

# CO2 Emissions from Scope 1 & Scope 2 Sources at Port of Seattle Maritime 2005 - 2023

All units in tonnes

			2005	2007	2011	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Scope 1	Stationary Source	Stationary Source Natural Gas	Fishermen's Terminal	120	117	101	81	92	111	103	101	101	104	113	-
			Marine Maintenance	175	172	156	107	129	142	151	162	161	149	140	-
			Pier 66 & Marina	-	-	-	264	259	305	522	616	506	482	521	-
			Salmon Bay Marina (6)	-	-	-	-	-	-	3	10	8	8	11	-
			Shilshole Bay Marina	242	37	51	32	36	54	50	54	73	67	-	-
			Terminal 91 (3)	1	1	0	1	3	24	27	22	-	-	-	-
			Terminal 102	50	65	107	71	81	85	69	106	107	169	172	-
			Terminal 117	6	9	0	-	-	-	-	-	-	-	-	-
			Duwamish River Hub (9)	-	-	-	-	-	-	-	-	-	-	6	-
			subtotal	593	401	417	555	600	722	925	1,068	937	985	1,030	-
	Biogenic Fuel <sup>(1)</sup>	THERMAL RENEWABLE NATURAL GAS	-	-	-	-	-	-	-	-	-	-	-	915	
	Propane	Terminal 30 Remediation	-	-	-	-	-	-	-	101	180	157	140	11	
	Steam (1)	Pier 66	348	391	365	-	-	-	-	-	-	-	-	-	
Mobile Source	Mobile Fleet Fossil Fuel Use	Gasoline used in fleet													
			464	414	420	476	508	551	615	573	468	469	505	525	
		Diesel used in fleet	403	63	273	333	286	307	359	309	64	35	32	31	
		CNG used in fleet	-	-	0	3	3	5	4	0	-	-	-	-	
		Propane used in fleet	-	-	-	8	5	8	8	6	6	5	5	6	
	subtotal	867	477	694	820	802	871	986	888	538	508	542	563		
	Biogenic Fuel Use	Biodiesel (B100 equivalent)	-	165	61	37	36	37	49	45	-	-	-	-	
*emissions not counted toward total		Renewable Diesel (R99)	-	-	-	-	-	-	-	6	234	291	189	206	
Scope 2	Electricity (2)	Fishermen's Terminal (4)	86	87	29	122	78	115	84	105	54	78	57	72	
		Marine Maintenance	13	12	4	11	7	10	7	9	4	5	5	5	
		Marine Maintenance - Parks	3	3	1	4	2	3	2	2	1	1	1	0	
		Maritime Industrial Center (5)	12	6	2	7	6	9	6	7	4	6	6	5	
		Pier 2 Uplands & CEM	-	-	0	0	0	0	0	0	0	0	0	0	
		Pier 28	1	-	-	-	-	-	-	-	-	-	-	-	
		Pier 48	9	6	-	-	-	-	-	-	-	-	-	-	
		Pier 66 & Marina	42	44	13	53	35	64	39	50	17	21	24	23	
		Pier 69	55	57	14	49	30	46	32	41	17	21	22	21	
		Salmon Bay Marina (6)	-	-	-	-	-	-	3	8	4	5	2	5	
		Shilshole Bay Marina	17	26	21	73	47	55	51	66	48	65	30	65	
		Terminal 5 Southeast	2	2	1	2	1	2	1	2	1	1	0	1	
		Terminal 18 (7)	0	0	0	0	0	0	0	0	0	0	-	-	
		Terminal 30 (Police Station)	-	-	-	-	-	-	-	-	-	-	1	1	
		Terminal 34 (7)	-	0	0	1	0	1	0	1	0	0	-	-	
		Terminal 86	-	-	-	-	-	-	-	-	-	-	-	-	
		Terminal 91 (8)	131	49	41	62	32	63	37	43	12	20	28	13	
		Terminal 91 Cruise Shore Power	-	-	-	-	-	-	-	-	-	-	-	-	
		Terminal 102 & Marina, T104	27	31	7	27	17	25	15	17	8	11	8	11	
		Terminal 106	21	20	5	9	7	9	5	7	3	5	4	3	
		Terminal 108	0	-	-	-	-	-	-	-	-	-	0	-	
		Terminal 117	1	0	0	-	-	-	-	-	-	-	-	-	
		World Trade Center West (9)	29	29	9	31	19	27	18	24	10	11	12	10	
		Duwamish River Hub (10)	-	-	-	-	-	-	-	-	-	0	0	0	
		subtotal		448	373	146	452	281	429	299	382	182	249	200	234
TOTAL			2,256	1,642	1,622	1,827	1,683	2,021	2,210	2,439	1,836	1,899	1,912	807	

