

Pasadena CAC  
Annual Presentation of TCEQ Emissions Inventory  
(EI) & EPA Toxics Release Inventory (TRI)  
FINAL 10.28.2022

# HANDOUTS

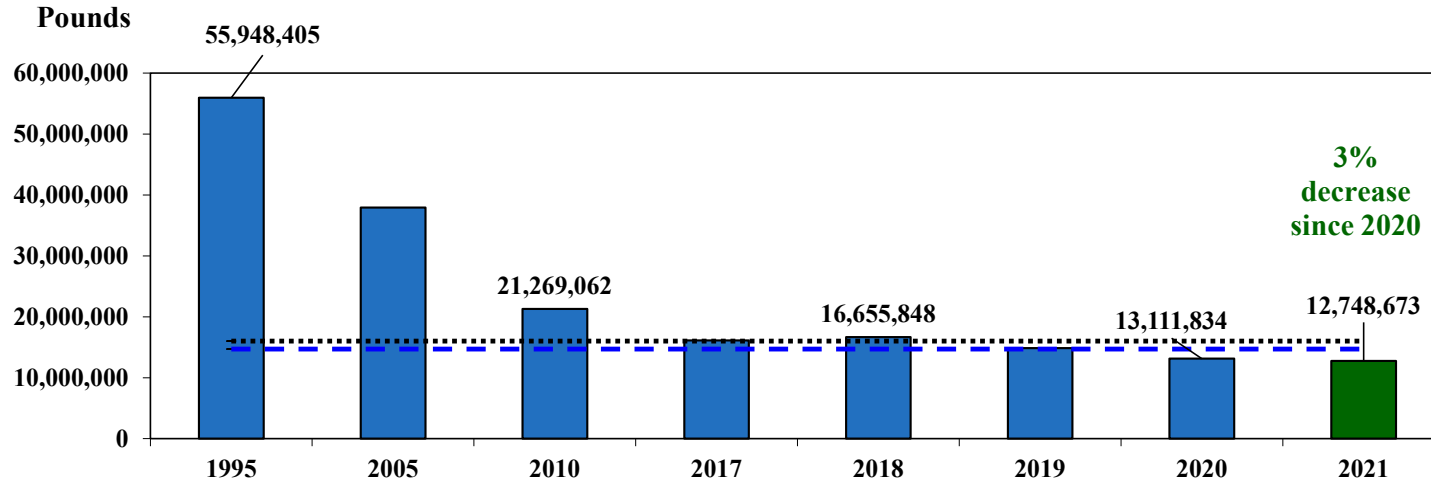
## Member Companies, Products Made, Common Uses

Company	Product(s)	Common Uses
<b>Chemicals</b>		
Afton	Fuel additives Lubricant additives	Gasoline for passenger cars Motor oil for passenger cars
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 Lubricant additives	Gasoline for passenger cars Motor oil for passenger cars
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) resin	PVC pipe, vinyl siding, window and door frames, fences and decks
PCI Nitrogen (resigned from PCAC in 2022)	Sulfuric acid, ammonium thiosulfate, and ammonium sulfate	Farming
Sekisui	Polyvinyl Alcohol	Coatings, films for packaging, safety glass
<b>Refining</b>		
Chevron Refinery	Petroleum Products	Transportation Fuel, Heating Fuel, Petrochemical Feedstocks, Residual Oil, Slurry Oil
LyondellBasell Refining	Fuels and lubes	LPG's, gasoline, diesel, kerosene, aviation fuel, lubricants
<b>Terminals, Treatment</b>		
Enterprise	Terminaling operation	Facilitates rail and truck loading
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
Gulf Coast Authority	Industrial waste water treatment facility	Clean water

## TCEQ Emissions Inventory

### 1995, 2005, 2010, 2017-2021 Total Emissions

Black dots = 10 year average. Blue dashes = 5 year average.



**1995→2021 : 77% Reduction in Emissions Inventory -Total Emissions**

Emissions Inventory Total Emissions									% Change
(pounds per year)									
Company	1995	2005	2010	2017	2018	2019	2020	2021	1995->2021
LyondellBasell Refinery	23,902,000	11,910,262	4,691,718	6,006,147	5,770,535	5,996,830	4,781,647	5,243,995	-78%
Chevron Refinery	8,728,820	9,104,660	8,214,126	4,065,251	5,348,335	3,422,106	2,897,410	2,544,632	-71%
Chevron Phillips	3,830,268	3,203,147	2,311,788	1,941,348	1,740,227	1,764,697	1,764,038	1,720,315	-55%
Kinder Morgan Liquids Terminal	9,022,320	8,325,629	1,645,277	1,822,274	1,336,874	1,442,017	1,553,784	1,558,669	-83% <span style="font-size: small;">Top "80%"</span>
Albemarle	3,900,000	1,202,516	496,900	483,000	519,100	456,000	381,900	389,700	-90%
BASF	877,170	652,760	521,120	152,416	268,871	185,907	147,005	287,301	-67%
OxyVinyls	594,823	681,999	459,527	299,566	302,681	316,513	306,620	286,383	-52%
ITC				108,954	126,839	166,927	197,553	182,982	169%
INEOS Phenol	485,451	321,240	243,709	138,738	267,904	156,175	156,938	152,389	-69%
Sekisui		44,526	64,361	46,140	39,433	97,940	109,179	118,907	77%
Air Products	1,276,520	1,314,234	1,277,544	144,246	136,689	117,842	77,855	89,822	-95%
Afton				62,958	57,631	61,874	61,874	63,213	4%
Enterprise Products			115,540	49,136	46,946	48,258	58,554	53,994	-53%
Kinder Morgan Export Terminal				88,460	45,897	40,933	25,197	28,715	-68%
Gulf Coast Authority			37,564	35,339	12,447	14,748	20,370	27,656	-26%
Ethyl				7,527	8,015	8,015	3,347	NR	NR
PCI Nitrogen	3,235,783	1,103,113	1,089,677	644,123	627,423	573,235	568,563		
Afton-Ethyl prior to 2016	95,250	65,590	100,211						
<b>Totals</b>	<b>55,948,405</b>	<b>37,929,676</b>	<b>21,269,062</b>	<b>16,095,622</b>	<b>16,655,848</b>	<b>14,870,017</b>	<b>13,111,834</b>	<b>12,748,673</b>	
<b>Percent Change (since previous year)</b>		<b>4%</b>	<b>-4%</b>	<b>-6%</b>	<b>3%</b>	<b>-11%</b>	<b>-12%</b>	<b>-3%</b>	
<b>Total Percent Change from 1995 to 2021:</b>									<b>-77%</b>
<b>Total Percent Change from 2017-2021:</b>									<b>-21%</b>

## Emissions Inventory Total Emissions: Changes in the last year

Company	Decrease/ Increase in Pounds	% Change from 2020 to 2021
LyondellBasell Refinery	462,348	9.7%
Chevron Refinery	-352,778	-12.2%
Chevron Phillips	-43,723	-2.5%
Kinder Morgan Liquids Terminal	4,885	0.3%
Albemarle	7,800	2.0%
BASF	140,296	95.4%
OxyVinyls	-20,237	-6.6%
ITC	-14,571	-7.4%
INEOS Phenol	-4,549	-2.9%
Sekisui	9,728	8.9%
Air Products	11,967	15.4%
Afton	1,339	2.2%
Enterprise Products	-4,560	-7.8%
Kinder Morgan Export Terminal	3,518	14.0%
Gulf Coast Authority	7,286	35.8%
Ethyl	NR	NR

NOTE: Ethyl did not submit data for RY 2021 (NR)

