

2020 Pollutant emissions and waste transfers from SEPA regulated industrial sites

This statistical release shows emissions of pollutants to air and water and off site waste transfers reported by operators of industrial sites under the **Scottish Pollutant Release Inventory (SPRI)** for the 2020 calendar year. Some historic data is included for comparison. Information about the SPRI and on the methodology used to prepare this release is provided in sections two and three of this document.

Complete SPRI data is available on Scotland’s Environment Web at: <https://www.environment.gov.scot/data/data-analysis/scottish-pollution-release-inventory/>

This is a data analysis tool which allows you to view summarised information by industry sector for pollutants and waste transfers. Data can be downloaded in bulk, including at a site level. It is updated annually when the previous year’s data is published.

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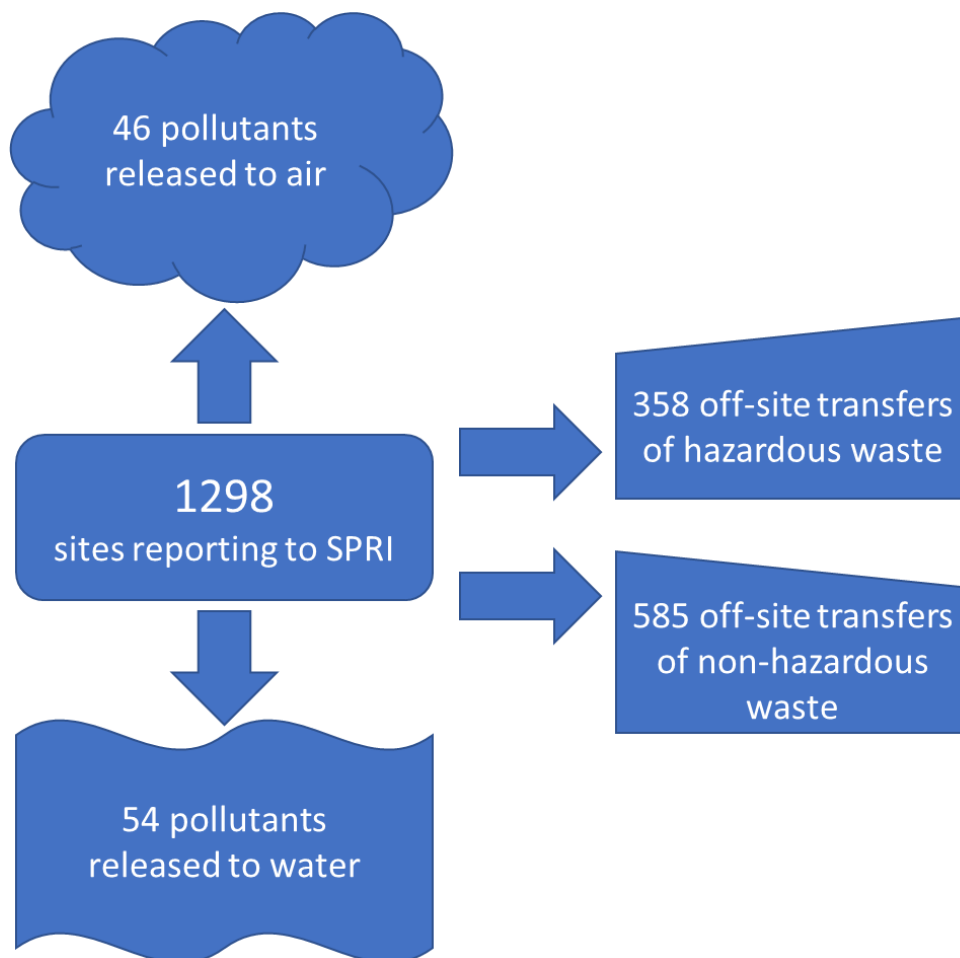
Media enquiries to: SEPA Communications Department: media@sepa.org.uk .

Feedback on this document to: SPRI.Administration@sepa.org.uk

This is an Experimental Official Statistics publication. These statistics have been produced to the high professional standards defined in the Code of Practice for Official Statistics, which sets out fourteen principles under the pillars of Trustworthiness, Quality and Value. More information on the Official Statistics Code of Practice can be found here: <http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html>. Lead statistician: Rebecca Chaffer.

1. The statistics

1.1 Key information for 2020



Information reported by operators reflected the impact of the covid-19 pandemic. From the set of around 420 main SPRI sites¹ who report pollutant emissions each year, 153 reported that some emissions were significantly different to those reported in 2019, which is a similar proportion to previous years. Of those asked for a qualification, 19 sites mentioned that the pandemic had had an impact on their emissions. In many cases, changes to production or throughput were noted, but operators also noted that changes to their monitoring timelines may have affected results. A further 12 sites who were not asked to qualify their data also noted on their forms that covid-19 had affected their emissions to some degree.²

The overall global warming potential of greenhouse gas emissions from the SEPA-regulated industrial sites which report to SPRI (measured as kilograms of carbon dioxide equivalent (kg CO₂e) reduced by 6% between 2019 and 2020. This reduction continues the decreasing trend seen since 2007 (2020's emissions are around 40% of 2007's), although since 2016 this decrease has slowed.

Emissions of all six greenhouse gases which are reportable to SPRI are discussed in section 1.3.

¹ 420 main SPRI sites: excludes Marine Fish Farms, Scottish Water, Radioactive Substances and sites who don't report pollutant emissions.

² Note that this information is derived from Qualifications which we do not release at a site level.

1.2 Emissions and Waste transfers for 2020

Emissions

Summary data is provided for all “above reporting threshold” (“ART” – see note below) emissions to air and water in the tables below (and on the accompanying data sheet). This is followed by more detailed information on greenhouse gas emissions data captured within SPRI.

Tables provided below show:

Table 1: Total ART emissions to air by pollutant and industry sector for 2020.

Table 3: Total ART emissions to water by pollutant and industry sector for 2020.

Table 3: Total ART emissions to water by pollutant and industry sector for 2020. All values are kg.

Pollutant name	Threshold (kg)	Total Release (kg)	1 - Energy sector	4 - Chemical industry	5 - Waste and wastewater m/ment	6 - Paper and wood production and processing	7 - Intensive livestock production and aquaculture	8 - Animal and vegetable products from the food and beverage sector
Ammonia	20	9,184,450	2,150	55	7,147,012			2,035,234
Anthracene	0.1	55.17	15.49	1.47	38.21			
Arsenic	5	533.53	23.77	21.73	488.03			
Asbestos	0.1	82.48			82.48			
Azamethiphos	0.001	333.31					333.31	
Benzene	10	886	686	200				
Benzo (g,h,i) perylene	0.1	10.85			10.85			
Benzo(a) pyrene	1	1.09			1.09			
Brominated diphenylethers - total as Br	0.1	0.65			0.65			
Cadmium	1	64.88	2.70	11.89	37.29			13.00
Chlorides - total as Cl	2,000,000	55,000,000		2,970,000	52,030,000			
Chloroform	5	81.51		45.60	35.91			
Chromium	20	711		48	441			222
Copper	20	54,578	65	300	7,754		42,631	3,829
Cyanides - total as CN	50	811		59	751			
Cypermethrin	0.005	0.31224			0.31224			
Deltamethrin	0.002	3.24994					3.24994	
Di(2-ethylhexyl) phthalate	0.1	1900.35			1900.35			
Diazinon	0.01	0.99			0.99			
Dioxins and furans - as ITEQ	0.0001	0.000993			0.000993			
Dioxins and furans - as WHO TEQ	0.0001	0.000993			0.000993			
Diuron	0.05	5.92			5.92			
Emamectin benzoate	0.001	43.1553					43.1553	
Ethylbenzene	10	48	48					
Fluoranthene	0.1	11.86		5.26	6.60			
Fluorides - total as F	2,000	200,365		2,135	198,230			
Halogenated organic compounds - total as AOX	1,000	93,680			93,680			
Hexachlorocyclohexane - all isomers	0.01	1.25			1.25			
Iron	1,000	422,050	1,996		420,055			
Isoproturon	0.01	0.45			0.45			
Lead	20	906			906			
Lindane	0.1	0.87			0.87			
Manganese	200	661						661
Mercury	0.1	12.33	0.74	0.86	10.46			0.28
Methylene chloride	10	111		98	13			
Naphthalene	1	1,106.73	10.03	5.32	1,091.38			
Nickel	20	5,840		137	4,828			875
Nitrogen - total as N	50,000	30,662,771		103,000	15,613,200		11,815,735	3,130,836
Nonylphenol ethoxylates	1	3,895.15			3,895.15			

Pollutant name	Threshold (kg)	Total Release (kg)	1 - Energy sector	4 - Chemical industry	5 - Waste and wastewater m/ment	6 - Paper and wood production and processing	7 - Intensive livestock production and aquaculture	8 - Animal and vegetable products from the food and beverage sector
Nonylphenols	1	621.92			621.92			
Nonyphenol and nonylphenol ethoxylates	1	2,623.18			2,623.18			
Octylphenol and octylphenol ethoxylates	1	5.16			5.16			
Octylphenols	1	5.16			5.16			
Organic tin compounds - total as Sn	5	11.91			11.91			
Permethrin	0.001	1.740050			1.740050			
Phenols - total as C	20	4,936	2,699	1,900	313			24
Phosphorus - total as P	5,000	4,130,093		26,413	1,676,500		1,817,029	610,151
Polychlorinated biphenyls	0.001	0.334600			0.334600			
Polycyclic aromatic hydrocarbons (PAHs)	1	78.73			78.73			
Toluene	10	692	569	123				
Total organic carbon or COD/3	50,000	69,543,368		1,322,223	10,139,400	290,194	45,110,898	12,680,653
Tributyltin compounds	0.005	0.59787			0.59787			
Xylene - all isomers	10	323	267	55				
Zinc	100	80,513	168	623	36,055		37,250	6,417

Notes on data provided in this publication:

- All values are in kilograms, with the exceptions of carbon dioxide to air which is given in tonnes (1,000kg) in some figures to simplify reporting.
- Most pollutants in SPRI have a threshold value. If a site's emission is below this value, they report only "BRT" (Below Reporting Threshold). If emissions are "ART" (Above Reporting Threshold) they must supply us with a value. **Figures for total emissions and number of reporting sites provided in this document are for "ART" submissions only.**
- Percentage figures given to show proportion of total emissions from each industrial sector are rounded so may not total 100.
- Precision of figures. Operators are asked to supply figures to three significant figures. Many provide more precise figures, and we have used these here. For some official reporting we are required to round each individual value to three significant figures which may cause slight discrepancies from the totals reported here.
- There are nine SPRI Industry Sectors, as listed in the tables below. For details of the activities which place a site within those sectors, including the minimum capacity a site must have to be required to report to SPRI, see table 6 and section 3. *About the Scottish Pollutant Release Inventory.*

Table 1: Total ART emissions to air by pollutant and industry sector for 2020. All values are kg except for carbon dioxide which is in tonnes

Pollutant name	Threshold (kg)	Total Release (kg)	1 - Energy sector	2 - Production and processing of metals	3 - Mineral industry	4 - Chemical industry	5 - Waste and wastewater m/ment	6 - Paper and wood production and processing	7 - Intensive livestock production and aquaculture	8 - Animal and vegetable products from the food and beverage sector	9 - Other activities
Ammonia	1,000	919,599			40,049	4,358	17,200	1,752	856,240		
Antimony	1	40.63	1.60		2.35		9.10	27.58			
Arsenic	1	58.40			30.56		2.53	25.31			
Benzene	1,000	119,606	65,695			53,911					
Butadiene	100	48,211	19,832			28,379					
Cadmium	1	38.97		1.33	1.51		15.05	21.08			
Carbon dioxide (tonnes)	10,000 t	10,644,634	5,107,008	69,717	650,224	1,750,778	2,073,711	694,052		288,675	10,470
Carbon monoxide	100,000	10,687,566	4,070,955		2,992,310	1,930,142	1,161,737	402,373		130,049	
Chlorine and total inorganic chlorine compounds - as HCl	10,000	27,721					13,263	14,458			
Chlorofluorocarbons (CFCs)	1	333.91					333.91				
Chromium	10	412.3		20.4	36.1		73.7	282.1			
Copper	10	221.2			83.8		51.1	86.3			
Dioxins and furans - as ITEQ	0.00001	0.000152					0.000081	0.000071			
Dioxins and furans - as WHO TEQ	0.00001	0.000130					0.000067	0.000063			
Ethylbenzene	100	602				602					
Fluorine and total inorganic fluorine compounds - as HF	1,000	19,421		19,421							
Formaldehyde	10	95,925.2			588	80.2		95,257			
Hydrochlorofluorocarbons (HCFCs)	1	223.07				3.33	215.74			4.00	
Hydrofluorocarbons (HFCs)	100	3,636				2,489				1,147	
Hydrogen chloride	10,000	38,863					38,863				
Lead	100	965			163			802			
Manganese	10	157.4			33.9		73.5	50.0			
Mercury	1	8.68					4.78	3.90			
Methane	10,000	25,990,167	3,992,440		58,785	365,157	20,926,548		619,607	27,630	

Pollutant name	Threshold (kg)	Total Release (kg)	1 - Energy sector	2 - Production and processing of metals	3 - Mineral industry	4 - Chemical industry	5 - Waste and wastewater m/ment	6 - Paper and wood production and processing	7 - Intensive livestock production and aquaculture	8 - Animal and vegetable products from the food and beverage sector	9 - Other activities
Methyl chloride	1,000	20,724				20,724					
Methyl chloroform	10	46.1					46.1				
Methylene chloride	1,000	103,985				103,985					
Naphthalene	100	317			317						
Nickel	10	128.8	26.4		56.4			46.0			
Nitrogen oxides, NO and NO ₂ as NO ₂	100,000	11,555,750	6,290,335		1,247,441	1,958,301	1,043,000	891,843		124,830	
Nitrous oxide	10,000	73,546	73,546								
Non-methane volatile organic compounds (NMVOCs)	10,000	22,862,457	10,323,274		75,163	3,651,203		591,026		7,893,287	328,504
Particulate matter - PM10 and smaller	10,000	591,915	75,361	15,884	249,113	102,393			149,165		
Particulate matter - total	50,000	519,108			55,506	117,048		65,044	281,510		
Particulates - PM2.5 and smaller only	1,000	7,674	1,231		2,926		3,517				
Perfluorocarbons (PFCs)	10	4,008.1		541		3,467					
Phenols - total as C	10	366.0			366						
Polycyclic aromatic hydrocarbons (PAHs)	1	1.37					1.37				
Selenium	100	520			520						
Styrene	100	585				585					
Sulphur hexafluoride	10	226.8				227					
Sulphur oxides, SO ₂ and SO ₃ as SO ₂	100,000	3,035,399	1,622,193	528,111	885,095						
Tetrachloroethane	10	13.3					13.3				
Toluene	100	121,317	83,048			35,141	109				3,019
Vanadium	10	10.5	10.5								
Xylene - all isomers	1,000	76,292	71,892			4,400					

Table 2: Number of sites reporting ART emissions to air, and percentage of total ART emissions released, by industry sector and pollutant for 2020

Pollutant	Total no of ART sites	1 - Energy sector		2 - Production and processing of metals		3 - Mineral industry		4 - Chemical industry		5 - Waste and waste-water m/ment		6 - Paper and wood production and processing		7 - Intensive livestock production and aquaculture		8 - Animal & vegetable products from food and beverage sector		9 - Other activities	
		Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020
Ammonia	119					2	4%	1	<1%	8	2%	1	<1%	107	93%				
Antimony	6	1	4%			1	6%			2	22%	2	68%						
Arsenic	5					2	52%			1	4%	2	43%						
Benzene	3	1	55%					2	45%										
Butadiene	4	1	41%					3	59%										
Cadmium	6			1	3%	1	4%			1	39%	3	54%						
Carbon dioxide	81	25	48%	2	<1%	4	6%	6	16%	32	19%	6	7%			5	3%	1	<1%
Carbon monoxide	25	12	38%			1	28%	2	18%	7	11%	2	4%			1	1%		
Chlorine and total inorganic chlorine compounds - as HCl	2									1	48%	1	52%						
Chlorofluorocarbons (CFCs)	22									22	100%								
Chromium	8			1	5%	1	9%			4	18%	2	68%						
Copper	5					2	38%			1	23%	2	39%						
Dioxins and furans - as ITEQ	5									3	53%	2	47%						
Dioxins and furans - as WHO TEQ	4									2	52%	2	48%						
Ethylbenzene	1							1	100%										
Fluorine and total inorganic fluorine compounds - as HF	1			1	100%														
Formaldehyde	5					1	<1%	1	<1%			3	99%						
Hydrochlorofluorocarbons (HCFCs)	21							1	1%	19	97%					1	2%		
Hydrofluorocarbons (HFCs)	5							3	68%							2	32%		
Hydrogen chloride	2									2	100%								
Lead	2					1	17%					1	83%						
Manganese	4					1	22%			2	47%	1	32%						
Mercury	5									3	55%	2	45%						
Methane	110	16	15%			2	<1%	3	1%	63	81%			25	2%	1	<1%		

Pollutant	Total no of ART sites	1 - Energy sector		2 - Production and processing of metals		3 - Mineral industry		4 - Chemical industry		5 - Waste and waste-water m/ment		6 - Paper and wood production and processing		7 - Intensive livestock production and aquaculture		8 - Animal & vegetable products from food and beverage sector		9 - Other activities	
		Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020
Methyl chloride	1							1	100%										
Methyl chloroform	2									2	100%								
Methylene chloride	2							2	100%										
Naphthalene	1					1	100%												
Nickel	6	1	21%			2	44%					3	36%						
Nitrogen oxides, NO and NO ₂ as NO ₂	27	12	54%			3	11%	3	17%	4	9%	4	8%			1	1%		
Nitrous oxide	5	5	100%																
Non-methane volatile organic compounds (NMVOCs)	39	18	45%			2	<1%	8	16%			2	3%			4	35%	5	1%
Particulate matter - PM10 and smaller	18	2	13%	1	3%	7	42%	1	17%					7	25%				
Particulate matter - total	6					1	11%	1	23%			1	13%	3	54%				
Particulates - PM2.5 and smaller only	4	1	16%			2	38%			1	46%								
Perfluorocarbons (PFCs)	3			1	13%			2	87%										
Phenols - total as C	1					1	100%												
Polycyclic aromatic hydrocarbons (PAHs)	1									1	100%								
Selenium	1					1	100%												
Styrene	1							1	100%										
Sulphur hexafluoride	2							2	100%										
Sulphur oxides, SO ₂ and SO ₃ as SO ₂	8	4	53%	1	17%	3	29%												
Tetrachloroethane	1									1	100%								
Toluene	9	1	68%					5	29%	1	<1%							2	2%
Vanadium	1	1	100%																
Xylene - all isomers	2	1	94%					1	6%										

Table 3: Total ART emissions to water by pollutant and industry sector for 2020. All values are kg.

Pollutant name	Threshold (kg)	Total Release (kg)	1 - Energy sector	4 - Chemical industry	5 - Waste and wastewater m/ment	6 - Paper and wood production and processing	7 - Intensive livestock production and aquaculture	8 - Animal and vegetable products from the food and beverage sector
Ammonia	20	9,184,450	2,150	55	7,147,012			2,035,234
Anthracene	0.1	55.17	15.49	1.47	38.21			
Arsenic	5	533.53	23.77	21.73	488.03			
Asbestos	0.1	82.48			82.48			
Azamethiphos	0.001	333.31					333.31	
Benzene	10	886	686	200				
Benzo (g,h,i) perylene	0.1	10.85			10.85			
Benzo(a) pyrene	1	1.09			1.09			
Brominated diphenylethers - total as Br	0.1	0.65			0.65			
Cadmium	1	64.88	2.70	11.89	37.29			13.00
Chlorides - total as Cl	2,000,000	55,000,000		2,970,000	52,030,000			
Chloroform	5	81.51		45.60	35.91			
Chromium	20	711		48	441			222
Copper	20	54,578	65	300	7,754		42,631	3,829
Cyanides - total as CN	50	811		59	751			
Cypermethrin	0.005	0.31224			0.31224			
Deltamethrin	0.002	3.24994					3.24994	
Di(2-ethylhexyl) phthalate	0.1	1900.35			1900.35			
Diazinon	0.01	0.99			0.99			
Dioxins and furans - as ITEQ	0.0001	0.000993			0.000993			
Dioxins and furans - as WHO TEQ	0.0001	0.000993			0.000993			
Diuron	0.05	5.92			5.92			
Emamectin benzoate	0.001	43.1553					43.1553	
Ethylbenzene	10	48	48					
Fluoranthene	0.1	11.86		5.26	6.60			
Fluorides - total as F	2,000	200,365		2,135	198,230			
Halogenated organic compounds - total as AOX	1,000	93,680			93,680			
Hexachlorocyclohexane - all isomers	0.01	1.25			1.25			
Iron	1,000	422,050	1,996		420,055			
Isoproturon	0.01	0.45			0.45			
Lead	20	906			906			
Lindane	0.1	0.87			0.87			
Manganese	200	661						661
Mercury	0.1	12.33	0.74	0.86	10.46			0.28
Methylene chloride	10	111		98	13			
Naphthalene	1	1,106.73	10.03	5.32	1,091.38			
Nickel	20	5,840		137	4,828			875
Nitrogen - total as N	50,000	30,662,771		103,000	15,613,200		11,815,735	3,130,836
Nonylphenol ethoxylates	1	3,895.15			3,895.15			
Nonylphenols	1	621.92			621.92			
Nonyphenol and nonylphenol ethoxylates	1	2,623.18			2,623.18			

Pollutant name	Threshold (kg)	Total Release (kg)	1 - Energy sector	4 - Chemical industry	5 - Waste and wastewater m/ment	6 - Paper and wood production and processing	7 - Intensive livestock production and aquaculture	8 - Animal and vegetable products from the food and beverage sector
Octylphenol and octylphenol ethoxylates	1	5.16			5.16			
Octylphenols	1	5.16			5.16			
Organic tin compounds - total as Sn	5	11.91			11.91			
Permethrin	0.001	1.740050			1.740050			
Phenols - total as C	20	4,936	2,699	1,900	313			24
Phosphorus - total as P	5,000	4,130,093		26,413	1,676,500		1,817,029	610,151
Polychlorinated biphenyls	0.001	0.334600			0.334600			
Polycyclic aromatic hydrocarbons (PAHs)	1	78.73			78.73			
Toluene	10	692	569	123				
Total organic carbon or COD/3	50,000	69,543,368		1,322,223	10,139,400	290,194	45,110,898	12,680,653
Tributyltin compounds	0.005	0.59787			0.59787			
Xylene - all isomers	10	323	267	55				
Zinc	100	80,513	168	623	36,055		37,250	6,417

Table 4: Number of sites reporting ART emissions to water, and percentage of total ART emissions released, by sector and pollutant for 2020

Pollutant	Total no of ART sites	1 - Energy sector		4 - Chemical industry		5 - Waste and wastewater m/ment		6 - Paper and wood production and processing		7 - Intensive livestock production and aquaculture		8 - Animal and vegetable products from the food and beverage sector	
		Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020
Ammonia	77	1	<1%	1	<1%	73	78%					2	22%
Anthracene	56	1	28%	1	3%	54	69%						
Arsenic	30	3	4%	1	4%	26	91%						
Asbestos	72					72	100%						
Azamethiphos	94									94	100%		
Benzene	4	3	77%	1	23%								
Benzo (g,h,i) perylene	26					26	100%						
Benzo(a) pyrene	1					1	100%						
Brominated diphenylethers - total as Br	4					4	100%						
Cadmium	18	1	4%	2	18%	14	57%					1	20%
Chlorides - total as Cl	12			1	5%	11	95%						
Chloroform	4			1	56%	3	44%						
Chromium	7			1	7%	5	62%					1	31%
Copper	109	1	<1%	2	<1%	58	14%			46	78%	2	7%

Pollutant	Total no of ART sites	1 - Energy sector		4 - Chemical industry		5 - Waste and wastewater m/ment		6 - Paper and wood production and processing		7 - Intensive livestock production and aquaculture		8 - Animal and vegetable products from the food and beverage sector	
		Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020
Cyanides - total as CN	8			1	7%	7	93%						
Cypermethrin	9					9	100%						
Deltamethrin	38									38	100%		
Di(2-ethylhexyl) phthalate	73					73	100%						
Diazinon	11					11	100%						
Dioxins and furans - as ITEQ	6					6	100%						
Dioxins and furans - as WHO TEQ	6					6	100%						
Diuron	27					27	100%						
Emamectin benzoate	109									109	100%		
Ethylbenzene	2	2	100%										
Fluoranthene	24			2	44%	22	56%						
Fluorides - total as F	27			1	1%	26	99%						
Halogenated organic compounds - total as AOX	26					26	100%						
Hexachlorocyclohexane - all isomers	14					14	100%						
Iron	50	1	<1%			49	100%						
Isoproturon	16					16	100%						
Lead	12					12	100%						
Lindane	5					5	100%						
Manganese	1											1	100%
Mercury	37	4	6%	2	7%	30	85%					1	2%
Methylene chloride	2			1	88%	1	12%						
Naphthalene	75	2	<1%	1	<1%	72	99%						
Nickel	45			1	2%	43	83%					1	15%
Nitrogen - total as N	176			1	<1%	50	51%			123	39%	2	10%
Nonylphenol ethoxylates	73					73	100%						
Nonylphenols	67					67	100%						
Nonyphenol and nonylphenol ethoxylates	73					73	100%						
Octylphenol and octylphenol ethoxylates	3					3	100%						
Octylphenols	3					3	100%						
Organic tin compounds - total as Sn	2					2	100%						
Permethrin	14					14	100%						
Phenols - total as C	11	4	55%	2	38%	4	6%					1	<1%
Phosphorus - total as P	201			1	<1%	44	41%			154	44%	2	15%
Polychlorinated biphenyls	12					12	100%						
Polycyclic aromatic hydrocarbons (PAHs)	24					24	100%						

Pollutant	Total no of ART sites	1 - Energy sector		4 - Chemical industry		5 - Waste and waste-water m/ment		6 - Paper and wood production and processing		7 - Intensive livestock production and aquaculture		8 - Animal and vegetable products from the food and beverage sector	
		Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020	Sites	% of 2020
Toluene	5	3	82%	2	18%								
Total organic carbon or COD/3	227			3	2%	32	15%	1	<1%	188	65%	3	18%
Tributyltin compounds	26					26	100%						
Xylene - all isomers	5	3	83%	2	17%								
Zinc	212	1	<1%	3	<1%	51	45%			155	46%	2	8%

Waste transfers

Table 5: Off site waste transfers by industry sector and type for 2020. All values are tonnes.

Industry sector	Hazardous Waste		Non-hazardous Waste	
	Disposal	Recovery	Disposal	Recovery
1 - Energy sector	3,135	5,094	3,901	14,180
2 - Production and processing of metals	1,491	1,748		4,962
3 - Mineral industry	490	40	624	3,054
4 - Chemical industry	221,563	64,551	11,659	14,645
6 - Paper and wood production and processing	2,934	4,181	2,753	18,581
7 - Intensive livestock production and aquaculture			4,189	61,933
8 - Animal and vegetable products from the food and beverage sector	4,742	155	85,633	101,513
9 - Other activities	451	1,443	6,073	3,538
Total	234,806	77,212	114,833	222,406

Note:

1. Excludes waste transferred by industry sector 5 - *Waste and waste-water management*, as this is reported elsewhere. <https://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/waste-data-for-scotland/>
2. The thresholds for reporting off-site waste transfers are 2 tonnes for hazardous and 2,000 tonnes for non-hazardous. No "BRT" report is necessary as it is assumed all sites will produce some waste.
3. "Disposal" and "Recovery" mean any of the operations provided for in Annex IIA and Annex IIB of [EU Waste Directive 2006/12/EC](#)

1.3 Greenhouse gas emissions

Emissions of four individual greenhouse gases, and two groups of greenhouse gases are reportable to SPRI.

Three of these are “Fluorinated greenhouse gases” or “F-gases”; a family of chemicals that contain fluorine which are also powerful greenhouse gases that contribute to climate change. The EU has regulation on the use of F-gases like hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). Note that the Kyoto “basket” of greenhouse gases includes nitrogen trifluoride (an F-gas) which is not reportable to SPRI.

Individual gases	Carbon dioxide	
	Methane	
	Nitrous oxide	
Groups of gases	Sulphur hexafluoride	F-gas
	Hydrofluorocarbons (HFCs)	F-gas
	Perfluorocarbons (PFCs)	F-gas

Global warming potential: a note on the use of “carbon dioxide equivalent” (CO₂e) mass

The Intergovernmental Panel on Climate Change (IPCC) explains Global Warming Potentials as: “Global Warming Potentials (GWP) are calculated as the ratio of the radiative forcing of one kilogramme greenhouse gas emitted to the atmosphere to that from one kilogramme CO₂ over a period of time.”³

The GWP values used in this publication are taken from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) over a 100-year period (in line with the approach taken for UK inventory/national reporting purposes).⁴

The GWPs used for the individual greenhouse gases are:

Greenhouse gas	Lifetime (years)	100 years GWP (AR4)
Carbon dioxide	50-200	1
Methane	12	25
Nitrous oxide	114	298
Sulphur hexafluoride	3200	22,800

For grouped gases:

It is currently not possible for us to reliably convert these to carbon dioxide equivalent (CO₂e) values as we do not formally collect information identifying individual species of hydrofluorocarbons and perfluorocarbons. However, to provide an illustration of the scale of these emissions in the context of SPRI total greenhouse gas releases, figures 1 and 2 use a worst-case scenario value for each group.

- For hydrofluorocarbons, we have used the value for **HFC-23 (100 years GWP (AR4) = 14,800)** as the largest in the IPCC set. The smallest value for an HFC in this set is 12. In reality, most HFC releases are known to be of refrigerants and the gases most commonly specifically identified to SPRI have GWPs of between 1,000 and 4,000.
- For perfluorocarbons, we have used the value for **PFC-116 (100 years GWP (AR4) = 12,200)** as the largest in the IPCC set. The smallest value for a PFC in this set is 7,390. We have very limited information on the species of PFC released from SPRI sites.