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

(2) 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).

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

(4) Fishermen's Terminal 2005 Scope 2 kWh adjusted to 61% of total due to data anomalies.

(5) Maritime Industrial Center 2005 Scope 2 kWh adjusted to 49% of total due to data anomalies.

(6) Salmon Bay Marina was purchased by Port of Seattle 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 91 Scope 2 kWh adjusted to 44% of total for 2005, 13% of total for 2015 and 2018, and 12% of total for 2021 due to data anomalies. (Proportions based on representative years.)

(9) World Trade Center West: 2010 actuals used as proxy for 2005, 2007 and 2011; 2016 actual used as proxy for 2015.

(10) Duwamish River Hub is a new property the Port rents, starting in 2021. No natural gas data was available for 2022.

# Energy Use from Scope 1 & 2 Sources at Port of Seattle Maritime 2005 - 2023

				2005	2007	2011	2015	2016	2017	2018	2019	2020	2021	2022	2023		
Scope 1	Stationary Source	Natural Gas	Fishermen's Terminal	22,635	22,034	19,096	15,209	17,373	20,899	19,348	19,093	18,944	19,607	21,220	-	therms	
			Marine Maintenance	32,957	32,520	29,459	20,122	24,323	26,792	28,536	30,503	30,318	28,055	26,416	-	therms	
			Pier 66 & Marina	-	-	-	49,701	48,927	57,522	98,491	116,012	95,458	90,851	98,208	-	therms	
			Salmon Bay Marina (2)	-	-	-	-	-	-	484	1,897	1,515	1,564	2,003	-	therms	
			Shilshole Bay Marina	45,568	7,038	9,673	5,988	6,809	10,221	9,402	9,416	10,218	13,772	12,692	-	therms	
			Terminal 91 (3)	95	109	87	179	618	4,607	5,050	4,235	-	-	-	-	therms	
			Terminal 102	9,422	12,252	20,270	13,402	15,204	16,037	13,059	20,051	20,101	31,771	32,352	-	therms	
			Terminal 117	1,082	1,717	28	-	-	-	-	-	-	-	-	-	therms	
			Duwamish River Hub (9)	-	-	-	-	-	-	-	-	-	-	1,150	-	therms	
			TOTAL NATURAL GAS	111,760	75,670	78,613	104,601	113,253	136,078	174,370	201,207	176,555	185,620	192,890	-	therms	
		Biogenic Fuel <sup>(a)</sup>	THERMAL RENEWABLE NATURAL GAS	-	-	-	-	-	-	-	-	-	-	-	172,457	therms	
		Propane	T30 Remediation	TOTAL PROPANE	-	-	-	-	-	-	-	17,643	31,488	27,500	24,430	1,903	gallons
		Steam	Pier 66	TOTAL STEAM	5,037	5,656	5,284	-	-	-	-	-	-	-	-	-	klb
	Mobile Source	Mobile Fleet Fossil Fuel Use	Gasoline Delivered	51,004	45,300	46,049	51,908	55,867	61,038	68,951	63,898	53,129	53,172	56,816	59,075	gallons	
			Business Miles Personal Vehicles	1,840	1,840	1,840	2,227	1,952	1,687	1,143	1,409	226	204	712	766	gallons	
			TOTAL GASOLINE	52,844	47,140	47,889	54,135	57,819	62,725	70,094	65,307	53,355	53,376	57,528	59,841	gallons	
			TOTAL DIESEL	39,433	6,219	26,781	32,638	27,971	30,109	35,165	30,243	6,227	3,688	3,330	3,265	gallons	
			TOTAL CNG	-	-	41	488	446	705	566	60	-	-	-	-	GGE	
			TOTAL PROPANE	-	-	-	1,390	942	1,348	1,317	996	1,010	847	798	1,129	gallons	
