

CO2 Emissions from Scope 3 Sources at Port of Seattle Maritime 2005 - 2023

All units in tonnes

			Scope 1-2 baseline year		Scope 3 baseline year		2005	2007	2011	2015	2016	2017	2018	2019	2020	2021	2022	2023
CONTROL	Staff Business Travel	Regional Flights		1	1	1	1	1	1	2	2	2	2	2	0	0.3	2	2
		Medium (intra-US) Haul Flights		82	82	82	82	82	82	69	69	98	98	98	13	8	65	65
		Long Haul Flights		16	16	16	16	16	16	15	15	25	25	25	3	-	26	26
		subtotal		100	100	100	100	100	100	86	86	125	125	125	15	8	93	93
	Tenant Natural Gas (1)	Terminal 91		-	-	114	51	89	122	136	193	73	46	174	(0)	-	-	-
		Terminal 102		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tenant Steam (2)	Pier 66		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tenant Electricity (3)	Fishermen's Terminal (4)		55	69	18	60	35	57	39	49	18	20	29	32	-	-	-
		Marine Maintenance		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Marine Maintenance - Parks		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Maritime Industrial Center (5)		13	21	5	17	8	11	7	8	3	3	4	4	-	-	-
		Pier 2 Uplands & CEM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Pier 28		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Pier 48		-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
		Pier 66 & Marina		22	20	6	26	15	23	17	22	7	10	11	10	-	-	-
		Pier 69		0	0	1	4	3	4	3	3	1	1	0	0.06	-	-	-
		Salmon Bay Marina (6)		-	-	-	-	-	-	-	-	-	-	2	1	-	-	-
		Shilshole Bay Marina		77	73	20	74	45	92	48	61	29	30	34	33	-	-	-
		Terminal 5 Southeast		-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
		Terminal 18 (7)		-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
		Terminal 34 (7)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Terminal 86 (8)		198	209	60	171	118	183	127	143	84	83	93	72	-	-	-
		Terminal 91 (9)		306	399	96	414	215	424	247	341	92	126	201	173	-	-	-
		T91 Cruise Shore Power (10)		-	-	-	-	-	-	30	81	-	22	33	42	-	-	-
		Terminal 102 & Marina		4	4	1	3	1	2	1	2	1	1	3	1	-	-	-
		Terminal 106		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Terminal 108		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Terminal 117		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		World Trade Center West (11)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Duwamish River Hub (12)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		subtotal		676	797	207	767	439	796	520	710	234	297	413	368	-	-	-
INFLUENCE	Employee Commute (2)	P69 and Maritime work locations		1,007	1,021	1,282	1,345	1,392	1,305	1,335	1,254	560	324	807	871	-	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Solid Waste Mgmt (2)	Maritime solid waste off-site mgmt		139	139	139	139	185	188	190	198	93	101	117	128	-	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maritime Supply Chain (2,13) <i>*Updated 2005, 2016, 2021 with 2021 PSEI</i>	Ocean-going vessels		68,428	68,428	87,090	87,090	59,325	59,325	59,325	59,325	5,607	47,642	103,687	103,687	-	-	-
		Commercial harbor vessels		8,547	8,547	3,726	3,726	9,647	9,647	9,647	9,647	9,647	11,555	11,555	11,555	-	-	-
		Recreational vessels		7,900	7,900	6,854	6,854	6,793	6,793	6,793	6,793	7,277	7,277	7,277	-	-	-	-
		Locomotives		7,545	7,545	6,239	6,239	4,553	4,553	4,553	4,553	4,836	4,836	4,836	-	-	-	-
		Cargo-handling equipment		3,926	3,926	407	407	354	354	354	354	406	406	406	-	-	-	-
		Cruise buses on terminals		13	13	13	13	15	15	15	15	4	4	4	-	-	-	-
		subtotal		96,359	96,359	104,329	104,329	80,686	80,686	80,686	80,686	26,968	71,720	127,766	127,766	-	-	-
	TOTAL			98,280	98,416	106,169	106,732	82,878	83,183	82,993	83,167	27,944	72,496	129,370	129,226	-	-	-

(1) In 2022, natural gas use in the Terminal 91 cruise building was reassigned as Scope 3 based on new metering information.