NOTE: PCI Nitrogen is no longer in PCAC

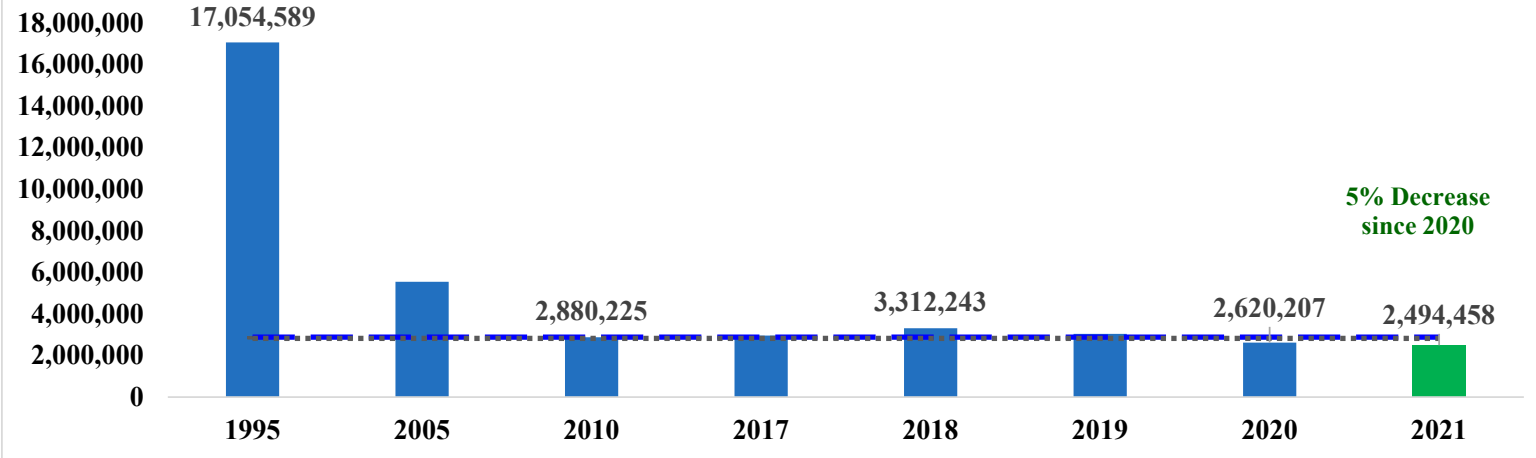
NOTE: Evonik is exempt from EI

NOTE: Starting in 2016 Afton and Ethyl are reporting separately

## Nitrogen Oxides (NOx)

### 1995, 2005, 2010, 2017-2021 TCEQ Air Emissions Inventory

Black dots = 10 year average. Blue dashes = 5 year average.



**1995→2021: 85% Reduction in NOx Emissions**

Nitrogen Oxides (NOx) (pounds per year)									% Change
Company	1995	2005	2010	2017	2018	2019	2020	2021	1995->2021
LyondellBasell Refinery	12,136,000	3,429,331	1,304,431	1,494,626	1,569,143	1,607,218	1,451,886	1,462,303	-88%
Chevron Refinery	2,039,000	1,300,720	962,684	995,445	1,304,426	980,525	735,769	658,737	-68%
Chevron Phillips	1,154,496	88,527	99,751	111,247	107,633	108,321	107,604	102,325	-91%
OxyVinyls	108,000	77,172	77,380	59,069	55,946	64,574	64,127	56,016	-48%
Air Products	308,806	141,366	218,024	55,469	52,877	35,439	32,467	35,084	-89%
Albemarle	610,000	310,000	74,000	47,000	46,000	35,060	34,000	34,000	-94%
ITC				17,728	23,294	30,260	31,120	28,543	27%
Kinder Morgan Liquids Terminal	1,280	616	20,791	49,303	27,446	29,960	21,698	28,078	2094%
BASF	373,720	126,740	61,800	31,349	37,109	25,916	18,745	25,761	-93%
INEOS Phenol	279,099	24,584	20,014	22,601	24,178	27,242	26,458	25,245	-91%
Sekisui		1,732	940	6,021	8,380	42,099	48,242	22,781	1215%
Enterprise Products			3,080	8,080	5,893	4,337	8,975	8,153	165%
Afton				5,032	5,120	6,225	6,051	5,995	17%
Kinder Morgan Export Terminal				13,103	16,450	4,887	1,395	1,211	-91%
Gulf Coast Authority			8	10,195	607	206	49	226	2725%
Ethyl				484	446	446	483	NR	NR
PCI Nitrogen	37,842	35,288	32,280	29,693	27,295	34,974	31,138		
Afton-Ethyl Prior to 2016	6,346	6,183	5,042						
<b>Totals</b>	<b>17,054,589</b>	<b>5,542,259</b>	<b>2,880,225</b>	<b>2,956,444</b>	<b>3,312,243</b>	<b>3,037,689</b>	<b>2,620,207</b>	<b>2,494,458</b>	
<b>Percent Change (since previous year)</b>		<b>-22%</b>	<b>-25%</b>	<b>4%</b>	<b>12%</b>	<b>-8%</b>	<b>-14%</b>	<b>-5%</b>	
<b>Total Percent Change from 1995 to 2021:</b>									<b>-85%</b>
<b>Total Percent Change from 2017-2021:</b>									<b>-16%</b>

Top "80%"

**Note:** August 2021: Albemarle submitted a correction for 2019 value; initial value was 40,000.

**NOTE:** GCA Submitted a correction of a typo in the 2018 NOx value, the value should have been 607 not 61.

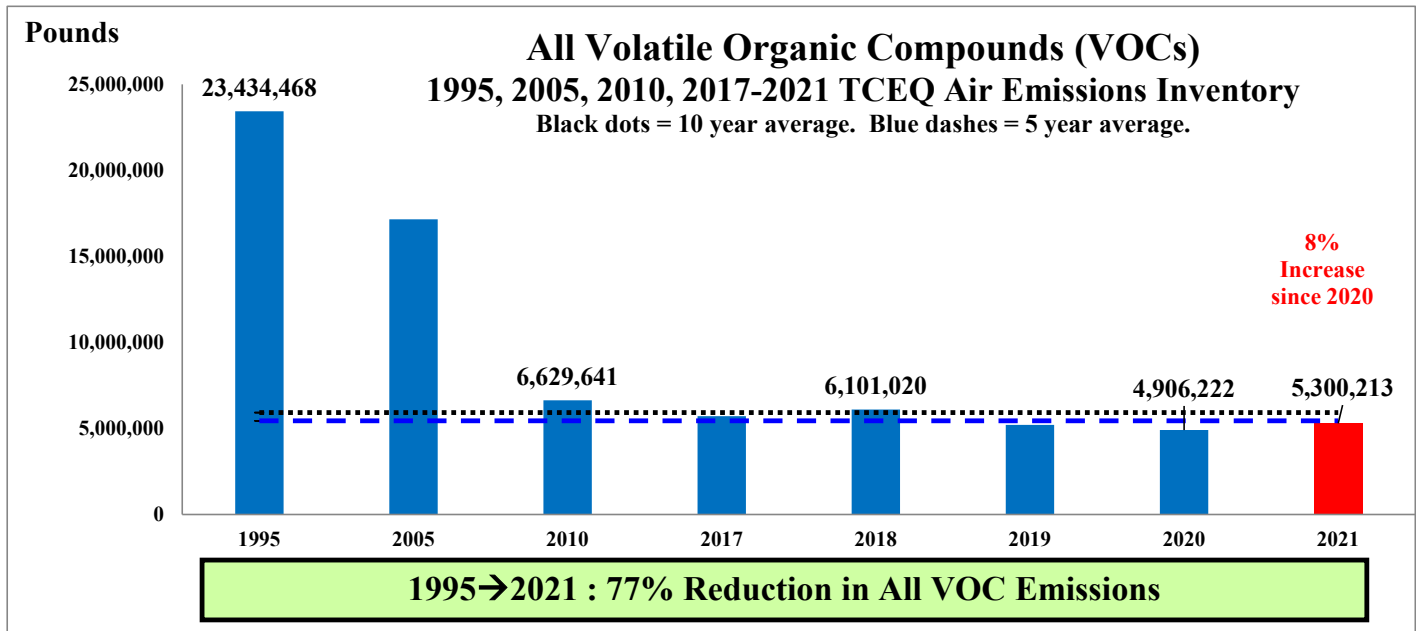
## NOx: Changes in the last year

Company	Decrease/ Increase in Pounds	% Change from 2020 to 2021	Comments
LyondellBasell Refinery	10,417	1%	Higher refinery rates and utilization of Fluid Catalytic Cracker Unit (FCCU)
Chevron Refinery	-77,032	-10%	Sustainable- Decrease primarily from reduced Fluid Catalytic Cracker (FCC) operating hours / rates
Chevron Phillips	-5,279	-5%	Temporary: Decrease in NOx from five Catalyst Activators due to new emission factors from regulatory required tuneups to the burners.
OxyVinyls	-8,111	-13%	Continuous monitoring of boiler stack; decrease in boiler operating hours
Air Products	2,617	8%	Additional routine authorized flaring
Albemarle	0	0%	
ITC	-2,577	-8%	
Kinder Morgan Liquids Terminal	6,380	29%	Temporary: Customer demand for controlled tank landings increased in 2021 vs 2020, resulting in higher combustion emissions.
BASF	7,016	37%	Calculation Method Change
INEOS Phenol	-1,213	-5%	
Sekisui	-25,461	-53%	Temporary: fewer emissions from facility unexpectedly shutdown for about a month due to the February severe winter storm event
Enterprise Products	-822	-9%	
Afton	-56	-1%	
Kinder Morgan Export Terminal	-184	-13%	Temporary: Decrease in tank landing vapor control unit (VCU) utilization in 2021.
Gulf Coast Authority	177	361%	Temporary: increased NOx loading from industrial users
Ethyl	NR	NR	

**NOTE:** Ethyl did not submit data for RY 2021 (NR)

**NOTE:** PCI Nitrogen is no longer in PCAC

**NOTE:** Starting in 2016 Afton and Ethyl are reporting separately



All Volatile Organic Compounds (VOCs) (pounds per year)									
Company	1995	2005	2010	2017	2018	2019	2020	2021	% Change 1995→2021
Kinder Morgan Liquids Terminal	9,010,000	8,306,072	1,508,285	1,177,480	1,258,077	1,373,600	1,499,090	1,496,404	-83%
LyondellBasell Refinery	7,662,000	4,062,963	1,598,804	1,683,361	1,585,328	1,446,548	1,353,589	1,476,960	-81%
Chevron Refinery	2,255,580	1,710,100	1,228,349	1,164,764	1,696,241	889,948	517,856	816,652	-64%
Chevron Phillips	1,929,440	1,935,165	1,292,253	986,873	846,772	757,024	779,807	760,810	-61%
Albemarle	1,500,000	210,000	180,000	241,000	240,000	222,940	225,000	220,000	-85%
OxyVinyls	553,760	460,692	278,087	141,110	139,826	143,239	140,542	137,222	-75%
INEOS Phenol	133,736	250,598	177,500	93,646	97,080	108,680	108,418	105,047	-21%
ITC				43,904	45,292	64,064	92,388	87,761	500%
Enterprise Products			101,380	48,960	45,147	46,233	57,452	53,994	-47%
BASF	204,860	110,640	99,680	12,911	39,090	37,060	23,737	33,471	-84%
Afton				35,673	31,881	33,069	32,106	31,421	-15%
Gulf Coast Authority			37,323	20,502	12,172	14,446	20,280	27,325	-27%
Kinder Morgan Export Terminal				19,607	19,009	26,441	21,182	24,954	27%
Sekisui		36,699	30,875	18,773	17,956	20,512	20,915	21,442	-42%
Air Products	87,560	13,058	18,892	16,240	14,220	9,322	7,804	6,750	-92%
Ethyl				6,071	7,111	7,111	2,798	NR	NR
PCI Nitrogen	2,282	5,123	5,444	2,494	5,818	2,980	3,258		
Afton-Ethyl Prior to 2016	95,250	51,553	72,769						
<b>Totals</b>	<b>23,434,468</b>	<b>17,152,663</b>	<b>6,629,641</b>	<b>5,713,368</b>	<b>6,101,020</b>	<b>5,203,218</b>	<b>4,906,222</b>	<b>5,300,213</b>	
<b>Percent Change (since previous year)</b>		<b>9%</b>	<b>-4%</b>	<b>-2%</b>	<b>7%</b>	<b>-15%</b>	<b>-6%</b>	<b>8%</b>	
		<b>Total Percent Change from 1995 to 2021</b>							<b>-77%</b>
		<b>Total Percent Change from 2017 to 2021</b>							<b>-7%</b>

Note: October 2021: Chevron Phillips submitted a correction for 2019 value; initial value was 689,140

Note: August 2021: Albemarle submitted a correction for 2019 value; initial value was 220,000.

## All VOCs: Changes in the last year

Company	Decrease/ Increase in Pounds	% Change from 2020 to 2021	Comments
Kinder Morgan Liquids Terminal	-2,686	0%	
LyondellBasell Refinery	123,371	9%	Higher refinery rates and increase from emission events (Winter Storm Uri)
Chevron Refinery	298,796	58%	Temporary: Increase primarily from maintenance associated with a tank cleaning and emission events
Chevron Phillips	-18,997	-2%	Temporary: Decrease in VOC flaring due to decreased production and downtime from Winter Storm Uri.
Albemarle	-5,000	-2%	Temporary: Variability year to year due to production.
OxyVinyls	-3,320	-2%	
INEOS Phenol	-3,371	-3%	
ITC	-4,627	-5%	Normal and routine fluctuations in product throughput and distribution modes
Enterprise Products	-3,458	-6%	
BASF	9,734	41%	Calculation Method Change
Afton	-685	-2%	
Gulf Coast Authority	7,045	35%	Temporary: increased VOC loading from industrial users
Kinder Morgan Export Terminal	3,772	18%	Temporary: Increase in barge loading of distillates and fuel oil which don't require vapor control.
Sekisui	527	3%	
Air Products	-1,054	-14%	
Ethyl	NR	NR	

NOTE: Ethyl did not submit data for RY 2021 (NR)

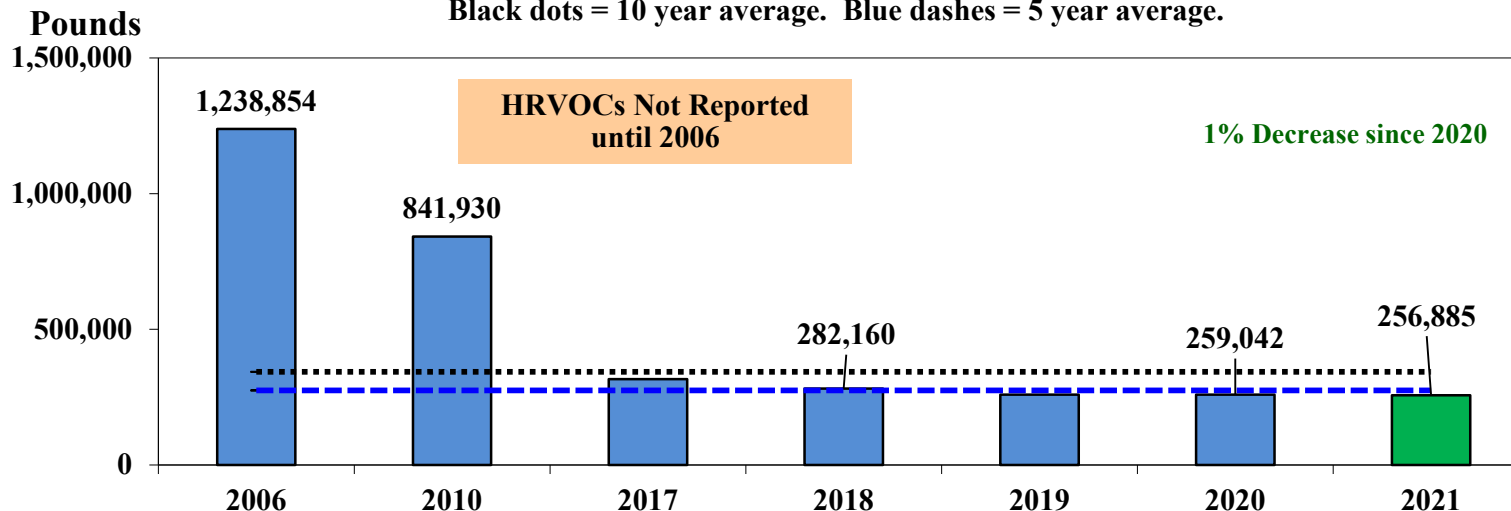
NOTE: PCI Nitrogen is no longer in PCAC

NOTE: Starting in 2016 Afton and Ethyl are reporting separately



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

2006, 2010, 2017-2021 TCEQ Air Emissions Inventory  
Black dots = 10 year average. Blue dashes = 5 year average.



**2006→2021: 79% Reduction in HRVOC Emissions**

Highly Reactive Volatile Organic Compounds (HRVOCs) <sub>(pounds per year)</sub>								% Change
Company	2006	2010	2017	2018	2019	2020	2021	2006->2021
Chevron Phillips	682,604	524,815	94,986	88,472	101,315	99,337	88,088	-87%
Chevron Refinery	153,455	171,266	121,180	75,475	42,279	45,119	47,311	-69%
LyondellBasell Refinery	151,040	34,515	40,340	47,987	45,428	43,275	45,345	-70%
Albemarle	190,000	55,000	40,000	35,000	39,020	36,800	33,600	-82%
Enterprise Products		25,067	3,880	17,239	19,112	26,396	28,038	383%
OxyVinyls	298	243	6,554	3,353	4,901	3,850	6,917	2221%
INEOS Phenol	57,097	16,824	7,580	7,940	2,800	2,000	3,800	-93%
BASF	4,360	14,200	2,377	6,694	4,210	1,838	2,935	-33%
Kinder Morgan Liquids Terminal						427	851	99%
<b>Totals</b>	<b>1,238,854</b>	<b>841,930</b>	<b>316,897</b>	<b>282,160</b>	<b>259,065</b>	<b>259,042</b>	<b>256,885</b>	
<b>Percent Change</b> (since previous year)		<b>-17%</b>	<b>-11%</b>	<b>-11%</b>	<b>-8%</b>	<b>-0.01%</b>	<b>-1%</b>	
<b>Total Percent Change from 2006 to 2021</b>								<b>-79%</b>
<b>Total Percent Change from 2017 to 2021</b>								<b>-19%</b>

Top "80%"

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

Note: August 2021: Albemarle submitted a correction for 2019 value; initial value was 30,000.

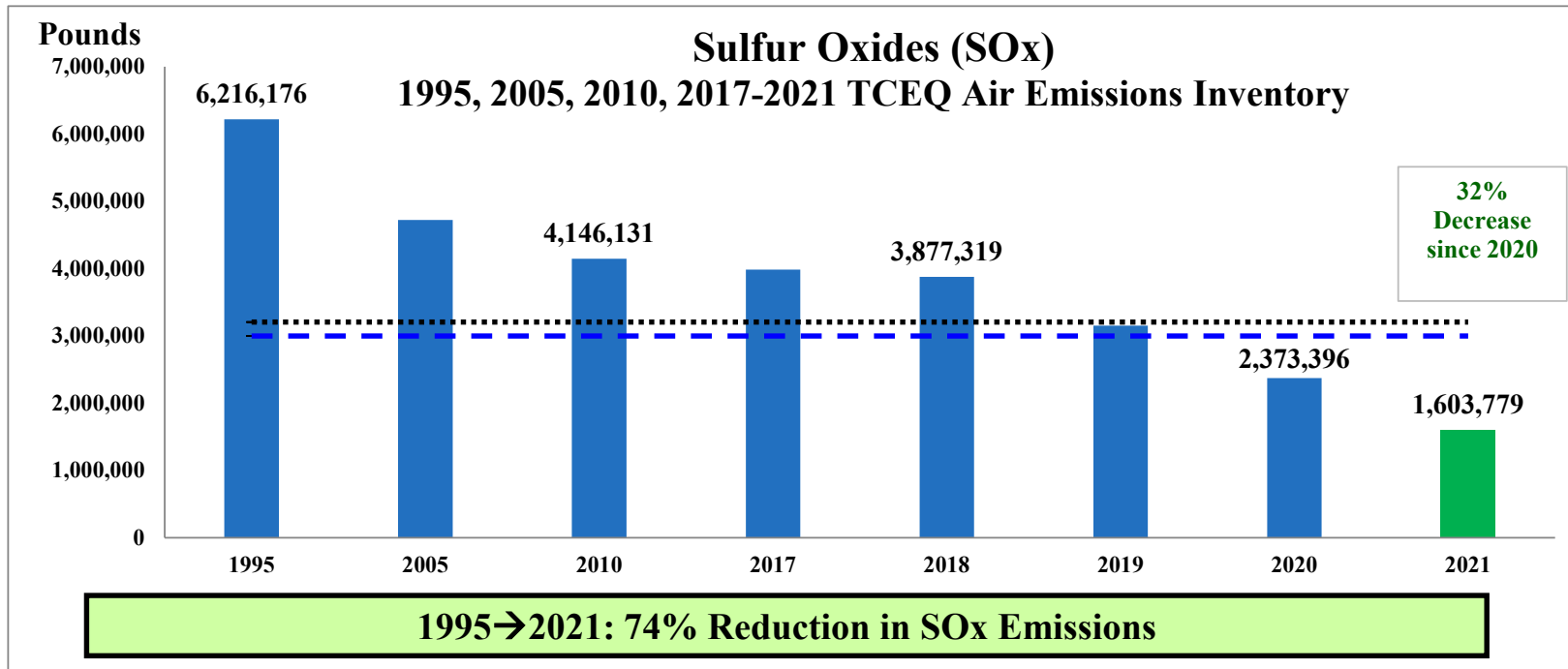
Note: August 2021: Chevron Phillips submitted a correction for 2019 value; initial value was 93,319.

**Note:** Data Transcription Error for Air Products found Sept 2019, values should have been zero. Therefore, 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.

**Note:** August 2022: Chevron Phillips submitted a correction for 2020 value; initial value was 96,448.

## HRVOCs: Changes in the last year

Company	Decrease /Increase in Pounds	% Change from 2020 to 2021	Comments
Chevron Phillips	-11,249	-11%	Temporary: Decrease in HRVOC flaring and process vent emissions due to decreased production and downtime from Winter Storm Uri.
Chevron Refinery	2,192	5%	Temporary: Increase primarily from an emission event
LyondellBasell Refinery	2,070	5%	
Albemarle	-3,200	-9%	
Enterprise Products	1,642	6%	
OxyVinyls	3,067	80%	Increase in fugitives from refrigeration skid
INEOS Phenol	1,800	90%	Propylene feedstock increased due to production increase
BASF	1,097	60%	Calculation Method Change
Kinder Morgan Liquids Terminal	424	99%	Temporary: Customer demand for controlled tank landings increased in 2021 vs 2020, resulting in higher combustion emissions of HRVOCs.



Sulfur Oxides (SOx) (pounds per year)									% Change
Company	1995	2005	2010	2017	2018	2019	2020	2021	1995->2021
LyondellBasell Refinery	1,892,000	1,606,028	671,235	2,088,569	1,828,392	1,921,194	1,067,193	1,108,027	-41%
Chevron Refinery	3,290,160	2,660,400	2,827,556	1,478,675	1,659,136	945,616	1,006,428	490,456	-85%
OxyVinyls	640	1,238	2,697	1,404	1,186	1,269	1,406	1,258	97%
Sekisui		642	41	553	411	1,674	2,158	761	19%
Enterprise Products			20	640	620	580	740	752	53%
Albemarle	2,800	1,700	1,100	1,200	1,000	750	640	710	-75%
BASF	360	2,080	440	379	634	670	1,984	450	25%
Air Products	4,160	4,060	5,204	558	472	380	344	322	-92%
ITC				169	220	280	294	270	200%
Kinder Morgan Liquids Terminal			111	172	216	212	178	220	98%
INEOS Phenol	948	19,691	20,446	195	201	210	193	216	-77%
Chevron Phillips	3,260	647	721	268	272	276	253	171	-95%
Kinder Morgan Export Terminal				99	105	115	72	72	-27%
Afton				48	40	56	54	54	13%
Gulf Coast Authority			1	674	40	37	36	40	6567%
Ethyl				32	30	30	33	NR	NR
PCI Nitrogen	1,021,848	423,579	616,500	411,250	384,345	276,931	291,390		
Afton-Ethyl Prior to 2016	0	53	60						
<b>Totals</b>	<b>6,216,176</b>	<b>4,720,117</b>	<b>4,146,131</b>	<b>3,984,885</b>	<b>3,877,319</b>	<b>3,150,280</b>	<b>2,373,396</b>	<b>1,603,779</b>	
<b>Percent Change (since previous year)</b>		<b>3%</b>	<b>4%</b>	<b>-19%</b>	<b>-3%</b>	<b>-19%</b>	<b>-25%</b>	<b>-32%</b>	
<b>Total Percent Change from 1995 to 2021:</b>									<b>-74%</b>
<b>Total Percent Change from 2017 to 2021:</b>									<b>-60%</b>

Top "80%"

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

## SOx: Changes in the last year

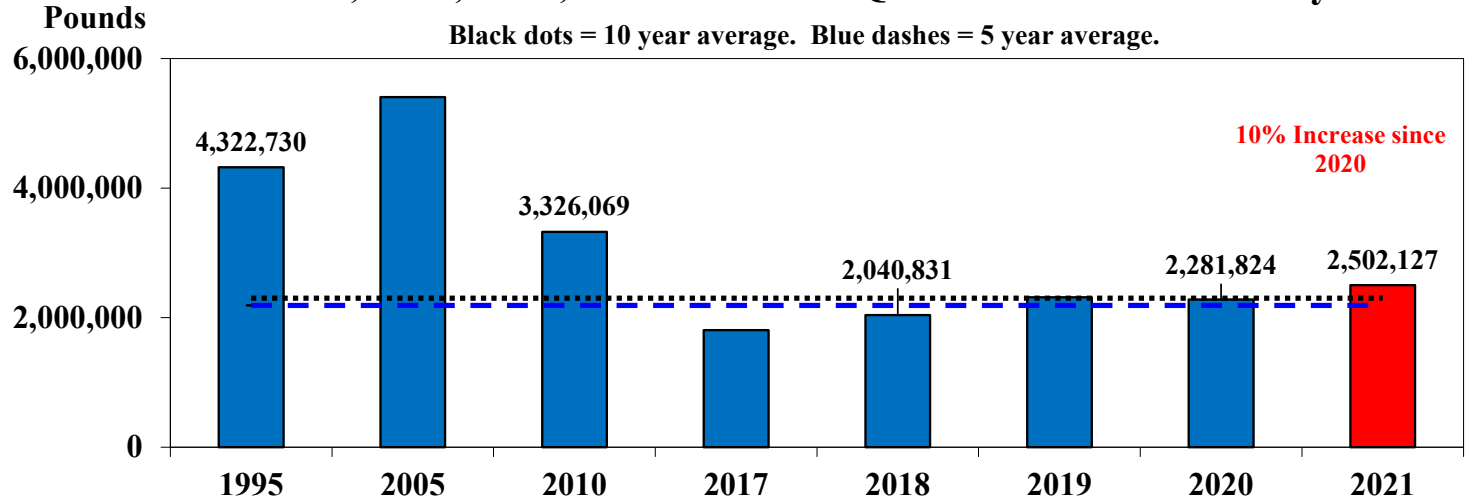
Company	Decrease/ Increase in Pounds	% Change from 2020 to 2021	Comment
LyondellBasell Refinery	40,834	4%	Higher refinery rates and increase from emission events (Winter Storm Uri)
Chevron Refinery	-515,972	-51%	Sustainable: Decrease primarily from reduced Fluid Catalytic Cracker (FCC) operating hours / rates
OxyVinyls	-148	-11%	Continuous monitoring of boiler stack; decrease in boiler operating hours
Sekisui	-1,397	-65%	Temporary: fewer emissions from facility unexpectedly shutdown for about a month due to the February severe winter storm event
Enterprise Products	12	2%	
Albemarle	70	11%	Temporary: Variability of natural gas combustion.
BASF	-1,534	-77%	Calculation Method Change
Air Products	-22	-6%	
ITC	-24	-8%	
Kinder Morgan Liquids Terminal	42	23%	Temporary: Customer demand for controlled tank landings increased in 2021 vs 2020, resulting in higher combustion emissions.
INEOS Phenol	23	12%	
Chevron Phillips	-82	-32%	Temporary: Catalyst Activator Heaters and Flares emitted less SO2 due to fewer heater operating hours, decrease in production, and downtime from Winter Storm Uri.
Kinder Morgan Export Terminal	0	0%	
Afton	0	0%	
Gulf Coast Authority	4	11%	Temporary: increased SOx loading from industrial users
Ethyl	NR	NR	

**NOTE:** Ethyl did not submit data for RY 2021 (NR)

**NOTE:** PCI Nitrogen is no longer in PCAC

**NOTE:** Starting in 2016 Afton and Ethyl are reporting separately

## Carbon Monoxide (CO) 1995, 2005, 2010, 2017-2021 TCEQ Air Emissions Inventory



Carbon Monoxide (CO) (pounds per year)									% Change
Company	1995	2005	2010	2017	2018	2019	2020	2021	1995->2021
LyondellBasell Refinery	1,586,000	2,450,584	703,750	413,023	420,861	652,356	618,375	867,953	-45%
Chevron Phillips	649,286	611,913	749,119	803,022	758,471	805,123	788,020	766,921	18%
Chevron Refinery	517,320	720,380	509,726	183,803	369,406	410,164	447,937	395,474	-24%
BASF	373,720	395,580	307,340	90,037	173,375	102,341	83,539	204,104	-45%
Albemarle	110,000	280,000	180,000	75,000	95,000	82,000	87,800	64,300	-42%
ITC				40,626	54,946	68,763	69,858	62,989	112%
Kinder Morgan Liquids Terminal	11,040	3,352	64,061	12,547	22,325	25,391	25,969	31,828	188%
OxyVinyls	113,200	42,718	22,657	16,582	23,329	32,940	32,444	27,524	-76%
Sekisui		5,453	3,029	10,026	7,593	24,904	28,395	25,311	364%
Afton				17,776	19,060	21,569	22,310	19,456	9%
Enterprise Products			3,800	21,960	18,721	13,660	18,005	13,189	94%
Air Products	844,380	829,446	722,488	28,130	28,076	16,074	11,564	12,662	-99%
INEOS Phenol	71,668	14,419	12,611	5,235	7,874	7,315	8,547	8,087	-89%
Kinder Morgan Export Terminal				52,758	9,222	8,660	2,359	2,280	-96%
Gulf Coast Authority			2	2,209	131	44	4	49	2350%
Ethyl				104	96	96	89	NR	NR
PCI Nitrogen	37,520	42,133	36,889	34,191	32,345	41,634	36,609		
Afton-Ethyl Prior to 2016	8,596	7,801	10,597						
<b>Totals</b>	<b>4,322,730</b>	<b>5,403,779</b>	<b>3,326,069</b>	<b>1,807,030</b>	<b>2,040,831</b>	<b>2,313,034</b>	<b>2,281,824</b>	<b>2,502,127</b>	
<b>Percent Change (since previous year)</b>		<b>10%</b>	<b>-14%</b>	<b>-11%</b>	<b>13%</b>	<b>13%</b>	<b>-1%</b>	<b>10%</b>	
<b>Total Percent Change from 1995 to 2021:</b>									<b>-42%</b>
<b>Total Percent Change from 2017 to 2021:</b>									<b>38%</b>

## CO: Changes in the last year

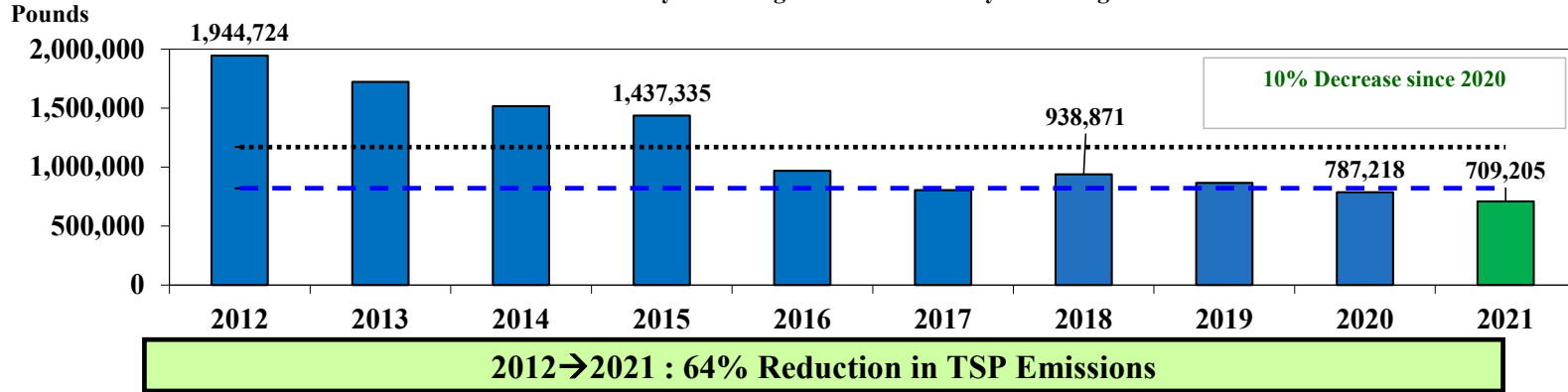
Company	Decrease/ Increase in Pounds	% Change from 2020 to 2021	Comment
LyondellBasell Refinery	249,578	40%	Higher refinery rates and increase from emission events (Winter Storm Uri)
Chevron Phillips	-21,099	-3%	Temporary: Decrease in CO from flares due to decreased production and downtime from Winter Storm Uri.
Chevron Refinery	-52,463	-12%	Sustainable- Decrease primarily from reduced Fluid Catalytic Cracker (FCC) operating hours / rates
BASF	120,565	144%	Calculation Method Change
Albemarle	-23,500	-27%	Temporary: Variability year to year
ITC	-6,869	-10%	Normal and routine fluctuations in product throughput and distribution modes
Kinder Morgan Liquids Terminal	5,859	23%	Temporary: Customer demand for controlled tank landings increased in 2021 vs 2020, resulting in higher combustion emissions.
OxyVinyls	-4,920	-15%	Continuous monitoring of boiler stack; decrease in boiler operating hours
Sekisui	-3,084	-11%	Temporary: fewer emissions from facility unexpectedly shutdown for about a month due to the February severe winter storm event
Afton	-2,854	-13%	Sustainable: freeze and scheduled maintenance events
Enterprise Products	-4,816	-27%	In 2020 the facility flare and one boiler CO figured higher compared to 2021. The decrease is potentially sustainable depending on operations that impact the flare.
Air Products	1,098	9%	Additional routine authorized flaring
INEOS Phenol	-460	-5%	
Kinder Morgan Export Terminal	-79	-3%	
Gulf Coast Authority	45	1125%	Temporary: increased CO loading from industrial users
Ethyl	NR	NR	

NOTE: Ethyl did not submit data for RY 2021 (NR)

NOTE: PCI Nitrogen is no longer in PCAC

NOTE: Starting in 2016 Afton and Ethyl are reporting separately

**Total Suspended Particulates (TSP)  
2012-2021 TCEQ Air Emissions Inventory**  
Black dots = 10 year average. Blue dashes = 5 year average.



Total Suspended Particulates (TSP) (pounds per year)											% Change
Company	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2012->2021
LyondellBasell Refinery	373,114	357,191	346,843	374,956	357,450	334,726	366,812	369,513	290,604	328,752	-12%
Chevron Refinery	1,071,952	987,424	729,210	680,600	258,215	135,110	228,499	166,260	164,553	178,635	-83%
OxyVinyls	71,657	82,245	75,240	73,811	75,617	80,108	72,718	69,962	69,452	67,101	-6%
Albemarle	7,700	6,700	7,256	22,000	49,200	51,000	61,000	40,000	39,000	44,000	471%
Chevron Phillips	134,160	96,973	111,620	48,203	38,239	35,465	27,080	21,579	30,558	29,721	-78%
Air Products	121,940	29,412	36,016	30,372	30,792	41,654	35,302	28,240	25,676	24,044	-80%
INEOS Phenol	15,817	11,325	11,265	13,275	11,082	12,038	12,428	12,728	12,535	12,994	-18%
BASF	25,914	26,033	27,450	25,620	2,225	6,198	18,664	19,921	19,000	8,196	-68%
Sekisui	27,028	26,992	28,162	28,838	635	418	1,248	3,745	4,467	4,427	-84%
Enterprise Products	2,897	2,938	30,266	30,286	30,590	4,340	5,432	4,980	5,539	4,008	38%
ITC				1,144	1,818	2,139	2,800	3,560	3,893	3,419	199%
Kinder Morgan Liquids Terminal	463	2,430	319	754	5,101	3,172	3,074	1,901	6,848	2,140	362%
Afton					604	594	1,580	930	908	1,555	157%
Kinder Morgan Export Terminal						830	1,057	828	189	197	-76%
Gulf Coast Authority	364	1,422	2	28	634	1,759	43	15	1	16	-96%
Ethyl					148	143	141	141	33	NR	NR
PCI Nitrogen	80,098	87,748	110,054	103,670	105,931	95,277	100,992	122,130	113,962		
Afton-Ethyl Prior to 2016	11,620	4,216	3,659	3,778							
<b>Totals</b>	<b>1,944,724</b>	<b>1,723,049</b>	<b>1,517,362</b>	<b>1,437,335</b>	<b>968,281</b>	<b>804,972</b>	<b>938,871</b>	<b>866,434</b>	<b>787,218</b>	<b>709,205</b>	
<b>Percent Change (since previous year)</b>		<b>-11%</b>	<b>-12%</b>	<b>-5%</b>	<b>-33%</b>	<b>-17%</b>	<b>17%</b>	<b>-8%</b>	<b>-9%</b>	<b>-10%</b>	
<b>Total Percent Change from 2012 to 2021:</b>											<b>-64%</b>
<b>Total Percent Change from 2017 to 2021:</b>											<b>-12%</b>

**Note:** Chevron Phillips submitted a correction in August 2021 for their 2019 TSP data, original value was 38,333. Corrected 2019 PCAC submittal to align with Emissions Inventory.

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

**Note:** Chevron Phillips submitted a correction in August 2022 for their 2020 TSP data, original value was 21,871.

## TSP: Changes in the last year

Company	Decrease/ Increase in Pounds	% Change from 2020 to 2021	Comment
LyondellBasell Refinery	38,148	13%	Higher refinery rates and utilization of Fluid Catalytic Cracker Unit (FCCU)
Chevron Refinery	14,082	9%	Temporary: Increase primarily from Fluid Catalytic Cracker (FCC) startup attempts after Winter Storm Uri and emission events
OxyVinyls	-2,351	-3%	
Albemarle	5,000	13%	Temporary: Variability year to year
Chevron Phillips	-837	-3%	
Air Products	-1,632	-6%	
BASF	-10,804	-57%	Calculation Method Change
INEOS Phenol	459	4%	
Sekisui	-40	-1%	
Enterprise Products	-1,531	-28%	In 2020 the facility Cooling Tower TSP was figured higher compared to 2021. The decrease is potentially sustainable depending on the operations of the cooling tower.
ITC	-474	-12%	
Kinder Morgan Liquids Terminal	-4,708	-69%	Sustainable: Change in calculation method
Afton	647	71%	Sustainable: increased emergency generator due to freeze
Kinder Morgan Export Terminal	8	4%	
Gulf Coast Authority	15	1500%	Temporary: increased sandblasting activities associated with maintenance
Ethyl	NR	NR	

**NOTE: Ethyl did not submit data for RY 2021 (NR)**

**NOTE: PCI Nitrogen is no longer in PCAC**

**NOTE: Starting in 2016 Afton and Ethyl are reporting separately**



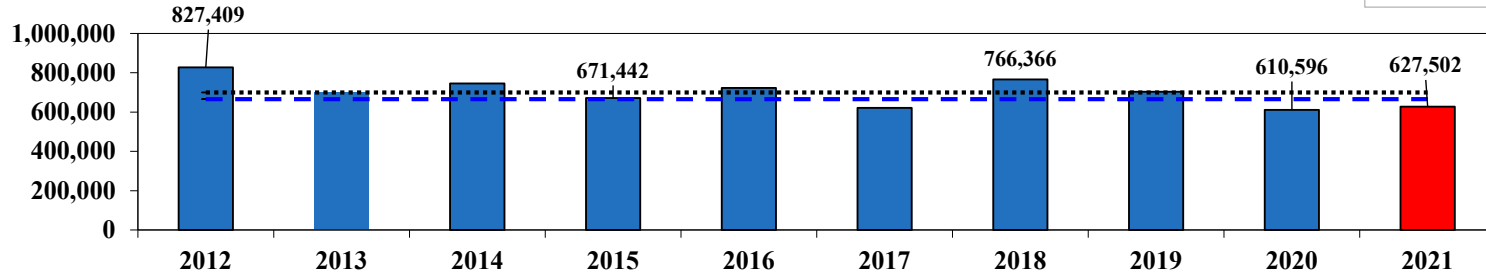
## Total Suspended Particulates Reported as PM 2.5

### 2012-2021 TCEQ Air Emissions Inventory

Black dots = 10 year average. Blue dashes = 5 year average.

**3%  
Increase  
since 2020**

Pounds



**2012→2021: 24% 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	2019	2020	2021	2012->2021
LyondellBasell Refinery	344,184	341,891	334,502	363,151	345,965	317,530	350,431	352,303	273,776	315,325	-8%
Chevron Refinery	89,030	94,459	128,773	122,560	212,633	125,241	212,577	153,935	152,354	165,949	86%
OxyVinyls	69,300	67,400	66,975	67,653	69,766	74,909	70,164	67,245	66,434	62,450	-10%
Air Products	121,940	29,412	36,016	30,372	30,792	41,654	35,302	28,240	25,676	24,044	-80%
Albemarle	40	44	46	1,300	1,000	900	34,000	22,000	16,500	17,500	43650%
INEOS Phenol	15,817	11,319	11,240	13,274	11,074	12,034	12,423	12,708	12,480	12,992	-18%
Chevron Phillips	134,160	96,469	111,620	9,291	9,167	9,366	9,419	9,408	9,429	9,269	-93%
BASF	25,914	26,033	27,450	25,620	33	3,012	4,283	4,619	4,283	7,908	-69%
Sekisui					3	2	706	3,274	3,975	3,919	113867%
ITC				1,144	1,818	2,139	2,800	3,560	3,893	3,419	199%
Kinder Morgan Liquids Terminal	308	2,348	319	754	5,101	3,172	3,074	1,901	1,798	2,123	589%
Enterprise Products	1,434	1,354	1,370	1,390	0	0	0	0	1,992	2,035	42%
Afton						830	680	712	683	358	-57%
Kinder Morgan Export Terminal						830	1,057	828	189	195	-77%
Gulf Coast Authority	179	1,406	2	18	575	848	43	15	1	16	-91%
Ethyl						143	0	0	0	NR	NR
PCI Nitrogen	24,660	28,224	26,715	34,232	35,019	28,224	29,407	42,223	37,133		
Afton-Ethyl Prior to 2016	443	469	564	683							
<b>Totals</b>	<b>827,409</b>	<b>700,828</b>	<b>745,592</b>	<b>671,442</b>	<b>722,946</b>	<b>620,835</b>	<b>766,366</b>	<b>702,971</b>	<b>610,596</b>	<b>627,502</b>	
<b>Percent Change (since previous year)</b>		-15%	6%	-10%	8%	-14%	23%	-8%	-13%	3%	
		<b>Total Percent Change from 2012 to 2021:</b>									<b>-24%</b>
		<b>Total Percent Change from 2017 to 2021:</b>									<b>1%</b>

Top "80%"

## TSP Reported as PM 2.5: Changes in the last year

Company	Decrease/ Increase in Pounds	% Change from 2020 to 2021	Comment
LyondellBasell Refinery	41,549	15%	Higher refinery rates and utilization of Fluid Catalytic Cracker Unit (FCCU)
Chevron Refinery	13,595	9%	Temporary: Increase primarily from Fluid Catalytic Cracker (FCC) startup attempts after Winter Storm Uri and emission events
OxyVinyls	-3,984	-6%	
Air Products	-1,632	-6%	
BASF	3,625	85%	Calculation Method Change
Albemarle	1,000	6%	
INEOS Phenol	512	4%	
Chevron Phillips	-160	-2%	
Sekisui	-56	-1%	
ITC	-474	-12%	
Kinder Morgan Liquids Terminal	325	18%	Temporary: Customer demand for controlled tank landings increased in 2021 vs 2020, resulting in higher combustion emissions
Enterprise Products	43	2%	
Afton	-325	-48%	
Kinder Morgan Export Terminal	6	3%	
Gulf Coast Authority	15	1500%	Temporary: increased sandblasting activities associated with maintenance
Ethyl	NR	NR	

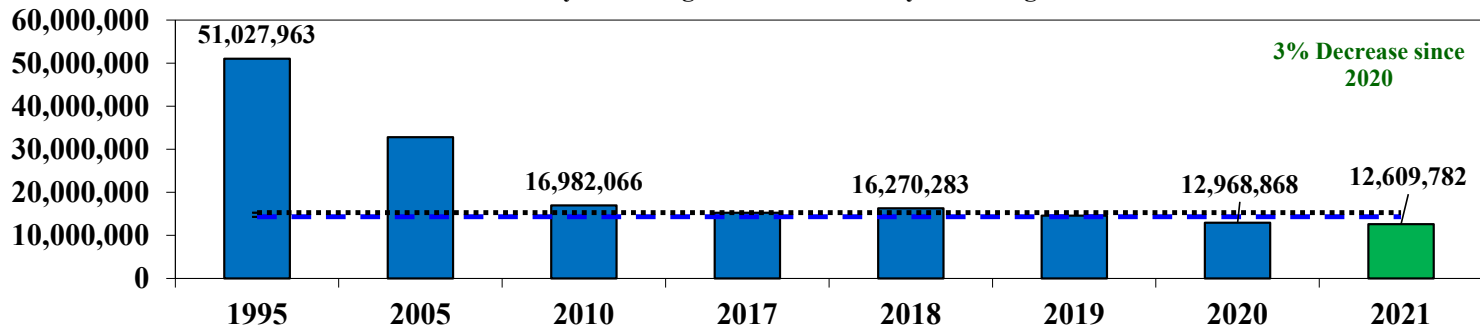
NOTE: Ethyl did not submit data for RY 2021 (NR)

NOTE: PCI Nitrogen is no longer in PCAC

NOTE: Starting in 2016 Afton and Ethyl are reporting separately

**Criteria Air Pollutant Emissions**  
**(includes SO<sub>x</sub>, NO<sub>x</sub>, VOCs, CO, and TSP)**  
**1995, 2005, 2010, 2017-2021**  
**TCEQ Air Emissions Inventory**

Black dots = 10 year average. Blue dashes = 5 year average.



**1995→2021: 75% Decrease in Total Criteria Pollutant Emissions**

Criteria Air Pollutant Inventory (Pounds per Year)									% Change
Company	1995	2005	2010	2017	2018	2019	2020	2021	1995->2021
LyondellBasell Refinery	23,276,000	11,548,906	4,278,220	6,014,305	5,770,535	5,996,830	4,781,647	5,243,995	-77%
Chevron Refinery	8,102,060	6,391,600	5,528,315	3,957,797	5,257,708	3,392,513	2,872,543	2,539,954	-69%
Chevron Phillips	3,736,482	2,636,252	2,141,844	1,936,875	1,740,228	1,692,323	1,706,242	1,659,948	-56%
Kinder Morgan Liquids Terminal	9,022,320	8,310,040	1,593,248	1,242,674	1,311,138	1,431,065	1,553,784	1,558,670	-83%
Albemarle	2,222,800	801,700	435,100	415,200	443,000	380,750	386,440	363,010	-84%
Oxy Vinyls	775,600	581,820	380,821	298,273	293,005	311,984	307,971	289,121	-63%
BASF	952,660	635,040	469,260	140,874	268,872	185,908	147,005	271,982	-71%
ITC				104,566	126,552	166,927	197,553	182,982	169%
INEOS Phenol	485,451	309,292	230,571	133,715	141,762	156,175	156,151	151,589	-69%
Enterprise			108,280	83,980	75,814	69,790	90,711	80,096	138%
Air Products	1,244,906	987,930	964,608	142,051	130,947	89,455	77,855	78,862	-94%
Sekisui		44,526	34,885	35,792	35,588	92,934	104,177	74,722	68%
Afton				59,123	57,681	61,849	61,429	58,481	-3%
Kinder Morgan Export Terminal				86,397	45,842	40,931	25,197	28,714	-67%
Gulf Coast Authority			37,333	35,339	12,993	14,748	20,370	27,656	251%
Ethyl				6,834	7,824	7,824	3,436	NR	NR
PCI Nitrogen	1,099,492	506,122	691,112	572,905	550,795	478,650	476,357		
Afton-Ethyl Prior to 2016	110,192	65,590	88,468						
<b>Totals</b>	<b>51,027,963</b>	<b>32,818,818</b>	<b>16,982,066</b>	<b>15,266,699</b>	<b>16,270,283</b>	<b>14,570,655</b>	<b>12,968,868</b>	<b>12,609,782</b>	
<b>Percent Change (since previous year)</b>		<b>10%</b>	<b>-8%</b>	<b>-8%</b>	<b>7%</b>	<b>-10%</b>	<b>-11%</b>	<b>-3%</b>	
<b>Total Percent Change from 1995 to 2021:</b>									<b>-75%</b>
<b>Total Percent Change from 2017 to 2021:</b>									<b>-17%</b>

Top "80%"

Note: 2017 Changes: (was 15,259,390). BASF submitted a correction in August 2019 for their 2017 SO<sub>x</sub> data, therefore changing their 2017 total from 141,723 to 140,874. LyondellBasell Refinery submitted a correction in August 2019 for their 2017 HRVOC and TSP data, therefore changing their 2017 total from 6,006,147 to 6,014,305.

## Criteria Air Pollutant Emissions: Changes in the last year

Company	Decrease/ Increase in Pounds	% Change from 2020 to 2021
LyondellBasell Refinery	462,348	10%
Chevron Refinery	-332,589	-12%
Chevron Phillips	-46,294	-3%
Kinder Morgan Liquids Terminal	4,886	0%
Albemarle	-23,430	-6%
Oxy Vinyls	-18,850	-6%
BASF	124,977	85%
ITC	-14,571	-7%
INEOS Phenol	-4,562	-3%
Enterprise	-10,615	-12%
Air Products	1,007	1%
Sekisui	-29,455	-28%
Afton	-2,948	-5%
Kinder Morgan Export Terminal	3,517	14%
Gulf Coast Authority	7,286	36%
Ethyl	NR	NR

NOTE: Ethyl did not submit data for RY 2021 (NR)

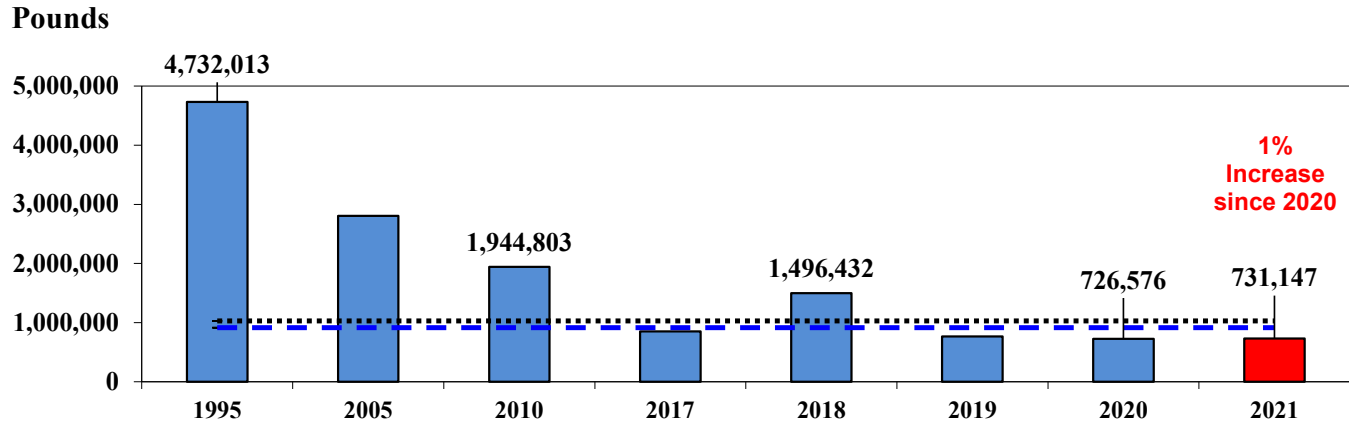
NOTE: PCI Nitrogen is no longer in PCAC

NOTE: Starting in 2016 Afton and Ethyl are reporting separately

## EPA TRI Total Air Releases

1995, 2005, 2010, 2017-2021

Black dots = 10 year average. Blue dashes = 5 year average.



**1995→2021 : 85% Reduction in TRI Total Air Releases**

TRI Total Air Releases (pounds per year)									% Change
Company	1995	2005	2010	2017	2018	2019	2020	2021	1995->2021
LyondellBasell Refinery	1,394,178	596,275	167,562	236,263	250,030	245,011	192,170	234,182	-83%
Chevron Phillips	1,139,354	1,108,974	546,394	170,048	134,602	152,322	151,654	127,119	-89%
Albemarle	427,200	113,000	95,000	89,000	123,000	70,000	76,000	92,000	-78%
Chevron Refinery	531,821	177,192	504,265	116,029	630,417	42,693	59,807	75,039	-86%
INEOS Phenol	82,789	127,224	99,150	58,603	172,668	55,059	52,871	62,717	-24%
Sekisui		31,083	29,300	27,793	19,271	17,200	15,600	57,102	84%
OxyVinyls	594,823	243,939	174,582	53,199	52,879	57,502	55,497	50,801	-91%
BASF	94,000	40,600	3,809	3,530	14,420	10,169	11,529	14,882	-84%
Air Products	303,400	232,556	188,804	20,447	13,989	10,513	9,491	7,340	-98%
Afton				4,225	5,386	6,532	7,375	7,301	44%
Evonik				4,215	4,215	4,236	4,253	2,326	-45%
Enterprise Products			99	504	504	688	291	338	240%
Ethyl				1,228	1,136	1,136	511	NR	NR
PCI Nitrogen	144,301	124,908	130,525	68,132	73,916	92,468	89,527		
Afton-Ethyl Prior to 2016	20,147	8,370	5,312						
<b>Totals</b>	<b>4,732,013</b>	<b>2,804,121</b>	<b>1,944,803</b>	<b>853,216</b>	<b>1,496,432</b>	<b>765,529</b>	<b>726,576</b>	<b>731,147</b>	
<b>Percent Change (since previous year)</b>		<b>-7%</b>	<b>-2%</b>	<b>-7%</b>	<b>75%</b>	<b>-49%</b>	<b>-5%</b>	<b>1%</b>	
<b>Total Percent Change from 1995 to 2021</b>									<b>-85%</b>
<b>Total Percent Change from 2017 to 2021</b>									<b>-14%</b>

Top 80 %

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

**Note:** In Sept 2021, Afton submitted a correction for their 2019 Point Source emissions causing the total emissions to change from 4,773 to 6,532 lbs.

**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 in the last year

Company	Decrease/ Increase in Pounds	% Change from 2020 to 2021	Comment
LyondellBasell Refinery	42,012	22%	<b>Fugitive:</b> Increase from emissions events in 2021 (Winter Storm Uri) <b>Point Source:</b> Higher refinery rates
Chevron Phillips	-24,535	-16%	<b>Fugitive:</b> Sustainable- Began monitoring unmonitored Leak Detection and Repair (LDAR) connectors, which used higher emission factors. <b>Point Source:</b> Temporary- Decrease in flaring due to decreased production and downtime from Winter Storm Uri.
Albemarle	16,000	21%	<b>Point Source:</b> Calculation method change and variability due to customer demand.
Chevron Refinery	15,232	25%	<b>Fugitive:</b> Paper-Increase primarily from wastewater emission factor change <b>Point Source:</b> Sustainable- Decrease primarily from reduced Fluid Catalytic Cracker (FCC) operating hours / rates
INEOS Phenol	9,846	19%	<b>Point Source:</b> Cumene production increased by 8% from 2020
Sekisui	41,502	266%	<b>Fugitive:</b> Temporary: experienced more power outages that led to reportable quantity emission events
OxyVinyls	-4,696	-8%	<b>Fugitive:</b> Decrease in fugitives from LDAR monitoring
BASF	3,353	29%	<b>Point Source:</b> The increase primarily occurred at the high pressure flare due to process upsets. Plant experienced more process upset emissions in 2021 vs. 2020. These upsets are generated by the process but the high pressure flare controls and then emits the emissions.
Air Products	-2,151	-23%	<b>Point Source:</b> Less production
Afton	-74	-1%	<b>Fugitive and Point Source:</b> Sustainable- Improved categorization of emission sources.
Evonik	-1,927	-45%	<b>Point Source:</b> Difference from 2020 is due to an emission event in 2020 involving a TRI chemical
Enterprise Products	47	16%	<b>Point Source:</b> There was an increase of 700 bbls of product processed in 2021 compared to 2020 that contains a TRI Chemical. This change can vary depending on the orders that are processed for the product.
Ethyl	NR	NR	

**NOTE:** Ethyl did not submit data for RY 2021 (NR)

**NOTE:** PCI Nitrogen is no longer in PCAC

**NOTE:** Starting in 2016 Afton and Ethyl are reporting separately