		Biogenic Fuel (1)	TOTAL BIODIESEL (B100)	-	17,479	6,416	3,960	3,785	3,891	5,165	4,740	-	-	-	-	gallons	
		TOTAL RENEWABLE DIESEL (R99)	-	-	-	-	-	-	-	571	22,907	28,553	18,337	21,546	gallons		
Scope 2	Electricity	Fishermen's Terminal (4)	4,180,093	4,210,132	4,701,915	5,129,427	5,477,054	5,457,682	5,787,908	5,561,173	6,064,896	7,406,345	5,446,394	6,885,443	kWh		
		Marine Maintenance	605,268	568,258	602,433	444,841	484,697	484,203	468,484	451,313	451,754	448,362	471,341	484,083	kWh		
		Marine Maintenance - Parks	123,729	129,263	107,506	147,957	146,132	126,642	109,104	102,800	109,838	99,081	53,894	41,810	kWh		
		Maritime Industrial Center (5)	590,842	308,016	400,128	288,220	415,673	434,771	395,516	393,535	462,220	548,523	549,541	466,004	kWh		
		Pier 2 Uplands & CEM	-	-	31	4,331	4,926.00	3,620	3,801	2,415	2,602	3,868	4,404	3,522	kWh		
		Pier 28	30,944	-	-	-	-	-	-	-	-	-	-	-	kWh		
		Pier 48	427,111	314,590	-	-	-	-	-	-	-	-	-	-	kWh		
		Pier 66 & Marina	2,053,113	2,108,872	2,015,526	2,209,312	2,482,208	3,041,614	2,666,100	2,654,889	1,922,209	1,985,037	2,250,845	2,216,284	kWh		
		Pier 69	2,648,243	2,743,615	2,278,577	2,075,603	2,129,904	2,172,272	2,168,388	2,197,238	1,877,723	2,015,053	2,121,852	1,956,768	kWh		
		Salmon Bay Marina (2)	-	-	-	-	-	-	187,120	433,440	411,080	434,052	233,060	472,968	kWh		
		Shilshole Bay Marina	843,126	1,282,413	3,294,950	3,083,057	3,326,580	2,637,053	3,507,559	3,483,707	5,354,110	6,192,733	2,849,750	6,144,812	kWh		
		Terminal 5 Southeast	104,920	117,547	106,520	101,520	95,480	93520	97,280	92,160	61,720	77,108	360	79,446	kWh		
		Terminal 18 (6)	11,958	10,384	1,595	1,313	1,317	970	735	610	9,079	418	-	-	kWh		
		Terminal 30 (Police Station)	-	-	-	-	-	-	-	-	-	-	72,927	69,352	kWh		
		Terminal 34 (6)	-	18,887	24,545	36,089	34,241	30,243	29,374	33,495	41,293	42,868	-	-	kWh		
		Terminal 86	-	-	-	-	-	-	-	-	-	-	(0)	-	kWh		
		Terminal 91 (7)	6,351,024	2,393,920	6,575,276	2,598,937	2,266,410	3,013,347	2,542,720	2,293,240	1,312,224	1,929,537	2,687,941	1,222,003	kWh		
		Terminal 91 Cruise Shore Power	-	-	-	-	-	-	-	-	-	-	-	-	kWh		
		Terminal 102 & Marina, T104	1,305,769	1,480,806	1,152,249	1,149,071	1,192,704	1,200,469	1,003,382	917,588	844,662	1,030,647	753,560	1,003,112	kWh		
		Terminal 106	999,580	959,100	759,898	391,440	464,080	424,400	354,160	367,833	355,972	432,511	405,923	245,391	kWh		
		Terminal 108	2,880	-	-	-	-	-	-	-	-	-	3	-	kWh		
		Terminal 117	43,313	7,176	9,923	-	-	-	-	-	-	-	-	-	kWh		
		World Trade Center West (8)	1,380,640	1,380,640	1,380,640	1,320,720	1,320,720	1,277,360	1,271,360	1,296,560	1,113,280	1,066,000	1,125,920	923,550	kWh		
		Duwamish River Hub (9)	-	-	-	-	-	-	-	-	-	3,092	16,897	11,914	kWh		
		TOTAL ELECTRICITY	21,702,553	18,033,618	23,411,712	18,981,838	19,842,125	20,398,166	20,592,991	20,281,995	20,394,661	23,715,235	19,044,611	22,226,463	kWh		

(a) In 2023, the Port started purchasing Renewable Natural Gas (RNG) from Puget Sound Energy (PSE) to replace all its Scope 1 fossil natural gas usage.

(1) Emissions associated with burning fuel from biogenic sources are not accounted for in the POS Maritime Inventory. The Inventory tracks the gallons of biogenic fuels used in operations.

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

(3) In 2022, natural gas use in the Terminal 91 (T91) cruise building was reassigned as Scope 3 based on new metering information

(4) Fishermen's Terminal (FT) 2005 Scope 2 kWh adjusted to 61% of total due to data anomalies

(5) Maritime Industrial Center (MIC) 2005 Scope 2 kWh adjusted to 49% of total due to data anomalies

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

(7) T91 Scope 2 kWh adjusted to 44% of total for 2005, 13% of total for 2015 and 2018, and 12% of total for 2021 due to data anomalies. (Proportions based on representative years

(8) World Trade Center West: 2010 actuals used as proxy for 2005, 2007 and 2011; 2016 actual used as proxy for 2015

(9) Duwamish River Hub is a new property the Port rents, starting in 2021. No natural gas data was available for 2022



## EMISSION FACTORS USED FOR POS MARITIME GHG INVENTORY

Updated:

7/18/2023

Scope	Year	Fuel	Emission Factor	Original Units	Converted Emission Factor	Converted Units	Citation	Notes
1	All	Natural Gas in Boilers	53.0600	kg CO <sub>2</sub> /MMBTU	0.00530600	tonnes CO <sub>2</sub> /therm	<a href="#">2023-Default-Emission-Factors-Final.pdf (theclimateregistry.org)</a>	<a href="#">Emission Factors for Greenhouse Gas Inventories (epa.gov)</a>
	All	Gasoline in Vehicles	8.7800	kg CO <sub>2</sub> /gallon	0.00878000	tonnes CO <sub>2</sub> /gallon	<a href="#">2023-Default-Emission-Factors-Final.pdf (theclimateregistry.org)</a>	<a href="#">Emission Factors for Greenhouse Gas Inventories (epa.gov)</a>
	All	Fossil Diesel in Vehicles (1)	10.2100	kg CO <sub>2</sub> /gallon	0.01021000	tonnes CO <sub>2</sub> /gallon	<a href="#">2023-Default-Emission-Factors-Final.pdf (theclimateregistry.org)</a>	<a href="#">Emission Factors for Greenhouse Gas Inventories (epa.gov)</a>
	All	Natural Gas in Vehicles	0.0545	kg CO <sub>2</sub> /scf	0.00690352	tonnes CO <sub>2</sub> /GGE	<a href="#">2023-Default-Emission-Factors-Final.pdf (theclimateregistry.org)</a>	
	All	Propane	5.72	kg CO <sub>2</sub> /gallon	0.00572000	tonnes CO <sub>2</sub> /gallon	<a href="#">2023-Default-Emission-Factors-Final.pdf (theclimateregistry.org)</a>	
	2005-2011	Steam (2)	156	Lbs. CO <sub>2</sub> e/MMBTu	0.069084097	tonnes CO <sub>2</sub> e/klb	<a href="#">Emission Factors for Greenhouse Gas Inventories (epa.gov)</a>	
2	2010	SCL Retail Electricity	45.57	lb CO <sub>2</sub> /MWh (2)	0.00002066	tonnes CO <sub>2</sub> /kWh	SCL correspondence & SCL retail factors found at <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a>	
	2011	SCL Retail Electricity	13.77	lb CO <sub>2</sub> /MWh (2)	0.00000625	tonnes CO <sub>2</sub> /kWh	SCL correspondence & SCL retail factors found at <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a>	
	2012	SCL Retail Electricity	25.62	lb CO <sub>2</sub> /MWh (2)	0.00001162	tonnes CO <sub>2</sub> /kWh	SCL correspondence & SCL retail factors found at <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a>	
	2013	SCL Retail Electricity	33.23	lb CO <sub>2</sub> /MWh (2)	0.00001507	tonnes CO <sub>2</sub> /kWh	SCL correspondence & SCL retail factors found at <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a>	
	2014	SCL Retail Electricity	20.08	lb CO <sub>2</sub> /MWh (2)	0.00000911	tonnes CO <sub>2</sub> /kWh	SCL correspondence & SCL retail factors found at <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a>	
	2015	SCL Retail Electricity	52.44	lb CO <sub>2</sub> /MWh (2)	0.00002379	tonnes CO <sub>2</sub> /kWh	SCL correspondence & SCL retail factors found at <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a>	
	2016	SCL Retail Electricity	31.22	lb CO <sub>2</sub> /MWh (2)	0.00001416	tonnes CO <sub>2</sub> /kWh	SCL correspondence & SCL retail factors found at <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a>	
	2017	SCL Retail Electricity	46.37	lb CO <sub>2</sub> /MWh (2)	0.00002103	tonnes CO <sub>2</sub> /kWh	SCL retail factors found at <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a>	
	2018	SCL Retail Electricity	32.05	lb CO <sub>2</sub> /MWh (2)	0.00001454	tonnes CO <sub>2</sub> /kWh	SCL retail factors found at <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a> . 2018 EF found at <a href="https://www.theclimateregistry.org/wp-content/uploads/2021/05/2021-Default-Emission-Factors-Final-1.pdf">https://www.theclimateregistry.org/wp-content/uploads/2021/05/2021-Default-Emission-Factors-Final-1.pdf</a> (Table 3.8)	
	2019	SCL Retail Electricity (3)	41.57	lb CO <sub>2</sub> /MWh (2)	0.00001886	tonnes CO <sub>2</sub> /kWh	SCL retail factor for 2019, found at: <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a>	The 2019 SCL retail electricity emissions factor was applied to 2019 electricity use, as the most recent published emissions factor.
	2020	SCL Retail Electricity (3)	19.64	lb CO <sub>2</sub> /MWh (2)	0.00000891	tonnes CO <sub>2</sub> /kWh	SCL retail factor for 2020, found at: <a href="https://www.theclimateregistry.org/wp-content/uploads/2023/06/2023-Default-Emission-Factors-Final-1.pdf">https://www.theclimateregistry.org/wp-content/uploads/2023/06/2023-Default-Emission-Factors-Final-1.pdf</a> (Table 3.8)	The 2020 emissions factor was used to recalculate 2020 and 2021 emissions herein, and to calculate 2022 emissions.
	2021	SCL Retail Electricity (3)	23.17	lb CO <sub>2</sub> /MWh (2)	0.00001051	tonnes CO <sub>2</sub> /kWh	SCL retail factor for 2021, found at: <a href="https://www.theclimateregistry.org/our-members/cris-public-reports/">https://www.theclimateregistry.org/our-members/cris-public-reports/</a>	

### Notes:

(1) The emission factor for 99% of Renewable Diesel (R99) as a vehicle fuel is 0 because combustion of the fuel is considered to produce biogenic CO<sub>2</sub> emissions.

Emissions from renewable diesel are not included in the total emissions estimate, because they are considered to be part of the natural carbon cycle and so are excluded under UNFCCC guidelines.

(2) Enwave Seattle provides an emission factor for CO<sub>2</sub>e, not CO<sub>2</sub>.

(3) SCL emissions factors converted from lb CO<sub>2</sub>/Mwh to tonnes CO<sub>2</sub> as follows: (lb CO<sub>2</sub>/MWh)\*(0.0004536 MT/lb)\*1 MWh/1000KWh or value\*0.000454/1000