

CO2 FROM SCOPE 3 SOURCES AT SEA-TAC AIRPORT (2015-2023)

All units in tonnes

			2015	2016	2017	2018	2019	2020	2021	2022	2023
CONTROL	Staff Business Travel	Regional Flights	1	5	5	3	3	0	1	3	3
		Medium (intra-US) Haul Flights	150	155	155	180	180	41	29	160	160
		Long Haul Flights	41	36	36	35	35	9	5	44	44
	Staff Commuting	Port employees at airport	4,086	4,299	4,400	6,889	4,232	2,045	3,325	3,805	2,140
GUIDE	Aircraft	APU use at gate & cargo	40,243	43,488	43,906	53,792	133,963	36,326	111,364	121,703	119,851
		Aircraft taxi/ground movement	183,790	169,789	171,419	180,592	200,284	131,621	220,494	236,708	249,183
	GSE & Airfield Vehicles	Gas	14,896	16,149	16,363	17,257	18,199	11,721	15,129	16,214	17,068
		Propane	41	44	45	47	49	32	41	44	46
		Diesel	10,703	11,603	11,757	12,399	13,077	8,422	10,871	11,650	12,264
	Tenants	Natural gas for cooking/heating	617	642	637	743	794	488	613	740	944
		Electricity use	507	535	467	472	444	323	304	325	712
		Commute travel	11,526	13,424	14,815	15,300	10,667	9,618	5,507	8,006	11,253
	Passenger Ground Travel Contracted by Airport	Taxis outbound under contract	4,492	4,310	3,436	3,169	3,789	640	1,643	2,971	3,484
		Limos under contract	4,879	5,185	4,784	4,878	4,744	1,156	1,377	2,380	2,618
		TNCs pickup	0	2,538	5,382	7,431	12,037	2,902	6,040	9,403	10,801
		Hotel & Parking Shuttles	7,574	7,524	7,396	7,435	7,801	3,209	4,904	6,151	6,206
		Shared Ride Vans	1,750	1,496	1,095	797	1,044	85	185	276	338
INFLUENCE	Aircraft	Approach	61,325	96,462	97,388	102,599	113,787	74,778	83,226	89,346	94,055
		Take-offs	101,940	71,436	72,122	75,981	84,266	55,377	74,120	74,898	78,845
		Climb-out	44,794	58,618	59,181	62,348	69,146	45,441	66,300	71,175	74,926
	Passenger Ground Travel Non-Contracted	Curbside dropoff/pickup	109,213	112,320	107,625	104,682	87,762	59,432	126,413	101,637	96,809
		Parking On-site and Off-site	60,969	52,233	58,567	64,052	53,810	20,525	44,557	44,020	35,019
		Drop off Taxis	8,853	4,757	5,031	3,324	1,856	209	1,171	2,060	3,731
		Drop off TNCs	4,041	7,849	11,443	14,729	23,020	5,248	3,965	10,046	10,831
		Non-Contracted Limos	2,831	3,060	2,402	2,025	1,560	1,470	812	1,302	1,005
		Rental Cars	19,105	17,718	19,070	19,464	21,083	7,139	14,257	15,899	18,076
		Airporters	2,558	3,736	2,434	2,082	2,938	533	1,703	1,942	2,341
		Buses & Shuttles	1,679	540	1,612	1,393	486	25	121	320	378
		Light Rail	600	692	710	598	411	212	252	377	558
		Public Transit Bus	603	652	669	733	459	253	386	436	462
	Airport Waste	Municipal Solid Waste	1,012	1,129	1,162	1,100	1,125	569	852	1,037	9,334
		Construction Waste	2,165	215	167	150	190	1,834	3,632	11	652
TOTAL			706,983	712,641	725,682	766,679	873,242	481,683	803,598	835,088	864,137
Emissions from all jet fuel dispensed to airlines at SEA			5,322,820	5,663,867	5,965,419	6,210,511	6,508,848	3,756,792	5,144,700	5,808,037	6,483,731

ENERGY USE FROM SCOPE 3 SOURCES AT SEA-TAC AIRPORT (2015-2023)

