Country profiles

Industrial pollution

Lithuania

December 2016

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European Environment Agency

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Introduction

Industry across the data sources
Although industry makes a significant contribution to the economic welfare and development of a country, pollution from industrial activities can also negatively affect people and the environment. Impacts such as premature deaths and damage to ecosystems occur as a result of the release of pollution to air and water, through the disposal of waste, and through the demand for resources and energy. Industrial sources still contribute a substantial proportion of total pollution in Europe. Pollution from industry is subject to national, European and international regulations, and standards that limit releases, waste and resource use.

Data sources
These country profiles present a set of graphs and tables that show the significance of industrial pollution using data from several sources:

- Eurostat's statistics on economy and finance (Eurostat, 2016a), energy (Eurostat, 2016b), water consumption (Eurostat, 2016c) and waste generation (Eurostat, 2016d);
- the European Environment Agency's (EEA's) compilation of data on emissions of air pollutants that will be submitted to the Convention on Long-range Transboundary Air Pollution (CLRTAP) (EEA, 2016a);
- the European Pollutant Release and Transfer Register (E-PRTR) (EEA, 2016b).

This country profile includes the data that were available from these sources on 22nd November 2016.

Definition of industry
Because of the different legal definitions of 'industry' used in the various data sets, certain assumptions have been made so that industry is considered in a consistent way (see the accompanying 'Country profiles — industrial emissions: Methodology report', hereafter referred to as the methodology report, for full details).

What is industry?
Industry refers to the production of goods or services within an economy. The different data sources used in these country profiles interpret this definition in slightly different ways. These country profiles have attempted to cover comparable activities across the different databases used. In summary, the activities selected across the data sets are the energy industry, metal production, cement and lime production, mining and quarrying, the chemical industry, manufacturing, the waste industry (including water and sewage management), and the distribution of electricity, gas, steam and air conditioning.

The energy used for transport related to the above industrial activities (except pipelines for the transmission of energy) and agricultural activities is not included.

The source codes for the data included are presented in Annex 1 of the accompanying methodology report. In summary, these include:

- NACE divisions B, C, D and E ;
- NFR categories 1A1, 1A2 (except 1A2gvii), 1A3e, 1A4ai, 1A4bi 1A4ci, 1A5a, 1B, 2 (except 2A5b, 2D3a) and 5;
- all E-PRTR sectors except 5f, 7a and 7b.

Economic sectors (based on the Statistical classification of economic activities in the European Community (NACE) divisions) are used in an attempt to harmonise the scope of industry across data sources. NACE divisions B, C, D and E cover the industrial activities discussed in these country profiles. NACE divisions consist of multiple NACE activities. A full list of activities under B, C, D and E is given in Table A1.1 of the methodology report.

Table I.1 NACE divisions

NACE division code	NACE division name
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities

The application of NACE divisions in the context of the different data sources is discussed below.

- The Eurostat data (Eurostat 2016a, 2016b, 2016c and 2016d) include NACE activities as part of the data set, and are extracted using the above NACE divisions as criteria. The grouping of categories for energy consumption (Eurostat, 2016b) and gross value added (GVA) (Eurostat, 2016a) are provided in Tables A1.4 and A1.5, respectively, of the methodology report.
- Industrial facilities report their main NACE activity as part of their reporting to the E-PRTR (EEA, 2016b), and data are extracted on the basis of the NACE divisions in Table I.1. Before data are aggregated up to NACE divisions, facilities that report their E-PRTR sector as 'Urban Waste Water Treatment Plants' (5.f), 'Installations for the intensive rearing of poultry or pigs' (7a) or 'Intensive aquaculture' (7b) are excluded.
- NACE activities are not included in the CLRTAP data (EEA, 2016a), which group emissions into Nomenclature for Reporting (NFR) categories. Emission categories do not have a one-to-one relationship with economic categories. Instead, the NFR categories are mapped to E-PRTR sectors, as limited by NACE divisions B, C, D and E, and excluding the sectors described above. These NFR categories are aggregated to give larger industry sectors, as detailed in Table A1.2 of the methodology report. The NFR categories reported under CLRTAP, but excluded from industry, are grouped together as 'non-industry', as detailed in Table A1.3 of the methodology report. The most significant non-industry categories are transport and agriculture.

The pollutants included in these country profiles have been defined as such on the basis of multiple criteria, with a focus on those pollutants under specific industrial legislation. As a result, the country profiles do not track emerging pollutants.

Methodology

The detailed methodology for the development of this country profile is available in the same URL where this country profile is made available at the EEA website.

Country coverage

These country profiles cover all 33 current EEA member countries (EEA33), which include the 28 European Union Member States together with Iceland, Liechtenstein, Norway, Switzerland and Turkey.

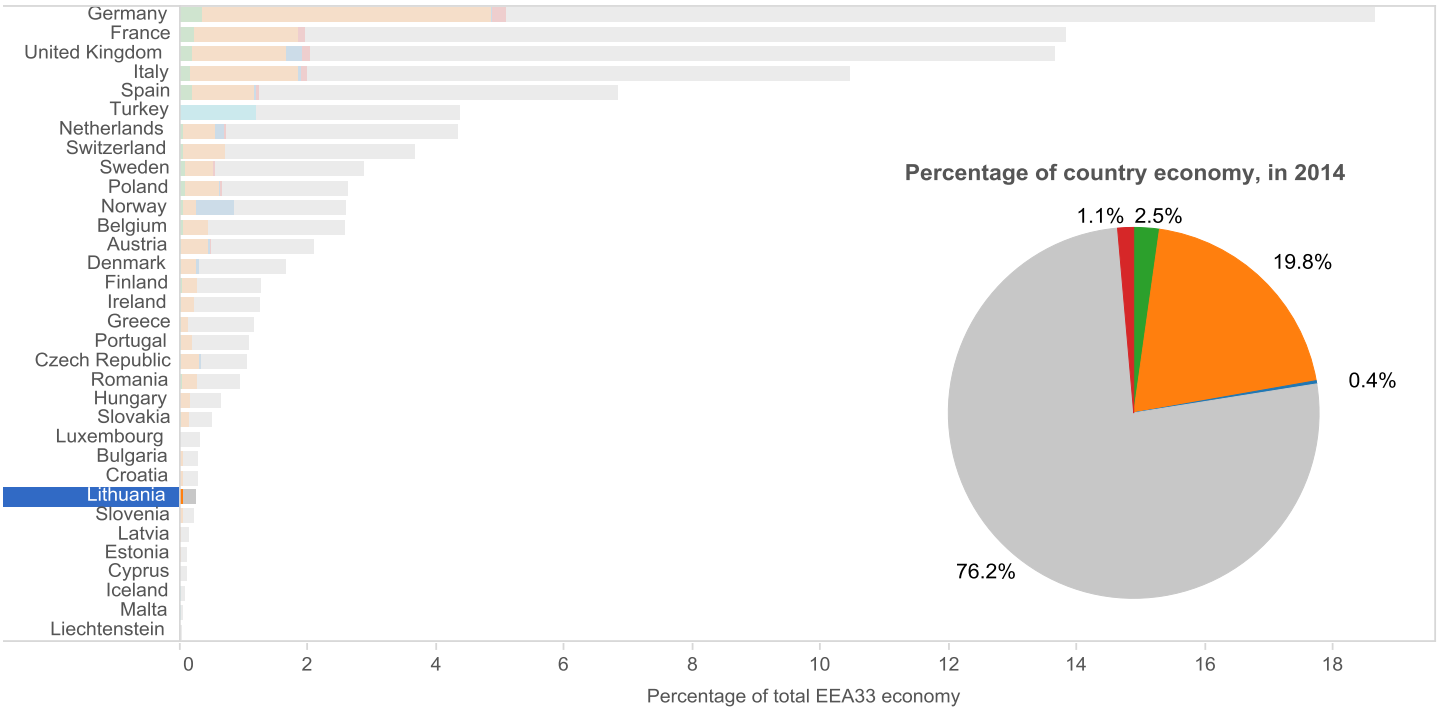
The graphs and tables presented in this document contain data that relate to Lithuania and the other EEA member countries. However, in some cases data were not available for one or more countries. Below each table and figure, information on the data source and the countries for which data were missing is included.

The significance of industry

THE SIGNIFICANCE OF INDUSTRY WITHIN THE ECONOMY IN TERMS OF GROSS VALUE ADDED

This section shows the significance of industry in the context of the economy. The parameter used is GVA, which captures the value of industry in terms of the goods and services provided by an economic activity.

Figure 1. GVA of industry as a percentage of EEA33 economy, and within Lithuania, in 2014

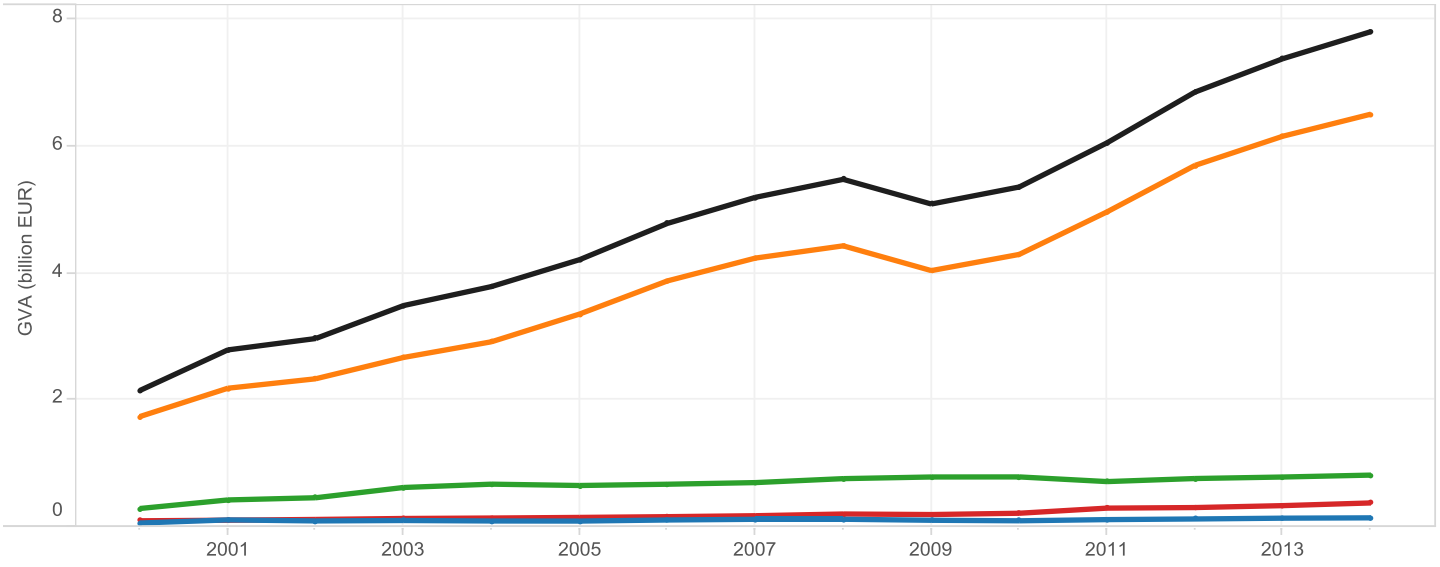


Source: Eurostat, 2016a. Data gap-filled according to methodology

Electricity, gas, steam and air conditioning supply
Manufacturing
Mining and quarrying
Waste management
Industry (no detail)
Non-industry
Total industry

Note: 'Industry (no detail)' is used for countries where no data were available at NACE detail.

Figure 2. Evolution of the GVA of industry in Lithuania, in billion EUR, for 2000-2014



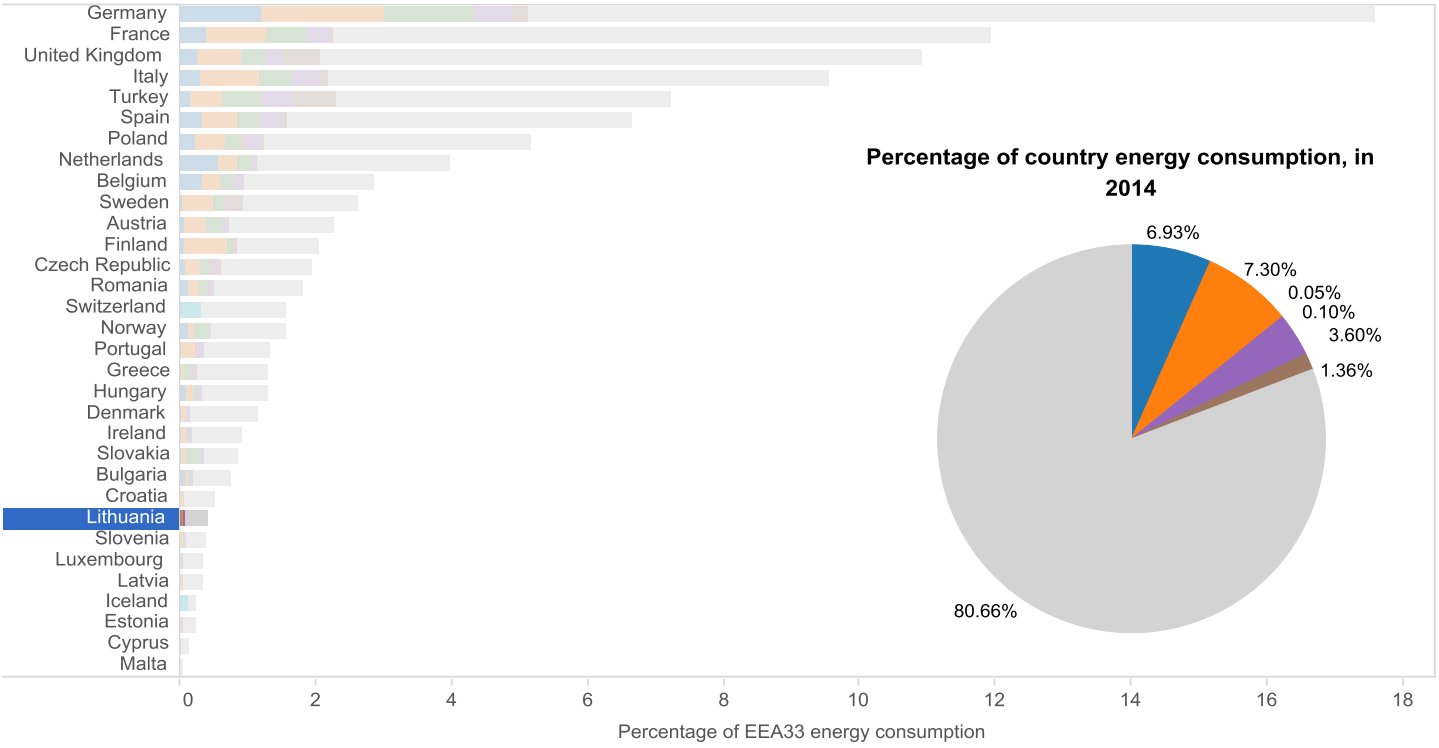
Source: Eurostat, 2016a. Data gap-filled according to methodology

GVA (€billion)	2006	2007	2008	2009	2010	2011	2012	2013	2014
Electricity, gas, steam and air conditioning supply	0.66	0.69	0.75	0.77	0.78	0.70	0.75	0.77	0.80
Manufacturing	3.87	4.23	4.42	4.03	4.28	4.95	5.69	6.15	6.50
Mining and quarrying	0.10	0.11	0.11	0.09	0.08	0.10	0.11	0.13	0.13
Waste management	0.15	0.16	0.19	0.18	0.20	0.28	0.29	0.32	0.37
Total industry	4.77	5.18	5.47	5.08	5.35	6.04	6.84	7.37	7.80

THE SIGNIFICANCE OF INDUSTRY IN TERMS OF ENERGY CONSUMPTION

This section shows the significance of industry as an energy consumer. The parameter used is final energy consumption, which is the energy supplied to the consumer (i.e. industry in this case) to run the industrial processes considered in this country profile.

Figure 3. Energy consumption of industry as a percentage of EEA33 energy consumption, and within Lithuania, in 2014

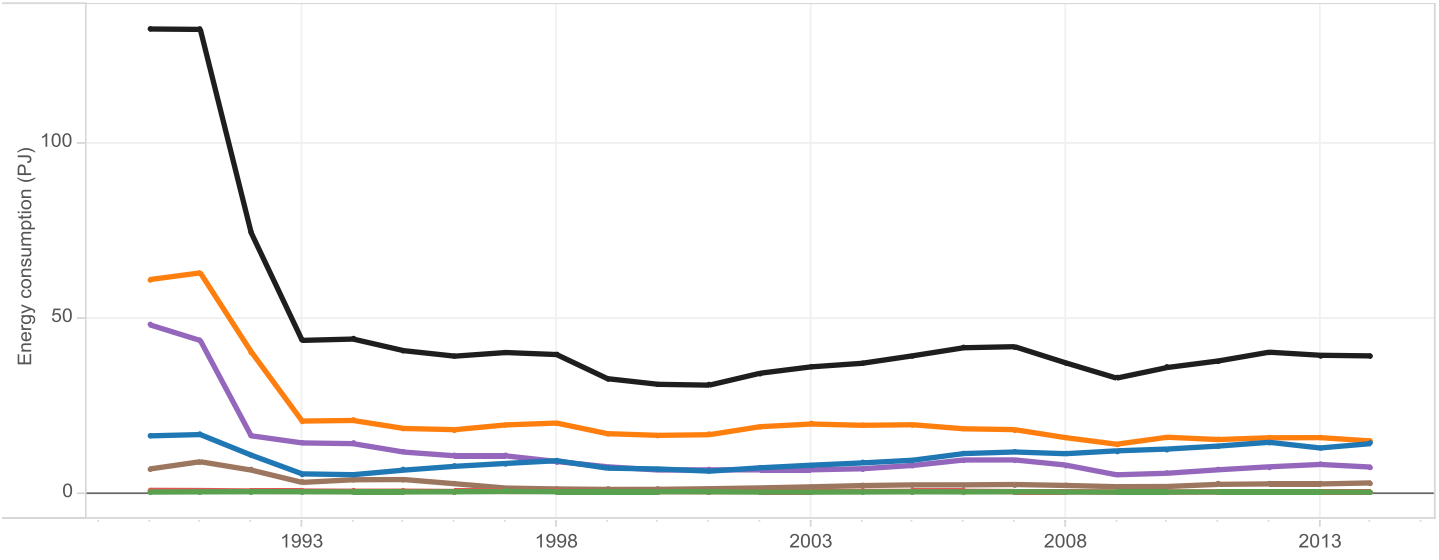


Source: Eurostat, 2016b. No data were available for Liechtenstein. The data were 'gap-filled' in accordance with 'gap-filling' methodology (see methodology report).

Chemical industry
Manufacturing
Metal industry
Mining and quarrying
Non-metallic minerals
Other industry
Industry (no detail)
Non-industry
Total industry

Note: 'Industry (no detail)' is used for countries for which no data were available at NACE level.

Figure 4. Evolution of the energy consumption of industry in Lithuania, in petajoules (PJ), for 1990-2014



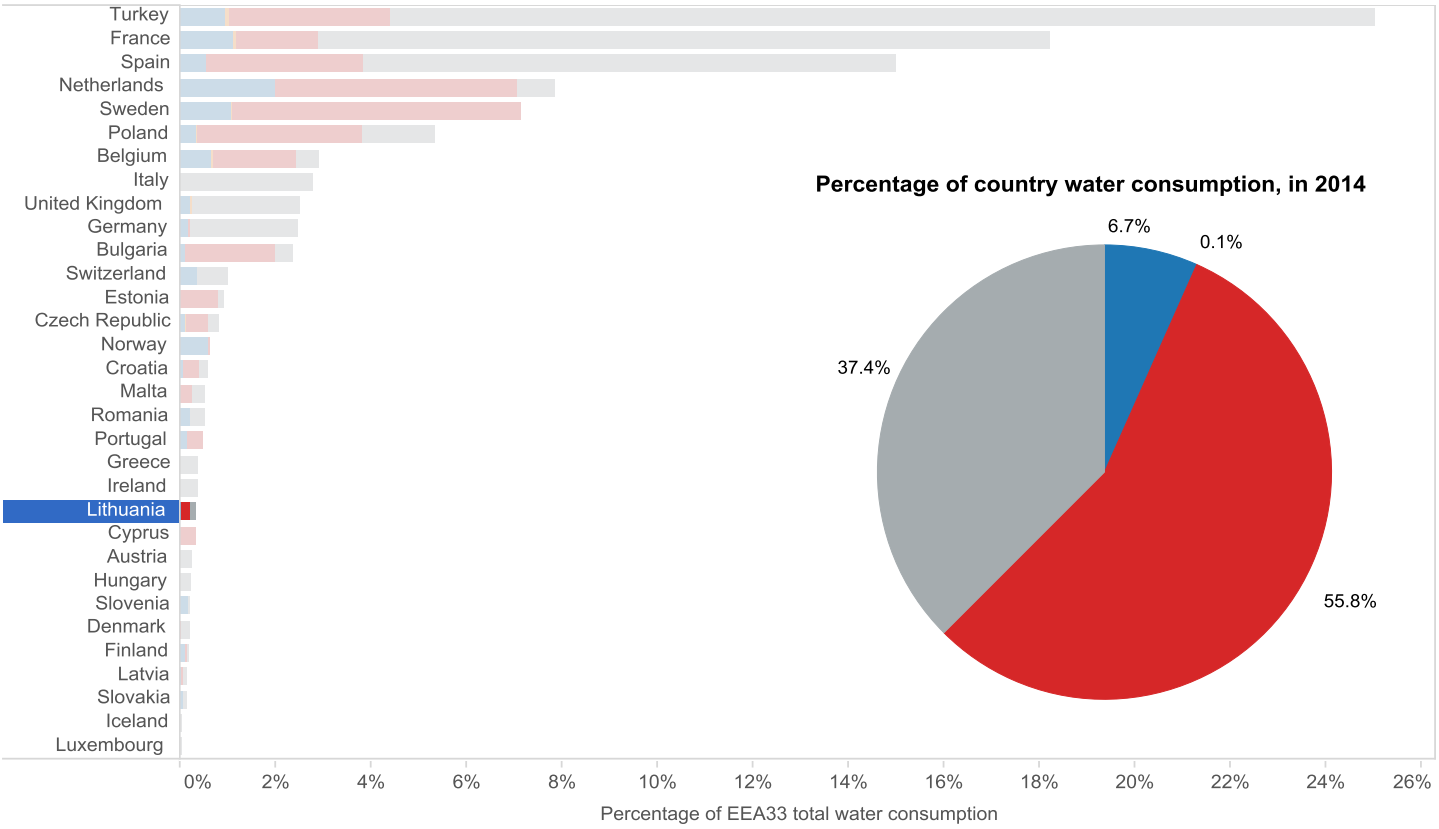
Source: Eurostat, 2016b. The data were 'gap-filled' in accordance with 'gap-filling' methodology (see methodology report).

Energy consumption (PJ)	2006	2007	2008	2009	2010	2011	2012	2013	2014
Chemical industry	11.15	11.60	11.12	11.93	12.45	13.30	14.38	12.75	14.01
Manufacturing	18.25	18.00	15.71	13.83	15.83	15.16	15.68	15.71	14.76
Metal industry	0.20	0.23	0.15	0.11	0.14	0.16	0.15	0.14	0.10
Mining and quarrying	0.35	0.29	0.27	0.14	0.15	0.20	0.15	0.21	0.21
Non-metallic minerals	9.31	9.33	7.87	5.07	5.52	6.51	7.36	8.04	7.29
Other industry	2.20	2.30	2.03	1.67	1.73	2.34	2.47	2.45	2.75
Total industry	41.45	41.76	37.14	32.76	35.80	37.66	40.18	39.30	39.11

THE SIGNIFICANCE OF INDUSTRY IN TERMS OF WATER USAGE

This section shows the significance of industry as a water consumer. The parameter used is water usage, which accounts for the water supplied to the consumer (i.e. industry in this case) for all the water uses that are necessary in order to run the processes of the industrial activities considered in this profile. This covers 'public', 'self' and 'other' water supplies.

Figure 5. Water usage by industry as a percentage of EEA33 water usage, and within Lithuania, in 2014

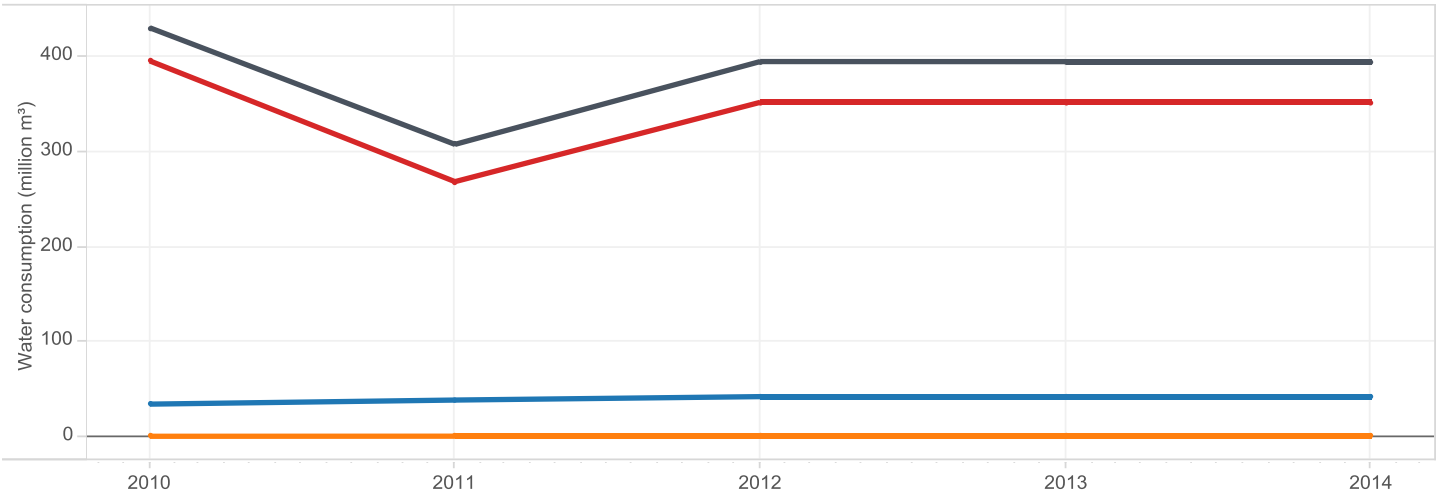


Source: Eurostat, 2016c. No data were available for Liechtenstein. The data were 'gap-filled' in accordance with 'gap-filling' methodology (see methodology report).

Manufacturing
Mining and quarrying
Production and distribution of electricity
Non-industry
Total industry

Note: the time series of Figure 6 has been shortened to the years where data are complete.

Figure 6. Evolution of industrial water usage in Lithuania, in million cubic metres (Mm^3), for 2010-2014



Source: Eurostat, 2016c. The data were 'gap-filled' in accordance with 'gap-filling' methodology (see methodology report).

Water consumption (Mm^3)	2010	2011	2012	2013	2014
Manufacturing	34.30	38.60	42.20	42.15	42.15
Mining and quarrying	0.50	0.60	0.70	0.71	0.71
Production and distribution of electricity	395.30	268.30	351.70	351.65	351.65
Total industry	430.10	307.50	394.60	394.51	394.51

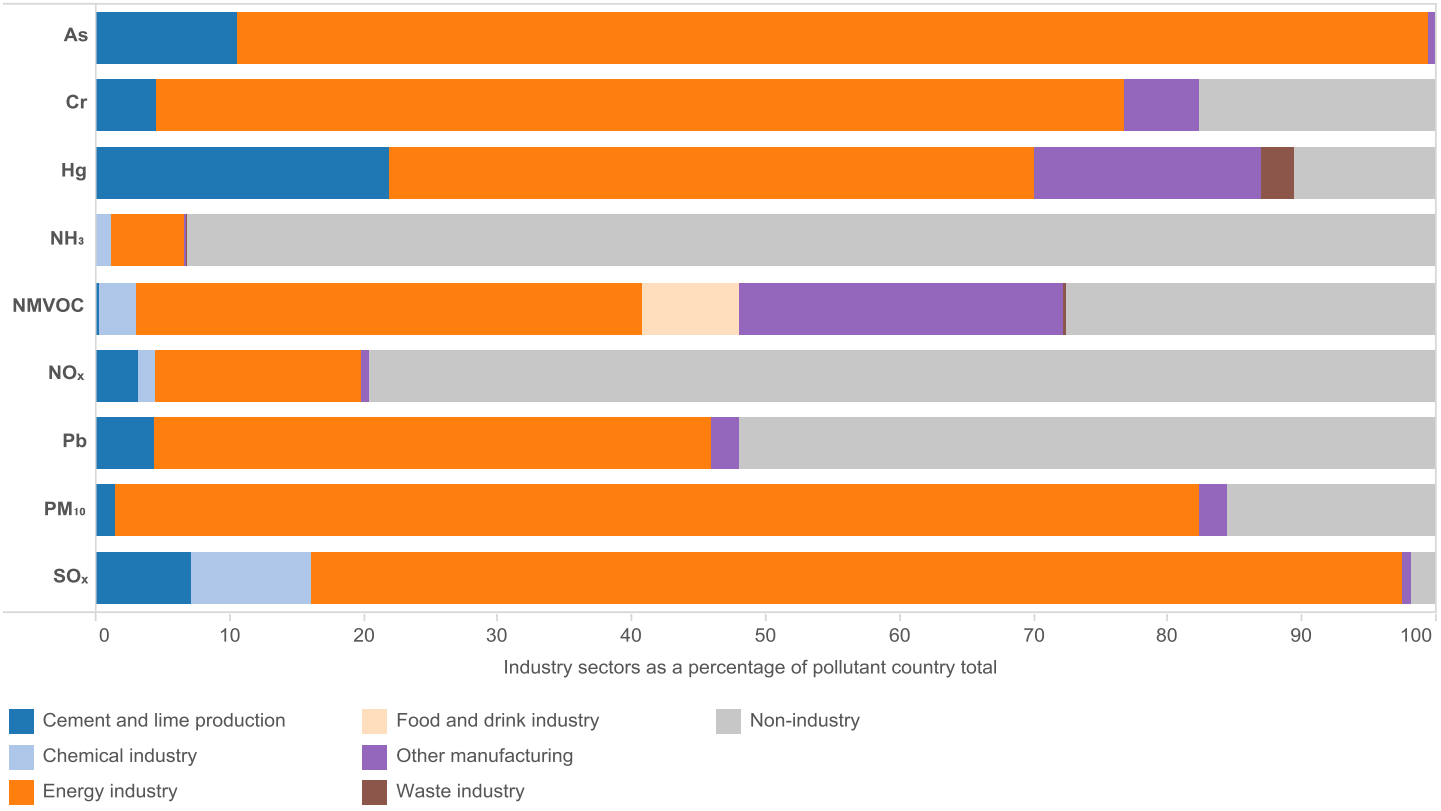
Industrial releases to air

THE SIGNIFICANCE OF INDUSTRY IN TERMS OF EMISSIONS TO AIR

Air pollution harms human health and the environment. In Europe, emissions of many air pollutants have decreased substantially in recent decades, resulting in improved air quality across the region. However, air pollutant concentrations are still high, and air-quality problems persist. The selected pollutants for which data are provided in this section are those that cause significant pressure on the environment and human health. Nitrogen oxides (NO_x), sulfur oxides (SO_x) and ammonia (NH_3) can cause acidification and/or eutrophication; non-methane volatile organic compounds (NMVOCs) contribute to ground-level ozone formation; and particulate matter (PM_{10}) is harmful to human health. Finally, the release of heavy metals leads to their accumulation in the food chain, which is an issue of concern given their toxicity. The heavy metals considered in this country profile are arsenic (As), chromium (Cr), lead (Pb) and mercury (Hg).

Figure 7. Industrial air emissions as a percentage of total country pollution, by sector origins, in Lithuania for 2014

The coloured sections of the bars represent the contribution of the different industrial sectors to the emissions to air for each pollutant. The grey areas reflect the contribution from human activities other than industry. The quantities, expressed as percentages, refer to the country's total air emissions for each pollutant. The smaller the grey area, the more significant the industrial releases of the particular pollutant. In the CLRTAP, NO_x is reported as nitric oxide and nitrogen dioxide (NO_2), expressed as NO_2, and SO_x covers all sulfur compounds, expressed as sulfur dioxide (SO_2) (including sulfur trioxide, sulfuric acid and reduced sulfur compounds, such as hydrogen sulfide, mercaptans and dimethyl sulfides, etc.).



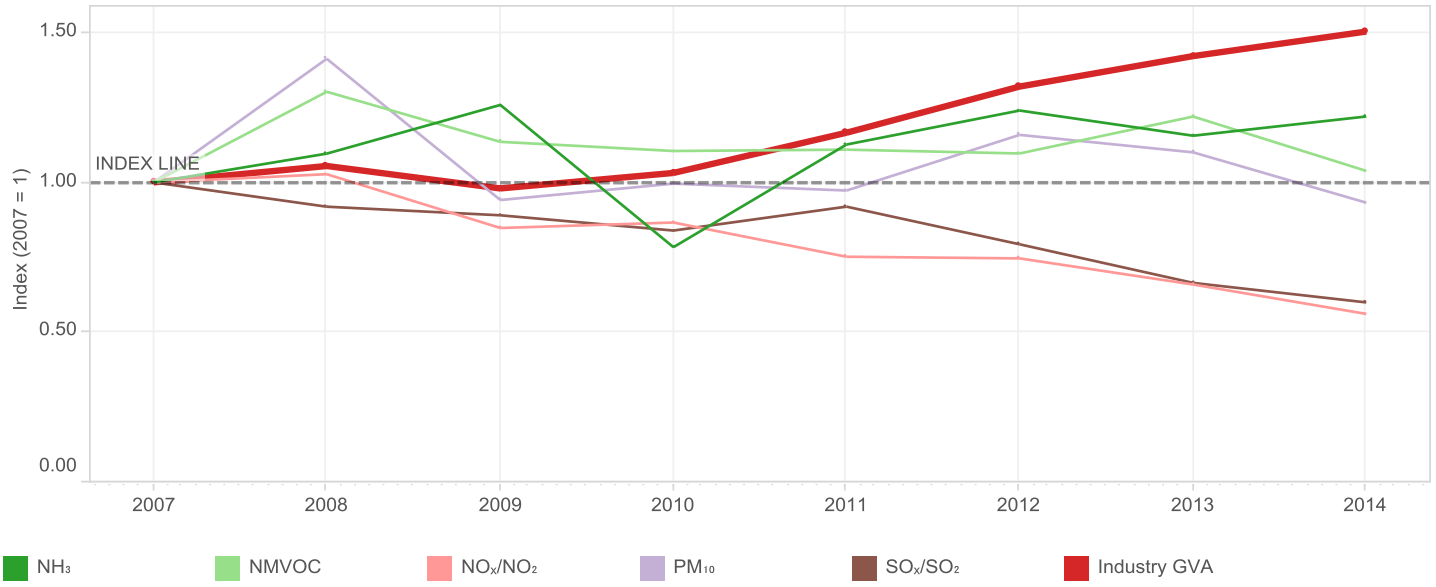
Source: EEA, 2016a.

Emissions (tonnes)	As	Cr	Hg	NH_3	NMVOC	NO_x	Pb	PM_{10}	SO_x
Cement and lime production	0.02	0.05	0.04	15.87	223.67	1 656.24	0.17	269.13	1 279.09
Chemical industry	-	-	-	456.83	1 906.04	676.74	-	-	1 588.23
Energy industry	0.19	0.79	0.09	2 213.08	26 121.58	7 847.06	1.57	15 437.88	14 515.83
Iron and steel manufacturing	-	-	-	-	-	-	-	-	-
Mining and quarrying	-	-	-	-	-	-	-	-	-
Non-ferrous metal production	-	-	-	-	-	-	-	-	-
Other manufacturing	0.00	0.06	0.03	78.03	16 803.79	343.88	0.08	394.32	119.42
Pulp, paper and wood production	-	-	-	-	-	-	-	-	-
Waste industry	0.00	0.00	0.00	29.28	166.95	1.90	0.00	0.10	0.28
Food and drink industry	-	-	-	-	4 968.61	-	-	-	-
Non-industry	0.00	0.19	0.02	38 136.41	19 069.01	40 887.97	1.97	2 965.69	329.63

TRENDS FOR KEY AIR POLLUTANT RELEASES

Emissions and economic growth trends are often coupled. One of the aims of environmental policy is to decouple economic growth from emissions and drive down emission trends, while allowing economies to continue to grow. The decoupling of industrial emission trends from industry GVA growth can be absolute (i.e. emissions decrease as GVA increases) or relative (i.e. emissions increase at a slower rate than GVA). Selected pollutant releases, indexed to 2007 (the first year of reporting under the E-PRTR), are presented together with industrial GVA (see Figure 2), also indexed to 2007, to show the coupling or decoupling of pollutant releases with economic growth.

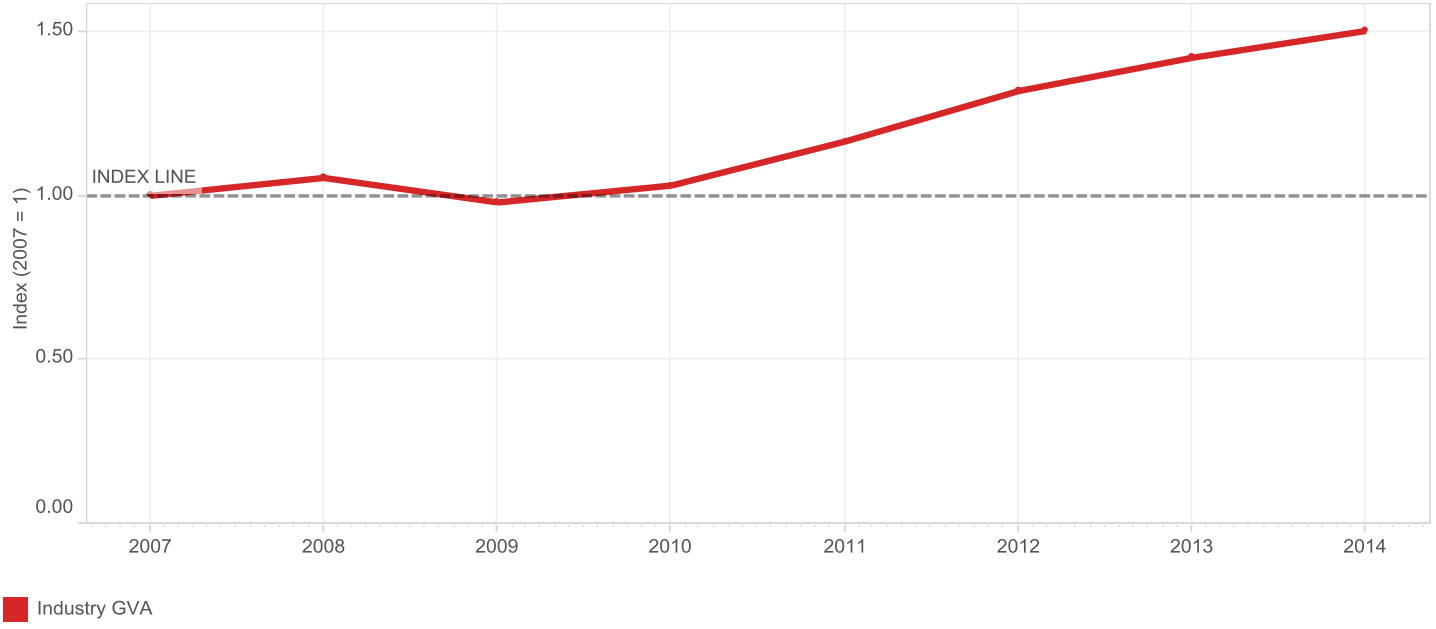
Figure 8. Industrial air pollution (based on E-PRTR data) from non-heavy metals versus economic growth in Lithuania, 2007-2014



Source: EEA, 2016b.

Releases (tonnes)	2007	2008	2009	2010	2011	2012	2013	2014
NH_3	472	517	594	369	531	585	545	575
NMVOC	8 645	11 263	9 816	9 551	9 590	9 480	10 547	8 976
NO_x/NO_2	7 905	8 121	6 700	6 844	5 940	5 897	5 207	4 430
PM_{10}	678	958	638	675	660	786	746	632
SO_x/SO_2	17 112	15 720	15 229	14 357	15 724	13 570	11 363	10 248

Figure 9. Industrial air pollution (based on E-PRTR data) from heavy metals versus economic growth in Lithuania, 2007-2014



Source: EEA, 2016b.

Releases (kg)	2007	2008	2009	2010	2011	2012	2013	2014
As	-	-	-	-	-	-	-	-
Cr	-	-	-	-	-	-	-	310
Hg	-	-	-	-	-	-	-	-
Pb	-	-	-	-	-	-	255	-

Industrial releases to water

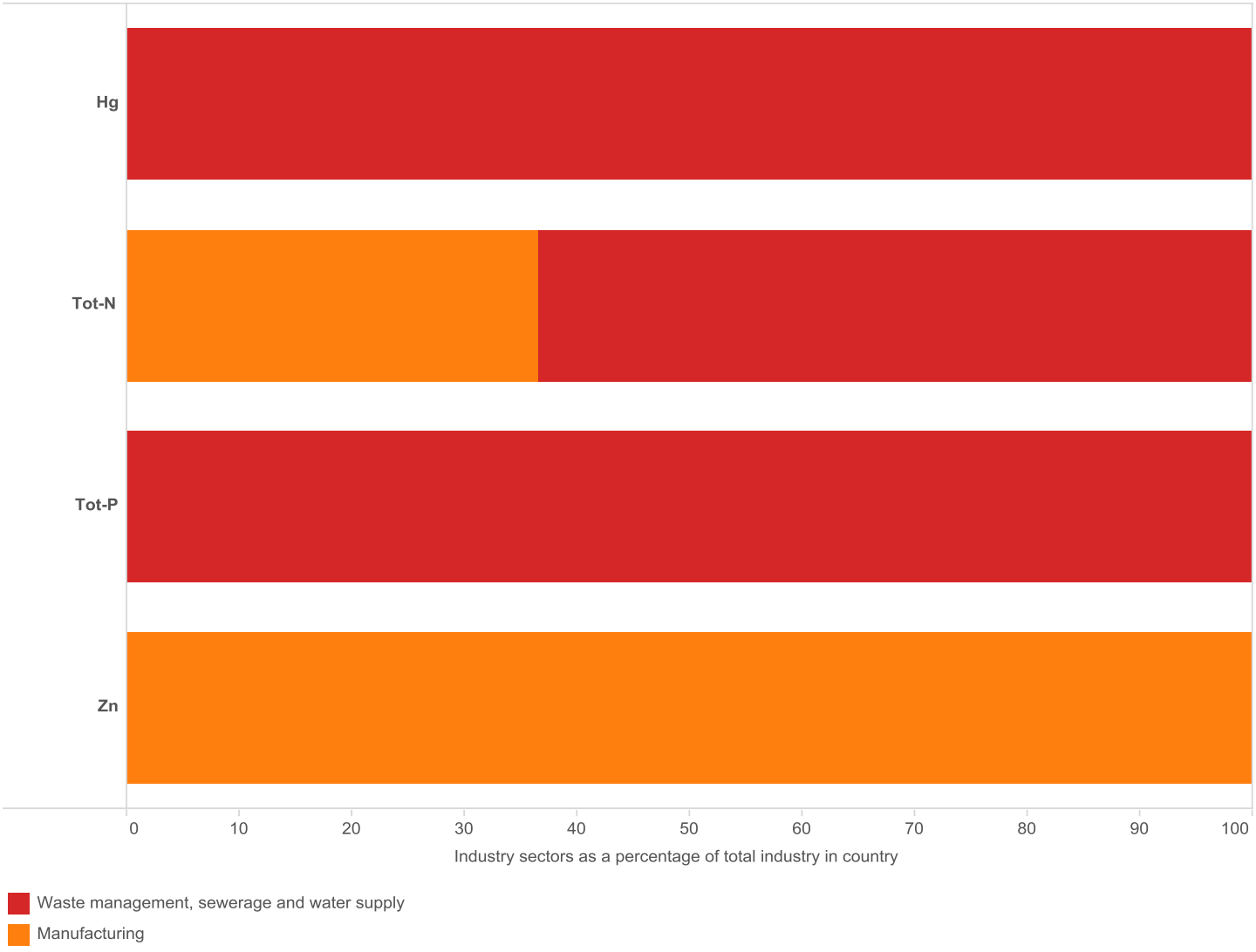
THE SIGNIFICANCE OF INDUSTRY IN TERMS OF RELEASES TO WATER

Industrial activities are an important source of water pollution. Industry releases pollutants that can be harmful to people and the environment. In this section, data are provided with regard to the release of the heavy metals aresinc (As), cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), nickel (Ni), lead (Pb) and zinc (Zn); the nutrients nitrogen (Tot-N) and phosphorus (Tot-P); and total organic carbon (TOC).

The coloured sections of the bars represent the contribution of the different industrial sectors (grouped by NACE divisions) to the releases to water for each pollutant. The sector contributions, expressed as percentages, reflect the country's total industrial water releases for each pollutant, as reported to the E-PRTR. The main NACE activity reported by the facility to the E-PRTR has been used for the grouping of industrial sectors.

For water releases, there are no complete inventories that cover all human activities. That is why the data source used for water releases is the E-PRTR. This data set covers releases above only a certain threshold for selected industrial activities. Therefore, the graph in Figure 10 captures a subset of industrial reality. In the E-PRTR, data on heavy metals include data on compounds of heavy metals.

Figure 10. Industrial water releases as a percentage of total country E-PRTR pollution in Lithuania, by sector origins, in 2014



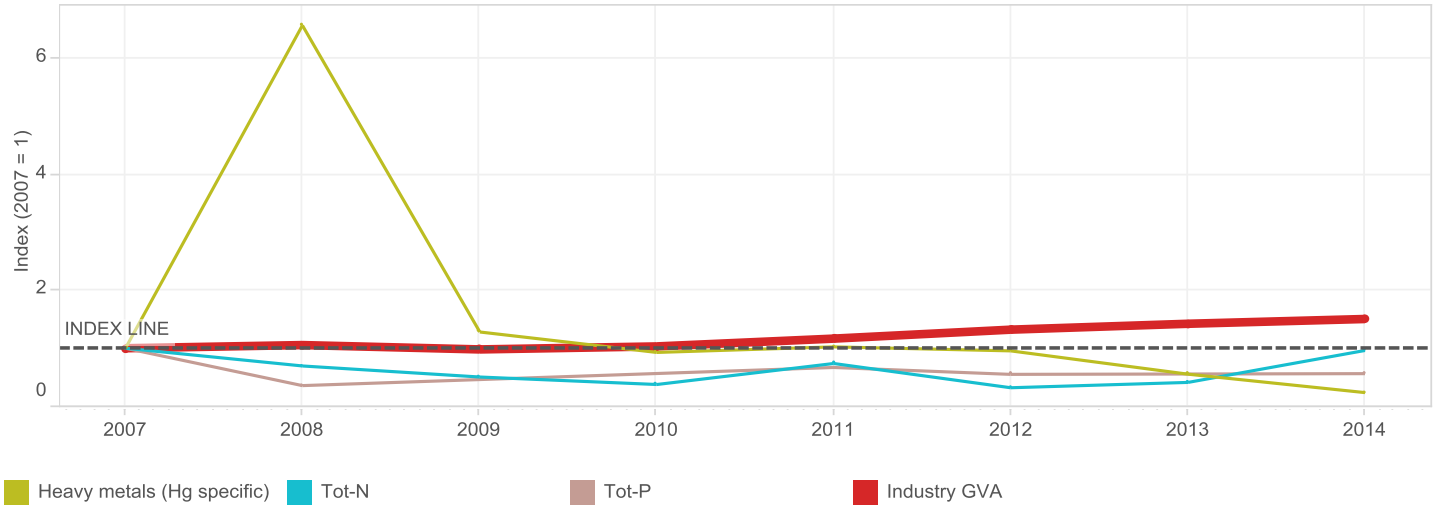
Source: EEA, 2016b.

Releases (tonnes)	As	Cd	Cr	Cu	Hg	Ni	Pb	TOC	Tot-N	Tot-P	Zn
Electricity, gas, steam and air conditioning supply	-	-	-	-	-	-	-	-	-	-	-
Manufacturing	-	-	-	-	-	-	-	-	83.000	-	0.112
Waste management, sewerage and water supply	-	-	-	-	0.001	-	-	-	144.000	9.000	-

TRENDS FOR KEY WATER POLLUTANT RELEASES

This section presents indexed data on releases (annual loads) and growth (GVA) to show the possible decoupling of the economy from environmental pressures. An explanation of this decoupling concept is given in the section 'Trends for key air pollutant releases' (page 9).

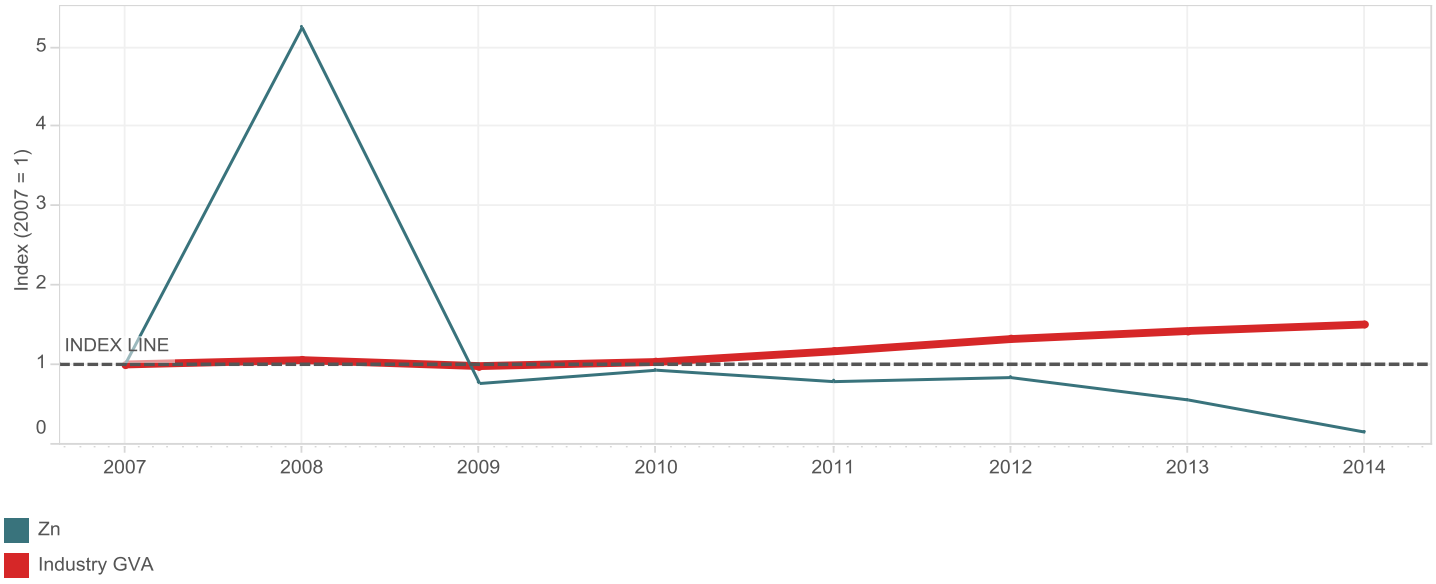
Figure 11. Industrial water pollution (based on E-PRTR data) versus economic growth in Lithuania, 2007-2014



Source: EEA, 2016b.
Note: As heavy metals in water pose comparable pressures to the environment, they can be aggregated by their relative toxicity. The methodology document includes details on this aggregation. The heavy metal releases are weighted by factors corresponding to the reciprocal predicted no effect concentration (PNEC) values (i.e. 1/PNEC values) (OSPAR, 2014) for each pollutant and set equivalent to one of the metals; in this case, Hg was chosen.

Releases (tonnes)	2007	2008	2009	2010	2011	2012	2013	2014
Heavy metals (Hg specific)	0.011	0.074	0.014	0.010	0.011	0.011	0.006	0.003
TOC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tot-N	236.000	164.000	119.000	88.600	174.000	75.400	97.100	227.000
Tot-P	16.000	5.700	0.000	0.000	10.700	8.800	0.000	9.000

Figure 12. Industrial water pollution (based on E-PRTR data), from heavy metals, versus economic growth in Lithuania, 2007-2014



Source: EEA, 2016b.

Releases (kg)	2007	2008	2009	2010	2011	2012	2013	2014
As	-	-	-	-	-	-	-	-
Cd	-	-	-	-	-	-	-	-
Cr	-	160	70	-	-	-	-	-
Cu	-	-	-	-	-	70	-	-
Hg	-	-	-	-	-	-	-	1
Ni	-	50	-	-	-	-	-	-
Pb	-	30	-	-	70	-	-	-
Zn	763	4 002	580	708	598	637	422	112

Industrial waste generation

THE SIGNIFICANCE OF INDUSTRY IN TERMS OF THE GENERATION OF WASTE

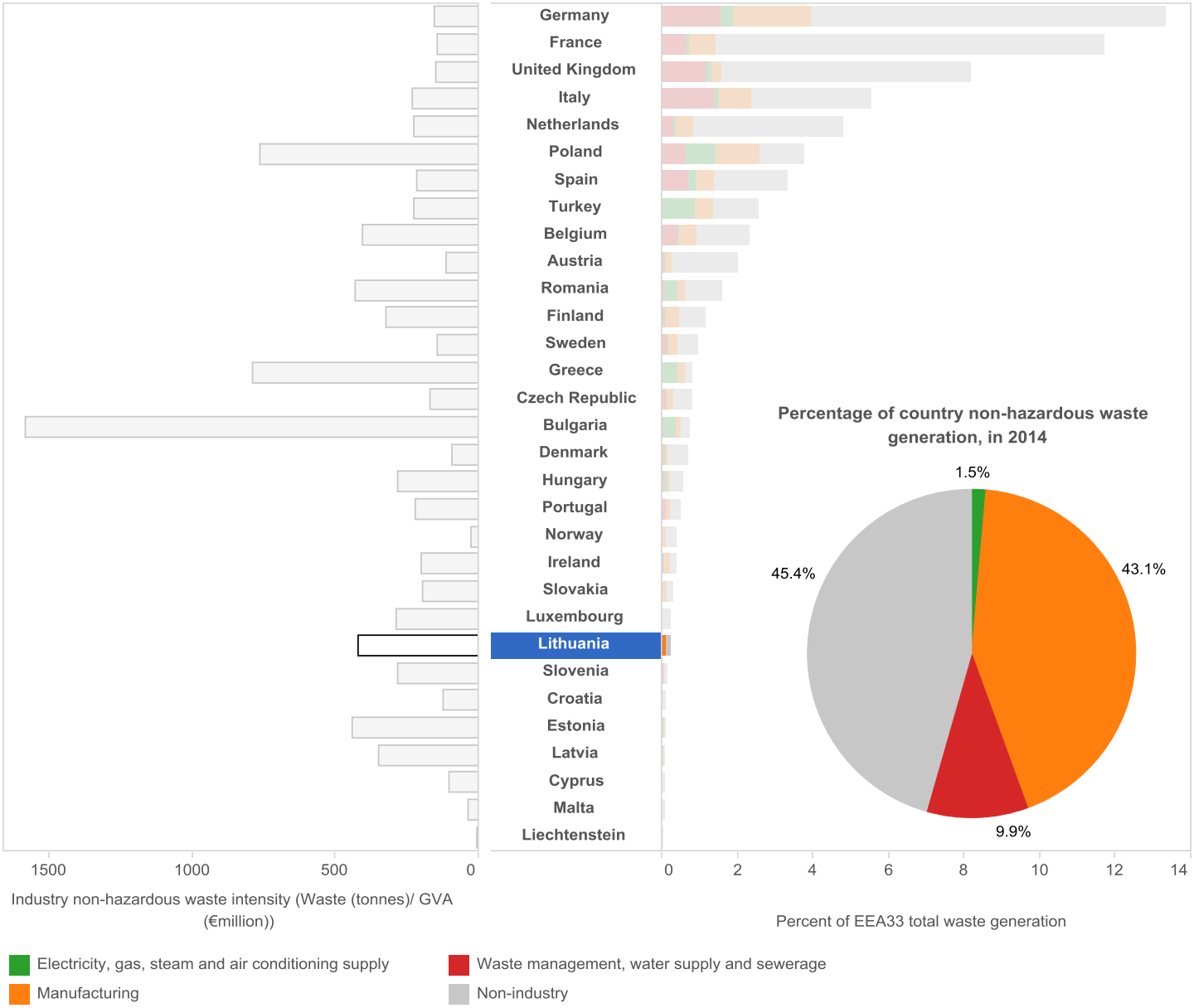
The waste produced by industrial activities comes from chemical solvents, paints, paper products, industrial by-products and metals among others. In the following analysis, data on industrial waste are grouped into three types: hazardous waste, non-hazardous waste, and waste from mining and quarrying. Mining and quarrying waste covers both hazardous and non-hazardous waste from these activities. Waste generation data are grouped by NACE divisions.

Hazardous waste can pose a risk to human health or the environment if not managed and disposed of correctly. The properties of waste that render it hazardous are defined in Annex III of the Waste Framework Directive (EC, 2008) and include, among others, explosive, flammable, toxic and carcinogenic properties. Data on waste from mining and quarrying are presented separately because of the different nature and large volumes of this type of waste. Mining and quarrying waste results from the prospecting, extraction, treatment and storage of mineral resources and the working of quarries. This category of waste is also addressed by a separate directive on the management of waste from extractive industries (EC, 2006).

The following figures on waste generation show (1) waste intensity (i.e. the relationship between waste generation (tonnes) and industry GVA (million EUR)); (2) the proportion of waste generated by the different activities out of the total waste generated by the EEA33; and (3) the proportion of country waste generation totals. Total waste covers all economic sectors.

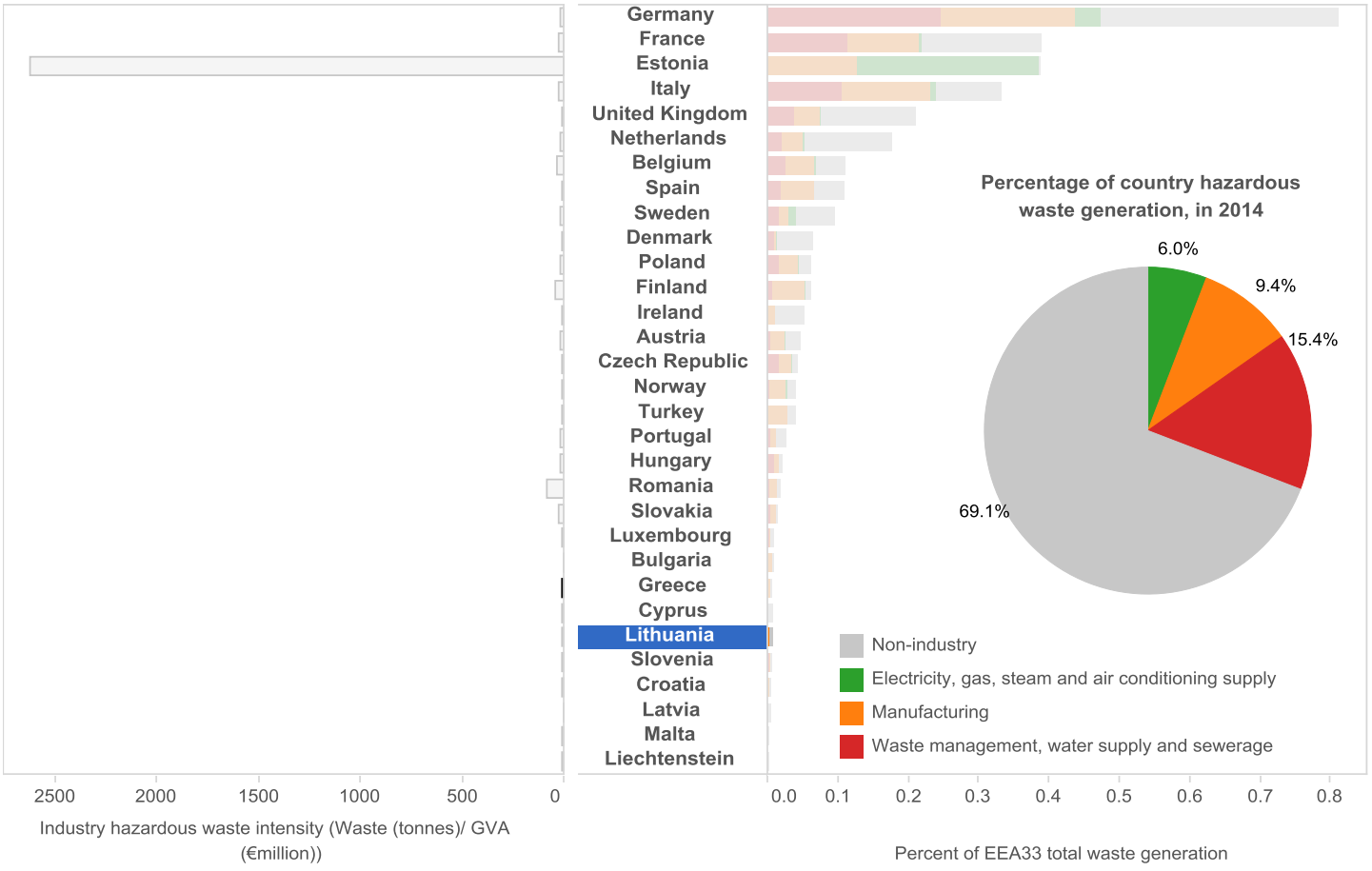
Waste intensity values quantify the relationship between waste generation and economic output. The larger the value, the more waste is generated by that country relative to the GVA that the particular sector produces in that country.

Figure 13. Industrial non-hazardous waste generation (excluding mining and quarrying), as a percentage of total EEA33 waste, and waste intensity, in 2014



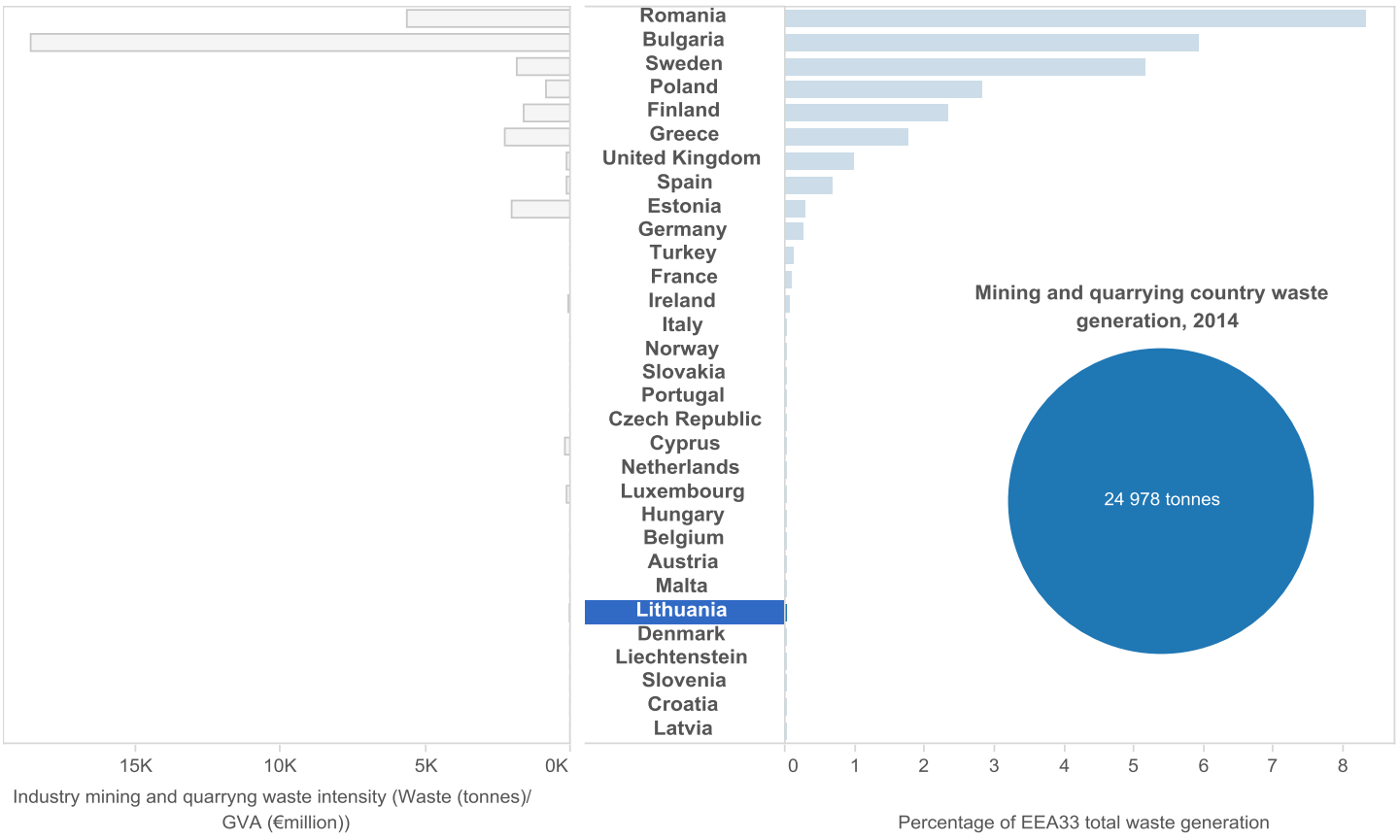
Source: Eurostat, 2016d. No data were available for Iceland or Switzerland.

Figure 14. Industrial hazardous waste generation (excluding mining and quarrying), as a percentage of total EEA33 waste, and waste intensity, 2014



Source: Eurostat, 2016d. No data were available for Iceland or Switzerland.

Figure 15. Mining and quarrying waste generation, as a percentage of total EEA33 waste, and waste intensity, 2014

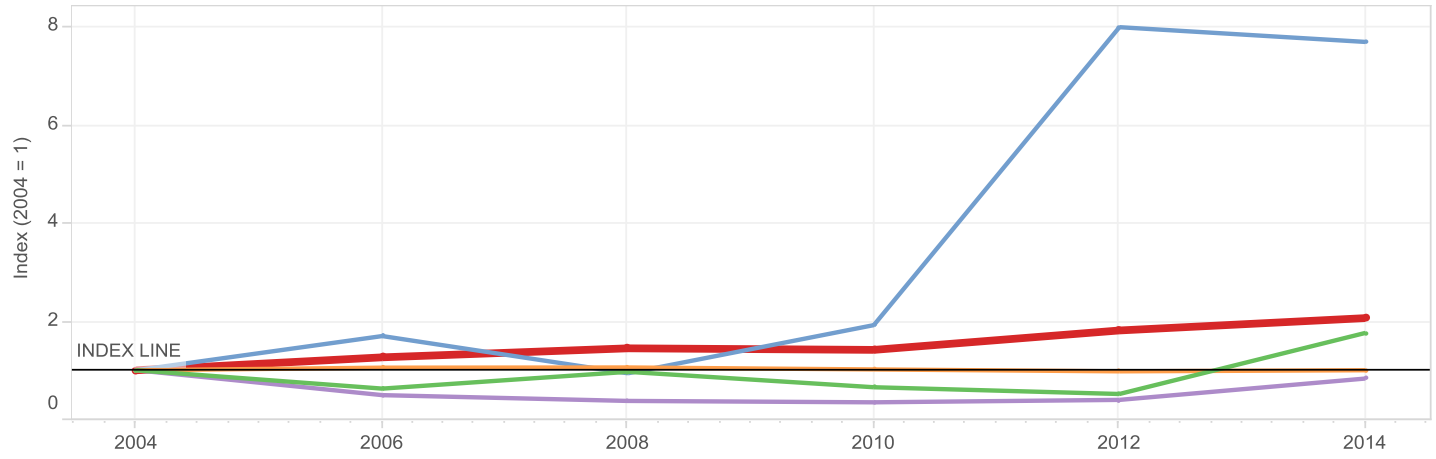


Source: Eurostat, 2016d. No data were available for Iceland or Switzerland.

WASTE GENERATION TRENDS

This section presents indexed data on waste generation. The data have been broken down by sector and growth (GVA) to show the possible coupling or decoupling of the economy and environmental pressures. An explanation of this concept is given in the 'Trends for key air pollutant releases' section (page 9). In this case, the data were indexed to 2004 levels.

Figure 16. Decoupling of industrial non-hazardous waste in Lithuania, 2004-2014 (latest years available)

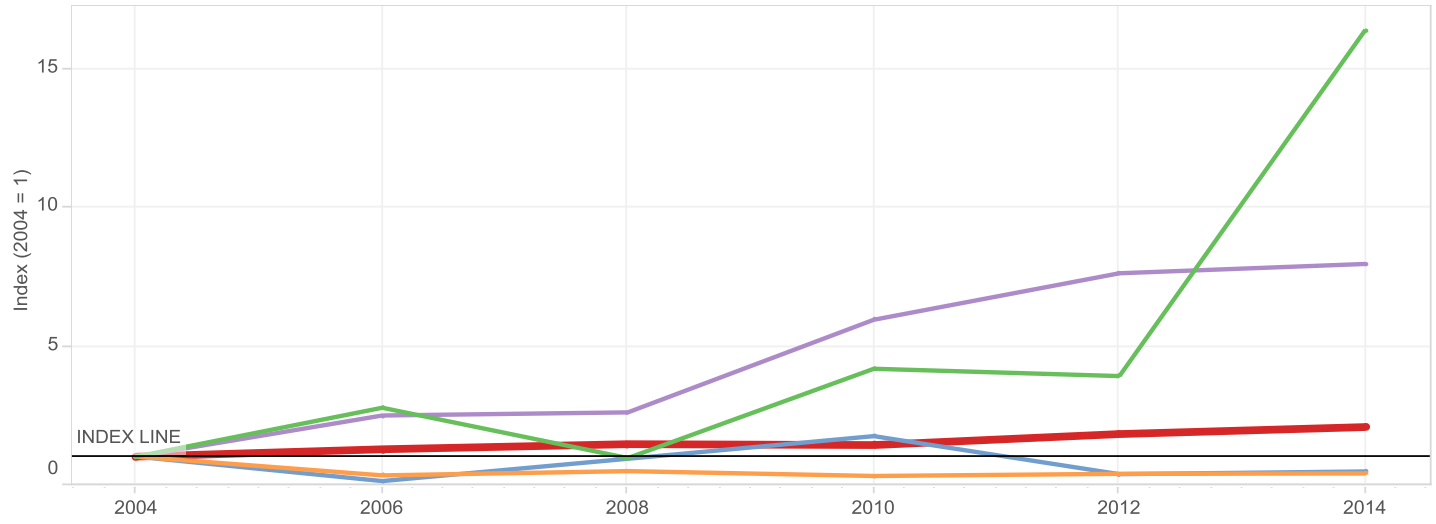


Source: Eurostat, 2016d.

Waste (tonnes)	2004	2006	2008	2010	2012	2014
Electricity, gas, steam and air conditioning supply	51 721	32 358	50 074	33 803	26 681	91 116
Manufacturing	2 592 413	2 728 567	2 738 820	2 636 043	2 536 270	2 593 126
Mining and quarrying	3 222	5 470	3 023	6 190	25 774	24 805
Waste management	718 624	353 921	269 036	248 624	284 324	597 347

Electricity, gas, steam and air conditioning supply
Manufacturing
Mining and quarrying
Waste management
Industry for GVA

Figure 17. Decoupling of industrial hazardous waste in Lithuania, 2004-2014 (latest years available)



Source: Eurostat, 2016d.

Waste (tonnes)	2004	2006	2008	2010	2012	2014
Electricity, gas, steam and air conditioning supply	603	1 664	571	2 511	2 352	9 871
Manufacturing	39 657	12 793	18 918	11 953	15 051	15 608
Mining and quarrying	373	44	344	648	137	173
Waste management	3 215	7 975	8 337	19 064	24 448	25 527

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Units, abbreviations and acronyms

As	Arsenic
Cd	Cadmium
CLRTAP	Convention on Long-range Transboundary Air Pollution
Cr	Chromium
Cu	Copper
EEA	European Environment Agency
EEA33	The 33 European Environment Agency member countries (the 28 European Union Member States together with Iceland, Liechtenstein, Norway, Switzerland and Turkey)
E-PRTR	European Pollutant Release and Transfer Register
GVA	Gross value added
Hg	Mercury
Mm^3	Million cubic metres
NACE	Statistical classification of economic activities in the European Community
NFR	Nomenclature for Reporting
NH_3	Ammonia
Ni	Nickel
NMVOC	Non-methane volatile organic compound
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
Pb	Lead
PJ	Petajoules
PM_{10}	Particulate matter
PNEC	Predicted no effect concentration
SO_2	Sulfur dioxide
SO_x	Sulfur oxides
TOC	Total organic carbon
Tot-N	Total nitrogen
Ton-P	Total phosphorous
Zn	Zinc