(2) Emissions from this category are expressed in tonnes CO₂e; this is assumed proxy for CO₂ value.

(3) As updated annual emission factors become available from Seattle City Light, they are applied to prior years' inventories. In 2022, emissions were recalculated for 2019 (using the 2019 emission factor), and 2020 and 2021 (using the 2020 emission factor).

(4) Fishermen's Terminal 2005 Scope 3 kWh adjusted to 39% of total due to data anomalies.

(5) Maritime Industrial Center 2005 Scope 2 kWh adjusted to 51% of total due to data anomalies.

(6) Salmon Bay Marina was purchased by POS in 2018.

(7) Starting in 2022, Terminal 18 and Pier 34 are omitted from the inventory because they are Northwest Seaport Alliance facilities.

(8) Terminal 86 values for 2005, 2007, 2011, and 2015 were estimated based on 2017 actuals and annual cargo throughput.

(9) Terminal 91 Scope 3 kWh adjusted to 56% of total for 2005, 87% of total for 2015 and 2018, and 88% for 2021 due to data anomalies. (Proportions based on representative years.)

(10) Terminal 91 Cruise Shore Power - 2018 and 2019 are the only year for which data is available. There was no cruise season in 2020 due to COVID-19 restrictions.

(11) World Trade Center West was newly added to the GHG inventory in 2018 with adjustments in prior years' inventories.

(12) Duwamish River Hub is new property the Port rents, added in 2021.

(13) The Maritime Supply Chain emissions for 2022/2023 were calculated using the 2021 Puget Sound Emissions Inventory results for all categories except for Ocean-Going vessels, which are based on 2022 data.



Energy Use from Scope 3 Sources at Port of Seattle Maritime 2005 - 2023

			2005	2007	2011	2015	2016	2017	2018	2019	2020	2021	2022	2023	
CONTROL	Staff Business Travel	Regional Flights	8,169	8,169	8,169	8,169	11,168	11,168	16,216	16,216	258	2,394	14,956	14,956	seat-miles/gal Jet A Fuel
		Medium (Intra-US) Haul Flights	631,281	631,281	631,281	631,281	532,852	532,852	750,716	750,716	96,567	62,654	498,245	498,245	seat-miles/gal Jet A Fuel
		Long Haul Flights	118,050	118,050	118,050	118,050	109,186	109,186	181,773	181,773	19,277	-	187,773	187,773	seat-miles/gal Jet A Fuel
	Tenant Natural Gas (1)	Terminal 91	-	-	21,391	9,688	16,722	22,917	25,663	36,405	13,701	8,670	32,852	(0)	therms
		Terminal 92	-	-	-	-	-	-	-	-	-	-	-	(0)	therms
	Tenant Steam (2)	Pier 66	-	-	-	-	-	-	-	-	-	-	-	-	kilbs
	Tenant Electricity	Fishermen's Terminal (3)	2,672,519	3,355,174	2,957,506	2,508,794	2,485,026	2,730,594	2,699,000	2,598,150	2,059,581	2,233,681	2,790,149	3,041,582	kWh
		Marine Maintenance - Parks													kWh
		Maritime Industrial Center (4)	614,958	1,000,984	829,272	721,780	532,927	512,629	475,484	413,465	300,180	356,247	392,059	387,596	kWh
		Pier 2 Uplands & CEM													kWh
		Pier 28													kWh
		Pier 48	-	54,240	-	-	-	-	-	-	-	-	-	-	kWh
		Pier 66 & Marina	1,045,051	977,233	915,369	1,090,915	1,050,376	1,081,585	1,182,750	1,165,074	745,452	1,106,172	1,091,215	929,757	kWh
		Pier 69	18,612	3,796	160,992	166,952	184,612	187,504	176,328	164,580	83,232	131,729	5,392	5,256	kWh
		Salmon Bay Marina (5)	-	-	-	-	-	-	-	-	-	-	228,956	81,847	kWh
		Shilshole Bay Marina	3,728,173	3,541,512	3,210,450	3,101,025	3,147,752	4,387,781	3,312,374	3,240,445	3,200,956	3,383,048	3,276,525	3,127,371	kWh
		Terminal 5 Southeast							-	-	-	-	79,510	-	kWh
		Terminal 18 (6)							-	-	18,590	27,409	-	-	kWh
		Terminal 34 (6)													kWh
		Terminal 86 (7)	9,590,358	10,129,624	9,548,117	7,176,901	8,366,709	8,679,486	8,762,063	7,590,623	9,429,451	9,315,587	8,876,188	6,828,237	kWh
		Terminal 91 (8)	14,819,055	19,300,354	15,382,199	17,392,884	15,167,510	20,165,609	17,016,667	18,103,662	10,359,168	14,149,942	19,109,815	16,495,189	kWh
		T91 Cruise Shore Power (9)							2,076,982	4,281,856		2,498,115	3,154,961	3,979,276	kWh
		Terminal 102 & Marina, T104	206,111	214,889	120,857	106,014	88,672	113,857	95,430	97,666	107,034	86,899	244,808	123,901	kWh
		Terminal 106							-	-	-	-	-	-	kWh
		Terminal 108							-	-	-	-	-	-	kWh
		Terminal 117							-	-	-	-	-	-	kWh
		World Trade Center West (10)							-	-	-	-	-	-	kWh
		Duwamish River Hub (11)							-	-	-	-	-	-	kWh
		subtotal	32,694,837	38,577,806	33,124,762	32,265,265	31,023,584	37,859,045	35,797,079	37,655,521	26,303,644	33,288,829	39,249,578	35,000,013	kWh
INFLUENCE	Employee Commute (2)	direct calculation of CO2	1,007	1,021	1,282	1,345	1,392	1,305	1,335	1,254	560	324	807	871	tonnes CO2
	Solid Waste Mgmt (2)	direct calculation of CO2	139	139	139	139	185	188	190	198		101	117	128	tonnes CO2
	Maritime Supply Chain (2)	direct calculation of CO2	96,359	96,359	104,329	104,329	80,686	80,686	80,686	80,686	26,968	71,720	127,766	127,766	tonnes CO2
		subtotal	97,505	97,519	105,749	105,813	82,264	82,179	82,212	82,138	27,621	72,146	128,573	128,637	tonnes CO2

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(5) Salmon Bay Marina was purchased by POS in 2018.
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EMISSION FACTORS USED FOR POS MARITIME GHG INVENTORY

Scope	Year	Fuel	Emission Factor	Original Units	Converted Emission Factor	Converted Units	Citation
3	2015	Jet-A in Regional Flights	70.0000	seat-mile/gallon	0.000139286	tonnes CO2/seat-mile	https://en.wikipedia.org/wiki/Fuel_economy_in_aircraft
	2015	Jet-A in Medium Haul Flights	75.0000	seat-mile/gallon	0.00013	tonnes CO2/seat-mile	http://www.wsj.com/articles/SB10001424052748704901104575423261677748380
	2015	Jet-A in Long Haul Flights	70.0000	seat-mile/gallon	0.000139286	tonnes CO2/seat-mile	https://en.wikipedia.org/wiki/Fuel_economy_in_aircraft
	All	Gasoline in Vehicles	8.7800	kg CO2/gallon	0.00878000	tonnes CO2/gallon	2023-Default-Emission-Factors-Final.pdf (theclimateregistry.org)
	All	Diesel in Vehicles	10.2100	kg CO2/gallon	0.01021000	tonnes CO2/gallon	2023-Default-Emission-Factors-Final.pdf (theclimateregistry.org)
	All	Propane	5.72	kg CO2/gallon	0.00572000	tonnes CO2/gallon	2023-Default-Emission-Factors-Final.pdf (theclimateregistry.org)
	All	Natural Gas in Boilers	53.0600	kg CO2/MMBTU	0.00530600	tonnes CO2/therm	2023-Default-Emission-Factors-Final.pdf (theclimateregistry.org)