			2015		2016		2017		2018		2019		2020		2021		2022		2023		
CONTROL	Staff Business Travel	Regional Flights	7,525	seat-miles	34,404	seat-miles	34,404	seat-miles	20,792	seat-miles	20,792	seat-miles	516	seat-miles	4,533	seat-miles	18,470	seat-miles	18,470	seat-miles	
		Medium (intra-US) Haul Flights	1,153,430	seat-miles	1,194,290	seat-miles	1,194,290	seat-miles	1,386,732	seat-miles	1,386,732	seat-miles	314,575	seat-miles	220,345	seat-miles	1,232,677	seat-miles	1,232,677	seat-miles	
		Long Haul Flights	297,691	seat-miles	259,303	seat-miles	259,303	seat-miles	248,651	seat-miles	248,651	seat-miles	61,951	seat-miles	39,145	seat-miles	314,491	seat-miles	314,491	seat-miles	
	Staff Commuting	Port employees at airport	4,086	tonnes CO2	4,299	tonnes CO2	4,400	tonnes CO2	6,889	tonnes CO2	4,232	tonnes CO2	2,045	tonnes CO2	3,325	tonnes CO2	3,018	tonnes CO2	2,140	tonnes CO2	
GUIDE	Aircraft	APU use at gate & cargo	4,127,453	gallons	4,460,347	gallons	4,503,136	gallons	5,517,123	gallons	13,739,804	gallons	3,725,746	gallons	11,421,899	gallons	12,482,399	gallons	12,292,443	gallons	
	GSE & Airfield Vehicles	Aircraft taxi/ground movement	183,790	tonnes CO2	169,789	tonnes CO2	171,419	tonnes CO2	180,592	tonnes CO2	200,284	tonnes CO2	131,621	tonnes CO2	220,872	tonnes CO2	236,708	tonnes CO2	249,183	tonnes CO2	
			403,717	gallons	436,257	gallons	440,445	gallons	425,311	gallons	2,072,835	gallons	287,215	gallons	1,723,147	gallons	1,846,697	gallons	1,944,018	gallons	
			7,099	gallons	7,671	gallons	7,745	gallons	8,160	gallons	8,634	gallons	5,510	gallons	7,178	gallons	7,692	gallons	8,098	gallons	
	Tenants		376,831	gallons	407,204	gallons	411,113	gallons	419,159	gallons	1,280,764	gallons	283,060	gallons	1,064,699	gallons	1,141,038	gallons	1,201,171	gallons	
		Natural gas for cooking/heating	116,237	therms	120,953	therms	120,119	therms	140,035	therms	149,721	therms	92,000	therms	115,531	therms	139,457	therms	177,870	therms	
		Electricity use	32,311,241	kWh	34,080,499	kWh	29,775,468	kWh	28,730,638	kWh	27,425,683	kWh	20,136,951	kWh	24,132,864	kWh	25,961,624	kWh	24,749,798	kWh	
	Passenger Ground Travel Contracted by Airport	Commuter travel	11,526	tonnes CO2	13,424	tonnes CO2	14,815	tonnes CO2	15,300	tonnes CO2	10,667	tonnes CO2	9,618	tonnes CO2	4,712	tonnes CO2	8,006	tonnes CO2	11,253	tonnes CO2	
		Airline eGSE electricity use		kWh		kWh		kWh	1,317,784	kWh	836,346	kWh	445,885	kWh	477,093	kWh	414,685	kWh	361,823	kWh	
		Taxis outbound under contract	4,492	tonnes CO2	4,310	tonnes CO2	3,436	tonnes CO2	3,169	tonnes CO2	3,789	tonnes CO2	640	tonnes CO2	1,643	tonnes CO2	2,971	tonnes CO2	3,484	tonnes CO2	
		Limos under contract	4,879	tonnes CO2	5,185	tonnes CO2	4,784	tonnes CO2	4,744	tonnes CO2	4,744	tonnes CO2	1,156	tonnes CO2	1,377	tonnes CO2	2,380	tonnes CO2	2,484	tonnes CO2	
		Pickup TNCs	0	tonnes CO2	2,538	tonnes CO2	5,382	tonnes CO2	7,431	tonnes CO2	12,037	tonnes CO2	2,902	tonnes CO2	6,039	tonnes CO2	9,403	tonnes CO2	10,801	tonnes CO2	
		Hotel & Parking Shuttles	7,574	tonnes CO2	7,524	tonnes CO2	7,396	tonnes CO2	7,435	tonnes CO2	7,801	tonnes CO2	3,209	tonnes CO2	4,904	tonnes CO2	6,151	tonnes CO2	6,206	tonnes CO2	
		Shared Ride Vans	1,750	tonnes CO2	1,496	tonnes CO2	1,095	tonnes CO2	797	tonnes CO2	1,044	tonnes CO2	85	tonnes CO2	182	tonnes CO2	276	tonnes CO2	338	tonnes CO2	
INFLUENCE	Aircraft	Approach	61,325	tonnes CO2	96,462	tonnes CO2	97,388	tonnes CO2	102,599	tonnes CO2	113,787	tonnes CO2	74,778	tonnes CO2	94,591	tonnes CO2	89,346	tonnes CO2	94,055	tonnes CO2	
	Passenger Ground Travel Non-Contracted	Take-offs	101,940	tonnes CO2	71,436	tonnes CO2	72,122	tonnes CO2	75,981	tonnes CO2	84,266	tonnes CO2	55,377	tonnes CO2	70,050	tonnes CO2	74,898	tonnes CO2	78,845	tonnes CO2	
			Climb-out	44,794	tonnes CO2	58,618	tonnes CO2	59,181	tonnes CO2	62,348	tonnes CO2	69,146	tonnes CO2	45,441	tonnes CO2	57,481	tonnes CO2	71,175	tonnes CO2	74,926	tonnes CO2
			Curbside dropoff/pickup	109,213	tonnes CO2	112,320	tonnes CO2	107,625	tonnes CO2	104,682	tonnes CO2	87,762	tonnes CO2	59,432	tonnes CO2	103,887	tonnes CO2	101,637	tonnes CO2	96,809	tonnes CO2
		Parking On-site and Off-site	60,969	tonnes CO2	52,233	tonnes CO2	58,567	tonnes CO2	64,052	tonnes CO2	53,810	tonnes CO2	20,525	tonnes CO2	36,558	tonnes CO2	44,020	tonnes CO2	35,019	tonnes CO2	
		Drop off Taxis	8,853	tonnes CO2	4,757	tonnes CO2	5,031	tonnes CO2	3,324	tonnes CO2	1,856	tonnes CO2	209	tonnes CO2	1,016	tonnes CO2	2,060	tonnes CO2	3,731	tonnes CO2	
		Drop off TNCs	4,041	tonnes CO2	7,849	tonnes CO2	11,443	tonnes CO2	14,729	tonnes CO2	23,020	tonnes CO2	5,248	tonnes CO2	6,683	tonnes CO2	10,046	tonnes CO2	10,582	tonnes CO2	
		Non-Contracted Limos	2,831	tonnes CO2	3,060	tonnes CO2	2,402	tonnes CO2	2,025	tonnes CO2	1,560	tonnes CO2	1,470	tonnes CO2	812	tonnes CO2	1,302	tonnes CO2	1,005	tonnes CO2	
		Rental Cars	19,105	tonnes CO2	17,718	tonnes CO2	19,070	tonnes CO2	19,464	tonnes CO2	21,083	tonnes CO2	7,139	tonnes CO2	12,145	tonnes CO2	15,899	tonnes CO2	18,076	tonnes CO2	
		Airporters	2,558	tonnes CO2	3,736	tonnes CO2	2,434	tonnes CO2	2,082	tonnes CO2	2,938	tonnes CO2	533	tonnes CO2	1,703	tonnes CO2	1,942	tonnes CO2	2,341	tonnes CO2	
		Buses & Shuttles	1,679	tonnes CO2	540	tonnes CO2	1,612	tonnes CO2	1,393	tonnes CO2	486	tonnes CO2	25	tonnes CO2	124	tonnes CO2	320	tonnes CO2	378	tonnes CO2	
		Light Rail	600	tonnes CO2	692	tonnes CO2	710	tonnes CO2	598	tonnes CO2	411	tonnes CO2	212	tonnes CO2	252	tonnes CO2	377	tonnes CO2	558	tonnes CO2	
		Public Transit Bus	603	tonnes CO2	652	tonnes CO2	669	tonnes CO2	733	tonnes CO2	459	tonnes CO2	253	tonnes CO2	386	tonnes CO2	436	tonnes CO2	462	tonnes CO2	
	Airport Waste	Municipal Solid Waste	1,012	tonnes CO2	1,129	tonnes CO2	1,162	tonnes CO2	1,158	tonnes CO2	1,125	tonnes CO2	569	tonnes CO2	852	tonnes CO2	1,037	tonnes CO2	9,334	tonnes CO2	
		Construction Waste	2,165	tonnes CO2	215	tonnes CO2	167	tonnes CO2	21	tonnes CO2	190	tonnes CO2	1,834	tonnes CO2	3,632	tonnes CO2	11	tonnes CO2	652	tonnes CO2	