³ 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Available at: <https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/>

⁴ AR4 Climate Change 2007: The Physical Science Basis. Available at: <https://www.ipcc.ch/report/ar4/wg1/>

SPRI provides information on greenhouse gas emissions from industrial sites only. The Scottish Greenhouse Gas Inventory⁵ is the key tool for understanding the origins and magnitudes of greenhouse gas emissions in Scotland.

Long term view of global warming potential of SPRI releases

Figures 1 and 2 show the global warming potential of total emissions from SPRI since 2007 (when the current regulations which our core reporting is based on came into force). Note that even when the worst case scenario of hydrofluorocarbon and perfluorocarbon values are used, they form a very small part of the overall total.

Figure 1: Global warming potential of greenhouse gases reported to SPRI since 2007 (kg CO₂e)

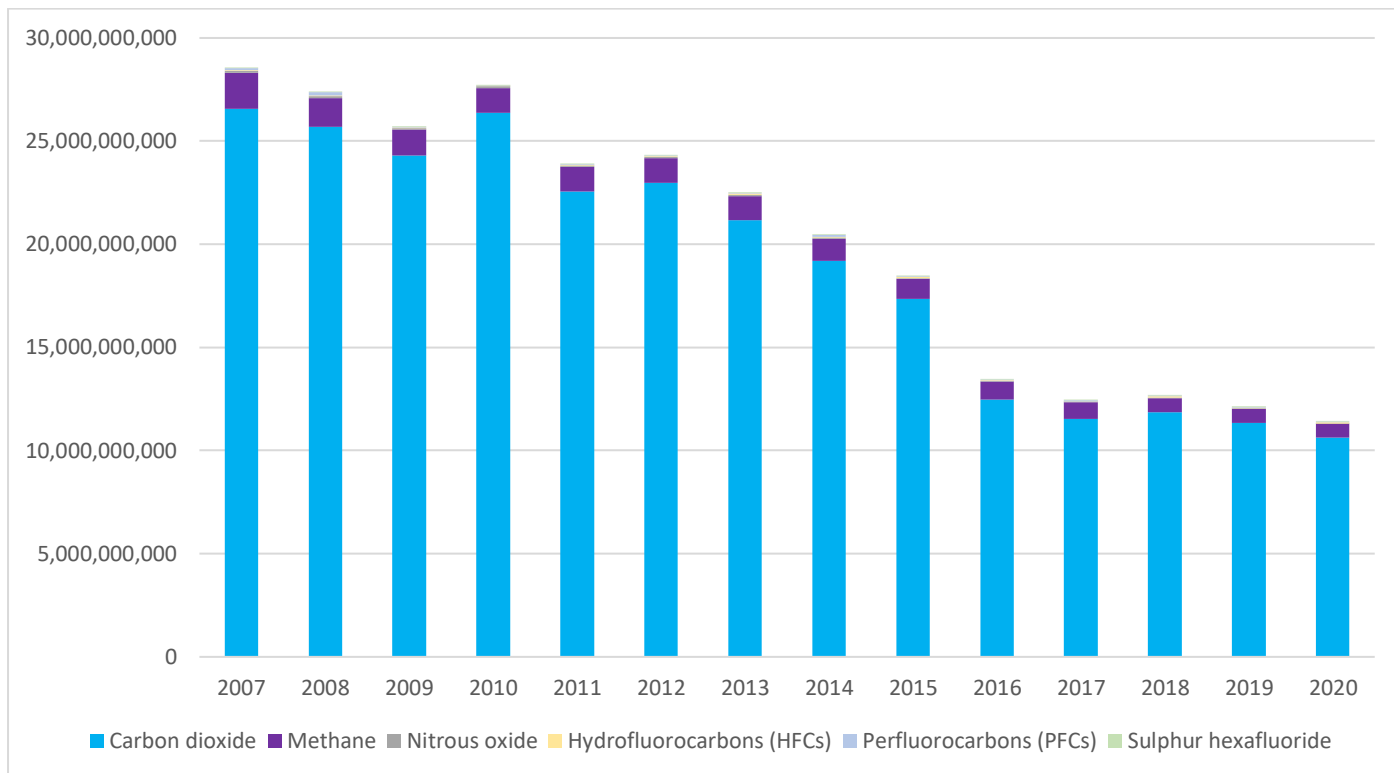
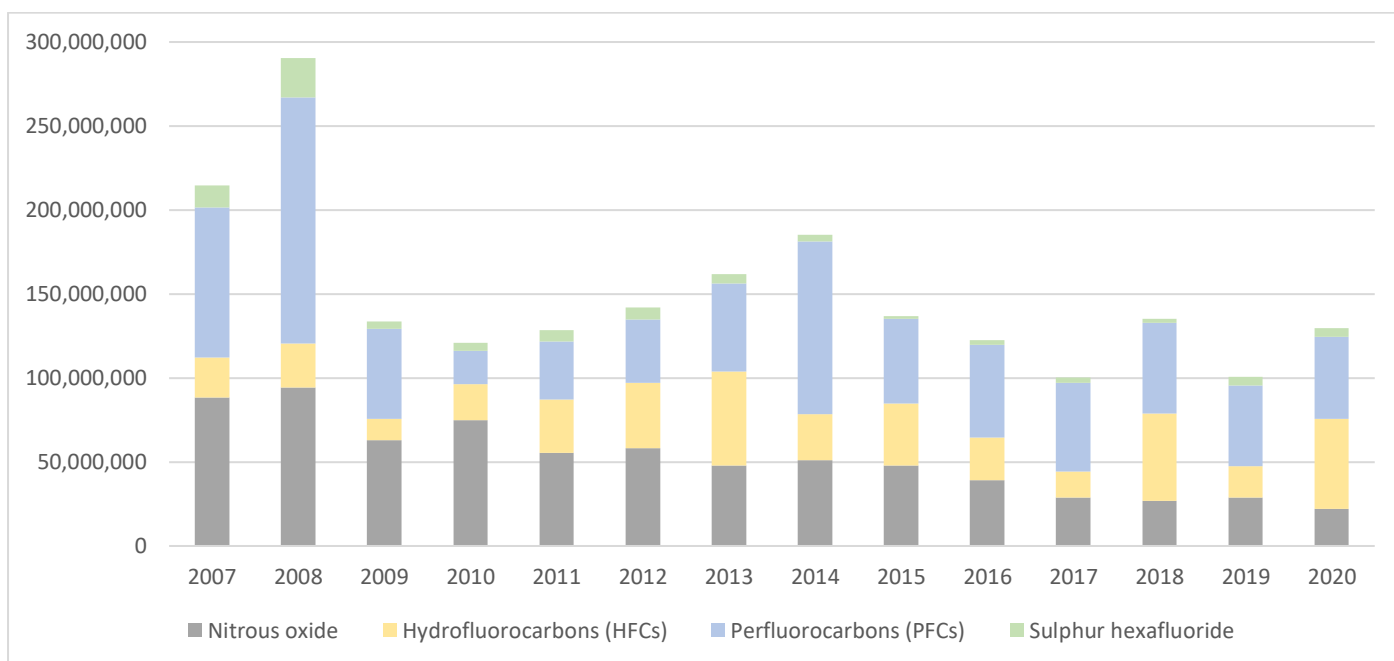


Figure 2: Global warming potential of greenhouse gases reported to SPRI since 2007 (kg CO₂e), excluding carbon dioxide and methane, to show relative scale of minor gases. Note that HFCs and PFCs use worst-case values.



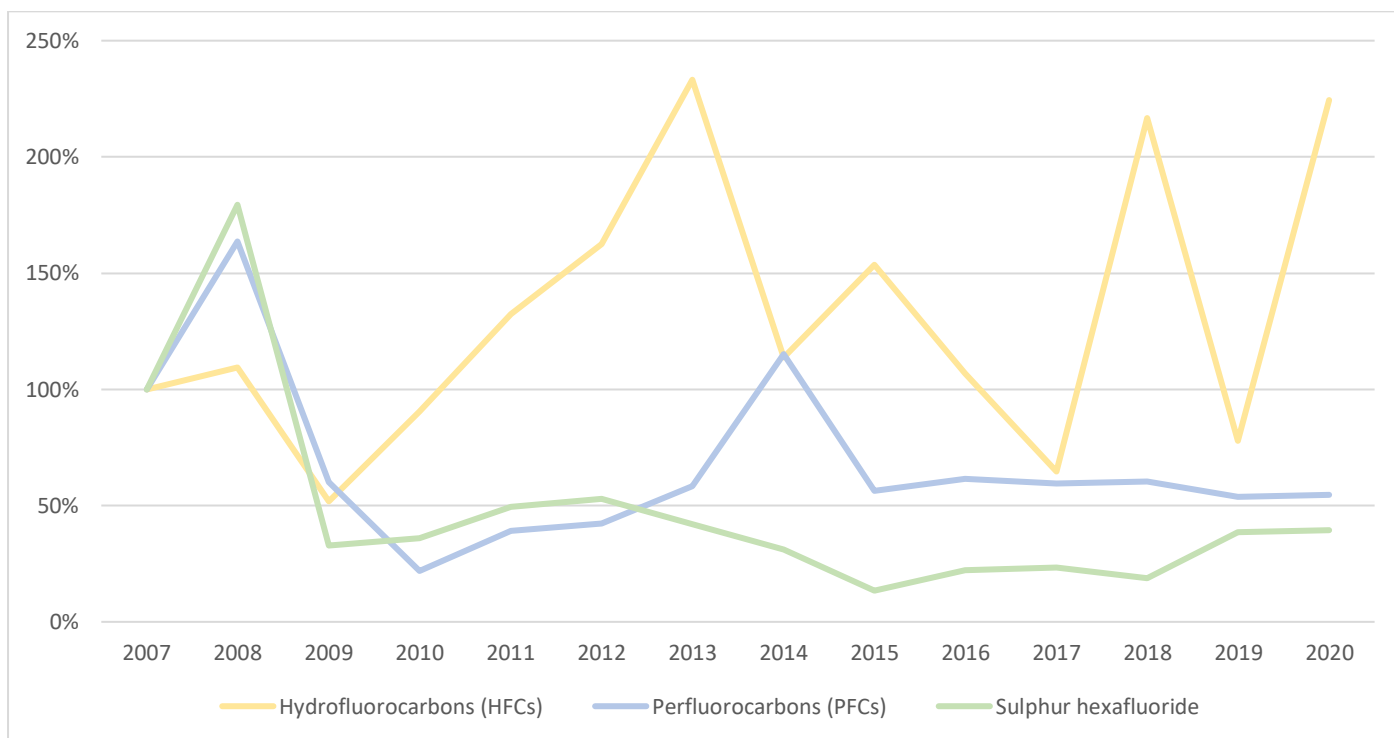
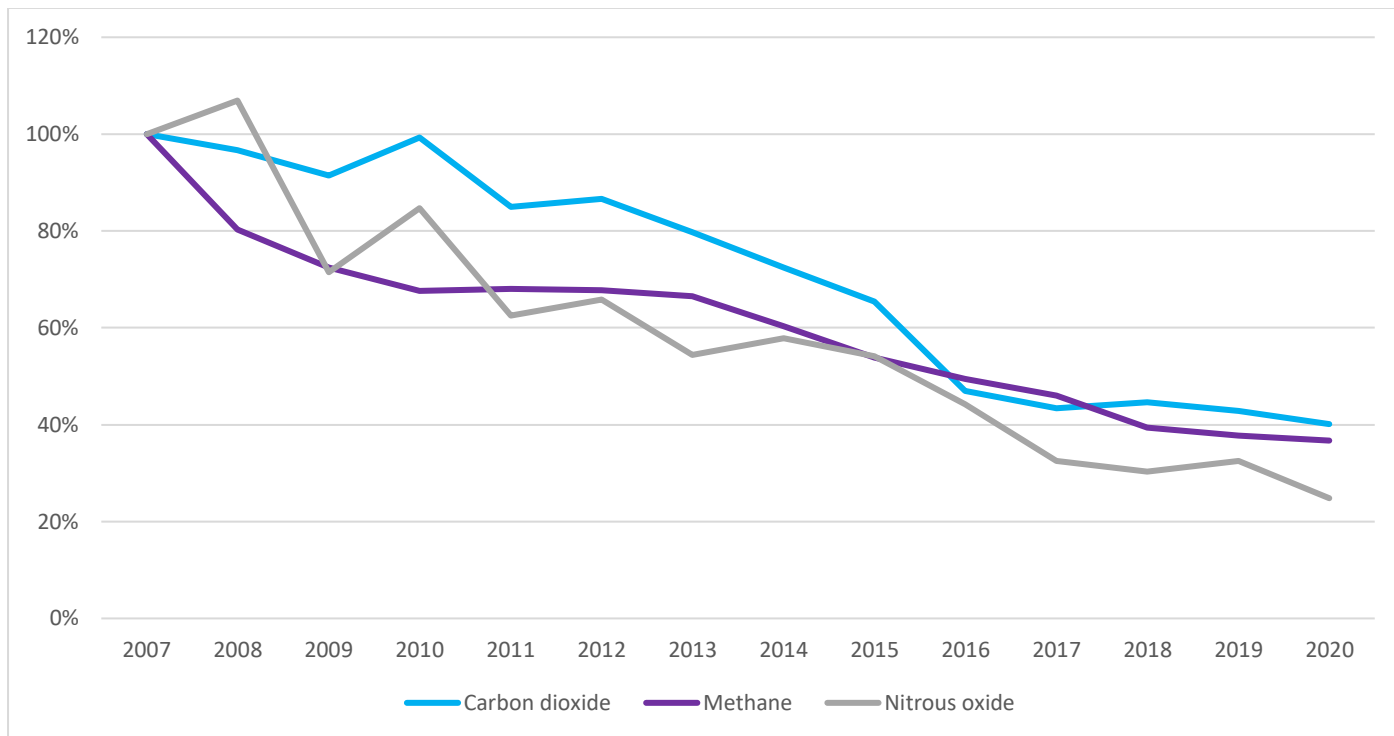
⁵ <https://www.gov.scot/publications/scottish-greenhouse-gas-statistics-1990-2019/>

Long term trends in greenhouse gas emissions

Carbon dioxide, methane and nitrous oxide emissions continue to follow a downward trend, although less pronounced than in the period from 2007 to 2016.

Hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride do not follow this clear downward trend. For hydrofluorocarbons, this is partly because emissions are generally unplanned losses of refrigerant from chiller systems, from a relatively small number of sites. Perfluorocarbons and sulphur hexafluoride are now only reported from four sites in Scotland, and the biggest emissions for both come from one site which tends to be highly consistent between years.

Figures 3 and 4: Annual SPRI Greenhouse gas emissions normalised against 2007 values



Short term variations in greenhouse gas emissions

Figure 5 shows the global warming potential of emissions by industry sector for 2019 and 2020, using the worst-case scenarios for hydrofluorocarbons and perfluorocarbons as described above. For reference, absolute figures for the three F-gases are provided in figure 6.

Figure 5: Global warming potential of greenhouse gases reported to SPRI by industry sector for 2019 and 2020 (kg CO₂e)

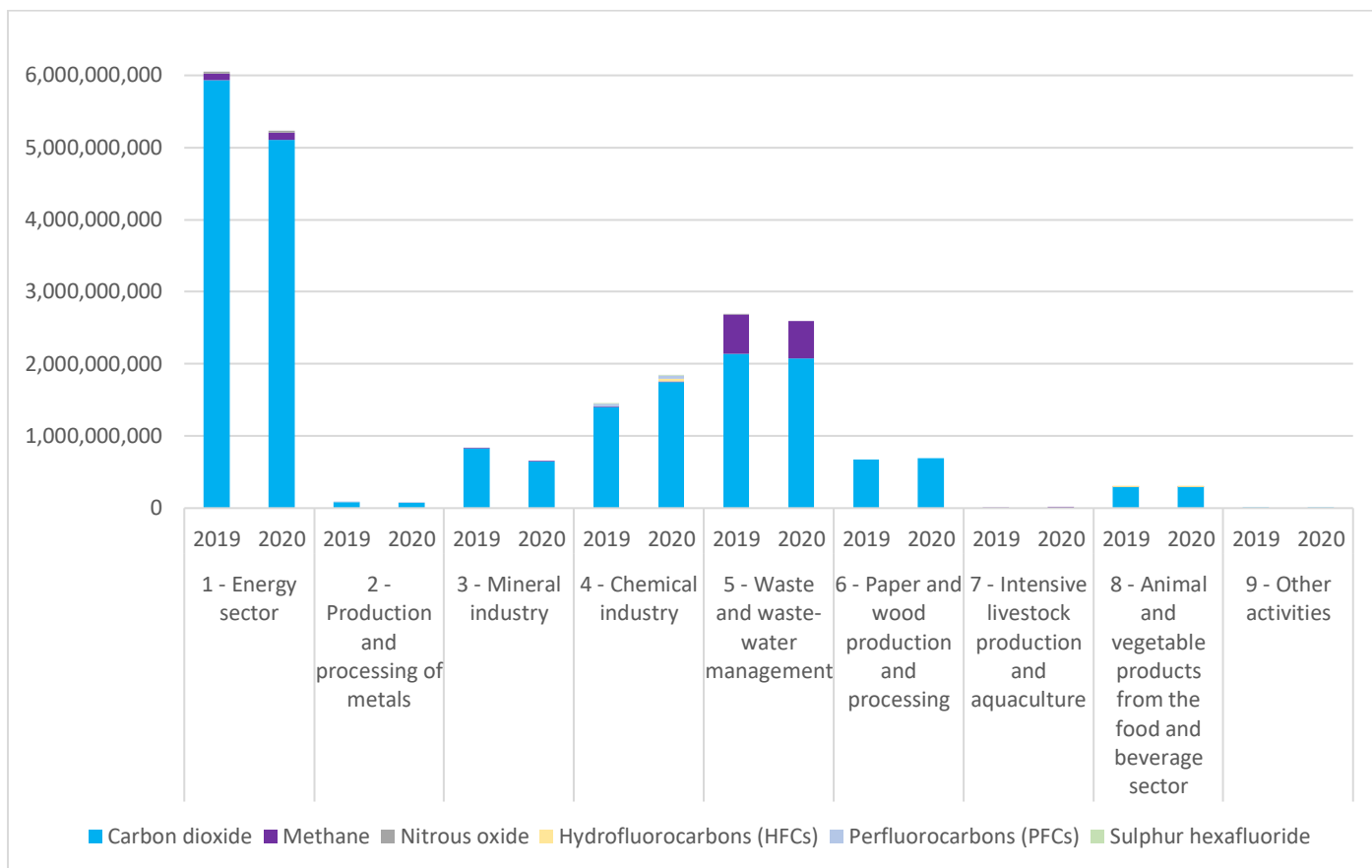
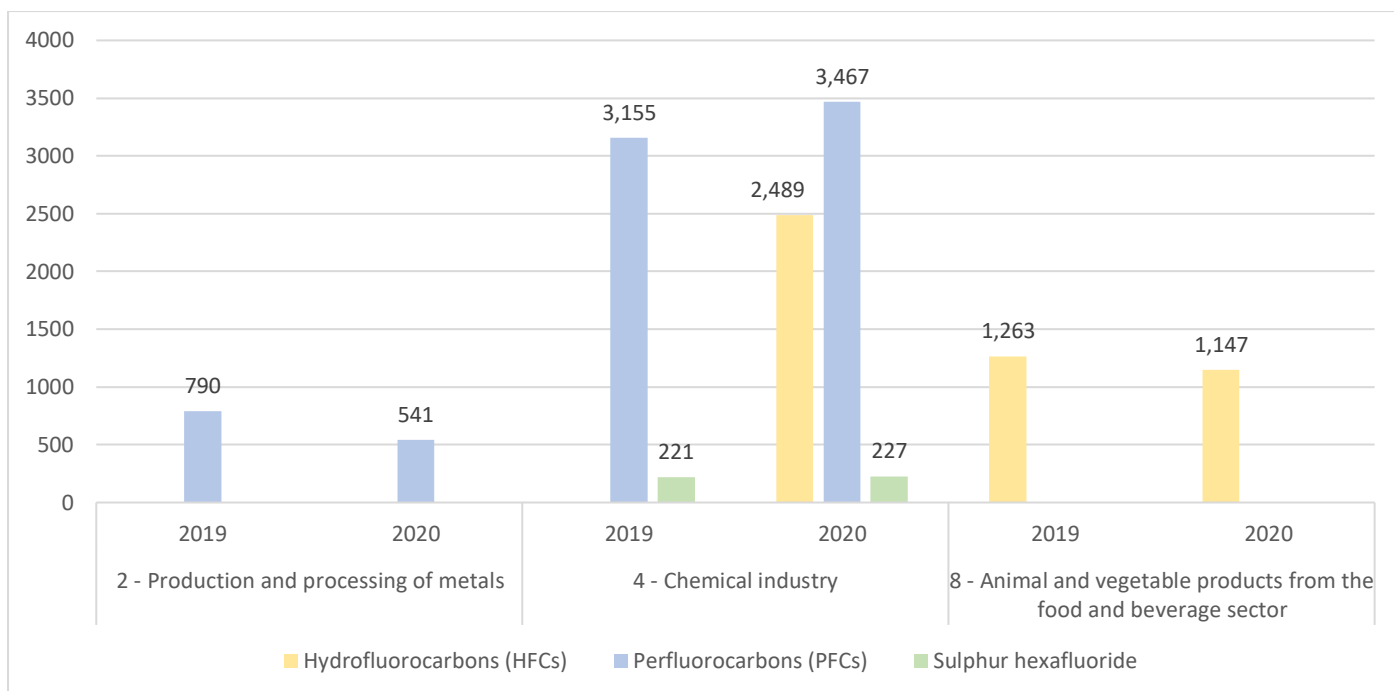


Figure 6: Emissions of F-gases reported to SPRI by industry sector for 2019 and 2020 (kg)



Notes on year to year variation in greenhouse gas emissions

Carbon dioxide	<p>Total releases show a 6% reduction from 2019. This figure hides a large amount of variability: of the top ten sites, three reported increases of more than 10% and four reported decreases of more than 10%.</p> <p>The 4 - <i>Chemical industry</i> sector reported an increase due largely to the two major sites, which account for 88% of the carbon dioxide releases from the sector, reporting lower than usual releases in 2019.</p> <p>The 1 – <i>Energy sector</i> reported a 14% decrease in emissions. Of the nine large sites (over 100,000,000kg release), five reported significant reductions while the remaining four were within 10% of their 2019 value. Each operator cited a different reason for their reduced emissions.</p>
Methane	<p>Total releases have remained largely static between 2019 and 2020, with a 3% reduction from 2019.</p> <p>Emissions from sites reporting under 5(d) Landfills (excluding landfills of inert waste) make up 79% of 2020's total methane emission.</p>
Nitrous oxide	<p>Six sites reported above the threshold in 2019; all of these reported reduced emissions in 2020, and one dropped below the threshold. Most of the year to year variation in total emissions is due to minor fluctuations around the threshold.</p> <p>All sites are in either the Energy sector or are incinerators in the Waste sector.</p>
Hydrofluorocarbons (HFCs)	<p>In 2019, two sites reported emissions above the threshold, compared to five in 2020. This level of variability is expected due to the nature of the releases.</p>
Perfluorocarbons(PFCs)	<p>The same three sites reported in 2019 and 2020</p>
Sulphur hexafluoride	<p>The same two sites reported in 2019 and 2020</p>

1.4 SPRI reporting data

SPRI sites by Activity code

The SPRI activity code reflects the activity or activities permitted to take place on a site as specified in the site authorisation. The codes allow Scottish sites to be compared to European sites by providing a common system of categorising industrial activities. The codes are largely the same as those listed in the European Pollutant Release and Transfer Register Regulation⁶.

Note that when we refer to “Industry sectors” we mean the top-level Activity code (e.g. Industry sector 1 is Energy).

Table 6: Number of sites required to report to SPRI in 2020 under each Activity code (including sub-codes)

Code	Activity	Capacity Threshold	Operator submits return	Waste system transfer
1	Energy sector			47
1(a)	Mineral oil and gas refineries	*	15	
1(b)	Installations for gasification and liquefaction	*	2	
1(c)	Thermal power stations and other combustion installations	With a heat input of 50 megawatts (MW)	30	
2	Production and processing of metals			17
2(c).i	Hot-rolling mills	With a capacity of 20 tonnes of crude steel per hour	1	
2(c).ii	Smitheries with hammers	With an energy of 50 kilojoules per hammer, where the calorific power used exceeds 20 MW	1	
2(d)	Ferrous metal foundries	With a production capacity of 20 tonnes per day	1	
2(e).i	For the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes	*	2	
2(e).ii	For the smelting, including the alloying, of non-ferrous metals, including recovered products (refining, foundry casting, etc.)	With a melting capacity of 4 tonnes per day for lead and cadmium or 20 tonnes per day for all other metals	2	
2(f)	Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process	Where the volume of the treatment vats equals 30m ³	10	
3	Mineral industry			26
3(a)	Underground mining and related operations	*	1	
3(b)	Opencast mining	Where the surface of the area being mined equals 25 hectares	20	
3(c).i	Cement clinker in rotary kilns	With a production capacity of 500 tonnes per day	1	
3(e)	Installations for the manufacture of glass, including glass fibre	With a melting capacity of 20 tonnes per day	3	
3(g)	Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain	With a production capacity of 75 tonnes per day, or with a kiln capacity of 4m ³ and with a setting density per kiln of 300 kg/m ³	1	
4	Chemical industry			37
4(a)	Chemical installations for the production on an industrial scale of basic organic chemicals, such as:	*	1	
4(a).i	Simple hydrocarbons (linear or cyclic, saturated or unsaturated, aliphatic or aromatic)	*	5	

⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32006R0166&from=EN#d1e32-12-1>

Code	Activity	Capacity Threshold	Operator submits return	Waste system transfer
4(a).ii	Oxygen-containing hydrocarbons such as alcohols, aldehydes, ketones, carboxylic acids, esters, acetates, ethers, peroxides, epoxy resins	*	3	
4(a).ix	Synthetic rubbers	*	1	
4(a).viii	Basic plastic materials (polymers, synthetic fibres and cellulose-based fibres)	*	1	
4(a).x	Dyes and pigments	*	1	
4(b).i	Gases, such as ammonia, chlorine or hydrogen chloride, fluorine or hydrogen fluoride, carbon oxides, sulphur compounds, nitrogen oxides, hydrogen, sulphur dioxide, carbonyl chloride	*	6	
4(b).ii	Acids, such as chromic acid, hydrofluoric acid, phosphoric acid, nitric acid, hydrochloric acid, sulphuric acid, oleum, sulphurous acids	*	2	
4(b).iv	Salts, such as ammonium chloride, potassium chlorate, potassium carbonate, sodium carbonate, perborate, silver nitrate	*	2	
4(b).v	Non-metals, metal oxides or other inorganic compounds such as calcium carbide, silicon, silicon carbide	*	6	
4(d)	Chemical installations for the production on an industrial scale of basic plant health products and of biocides	*	2	
4(e)	Installations using a chemical or biological process for the production on an industrial scale of basic pharmaceutical products	*	6	
4(f)	Installations for the production on an industrial scale of explosives and pyrotechnic products	*	1	
5	Waste and waste-water management		498	
5(a)	Installations for the recovery or disposal of hazardous waste.	Receiving 10 tonnes per day	46	7
5(b)	Installations for the incineration of municipal waste	With a capacity of 3 tonnes per hour	15	
5(c)	Installations for the disposal of non-hazardous waste	With a capacity of 50 tonnes per day	16	255
5(d)	Landfills (excluding landfills of inert waste)	Receiving 10 tonnes per day or with a total capacity of 25,000 tonnes	76	
5(e)	Installations for the disposal or recycling of animal carcasses and animal waste	With a treatment capacity of 10 tonnes per day	9	
5(f).i	Municipal waste-water treatment plants	With a capacity below 100,000 population equivalent	59	
5(f).ii	Municipal waste-water treatment plants	With a capacity of 100,000 population equivalent	14	
5(g)	Independently operated industrial waste-water treatment plants which serve one or more activities of this list	With a capacity of 10,000m ³ per day	1	
6	Paper and wood production and processing		36	
6(a)	Industrial plants for the production of pulp from timber or similar fibrous materials	*	1	
6(b)	Industrial plants for the production of paper and board and other primary wood products (such as chipboard, fibreboard and plywood)	With a production capacity of 20 tonnes per day	9	
6(c)	Industrial plants for the preservation of wood and wood products with chemicals	With a production capacity of 50m ³ per day	26	
7	Intensive livestock production and aquaculture		489	
7(a).i	Installations for the intensive rearing of poultry	With 40,000 places for poultry	97	

Code	Activity	Capacity Threshold	Operator submits return	Waste system transfer
7(a).ii	Installations for the intensive rearing of pigs	With 2,000 places for production pigs (over 30 kg)	15	
7(a).iii	Installations for the intensive rearing of pigs	With 750 places for sows	2	
7(b).i	Intensive aquaculture	Not exceeding 1,000 tonnes of fish and shellfish per year	162	
7(b).ii	Intensive aquaculture	With 1,000 tonnes of fish and shellfish per year	213	
8	Animal and vegetable products from the food and beverage sector		57	
8(a)	Slaughterhouses	With a carcass production capacity of 50 tonnes per day	18	
8(b).i	(i) Animal raw materials (other than milk)	With a finished product production capacity of 75 tonnes per day	14	
8(b).ii	(ii) Vegetable raw materials	With a finished product production capacity of 300 tonnes per day (average value on a quarterly basis)	20	
8(c)	Treatment and processing of milk	With a capacity to receive 200 tonnes of milk or more per day (average value on an annual basis)	5	
9	Other activities		21	
9(a)	Plants for the pre-treatment (operations such as washing, bleaching, mercerization) or dyeing of fibres or textiles	With a treatment capacity of 10 tonnes per day	2	
9(b)	Plants for the tanning of hides and skins	With a treatment capacity of 12 tonnes of finished product per day	3	
9(c)	Installations for the surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating	With a consumption capacity of 150 kg per hour or 200 tonnes per year	13	
9(e)	Installations for the building of, and painting or removal of paint from ships	With a capacity for ships 100m long	3	
10	Radioactive Substances sites		70	
10(a)	All nuclear installations (including plants undergoing decommissioning) and all non-nuclear installations holding authorisation for air, water and waste water releases: Radioactive substances activity – nuclear		5	
10(b)	All nuclear installations (including plants undergoing decommissioning) and all non-nuclear installations holding authorisation for air, water and waste water releases: Radioactive substances activity – non- nuclear		65	
Total sites required to report to SPRI in 2020			1298	

As the table shows, a set of sites which have an activity of waste handling (under industry *sector 5 - Waste and waste-water management*) have SPRI data taken from their Waste Licensed Site Return data submission. These sites do not release pollutants, so the data is only for waste, and is provided as a condition of their permit.

Excluding these waste sites, 22 sites have not yet submitted SPRI returns for 2020. All are non-operational and the majority are either in administration or abandoned. We would not expect any to release pollutants from processes, but disused waste sites may potentially still have emissions, although not at a level which would significantly affect pollutant totals for 2020.

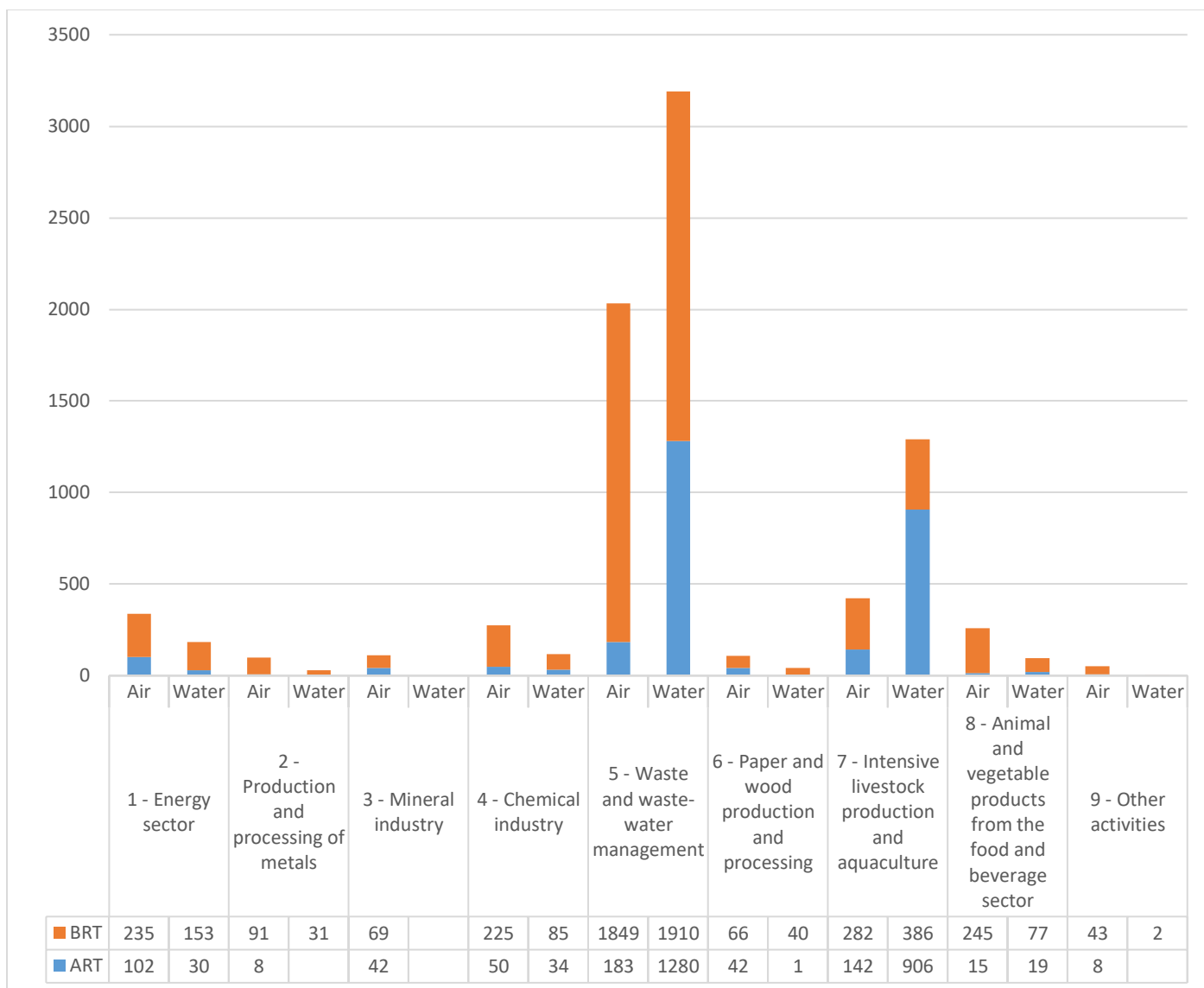
Pollutants reported by Activity code

As noted above, the quantitative figures provided in this statistical release include only those reports of pollutants at levels above reporting thresholds (ART). SPRI also requires all sites to report where they do emit a pollutant but at a level below reporting thresholds (BRT), and there may be substantial numbers of these unquantified minor releases.

The graph shows the total number of individual pollutant releases reported by each industry sector, identified as either ART or BRT. For example, Energy sector sites reported 337 individual emissions to air, of which 102 were ART. (Tables 2 and 4 show more detail on the numbers of sites reporting each pollutant at ART).

A full breakdown by pollutant is included in the accompanying datasheet.

Figure 7: Number of individually-reported pollutants emitted to air and water at above and below reporting thresholds in each industry area for 2020



2. About this Experimental Statistic

Experimental statistics are a subset of newly developed or innovative official statistics that are undergoing evaluation. They are published in order to involve users and stakeholders at an early stage in assessing their suitability and quality.

2.1 Scope of this statistical release

We have focussed on the emissions of pollutants to the environment and on off-site waste transfers from non-waste sites, as these are the areas where SEPA receives the most enquiries, and where SPRI provides data which is both significant and unavailable elsewhere. We have not included data on the areas below but all are available on Scotland's Environment Web:

- radioactive substances
- releases to waste water
- off-site waste transfers from waste sector sites

2.2 User statement

SPRI provides the Scottish part of the UK Pollutant Release and Transfer Register (PRTR). The UK is a Party to the UN Kiev Protocol on Pollutant Release and Transfer Registers⁷ which aims 'to enhance public access to information through the establishment of coherent, nationwide PRTRs'. The Protocol requires Parties to provide information on pollution sources to members of the public.

SPRI data are also used to fulfil various other reporting requirements and obligations including those of the UK National Atmospheric Emissions Inventory (NAEI)⁸, and the UK Greenhouse Gas Inventory, which fulfills the UN Kyoto Framework Convention on Climate Change (UNFCCC)⁹. Other obligatory uses are the OSPAR Convention¹⁰ and Scotland's Marine Atlas¹¹.

The data are also used by central government, researchers and the general public.

2.3 Feedback

We welcome feedback on this publication and the data from all users including information on how and why the data are used. This helps us to understand the value of the statistics to external users. Please see our contact details at the bottom of the first page of this notice.

⁷ <https://unece.org/env/pp/protocol-on-prtrs-introduction>

⁸ <https://naei.beis.gov.uk/>

⁹ <https://unfccc.int/process-and-meetings/the-convention/what-is-the-united-nations-framework-convention-on-climate-change>

¹⁰ <https://www.ospar.org/>

¹¹ <http://marine.gov.scot/data-source-types/scotlands-marine-atlas>

2.4 Revisions

SEPA will provide information about any revisions made to published information in this statistics release and the associated datasets. Revisions could occur for various reasons, including when data from third parties is unavailable or provisional at the time of publishing or if there are subsequent methodological improvements or refinements. Requests for revisions may be made by SEPA or by Operators.

Note that revisions to individual returns may occur throughout the year. The revision process requires similar Quality Assurance checks to those carried out on annual data submissions and the return may be unavailable during this period.

Data available on Scotland's Environment Web¹² updates annually and will include all significant revisions to previous years. Where necessary, PRTR data revisions will be resupplied to Defra to allow the UK-PRTR to be updated.

Table 7: Revisions to historic SPRI pollutant emission data since last publication (all values are kg)

Site name	Dataset year	Pollutant	Medium	Mass (kg)	
				original	updated
Addistone Poultry Farm, Earlston	2019	Ammonia	Air	10,120	5,735
Bennadrove L/F Site, Marybank, Isle of Lewis	2019	Chlorofluorocarbons (CFCs)	Air	BRT	1.02
Bennadrove L/F Site, Marybank, Isle of Lewis	2019	Hydrochlorofluorocarbons (HCFCs)	Air	25.5	27.6
Bennadrove L/F Site, Marybank, Isle of Lewis	2019	Methane	Air	602,000	624,000
Bennadrove L/F Site, Marybank, Isle of Lewis	2019	Methyl chloroform	Air	27.2	26.2
Dalderse (Falkirk) WwTW	2019	Methane	Air	25,000	36,000
EPR Scotland Ltd Westfield Biomass Plant Fife	2019	Carbon dioxide	Air	85,993,000	107,647,000
Galashiels WwTW	2018	Carbon dioxide	Air	N/A	BRT
Galashiels WwTW	2018	Methane	Air	32,000	BRT
Gartbreck Landfill Site, Bowmore, Islay	2019	Methane	Air	57,400	64,400
Hatton PFI WwTW	2019	Methane	Air	14,000	16,000
INEOS FPS Ltd, Kinneil Terminal, Grangemouth	2019	Carbon dioxide	Air	345,238,133	360,818,515
Newbridge PFI WwTW	2019	Iron	Water	BRT	1,731
Nigg PFI WwTW	2019	Carbon dioxide	Air	BRT	13,000,000
Nigg PFI WwTW	2019	Methane	Air	15,000	20,000
PX Limited, St Fergus Gas Terminal, Aberdeen	2019	Methane	Air	223,015	93,781
PX Limited, St Fergus Gas Terminal, Aberdeen	2019	Non-methane volatile organic compounds (NMVOCs)	Air	32,760	20,295
Rosyth Dockyard, Dunfermiline	2019	Non-methane volatile organic compounds (NMVOCs)	Air	12,485	BRT
Seafeld PFI (Edinburgh) WwTW	2019	Carbon dioxide	Air	27,000,000	39,000,000
Seafeld PFI (Edinburgh) WwTW	2019	Methane	Air	41,000	61,000
Stirling WwTW	2019	Methane	Air	BRT	26,000
Sullom Voe Terminal, Refinery	2019	Methane	Air	177,526	173,218

