

Appendix B

Emissions Calculation Tables

Total Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	4,992,914.2	664.5	17.2	227.6	20.7	20.1	1.5	0.00	1.8	0.07	57,435.1	1.0	2.0	25.0	599.0	58,059.2
Offshore Substation Installation (OSS)	560,474.8	82.8	1.8	24.9	2.6	2.5	0.2	0.00	0.2	0.01	6,507.1	0.1	0.3	2.2	76.0	6,585.4
Scour Protection	1,028,760.7	171.5	3.9	40.7	6.0	5.8	1.1	0.00	0.6	0.05	11,403.5	0.1	0.6	1.8	165.0	11,570.3
Inter Array Cable Installation	1,193,952.0	198.3	4.6	46.8	7.0	6.7	1.4	0.00	0.6	0.06	13,226.2	0.1	0.6	2.1	191.4	13,419.7
WTG Installation	7,528,737.1	1,429.7	20.1	323.8	43.4	42.1	2.0	0.01	3.1	0.09	89,494.5	0.6	4.3	13.8	1,278.2	90,786.5
Export Cable Installation	4,717,787.2	792.0	16.2	190.6	27.1	26.3	3.9	0.00	2.3	0.18	52,512.6	0.3	2.5	8.2	756.5	53,277.2
Fuel Bunkering	554,115.0	77.3	2.4	24.2	2.8	2.7	0.2	0.00	0.2	0.01	6,228.1	0.1	0.2	2.4	69.7	6,300.2
Commissioning Generators	149,185.7	13.0	1.6	11.5	0.2	0.2	0.0	0.00	0.0	0.00	1,702.8	0.1	0.0	1.7	4.1	1,708.6
Miscellaneous	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	20,725,926.8	3,429.1	68.7	890.1	109.8	106.5	10.3	0.01	8.9	0.47	238,509.9	2.3	10.5	57.2	3,140.0	241,707.1

Vessel Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	3,351,386.2	593.4	9.5	138.9	19.2	18.6	1.3	0.00	1.4	0.06	38,699.2	0.2	1.9	6.0	553.7	39,259.0
Offshore Substation Installation (OSS)	434,847.7	77.4	1.2	18.1	2.5	2.4	0.2	0.00	0.2	0.01	5,073.3	0.0	0.2	0.8	72.6	5,146.6
Scour Protection	1,028,760.7	171.5	3.9	40.7	6.0	5.8	1.1	0.00	0.6	0.05	11,403.5	0.1	0.6	1.8	165.0	11,570.3
Inter Array Cable Installation	1,193,952.0	198.3	4.6	46.8	7.0	6.7	1.4	0.00	0.6	0.06	13,226.2	0.1	0.6	2.1	191.4	13,419.7
WTG Installation	7,528,737.1	1,429.7	20.1	323.8	43.4	42.1	2.0	0.01	3.1	0.09	89,494.5	0.6	4.3	13.8	1,278.2	90,786.5
Export Cable Installation	4,717,787.2	792.0	16.2	190.6	27.1	26.3	3.9	0.00	2.3	0.18	52,512.6	0.3	2.5	8.2	756.5	53,277.2
Fuel Bunkering	410,115.0	68.4	1.3	16.4	2.3	2.3	0.2	0.00	0.2	0.01	4,584.5	0.0	0.2	0.7	65.8	4,651.0
Commissioning Generators	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	18,665,585.9	3,330.6	56.9	775.4	107.6	104.2	10.1	0.01	8.4	0.46	214,993.8	1.3	10.3	33.4	3,083.1	218,110.3

Non-Vessel Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	1,641,528.0	71.1	7.6	88.7	1.4	1.4	0.2	0.00	0.4	0.01	18,735.9	0.8	0.2	19.0	45.3	18,800.2
Offshore Substation Installation (OSS)	125,627.1	5.4	0.6	6.8	0.1	0.1	0.0	0.00	0.0	0.00	1,433.9	0.1	0.0	1.5	3.5	1,438.8
Scour Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0
Inter Array Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0
WTG Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0
Export Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0
Fuel Bunkering	144,000.0	8.9	1.1	7.8	0.4	0.4	0.0	0.00	0.0	0.00	1,643.6	0.1	0.0	1.7	4.0	1,649.2
Commissioning Generators	149,185.7	13.0	1.6	11.5	0.2	0.2	0.0	0.00	0.0	0.00	1,702.8	0.1	0.0	1.7	4.1	1,708.6
Miscellaneous	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	2,060,340.9	98.5	11.8	114.7	2.2	2.2	0.2	0.00	0.5	0.01	23,516.1	1.0	0.2	23.8	56.9	23,596.8
Engines Only B02	2,060,340.9	98.5	10.9	114.7	2.2	2.2	0.2	0.00	0.5	0.01	23,516.1	1.0	0.2	23.8	56.9	23,596.8

OCS Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	4,348,006.0	554.6	15.2	201.4	17.0	16.5	1.1	0.002	1.5	0.1	50,097.9	1.0	1.7	23.9	493.9	50,615.6
Offshore Substation Installation (OSS)	347,029.6	44.5	1.2	16.0	1.4	1.3	0.1	0.000	0.1	0.0	3,991.1	0.1	0.1	1.9	40.0	4,033.0
Scour Protection	347,029.6	152.7	3.4	36.3	5.3	5.1	1.0	0.001	0.5	0.0	10,148.6	0.1	0.5	1.6	146.7	10,296.9
Inter Array Cable Installation	1,007,319.2	167.5	3.9	39.6	5.9	5.7	1.1	0.001	0.5	0.1	11,162.4	0.1	0.5	1.7	161.5	11,325.7
WTG Installation	6,684,714.4	1,265.8	17.9	286.8	38.5	37.3	1.8	0.006	2.7	0.1	79,231.0	0.5	3.8	12.3	1,131.7	80,375.0
Export Cable Installation	2,341,195.9	393.2	8.0	94.7	13.4	13.0	1.9	0.002	1.1	0.1	26,064.6	0.2	1.3	4.1	375.4	26,444.1
Fuel Bunkering	466,992.7	62.8	2.1	20.7	2.3	2.2	0.2	0.000	0.2	0.0	5,254.6	0.1	0.2	2.2	55.8	5,312.6
Commissioning Generators	149,185.7	13.0	1.6	11.5	0.2	0.2	0.0	0.000	0.0	0.0	1,702.8	0.1	0.0	1.7	4.1	1,708.6
Miscellaneous	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	15,691,473.0	2,654.2	54.2	706.9	84.0	81.4	7.3	0.01	6.8	0.3	187,653.0	2.0	8.1	49.3	2,409.1	190,111.5

OCS Vessel Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	2,706,478.0	483.6	7.6	112.7	15.5	15.0	0.97	0.0	1.1	0.0	31,362.0	0.2	1.5	4.9	448.6	31,815.4
Offshore Substation Installation (OSS)	221,402.4	39.1	0.6	9.2	1.3	1.2	0.08	0.0	0.1	0.0	2,557.3	0.0	0.1	0.4	36.6	2,594.3
Scour Protection	347,029.6	152.7	3.4	36.3	5.3	5.1	0.98	0.0	0.5	0.0	10,148.6	0.1	0.5	1.6	146.7	10,296.9
Inter Array Cable Installation	1,007,319.2	167.5	3.9	39.6	5.9	5.7	1.13	0.0	0.5	0.1	11,162.4	0.1	0.5	1.7	161.5	11,325.7
WTG Installation	6,684,714.4	1,265.8	17.9	286.8	38.5	37.3	1.82	0.0	2.7	0.1	79,231.0	0.5	3.8	12.3	1,131.7	80,375.0
Export Cable Installation	2,341,195.9	393.2	8.0	94.7	13.4	13.0	1.90	0.0	1.1	0.1	26,064.6	0.2	1.3	4.1	375.4	26,444.1
Fuel Bunkering	322,992.7	53.9	1.0	12.9	1.8	1.8	0.17	0.0	0.1	0.0	3,611.0	0.0	0.2	0.6	51.8	3,663.4
Commissioning Generators	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	13,631,132.1	2,555.7	42.4	592.2	81.8	79.2	7.0	0.01	6.3	0.3	164,136.9	1.0	7.9	25.5	2,352.3	166,514.6

OCS Non-Vessel Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	1,641,528.0	71.1	7.6	88.7	1.4	1.4	0.17	0.00	0.40	0.01	18,735.9	0.76	0.15	19.0	45.3	18,800.2
Offshore Substation Installation (OSS)	125,627.1	5.4	0.6	6.8	0.1	0.1	0.01	0.00	0.03	0.00	1,433.9	0.06	0.01	1.5	3.5	1,438.8
Scour Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0
Inter Array Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0
WTG Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0
Export Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0
Fuel Bunkering	144,000.0	8.9	1.1	7.8	0.4	0.4	0.02	0.00	0.02	0.00	1,643.6	0.07	0.01	1.7	4.0	1,649.2
Commissioning Generators	149,185.7	13.0	1.6	11.5	0.2	0.2	0.02	0.00	0.04	0.00	1,702.8	0.07	0.01	1.7	4.1	1,708.6
Miscellaneous	0.0	0.0	0.9	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0
Total B02	2,060,340.9	98.5	11.8	114.7	2.2	2.2	0.22	0.00	0.48	0.01	23,516.1	0.95	0.19	23.8	56.9	23,596.8
Engines Only B02	2,060,340.9	98.5	10.9	114.7	2.2	2.2	0.22	0.00	0.5	0.01	23,516.1	0.95	0.19	23.8	56.9	23,596.8

Peak Year OCS Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	3,043,604.2	388.3	10.6	141.0	11.9	11.5	0.8	0.002	1.1	0.0	35,068.5	0.7	1.2	16.7	345.7	35,430.9
Offshore Substation Installation (OSS)	347,029.6	44.5	1.2	16.0	1.4	1.3	0.1	0.000	0.1	0.0	3,991.1	0.1	0.1	1.9	40.0	4,033.0
Scour Protection	242,920.7	106.9	2.4	25.4	3.7	3.6	0.7	0.000	0.3	0.0	7,104.0	0.0	0.3	1.1	102.7	7,207.8
Inter Array Cable Installation	1,007,319.2	167.5	3.9	39.6	5.9	5.7	1.1	0.001	0.5	0.1	11,162.4	0.1	0.5	1.7	161.5	11,325.7
WTG Installation	4,718,622.0	893.5	12.6	202.5	27.2	26.3	1.3	0.004	1.9	0.1	55,927.8	0.3	2.7	8.6	798.9	56,735.3
Export Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fuel Bunkering	233,496.3	31.4	1.0	10.4	1.1	1.1	0.1	0.000	0.1	0.0	2,627.3	0.0	0.1	1.1	27.9	2,656.3
Commissioning Generators	149,185.7	13.0	1.6	11.5	0.2	0.2	0.0	0.000	0.0	0.0	1,702.8	0.1	0.0	1.7	4.1	1,708.6
Miscellaneous	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	9,742,177.7	1,645.1	33.8	446.2	51.4	49.8	4.1	0.007	4.2	0.2	117,583.9	1.3	5.0	32.9	1,480.8	119,097.6

Peak Year OCS Vessel Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	1,894,534.6	338.5	5.3	78.9	10.9	10.5	0.7	0.002	0.8	0.0	21,953.4	0.1	1.1	3.4	314.0	22,270.8
Offshore Substation Installation (OSS)	221,402.4	39.1	0.6	9.2	1.3	1.2	0.1	0.000	0.1	0.0	2,557.3	0.0	0.1	0.4	36.6	2,594.3
Scour Protection	242,920.7	106.9	2.4	25.4	3.7	3.6	0.7	0.000	0.3	0.0	7,104.0	0.0	0.3	1.1	102.7	7,207.8
Inter Array Cable Installation	1,007,319.2	167.5	3.9	39.6	5.9	5.7	1.1	0.001	0.5	0.1	11,162.4	0.1	0.5	1.7	161.5	11,325.7
WTG Installation	4,718,622.0	893.5	12.6	202.5	27.2	26.3	1.3	0.004	1.9	0.1	55,927.8	0.3	2.7	8.6	798.9	56,735.3
Export Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fuel Bunkering	161,496.3	27.0	0.5	6.5	0.9	0.9	0.1	0.000	0.1	0.0	1,805.5	0.0	0.1	0.3	25.9	1,831.7
Commissioning Generators	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	8,246,295.2	1,572.4	25.4	362.0	49.8	48.3	3.9	0.007	3.8	0.2	100,510.3	0.6	4.8	15.6	1,439.6	101,965.5

Peak Year OCS Non-Vessel Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	1,149,069.6	49.8	5.3	62.1	1.0	1.0	0.12	0.00	0.28	0.01	13,115.2	0.53	0.11	13.3	31.7	13,160.2
Offshore Substation Installation (OSS)	125,627.1	5.4	0.6	6.8	0.1	0.1	0.01	0.00	0.03	0.00	1,433.9	0.06	0.01	1.5	3.5	1,438.8
Scour Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0
Inter Array Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0
WTG Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0
Export Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0
Fuel Bunkering	72,000.0	4.4	0.6	3.9	0.2	0.2	0.01	0.00	0.01	0.00	821.8	0.03	0.01	0.8	2.0	824.6
Commissioning Generators	149,185.7	13.0	1.6	11.5	0.2	0.2	0.02	0.00	0.04	0.00	1,702.8	0.07	0.01	1.7	4.1	1,708.6
Miscellaneous	0.0	0.0	0.4	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0
Total B02	1,495,882.5	72.7	8.5	84.3	1.6	1.6	0.16	0.00	0.36	0.01	17,073.6	0.69	0.14	17.3	41.3	17,132.2
Engines Only B02	1,495,882.5	72.7	8.0	84.3	1.6	1.6	0.16	0.00	0.36	0.01	17,073.6	0.69	0.14	17.3	41.3	17,132.2

Year 1 OCS Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	1,304,401.8	166.4	4.6	60.4	5.1	4.9	0.3	0.001	0.5	0.0	15,029.4	0.3	0.5	7.2	148.2	15,184.7
Offshore Substation Installation (OSS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scour Protection	104,108.9	45.8	1.0	10.9	1.6	1.5	0.3	0.000	0.1	0.0	3,044.6	0.0	0.1	0.5	44.0	3,089.1
Inter Array Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WTG Installation	1,966,092.5	372.3	5.3	84.4	11.3	11.0	0.5	0.002	0.8	0.0	23,303.2	0.1	1.1	3.6	332.9	23,639.7
Export Cable Installation	2,341,195.9	393.2	8.0	94.7	13.4	13.0	1.9	0.002	1.1	0.1	26,064.6	0.2	1.3	4.1	375.4	26,444.1
Fuel Bunkering	233,496.3	31.4	1.0	10.4	1.1	1.1	0.1	0.000	0.1	0.0	2,627.3	0.0	0.1	1.1	27.9	2,656.3
Commissioning Generators	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	5,949,295.3	1,009.1	20.3	260.7	32.6	31.6	3.2	0.004	2.6	0.1	70,069.1	0.7	3.1	16.4	928.3	71,013.8

Year 2 OCS Emissions																
Activity Group	Fuel Consumption (gal)	Emissions (tons)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	3,043,604.2	388.3	10.6	141.0	11.9	11.5	0.8	0.002	1.1	0.0	35,068.5	0.7	1.2	16.7	345.7	35,430.9
Offshore Substation Installation (OSS)	347,029.6	44.5	1.2	16.0	1.4	1.3	0.1	0.000	0.1	0.0	3,991.1	0.1	0.1	1.9	40.0	4,033.0
Scour Protection	242,920.7	106.9	2.4	25.4	3.7	3.6	0.7	0.000	0.3	0.0	7,104.0	0.0	0.3	1.1	102.7	7,207.8
Inter Array Cable Installation	1,007,319.2	167.5	3.9	39.6	5.9	5.7	1.1	0.001	0.5	0.1	11,162.4	0.1	0.5	1.7	161.5	11,325.7
WTG Installation	4,718,622.0	893.5	12.6	202.5	27.2	26.3	1.3	0.004	1.9	0.1	55,927.8	0.3	2.7	8.6	798.9	56,735.3
Export Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fuel Bunkering	233,496.3	31.4	1.0	10.4	1.1	1.1	0.1	0.000	0.1	0.0	2,627.3	0.0	0.1	1.1	27.9	2,656.3
Commissioning Generators	149,185.7	13.0	1.6	11.5	0.2	0.2	0.0	0.000	0.0	0.0	1,702.8	0.1	0.0	1.7	4.1	1,708.6
Miscellaneous	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	9,742,177.7	1,645.1	33.8	446.2	51.4	49.8	4.1	0.007	4.2	0.2	117,583.9	1.3	5.0	32.9	1,480.8	119,097.6

Total Emissions															
Activity Group	Fuel Consumption (gal)	Emissions (tons)													
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	3,370,306.2	447.1	11.6	153.7	13.9	13.5	1.0	0.002	1.2	38,752.2	0.7	1.4	17.0	402.9	39,172.1
Offshore Substation Installation (OSS)	280,237.4	41.4	0.9	12.5	1.3	1.3	0.1	0.000	0.1	3,253.6	0.0	0.1	1.1	38.0	3,292.7
Scour Protection	681,350.4	113.6	2.6	27.0	4.0	3.8	0.7	0.000	0.4	7,553.6	0.0	0.4	1.2	109.2	7,664.0
Inter Array Cable Installation	786,571.5	130.7	3.0	30.9	4.6	4.4	0.9	0.001	0.4	8,715.5	0.1	0.4	1.4	126.1	8,843.0
WTG Installation	5,083,172.5	972.4	13.7	220.3	29.5	28.6	1.4	0.004	2.1	60,864.6	0.4	2.9	9.4	869.3	61,743.3
Export Cable Installation	2,361,137.0	396.4	8.1	95.4	13.6	13.1	1.9	0.002	1.2	26,281.4	0.2	1.3	4.1	378.6	26,664.0
Fuel Bunkering	379,578.1	53.0	1.6	16.6	1.9	1.9	0.2	0.000	0.1	4,266.1	0.1	0.2	1.6	47.9	4,315.6
Commissioning Generators	60,205.7	5.2	0.6	4.6	0.1	0.1	0.0	0.000	0.0	687.2	0.0	0.0	0.7	1.7	689.5
Miscellaneous	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	13,002,558.7	2,159.8	43.0	560.8	68.9	66.8	6.2	0.009	5.6	150,374.1	1.5	6.6	36.4	1,973.8	152,384.3

Vessel Emissions															
Activity Group	Fuel Consumption (gal)	Emissions (tons)													
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	2,253,620.5	398.7	6.4	93.4	12.9	12.5	0.9	0.002	1.0	26,006.6	0.2	1.2	4.0	372.1	26,382.8
Offshore Substation Installation (OSS)	217,423.9	38.7	0.6	9.1	1.3	1.2	0.1	0.000	0.1	2,536.6	0.0	0.1	0.4	36.3	2,573.3
Scour Protection	681,350.4	113.6	2.6	27.0	4.0	3.8	0.7	0.000	0.4	7,553.6	0.0	0.4	1.2	109.2	7,664.0
Inter Array Cable Installation	786,571.5	130.7	3.0	30.9	4.6	4.4	0.9	0.001	0.4	8,715.5	0.1	0.4	1.4	126.1	8,843.0
WTG Installation	5,083,172.5	972.4	13.7	220.3	29.5	28.6	1.4	0.004	2.1	60,864.6	0.4	2.9	9.4	869.3	61,743.3
Export Cable Installation	2,361,137.0	396.4	8.1	95.4	13.6	13.1	1.9	0.002	1.2	26,281.4	0.2	1.3	4.1	378.6	26,664.0
Fuel Bunkering	281,863.8	47.0	0.9	11.3	1.6	1.6	0.2	0.000	0.1	3,150.8	0.0	0.2	0.5	45.2	3,196.5
Commissioning Generators	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	11,665,139.5	2,097.5	35.3	487.2	67.5	65.3	6.0	0.009	5.2	135,109.2	0.8	6.5	21.0	1,936.9	137,067.0

Non-Vessel Emissions															
Activity Group	Fuel Consumption (gal)	Emissions (tons)													
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	1,116,685.7	48.4	5.2	60.3	1.0	1.0	0.1	0.00	0.3	12,745.5	0.5	0.1	12.9	30.8	12,789.3
Offshore Substation Installation (OSS)	62,813.6	2.7	0.3	3.4	0.1	0.1	0.0	0.00	0.0	716.9	0.0	0.0	0.7	1.7	719.4
Scour Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inter Array Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WTG Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Export Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fuel Bunkering	97,714.3	6.0	0.7	5.3	0.3	0.3	0.0	0.00	0.0	1,115.3	0.0	0.0	1.1	2.7	1,119.1
Commissioning Generators	60,205.7	5.2	0.6	4.6	0.1	0.1	0.0	0.00	0.0	687.2	0.0	0.0	0.7	1.7	689.5
Miscellaneous	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	1,337,419.3	62.3	7.7	73.6	1.4	1.4	0.1	0.00	0.3	15,264.9	0.6	0.1	15.5	36.9	15,317.3
Engines Only B02		62.3	6.8	73.6	1.4	1.4	0.1	0.00	0.3	15,264.9	0.6	0.1	15.5	36.9	15,317.3

OCS Emissions															
Activity Group	Fuel Consumption (gal)	Emissions (tons)													
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	2,954,506.7	376.7	10.3	136.9	11.5	11.2	0.8	0.001	1.1	34,040.5	0.6	1.1	16.2	335.4	34,392.1
Offshore Substation Installation (OSS)	173,514.8	22.3	0.6	8.0	0.7	0.7	0.0	0.000	0.1	1,995.6	0.0	0.1	0.9	20.0	2,016.5
Scour Protection	173,514.8	104.2	2.4	24.8	3.6	3.5	0.7	0.000	0.3	6,926.1	0.0	0.3	1.1	100.1	7,027.4
Inter Array Cable Installation	693,173.4	115.3	2.7	27.2	4.0	3.9	0.8	0.000	0.4	7,682.7	0.0	0.4	1.2	111.1	7,795.1
WTG Installation	4,514,956.4	862.0	12.2	195.3	26.2	25.4	1.2	0.004	1.9	53,954.7	0.3	2.6	8.3	770.7	54,733.7
Export Cable Installation	1,171,744.1	196.8	4.0	47.4	6.7	6.5	0.9	0.001	0.6	13,045.1	0.1	0.6	2.0	187.9	13,235.0
Fuel Bunkering	317,866.4	42.8	1.4	14.1	1.6	1.5	0.1	0.000	0.1	3,576.5	0.1	0.1	1.5	38.0	3,616.0
Commissioning Generators	60,205.7	5.2	0.6	4.6	0.1	0.1	0.0	0.000	0.0	687.2	0.0	0.0	0.7	1.7	689.5
Miscellaneous	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	10,059,482.4	1,725.3	35.0	458.3	54.5	52.8	4.6	0.007	4.4	121,908.4	1.3	5.3	32.0	1,564.9	123,505.4

Total Emissions															
Activity Group	Fuel Consumption (gal)	Emissions (tons)													
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	2,383,810.4	317.5	8.2	108.6	9.9	9.6	0.7	0.001	0.9	27,423.2	0.5	1.0	11.9	286.3	27,721.4
Offshore Substation Installation (OSS)	280,237.4	41.4	0.9	12.5	1.3	1.3	0.1	0.000	0.1	3,253.6	0.0	0.1	1.1	38.0	3,292.7
Scour Protection	495,091.4	82.5	1.9	19.6	2.9	2.8	0.5	0.000	0.3	5,487.9	0.0	0.3	0.9	79.4	5,568.1
Inter Array Cable Installation	592,150.5	98.4	2.3	23.2	3.5	3.3	0.7	0.000	0.3	6,561.1	0.0	0.3	1.0	94.9	6,657.1
WTG Installation	3,564,771.6	681.9	9.6	154.5	20.7	20.1	1.0	0.003	1.5	42,686.5	0.3	2.0	6.6	609.7	43,302.8
Export Cable Installation	2,361,137.0	396.4	8.1	95.4	13.6	13.1	1.9	0.002	1.2	26,281.4	0.2	1.3	4.1	378.6	26,664.0
Fuel Bunkering	266,721.5	37.3	1.1	11.6	1.3	1.3	0.1	0.000	0.1	2,997.7	0.0	0.1	1.1	33.7	3,032.5
Commissioning Generators	49,302.9	4.3	0.5	3.8	0.1	0.1	0.0	0.000	0.0	562.7	0.0	0.0	0.6	1.4	564.7
Miscellaneous	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	9,993,222.6	1,659.7	33.4	429.2	53.2	51.6	5.0	0.007	4.3	115,254.0	1.1	5.1	27.3	1,521.9	116,803.3

Vessel Emissions															
Activity Group	Fuel Consumption (gal)	Emissions (tons)													
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	1,602,130.4	283.7	4.6	66.4	9.2	8.9	0.6	0.001	0.7	18,501.3	0.1	0.9	2.9	264.7	18,768.9
Offshore Substation Installation (OSS)	217,423.9	38.7	0.6	9.1	1.3	1.2	0.1	0.000	0.1	2,536.6	0.0	0.1	0.4	36.3	2,573.3
Scour Protection	495,091.4	82.5	1.9	19.6	2.9	2.8	0.5	0.000	0.3	5,487.9	0.0	0.3	0.9	79.4	5,568.1
Inter Array Cable Installation	592,150.5	98.4	2.3	23.2	3.5	3.3	0.7	0.000	0.3	6,561.1	0.0	0.3	1.0	94.9	6,657.1
WTG Installation	3,564,771.6	681.9	9.6	154.5	20.7	20.1	1.0	0.003	1.5	42,686.5	0.3	2.0	6.6	609.7	43,302.8
Export Cable Installation	2,361,137.0	396.4	8.1	95.4	13.6	13.1	1.9	0.002	1.2	26,281.4	0.2	1.3	4.1	378.6	26,664.0
Fuel Bunkering	198,150.0	33.0	0.6	7.9	1.1	1.1	0.1	0.000	0.1	2,215.0	0.0	0.1	0.3	31.8	2,247.1
Commissioning Generators	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	9,030,854.8	1,614.6	27.7	376.1	52.2	50.6	4.9	0.007	4.1	104,269.8	0.6	5.0	16.2	1,495.4	105,781.4

Non-Vessel Emissions															
Activity Group	Fuel Consumption (gal)	Emissions (tons)													
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	781,680.0	33.9	3.6	42.2	0.7	0.7	0.1	0.00	0.2	8,921.9	0.4	0.1	9.0	21.6	8,952.5
Offshore Substation Installation (OSS)	62,813.6	2.7	0.3	3.4	0.1	0.1	0.0	0.00	0.0	716.9	0.0	0.0	0.7	1.7	719.4
Scour Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inter Array Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WTG Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Export Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fuel Bunkering	68,571.4	4.2	0.5	3.7	0.2	0.2	0.0	0.00	0.0	782.7	0.0	0.0	0.8	1.9	785.3
Commissioning Generators	49,302.9	4.3	0.5	3.8	0.1	0.1	0.0	0.00	0.0	562.7	0.0	0.0	0.6	1.4	564.7
Miscellaneous	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	962,367.9	45.1	5.8	53.1	1.0	1.0	0.1	0.00	0.2	10,984.2	0.4	0.1	11.1	26.6	11,021.9
Engines Only B02		45.1	5.0	53.1	1.0	1.0	0.1	0.00	0.2	10,984.2	0.4	0.1	11.1	26.6	11,021.9

OCS Emissions															
Activity Group	Fuel Consumption (gal)	Emissions (tons)													
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation Installation (FOU) B02	2,071,728.0	264.3	7.2	96.0	8.1	7.9	0.5	0.001	0.7	23,870.5	0.5	0.8	11.4	235.4	24,117.2
Offshore Substation Installation (OSS)	173,514.8	22.3	0.6	8.0	0.7	0.7	0.0	0.000	0.1	1,995.6	0.0	0.1	0.9	20.0	2,016.5
Scour Protection	173,514.8	73.1	1.7	17.4	2.5	2.5	0.5	0.000	0.2	4,860.4	0.0	0.2	0.8	70.3	4,931.4
Inter Array Cable Installation	498,752.3	83.0	1.9	19.6	2.9	2.8	0.5	0.000	0.3	5,528.3	0.0	0.3	0.9	80.0	5,609.1
WTG Installation	3,159,070.2	603.2	8.5	136.7	18.3	17.8	0.9	0.003	1.3	37,752.4	0.2	1.8	5.8	539.2	38,297.5
Export Cable Installation	1,171,744.1	196.8	4.0	47.4	6.7	6.5	0.9	0.001	0.6	13,045.1	0.1	0.6	2.0	187.9	13,235.0
Fuel Bunkering	223,160.3	30.0	1.0	9.9	1.1	1.1	0.1	0.000	0.1	2,510.9	0.0	0.1	1.1	26.7	2,538.7
Commissioning Generators	49,302.9	4.3	0.5	3.8	0.1	0.1	0.0	0.000	0.0	562.7	0.0	0.0	0.6	1.4	564.7
Miscellaneous	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total B02	7,520,787.4	1,276.9	26.3	338.7	40.5	39.2	3.5	0.005	3.3	90,125.8	0.9	3.9	23.4	1,160.8	91,310.1

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Trips	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Emissions During Construction																	
Foundation Installation (FOU) B02																	
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	6	4 x 3840kW 2 x 4800kW	24,960	3 main	Europe	2	250	1,000	10	100	0	0	0	100	7M
		Main Engine (Maneuvering)	6	4 x 3840kW 2 x 4800kW	24,960	3 main		0	250	0	10	0	294	24	7,056	7,056	7M
		Auxiliary Engine (Transit)	1	1,110	1,110	3 Auxiliary		2	250	1,000	10	100	0	0	0	100	7A
		Auxiliary Engine (Maneuvering)	1	1,110	1,110	3 Auxiliary		0	250	0	10	0	294	24	7,056	7,056	7A
Bubble Curtain Support Vessel	Tug	Main Engine (Transit)	2	5,530	11,060	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	11M
		Main Engine (Maneuvering)	2	5,530	11,060	1 & 2 main		0	91	0	10	0	294	24	7,056	7,056	11M
		Auxiliary Engine (Transit)	0	0	0	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	11A
		Auxiliary Engine (Maneuvering)	0	0	0	1 & 2 auxiliary		0	91	0	10	0	294	24	7,056	7,056	11A
Barge 1	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	50	91	9,124	7	1,303	0	0	0	1,303	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	7	0	294	24	7,056	7,056	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		50	91	9,124	7	1,303	0	0	0	1,303	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	7	0	294	24	7,056	7,056	2A
Barge 2	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	50	91	9,124	7	1,303	0	0	0	1,303	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	7	0	294	24	7,056	7,056	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		50	91	9,124	7	1,303	0	0	0	1,303	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	7	0	294	24	7,056	7,056	2A
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	50	91	9,124	7	1,303	0	0	0	1,303	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	7	0	294	24	7,056	7,056	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		50	91	9,124	7	1,303	0	0	0	1,303	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	7	0	294	24	7,056	7,056	11A
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	50	91	9,124	7	1,303	0	0	0	1,303	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	7	0	294	24	7,056	7,056	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		50	91	9,124	7	1,303	0	0	0	1,303	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	7	0	294	24	7,056	7,056	11A
Crew Transfer / PSO / Noise Monitoring Vessel	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	169	17	5,874	29	206	0	0	0	206	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	29	0	294	24	7,056	7,056	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		169	17	5,874	29	206	0	0	0	206	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	29	0	294	24	7,056	7,056	4A
Bubble Curtain Power	Air Compressor	Air Compressor	20	399	7,980	Stage III B	N/A	0	0	0	0	0	294	8	2,352	2,352	16
Hydraulic Hammer Power	Hydraulic Hammer Engine	Hammer Engine	3	597	1,791	Tier 2 Non-Road	N/A	0	0	0	0	0	294	8	2,352	2,352	18
Offshore Substation Installation (OSS)																	
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	6	4 x 3840kW 2 x 4800kW	24,960	3 main	Europe	2	250	1,000	10	100	0	0	0	100	7M
		Main Engine (Maneuvering)	6	4 x 3840kW 2 x 4800kW	24,960	3 main		0	250	0	10	0	18	24	432	432	7M
		Auxiliary Engine (Transit)	1	1,110	1,110	3 Auxiliary		2	250	1,000	10	100	0	0	0	100	7A
		Auxiliary Engine (Maneuvering)	1	1,110	1,110	3 Auxiliary		0	250	0	10	0	18	24	432	432	7A
	Bubble Curtain Support Vessel	Main Engine (Transit)	2	5,530	11,060	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	11M
		Main Engine (Maneuvering)	2	5,530	11,060	1 & 2 main		0	91	0	10	0	18	24	432	432	11M
		Auxiliary Engine (Transit)	0	0	0	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	11A
		Auxiliary Engine (Maneuvering)	0	0	0	1 & 2 auxiliary		0	91	0	10	0	18	24	432	432	11A
Transport Barge 1	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	6	91	1,095	10	109	0	0	0	109	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	10	24	240	240	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		6	91	1,095	10	109	0	0	0	109	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	10	24	240	240	2A
Transport Barge 2	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	6	91	1,095	10	109	0	0	0	109	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	10	24	240	240	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		6	91	1,095	10	109	0	0	0	109	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	10	24	240	240	2A
Transport Barge 3	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	6	91	1,095	10	109	0	0	0	109	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	10	24	240	240	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		6	91	1,095	10	109	0	0	0	109	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	10	24	240	240	2A
Transport Barge 4	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	6	91	1,095	10	109	0	0	0	109	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	10	24	240	240	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		6	91	1,095	10	109	0	0	0	109	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	10	24	240	240	2A
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	6	91	1,095	10	109	0	0	0	109	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	10	24	240	240	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		6	91	1,095	10	109	0	0	0	109	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	10	24	240	240	11A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Trips	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	6	91	1,095	10	109	0	0	0	109	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	10	24	240	240	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		6	91	1,095	10	109	0	0	0	109	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	10	24	240	240	11A
US Towing Tug 3	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	6	91	1,095	10	109	0	0	0	109	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	10	24	240	240	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		6	91	1,095	10	109	0	0	0	109	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	10	24	240	240	11A
US Towing Tug 4	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	6	91	1,095	10	109	0	0	0	109	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	10	24	240	240	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		6	91	1,095	10	109	0	0	0	109	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	10	24	240	240	11A
	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	14	17	487	29	17	0	0	0	17	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	29	0	56	24	1,344	1,344	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		14	17	487	29	17	0	0	0	17	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	29	0	56	24	1,344	1,344	4A
	Bubble Curtain Power	Air Compressor	20	399	7,980	Stage III B	N/A	0	0	0	0	0	18	10	180	180	16
	Hydraulic Hammer Power	Hammer Engine	3	597	1,791	Tier 2 Non-Road	N/A	0	0	0	0	0	18	10	180	180	18
Scour Protection																	
	Fall Pipe Vessel	Main Engine (Transit)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main	Europe	2	250	1,000	10	100	0	0	0	100	3M
		Main Engine (Maneuvering)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main		0	250	0	10	0	92	24	2,208	2,208	3M
		Auxiliary Engine (Transit)	1	2,950	2,950	1 & 2 auxiliary		2	250	1,000	10	100	0	0	0	100	3A
		Auxiliary Engine (Maneuvering)	1	2,950	2,950	1 & 2 auxiliary		0	250	0	10	0	92	24	2,208	2,208	3A
	US Dredger	Main Engine (Transit)	2	641	1,283	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	5M
		Main Engine (Maneuvering)	2	641	1,283	1 & 2 main		0	91	0	10	0	58	24	1,392	1,392	5M
		Auxiliary Engine (Transit)	1	954	954	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	5A
		Auxiliary Engine (Maneuvering)	1	954	954	1 & 2 auxiliary		0	91	0	10	0	58	24	1,392	1,392	5A
Inter Array Cable Installation																	
Cable Installation Vessel	Cable Installation Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	Europe	2	250	1,000	10	100	0	0	0	100	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	250	0	10	0	220	24	5,280	5,280	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		2	250	1,000	10	100	0	0	0	100	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	250	0	10	0	220	24	5,280	5,280	3A
Cable Installation Support Activities	Support Vessel/SOV	Main Engine (Transit)	4	1,200	4,800	1 & 2 main	Europe	2	250	1,000	10	100	0	0	0	100	3M
		Main Engine (Maneuvering)	4	1,200	4,800	1 & 2 main		0	250	0	10	0	138	24	3,307	3,307	3M
		Auxiliary Engine (Transit)	1	800	800	1 & 2 auxiliary		2	250	1,000	10	100	0	0	0	100	3A
		Auxiliary Engine (Maneuvering)	1	800	800	1 & 2 auxiliary		0	250	0	10	0	138	24	3,307	3,307	3A
Sand Wave Clearance	TSHD (Dredger)	Main Engine (Transit)	2	641	1,283	1 & 2 main	Europe	2	250	1,000	10	100	0	0	0	100	5M
		Main Engine (Maneuvering)	2	641	1,283	1 & 2 main		0	250	0	10	0	144	24	3,453	3,453	5M
		Auxiliary Engine (Transit)	1	954	954	1 & 2 auxiliary		2	250	1,000	10	100	0	0	0	100	5A
		Auxiliary Engine (Maneuvering)	1	954	954	1 & 2 auxiliary		0	250	0	10	0	144	24	3,453	3,453	5A
Pre Lay Grapnel Run AHTS 1	AHTS	Main Engine (Transit)	2	4,500	9,000	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	11M
		Main Engine (Maneuvering)	2	4,500	9,000	1 & 2 main		0	91	0	10	0	21	24	507	507	11M
		Auxiliary Engine (Transit)	2	410	820	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	11A
		Auxiliary Engine (Maneuvering)	2	410	820	1 & 2 auxiliary		0	91	0	10	0	21	24	507	507	11A
Pre Lay Grapnel Run AHTS 2	AHTS	Main Engine (Transit)	2	4,500	9,000	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	11M
		Main Engine (Maneuvering)	2	4,500	9,000	1 & 2 main		0	91	0	10	0	21	24	507	507	11M
		Auxiliary Engine (Transit)	2	410	820	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	11A
		Auxiliary Engine (Maneuvering)	2	410	820	1 & 2 auxiliary		0	91	0	10	0	21	24	507	507	11A
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main	Europe	2	250	1,000	10	100	0	0	0	100	3M
		Main Engine (Maneuvering)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main		0	250	0	10	0	3	24	67	67	3M
		Auxiliary Engine (Transit)	1	2,950	2,950	1 & 2 auxiliary		2	250	1,000	10	100	0	0	0	100	3A
		Auxiliary Engine (Maneuvering)	1	2,950	2,950	1 & 2 auxiliary		0	250	0	10	0	3	24	67	67	3A
WTG Installation																	
WTG Installation Vessel	Jackup Vessel	Main Engine (Transit)	7	4 x 3,535kW 3 x 2,650kW	22,090	3 main	NJWP	2	91	365	10	36	0	0	0	36	7M
		Main Engine (Maneuvering)	7	4 x 3,535kW 3 x 2,650kW	22,090	3 main		0	91	0	10	0	517	24	12,410	12,410	7M
		Auxiliary Engine (Transit)	1	2,650	2,650	3 Auxiliary		2	91	365	10	36	0	0	0	36	7A
		Auxiliary Engine (Maneuvering)	1	2,650	2,650	3 Auxiliary		0	91	0	10	0	517	24	12,410	12,410	7A
US Jack Up Feeder 1	Jack up	Main Engine (Transit)	2	2,500	5,000	3 main	NJWP	100	91	18,249	10	1,825	0	0	0	1,825	7M
		Main Engine (Maneuvering)	2	2,500	5,000	3 main		0	91	0	10	0	238	24	5,723	5,723	7M
		Auxiliary Engine (Transit)	1	2,500	2,500	1 & 2 auxiliary		100	91	18,249	10	1,825	0	0	0	1,825	7A
		Auxiliary Engine (Maneuvering)	1	2,500	2,500	1 & 2 auxiliary		0	91	0	10	0	238	24	5,723	5,723	7A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Trips	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
US Jack Up Feeder 2	Jack up	Main Engine (Transit)	2	2,500	5,000	3 main	NJWP	100	91	18,249	10	1,825	0	0	0	1,825	7M
		Main Engine (Maneuvering)	2	2,500	5,000	3 main		0	91	0	10	0	238	24	5,723	5,723	7M
		Auxiliary Engine (Transit)	1	2,500	2,500	1 & 2 auxiliary		100	91	18,249	10	1,825	0	0	0	1,825	7A
		Auxiliary Engine (Maneuvering)	1	2,500	2,500	1 & 2 auxiliary		0	91	0	10	0	238	24	5,723	5,723	7A
Crew Transfer	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	130	17	4,519	29	159	0	0	0	159	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	29	0	517	24	12,410	12,410	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		130	17	4,519	29	159	0	0	0	159	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	29	0	517	24	12,410	12,410	4A
WTG Commissioning SOV	Service Operation Vessel	Main Engine (Transit)	4	1,200	4,800	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	3M
		Main Engine (Maneuvering)	4	1,200	4,800	1 & 2 main		0	91	0	10	0	517	24	12,410	12,410	3M
		Auxiliary Engine (Transit)	1	800	800	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	3A
		Auxiliary Engine (Maneuvering)	1	800	800	1 & 2 auxiliary		0	91	0	10	0	517	24	12,410	12,410	3A
Export Cable Installation																	
Cable Installation Vessel 1	Cable Installation Vessel	Main Engine (Transit)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	3M
		Main Engine (Maneuvering)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main		0	91	0	10	0	348	24	8,352	8,352	3M
		Auxiliary Engine (Transit)	2	1,400	2,800	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	3A
		Auxiliary Engine (Maneuvering)	2	1,400	2,800	1 & 2 auxiliary		0	91	0	10	0	348	24	8,352	8,352	3A
Cable Installation Vessel 2	Cable Installation Vessel	Main Engine (Transit)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	3M
		Main Engine (Maneuvering)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main		0	91	0	10	0	348	24	8,352	8,352	3M
		Auxiliary Engine (Transit)	2	1,400	2,800	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	3A
		Auxiliary Engine (Maneuvering)	2	1,400	2,800	1 & 2 auxiliary		0	91	0	10	0	348	24	8,352	8,352	3A
Support and Jointing Vessel	Support Vessel	Main Engine (Transit)	3	2 x 2350kW 1 x 1786kW	6,486	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	3M
		Main Engine (Maneuvering)	3	2 x 2350kW 1 x 1786kW	6,486	1 & 2 main		0	91	0	10	0	70	24	1,680	1,680	3M
		Auxiliary Engine (Transit)	2	994	1,988	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	3A
		Auxiliary Engine (Maneuvering)	2	994	1,988	1 & 2 auxiliary		0	91	0	10	0	70	24	1,680	1,680	3A
TSHD	Dredger	Main Engine (Transit)	2	641	1,283	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	5M
		Main Engine (Maneuvering)	2	641	1,283	1 & 2 main		0	91	0	10	0	253	24	6,072	6,072	5M
		Auxiliary Engine (Transit)	1	954	954	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	5A
		Auxiliary Engine (Maneuvering)	1	954	954	1 & 2 auxiliary		0	91	0	10	0	253	24	6,072	6,072	5A
AHTS	Tug	Main Engine (Transit)	2	4,500	9,000	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	11M
		Main Engine (Maneuvering)	2	4,500	9,000	1 & 2 main		0	91	0	10	0	103	24	2,472	2,472	11M
		Auxiliary Engine (Transit)	2	410	820	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	11A
		Auxiliary Engine (Maneuvering)	2	410	820	1 & 2 auxiliary		0	91	0	10	0	103	24	2,472	2,472	11A
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main	Europe	2	250	1,000	10	100	0	0	0	100	3M
		Main Engine (Maneuvering)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main		0	250	0	10	0	6	24	144	144	3M
		Auxiliary Engine (Transit)	1	2,950	2,950	1 & 2 auxiliary		2	250	1,000	10	100	0	0	0	100	3A
		Auxiliary Engine (Maneuvering)	1	2,950	2,950	1 & 2 auxiliary		0	250	0	10	0	6	24	144	144	3A
Fuel Bunkering																	
Towing Tug	Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	24	91	4,380	10	438	0	0	0	438	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	168	24	4,032	4,032	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		24	91	4,380	10	438	0	0	0	438	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	168	24	4,032	4,032	11A
Barge	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	24	91	4,380	10	438	0	0	0	438	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	168	24	4,032	4,032	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		24	91	4,380	10	438	0	0	0	438	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	168	24	4,032	4,032	2A
Motion Compensation	Motion Compensation	Motion Compensation Engine	1	500	500	Tier 3 Non-Road	NJWP	0	91	0	0	0	168	24	4,032	4,032	17
Commissioning Generators																	
OSS Commissioning Generators	Generator	Marine Tier 3 Generator	8	500	4,000	Marine Tier 3	N/A	0	0	0	0	0	56	12	672	672	31
WTG Commissioning Generators	Generator	Marine Tier 3 Generator	1	240	240	Marine Tier 3	N/A	0	0	0	0	0	517	12	6,205	6,205	32
Miscellaneous																	
Marine Paint	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fuel Evaporation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
US Jack Up Feeder 2	Jack up	Main Engine (Transit)	0.83	435,034	83.73	1.17	19.20	2.59	2.50	0.11	0.00	0.18	0.0050	5,401.79	0.03	0.26	0.83	77.12	5,479.74
		Main Engine (Maneuvering)	0.20	328,773	63.28	0.88	14.51	1.96	1.89	0.08	0.00	0.14	0.0038	4,082.36	0.03	0.20	0.63	58.28	4,141.27
		Auxiliary Engine (Transit)	0.43	124,586	24.98	0.30	5.36	0.69	0.67	0.01	0.00	0.05	0.0006	1,401.68	0.01	0.07	0.22	19.98	1,421.87
		Auxiliary Engine (Maneuvering)	0.43	390,742	78.33	0.95	16.82	2.17	2.10	0.04	0.00	0.15	0.0019	4,396.13	0.03	0.21	0.68	62.65	4,459.46
Crew Transfer	Crew Transfer Vessel	Main Engine (Transit)	0.83	17,450	2.77	0.04	0.70	0.09	0.09	0.00	0.00	0.01	0.0001	196.31	0.00	0.01	0.03	2.80	199.14
		Main Engine (Maneuvering)	0.20	329,122	52.27	0.80	13.14	1.77	1.71	0.03	0.00	0.12	0.0016	3,702.63	0.02	0.18	0.57	52.77	3,755.97
		Auxiliary Engine (Transit)	0.43	234	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	2.63	0.00	0.00	0.00	0.04	2.67
		Auxiliary Engine (Maneuvering)	0.43	18,301	3.30	0.04	0.79	0.10	0.10	0.00	0.00	0.01	0.0001	205.90	0.00	0.01	0.03	2.93	208.86
WTG Commissioning SOV	Service Operation Vessel	Main Engine (Transit)	0.16	1,780	0.29	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.0001	19.62	0.00	0.00	0.00	0.29	19.91
		Main Engine (Maneuvering)	0.10	394,004	64.90	1.71	15.05	2.33	2.26	0.58	0.00	0.23	0.0267	4,342.70	0.03	0.21	0.68	63.18	4,406.56
		Auxiliary Engine (Transit)	0.16	297	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	3.34	0.00	0.00	0.00	0.05	3.39
		Auxiliary Engine (Maneuvering)	0.10	65,667	11.27	0.16	2.83	0.36	0.35	0.01	0.00	0.02	0.0003	738.81	0.00	0.04	0.11	10.53	749.45
Export Cable Installation																			
Cable Installation Vessel 1	Cable Installation Vessel	Main Engine (Transit)	0.83	17,211	2.83	0.07	0.66	0.10	0.10	0.03	0.00	0.01	0.0012	189.69	0.00	0.01	0.03	2.76	192.48
		Main Engine (Maneuvering)	0.20	949,035	156.32	4.12	36.24	5.60	5.44	1.40	0.00	0.57	0.0643	10,460.23	0.07	0.51	1.65	152.17	10,614.04
		Auxiliary Engine (Transit)	0.56	3,634	0.62	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.0000	40.89	0.00	0.00	0.01	0.58	41.48
		Auxiliary Engine (Maneuvering)	0.56	831,706	142.77	2.02	35.80	4.62	4.48	0.09	0.00	0.32	0.0040	9,357.28	0.06	0.45	1.44	133.36	9,492.09
Cable Installation Vessel 2	Cable Installation Vessel	Main Engine (Transit)	0.83	17,211	2.83	0.07	0.66	0.10	0.10	0.03	0.00	0.01	0.0012	189.69	0.00	0.01	0.03	2.76	192.48
		Main Engine (Maneuvering)	0.20	949,035	156.32	4.12	36.24	5.60	5.44	1.40	0.00	0.57	0.0643	10,460.23	0.07	0.51	1.65	152.17	10,614.04
		Auxiliary Engine (Transit)	0.56	3,634	0.62	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.0000	40.89	0.00	0.00	0.01	0.58	41.48
		Auxiliary Engine (Maneuvering)	0.56	831,706	142.77	2.02	35.80	4.62	4.48	0.09	0.00	0.32	0.0040	9,357.28	0.06	0.45	1.44	133.36	9,492.09
Support and Jointing Vessel	Support Vessel	Main Engine (Transit)	0.83	12,478	2.06	0.05	0.48	0.07	0.07	0.02	0.00	0.01	0.0008	137.53	0.00	0.01	0.02	2.00	139.55
		Main Engine (Maneuvering)	0.20	138,404	22.80	0.60	5.28	0.82	0.79	0.20	0.00	0.08	0.0094	1,525.48	0.01	0.07	0.24	22.19	1,547.92
		Auxiliary Engine (Transit)	0.56	2,580	0.44	0.01	0.11	0.01	0.01	0.00	0.00	0.00	0.0000	29.03	0.00	0.00	0.00	0.41	29.45
		Auxiliary Engine (Maneuvering)	0.56	118,781	20.39	0.29	5.11	0.66	0.64	0.01	0.00	0.05	0.0006	1,336.37	0.01	0.06	0.21	19.05	1,355.62
TSHD	Dredger	Main Engine (Transit)	0.83	2,468	0.41	0.01	0.09	0.02	0.01	0.00	0.00	0.00	0.0002	27.01	0.00	0.00	0.00	0.40	27.41
		Main Engine (Maneuvering)	0.20	98,921	16.48	0.48	3.66	0.62	0.58	0.19	0.00	0.06	0.0088	1,082.75	0.01	0.05	0.17	15.86	1,098.78
		Auxiliary Engine (Transit)	0.56	1,239	0.21	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.0000	13.94	0.00	0.00	0.00	0.20	14.14
		Auxiliary Engine (Maneuvering)	0.56	206,123	35.24	0.50	8.87	1.14	1.11	0.02	0.00	0.08	0.0010	2,319.03	0.01	0.11	0.36	33.05	2,352.44
AHTS	Tug	Main Engine (Transit)	0.83	17,315	2.86	0.05	0.69	0.10	0.10	0.01	0.00	0.01	0.0005	193.44	0.00	0.01	0.03	2.78	196.24
		Main Engine (Maneuvering)	0.20	282,588	46.69	0.88	11.23	1.62	1.57	0.16	0.00	0.13	0.0074	3,157.05	0.02	0.15	0.49	45.31	3,202.85
		Auxiliary Engine (Transit)	0.43	817	0.14	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.0000	9.20	0.00	0.00	0.00	0.13	9.33
		Auxiliary Engine (Maneuvering)	0.43	55,356	9.70	0.13	2.38	0.31	0.30	0.01	0.00	0.02	0.0003	622.79	0.00	0.03	0.10	8.88	631.77
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	0.83	112,804	18.58	0.49	4.31	0.67	0.65	0.17	0.00	0.07	0.0076	1,243.32	0.01	0.06	0.20	18.09	1,261.60
		Main Engine (Maneuvering)	0.20	39,142	6.45	0.17	1.49	0.23	0.22	0.06	0.00	0.02	0.0027	431.42	0.00	0.02	0.07	6.28	437.76
		Auxiliary Engine (Transit)	0.56	10,492	1.80	0.03	0.45	0.06	0.06	0.00	0.00	0.00	0.0001	118.04	0.00	0.01	0.02	1.68	119.74
		Auxiliary Engine (Maneuvering)	0.56	15,108	2.59	0.04	0.65	0.08	0.08	0.00	0.00	0.01	0.0001	169.98	0.00	0.01	0.03	2.42	172.42
Fuel Bunkering																			
Towing Tug	Tug	Main Engine (Transit)	0.83	116,582	19.26	0.36	4.63	0.67	0.65	0.07	0.00	0.05	0.0031	1,302.44	0.01	0.06	0.20	18.69	1,321.34
		Main Engine (Maneuvering)	0.20	258,621	42.73	0.81	10.28	1.48	1.44	0.15	0.00	0.12	0.0068	2,889.30	0.02	0.14	0.45	41.47	2,931.21
		Auxiliary Engine (Transit)	0.43	2,823	0.49	0.01	0.12	0.02	0.02	0.00	0.00	0.00	0.0000	31.76	0.00	0.00	0.00	0.45	32.21
		Auxiliary Engine (Maneuvering)	0.43	25,986	4.56	0.06	1.12	0.14	0.14	0.00	0.00	0.01	0.0001	292.36	0.00	0.01	0.05	4.17	296.57
Barge	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.20	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	598	0.13	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.0000	6.73	0.00	0.00	0.00	0.10	6.82
		Auxiliary Engine (Maneuvering)	0.43	5,505	1.20	0.01	0.24	0.03	0.03	0.00	0.00	0.00	0.0000	61.94	0.00	0.00	0.01	0.88	62.83
Motion Compensation	Motion Compensation	Motion Compensation Engine	1.00	144,000	8.89	1.10	7.78	0.44	0.44	0.02	0.00	0.02	0.0007	1,643.57	0.07	0.01	1.67	3.97	1,649.21
Commissioning Generators																			
OSS Commissioning Generators	Generator	Marine Tier 3 Generator	0.50	96,000	8.59	1.03	7.41	0.15	0.14	0.01	0.00	0.03	0.00	1,095.72	0.04	0.01	1.11	2.65	1,099.48
WTG Commissioning Generators	Generator	Marine Tier 3 Generator	0.50	53,186	4.43	0.53	4.10	0.10	0.10	0.01	0.00	0.01	0.00	607.05	0.02	0.00	0.62	1.47	609.13
Miscellaneous																			
Marine Paint	N/A	N/A	N/A	N/A	N/A	0.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fuel Evaporation	N/A	N/A	N/A	N/A	N/A	0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Construction																				
Foundation Installation (FOU) B02																				
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	25	10%	11,901	2.29	0.03	0.53	0.07	0.07	0.00	0.00	0.00	0.0001	147.77	0.00	0.01	0.02	2.11	149.90
		Main Engine (Maneuvering)	25	100%	1,011,698	194.72	2.72	44.65	6.02	5.82	0.25	0.00	0.42	0.0116	12,562.19	0.08	0.60	1.94	179.34	12,743.48
		Auxiliary Engine (Transit)	25	10%	419	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	4.44	0.00	0.00	0.00	0.06	4.51
		Auxiliary Engine (Maneuvering)	25	100%	295,532	55.84	0.68	11.99	1.55	1.50	0.03	0.00	0.11	0.0013	3,133.88	0.02	0.15	0.48	44.66	3,179.03
Bubble Curtain Support Vessel	Tug	Main Engine (Transit)	25	27%	5,830	0.96	0.02	0.23	0.03	0.03	0.00	0.00	0.00	0.0002	65.13	0.00	0.00	0.01	0.93	66.08
		Main Engine (Maneuvering)	25	100%	495,618	81.89	1.55	19.70	2.84	2.75	0.28	0.00	0.23	0.0130	5,537.00	0.03	0.27	0.86	79.47	5,617.33
		Auxiliary Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
Barge 1	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	488	0.11	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	5.49	0.00	0.00	0.00	0.08	5.57
		Auxiliary Engine (Maneuvering)	25	100%	9,635	2.10	0.02	0.41	0.05	0.05	0.00	0.00	0.00	0.0000	108.40	0.00	0.01	0.02	1.54	109.96
Barge 2	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	488	0.11	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	5.49	0.00	0.00	0.00	0.08	5.57
		Auxiliary Engine (Maneuvering)	25	100%	9,635	2.10	0.02	0.41	0.05	0.05	0.00	0.00	0.00	0.0000	108.40	0.00	0.01	0.02	1.54	109.96
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	25	27%	95,068	15.71	0.30	3.78	0.54	0.53	0.05	0.00	0.04	0.0025	1,062.09	0.01	0.05	0.17	15.24	1,077.50
		Main Engine (Maneuvering)	25	100%	226,294	37.39	0.71	8.99	1.30	1.26	0.13	0.00	0.10	0.0060	2,528.14	0.02	0.12	0.39	36.28	2,564.81
		Auxiliary Engine (Transit)	25	27%	2,302	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.0000	25.90	0.00	0.00	0.00	0.37	26.27
		Auxiliary Engine (Maneuvering)	25	100%	45,475	7.97	0.11	1.96	0.25	0.24	0.00	0.00	0.02	0.0002	511.63	0.00	0.02	0.08	7.29	519.00
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	25	27%	95,068	15.71	0.30	3.78	0.54	0.53	0.05	0.00	0.04	0.0025	1,062.09	0.01	0.05	0.17	15.24	1,077.50
		Main Engine (Maneuvering)	25	100%	226,294	37.39	0.71	8.99	1.30	1.26	0.13	0.00	0.10	0.0060	2,528.14	0.02	0.12	0.39	36.28	2,564.81
		Auxiliary Engine (Transit)	25	27%	2,302	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.0000	25.90	0.00	0.00	0.00	0.37	26.27
		Auxiliary Engine (Maneuvering)	25	100%	45,475	7.97	0.11	1.96	0.25	0.24	0.00	0.00	0.02	0.0002	511.63	0.00	0.02	0.08	7.29	519.00
Crew Transfer / PSO / Noise Monitoring Vessel	Crew Transfer Vessel	Main Engine (Transit)	17	100%	22,685	3.60	0.06	0.91	0.12	0.12	0.00	0.00	0.01	0.0001	255.21	0.00	0.01	0.04	3.64	258.89
		Main Engine (Maneuvering)	17	100%	93,565	14.86	0.23	3.74	0.50	0.49	0.01	0.00	0.04	0.0004	1,052.61	0.01	0.05	0.16	15.00	1,067.77
		Auxiliary Engine (Transit)	17	100%	304	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	3.42	0.00	0.00	0.00	0.05	3.47
		Auxiliary Engine (Maneuvering)	17	100%	10,405	1.88	0.03	0.45	0.06	0.06	0.00	0.00	0.00	0.0000	117.07	0.00	0.01	0.02	1.67	118.75
Bubble Curtain Power	Air Compressor	Air Compressor	N/A	100%	1,340,640	41.38	3.93	72.41	0.52	0.52	0.14	0.00	0.36	0.0065	15,301.68	0.62	0.12	15.52	36.99	15,354.19
Hydraulic Hammer Power	Hydraulic Hammer Engine	Hammer Engine	N/A	100%	300,888	29.72	3.68	16.25	0.93	0.93	0.03	0.00	0.03	0.0015	3,434.25	0.14	0.03	3.48	8.30	3,446.03
Offshore Substation Installation (OSS)																				
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	25	10%	11,901	2.29	0.03	0.53	0.07	0.07	0.00	0.00	0.00	0.00	147.77	0.00	0.01	0.02	2.11	149.90
		Main Engine (Maneuvering)	25	100%	61,941	11.92	0.17	2.73	0.37	0.36	0.02	0.00	0.03	0.00	769.11	0.00	0.04	0.12	10.98	780.21
		Auxiliary Engine (Transit)	25	10%	419	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	0.00	0.00	0.06	4.51
		Auxiliary Engine (Maneuvering)	25	100%	18,094	3.42	0.04	0.73	0.09	0.09	0.00	0.00	0.01	0.00	191.87	0.00	0.01	0.03	2.73	194.63
	Bubble Curtain Support Vessel	Main Engine (Transit)	25	27%	5,830	0.96	0.02	0.23	0.03	0.03	0.00	0.00	0.00	0.00	65.13	0.00	0.00	0.01	0.93	66.08
		Main Engine (Maneuvering)	25	100%	30,344	5.01	0.09	1.21	0.17	0.17	0.02	0.00	0.01	0.00	339.00	0.00	0.02	0.05	4.87	343.92
		Auxiliary Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport Barge 1	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	41	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.01	0.47
		Auxiliary Engine (Maneuvering)	25	100%	328	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.69	0.00	0.00	0.00	0.05	3.74
Transport Barge 2	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	41	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.01	0.47
		Auxiliary Engine (Maneuvering)	25	100%	328	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.69	0.00	0.00	0.00	0.05	3.74
Transport Barge 3	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	41	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.01	0.47
		Auxiliary Engine (Maneuvering)	25	100%	328	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00						

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	25	27%	7,986	1.32	0.02	0.32	0.05	0.04	0.00	0.00	0.00	0.00	89.22	0.00	0.00	0.01	1.28	90.51
		Main Engine (Maneuvering)	25	100%	7,697	1.27	0.02	0.31	0.04	0.04	0.00	0.00	0.00	0.00	85.99	0.00	0.00	0.01	1.23	87.24
		Auxiliary Engine (Transit)	25	27%	193	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.18	0.00	0.00	0.00	0.03	2.21
		Auxiliary Engine (Maneuvering)	25	100%	1,547	0.27	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	17.40	0.00	0.00	0.00	0.25	17.65
US Towing Tug 3	US Towing Tug	Main Engine (Transit)	25	27%	7,986	1.32	0.02	0.32	0.05	0.04	0.00	0.00	0.00	0.00	89.22	0.00	0.00	0.01	1.28	90.51
		Main Engine (Maneuvering)	25	100%	7,697	1.27	0.02	0.31	0.04	0.04	0.00	0.00	0.00	0.00	85.99	0.00	0.00	0.01	1.23	87.24
		Auxiliary Engine (Transit)	25	27%	193	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.18	0.00	0.00	0.00	0.03	2.21
		Auxiliary Engine (Maneuvering)	25	100%	1,547	0.27	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	17.40	0.00	0.00	0.00	0.25	17.65
US Towing Tug 4	US Towing Tug	Main Engine (Transit)	25	27%	7,986	1.32	0.02	0.32	0.05	0.04	0.00	0.00	0.00	0.00	89.22	0.00	0.00	0.01	1.28	90.51
		Main Engine (Maneuvering)	25	100%	7,697	1.27	0.02	0.31	0.04	0.04	0.00	0.00	0.00	0.00	85.99	0.00	0.00	0.01	1.23	87.24
		Auxiliary Engine (Transit)	25	27%	193	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.18	0.00	0.00	0.00	0.03	2.21
		Auxiliary Engine (Maneuvering)	25	100%	1,547	0.27	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	17.40	0.00	0.00	0.00	0.25	17.65
	Crew Transfer Vessel	Main Engine (Transit)	17	100%	1,879	0.30	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.00	21.14	0.00	0.00	0.00	0.30	21.45
		Main Engine (Maneuvering)	17	100%	17,822	2.83	0.04	0.71	0.10	0.09	0.00	0.00	0.01	0.00	200.50	0.00	0.01	0.03	2.86	203.39
		Auxiliary Engine (Transit)	17	100%	25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.29
		Auxiliary Engine (Maneuvering)	17	100%	1,982	0.36	0.00	0.09	0.01	0.01	0.00	0.00	0.00	0.00	22.30	0.00	0.00	0.00	0.32	22.62
	Bubble Curtain Power	Air Compressor	N/A	100%	102,600	3.17	0.30	5.54	0.04	0.04	0.01	0.00	0.03	0.00	1,171.05	0.05	0.01	1.19	2.83	1,175.07
	Hydraulic Hammer Power	Hammer Engine	N/A	100%	23,027	2.27	0.28	1.24	0.07	0.07	0.00	0.00	0.00	0.00	262.83	0.01	0.00	0.27	0.64	263.73
Scour Protection																				
	Fall Pipe Vessel	Main Engine (Transit)	25	10%	11,280	1.86	0.05	0.43	0.07	0.06	0.02	0.00	0.01	0.00	124.33	0.00	0.01	0.02	1.81	126.16
		Main Engine (Maneuvering)	25	100%	600,172	98.86	2.60	22.92	3.54	3.44	0.89	0.00	0.36	0.04	6,615.07	0.04	0.32	1.04	96.23	6,712.35
		Auxiliary Engine (Transit)	25	10%	1,049	0.18	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.00	11.80	0.00	0.00	0.00	0.17	11.97
		Auxiliary Engine (Maneuvering)	25	100%	231,655	39.77	0.56	9.97	1.29	1.25	0.02	0.00	0.09	0.00	2,606.29	0.02	0.12	0.40	37.14	2,643.83
	US Dredger	Main Engine (Transit)	25	27%	676	0.11	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	0.00	0.11	7.51
		Main Engine (Maneuvering)	25	100%	22,677	3.78	0.11	0.84	0.14	0.13	0.04	0.00	0.01	0.00	248.22	0.00	0.01	0.04	3.64	251.89
		Auxiliary Engine (Transit)	25	27%	339	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.82	0.00	0.00	0.00	0.05	3.87
		Auxiliary Engine (Maneuvering)	25	100%	47,254	8.08	0.11	2.03	0.26	0.25	0.00	0.00	0.02	0.00	531.64	0.00	0.03	0.08	7.58	539.30
Inter Array Cable Installation																				
Cable Installation Vessel	Cable Installation Vessel	Main Engine (Transit)	25	10%	3,837	0.63	0.02	0.15	0.02	0.02	0.01	0.00	0.00	0.00	42.30	0.00	0.00	0.01	0.62	42.92
		Main Engine (Maneuvering)	25	100%	488,234	80.42	2.12	18.64	2.88	2.80	0.72	0.00	0.29	0.03	5,381.30	0.03	0.26	0.85	78.28	5,460.43
		Auxiliary Engine (Transit)	25	10%	60	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.01	0.69
		Auxiliary Engine (Maneuvering)	25	100%	31,722	5.45	0.08	1.37	0.18	0.17	0.00	0.00	0.01	0.00	356.89	0.00	0.02	0.06	5.09	362.03
Cable Installation Support Activities	Support Vessel/SOV	Main Engine (Transit)	25	10%	488	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.38	0.00	0.00	0.00	0.08	5.45
		Main Engine (Maneuvering)	25	100%	104,983	17.29	0.46	4.01	0.62	0.60	0.15	0.00	0.06	0.01	1,157.12	0.01	0.06	0.18	16.83	1,174.13
		Auxiliary Engine (Transit)	25	10%	81	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.01	0.93
		Auxiliary Engine (Maneuvering)	25	100%	17,497	3.00	0.04	0.75	0.10	0.09	0.00	0.00	0.01	0.00	196.86	0.00	0.01	0.03	2.81	199.69
Sand Wave Clearance	TSHD (Dredger)	Main Engine (Transit)	25	10%	676	0.11	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	0.00	0.11	7.51
		Main Engine (Maneuvering)	25	100%	56,259	9.37	0.27	2.08	0.35	0.33	0.11	0.00	0.04	0.01	615.79	0.00	0.03	0.10	9.02	624.91
		Auxiliary Engine (Transit)	25	10%	339	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.82	0.00	0.00	0.00	0.05	3.87
		Auxiliary Engine (Maneuvering)	25	100%	117,229	20.04	0.28	5.05	0.65	0.63	0.01	0.00	0.04	0.00	1,318.91	0.01	0.06	0.20	18.80	1,337.91
Pre Lay Grapnel Run AHTS 1	AHTS	Main Engine (Transit)	25	27%	4,744	0.78	0.01	0.19	0.03	0.03	0.00	0.00	0.00	0.00	53.00	0.00	0.00	0.01	0.76	53.77
		Main Engine (Maneuvering)	25	100%	57,920	9.57	0.18	2.30	0.33	0.32	0.03	0.00	0.03	0.00	647.08	0.00	0.03	0.10	9.29	656.46
		Auxiliary Engine (Transit)	25	27%	224	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.52	0.00	0.00	0.00	0.04	2.56
		Auxiliary Engine (Maneuvering)	25	100%	11,346	1.99	0.03	0.49	0.06	0.06	0.00	0.00	0.00	0.00	127.65	0.00	0.01	0.02	1.82	129.49
Pre Lay Grapnel Run AHTS 2	AHTS	Main Engine (Transit)	25	27%	4,744	0.78	0.01	0.19	0.03	0.03	0.00	0.00	0.00	0.00	53.00	0.00	0.00	0.01	0.76	53.77
		Main Engine (Maneuvering)	25	100%	57,920	9.57	0.18	2.30	0.33	0.32	0.03	0.00	0.03	0.00	647.08	0.00	0.03	0.10	9.29	656.46
		Auxiliary Engine (Transit)	25	27%	224	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.52	0.00	0.00	0.00	0.04	2.56
		Auxiliary Engine (Maneuvering)	25	100%	11,346	1.99	0.03	0.49	0.06	0.06	0.00	0.00	0.00	0.00	127.65	0.00	0.01	0.02	1.82	129.49
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	25	10%	11,280	1.86	0.05	0.43	0.07	0.06	0.02	0.00	0.01	0.00	124.33	0.00	0.01	0.02	1.81	126.16
		Main Engine (Maneuvering)	25	100%	18,121	2.98	0.08	0.69	0.11	0.10	0.03	0.00	0.01	0.00	199.73	0.00	0.01	0.03	2.91	202.67
		Auxiliary Engine (Transit)	25	10%	1,049	0.18	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.00	11.80	0.00	0.00	0.00	0.17	11.97
		Auxiliary Engine (Maneuvering)	25	100%	6,994	1.20	0.02	0.30	0.04	0.04	0.00	0.00	0.00	0.00	78.69	0.00	0.00	0.01	1.12	79.83
WTG Installation																				
WTG Installation Vessel	Jackup Vessel	Main Engine (Transit)	25	27%	10,532	2.03	0.03	0.46	0.06	0.06	0.00	0.00	0.00	0.00	130.78	0.00	0.01	0.02	1.87	132.67
		Main Engine (Maneuvering)	25	100%	3,149,526	606.18	8.46	139.00	18.74	18.139										

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
US Jack Up Feeder 2	Jack up	Main Engine (Transit)	25	27%	119,197	22.94	0.32	5.26	0.71	0.69	0.03	0.00	0.05	0.00	1,480.06	0.01	0.07	0.23	21.13	1,501.42
		Main Engine (Maneuvering)	25	100%	328,773	63.28	0.88	14.51	1.96	1.89	0.08	0.00	0.14	0.00	4,082.36	0.03	0.20	0.63	58.28	4,141.27
		Auxiliary Engine (Transit)	25	27%	34,136	6.84	0.08	1.47	0.19	0.18	0.00	0.00	0.01	0.00	384.05	0.00	0.02	0.06	5.47	389.59
		Auxiliary Engine (Maneuvering)	25	100%	390,742	78.33	0.95	16.82	2.17	2.10	0.04	0.00	0.15	0.00	4,396.13	0.03	0.21	0.68	62.65	4,459.46
Crew Transfer	Crew Transfer Vessel	Main Engine (Transit)	17	100%	17,450	2.77	0.04	0.70	0.09	0.09	0.00	0.00	0.01	0.00	196.31	0.00	0.01	0.03	2.80	199.14
		Main Engine (Maneuvering)	17	100%	329,122	52.27	0.80	13.14	1.77	1.71	0.03	0.00	0.12	0.00	3,702.63	0.02	0.18	0.57	52.77	3,755.97
		Auxiliary Engine (Transit)	17	100%	234	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.63	0.00	0.00	0.00	0.04	2.67
		Auxiliary Engine (Maneuvering)	17	100%	18,301	3.30	0.04	0.79	0.10	0.10	0.00	0.00	0.01	0.00	205.90	0.00	0.01	0.03	2.93	208.86
WTG Commissioning SOV	Service Operation Vessel	Main Engine (Transit)	25	27%	488	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.38	0.00	0.00	0.00	0.08	5.45
		Main Engine (Maneuvering)	25	100%	394,004	64.90	1.71	15.05	2.33	2.26	0.58	0.00	0.23	0.03	4,342.70	0.03	0.21	0.68	63.18	4,406.56
		Auxiliary Engine (Transit)	25	27%	81	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.01	0.93
		Auxiliary Engine (Maneuvering)	25	100%	65,667	11.27	0.16	2.83	0.36	0.35	0.01	0.00	0.02	0.00	738.81	0.00	0.04	0.11	10.53	749.45
Export Cable Installation																				
Cable Installation Vessel 1	Cable Installation Vessel	Main Engine (Transit)	25	27%	4,716	0.78	0.02	0.18	0.03	0.03	0.01	0.00	0.00	0.00	51.98	0.00	0.00	0.01	0.76	52.74
		Main Engine (Maneuvering)	25	51%	484,895	79.87	2.10	18.52	2.86	2.78	0.72	0.00	0.29	0.03	5,344.50	0.03	0.26	0.84	77.75	5,423.09
		Auxiliary Engine (Transit)	25	27%	996	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.20	0.00	0.00	0.00	0.16	11.37
		Auxiliary Engine (Maneuvering)	25	51%	424,947	72.95	1.03	18.29	2.36	2.29	0.04	0.00	0.16	0.00	4,780.96	0.03	0.23	0.74	68.14	4,849.84
Cable Installation Vessel 2	Cable Installation Vessel	Main Engine (Transit)	25	27%	4,716	0.78	0.02	0.18	0.03	0.03	0.01	0.00	0.00	0.00	51.98	0.00	0.00	0.01	0.76	52.74
		Main Engine (Maneuvering)	25	51%	484,895	79.87	2.10	18.52	2.86	2.78	0.72	0.00	0.29	0.03	5,344.50	0.03	0.26	0.84	77.75	5,423.09
		Auxiliary Engine (Transit)	25	27%	996	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.20	0.00	0.00	0.00	0.16	11.37
		Auxiliary Engine (Maneuvering)	25	51%	424,947	72.95	1.03	18.29	2.36	2.29	0.04	0.00	0.16	0.00	4,780.96	0.03	0.23	0.74	68.14	4,849.84
Support and Jointing Vessel	Support Vessel	Main Engine (Transit)	25	27%	3,419	0.56	0.01	0.13	0.02	0.02	0.01	0.00	0.00	0.00	37.68	0.00	0.00	0.01	0.55	38.24
		Main Engine (Maneuvering)	25	51%	70,716	11.65	0.31	2.70	0.42	0.41	0.10	0.00	0.04	0.00	779.42	0.00	0.04	0.12	11.34	790.89
		Auxiliary Engine (Transit)	25	27%	707	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.95	0.00	0.00	0.00	0.11	8.07
		Auxiliary Engine (Maneuvering)	25	51%	60,689	10.42	0.15	2.61	0.34	0.33	0.01	0.00	0.02	0.00	682.80	0.00	0.03	0.11	9.73	692.64
TSHD	Dredger	Main Engine (Transit)	25	27%	676	0.11	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	0.00	0.11	7.51
		Main Engine (Maneuvering)	25	51%	50,542	8.42	0.25	1.87	0.32	0.30	0.10	0.00	0.03	0.00	553.21	0.00	0.03	0.09	8.10	561.40
		Auxiliary Engine (Transit)	25	27%	339	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.82	0.00	0.00	0.00	0.05	3.87
		Auxiliary Engine (Maneuvering)	25	51%	105,316	18.01	0.26	4.53	0.58	0.57	0.01	0.00	0.04	0.00	1,184.88	0.01	0.06	0.18	16.89	1,201.95
AHTS	Tug	Main Engine (Transit)	25	27%	4,744	0.78	0.01	0.19	0.03	0.03	0.00	0.00	0.00	0.00	53.00	0.00	0.00	0.01	0.76	53.77
		Main Engine (Maneuvering)	25	51%	144,384	23.86	0.45	5.74	0.83	0.80	0.08	0.00	0.07	0.00	1,613.05	0.01	0.08	0.25	23.15	1,636.45
		Auxiliary Engine (Transit)	25	27%	224	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.52	0.00	0.00	0.00	0.04	2.56
		Auxiliary Engine (Maneuvering)	25	51%	28,283	4.96	0.07	1.22	0.16	0.15	0.00	0.00	0.01	0.00	318.21	0.00	0.02	0.05	4.54	322.79
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	25	10%	11,280	1.86	0.05	0.43	0.07	0.06	0.02	0.00	0.01	0.00	124.33	0.00	0.01	0.02	1.81	126.16
		Main Engine (Maneuvering)	25	51%	19,999	3.29	0.09	0.76	0.12	0.11	0.03	0.00	0.01	0.00	220.43	0.00	0.01	0.03	3.21	223.67
		Auxiliary Engine (Transit)	25	10%	1,049	0.18	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.00	11.80	0.00	0.00	0.00	0.17	11.97
		Auxiliary Engine (Maneuvering)	25	51%	7,719	1.33	0.02	0.33	0.04	0.04	0.00	0.00	0.00	0.00	86.85	0.00	0.00	0.01	1.24	88.10
Fuel Bunkering																				
Towing Tug	Tug	Main Engine (Transit)	25	27%	31,943	5.28	0.10	1.27	0.18	0.18	0.02	0.00	0.01	0.00	356.86	0.00	0.02	0.06	5.12	362.04
		Main Engine (Maneuvering)	25	100%	258,621	42.73	0.81	10.28	1.48	1.44	0.15	0.00	0.12	0.01	2,889.30	0.02	0.14	0.45	41.47	2,931.21
		Auxiliary Engine (Transit)	25	27%	773	0.14	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	8.70	0.00	0.00	0.00	0.12	8.83
		Auxiliary Engine (Maneuvering)	25	100%	25,986	4.56	0.06	1.12	0.14	0.14	0.00	0.00	0.01	0.00	292.36	0.00	0.01	0.05	4.17	296.57
Barge	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	0.03	1.87
		Auxiliary Engine (Maneuvering)	25	100%	5,505	1.20	0.01	0.24	0.03	0.03	0.00	0.00	0.00	0.00	61.94	0.00	0.00	0.01	0.88	62.83
Motion Compensation	Motion Compensation	Motion Compensation Engine	N/A	100%	144,000	8.89	1.10	7.78	0.44	0.44	0.02	0.00	0.02	0.00	1,643.57	0.07	0.01	1.67	3.97	1,649.21
Commissioning Generators																				
OSS Commissioning Generators	Generator	Marine Tier 3 Generator	N/A	100%	96,000	8.59	1.03	7.41	0.15	0.14	0.01	0.00	0.03	0.00	1,095.72	0.04	0.01	1.11	2.65	1,099.48
WTG Commissioning Generators	Generator	Marine Tier 3 Generator	N/A	100%	53,186	4.43	0.53	4.10	0.10	0.10	0.01	0.00	0.01	0.00	607.05	0.02	0.00	0.62	1.47	609.13
Miscellaneous																				
Marine Paint	N/A	N/A	N/A	100%	N/A	N/A	0.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fuel Evaporation	N/A	N/A	N/A	100%	N/A	N/A	0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Trips	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Emissions During Construction																	
Foundation Installation (FOU) B02																	
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	6	4 x 3840kW 2 x 4800kW	24,960	3 main	Europe	1	250	500	10	50	0	0	0	50	7M
		Main Engine (Maneuvering)	6	4 x 3840kW 2 x 4800kW	24,960	3 main		0	250	0	10	0	200	24	4,800	4,800	7M
		Auxiliary Engine (Transit)	1	1,110	1,110	3 Auxiliary		1	250	500	10	50	0	0	0	50	7A
		Auxiliary Engine (Maneuvering)	1	1,110	1,110	3 Auxiliary		0	250	0	10	0	200	24	4,800	4,800	7A
Bubble Curtain Support Vessel	Tug	Main Engine (Transit)	2	5,530	11,060	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	11M
		Main Engine (Maneuvering)	2	5,530	11,060	1 & 2 main		0	91	0	10	0	200	24	4,800	4,800	11M
		Auxiliary Engine (Transit)	0	0	0	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	11A
		Auxiliary Engine (Maneuvering)	0	0	0	1 & 2 auxiliary		0	91	0	10	0	200	24	4,800	4,800	11A
Barge 1	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	34	91	6,204	7	886	0	0	0	886	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	7	0	200	24	4,800	4,800	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		34	91	6,204	7	886	0	0	0	886	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	7	0	200	24	4,800	4,800	2A
Barge 2	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	34	91	6,204	7	886	0	0	0	886	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	7	0	200	24	4,800	4,800	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		34	91	6,204	7	886	0	0	0	886	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	7	0	200	24	4,800	4,800	2A
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	34	91	6,204	7	886	0	0	0	886	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	7	0	200	24	4,800	4,800	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		34	91	6,204	7	886	0	0	0	886	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	7	0	200	24	4,800	4,800	11A
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	34	91	6,204	7	886	0	0	0	886	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	7	0	200	24	4,800	4,800	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		34	91	6,204	7	886	0	0	0	886	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	7	0	200	24	4,800	4,800	11A
Crew Transfer / PSO / Noise Monitoring Vessel	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	115	17	3,997	29	140	0	0	0	140	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	29	0	200	24	4,800	4,800	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		115	17	3,997	29	140	0	0	0	140	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	29	0	200	24	4,800	4,800	4A
Bubble Curtain Power	Air Compressor	Air Compressor	20	399	7,980	Stage III B	N/A	0	0	0	0	0	200	8	1,600	1,600	16
Hydraulic Hammer Power	Hydraulic Hammer Engine	Hammer Engine	3	597	1,791	Tier 2 Non-Road	N/A	0	0	0	0	0	200	8	1,600	1,600	18
Offshore Substation Installation (OSS)																	
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	6	4 x 3840kW 2 x 4800kW	24,960	3 main	Europe	1	250	500	10	50	0	0	0	50	7M
		Main Engine (Maneuvering)	6	4 x 3840kW 2 x 4800kW	24,960	3 main		0	250	0	10	0	9	24	216	216	7M
		Auxiliary Engine (Transit)	1	1,110	1,110	3 Auxiliary		1	250	500	10	50	0	0	0	50	7A
		Auxiliary Engine (Maneuvering)	1	1,110	1,110	3 Auxiliary		0	250	0	10	0	9	24	216	216	7A
	Bubble Curtain Support Vessel	Main Engine (Transit)	2	5,530	11,060	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	11M
		Main Engine (Maneuvering)	2	5,530	11,060	1 & 2 main		0	91	0	10	0	9	24	216	216	11M
		Auxiliary Engine (Transit)	0	0	0	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	11A
		Auxiliary Engine (Maneuvering)	0	0	0	1 & 2 auxiliary		0	91	0	10	0	9	24	216	216	11A
Transport Barge 1	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	5	24	120	120	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	2A
Transport Barge 2	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	5	24	120	120	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	2A
Transport Barge 3	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	5	24	120	120	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	2A
Transport Barge 4	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	5	24	120	120	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	2A
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	5	24	120	120	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	11A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Trips	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	5	24	120	120	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	11A
US Towing Tug 3	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	5	24	120	120	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	11A
US Towing Tug 4	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	5	24	120	120	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	11A
	Crew Transfer Vessel	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	Atlantic City	3	91	547	10	55	0	0	0	55	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	5	24	120	120	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	11A
		Main Engine (Transit)	4	522	2,088	1 & 2 main		7	17	243	29	9	0	0	0	9	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	29	0	28	24	672	672	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		7	17	243	29	9	0	0	0	9	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	29	0	28	24	672	672	4A
	Bubble Curtain Power	Air Compressor	20	399	7,980	Stage III B	N/A	0	0	0	0	0	9	10	90	90	16
	Hydraulic Hammer Power	Hammer Engine	3	597	1,791	Tier 2 Non-Road	N/A	0	0	0	0	0	9	10	90	90	18
Scour Protection																	
	Fall Pipe Vessel	Main Engine (Transit)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	3M
		Main Engine (Maneuvering)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main		0	250	0	10	0	63	24	1,512	1,512	3M
		Auxiliary Engine (Transit)	1	2,950	2,950	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	3A
		Auxiliary Engine (Maneuvering)	1	2,950	2,950	1 & 2 auxiliary		0	250	0	10	0	63	24	1,512	1,512	3A
	US Dredger	Main Engine (Transit)	2	641	1,283	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	5M
		Main Engine (Maneuvering)	2	641	1,283	1 & 2 main		0	91	0	10	0	40	24	960	960	5M
		Auxiliary Engine (Transit)	1	954	954	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	5A
		Auxiliary Engine (Maneuvering)	1	954	954	1 & 2 auxiliary		0	91	0	10	0	40	24	960	960	5A
Inter Array Cable Installation																	
Cable Installation Vessel	Cable Installation Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	250	0	10	0	150	24	3,600	3,600	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	250	0	10	0	150	24	3,600	3,600	3A
Cable Installation Support Activities	Support Vessel/SOV	Main Engine (Transit)	4	1,200	4,800	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	3M
		Main Engine (Maneuvering)	4	1,200	4,800	1 & 2 main		0	250	0	10	0	94	24	2,256	2,256	3M
		Auxiliary Engine (Transit)	1	800	800	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	3A
		Auxiliary Engine (Maneuvering)	1	800	800	1 & 2 auxiliary		0	250	0	10	0	94	24	2,256	2,256	3A
Sand Wave Clearance	TSHD (Dredger)	Main Engine (Transit)	2	641	1,283	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	5M
		Main Engine (Maneuvering)	2	641	1,283	1 & 2 main		0	250	0	10	0	98	24	2,352	2,352	5M
		Auxiliary Engine (Transit)	1	954	954	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	5A
		Auxiliary Engine (Maneuvering)	1	954	954	1 & 2 auxiliary		0	250	0	10	0	98	24	2,352	2,352	5A
Pre Lay Grapnel Run AHTS 1	AHTS	Main Engine (Transit)	2	4,500	9,000	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	11M
		Main Engine (Maneuvering)	2	4,500	9,000	1 & 2 main		0	91	0	10	0	15	24	360	360	11M
		Auxiliary Engine (Transit)	2	410	820	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	11A
		Auxiliary Engine (Maneuvering)	2	410	820	1 & 2 auxiliary		0	91	0	10	0	15	24	360	360	11A
Pre Lay Grapnel Run AHTS 2	AHTS	Main Engine (Transit)	2	4,500	9,000	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	11M
		Main Engine (Maneuvering)	2	4,500	9,000	1 & 2 main		0	91	0	10	0	15	24	360	360	11M
		Auxiliary Engine (Transit)	2	410	820	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	11A
		Auxiliary Engine (Maneuvering)	2	410	820	1 & 2 auxiliary		0	91	0	10	0	15	24	360	360	11A
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	3M
		Main Engine (Maneuvering)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main		0	250	0	10	0	2	24	48	48	3M
		Auxiliary Engine (Transit)	1	2,950	2,950	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	3A
		Auxiliary Engine (Maneuvering)	1	2,950	2,950	1 & 2 auxiliary		0	250	0	10	0	2	24	48	48	3A
WTG Installation																	
WTG Installation Vessel	Jackup Vessel	Main Engine (Transit)	7	4 x 3,535kW 3 x 2,650kW	22,090	3 main	NJWP	1	91	182	10	18	0	0	0	18	7M
		Main Engine (Maneuvering)	7	4 x 3,535kW 3 x 2,650kW	22,090	3 main		0	91	0	10	0	352	24	8,448	8,448	7M
		Auxiliary Engine (Transit)	1	2,650	2,650	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	7A
		Auxiliary Engine (Maneuvering)	1	2,650	2,650	1 & 2 auxiliary		0	91	0	10	0	352	24	8,448	8,448	7A
US Jack Up Feeder 1	Jack up	Main Engine (Transit)	2	2,500	5,000	3 main	NJWP	68	91	12,409	10	1,241	0	0	0	1,241	7M
		Main Engine (Maneuvering)	2	2,500	5,000	3 main		0	91	0	10	0	163	24	3,912	3,912	7M
		Auxiliary Engine (Transit)	1	2,500	2,500	1 & 2 auxiliary		68	91	12,409	10	1,241	0	0	0	1,241	7A
		Auxiliary Engine (Maneuvering)	1	2,500	2,500	1 & 2 auxiliary		0	91	0	10	0	163	24	3,912	3,912	7A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Trips	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
US Jack Up Feeder 2	Jack up	Main Engine (Transit)	2	2,500	5,000	3 main	NJWP	68	91	12,409	10	1,241	0	0	0	1,241	7M
		Main Engine (Maneuvering)	2	2,500	5,000	3 main		0	91	0	10	0	163	24	3,912	3,912	7M
		Auxiliary Engine (Transit)	1	2,500	2,500	1 & 2 auxiliary		68	91	12,409	10	1,241	0	0	0	1,241	7A
		Auxiliary Engine (Maneuvering)	1	2,500	2,500	1 & 2 auxiliary		0	91	0	10	0	163	24	3,912	3,912	7A
Crew Transfer	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	89	17	3,094	29	109	0	0	0	109	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	29	0	352	24	8,448	8,448	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		89	17	3,094	29	109	0	0	0	109	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	29	0	352	24	8,448	8,448	4A
WTG Commissioning SOV	Service Operation Vessel	Main Engine (Transit)	4	1,200	4,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	4	1,200	4,800	1 & 2 main		0	91	0	10	0	352	24	8,448	8,448	3M
		Auxiliary Engine (Transit)	1	800	800	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	1	800	800	1 & 2 auxiliary		0	91	0	10	0	352	24	8,448	8,448	3A
Export Cable Installation																	
Cable Installation Vessel 1	Cable Installation Vessel	Main Engine (Transit)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main		0	91	0	10	0	174	24	4,176	4,176	3M
		Auxiliary Engine (Transit)	2	1,400	2,800	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	2	1,400	2,800	1 & 2 auxiliary		0	91	0	10	0	174	24	4,176	4,176	3A
Cable Installation Vessel 2	Cable Installation Vessel	Main Engine (Transit)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main		0	91	0	10	0	174	24	4,176	4,176	3M
		Auxiliary Engine (Transit)	2	1,400	2,800	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	2	1,400	2,800	1 & 2 auxiliary		0	91	0	10	0	174	24	4,176	4,176	3A
Support and Jointing Vessel	Support Vessel	Main Engine (Transit)	3	2 x 2350kW 1 x 1786kW	6,486	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	3	2 x 2350kW 1 x 1786kW	6,486	1 & 2 main		0	91	0	10	0	35	24	840	840	3M
		Auxiliary Engine (Transit)	2	994	1,988	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	2	994	1,988	1 & 2 auxiliary		0	91	0	10	0	35	24	840	840	3A
TSHD	Dredger	Main Engine (Transit)	2	641	1,283	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	5M
		Main Engine (Maneuvering)	2	641	1,283	1 & 2 main		0	91	0	10	0	127	24	3,048	3,048	5M
		Auxiliary Engine (Transit)	1	954	954	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	5A
		Auxiliary Engine (Maneuvering)	1	954	954	1 & 2 auxiliary		0	91	0	10	0	127	24	3,048	3,048	5A
AHTS	Tug	Main Engine (Transit)	2	4,500	9,000	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	11M
		Main Engine (Maneuvering)	2	4,500	9,000	1 & 2 main		0	91	0	10	0	52	24	1,248	1,248	11M
		Auxiliary Engine (Transit)	2	410	820	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	11A
		Auxiliary Engine (Maneuvering)	2	410	820	1 & 2 auxiliary		0	91	0	10	0	52	24	1,248	1,248	11A
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	3M
		Main Engine (Maneuvering)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main		0	250	0	10	0	3	24	72	72	3M
		Auxiliary Engine (Transit)	1	2,950	2,950	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	3A
		Auxiliary Engine (Maneuvering)	1	2,950	2,950	1 & 2 auxiliary		0	250	0	10	0	3	24	72	72	3A
Fuel Bunkering																	
Towing Tug	Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	17	91	3,102	10	310	0	0	0	310	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	114	24	2,736	2,736	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		17	91	3,102	10	310	0	0	0	310	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	114	24	2,736	2,736	11A
Barge	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	17	91	3,102	10	310	0	0	0	310	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	114	24	2,736	2,736	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		17	91	3,102	10	310	0	0	0	310	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	114	24	2,736	2,736	2A
Motion Compensation	Motion Compensation	Motion Compensation Engine	1	500	500	Tier 3 Non-Road	NJWP	0	91	0	0	0	114	24	2,736	2,736	17
Commissioning Generators																	
OSS Commissioning Generators	Generator	Marine Tier 3 Generator	4	500	2,000	Tier 4 Non-Road	N/A	0	0	0	0	0	28	12	336	336	31
WTG Commissioning Generators	Generator	Marine Tier 3 Generator	1	240	240	Tier 4 Non-Road	N/A	0	0	0	0	0	352	12	4,224	4,224	32
Miscellaneous																	
Marine Paint	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fuel Evaporation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Construction																			
Foundation Installation (FOU) B02																			
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	0.83	59,503	11.45	0.16	2.63	0.35	0.34	0.01	0.00	0.02	0.0007	738.85	0.00	0.04	0.11	10.55	749.51
		Main Engine (Maneuvering)	0.10	688,230	132.46	1.85	30.38	4.09	3.96	0.17	0.00	0.29	0.0079	8,545.71	0.05	0.41	1.32	122.00	8,669.03
		Auxiliary Engine (Transit)	0.56	2,094	0.40	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.0000	22.21	0.00	0.00	0.00	0.32	22.53
		Auxiliary Engine (Maneuvering)	0.56	201,043	37.99	0.46	8.16	1.05	1.02	0.02	0.00	0.07	0.0009	2,131.89	0.01	0.10	0.33	30.38	2,162.61
Bubble Curtain Support Vessel	Tug	Main Engine (Transit)	0.83	10,639	1.76	0.03	0.42	0.06	0.06	0.01	0.00	0.00	0.0003	118.86	0.00	0.01	0.02	1.71	120.58
		Main Engine (Maneuvering)	0.10	337,155	55.71	1.05	13.40	1.93	1.87	0.19	0.00	0.15	0.0089	3,766.67	0.02	0.18	0.59	54.06	3,821.31
		Auxiliary Engine (Transit)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
Barge 1	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	1,210	0.26	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.0000	13.62	0.00	0.00	0.00	0.19	13.81
		Auxiliary Engine (Maneuvering)	0.43	6,554	1.43	0.02	0.28	0.04	0.04	0.00	0.00	0.00	0.0000	73.74	0.00	0.00	0.01	1.05	74.80
Barge 2	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	1,210	0.26	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.0000	13.62	0.00	0.00	0.00	0.19	13.81
		Auxiliary Engine (Maneuvering)	0.43	6,554	1.43	0.02	0.28	0.04	0.04	0.00	0.00	0.00	0.0000	73.74	0.00	0.00	0.01	1.05	74.80
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	0.83	235,939	38.99	0.74	9.38	1.35	1.31	0.14	0.00	0.11	0.0062	2,635.89	0.02	0.13	0.41	37.83	2,674.13
		Main Engine (Maneuvering)	0.10	153,941	25.44	0.48	6.12	0.88	0.86	0.09	0.00	0.07	0.0041	1,719.82	0.01	0.08	0.27	24.68	1,744.77
		Auxiliary Engine (Transit)	0.43	5,712	1.00	0.01	0.25	0.03	0.03	0.00	0.00	0.00	0.0000	64.27	0.00	0.00	0.01	0.92	65.19
		Auxiliary Engine (Maneuvering)	0.43	30,935	5.42	0.08	1.33	0.17	0.17	0.00	0.00	0.01	0.0001	348.04	0.00	0.02	0.05	4.96	353.06
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	0.83	235,939	38.99	0.74	9.38	1.35	1.31	0.14	0.00	0.11	0.0062	2,635.89	0.02	0.13	0.41	37.83	2,674.13
		Main Engine (Maneuvering)	0.10	153,941	25.44	0.48	6.12	0.88	0.86	0.09	0.00	0.07	0.0041	1,719.82	0.01	0.08	0.27	24.68	1,744.77
		Auxiliary Engine (Transit)	0.43	5,712	1.00	0.01	0.25	0.03	0.03	0.00	0.00	0.00	0.0000	64.27	0.00	0.00	0.01	0.92	65.19
		Auxiliary Engine (Maneuvering)	0.43	30,935	5.42	0.08	1.33	0.17	0.17	0.00	0.00	0.01	0.0001	348.04	0.00	0.02	0.05	4.96	353.06
Crew Transfer / PSO / Noise Monitoring Vessel	Crew Transfer Vessel	Main Engine (Transit)	0.83	15,437	2.45	0.04	0.62	0.08	0.08	0.00	0.00	0.01	0.0001	173.66	0.00	0.01	0.03	2.48	176.17
		Main Engine (Maneuvering)	0.10	63,650	10.11	0.15	2.54	0.34	0.33	0.01	0.00	0.02	0.0003	716.06	0.00	0.03	0.11	10.21	726.38
		Auxiliary Engine (Transit)	0.43	207	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	2.33	0.00	0.00	0.00	0.03	2.36
		Auxiliary Engine (Maneuvering)	0.43	7,078	1.28	0.02	0.30	0.04	0.04	0.00	0.00	0.00	0.0000	79.64	0.00	0.00	0.01	1.13	80.78
Bubble Curtain Power	Air Compressor	Air Compressor	1.00	912,000	28.15	2.67	49.26	0.35	0.35	0.10	0.00	0.25	0.0044	10,409.31	0.42	0.08	10.56	25.16	10,445.03
Hydraulic Hammer Power	Hydraulic Hammer Engine	Hammer Engine	1.00	204,686	20.22	2.50	11.06	0.63	0.63	0.02	0.00	0.02	0.0010	2,336.22	0.09	0.02	2.37	5.65	2,344.24
Offshore Substation Installation (OSS)																			
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	0.83	59,503	11.45	0.16	2.63	0.35	0.34	0.01	0.00	0.02	0.0007	738.85	0.00	0.04	0.11	10.55	749.51
		Main Engine (Maneuvering)	0.10	30,970	5.96	0.08	1.37	0.18	0.18	0.01	0.00	0.01	0.0004	384.56	0.00	0.02	0.06	5.49	390.11
		Auxiliary Engine (Transit)	0.56	2,094	0.40	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.0000	22.21	0.00	0.00	0.00	0.32	22.53
		Auxiliary Engine (Maneuvering)	0.56	9,047	1.71	0.02	0.37	0.05	0.05	0.00	0.00	0.00	0.0000	95.94	0.00	0.00	0.01	1.37	97.32
	Bubble Curtain Support Vessel	Main Engine (Transit)	0.83	10,639	1.76	0.03	0.42	0.06	0.06	0.01	0.00	0.00	0.0003	118.86	0.00	0.01	0.02	1.71	120.58
		Main Engine (Maneuvering)	0.10	15,172	2.51	0.05	0.60	0.09	0.08	0.01	0.00	0.01	0.0004	169.50	0.00	0.01	0.03	2.43	171.96
		Auxiliary Engine (Transit)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
Transport Barge 1	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	75	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.84	0.00	0.00	0.00	0.01	0.85
		Auxiliary Engine (Maneuvering)	0.43	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 2	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	75	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.84	0.00	0.00	0.00	0.01	0.85
		Auxiliary Engine (Maneuvering)	0.43	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 3	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	75	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.84	0.00	0.00	0.00	0.01	0.85
		Auxiliary Engine (Maneuvering)	0.43	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 4	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	75	0.02	0.00	0.00	0.00	0.00	0.00	0.								

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
US Jack Up Feeder 2	Jack up	Main Engine (Transit)	0.83	295,823	56.94	0.79	13.06	1.76	1.70	0.07	0.00	0.12	0.0034	3,673.22	0.02	0.18	0.57	52.44	3,726.22
		Main Engine (Maneuvering)	0.20	224,722	43.25	0.60	9.92	1.34	1.29	0.06	0.00	0.09	0.0026	2,790.37	0.02	0.13	0.43	39.84	2,830.63
		Auxiliary Engine (Transit)	0.43	84,718	16.98	0.21	3.65	0.47	0.46	0.01	0.00	0.03	0.0004	953.14	0.01	0.05	0.15	13.58	966.87
		Auxiliary Engine (Maneuvering)	0.43	267,079	53.54	0.65	11.50	1.48	1.44	0.03	0.00	0.10	0.0013	3,004.83	0.02	0.14	0.46	42.82	3,048.12
Crew Transfer	Crew Transfer Vessel	Main Engine (Transit)	0.83	11,947	1.90	0.03	0.48	0.06	0.06	0.00	0.00	0.00	0.0001	134.40	0.00	0.01	0.02	1.92	136.34
		Main Engine (Maneuvering)	0.20	224,047	35.58	0.54	8.94	1.21	1.17	0.02	0.00	0.08	0.0011	2,520.53	0.02	0.12	0.39	35.92	2,556.85
		Auxiliary Engine (Transit)	0.43	160	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.80	0.00	0.00	0.00	0.03	1.83
		Auxiliary Engine (Maneuvering)	0.43	12,458	2.25	0.03	0.54	0.07	0.07	0.00	0.00	0.00	0.0001	140.16	0.00	0.01	0.02	2.00	142.18
WTG Commissioning SOV	Service Operation Vessel	Main Engine (Transit)	0.16	890	0.15	0.00	0.03	0.01	0.01	0.00	0.00	0.00	0.0001	9.81	0.00	0.00	0.00	0.14	9.95
		Main Engine (Maneuvering)	0.10	268,215	44.18	1.16	10.24	1.58	1.54	0.40	0.00	0.16	0.0182	2,956.25	0.02	0.14	0.47	43.01	2,999.73
		Auxiliary Engine (Transit)	0.16	148	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.67	0.00	0.00	0.00	0.02	1.69
		Auxiliary Engine (Maneuvering)	0.10	44,702	7.67	0.11	1.92	0.25	0.24	0.00	0.00	0.02	0.0002	502.94	0.00	0.02	0.08	7.17	510.18
Export Cable Installation																			
Cable Installation Vessel 1	Cable Installation Vessel	Main Engine (Transit)	0.83	8,605	1.42	0.04	0.33	0.05	0.05	0.01	0.00	0.01	0.0006	94.85	0.00	0.00	0.01	1.38	96.24
		Main Engine (Maneuvering)	0.20	474,518	78.16	2.06	18.12	2.80	2.72	0.70	0.00	0.28	0.0322	5,230.11	0.03	0.26	0.82	76.09	5,307.02
		Auxiliary Engine (Transit)	0.56	1,817	0.31	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.0000	20.44	0.00	0.00	0.00	0.29	20.74
		Auxiliary Engine (Maneuvering)	0.56	415,853	71.39	1.01	17.90	2.31	2.24	0.04	0.00	0.16	0.0020	4,678.64	0.03	0.22	0.72	66.68	4,746.04
Cable Installation Vessel 2	Cable Installation Vessel	Main Engine (Transit)	0.83	8,605	1.42	0.04	0.33	0.05	0.05	0.01	0.00	0.01	0.0006	94.85	0.00	0.00	0.01	1.38	96.24
		Main Engine (Maneuvering)	0.20	474,518	78.16	2.06	18.12	2.80	2.72	0.70	0.00	0.28	0.0322	5,230.11	0.03	0.26	0.82	76.09	5,307.02
		Auxiliary Engine (Transit)	0.56	1,817	0.31	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.0000	20.44	0.00	0.00	0.00	0.29	20.74
		Auxiliary Engine (Maneuvering)	0.56	415,853	71.39	1.01	17.90	2.31	2.24	0.04	0.00	0.16	0.0020	4,678.64	0.03	0.22	0.72	66.68	4,746.04
Support and Jointing Vessel	Support Vessel	Main Engine (Transit)	0.83	6,239	1.03	0.03	0.24	0.04	0.04	0.01	0.00	0.00	0.0004	68.77	0.00	0.00	0.01	1.00	69.78
		Main Engine (Maneuvering)	0.20	69,202	11.40	0.30	2.64	0.41	0.40	0.10	0.00	0.04	0.0047	762.74	0.00	0.04	0.12	11.10	773.96
		Auxiliary Engine (Transit)	0.56	1,290	0.22	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.0000	14.52	0.00	0.00	0.00	0.21	14.73
		Auxiliary Engine (Maneuvering)	0.56	59,390	10.19	0.14	2.56	0.33	0.32	0.01	0.00	0.02	0.0003	668.19	0.00	0.03	0.10	9.52	677.81
TSHD	Dredger	Main Engine (Transit)	0.83	1,234	0.21	0.01	0.05	0.01	0.01	0.00	0.00	0.00	0.0001	13.50	0.00	0.00	0.00	0.20	13.70
		Main Engine (Maneuvering)	0.20	49,656	8.27	0.24	1.84	0.31	0.29	0.10	0.00	0.03	0.0044	543.51	0.00	0.03	0.09	7.96	551.56
		Auxiliary Engine (Transit)	0.56	619	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.0000	6.97	0.00	0.00	0.00	0.10	7.07
		Auxiliary Engine (Maneuvering)	0.56	103,469	17.69	0.25	4.45	0.57	0.56	0.01	0.00	0.04	0.0005	1,164.10	0.01	0.06	0.18	16.59	1,180.87
AHTS	Tug	Main Engine (Transit)	0.83	8,657	1.43	0.03	0.34	0.05	0.05	0.00	0.00	0.00	0.0002	96.72	0.00	0.00	0.02	1.39	98.12
		Main Engine (Maneuvering)	0.20	142,666	23.57	0.45	5.67	0.82	0.79	0.08	0.00	0.07	0.0038	1,593.85	0.01	0.08	0.25	22.88	1,616.97
		Auxiliary Engine (Transit)	0.43	409	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	4.60	0.00	0.00	0.00	0.07	4.66
		Auxiliary Engine (Maneuvering)	0.43	27,947	4.90	0.07	1.20	0.16	0.15	0.00	0.00	0.01	0.0001	314.42	0.00	0.02	0.05	4.48	318.95
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	0.83	56,402	9.29	0.24	2.15	0.33	0.32	0.08	0.00	0.03	0.0038	621.66	0.00	0.03	0.10	9.04	630.80
		Main Engine (Maneuvering)	0.20	19,571	3.22	0.08	0.75	0.12	0.11	0.03	0.00	0.01	0.0013	215.71	0.00	0.01	0.03	3.14	218.88
		Auxiliary Engine (Transit)	0.56	5,246	0.90	0.01	0.23	0.03	0.03	0.00	0.00	0.00	0.0000	59.02	0.00	0.00	0.01	0.84	59.87
		Auxiliary Engine (Maneuvering)	0.56	7,554	1.30	0.02	0.33	0.04	0.04	0.00	0.00	0.00	0.0000	84.99	0.00	0.00	0.01	1.21	86.21
Fuel Bunkering																			
Towing Tug	Tug	Main Engine (Transit)	0.83	82,579	13.65	0.26	3.28	0.47	0.46	0.05	0.00	0.04	0.0022	922.56	0.01	0.04	0.14	13.24	935.95
		Main Engine (Maneuvering)	0.20	175,493	29.00	0.55	6.98	1.01	0.97	0.10	0.00	0.08	0.0046	1,960.60	0.01	0.09	0.30	28.14	1,989.04
		Auxiliary Engine (Transit)	0.43	1,999	0.35	0.00	0.09	0.01	0.01	0.00	0.00	0.00	0.0000	22.49	0.00	0.00	0.00	0.32	22.82
		Auxiliary Engine (Maneuvering)	0.43	17,633	3.09	0.04	0.76	0.10	0.09	0.00	0.00	0.01	0.0001	198.39	0.00	0.01	0.03	2.83	201.24
Barge	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.20	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	424	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	4.77	0.00	0.00	0.00	0.07	4.83
		Auxiliary Engine (Maneuvering)	0.43	3,736	0.82	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.0000	42.03	0.00	0.00	0.01	0.60	42.64
Motion Compensation	Motion Compensation	Motion Compensation Engine	1.00	97,714	6.03	0.75	5.28	0.30	0.30	0.01	0.00	0.01	0.0005	1,115.28	0.05	0.01	1.13	2.70	1,119.11
Commissioning Generators																			
OSS Commissioning Generators	Generator	Marine Tier 3 Generator	0.50	24,000	2.15	0.26	1.85	0.04	0.04	0.00	0.00	0.01	0.00	273.93	0.01	0.00	0.28	0.66	274.87
WTG Commissioning Generators	Generator	Marine Tier 3 Generator	0.50	36,206	3.02	0.36	2.79	0.07	0.07	0.00	0.00	0.01	0.00	413.24	0.02	0.00	0.42	1.00	414.66
Miscellaneous																			
Marine Paint	N/A	N/A	N/A	N/A	N/A	0.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fuel Evaporation	N/A	N/A	N/A	N/A	N/A	0.09	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Construction																				
Foundation Installation (FOU) B02																				
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	25	10%	5,950	1.15	0.02	0.26	0.04	0.03	0.00	0.00	0.00	0.0001	73.88	0.00	0.00	0.01	1.05	74.95
		Main Engine (Maneuvering)	25	100%	688,230	132.46	1.85	30.38	4.09	3.96	0.17	0.00	0.29	0.0079	8,545.71	0.05	0.41	1.32	122.00	8,669.03
		Auxiliary Engine (Transit)	25	10%	209	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	2.22	0.00	0.00	0.00	0.03	2.25
		Auxiliary Engine (Maneuvering)	25	100%	201,043	37.99	0.46	8.16	1.05	1.02	0.02	0.00	0.07	0.0009	2,131.89	0.01	0.10	0.33	30.38	2,162.61
Bubble Curtain Support Vessel	Tug	Main Engine (Transit)	25	27%	2,915	0.48	0.01	0.12	0.02	0.02	0.00	0.00	0.00	0.0001	32.57	0.00	0.00	0.01	0.47	33.04
		Main Engine (Maneuvering)	25	100%	337,155	55.71	1.05	13.40	1.93	1.87	0.19	0.00	0.15	0.0089	3,766.67	0.02	0.18	0.59	54.06	3,821.31
		Auxiliary Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
Barge 1	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	332	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	3.73	0.00	0.00	0.00	0.05	3.78
		Auxiliary Engine (Maneuvering)	25	100%	6,554	1.43	0.02	0.28	0.04	0.04	0.00	0.00	0.00	0.0000	73.74	0.00	0.00	0.01	1.05	74.80
Barge 2	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	332	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	3.73	0.00	0.00	0.00	0.05	3.78
		Auxiliary Engine (Maneuvering)	25	100%	6,554	1.43	0.02	0.28	0.04	0.04	0.00	0.00	0.00	0.0000	73.74	0.00	0.00	0.01	1.05	74.80
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	25	27%	64,646	10.68	0.20	2.57	0.37	0.36	0.04	0.00	0.03	0.0017	722.22	0.00	0.03	0.11	10.37	732.70
		Main Engine (Maneuvering)	25	100%	153,941	25.44	0.48	6.12	0.88	0.86	0.09	0.00	0.07	0.0041	1,719.82	0.01	0.08	0.27	24.68	1,744.77
		Auxiliary Engine (Transit)	25	27%	1,565	0.27	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.0000	17.61	0.00	0.00	0.00	0.25	17.86
		Auxiliary Engine (Maneuvering)	25	100%	30,935	5.42	0.08	1.33	0.17	0.17	0.00	0.00	0.01	0.0001	348.04	0.00	0.02	0.05	4.96	353.06
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	25	27%	64,646	10.68	0.20	2.57	0.37	0.36	0.04	0.00	0.03	0.0017	722.22	0.00	0.03	0.11	10.37	732.70
		Main Engine (Maneuvering)	25	100%	153,941	25.44	0.48	6.12	0.88	0.86	0.09	0.00	0.07	0.0041	1,719.82	0.01	0.08	0.27	24.68	1,744.77
		Auxiliary Engine (Transit)	25	27%	1,565	0.27	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.0000	17.61	0.00	0.00	0.00	0.25	17.86
		Auxiliary Engine (Maneuvering)	25	100%	30,935	5.42	0.08	1.33	0.17	0.17	0.00	0.00	0.01	0.0001	348.04	0.00	0.02	0.05	4.96	353.06
Crew Transfer / PSO / Noise Monitoring Vessel	Crew Transfer Vessel	Main Engine (Transit)	17	100%	15,437	2.45	0.04	0.62	0.08	0.08	0.00	0.00	0.01	0.0001	173.66	0.00	0.01	0.03	2.48	176.17
		Main Engine (Maneuvering)	17	100%	63,650	10.11	0.15	2.54	0.34	0.33	0.01	0.00	0.02	0.0003	716.06	0.00	0.03	0.11	10.21	726.38
		Auxiliary Engine (Transit)	17	100%	207	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	2.33	0.00	0.00	0.00	0.03	2.36
		Auxiliary Engine (Maneuvering)	17	100%	7,078	1.28	0.02	0.30	0.04	0.04	0.00	0.00	0.00	0.0000	79.64	0.00	0.00	0.01	1.13	80.78
Bubble Curtain Power	Air Compressor	Air Compressor	N/A	100%	912,000	28.15	2.67	49.26	0.35	0.35	0.10	0.00	0.25	0.0044	10,409.31	0.42	0.08	10.56	25.16	10,445.03
Hydraulic Hammer Power	Hydraulic Hammer Engine	Hammer Engine	N/A	100%	204,686	20.22	2.50	11.06	0.63	0.63	0.02	0.00	0.02	0.0010	2,336.22	0.09	0.02	2.37	5.65	2,344.24
Offshore Substation Installation (OSS)																				
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	25	10%	5,950	1.15	0.02	0.26	0.04	0.03	0.00	0.00	0.00	0.00	73.88	0.00	0.00	0.01	1.05	74.95
		Main Engine (Maneuvering)	25	100%	30,970	5.96	0.08	1.37	0.18	0.18	0.01	0.00	0.01	0.00	384.56	0.00	0.02	0.06	5.49	390.11
		Auxiliary Engine (Transit)	25	10%	209	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	0.00	0.00	0.03	2.25
		Auxiliary Engine (Maneuvering)	25	100%	9,047	1.71	0.02	0.37	0.05	0.05	0.00	0.00	0.00	0.00	95.94	0.00	0.00	0.01	1.37	97.32
	Bubble Curtain Support Vessel	Main Engine (Transit)	25	27%	2,915	0.48	0.01	0.12	0.02	0.02	0.00	0.00	0.00	0.00	32.57	0.00	0.00	0.01	0.47	33.04
		Main Engine (Maneuvering)	25	100%	15,172	2.51	0.05	0.60	0.09	0.08	0.01	0.00	0.01	0.00	169.50	0.00	0.01	0.03	2.43	171.96
		Auxiliary Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport Barge 1	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.23
		Auxiliary Engine (Maneuvering)	25	100%	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 2	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.23
		Auxiliary Engine (Maneuvering)	25	100%	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 3	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.23
		Auxiliary Engine (Maneuvering)	25	100%	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 4	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	25	27%	3,993	0.66	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	44.61	0.00	0.00	0.01	0.64	45.25
		Main Engine (Maneuvering)	25	100%	3,849	0.64	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	43.00	0.00	0.00	0.01	0.62	43.62
		Auxiliary Engine (Transit)	25	27%	97	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.00	0.02	1.10
		Auxiliary Engine (Maneuvering)	25	100%	773	0.14	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	8.70	0.00	0.00	0.00	0.12	8.83
US Towing Tug 3	US Towing Tug	Main Engine (Transit)	25	27%	3,993	0.66	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	44.61	0.00	0.00	0.01	0.64	45.25
		Main Engine (Maneuvering)	25	100%	3,849	0.64	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	43.00	0.00	0.00	0.01	0.62	43.62
		Auxiliary Engine (Transit)	25	27%	97	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.00	0.02	1.10
		Auxiliary Engine (Maneuvering)	25	100%	773	0.14	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	8.70	0.00	0.00	0.00	0.12	8.83
US Towing Tug 4	US Towing Tug	Main Engine (Transit)	25	27%	3,993	0.66	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	44.61	0.00	0.00	0.01	0.64	45.25
		Main Engine (Maneuvering)	25	100%	3,849	0.64	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	43.00	0.00	0.00	0.01	0.62	43.62
		Auxiliary Engine (Transit)	25	27%	97	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.00	0.02	1.10
		Auxiliary Engine (Maneuvering)	25	100%	773	0.14	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	8.70	0.00	0.00	0.00	0.12	8.83
	Crew Transfer Vessel	Main Engine (Transit)	17	100%	940	0.15	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	10.57	0.00	0.00	0.00	0.15	10.72
		Main Engine (Maneuvering)	17	100%	8,911	1.42	0.02	0.36	0.05	0.05	0.00	0.00	0.00	0.00	100.25	0.00	0.00	0.02	1.43	101.69
		Auxiliary Engine (Transit)	17	100%	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.14
		Auxiliary Engine (Maneuvering)	17	100%	991	0.18	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.15	0.00	0.00	0.00	0.16	11.31
	Bubble Curtain Power	Air Compressor	N/A	100%	51,300	1.58	0.15	2.77	0.02	0.02	0.01	0.00	0.01	0.00	585.52	0.02	0.00	0.59	1.42	587.53
	Hydraulic Hammer Power	Hammer Engine	N/A	100%	11,514	1.14	0.14	0.62	0.04	0.04	0.00	0.00	0.00	0.00	131.41	0.01	0.00	0.13	0.32	131.86
Scour Protection																				
	Fall Pipe Vessel	Main Engine (Transit)	25	10%	5,640	0.93	0.02	0.22	0.03	0.03	0.01	0.00	0.00	0.00	62.17	0.00	0.00	0.01	0.90	63.08
		Main Engine (Maneuvering)	25	100%	410,987	67.70	1.78	15.69	2.43	2.35	0.61	0.00	0.24	0.03	4,529.89	0.03	0.22	0.71	65.90	4,596.50
		Auxiliary Engine (Transit)	25	10%	525	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.90	0.00	0.00	0.00	0.08	5.99
		Auxiliary Engine (Maneuvering)	25	100%	158,633	27.23	0.39	6.83	0.88	0.85	0.02	0.00	0.06	0.00	1,784.74	0.01	0.09	0.28	25.44	1,810.45
	US Dredger	Main Engine (Transit)	25	27%	338	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.05	3.75	
		Main Engine (Maneuvering)	25	100%	15,640	2.61	0.08	0.58	0.10	0.09	0.03	0.00	0.01	0.00	171.19	0.00	0.01	0.03	2.51	173.72
		Auxiliary Engine (Transit)	25	27%	170	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.91	0.00	0.00	0.00	0.03	1.94
		Auxiliary Engine (Maneuvering)	25	100%	32,589	5.57	0.08	1.40	0.18	0.18	0.00	0.00	0.01	0.00	366.65	0.00	0.02	0.06	5.23	371.93
Inter Array Cable Installation																				
Cable Installation Vessel	Cable Installation Vessel	Main Engine (Transit)	25	10%	1,919	0.32	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	21.15	0.00	0.00	0.00	0.31	21.46
		Main Engine (Maneuvering)	25	100%	332,887	54.83	1.44	12.71	1.96	1.91	0.49	0.00	0.20	0.02	3,669.07	0.02	0.18	0.58	53.38	3,723.02
		Auxiliary Engine (Transit)	25	10%	39	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.01	0.45
		Auxiliary Engine (Maneuvering)	25	100%	28,167	4.84	0.07	1.21	0.16	0.15	0.00	0.00	0.01	0.00	316.90	0.00	0.02	0.05	4.52	321.47
Cable Installation Support Activities	Support Vessel/SOV	Main Engine (Transit)	25	10%	244	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.69	0.00	0.00	0.00	0.04	2.73
		Main Engine (Maneuvering)	25	100%	71,626	11.80	0.31	2.74	0.42	0.41	0.11	0.00	0.04	0.00	789.45	0.00	0.04	0.12	11.48	801.06
		Auxiliary Engine (Transit)	25	10%	41	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.01	0.46
		Auxiliary Engine (Maneuvering)	25	100%	11,938	2.05	0.03	0.51	0.07	0.06	0.00	0.00	0.00	0.00	134.31	0.00	0.01	0.02	1.91	136.24
Sand Wave Clearance	TSHD (Dredger)	Main Engine (Transit)	25	10%	338	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.05	3.75	
		Main Engine (Maneuvering)	25	100%	38,317	6.38	0.19	1.42	0.24	0.23	0.07	0.00	0.03	0.00	419.40	0.00	0.02	0.07	6.14	425.61
		Auxiliary Engine (Transit)	25	10%	170	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.91	0.00	0.00	0.00	0.03	1.94
		Auxiliary Engine (Maneuvering)	25	100%	79,842	13.65	0.19	3.44	0.44	0.43	0.01	0.00	0.03	0.00	898.28	0.01	0.04	0.14	12.80	911.22
Pre Lay Grapnel Run AHTS 1	AHTS	Main Engine (Transit)	25	27%	2,372	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	26.50	0.00	0.00	0.00	0.38	26.88
		Main Engine (Maneuvering)	25	100%	41,154	6.80	0.13	1.64	0.24	0.23	0.02	0.00	0.02	0.00	459.76	0.00	0.02	0.07	6.60	466.43
		Auxiliary Engine (Transit)	25	27%	112	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	0.00	0.00	0.00	0.02	1.28
		Auxiliary Engine (Maneuvering)	25	100%	8,062	1.41	0.02	0.35	0.04	0.04	0.00	0.00	0.00	0.00	90.70	0.00	0.00	0.01	1.29	92.00
Pre Lay Grapnel Run AHTS 2	AHTS	Main Engine (Transit)	25	27%	2,372	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	26.50	0.00	0.00	0.00	0.38	26.88
		Main Engine (Maneuvering)	25	100%	41,154	6.80	0.13	1.64	0.24	0.23	0.02	0.00	0.02	0.00	459.76	0.00	0.02	0.07	6.60	466.43
		Auxiliary Engine (Transit)	25	27%	112	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	0.00	0.00	0.00	0.02	1.28
		Auxiliary Engine (Maneuvering)	25	100%	8,062	1.41	0.02	0.35	0.04	0.04	0.00	0.00	0.00	0.00	90.70	0.00	0.00	0.01	1.29	92.00
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	25	10%	5,640	0.93	0.02	0.22	0.03	0.03	0.01	0.00	0.00	0.00	62.17	0.00	0.00	0.01	0.90	63.08
		Main Engine (Maneuvering)	25	100%	13,047	2.15	0.06	0.50	0.08	0.07	0.02	0.00	0.01	0.00	143.81	0.00	0.01	0.02	2.09	145.92
		Auxiliary Engine (Transit)	25	10%	525	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.90	0.00	0.00	0.00	0.08	5.99
		Auxiliary Engine (Maneuvering)	25	100%	5,036	0.86	0.01	0.22	0.03	0.03	0.00	0.00	0.00	0.00	56.66	0.00	0.00	0.01	0.81	57.47
WTG Installation																				
WTG Installation Vessel	Jackup Vessel	Main Engine (Transit)	25	27%	5,266															