EMISSION FACTORS USED FOR SCOPE 3 SOURCES AT SEA-TAC AIRPORT

Scope	Year	Fuel	Emission Factor	Original Units	Converted Emission Factor	Converted Units	Citation
3	All	Jet-A in Regional Flights	70.0000	seat-mile/gallon	0.00013929	tonnes CO2/seat-mile	https://en.wikipedia.org/wiki/Fuel_economy_in_aircraft
	All	Jet-A in Medium Haul Flights	75.0000	seat-mile/gallon	0.00013000	tonnes CO2/seat-mile	http://www.wsj.com/articles/SB10001424052748704901104575423261677748380
	All	Jet-A in Long Haul Flights	70.0000	seat-mile/gallon	0.00013929	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 in Vehicles	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
	2019	BPA electricity	0.0157	tonnes CO2/MWh	0.00001570	tonnes CO2/kWh	BPA correspondence using eGRID/TCR methodology
	2020	BPA Electricity	0.0128	tonnes CO2/MWh	0.00001282	tonnes CO2/kWh	BPA correspondence using eGRID/TCR methodology
	2021	BPA Electricity	0.0126	tonnes CO2/MWh	0.00001260	tonnes CO2/kWh	BPA correspondence using eGRID/TCR methodology
	2022	BPA Electricity	0.0125	tonnes CO2/MWh	0.00001250	tonnes CO2/kWh	BPA correspondence using eGRID/TCR methodology
	2023	BPA Electricity	63.41	lbs CO2/MWh	0.00002876	tonnes CO2/kWh	BPA correspondence using eGRID/TCR methodology
	All	Jet-A	9.7500	kg CO2/gallon	0.00975000	tonnes CO2/gallon	https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf