



Energy Use from Scope 1 & 2 Sources at Port of Seattle Maritime 2005, 2015-2020

		2005*	2015	2016	2017	2018	2019	2020			
Scope 1	Stationary Source	Natural Gas	Fishermen's Terminal	22,635	15,209	17,373	20,899	19,348	19,093	18,944	therms
			Marine Maintenance	32,957	20,122	24,323	26,792	28,536	30,503	30,318	therms
			Pier 66 & Marina	-	49,701	48,927	57,522	98,491	116,012	95,458	therms
			Salmon Bay Marina	-	-	-	-	484	1,897	1,515	therms
			Shilshole Bay Marina	45,568	5,988	6,809	10,221	9,402	9,416	10,218	therms
			Terminal 91	95	9,867	17,340	27,524	30,713	40,640	13,701	therms
			Terminal 102	9,422	13,402	15,204	16,037	13,059	20,051	20,101	therms
			Terminal 117	1,082	-	-	-	-	-	-	therms
			TOTAL NATURAL GAS	111,760	114,289	129,975	158,995	200,033	237,612	190,255	therms
		Propane	T30 Remediation	TOTAL PROPANE	-	-	-	-	17,643	31,488	gallons
	Steam	Pier 66	TOTAL STEAM	5,037	-	-	-	-	-	klb	
	Mobile Source	Mobile Fleet Fossil Fuel Use	Gasoline Delivered	51,004	51,908	55,867	61,038	68,951	63,898	53,129	gallons
			Business Miles Personal Vehicles	1,840	2,227	1,952	1,687	1,143	1,409	226	gallons
			TOTAL GASOLINE	52,844	54,135	57,819	62,725	70,094	65,307	53,355	gallons
			TOTAL DIESEL	39,433	32,638	27,971	30,109	35,165	30,243	6,227	gallons
			TOTAL CNG	-	488	446	705	566	60	-	GGE
		TOTAL PROPANE	-	1,390	942	1,348	1,317	996	1,010	gallons	
Biogenic Fuel (1)		TOTAL BIODIESEL (B100)	-	3,960	3,785	3,891	5,165	4,740	-	gallons	
TOTAL RENEWABLE DIESEL (R99)	-	-	-	-	-	-	571	22,907	gallons		
Scope 2	Electricity	Fishermen's Terminal (2)	4,180,093	5,129,427	5,477,054	5,457,682	5,787,908	5,561,173	6,064,896	kWh	
		Marine Maintenance	605,268	444,841	484,697	484,203	468,484	451,313	451,754	kWh	
		Marine Maintenance - Parks	123,729	147,957	146,132	126,642	109,104	102,800	109,838	kWh	
		Maritime Industrial Center (3)	590,842	288,220	415,673	434,771	395,516	393,535	462,220	kWh	
		Pier 2 Uplands & CEM	-	4,331	4,926.00	3,620	3,801	2,415	2,602	kWh	
		Pier 28	30,944	-	-	-	-	-	-	kWh	
		Pier 48	427,111	-	-	-	-	-	-	kWh	
		Pier 66 & Marina	2,053,113	2,209,312	2,482,208	3,041,614	2,666,100	2,654,889	1,922,209	kWh	
		Pier 69	2,648,243	2,075,603	2,129,904	2,172,272	2,168,388	2,197,238	1,877,723	kWh	
		Salmon Bay Marina	-	-	-	-	187,120	433,440	411,080	kWh	
		Shilshole Bay Marina	843,126	3,083,057	3,326,580	2,637,053	3,507,559	3,483,707	5,354,110	kWh	
		Terminal 5 Southeast	104,920	101,520	95,480	93,520	97,280	92,160	61,720	kWh	
		Terminal 18	11,958	1,313	1,317	970	735	610	9,079	kWh	
		Terminal 34	-	36,089	34,241	30,243	29,374	33,495	41,293	kWh	
		Terminal 86	-	-	-	-	-	-	-	kWh	
		Terminal 91 (4)	6,351,024	2,598,937	2,266,410	3,013,347	2,542,720	2,293,240	1,312,224	kWh	
		Terminal 91 Cruise Shore Power	-	-	-	-	-	-	-	kWh	
		Terminal 102 & Marina, T104	1,305,769	1,149,071	1,192,704	1,200,469	1,003,382	917,588	844,662	kWh	
		Terminal 106	999,580	391,440	464,080	424,400	354,160	367,833	355,972	kWh	
		Terminal 108	2,880	-	-	-	-	-	-	kWh	
		Terminal 117	43,313	-	-	-	-	-	-	kWh	
		World Trade Center West (5)	1,380,640	1,320,720	1,320,720	1,277,360	1,271,360	1,296,560	1,113,280	kWh	
		TOTAL ELECTRICITY	21,702,553	18,981,838	19,842,125	20,398,166	20,592,991	20,281,995	20,394,661	kWh	

*2005 is the baseline year

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

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

(4) Terminal 91 Scope 2 kWh adjusted to 44% of total for 2005 and 13% of total for 2015 and 2018 due to data anomalies.

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



CO₂ Emissions from Scope 1 & Scope 2 Sources at Port of Seattle Maritime 2005, 2015-2020

All units in tonnes

		2005	2015	2016	2017	2018	2019	2020			
Scope 1	Stationary Source	Stationary Source									
		Natural Gas	Fishermen's Terminal	120	81	92	111	103	101	101	
			Marine Maintenance	175	107	129	142	151	162	161	
			Pier 66 & Marina	-	264	259	305	522	616	506	
			Salmon Bay Marina	-	-	-	-	3	10	8	
			Shilshole Bay Marina	242	32	36	54	50	50	54	
			Terminal 91	1	52	92	146	163	216	73	
			Terminal 102	50	71	81	85	69	106	107	
			Terminal 117	6	-	-	-	-	-	-	
			subtotal	593	606	689	843	1,061	1,261	1,009	
		Propane						101	180		
			Terminal 30 Remediation	-	-	-	-	-	-		
		Steam (1)									
			Pier 66	348	-	-	-	-	-		
		Mobile Source	Mobile Fleet Fossil Fuel Use	Gasoline used in fleet	464	476	508	551	615	573	468
			Diesel used in fleet	403	333	286	307	359	309	64	
			CNG used in fleet	-	3	3	5	4	0	-	
			Propane used in fleet	-	8	5	8	8	6	6	
			subtotal	867	820	802	871	986	888	538	
		Biogenic Fuel Use	Biodiesel (B100 equivalent)	-	37	36	37	49	45	-	
	<i>*emissions not counted toward total</i>	Renewable Diesel (R99)	-	-	-	-	6	234			
Scope 2	Electricity	Fishermen's Terminal (2)	86	122	78	77	84	81	88		
		Marine Maintenance	13	11	7	7	7	7	7		
		Marine Maintenance - Parks	3	4	2	2	2	1	2		
		Maritime Industrial Center (3)	12	7	6	6	6	6	7		
		Pier 2 Uplands & CEM	-	0	0	0	0	0	0		
		Pier 28	1	-	-	-	-	-	-		
		Pier 48	9	-	-	-	-	-	-		
		Pier 66 & Marina	42	53	35	43	39	39	28		
		Pier 69	55	49	30	31	32	32	27		
		Salmon Bay Marina	-	-	-	-	3	6	6		
		Shilshole Bay Marina	17	73	47	37	51	51	78		
		Terminal 5 Southeast	2	2	1	1	1	1	1		
		Terminal 18	0	0	0	0	0	0	0		
		Terminal 34	-	1	0	0	0	0	1		
		Terminal 86	-	-	-	-	-	-	-		
		Terminal 91 (4)	131	62	32	43	37	33	19		
		Terminal 91 Cruise Shore Power	-	-	-	-	-	-	-		
		Terminal 102 & Marina, T104	27	27	17	17	15	13	12		
		Terminal 106	21	9	7	6	5	5	5		
		Terminal 108	0	-	-	-	-	-	-		
		Terminal 117	1	-	-	-	-	-	-		
		World Trade Center West (5)	29	31	19	18	18	19	16		
			subtotal	449	452	281	289	299	295	296	
		TOTAL		2,256	1,878	1,772	2,003	2,346	2,545	2,024	

- (1) Emissions for this category are expressed in tonnes CO₂e; this is assumed proxy for CO₂ value.
- (2) Fishermen's Terminal 2005 Scope 2 kWh adjusted to 61% of total due to data anomalies.
- (3) Maritime Industrial Center 2005 Scope 2 kWh adjusted to 49% of total due to data anomalies.
- (4) Terminal 91 Scope 2 kWh adjusted to 44% of total for 2005 and 13% of total for 2015 and 2018 due to data anomalies.
- (5) World Trade Center West: 2010 actuals used as proxy for 2005, 2007 and 2011; 2016 actual used as proxy for 2015.