¹² <https://informatics.sepa.org.uk/SPRI/>

Table 8: Revisions to historic SPRI waste data since last publication

Site name	Dataset year	Waste type	Recovery or disposal	Mass (tonnes)	
				original	new
TWMA - Dales Ind Est, Peterhead	2019	Hazardous	Recovery	0.01	3,431
TWMA - Dales Ind Est, Peterhead	2019	Hazardous	Disposal	3,138	15
TWMA - Dales Ind Est, Peterhead	2019	Non Hazardous	Recovery	73	312
TWMA - Dales Ind Est, Peterhead	2019	Non Hazardous	Disposal	14,316	15,851
West Carron Landfill, Stenhouse Rd, Falkirk	2019	Non Hazardous	Disposal	2,434	7,237

2.5 Release

The release of this publication is in line with practices specified in the Code of Practice for Official Statistics. The statistics are released at the standard time of 9.30 am on a preannounced weekday date. Pre-release access to the statistics in their final form is provided to Scottish Ministers and those on a list of named officials advising them five working days before the public release. This is to ensure that at the time of release Scottish Ministers are able to comment publicly on the statistics based on a correct understanding of them.

3. About the Scottish Pollutant Release Inventory

3.1 What is the Scottish Pollutant Release Inventory?

The SPRI is a Pollutant Release and Transfer Register (PRTR) and has the primary purpose of making publicly available officially reported annual releases of specified pollutants to air and water from SEPA-regulated industrial facilities. It also provides information on off-site transfers of waste and waste-water from these facilities.

The SPRI data is collected, quality assured and made public under the requirements of Freedom of Information and can be compared with PRTR information from other countries. SPRI datasets from 2002 to the present year (except 2003) are available and reported annually.

A full list of the pollutants whose emissions must be reported can be found on the SPRI Schedule¹³, which is updated annually. SPRI pollutants are substances considered to be environmentally significant and of interest to the public.

3.2 Who reports?

Operators of sites carrying out specific activities (67 activities covering 10 major sectors) above defined capacity thresholds are obliged to report to SPRI on an annual basis. The activities and their thresholds are largely determined by European reporting requirements but some activity thresholds have been lowered so more Scottish sites are included.

Below is a brief summary of the SPRI activities and thresholds:

- Most Part A processes defined in the Pollution Prevention and Control (Scotland) Regulations 2012 (as amended), together with any directly associated activities. These are the bigger industrial activities covering the energy, mineral, metal, chemical, waste management, food and drink, paper and pulp and intensive agricultural sectors;
- Municipal sewage treatment works with a design population equivalent of >15,000 population equivalent (where population equivalent has the meaning given in the Urban Waste Water Treatment (Scotland) Regulations (UWWTR);
- All industrial wastewater treatment plants with a capacity to treat at least 10,000 m³/d (cubic metres per day);
- All marine-caged fish farms (no capacity limit);
- All opencast mining and quarrying sites where the surface area of the area effectively under extractive operation equals 25 hectares and above and includes all underground mining;
- All sites having a waste management licence (WML) with a capacity to accept at least 50 tonnes/day for the disposal of non-hazardous waste and sites with a capacity of receiving 10 tonnes/day for the recovery and disposal of hazardous waste
- All nuclear installations (including plants undergoing decommissioning) and all non-nuclear installations holding authorisation for air, water and waste water releases.

Most sites which are required to report to SPRI will have been notified by SEPA by either a Pollution Prevention and Control (PPC) Regulation 63(2) Notice or a notification letter. Sites with only Waste Management Licences (WML) report their off-site waste transfers quarterly to SEPA, and are notified that SEPA will use this data to fulfil their reporting obligations.

¹³ <https://www.sepa.org.uk/media/594098/spri-schedule-2021.pdf>

Sites which have not operated and have no emissions must still submit a return while they retain an active authorisation or permit. Reports must be submitted annually for the previous calendar year; for most sites by February 28th each year.

3.3 SEPA's role

We collect and quality assure (QA) the SPRI data, and then make it publicly available.

SPRI data remains the operator's and it is their legal responsibility to supply accurate information. Our QA process is there to check that the data is complete, coherent and credible. In outline:

- We carry out data checks using historic data from the site and similar sites.
- Where data is flagged in our checking process, we may ask the operator to confirm their figures and provide more detail on the reasons for any variations. We also ask Site Officers to cross reference against other available data and to use their knowledge of the site to assess whether information is credible.
- We carry out a set of cross checks against other SEPA data sources – for example the Emissions Trading System data on carbon dioxide emissions. We check that accidental releases have been notified to SEPA where appropriate.
- The overall data for each industry sector is reviewed by colleagues who have substantial knowledge of the sites and the processes they use, to help us understand each individual return's place in the sector.
- Once data has been through QA, we will submit the required sub-set to Defra, who will use it in the UK-PRTR. Defra will carry out further checks and inform us of any issues they identify.
- Sub-sets of SPRI data are used to fulfil national and international reporting obligations (e.g. UK National Atmospheric Emissions Inventory), and these will often have their own quality assurance processes which provide us with feedback.

Note that we do not use SPRI data to assess regulatory compliance.

3.4 Information to consider when using SPRI data and technical notes

Regulatory and environmental impact

SPRI data can be used to broadly compare facilities or sectors and it provides a general overview of the total amounts of pollutants released or waste transferred. However, direct, detailed comparisons between sites are only possible where significant further information is available about all of the processes carried out on site; even where this is possible, few sites have direct equivalents.

SPRI data cannot provide assessments of the regulatory compliance of the facilities or the health or environmental impact of their releases. Compliance information can be found on SEPA's website¹⁴.

Annual mass emissions alone are not necessarily directly related to concentrations being emitted at any particular time and cannot be used to directly predict the resulting concentrations in the environment. High annual mass emissions are often due to the large size of the industrial process, where relatively low concentrations are released in very large flows of air or water. The efficiency of the site's industrial abatement and treatment processes will have a significant impact on emissions. These are guided by relevant UK legislation and Scottish Regulations.

Annual mass releases are not directly comparable with air or water quality standards. Reporting thresholds for each pollutant are set based on characteristics of the pollutant (its toxicity, transport and persistence in the environment) to indicate what mass emission may give rise to 'significant' environmental concentrations.

¹⁴ <https://www.sepa.org.uk/regulations/authorisations-and-permits/compliance-assessment-scheme/>

Technical notes on data:

Annual variability

Caution should be used when comparing one year's data to the previous year's, particularly on a site by site basis. Substantial year to year variability is expected within some sections of the SPRI data, and we allow for this in our QA process.

For example, within the industry sector 7 – Intensive livestock production and agriculture we would expect emissions from poultry farms to be some of the most consistent in SPRI, because operators will tend to stock to similar levels across the whole year, every year. Marine fish farms, on the other hand, have clearly defined production cycles which include fallow periods, so emissions are expected to vary accordingly.

Many sites will base their emission values on spot testing which has happened at different points throughout the year and again, in some industry sectors we can expect these to be quite variable.

Methods

There are three broad ways operators can produce their SPRI figures: measuring, calculating or estimating. Guidance on the SPRI webpage explains where and when each should be used in detail, but we expect the operator to use the best available data and method to produce their figure. In many cases this will be to use the methodologies described under their SEPA authorisations. In some cases it may be modelled (e.g. many of the pollutants from landfills and waste water treatment works), or we ask the operator to use an emission factor (e.g. poultry farmers' ammonia emissions). The best available methods therefore have a wide range of both precisions and accuracies, and this should be kept in mind when data is used.

Figures reported

Related to the point about methods; we formally ask operators to supply data to three significant figures but, as noted in Section one, they normally provide much more than this. We do not receive information on confidence intervals; be aware that a figure which provides high precision may have lower accuracy.

Note that:

- All non-radioactive pollutants are reported in kilograms (kg)
- All radioactive pollutants are reported in megabecquerel (MBq)
- Off-site waste transfers are reported in metric tonnes (t)

We may display data using different units for ease of use. Commonly, carbon dioxide and overall greenhouse gas emissions are reported in kilotonnes (kt – 1,000,000kg) and megatonnes (Mt – 1,000,000,000kg).

Accidental releases

Figures for accidental releases are included within the main total. It is possible to have a quantified accidental release but for the total emission to be below the reporting threshold (BRT). SPRI has very clear and specific definitions of accidental releases; please see the SPRI webpage for more detail.

United Kingdom Pollutant Release and Transfer Register – UK-PRTR

Most SPRI waste transfer data and a sub-set of pollutant emissions data, covering roughly half of the SPRI sites, is supplied to the UK PRTR and will be published on the UK's PRTR webpage. The datasets have different reporting requirements: the UK-PRTR remains focused on emissions significant at the national and European scale, whereas SPRI is tailored to gather information which is useful from the Scottish national perspective. Around 20% of individual reported rows of SPRI pollutant data is included in the UK-PRTR, but as it covers the largest releasees, it will generally represent around 90% of SPRI's total emission for each pollutant.

Various Scotland-relevant pollutants and industrial sectors are included in the SPRI but not required by the UK-PRTR Regulation; for example the radioactive substances. In addition, Urban Waste Water Treatment Plants and marine fish farms have a lower activity threshold in SPRI, so more of our sites come into reporting requirements. Thresholds for some pollutants are set to less than the UK thresholds.

Full details of the SPRI and UK-PRTR reporting requirements are available on the SPRI website¹⁵ and the UK-PRTR website¹⁶.

¹⁵ <https://www.sepa.org.uk/environment/environmental-data/spri/>

¹⁶ <https://www.gov.uk/guidance/uk-pollutant-release-and-transfer-register-prtr-data-sets#search-the-prtr-database-on-your-chosen-parameters>