

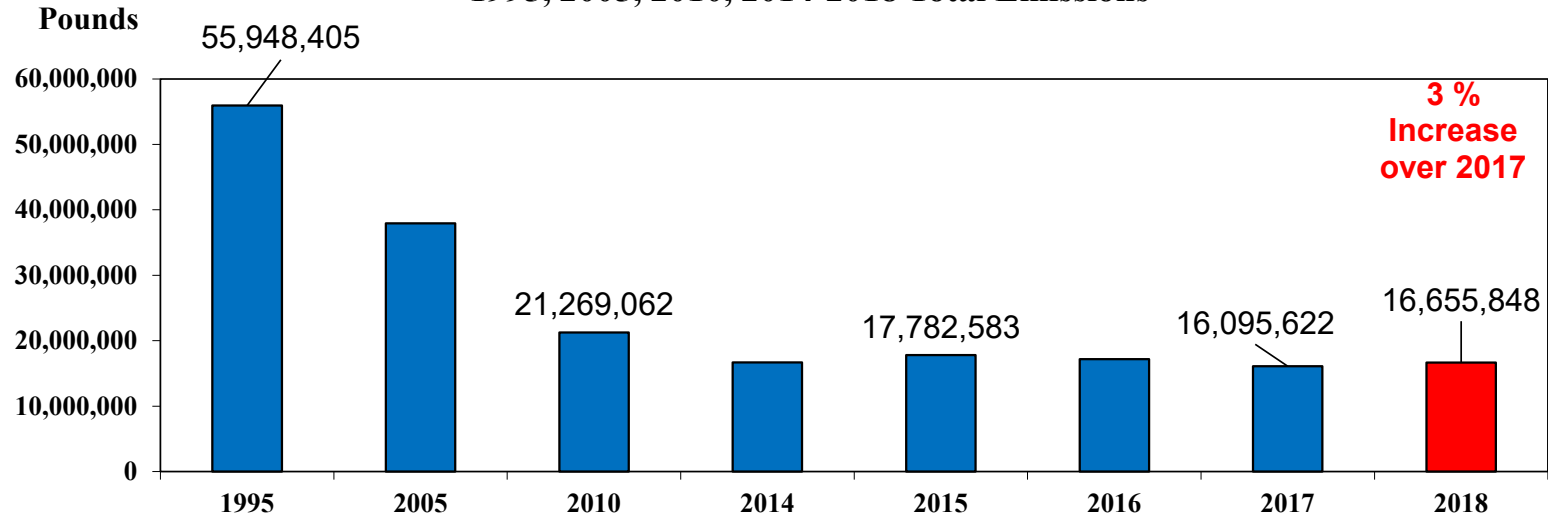
Pasadena CAC
Annual Presentation of TCEQ Emissions Inventory
(EI) & EPA Toxics Release Inventory (TRI)

FINAL 10-26-19

Member Companies, Products Made, Common Uses

Company	Product(s)	Common Uses
Chemicals		
Afton	Fuel additives Lubricant additives	Gasoline for passenger cars oil for passenger cars Motor
Air Products	Gaseous hydrogen	Used in the production of gasoline
Albemarle	Special chemical manufacturing.	Industrial organic chemicals and polymer catalysts.
BASF	DOTP plasticizer 2-Ethylhexanol (2-EH)	Phthalate-free plasticizer production for flexible PVC products such as flooring. 2-EH production used as raw material for Plasticizer Plant.
Chevron Phillips	High density polyethylene (HDPE)	Plastic pipe, merchandise bags, milk jugs, food & beverage containers, household chemical & detergent bottles, pails, drums, pressure pipe, gasoline containers & tanks, and flexible packaging
Enterprise	High purity isobutylene	Goes into tires, cell phone plastics, and lubricants.
Ethyl	Fuel additives	Gasoline for passenger cars Fuel for airplane rotary engines
Evonik (began operating in 2017)	Specialty chemicals supporting polyurethane industry	Foam insulation, memory foam, spray foam insulation, automotive interiors, athletic shoe soles
INEOS Phenol	Cumene	Adhesives, plastics
Oxy Vinyls	Poly Vinyl Chloride (PVC)	PVC pipe, vinyl siding, window and door frames, fences and decks
PCI Nitrogen	Sulfuric acid, ammonium thiosulfate, and ammonium sulfate	Farming
Sekisui	Polyvinyl Alcohol	Coatings, films for packaging, safety glass
Refining		
LyondellBasell Refining	Fuels and lubes	LPG's, gasoline, diesel, kerosene, aviation fuel, lubricants
Pasadena Refining (now Chevron Refinery)	Petroleum Products	Transportation Fuel, Heating Fuel, Petrochemical Feedstocks, Residual Oil, Slurry Oil
Terminals, Treatment		
Enterprise	Terminaling operation	Facilitates rail and truck loading
Gulf Coast Authority	Industrial waste water treatment facility	Clean water
ITC	Liquid storage and transportation.	The facility stores liquid products based on customer needs and demands- primarily petroleum products such as gasoline blendstocks, distillates (ie. Diesel), naptha, etc.
Kinder Morgan Exports Terminal (began operating in 2017)	Storage and distribution operation	Bulk liquid petroleum storage
Kinder Morgan Liquids Terminal	Storage and distribution operation	Bulk storage of various petroleum products

Emissions Inventory 1995, 2005, 2010, 2014-2018 Total Emissions



1995→2018 : 70% Reduction in Emissions Inventory -Total Emissions

Emissions Inventory Total Emissions (pounds per year)									
Company	1995	2005	2010	2014	2015	2016	2017	2018	% Change 1995->2018
LyondellBasell Refinery	23,902,000	11,910,262	4,691,718	4,798,480	5,405,376	6,928,876	6,006,147	5,770,535	-76%
Pasadena Refining (now Chevron Refinery)	8,728,820	9,104,660	8,214,126	5,513,158	6,019,746	4,570,362	4,065,251	5,348,335	-39%
Chevron Phillips	3,830,268	3,203,147	2,311,788	1,846,000	1,899,480	1,730,449	1,941,348	1,740,227	-55%
Kinder Morgan Liquids Terminal	9,022,320	8,325,629	1,645,277	1,702,512	1,687,734	1,796,238	1,822,274	1,336,874	-85% Top "80%"
PCI Nitrogen	3,235,783	1,103,113	1,089,677	687,191	927,405	877,867	644,123	627,423	-81%
Albemarle	3,900,000	1,202,516	496,900	589,486	570,500	418,000	483,000	519,100	-87%
Oxy Vinyls	594,823	681,999	459,527	449,862	326,220	325,405	299,566	302,681	-49%
BASF	877,170	652,760	521,120	380,960	313,160	13,229	152,416	268,871	-69%
INEOS Phenol	485,451	321,240	243,709	227,111	160,961	129,232	138,738	267,904	-45%
Air Products	1,276,520	1,314,234	1,277,544	145,544	108,060	130,975	144,246	136,689	-89%
ITC					67,969	62,430	108,954	126,839	87%
Afton						60,666	62,958	57,631	-5%
Enterprise			115,540	199,737	128,458	52,598	49,136	46,946	-59%
Kinder Morgan Export Terminal							88,460	45,897	-48%
Sekisui		44,526	64,361	85,284	82,599	38,293	46,140	39,433	-41%
Gulf Coast Authority			37,564	7,970	9,408	20,739	35,339	12,447	-67%
Ethyl						6,807	7,527	8,015	18%
Afton-Ethyl prior to 2016	95,250	65,590	100,211	65,809	75,507				
Totals	55,948,405	37,929,676	21,269,062	16,699,104	17,782,583	17,162,167	16,095,622	16,655,848	
Percent Change (since previous year)		4%	-4%	5%	6%	-3%	-6%	3%	
Total Percent Change from 1995 to 2018:									-70%

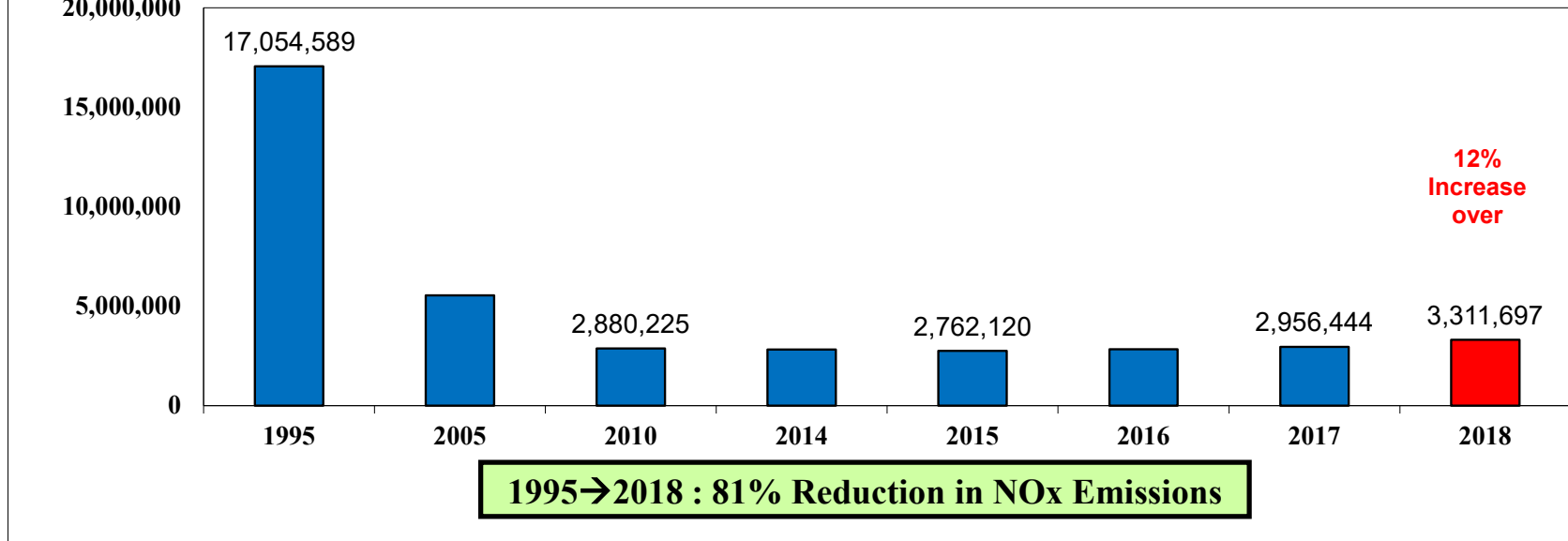
Emissions Inventory Total Emissions:

Changes	Decrease/ Increase in Pounds	% Change from 2017 to 2018
LyondellBasell Refinery	-235,612	-3.9%
Pasadena Refining (now Chevron Refinery)	1,283,084	31.6%
Chevron Phillips	-201,121	-10.4%
Kinder Morgan Liquids Terminal	-485,400	-26.6%
PCI Nitrogen	-16,700	-2.6%
Albemarle	36,100	7.5%
Oxy Vinyls	3,115	1.0%
BASF	116,455	76.4%
INEOS Phenol	129,167	93.1%
Air Products	-7,557	-5.2%
ITC	17,885	16.4%
Afton	-5,327	-8.5%
Enterprise	-2,190	-4.5%
Kinder Morgan Export Terminal	-42,563	-48.1%
Sekisui	-6,707	-14.5%
Gulf Coast Authority	-22,892	-64.8%
Ethyl	488	6.5%

NOTE: Evonik and Ethyl are exempt from EI

NOTE: Starting in 2016 Afton and Ethyl are reporting separately

Oxides of Nitrogen (NOx) 1995, 2005, 2010, 2014-2018 Air Emissions Inventory

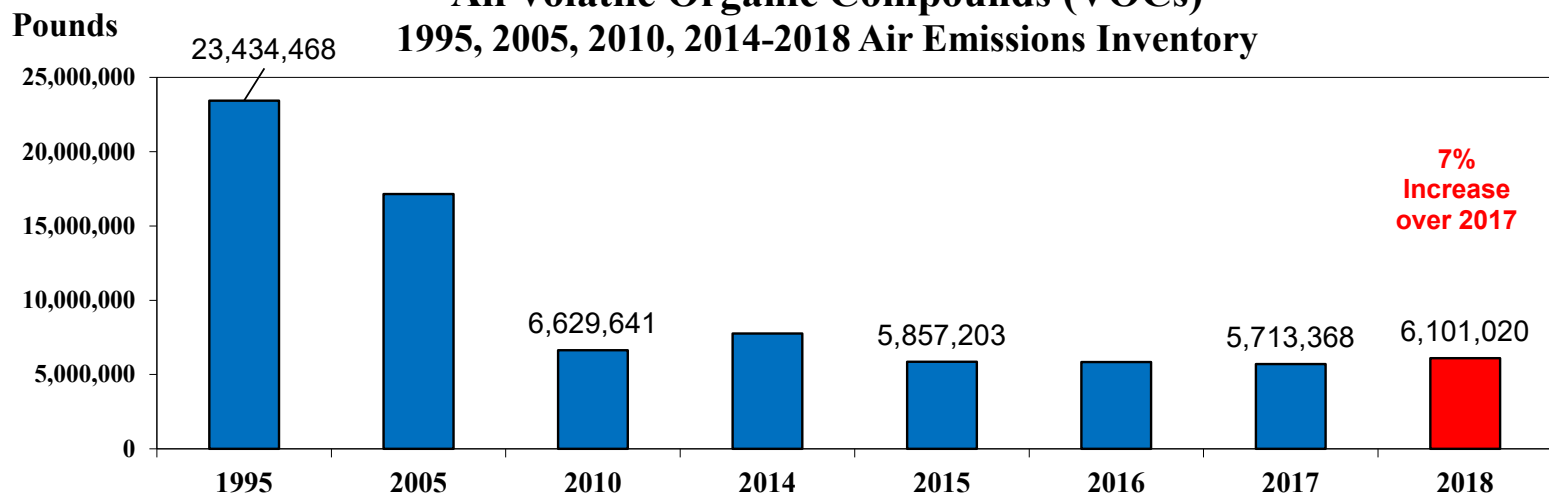


Oxides of Nitrogen (NOx) (pounds per year)									
Company	1995	2005	2010	2014	2015	2016	2017	2018	% Change 1995→2018
LyondellBasell Refinery	12,136,000	3,429,331	1,304,431	1,594,295	1,526,116	1,541,413	1,494,626	1,569,143	-87%
Pasadena Refining (now Chevron Refinery)	2,039,000	1,300,720	962,684	788,137	766,903	876,704	995,445	1,304,426	-36%
Chevron Phillips	1,154,496	88,527	99,751	107,340	118,621	109,920	111,247	107,633	-91%
Oxy Vinyls	108,000	77,172	77,380	72,669	63,967	61,636	59,069	55,946	-48%
Air Products	308,806	141,366	218,024	46,660	35,693	56,519	55,469	52,877	-83%
Albemarle	610,000	310,000	74,000	61,339	55,000	33,200	47,000	46,000	-92%
BASF	373,720	126,740	61,800	52,300	45,440	4,176	31,349	37,109	-90%
Kinder Morgan Liquids Terminal	1,280	616	20,791	36,856	42,320	57,480	49,303	27,446	2044%
PCI Nitrogen	37,842	35,288	32,280	25,800	35,123	36,988	29,693	27,295	-28%
INEOS Phenol	279,099	24,584	20,014	17,553	20,838	17,906	22,601	24,178	-91%
ITC					22,389	15,054	17,728	23,294	4%
Kinder Morgan Export Terminal							13,103	16,450	26%
Sekisui		1,732	940	6,058	19,544	6,938	6,021	8,380	384%
Enterprise			3,080	4,872	4,427	5,644	8,080	5,893	91%
Afton						5,120	5,032	5,120	0%
Ethyl						484	484	446	-8%
Gulf Coast Authority			8	22	31	6,503	10,195	61	663%
Afton-Ethyl Prior to 2016	6,346	6,183	5,042	4,589	5,708				
Totals	17,054,589	5,542,259	2,880,225	2,818,490	2,762,120	2,835,685	2,956,444	3,311,697	
Percent Change (since previous year)		-22%	-25%	9%	-2%	3%	4%	12%	
Total Percent Change from 1995 to 2018:									-81%

Oxides of Nitrogen (NOx): Reasons for Changes ±10%

Changes ± 10%	Decrease/ Increase in Pounds	% Change from 2017 to 2018	Comments
Pasadena Refining (now Chevron Refinery)	308,981	31%	Annual Operating Hours Increased in 2018. [A major maintenance turnaround occurred in 2017, as well as Hurricane Harvey. These events reduced operating rates/hours for multiple process units in the refinery during 2017.]
BASF	5,760	18%	Increase due to plant operating all year
Kinder Morgan Liquids Terminal	-21,857	-44%	NOx emission factor (EF) representations were updated based on the latest Vapor Combustion Unit (VCU) stack test results and engine manufacturer's specifications.
ITC	5,566	31%	Expanded tank farm and terminal throughput with combustion control
Kinder Morgan Export Terminal	3,347	26%	Throughput increase / Updated 2018 EF representations (sustainable)
Sekisui	2,359	39%	Sustainable: Acquired boiler from Air Products on October 1, 2018
Enterprise	-2,187	-27%	No comment provided
Gulf Coast Authority	-10,134	-99%	Temporary- decrease due to operating hours of equipment decreasing from project related work.

All Volatile Organic Compounds (VOCs) 1995, 2005, 2010, 2014-2018 Air Emissions Inventory



1995→2018 : 74% Reduction in All VOC Emissions

All Volatile Organic Compounds (VOCs) (pounds per year)									
Company	1995	2005	2010	2014	2015	2016	2017	2018	% Change 1995->2018
Pasadena Refining (now Chevron Refinery)	2,255,580	1,710,100	1,228,349	1,324,892	1,360,707	1,338,237	1,164,764	1,696,241	-25%
LyondellBasell Refinery	7,662,000	4,062,963	1,598,804	1,709,538	1,700,052	1,814,696	1,683,361	1,585,328	-79%
Kinder Morgan Liquids Terminal	9,010,000	8,306,072	1,508,285	1,627,545	1,161,468	1,288,697	1,177,480	1,258,077	-86%
Chevron Phillips	1,929,440	1,935,165	1,292,253	802,740	853,153	771,588	986,873	846,772	-56%
Albemarle	1,500,000	210,000	180,000	217,212	290,000	220,400	241,000	240,000	-84%
Oxy Vinyls	553,760	460,692	278,087	267,781	167,007	166,892	141,110	139,826	-75%
INEOS Phenol	133,736	250,598	177,500	176,711	102,005	81,399	93,646	97,080	-27%
ITC					14,624	26,170	43,904	45,292	210%
Enterprise			101,380	1,491,909	69,399	52,598	48,960	45,147	-55%
BASF	204,860	110,640	99,680	54,020	47,380	1,672	12,911	39,090	-81%
Afton						36,924	35,673	31,881	-14%
Kinder Morgan Export Terminal							19,607	19,009	-3%
Sekisui		36,699	30,875	20,422	17,641	17,002	18,773	17,956	-51%
Air Products	87,560	13,058	18,892	10,342	17,410	13,400	16,240	14,220	-84%
Gulf Coast Authority			37,323	7,940	9,315	11,762	20,502	12,172	-67%
Ethyl						6,044	6,071	7,111	18%
PCI Nitrogen	2,282	5,123	5,444	2,332	2,877	2,670	2,494	5,818	155%
Afton-Ethyl Prior to 2016	95,250	51,553	72,769	41,220	44,165				
Totals	23,434,468	17,152,663	6,629,641	7,754,604	5,857,203	5,850,151	5,713,368	6,101,020	
Percent Change (since previous year)		9%	-4%	21%	-24%	0%	-2%	7%	
Total Percent Change from 1995 to 2018									-74%

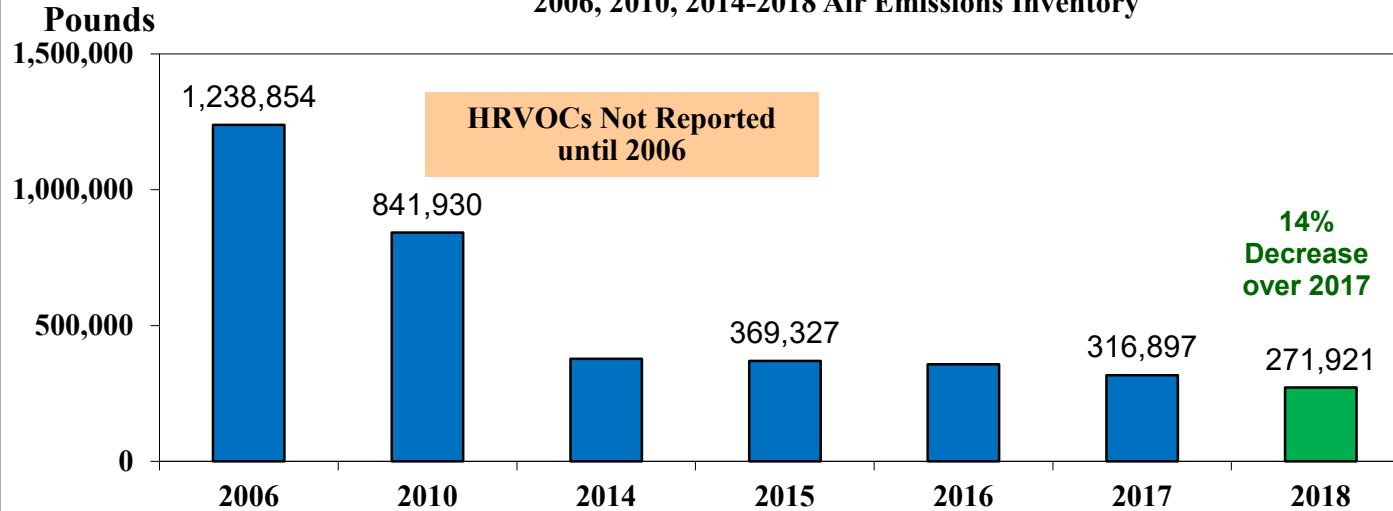
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All Volatile Organic Compounds (VOCs):Reasons for Changes ±10%

Changes ± 10%	Decrease/ Increase in Pounds	% Change from 2017 to 2018	Comments
Pasadena Refining (now Chevron Refinery)	531,477	46%	Increase is primarily from an emission event that occurred in 2018 (temporary); some impact also from increased annual operating hours in 2018
Chevron Phillips	-140,101	-14%	SUSTAINABLE - Expect improved fugitives leak detection and repair performance to continue. Vent control project emission reductions are sustainable.
BASF	26,179	203%	Increase due to plant operating all year
Afton	-3,792	-11%	No comment provided
Air Products	-2,020	-12%	Combination of less production and sale of boiler
Gulf Coast Authority	-8,330	-41%	Temporary- decreased VOCs in waste water from industrial users
Ethyl	1,040	17%	No comment provided
PCI Nitrogen	3,324	133%	2017 numbers low due to a Turnaround and Hurricane Harvey causing a reduction in production

Highly Reactive Volatile Organic Compounds (HRVOCs) (subset of VOCs)

2006, 2010, 2014-2018 Air Emissions Inventory



2006→2018 : 78% Reduction in HRVOC Emissions

Highly Reactive Volatile Organic Compounds (HRVOCs) _(pounds per year)								% Change
Company	2006	2010	2014	2015	2016	2017	2018	2006→2018
Chevron Phillips	682,604	524,815	138,320	100,204	88,999	94,986	88,472	-87%
Pasadena Refining (now Chevron Refinery)	153,455	171,266	112,824	151,822	134,285	121,180	75,475	-51%
LyondellBasell Refinery	151,040	34,515	38,629	50,470	85,575	40,340	47,987	-68%
Albemarle	190,000	55,000	53,314	39,000	31,000	40,000	35,000	-82%
INEOS Phenol	57,097	16,824	2,075	1,797	2,600	7,580	7,940	-86%
Enterprise		25,067	11,120	10,978	8,086	3,880	7,000	21%
BASF	4,360	14,200	19,171	9,241	32	2,377	6,694	54%
Oxy Vinyls	298	243	2,210	5,815	6,448	6,554	3,353	1025%
Totals	1,238,854	841,930	377,663	369,327	357,025	316,897	271,921	
Percent Change (since previous year)		-17%	-2%	-2%	-3%	-11%	-14%	
Total Percent Change from 2006 to 2018								-78%

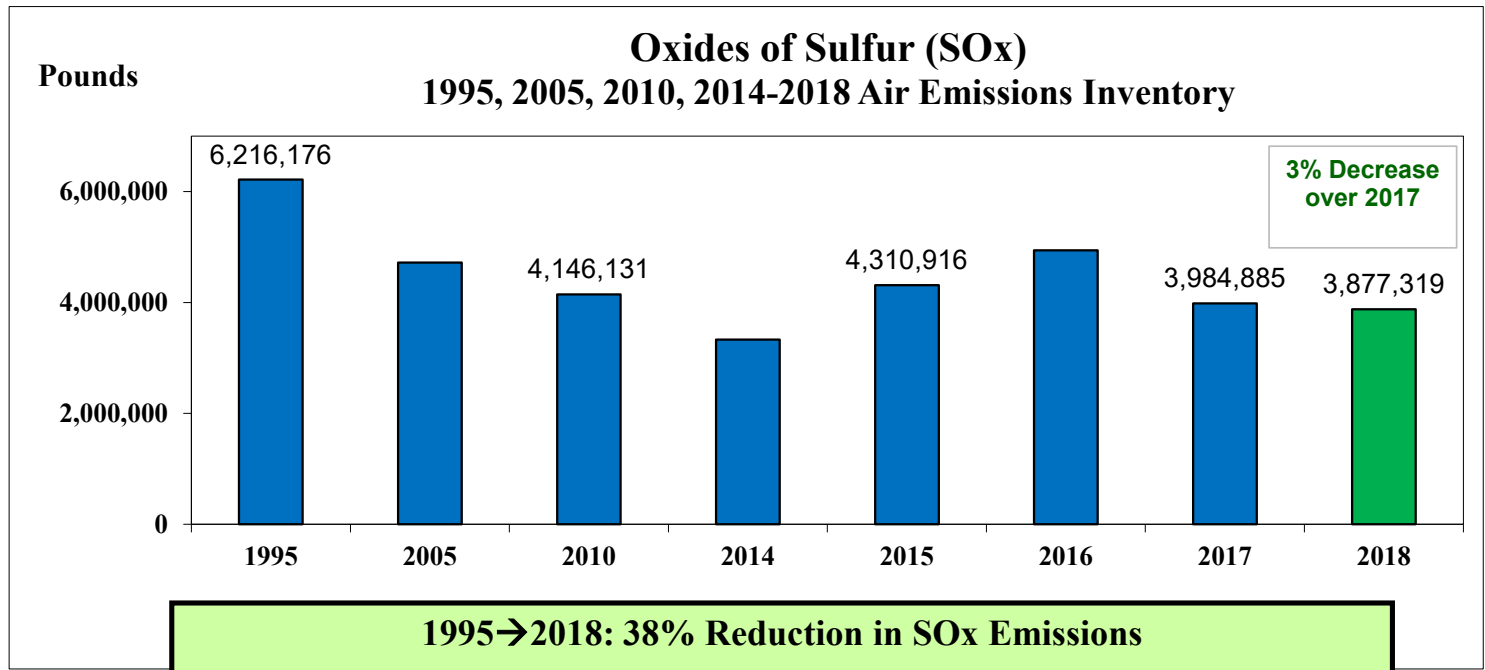
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Not Subject to HRVOC Reporting: Afton, Air Products, Ethyl, Evonik, Gulf Coast Authority, ITC, Kinder Morgan Export Terminal, Kinder Morgan Liquids Terminal, PCI Nitroaen. & Sekisui

Note: Data Transcription Error for Air Products found Sept 2019, values should have been zero. The total values for 2006 and 2010 have changed. Original values were: 2006 (1,250,814) and 2010 (860,822). LyondellBasell Refinery submitted a correction in August 2019 for their 2017 HRVOC data, original value was 39,436.

Highly Reactive Volatile Organic Compounds (HRVOCs):Reasons for Changes ± 10%

Changes ± 10%	Decrease /Increase in Pounds	% Change from 2017 to 2018	Comments
Pasadena Refining (now Chevron Refinery)	-45,705	-38%	Decrease of emission events involving HRVOCs. Fewer HRVOC compounds sent to the flares. Monitoring data showed decrease of fugitive leaks containing HRVOC compounds.
LyondellBasell Refinery	7,647	19%	Normal variation in cooling towers, fugitives, and flares yr-to-yr; made correction to prior year number
Albemarle	-5,000	-13%	Temporary- Variability of demand-
Enterprise	3,120	80%	Plant upset - not sustaining
BASF	4,317	182%	Increase due to plant operating the entire year.
Oxy Vinyls	-3,201	-49%	Reduction in fugitives from recovery refrigeration skid (49% decrease)



Oxides of Sulfur (SOx) (pounds per year)									% Change
Company	1995	2005	2010	2014	2015	2016	2017	2018	1995→2018
LyondellBasell Refinery	1,892,000	1,606,028	671,235	743,775	1,057,159	2,545,563	2,088,569	1,828,392	-3%
Pasadena Refining (now Chevron Refinery)	3,290,160	2,660,400	2,827,556	2,138,706	2,592,240	1,778,822	1,478,675	1,659,136	-50%
PCI Nitrogen	1,021,848	423,579	616,500	443,351	654,540	612,208	411,250	384,345	-62%
Oxy Vinyls	640	1,238	2,697	2,078	1,662	1,554	1,404	1,186	85%
Albemarle	2,800	1,700	1,100	960	1,300	820	1,200	1,000	-64%
BASF	360	2,080	440	320	300	33	379	634	76%
Enterprise			20	490	512	568	640	620	26%
Air Products	4,160	4,060	5,204	490	406	512	558	472	-89%
Sekisui		642	41	18	1,575	776	553	411	-36%
Chevron Phillips	3,260	647	721	321	344	226	268	272	-92%
ITC					90	144	169	220	144%
Kinder Morgan Liquids Terminal			111	251	527	302	172	216	94%
INEOS Phenol	948	19,691	20,446	177	207	173	195	201	-79%
Kinder Morgan Export Terminal							99	105	7%
Afton						48	48	40	-17%
Gulf Coast Authority			1	1	2	430	674	40	6567%
Ethyl						32	32	30	-6%
Afton-Ethyl Prior to 2016	0	53	60	42	52				
Totals	6,216,176	4,720,117	4,146,131	3,330,980	4,310,916	4,942,211	3,984,885	3,877,319	
Percent Change (since previous year)		3%	4%	100%	29%	15%	-19%	-3%	
Total Percent Change from 1995 to 2018:									-38%

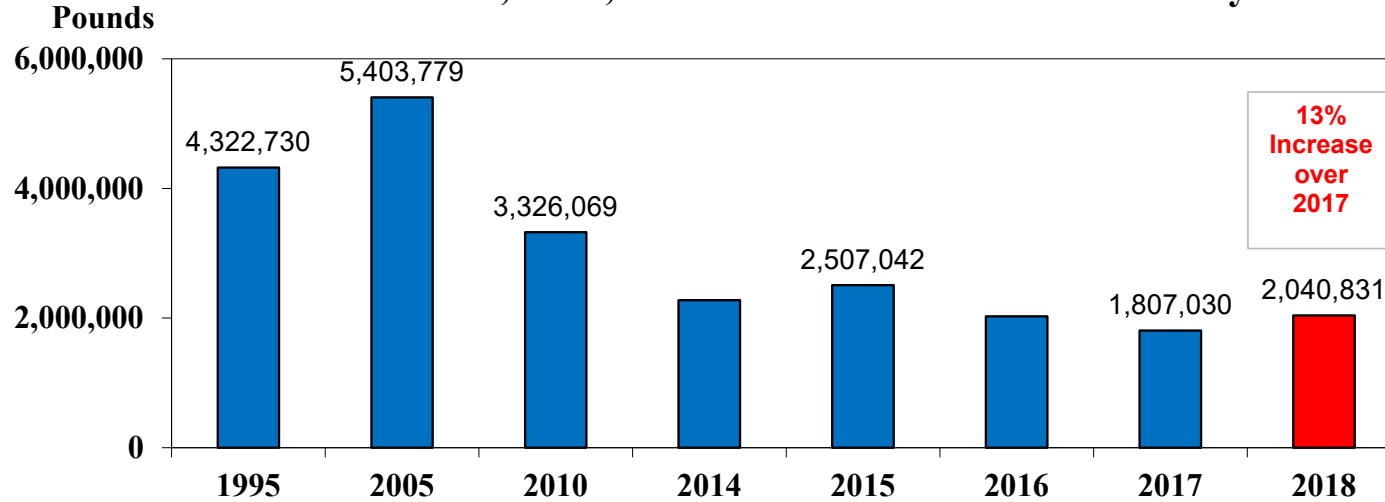
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Note: BASF submitted a correction in August 2019 for their 2017 SOx data, therefore changing their 2017 data from 1,228 to 379.

Oxides of Sulfur (SOx): Reasons for Changes ± 10%

Changes ± 10%	Decrease/ Increase in Pounds	% Change from 2017 to 2018	Comment
LyondellBasell Refinery	-260,178	-12%	Primarily from fewer emissions from upsets
Pasadena Refining (now Chevron Refinery)	180,461	12%	Annual operating hours increased in 2018 Annual operating hours increased in 2018 [A major maintenance turnaround occurred in 2017, as well as Hurricane Harvey. These events reduced operating rates/hours for multiple process units in the refinery during 2017.]
Oxy Vinyls	-218	-16%	Based on continuous monitoring directly from boiler stacks (16% decrease)
Albemarle	-200	-17%	Temporary - Decreased Sandblast Activity
BASF	255	67%	Increase due to plant operating the entire year.
Air Products	-86	-15%	Combination of less production and sale of boiler
Sekisui	-142	-26%	Sustainable: Acquired boiler from Air Products on October 1, 2018
ITC	51	30%	Expanded tank farm and terminal throughput with combustion control
Kinder Morgan Liquids Terminal	44	26%	Addition of two tank VCUs (sustainable)
Afton	-8	-17%	No comment provided
Gulf Coast Authority	-634	-94%	Temporary- decrease due to operating hours of equipment decreasing from project related work.

Carbon Monoxide (CO) 1995, 2005, 2014-2018 Air Emissions Inventory



1995→2018: 53% Reduction in CO Emissions

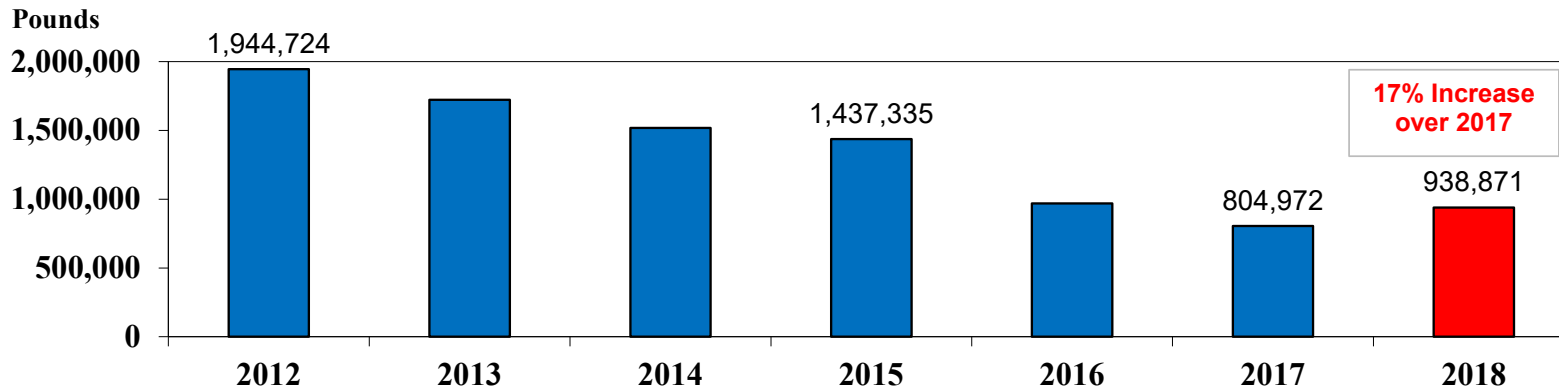
Carbon Monoxide (CO) (pounds per year)									% Change
Company	1995	2005	2010	2014	2015	2016	2017	2018	1995->2018
Chevron Phillips	649,286	611,913	749,119	823,980	894,153	810,701	803,022	758,471	17%
LyondellBasell Refinery	1,586,000	2,450,584	703,750	475,180	747,092	669,753	413,023	420,861	-73%
Pasadena Refining (now Chevron Refinery)	517,320	720,380	509,726	391,952	373,260	300,333	183,803	369,406	-29%
BASF	373,720	395,580	307,340	235,900	188,040	5,089	90,037	173,375	-54%
Albemarle	110,000	280,000	180,000	183,464	120,000	62,000	75,000	95,000	-14%
ITC					29,722	17,958	40,626	54,946	37%
PCI Nitrogen	37,520	42,133	36,889	29,921	40,660	41,749	34,191	32,345	-14%
Air Products	844,380	829,446	722,488	30,656	23,290	24,952	28,130	28,076	-97%
Oxy Vinyls	113,200	42,718	22,657	20,162	15,003	15,424	16,582	23,329	-79%
Kinder Morgan Liquids Terminal	11,040	3,352	64,061	37,020	15,633	17,980	12,547	22,325	102%
Afton						17,770	17,776	19,060	7%
Enterprise			3,800	21,660	23,560	18,117	21,960	18,721	175%
Kinder Morgan Export Terminal							52,758	9,222	-83%
INEOS Phenol	71,668	14,419	12,611	2,614	3,191	12,089	5,235	7,874	-89%
Sekisui		5,453	3,029	5,053	12,189	9,998	10,026	7,593	39%
Gulf Coast Authority			2	5	7	1,410	2,209	131	6450%
Ethyl						104	104	96	-8%
Afton-Ethyl Prior to 2016	8,596	7,801	10,597	17,767	21,242				
Totals	4,322,730	5,403,779	3,326,069	2,275,334	2,507,042	2,025,427	1,807,030	2,040,831	
Percent Change (since previous year)		10%	-14%	-1%	10%	-19%	-11%	13%	
Total Percent Change from 1995 to 2018:									-53%

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Carbon Monoxide (CO):Reasons for Changes ±10%

Changes ± 10%	Decrease/ Increase in Pounds	% Change from 2017 to 2018	Comment
Pasadena Refining (now Chevron Refinery)	185,603	101%	Annual operating hours increased in 2018
BASF	83,338	93%	Increase due to plant operating the entire year.
Albemarle	20,000	27%	Temporary – Variable production
ITC	14,320	35%	Expanded tank farm and terminal throughput with combustion control
Oxy Vinyls	6,747	41%	Based on continuous monitoring directly from boiler stacks (41% increase)
Kinder Morgan Liquids Terminal Enterprise	9,778	78%	CO increase in 2018 was due to change in CO EF representation on multiple VCUs with new stack test data and addition of two tank VCUs. (sustainable)
Enterprise	-3,239	-15%	No comment provided
Kinder Morgan Export Terminal	-43,536	-83%	Natural gas usage of Vapor Combustion Units (VCU) reduced in 2018
INEOS Phenol	2,639	50%	Heater shut downs increased
Sekisui	-2,433	-24%	Acquired boiler from Air Products on October 1, 2018
Gulf Coast Authority	-2,078	-94%	Temporary- decrease due to operating hours of equipment decreasing from project related work.

Total Suspended Particulates (TSP) 2012-2018 Air Emissions Inventory



2012→2018 : 52% Reduction in TSP Emissions

Total Suspended Particulates (TSP) (pounds per year)								% Change
Company	2012	2013	2014	2015	2016	2017	2018	2012->2018
LyondellBasell Refinery	373,114	357,191	346,843	374,956	357,450	334,726	366,812	-2%
Pasadena Refining (now Chevron Refinery)	1,071,952	987,424	729,210	680,600	258,215	135,110	228,499	-79%
PCI Nitrogen	80,098	87,748	110,054	103,670	105,931	95,277	100,992	26%
Oxy Vinyls	71,657	82,245	75,240	73,811	75,617	80,108	72,718	1% Top "80%"
Albemarle	7,700	6,700	7,256	22,000	49,200	51,000	61,000	692%
Air Products	121,940	29,412	36,016	30,372	30,792	41,654	35,302	-71%
Chevron Phillips	134,160	96,973	111,620	48,203	38,239	35,465	27,080	-80%
BASF	25,914	26,033	27,450	25,620	2,225	6,198	18,664	-28%
INEOS Phenol	15,817	11,325	11,265	13,275	11,082	12,038	12,428	-21%
Enterprise	2,897	2,938	30,266	30,286	30,590	4,340	5,432	88%
Kinder Morgan Liquids Terminal	463	2,430	319	754	5,101	3,172	3,074	564%
ITC				1,144	1,818	2,139	2,800	145%
Afton					604	594	1,580	162%
Sekisui	27,028	26,992	28,162	28,838	635	418	1,248	-95%
Kinder Morgan Export Terminal						830	1,057	27%
Ethyl					148	143	141	-5%
Gulf Coast Authority	364	1,422	2	28	634	1,759	43	-88%
Afton-Ethyl Prior to 2016	11,620	4,216	3,659	3,778				
Totals	1,944,724	1,723,049	1,517,362	1,437,335	968,281	804,972	938,871	
Percent Change (since previous year)		-11%	-12%	-5%	-33%	-17%	17%	
Total Percent Change from 2012 to 2018:								-52%

Note: LyondellBasell Refinery submitted a correction in August 2019 for their 2017 TSP data, original value was 326,568.

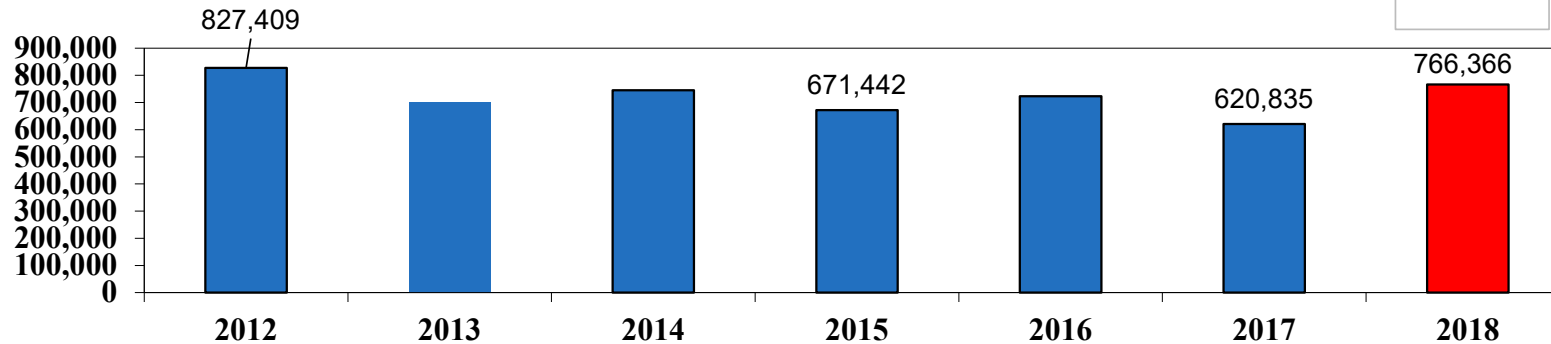
Total Suspended Particulates (TSP):Reasons for Changes ± 10%

Changes ± 10%	Decrease/ Increase in Pounds	% Change from 2017 to 2018	Comment
LyondellBasell Refinery	32,086	10%	FCCU had T/A in 2017; made correction to prior year number
Pasadena Refining (now Chevron Refinery)	93,389	69%	Annual operating hours increased in 2018. [A major maintenance turnaround occurred in 2017, as well as Hurricane Harvey. These events reduced operating rates/hours for multiple process units in the refinery during 2017.]
Albemarle	10,000	20%	Calculation method change- approach suggested by TCEQ
Air Products	-6,352	-15%	Combination of less production and sale of boiler
Chevron Phillips	-8,385	-24%	Temporary- Lower than expected solids content in cooling tower water
BASF	12,466	201%	Increase due to plant operating the entire year
Enterprise	1,092	25%	No comment provided
ITC	661	31%	Expanded tank farm and terminal throughput with combustion control
Afton	986	166%	No comment provided
Sekisui	830	198%	Sustainable: Acquired boiler from Air Products on October 1, 2018
Kinder Morgan Export Terminal	227	27%	Throughput increase (sustainable)
Gulf Coast Authority	-1,716	-98%	Temporary- decrease due to decreased sandblasting activities associated with maintenance projects.

Total Suspended Particulates Reported as PM 2.5 2012-2018 Air Emissions Inventory

**23%
Increase
over 2017**

Pounds



2012→2018: 7% Reduction in PM 2.5 Emissions

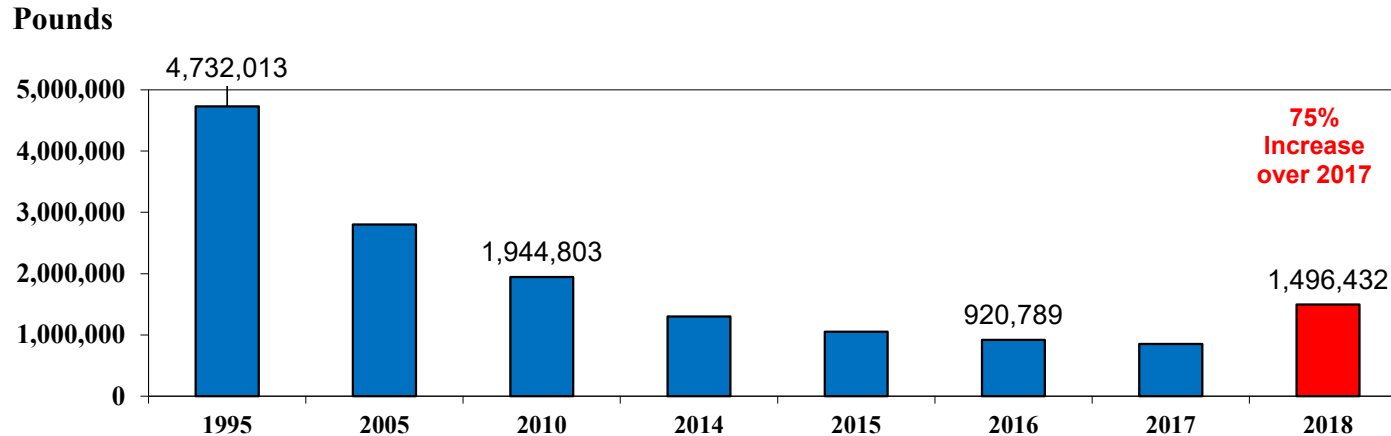
Total Suspended Particulates (TSP) reported as PM 2.5 (pounds per year)								% Change
Company	2012	2013	2014	2015	2016	2017	2018	2012->2018
LyondellBasell Refinery	344,184	341,891	334,502	363,151	345,965	317,530	350,431	2%
Pasadena Refining (now Chevron Refinery)	89,030	94,459	128,773	122,560	212,633	125,241	212,577	139%
Oxy Vinyls	69,300	67,400	66,975	67,653	69,766	74,909	70,164	1%
Air Products	121,940	29,412	36,016	30,372	30,792	41,654	35,302	-71%
Albemarle	40	44	46	1,300	1,000	900	34,000	84900%
PCI Nitrogen	24,660	28,224	26,715	34,232	35,019	28,224	29,407	19%
INEOS Phenol	15,817	11,319	11,240	13,274	11,074	12,034	12,423	-21%
Chevron Phillips	134,160	96,469	111,620	9,291	9,167	9,366	9,419	-93%
BASF	25,914	26,033	27,450	25,620	33	3,012	4,283	-83%
Kinder Morgan Liquids Terminal	308	2,348	319	754	5,101	3,172	3,074	898%
ITC				1,144	1,818	2,139	2,800	145%
Kinder Morgan Export Terminal						830	1,057	27%
Sekisui					3	2	706	23433%
Afton						830	680	-18%
Gulf Coast Authority	179	1,406	2	18	575	848	43	-76%
Ethyl						143	0	-100%
Enterprise	1,434	1,354	1,370	1,390	0	0	0	-100%
Afton-Ethyl Prior to 2016	443	469	564	683				
Totals	827,409	700,828	745,592	671,442	722,946	620,835	766,366	
Percent Change (since previous year)		-15%	6%	-10%	8%	-14%	23%	
Total Percent Change from 2012 to 2018:								-7%

Top "80%"

Total Suspended Particulates Reported as PM 2.5: Reasons for Changes ±10%

Changes ± 10%	Decrease/ Increase in Pounds	% Change from 2017 to 2018	Comment
LyondellBasell Refinery	32,901	10%	FCCU had T/A in 2017
Pasadena Refining (now Chevron Refinery)	87,336	70%	Annual operating hours increased in 2018. [A major maintenance turnaround occurred in 2017, as well as Hurricane Harvey. These events reduced operating rates/hours for multiple process units in the refinery during 2017.]
Air Products	-6,352	-15%	Combination of less production and sale of boiler
Albemarle	33,100	3678%	Updated calculation method
BASF	1,271	42%	Increase due to plant operating the entire year.
TTC	661	31%	Expanded tank farm and terminal throughput with combustion control
Kinder Morgan Export Terminal	227	27%	No comment provided
Sekisui	704	39122%	Sustainable: Acquired boiler from Air Products on October 1, 2018
Afton	-150	-18%	No comment provided
Gulf Coast Authority	-805	-95%	Temporary- decrease due to decreased sandblasting activities associated with maintenance projects.
Ethyl	-143	-100%	No comment provided

TRI Total Air Emissions 1995, 2005, 2010, 2014-2018



1995→2018 : 68% Reduction in TRI Total Air Emissions

TRI Total Air Emissions (pounds per year)									% Change
Company	1995	2005	2010	2014	2015	2016	2017	2018	1995->2018
Pasadena Refining (now Chevron Refinery)	531,821	177,192	504,265	318,690	363,734	239,831	116,029	630,417	19%
LyondellBasell Refinery	1,394,178	596,275	167,562	213,033	202,415	254,158	236,263	250,030	-82%
INEOS Phenol	82,789	127,224	99,150	127,764	58,566	47,579	58,603	172,668	109%
Chevron Phillips	1,139,354	1,108,974	546,394	147,954	150,878	141,114	170,048	134,602	-88%
Albemarle	427,200	113,000	95,000	156,295	98,600	60,000	89,000	123,000	-71%
PCI Nitrogen	144,301	124,908	130,525	70,022	65,150	76,372	68,132	73,916	-49%
Oxy Vinyls	594,823	243,939	174,582	182,251	70,639	62,146	53,199	52,879	-91%
Sekisui		31,083	29,300	43,358	18,121	16,707	27,793	19,271	-38%
BASF	94,000	40,600	3,809	3,430	2,706	5	3,530	14,420	-85%
Air Products	303,400	232,556	188,804	21,980	15,508	12,370	20,447	13,989	-95%
Afton						5,078	4,225	5,386	6%
Evonik							4,215	4,215	0%
Ethyl						960	1,228	1,136	18%
Enterprise			99	11,426	3,092	4,469	504	504	407%
Afton-Ethyl Prior to 2016	20,147	8,370	5,312	4,389	4,652				
Totals	4,732,013	2,804,121	1,944,803	1,300,592	1,054,061	920,789	853,216	1,496,432	
Percent Change (since previous year)		-7%	-2%	29%	-19%	-13%	-7%	75%	
Total Percent Change from 1995 to 2018									-68%

Top 80 %

Not subject to TRI Reporting: Gulf Coast Authority, ITC, Kinder Morgan Export Terminal and Kinder Morgan Liquids Terminals.

Note: 2017 Changes: (was 838,216). LyondellBasell Refinery submitted a correction in August 2019 for their 2017 fugitive and point data, therefore changing their 2017 total from 221,263 to 236,263.

Total TRI Air Releases: Changes ±10%

Changes ±10%	Decrease/ Increase in Pounds	% Change from 2017 to 2018	Comment
Pasadena Refining (now Chevron Refinery)	514,388	443%	Fugitive: LDAR monitoring data showed decrease of fugitive leaks containing TRI Compounds (sustainable) Point Source/Stack: Increase is primarily from an emission event that occurred in 2018 (temporary); Annual operating hours also increased in 2018 [A major maintenance turnaround occurred in 2017, as well as Hurricane Harvey. These events reduced operating rates/hours for multiple process units in the refinery during 2017.]
INEOS Phenol	114,065	195%	Point Source/Stack: Heavy rain event, coupled with a leaking valve, led to a significant amount of water on top of the tanks' floating roofs. The rain water overcame the floating roofs and resulted in product on top of the roofs.
Chevron Phillips	-35,447	-21%	Fugitive: SUSTAINABLE - Decrease caused by lower leak rates sustainable process improvements , eliminating unit upsets and additional repairs made during a planned unit turnaround. Point Source/Stack: SUSTAINABLE - Installation of control device reduced emissions.
Albemarle	34,000	38%	Fugitive and Point Source/Stack: Calculation Method Improved
Sekisui	-8,522	-31%	Fugitive: Sustainable: Reportable Quantity emission events in 2017 led to higher fugitive emissions. Point Source/Stack: Sustainable: turnaround during 2017 meant less production, acquired boiler from Air Products on October 1, 2018
BASF	10,890	308%	Fugitive and Point Source/Stack: Increase due to plant operating the entire year.
Air Products	-6,458	-32%	Fugitive and Point Source/Stack: As of Oct 2018, Air Products no longer owns and operates a boiler which contributed emissions in the past.
Afton	1,161	27%	Fugitive and Point Source/Stack: Updates to emissions calculations, physical properties of raw materials and product composition