Port of Seattle EMISSION FACTORS USED FOR POS MARITIME GHG INVENTORY
Updated: 6/30/2021

Scope 1 & 2 Emission Factors

Scope	Year	Fuel	Emission Factor	Original Units	Converted Emission Factor	Converted Units	Citation
1	All	Natural Gas in Boilers	53.0600	kg CO2/MMBTU	0.00530600	tonnes CO2/therm	https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf
	All	Gasoline in Vehicles	8.7800	kg CO2/gallon	0.00878000	tonnes CO2/gallon	https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf
	All	Diesel in Vehicles (1)	10.2100	kg CO2/gallon	0.01021000	tonnes CO2/gallon	https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf
	All	Natural Gas in Vehicles	0.0545	kg CO2/scf	0.00690352	tonnes CO2/GGE	https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf
	All	Propane	5.72	kg CO2/gallon	0.00572000	tonnes CO2/gallon	https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf
	2005-201	Steam (2)	156	Lbs. CO2e/MMBtu	0.069084097	tonnes CO2e/kib	provided by EnWave
2	2010	SCL Retail Electricity	45.57	lb CO2/MWh (2)	0.00002066	tonnes CO2/kWh	SCL correspondence & SCL retail factors found at https://www.theclimateregistry.org/our-members/cris-public-reports/
	2011	SCL Retail Electricity	13.77	lb CO2/MWh (2)	0.00000625	tonnes CO2/kWh	SCL correspondence & SCL retail factors found at https://www.theclimateregistry.org/our-members/cris-public-reports/
	2012	SCL Retail Electricity	25.62	lb CO2/MWh (2)	0.00001162	tonnes CO2/kWh	SCL correspondence & SCL retail factors found at https://www.theclimateregistry.org/our-members/cris-public-reports/
	2013	SCL Retail Electricity	33.23	lb CO2/MWh (2)	0.00001507	tonnes CO2/kWh	SCL correspondence & SCL retail factors found at https://www.theclimateregistry.org/our-members/cris-public-reports/
	2014	SCL Retail Electricity	20.08	lb CO2/MWh (2)	0.00000911	tonnes CO2/kWh	SCL correspondence & SCL retail factors found at https://www.theclimateregistry.org/our-members/cris-public-reports/
	2015	SCL Retail Electricity	52.44	lb CO2/MWh (2)	0.00002379	tonnes CO2/kWh	SCL correspondence & SCL retail factors found at https://www.theclimateregistry.org/our-members/cris-public-reports/
	2016	SCL Retail Electricity	31.22	lb CO2/MWh (2)	0.00001416	tonnes CO2/kWh	SCL correspondence & SCL retail factors found at https://www.theclimateregistry.org/our-members/cris-public-reports/
	2017	SCL Retail Electricity	46.37	lb CO2/MWh (2)	0.00002103	tonnes CO2/kWh	SCL retail factors found at https://www.theclimateregistry.org/our-members/cris-public-reports/
	2018	SCL Retail Electricity (3)	32.05	lb CO2/MWh (2)	0.00001454	tonnes CO2/kWh	SCL retail factors found at https://www.theclimateregistry.org/our-members/cris-public-reports/ . 2018 EF found at https://www.theclimateregistry.org/wp-content/uploads/2021/05/2021-Default-Emission-Factor-Documents.pdf?mc_cid=4b45d12237&mc_eid=5f138d1baa

Notes:

- (1) The emission factor for Renewable Diesel as a vehicle fuel is 0 because combustion of the fuel is considered to produce biogenic CO2 emissions. These emissions 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 CO2e, not CO2.
- (3) SCL emissions factors converted from lb CO2/Mwh to tonnes CO2 as follows: (lb CO2/MWh)*(0.0004536 MT/lb)*1 MWh/1000KWh or value*0.000454/1000

Scope 3 Emission Factors

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 Flight	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	https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf
	All	Diesel in Vehicles	10.2100	kg CO2/gallon	0.01021000	tonnes CO2/gallon	https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf
	All	Propane	5.72	kg CO2/gallon	0.00572000	tonnes CO2/gallon	https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf
	All	Natural Gas in Boilers	53.0600	kg CO2/MMBTU	0.00530600	tonnes CO2/therm	https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

Biogenic Emission Factors

Scope	Year	Fuel	Emission Factor	Original Units	Converted Emission Factor	Converted Units	Citation
1	All	Renewable Diesel (2)	10.2100	kg CO2/gallon	0.01021000	tonnes CO2/gallon	https://www.theclimateregistry.org/wp-content/uploads/2018/06/The-Climate-Registry-2018-Default-Emission-Factor-Documents.pdf
	All	B100 Diesel in Vehicles (1)	9.4500	kg CO2/gallon	0.00945000	tonnes CO2/gallon	https://www.theclimateregistry.org/wp-content/uploads/2018/06/The-Climate-Registry-2018-Default-Emission-Factor-Documents.pdf

Notes:

- (1) B100 is not currently used by POS Maritime. When biofuel blends are used, a composite emission factor calculation will be performed in the applicable worksheet. For example, B20 used in fleet vehicles is accounted for as 80% Diesel in Tab 3-Mobile Fleet Fossil Fuel Use and