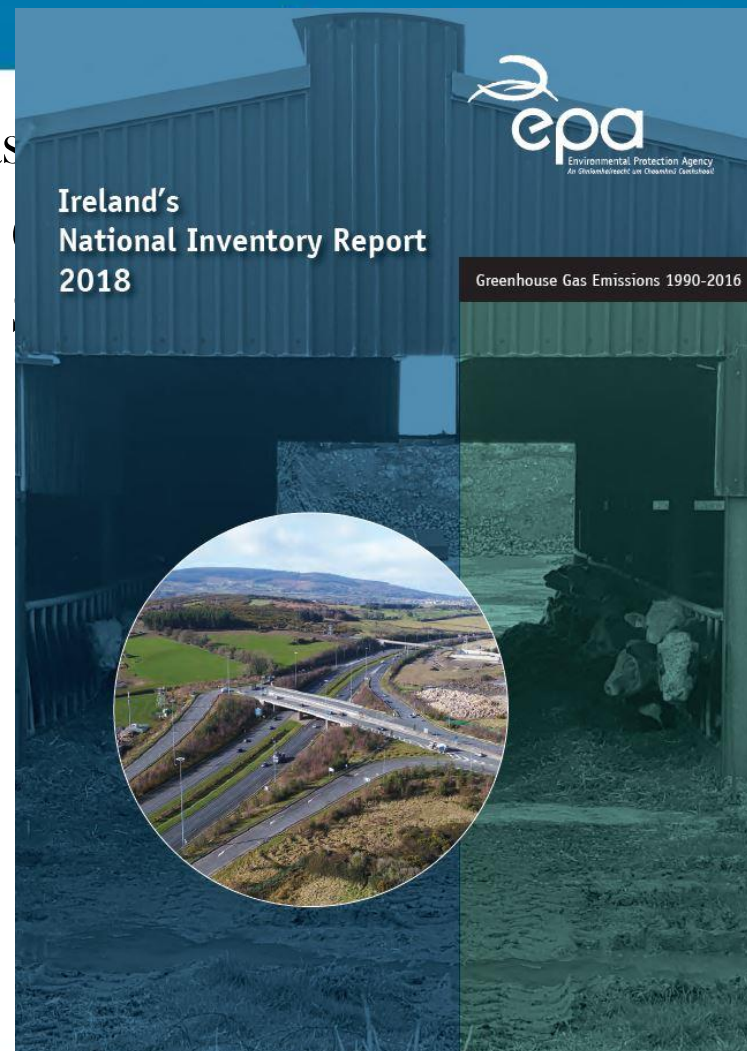
- Highlights
- Trends in GHG emissions in Ireland 1990-2016
- Effort Sharing Decision compliance

Sources of Greenhouse Gas Emissions

■ Sources

- Energy Industries
- Residential
- Manufacturing Combustion
- Commercial Services
- Public Services
- Transport
- Industrial Processes
- F-Gases
- Agriculture
- Waste

■ Gas



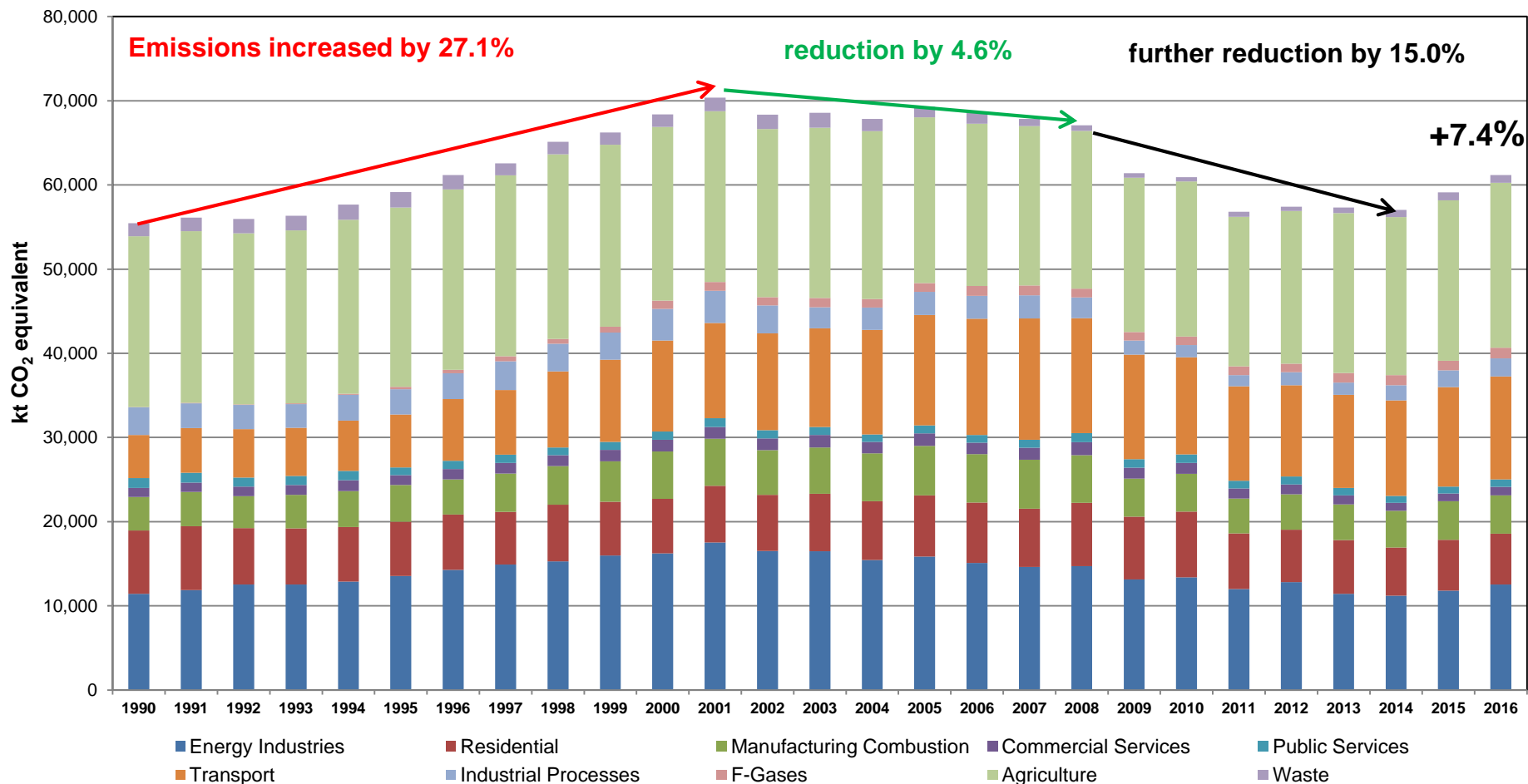
Highlights (1)

- ❑ Total GHG emissions in 2016 are 61.55 Mt CO₂eq, up 2.12 Mt CO₂eq, 3.6% increase
- ❑ Greenhouse gas emissions increased in all sectors: *Energy Industries, Residential, Commercial Services, Public Services, Transport, Industrial Processes, F-Gases, Agriculture* sectors, *Waste sectors and Manufacturing Combustion*
- ❑ In 2016, emissions in the European Union's Emissions Trading Sector (ETS) sector increased by 5.4% or 0.91 Mt CO₂eq and non-ETS emissions increased by 2.8% or 1.21 Mt CO₂eq
- ❑ *Energy Industries* emissions are up 0.71 Mt CO₂eq a 6.0% increase, reflecting a 27.7% increase in natural gas use. Also wind and hydro renewables for electricity generation reduced by 6.5% and 15.6% in 2016
- ❑ *Transport* emissions are up 0.48 Mt CO₂eq a 4.1% increase. This is the fourth successive year of increases, with gasoline use declining by 6.7% and increases in diesel of 8.0% and decrease in biofuels use of 8.0%
- ❑ *Agriculture* emissions increased by 2.7% or 0.53 Mt CO₂eq in 2016. Dairy cow numbers increased by 6.2% with a 4.0% increase in milk production

Highlights (2)

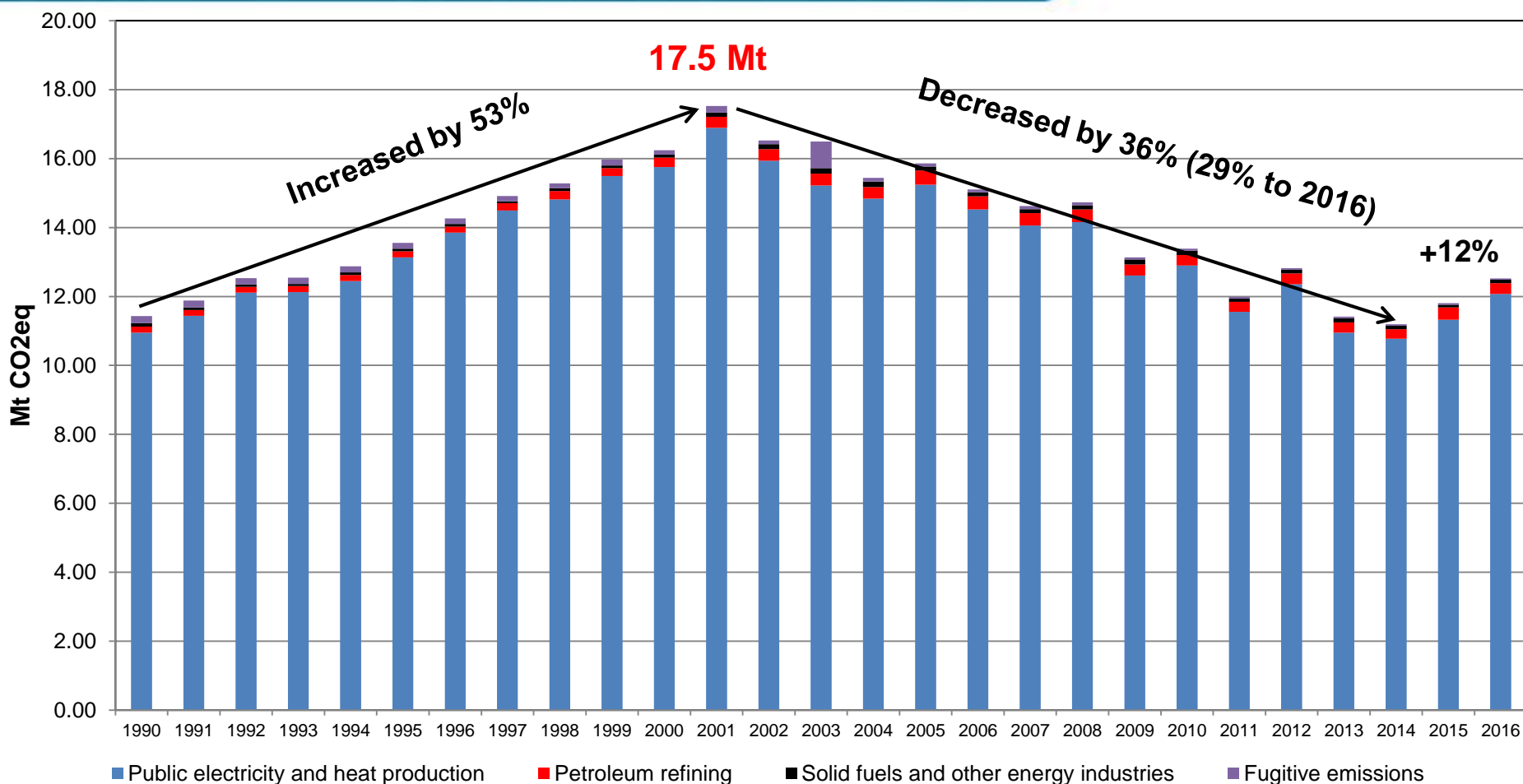
- ❑ *Industrial Processes* emissions are up 7.1% or 0.14 Mt CO₂eq, mainly from increased cement production
- ❑ *Residential* emissions are almost unchanged, up 0.01 Mt CO₂eq a 0.1% increase, with 2.6% fewer degree days than 2015. Kerosene use increased by 5.2% and natural gas by 1.4%, with a 13.3% reduction in coal use
- ❑ *Commercial Services* and *Public Services* both showed increases of 2.5% and 2.7% respectively
- ❑ Emissions from *F-Gases* increased by 11.0% in 2016
- ❑ Emissions from the *Manufacturing Combustion* sector increased by 0.07 Mt CO₂eq or 1.6% in 2016
- ❑ *Waste* emissions increased by 0.9% or 0.01Mt CO₂eq in 2016
- ❑ Ireland is compliant with its annual emission allocations in 2013, 2014 and 2015, however, these figures indicate that **Ireland exceeds its 2016 annual limit**

GHG emissions 1990-2016



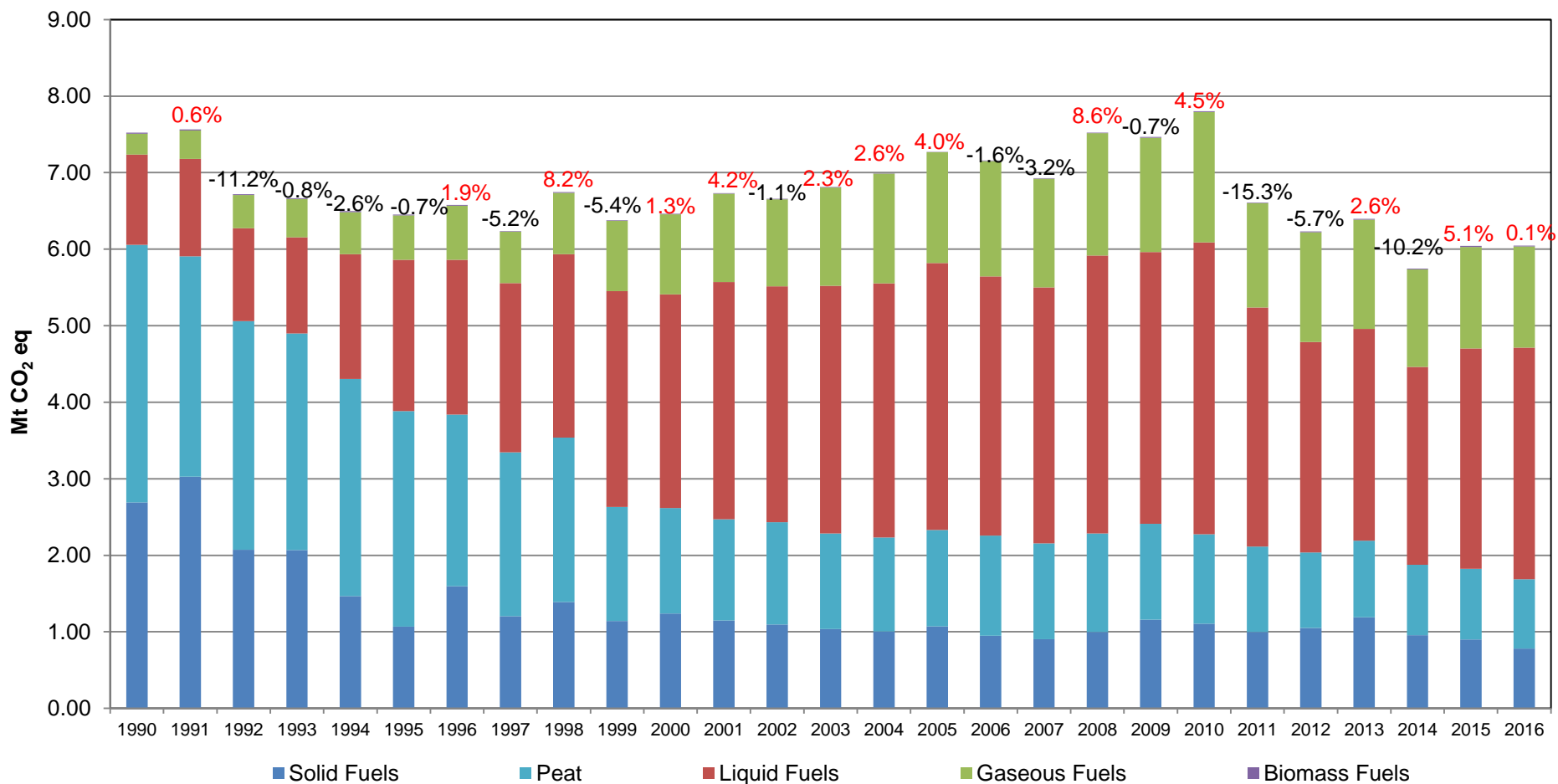
Overall emissions in 2016 are 10.9% above 1990 levels

Energy Industries GHG emissions 1990-2016



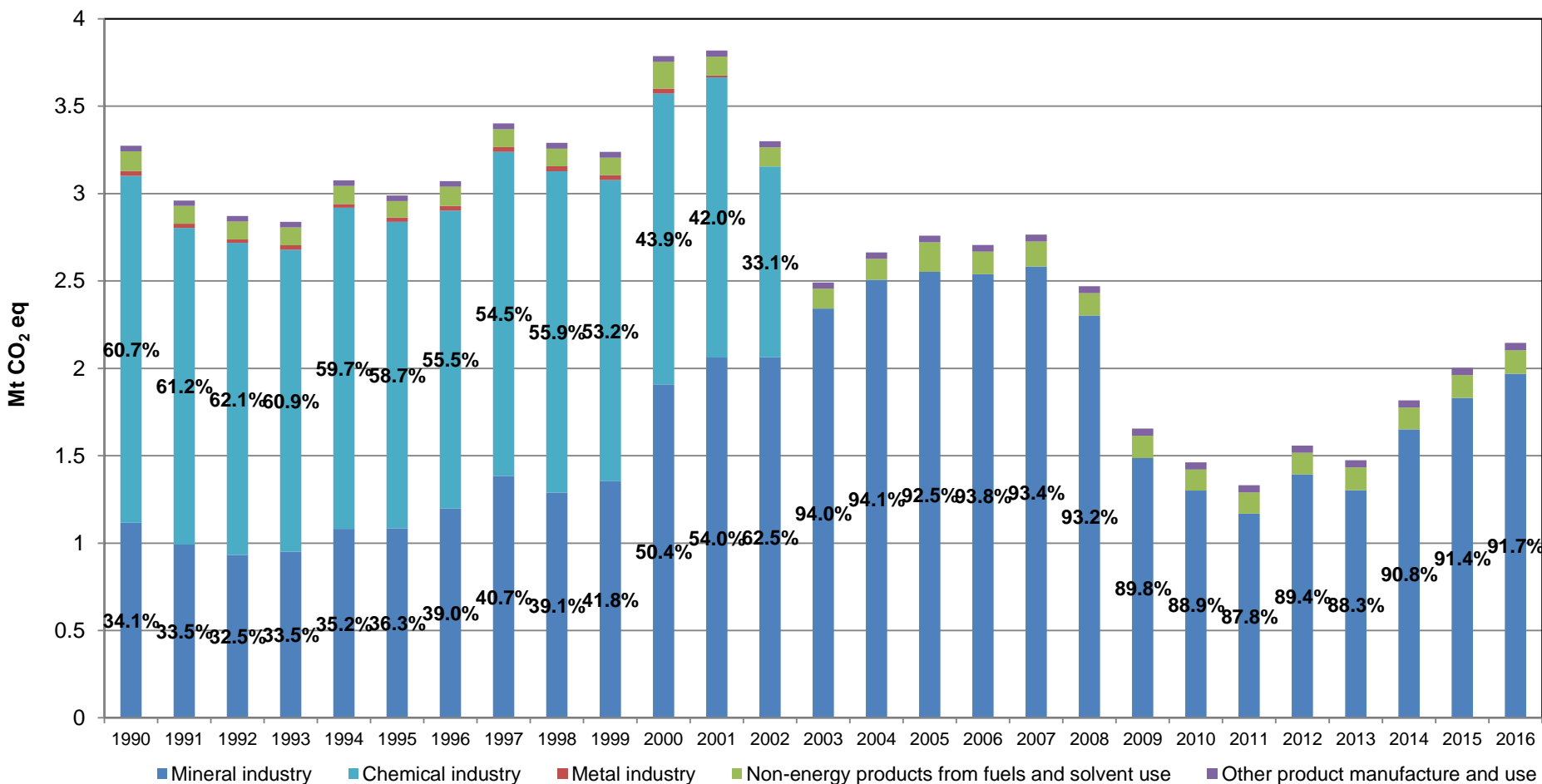
Overall emissions in 2016 are 9.8 % above 1990 levels

Residential GHG emissions 1990-2016



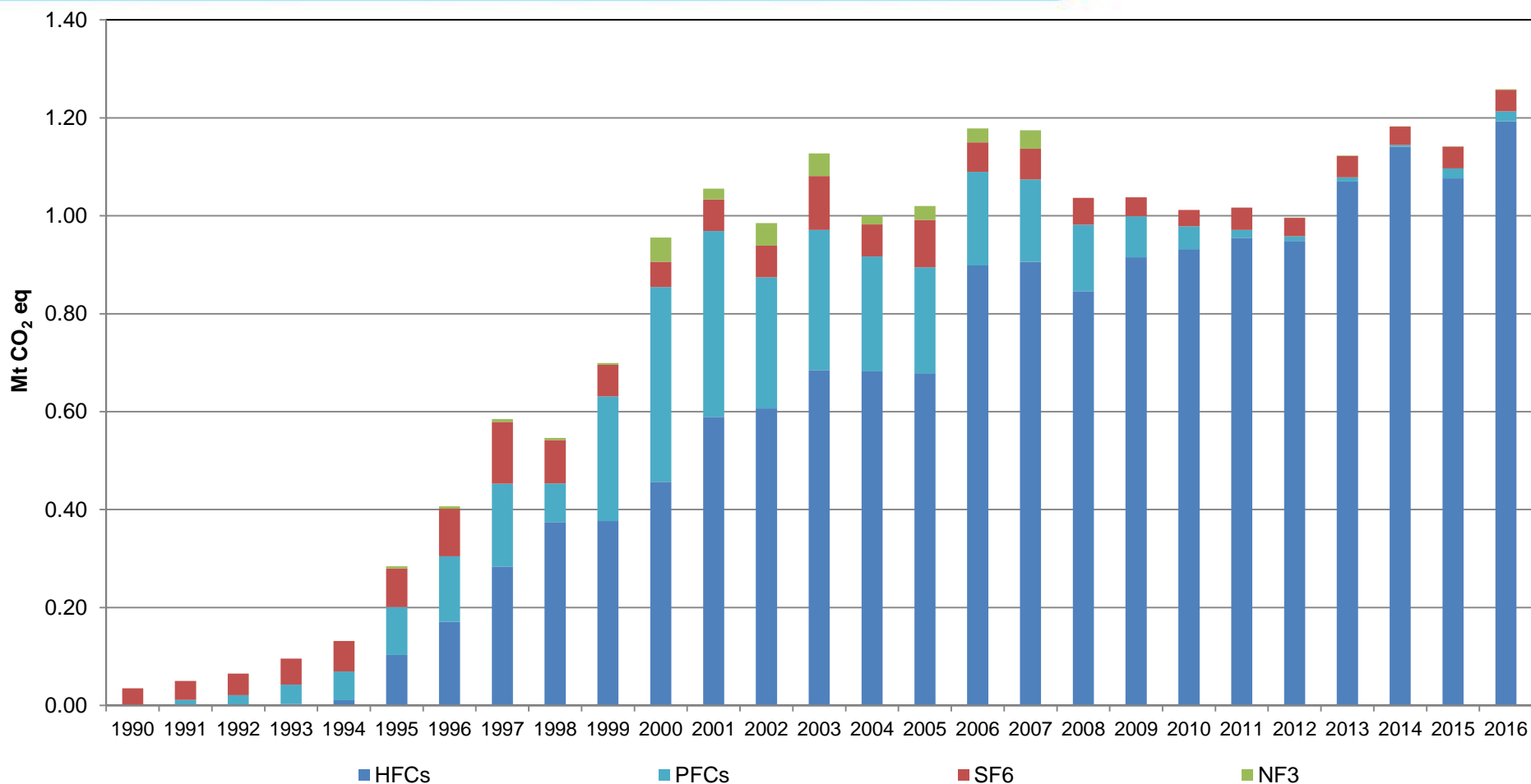
Emissions in 2016 are 19.6% below 1990 levels

Industrial Processes 1990-2016



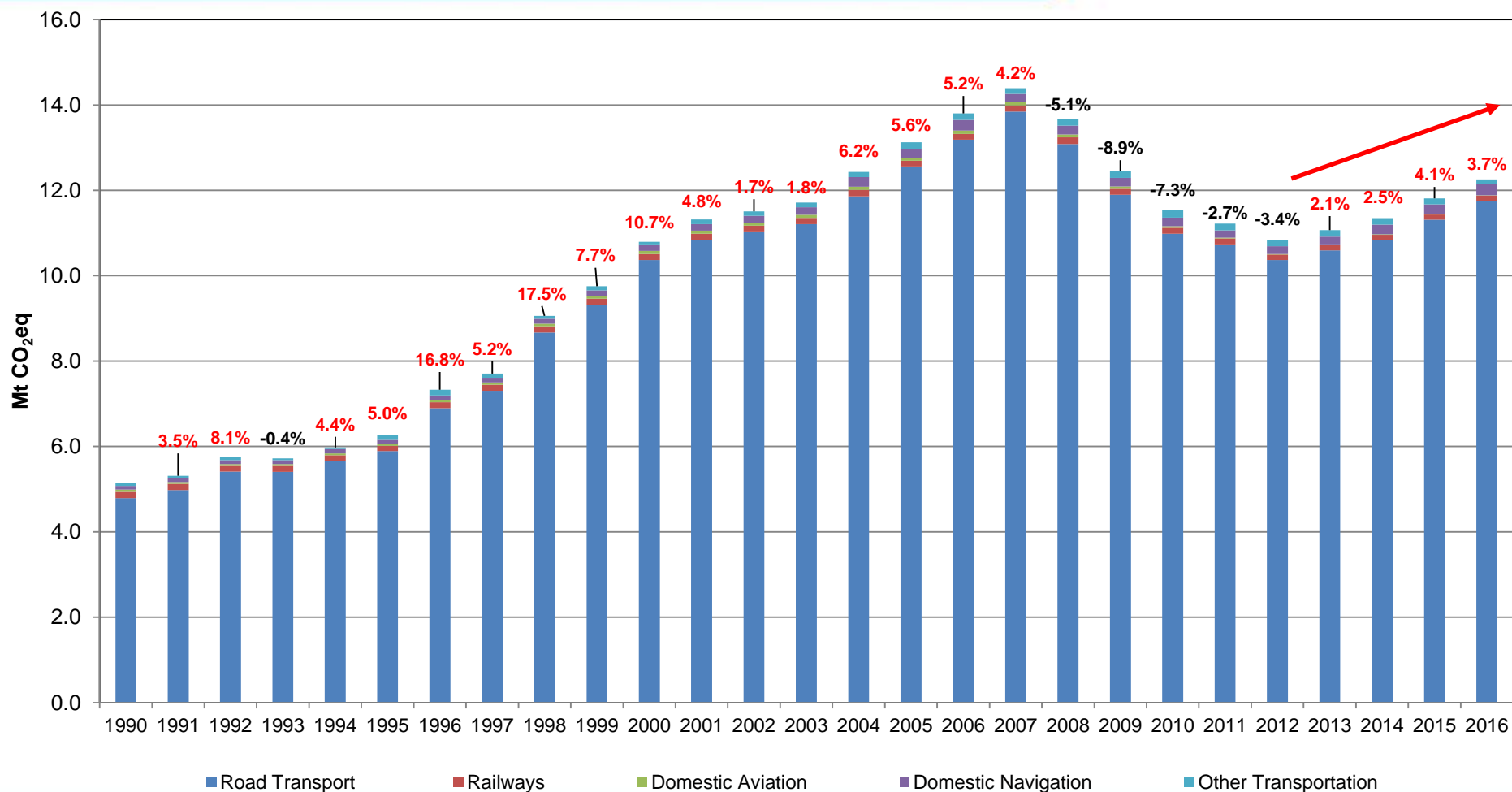
Overall emissions in 2016 are 34.5% below 1990 levels

F-Gases 1990-2016



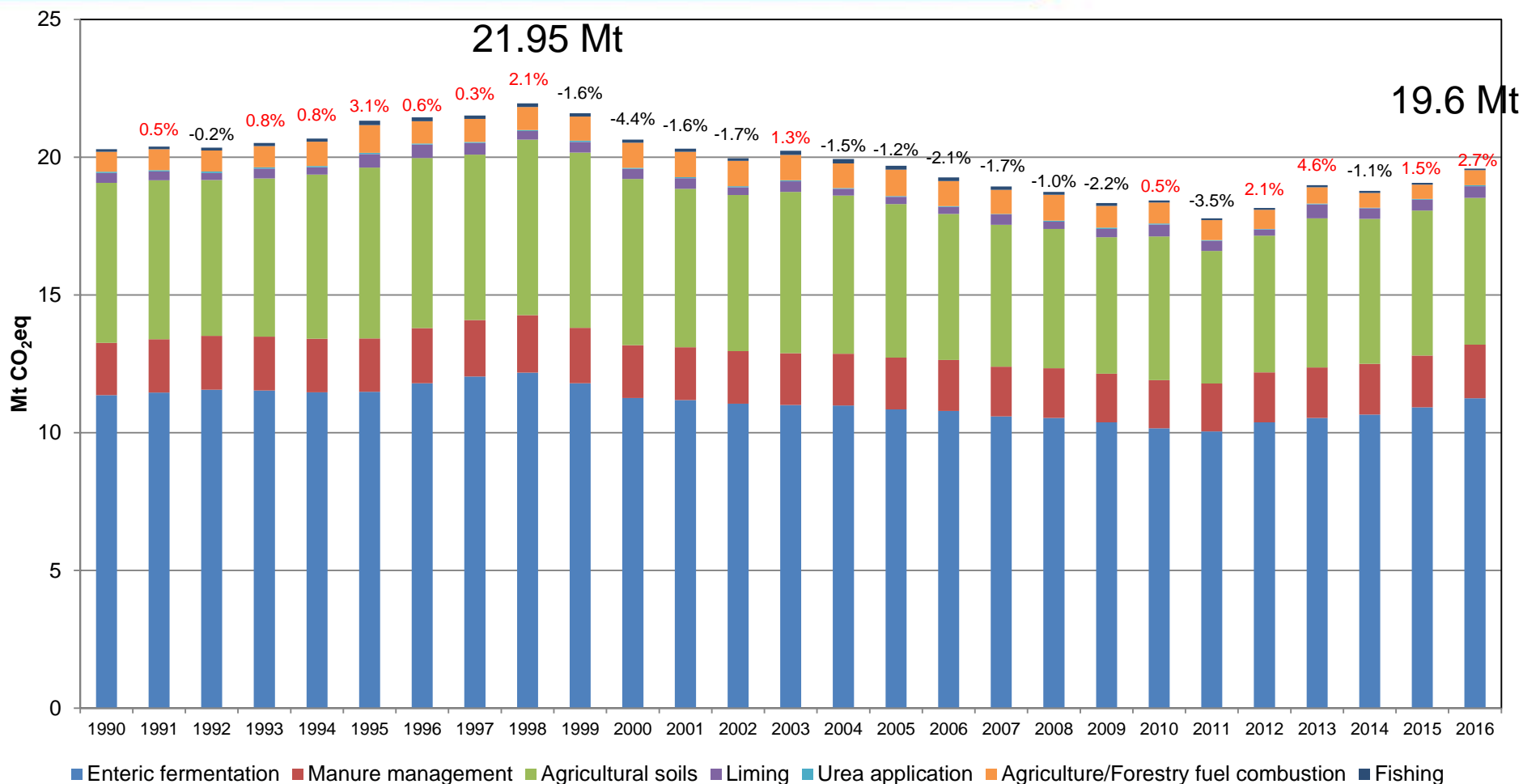
Overall emissions in 2016 are ~ 35 times higher than 1990 levels

Transport GHG emissions 1990-2016



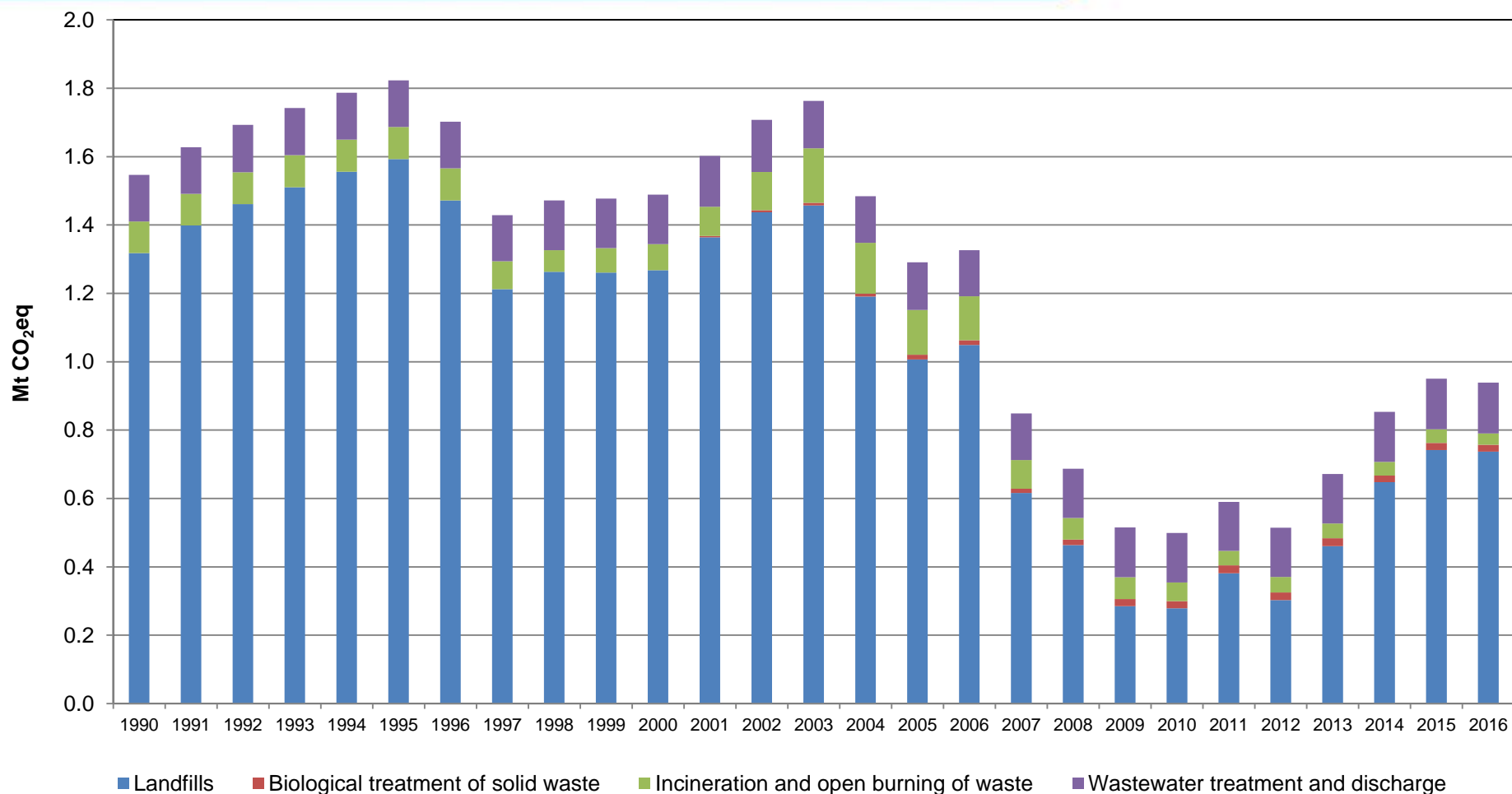
Overall transport emissions in 2016 are 139% above 1990 levels

Agriculture GHG emissions 1990-2016



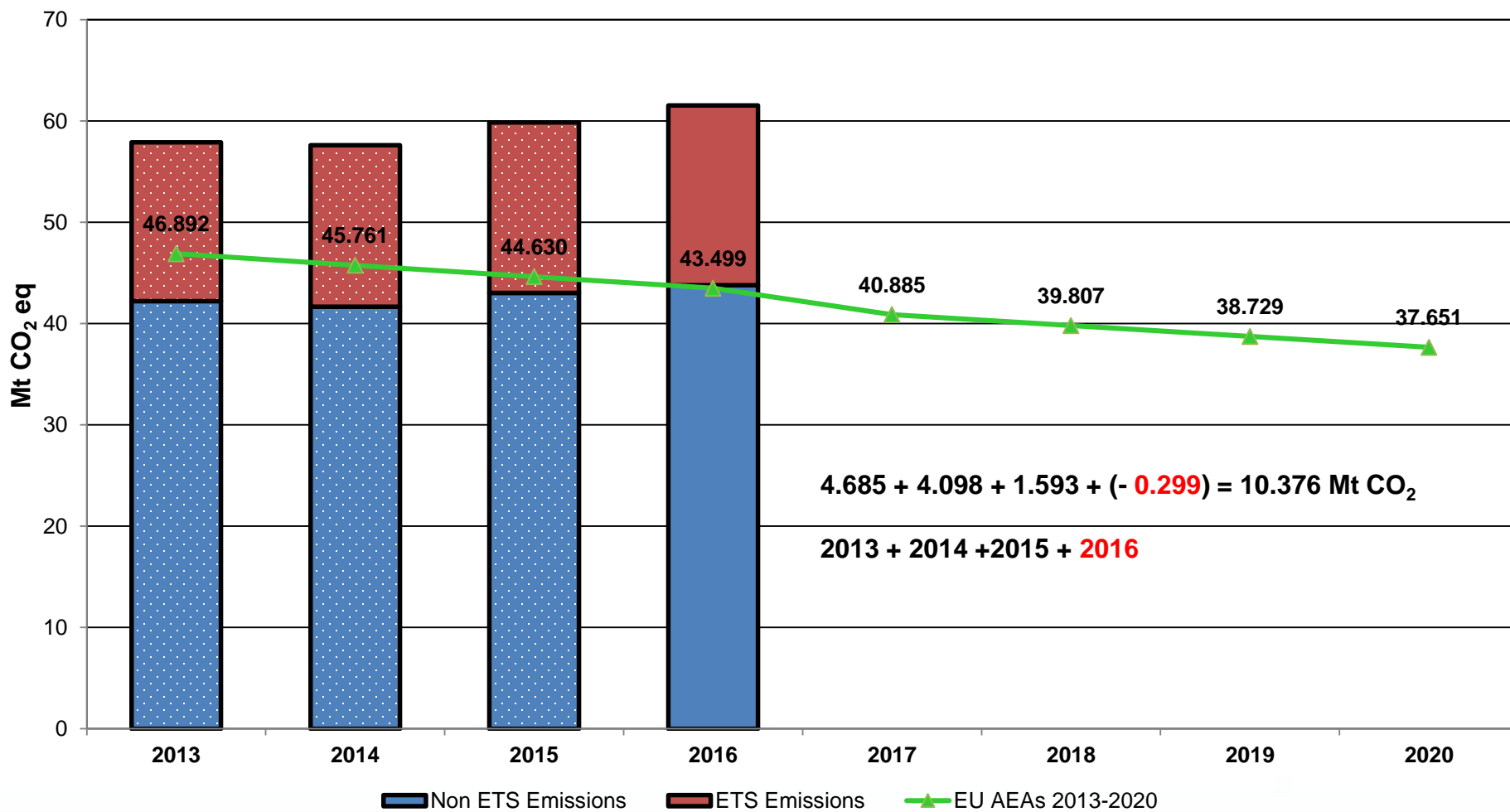
Overall emissions in 2016 are 3.5% below 1990 levels

Waste GHG emissions 1990-2016



Overall emissions in 2016 are 39.3 % below 1990 levels

Effort Sharing Decision compliance 2013-2020



Overview – Air pollutants

- Air pollutants – what do we report
- Trends in air pollutants
- National Emissions Ceilings Directive

Air pollutants – what do we report

The Environmental Protection Agency

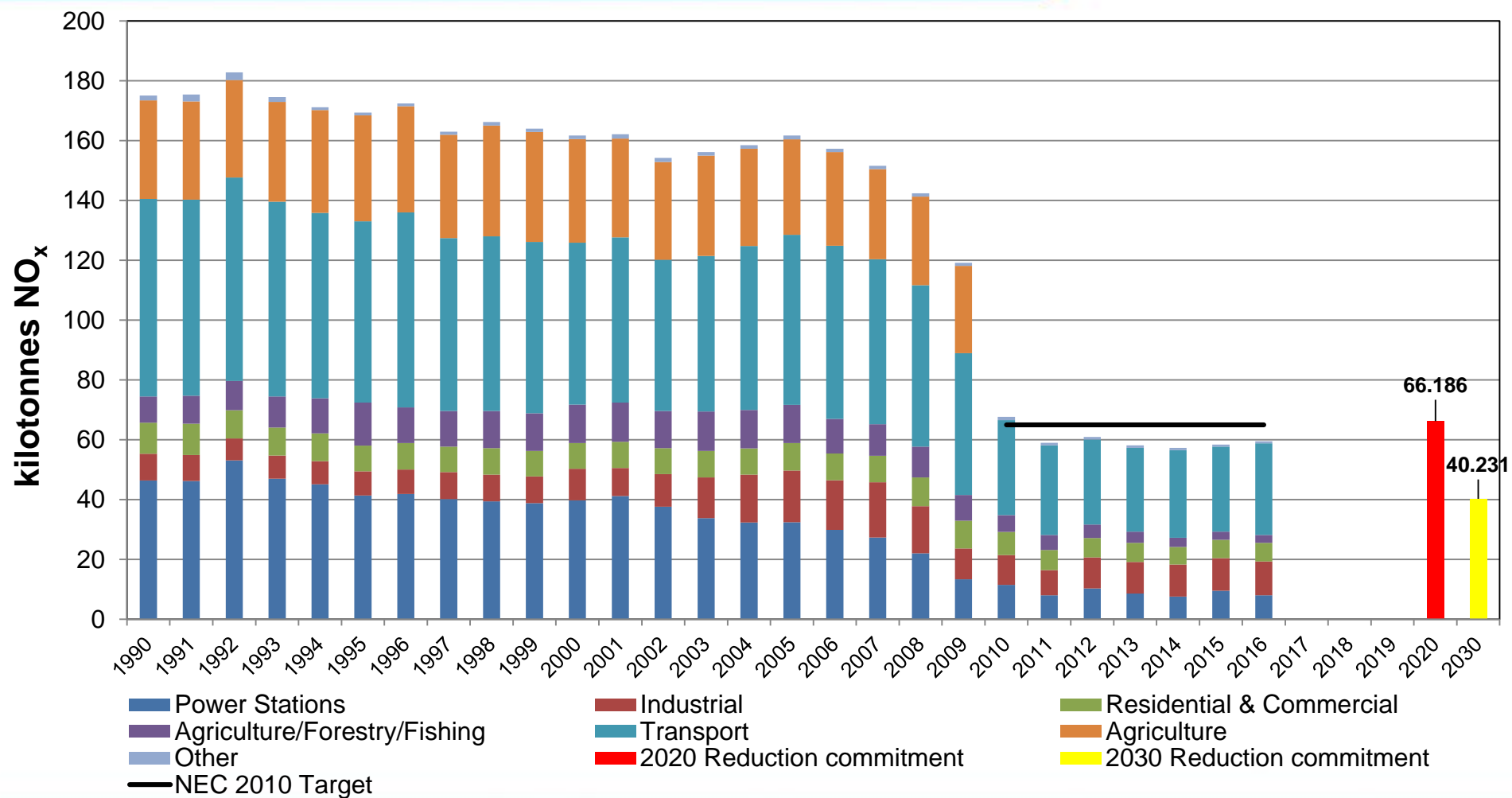
Ireland's

Informative Inventory Report 2018

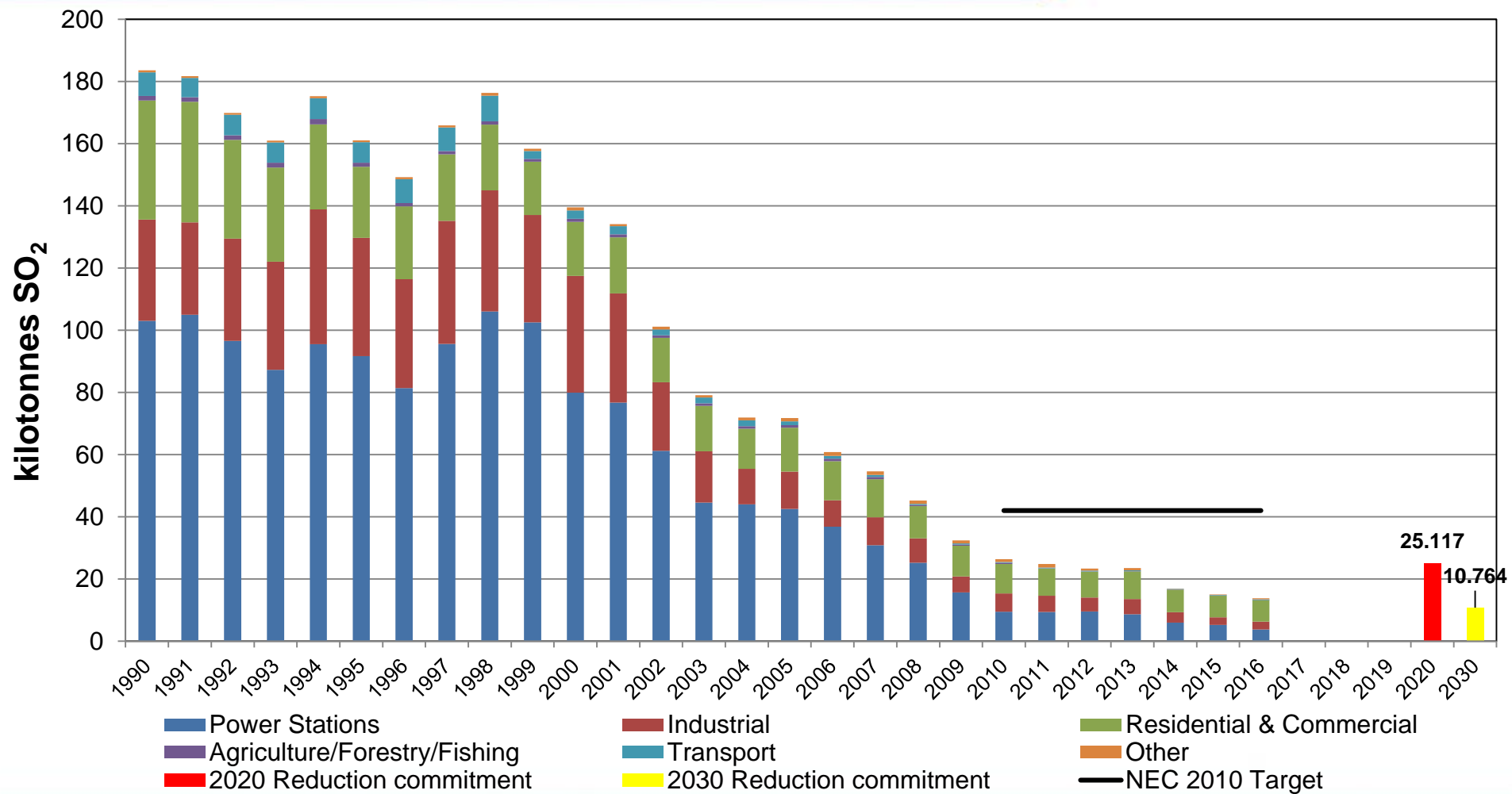
- Air Pollutant Inventories (15)
- Main pollutants; NO_x , SO_2 ,
- Heavy metals; Pb, Cd, Hg (Zn (additional)
- Persistent Organic Pollutants PAHs, HCB and PCBs
- Particulate matter; TSP, PM_{10}
- Informative Inventory Report
- National gridded data (x-2) (0.1 degree grid) (1st May 20
- LPS data (x-2) every four ye



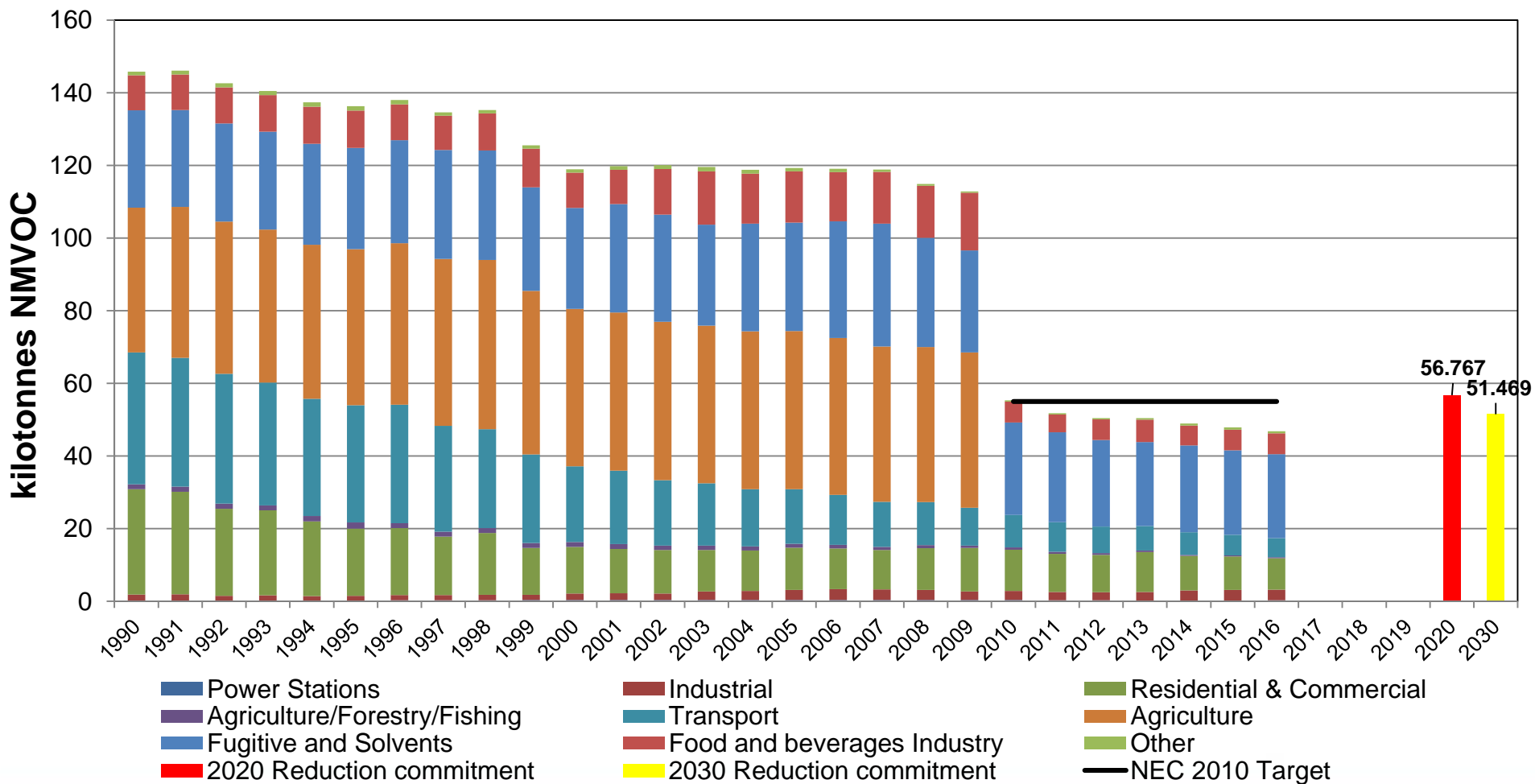
Trends in NO_x



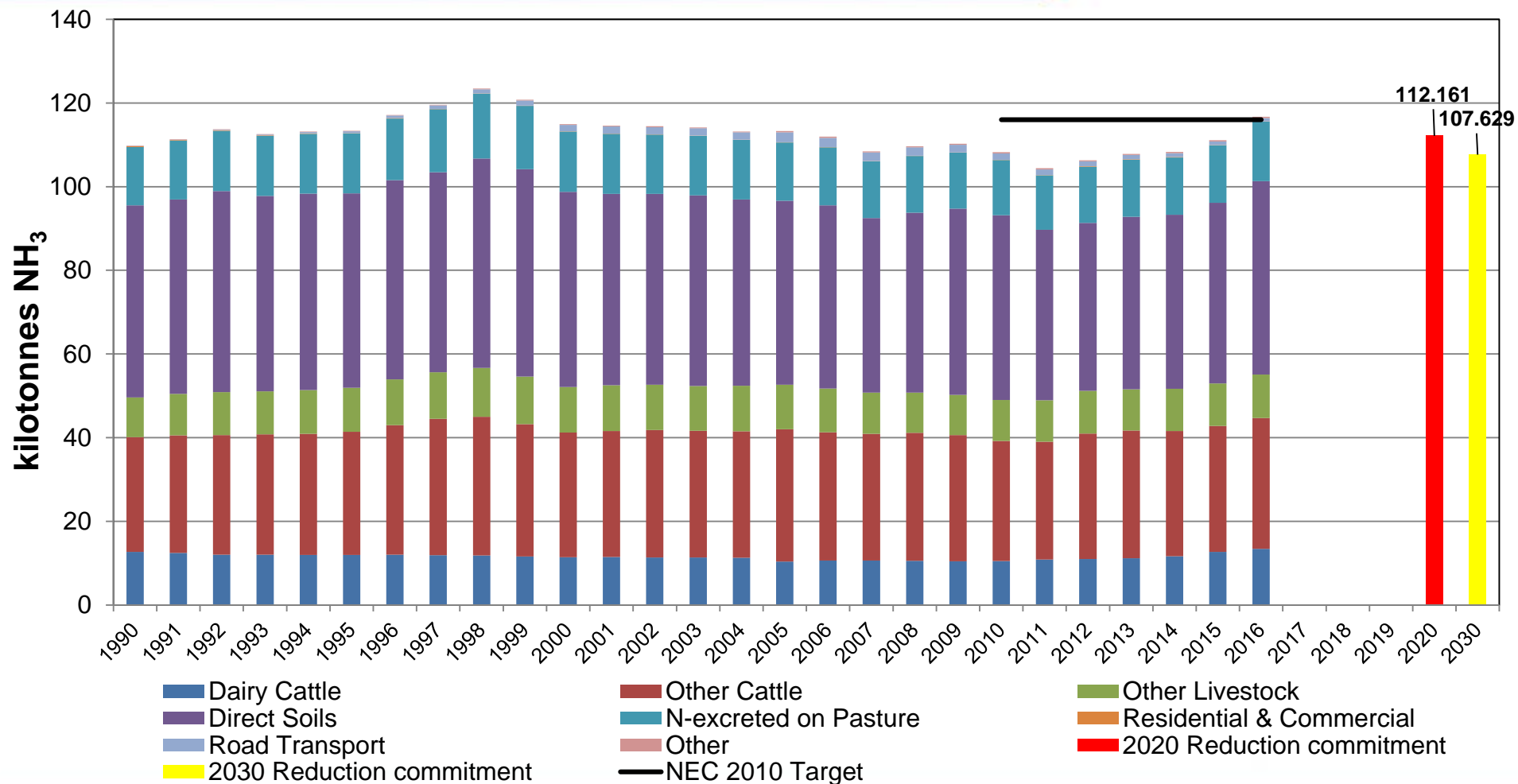
Trends in SO₂



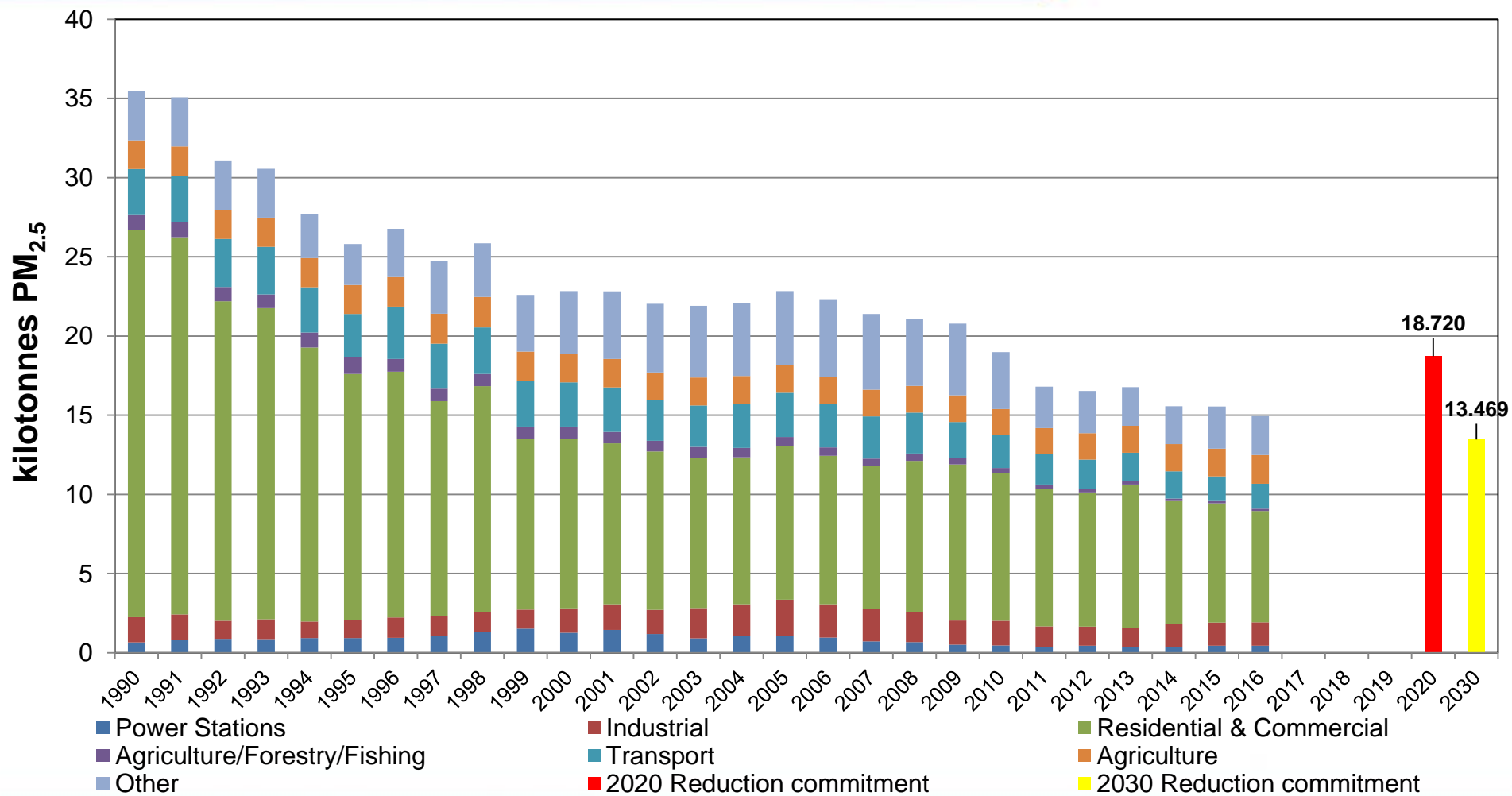
Trends in NMVOC



Trends in NH₃



Trends in PM_{2.5}



National Emission Ceilings Directive (2016/2284)

- Commitments under Directive 2001/81/EC apply until 31/12/2019
 - SO₂ 42 kilotonnes
 - NO_x 65 kilotonnes
 - NH₃ 116 kilotonnes
 - NMVOC 55 kilotonnes

- New targets for SO₂, NO_x, NH₃, NMVOC and PM_{2.5} applicable from 2020 to 2029 and 2030 onwards based on 2005 base

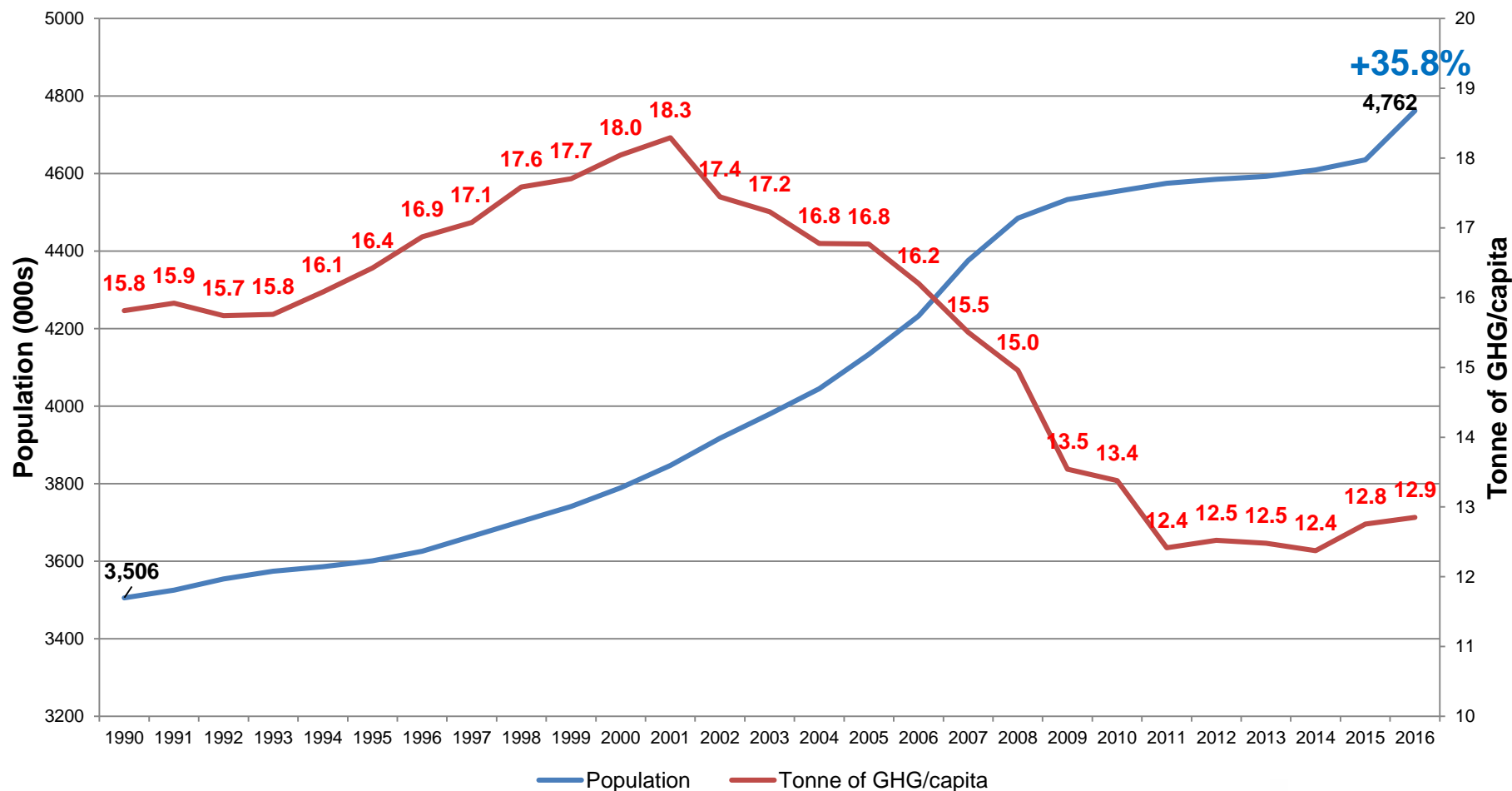
National Emission Ceilings Directive (2016/2284)

kilotonnes	Article 21(1) (a)							Article 4(1) and Annex II	
	2010	2011	2012	2013	2014	2015	2016	New reduction commitments	
	2020	2030							
National Total SO ₂	26.34	24.84	23.37	23.51	16.89	15.00	13.77	25.12	10.76
NEC ceiling 2010-2019	42.00	42.00	42.00	42.00	42.00	42.00	42.00	-65%	-85%
National Total NO _x	113.32	101.35	104.72	105.43	104.14	104.39	107.30	66.19	40.23
NEC ceiling 2010-2019	65.00	65.00	65.00	65.00	65.00	65.00	65.00	-49%	-69%
National Total NMVOC	109.24	106.51	107.90	110.34	106.11	106.40	108.25	56.77	51.47
NEC ceiling 2010-2019	55.00	55.00	55.00	55.00	55.00	55.00	55.00	-25%	-32%
National Total NH ₃	108.23	104.38	106.29	107.83	108.31	111.12	116.70	112.16	107.63
NEC ceiling 2010-2019	116.00	116.00	116.00	116.00	116.00	116.00	116.00	-1%	-5%
National Total PM _{2.5}	18.99	16.80	16.52	16.77	15.57	15.55	14.94	18.73	13.47
NEC ceiling 2010-2019	NA	NA	NA	NA	NA	NA	NA	-18%	-41%

Additional Information

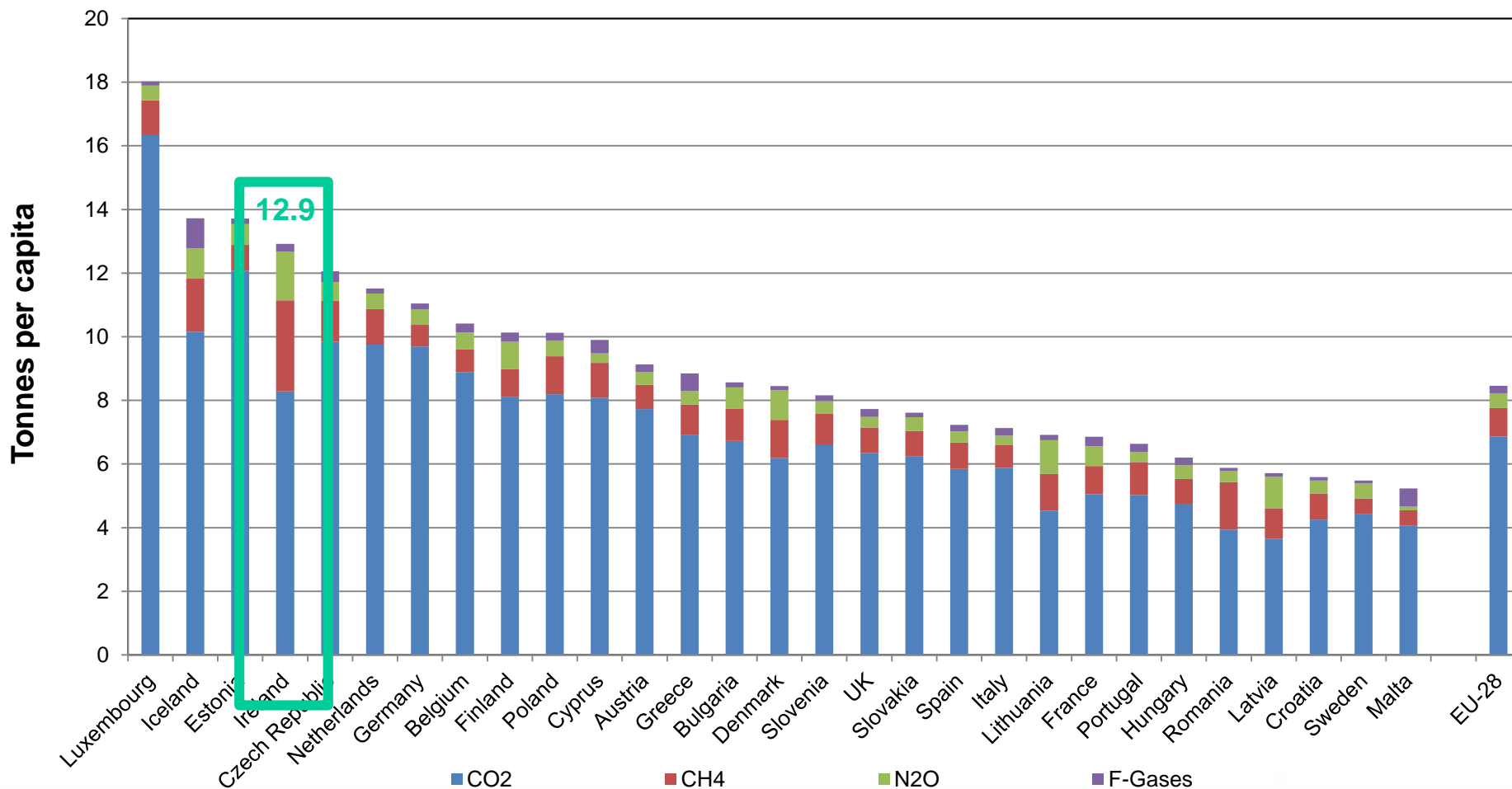
- www.epa.ie
- <http://www.epa.ie/climate/emissionsinventoriesandprojections/nationalemissionsinventories/>
- <http://www.epa.ie/pubs/reports/air/airemissions/ghgemissions/>
- <http://www.epa.ie/climate/emissionsinventoriesandprojections/nationalemissionsinventories/transboundarygasemissions/>

GHG emissions/capita Ireland 1990-2016



GHG per capita emissions are 18% lower than in 1990

GHG emissions/capita for all EU/EEA Member states in 2015 (source EEA)



Effort Sharing Decision compliance 2013-2020

		2013	2014	2015	2016	2017	2018	2019	2020	
A	Total greenhouse gas emissions without LULUCF ¹	57,903.4	57,626.0	59,878.2	61,545.8	0.0	0.0	0.0	0.0	kt CO ₂ eq
B	NF ₃ emissions	0.9	1.0	1.0	1.0	0.0	0.0	0.0	0.0	kt CO ₂ eq
C	Total greenhouse gas emissions without LULUCF and without NF3 emissions	57,902.5	57,625.1	59,877.3	61,544.9	0.0	0.0	0.0	0.0	kt CO ₂ eq
D	Total verified emissions from stationary installations under Directive 2003/87/EC ²	15,685.7	15,952.7	16,829.7	17,737.0	0.0	0.0	0.0	0.0	kt CO ₂ eq
E	CO ₂ emissions from 1.A.3.A civil aviation	10.0	9.4	10.4	9.7	0.0	0.0	0.0	0.0	kt CO ₂ eq
F	Total ESD emissions (= C-D-E)	42,206.8	41,663.0	43,037.2	43,798.2	0.0	0.0	0.0	0.0	kt CO ₂ eq
G	EU ESD Targets	46,891.9	45,760.9	44,629.9	43,498.9	40,885.1	39,807.1	38,729.2	37,651.3	kt CO ₂ eq
	Distance to target (= F-G)	-4,685.1	-4,097.9	-1,592.7	299.3					