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
US Jack Up Feeder 2	Jack up	Main Engine (Transit)	25	27%	81,054	15.60	0.22	3.58	0.48	0.47	0.02	0.00	0.03	0.00	1,006.44	0.01	0.05	0.16	14.37	1,020.97
		Main Engine (Maneuvering)	25	100%	224,722	43.25	0.60	9.92	1.34	1.29	0.06	0.00	0.09	0.00	2,790.37	0.02	0.13	0.43	39.84	2,830.63
		Auxiliary Engine (Transit)	25	27%	23,212	4.65	0.06	1.00	0.13	0.12	0.00	0.00	0.01	0.00	261.16	0.00	0.01	0.04	3.72	264.92
		Auxiliary Engine (Maneuvering)	25	100%	267,079	53.54	0.65	11.50	1.48	1.44	0.03	0.00	0.10	0.00	3,004.83	0.02	0.14	0.46	42.82	3,048.12
Crew Transfer	Crew Transfer Vessel	Main Engine (Transit)	17	100%	11,947	1.90	0.03	0.48	0.06	0.06	0.00	0.00	0.00	0.00	134.40	0.00	0.01	0.02	1.92	136.34
		Main Engine (Maneuvering)	17	100%	224,047	35.58	0.54	8.94	1.21	1.17	0.02	0.00	0.08	0.00	2,520.53	0.02	0.12	0.39	35.92	2,556.85
		Auxiliary Engine (Transit)	17	100%	160	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.03	1.83
		Auxiliary Engine (Maneuvering)	17	100%	12,458	2.25	0.03	0.54	0.07	0.07	0.00	0.00	0.00	0.00	140.16	0.00	0.01	0.02	2.00	142.18
WTG Commissioning SOV	Service Operation Vessel	Main Engine (Transit)	25	27%	244	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.69	0.00	0.00	0.00	0.04	2.73
		Main Engine (Maneuvering)	25	100%	268,215	44.18	1.16	10.24	1.58	1.54	0.40	0.00	0.16	0.02	2,956.25	0.02	0.14	0.47	43.01	2,999.73
		Auxiliary Engine (Transit)	25	27%	41	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.01	0.46
		Auxiliary Engine (Maneuvering)	25	100%	44,702	7.67	0.11	1.92	0.25	0.24	0.00	0.00	0.02	0.00	502.94	0.00	0.02	0.08	7.17	510.18
Export Cable Installation																				
Cable Installation Vessel 1	Cable Installation Vessel	Main Engine (Transit)	25	27%	2,358	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.99	0.00	0.00	0.00	0.38	26.37
		Main Engine (Maneuvering)	25	51%	242,448	39.94	1.05	9.26	1.43	1.39	0.36	0.00	0.14	0.02	2,672.25	0.02	0.13	0.42	38.87	2,711.54
		Auxiliary Engine (Transit)	25	27%	498	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.00	0.00	0.08	5.68
		Auxiliary Engine (Maneuvering)	25	51%	212,474	36.47	0.52	9.15	1.18	1.14	0.02	0.00	0.08	0.00	2,390.48	0.01	0.11	0.37	34.07	2,424.92
Cable Installation Vessel 2	Cable Installation Vessel	Main Engine (Transit)	25	27%	2,358	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.99	0.00	0.00	0.00	0.38	26.37
		Main Engine (Maneuvering)	25	51%	242,448	39.94	1.05	9.26	1.43	1.39	0.36	0.00	0.14	0.02	2,672.25	0.02	0.13	0.42	38.87	2,711.54
		Auxiliary Engine (Transit)	25	27%	498	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.00	0.00	0.08	5.68
		Auxiliary Engine (Maneuvering)	25	51%	212,474	36.47	0.52	9.15	1.18	1.14	0.02	0.00	0.08	0.00	2,390.48	0.01	0.11	0.37	34.07	2,424.92
Support and Jointing Vessel	Support Vessel	Main Engine (Transit)	25	27%	1,709	0.28	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.84	0.00	0.00	0.00	0.27	19.12
		Main Engine (Maneuvering)	25	51%	35,358	5.82	0.15	1.35	0.21	0.20	0.05	0.00	0.02	0.00	389.71	0.00	0.02	0.06	5.67	395.44
		Auxiliary Engine (Transit)	25	27%	354	0.06	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.98	0.00	0.00	0.00	0.06	4.03
		Auxiliary Engine (Maneuvering)	25	51%	30,345	5.21	0.07	1.31	0.17	0.16	0.00	0.00	0.01	0.00	341.40	0.00	0.02	0.05	4.87	346.32
TSHD	Dredger	Main Engine (Transit)	25	27%	338	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.05	3.75
		Main Engine (Maneuvering)	25	51%	25,371	4.23	0.12	0.94	0.16	0.15	0.05	0.00	0.02	0.00	277.70	0.00	0.01	0.04	4.07	281.81
		Auxiliary Engine (Transit)	25	27%	170	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.91	0.00	0.00	0.00	0.03	1.94
		Auxiliary Engine (Maneuvering)	25	51%	52,866	9.04	0.13	2.28	0.29	0.28	0.01	0.00	0.02	0.00	594.78	0.00	0.03	0.09	8.48	603.35
AHTS	Tug	Main Engine (Transit)	25	27%	2,372	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	26.50	0.00	0.00	0.00	0.38	26.88
		Main Engine (Maneuvering)	25	51%	72,893	12.04	0.23	2.90	0.42	0.40	0.04	0.00	0.03	0.00	814.35	0.01	0.04	0.13	11.69	826.17
		Auxiliary Engine (Transit)	25	27%	112	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	0.00	0.00	0.00	0.02	1.28
		Auxiliary Engine (Maneuvering)	25	51%	14,279	2.50	0.03	0.61	0.08	0.08	0.00	0.00	0.01	0.00	160.65	0.00	0.01	0.02	2.29	162.96
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	25	10%	5,640	0.93	0.02	0.22	0.03	0.03	0.01	0.00	0.00	0.00	62.17	0.00	0.00	0.01	0.90	63.08
		Main Engine (Maneuvering)	25	51%	9,999	1.65	0.04	0.38	0.06	0.06	0.01	0.00	0.01	0.00	110.21	0.00	0.01	0.02	1.60	111.83
		Auxiliary Engine (Transit)	25	10%	525	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.90	0.00	0.00	0.00	0.08	5.99
		Auxiliary Engine (Maneuvering)	25	51%	3,860	0.66	0.01	0.17	0.02	0.02	0.00	0.00	0.00	0.00	43.42	0.00	0.00	0.01	0.62	44.05
Fuel Bunkering																				
Towing Tug	Tug	Main Engine (Transit)	25	27%	22,626	3.74	0.07	0.90	0.13	0.13	0.01	0.00	0.01	0.00	252.78	0.00	0.01	0.04	3.63	256.44
		Main Engine (Maneuvering)	25	100%	175,493	29.00	0.55	6.98	1.01	0.97	0.10	0.00	0.08	0.00	1,960.60	0.01	0.09	0.30	28.14	1,989.04
		Auxiliary Engine (Transit)	25	27%	548	0.10	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	6.16	0.00	0.00	0.00	0.09	6.25
		Auxiliary Engine (Maneuvering)	25	100%	17,633	3.09	0.04	0.76	0.10	0.09	0.00	0.00	0.01	0.00	198.39	0.00	0.01	0.03	2.83	201.24
Barge	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	116	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.02	1.32
		Auxiliary Engine (Maneuvering)	25	100%	3,736	0.82	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.03	0.00	0.00	0.01	0.60	42.64
Motion Compensation	Motion Compensation	Motion Compensation Engine	N/A	100%	97,714	6.03	0.75	5.28	0.30	0.30	0.01	0.00	0.01	0.00	1,115.28	0.05	0.01	1.13	2.70	1,119.11
Commissioning Generators																				
OSS Commissioning Generators	Generator	Marine Tier 3 Generator	N/A	100%	24,000	2.15	0.26	1.85	0.04	0.04	0.00	0.00	0.01	0.00	273.93	0.01	0.00	0.28	0.66	274.87
WTG Commissioning Generators	Generator	Marine Tier 3 Generator	N/A	100%	36,206	3.02	0.36	2.79	0.07	0.07	0.00	0.00	0.01	0.00	413.24	0.02	0.00	0.42	1.00	414.66
Miscellaneous																				
Marine Paint	N/A	N/A	N/A	100%	N/A	N/A	0.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fuel Evaporation	N/A	N/A	N/A	100%	N/A	N/A	0.09	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Trips	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Emissions During Construction																	
Foundation Installation (FOU) B02																	
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	6	4 x 3840kW 2 x 4800kW	24,960	3 main	Europe	1	250	500	10	50	0	0	0	50	7M
		Main Engine (Maneuvering)	6	4 x 3840kW 2 x 4800kW	24,960	3 main		0	250	0	10	0	140	24	3,360	3,360	7M
		Auxiliary Engine (Transit)	1	1,110	1,110	3 Auxiliary		1	250	500	10	50	0	0	0	50	7A
		Auxiliary Engine (Maneuvering)	1	1,110	1,110	3 Auxiliary		0	250	0	10	0	140	24	3,360	3,360	7A
Bubble Curtain Support Vessel	Tug	Main Engine (Transit)	2	5,530	11,060	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	11M
		Main Engine (Maneuvering)	2	5,530	11,060	1 & 2 main		0	91	0	10	0	140	24	3,360	3,360	11M
		Auxiliary Engine (Transit)	0	0	0	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	11A
		Auxiliary Engine (Maneuvering)	0	0	0	1 & 2 auxiliary		0	91	0	10	0	140	24	3,360	3,360	11A
Barge 1	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	24	91	4,380	7	626	0	0	0	626	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	7	0	140	24	3,360	3,360	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		24	91	4,380	7	626	0	0	0	626	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	7	0	140	24	3,360	3,360	2A
Barge 2	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	24	91	4,380	7	626	0	0	0	626	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	7	0	140	24	3,360	3,360	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		24	91	4,380	7	626	0	0	0	626	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	7	0	140	24	3,360	3,360	2A
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	24	91	4,380	7	626	0	0	0	626	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	7	0	140	24	3,360	3,360	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		24	91	4,380	7	626	0	0	0	626	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	7	0	140	24	3,360	3,360	11A
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	24	91	4,380	7	626	0	0	0	626	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	7	0	140	24	3,360	3,360	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		24	91	4,380	7	626	0	0	0	626	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	7	0	140	24	3,360	3,360	11A
Crew Transfer / PSO / Noise Monitoring Vessel	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	81	17	2,815	29	99	0	0	0	99	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	29	0	140	24	3,360	3,360	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		81	17	2,815	29	99	0	0	0	99	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	29	0	140	24	3,360	3,360	4A
Bubble Curtain Power	Air Compressor	Air Compressor	20	399	7,980	Stage III B	N/A	0	0	0	0	0	140	8	1,120	1,120	16
Hydraulic Hammer Power	Hydraulic Hammer Engine	Hammer Engine	3	597	1,791	Tier 2 Non-Road	N/A	0	0	0	0	0	140	8	1,120	1,120	18
Offshore Substation Installation (OSS)																	
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	6	4 x 3840kW 2 x 4800kW	24,960	3 main	Europe	1	250	500	10	50	0	0	0	50	7M
		Main Engine (Maneuvering)	6	4 x 3840kW 2 x 4800kW	24,960	3 main		0	250	0	10	0	9	24	216	216	7M
		Auxiliary Engine (Transit)	1	1,110	1,110	3 Auxiliary		1	250	500	10	50	0	0	0	50	7A
		Auxiliary Engine (Maneuvering)	1	1,110	1,110	3 Auxiliary		0	250	0	10	0	9	24	216	216	7A
	Bubble Curtain Support Vessel	Main Engine (Transit)	2	5,530	11,060	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	11M
		Main Engine (Maneuvering)	2	5,530	11,060	1 & 2 main		0	91	0	10	0	9	24	216	216	11M
		Auxiliary Engine (Transit)	0	0	0	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	11A
		Auxiliary Engine (Maneuvering)	0	0	0	1 & 2 auxiliary		0	91	0	10	0	9	24	216	216	11A
Transport Barge 1	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	5	24	120	120	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	2A
Transport Barge 2	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	5	24	120	120	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	2A
Transport Barge 3	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	5	24	120	120	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	2A
Transport Barge 4	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	5	24	120	120	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	2A
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	2A
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	5	24	120	120	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	11A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Trips	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	5	24	120	120	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	11A
US Towing Tug 3	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	5	24	120	120	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	11A
US Towing Tug 4	US Towing Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	3	91	547	10	55	0	0	0	55	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	5	24	120	120	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		3	91	547	10	55	0	0	0	55	11A
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	5	24	120	120	11A
	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	7	17	243	29	9	0	0	0	9	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	29	0	28	24	672	672	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		7	17	243	29	9	0	0	0	9	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	29	0	28	24	672	672	4A
	Bubble Curtain Power	Air Compressor	20	399	7,980	Stage III B	N/A	0	0	0	0	0	9	10	90	90	16
	Hydraulic Hammer Power	Hammer Engine	3	597	1,791	Tier 2 Non-Road	N/A	0	0	0	0	0	9	10	90	90	18
Scour Protection																	
	Fall Pipe Vessel	Main Engine (Transit)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	3M
		Main Engine (Maneuvering)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main		0	250	0	10	0	44	24	1,056	1,056	3M
		Auxiliary Engine (Transit)	1	2,950	2,950	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	3A
		Auxiliary Engine (Maneuvering)	1	2,950	2,950	1 & 2 auxiliary		0	250	0	10	0	44	24	1,056	1,056	3A
	US Dredger	Main Engine (Transit)	2	641	1,283	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	5M
		Main Engine (Maneuvering)	2	641	1,283	1 & 2 main		0	91	0	10	0	28	24	672	672	5M
		Auxiliary Engine (Transit)	1	954	954	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	5A
		Auxiliary Engine (Maneuvering)	1	954	954	1 & 2 auxiliary		0	91	0	10	0	28	24	672	672	5A
Inter Array Cable Installation																	
Cable Installation Vessel	Cable Installation Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	250	0	10	0	105	24	2,520	2,520	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	250	0	10	0	105	24	2,520	2,520	3A
Cable Installation Support Activities	Support Vessel/SOV	Main Engine (Transit)	4	1,200	4,800	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	3M
		Main Engine (Maneuvering)	4	1,200	4,800	1 & 2 main		0	250	0	10	0	66	24	1,584	1,584	3M
		Auxiliary Engine (Transit)	1	800	800	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	3A
		Auxiliary Engine (Maneuvering)	1	800	800	1 & 2 auxiliary		0	250	0	10	0	66	24	1,584	1,584	3A
Sand Wave Clearance	TSHD (Dredger)	Main Engine (Transit)	2	641	1,283	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	5M
		Main Engine (Maneuvering)	2	641	1,283	1 & 2 main		0	250	0	10	0	69	24	1,656	1,656	5M
		Auxiliary Engine (Transit)	1	954	954	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	5A
		Auxiliary Engine (Maneuvering)	1	954	954	1 & 2 auxiliary		0	250	0	10	0	69	24	1,656	1,656	5A
Pre Lay Grapnel Run AHTS 1	AHTS	Main Engine (Transit)	2	4,500	9,000	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	11M
		Main Engine (Maneuvering)	2	4,500	9,000	1 & 2 main		0	91	0	10	0	11	24	264	264	11M
		Auxiliary Engine (Transit)	2	410	820	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	11A
		Auxiliary Engine (Maneuvering)	2	410	820	1 & 2 auxiliary		0	91	0	10	0	11	24	264	264	11A
Pre Lay Grapnel Run AHTS 2	AHTS	Main Engine (Transit)	2	4,500	9,000	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	11M
		Main Engine (Maneuvering)	2	4,500	9,000	1 & 2 main		0	91	0	10	0	11	24	264	264	11M
		Auxiliary Engine (Transit)	2	410	820	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	11A
		Auxiliary Engine (Maneuvering)	2	410	820	1 & 2 auxiliary		0	91	0	10	0	11	24	264	264	11A
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	3M
		Main Engine (Maneuvering)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main		0	250	0	10	0	2	24	48	48	3M
		Auxiliary Engine (Transit)	1	2,950	2,950	1 & 2 auxiliary		1	250	500	10	50	0	0	0	50	3A
		Auxiliary Engine (Maneuvering)	1	2,950	2,950	1 & 2 auxiliary		0	250	0	10	0	2	24	48	48	3A
WTG Installation																	
WTG Installation Vessel	Jackup Vessel	Main Engine (Transit)	7	4 x 3,535kW 3 x 2,650kW	22,090	3 main	NJWP	1	91	182	10	18	0	0	0	18	7M
		Main Engine (Maneuvering)	7	4 x 3,535kW 3 x 2,650kW	22,090	3 main		0	91	0	10	0	246	24	5,904	5,904	7M
		Auxiliary Engine (Transit)	1	2,650	2,650	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	7A
		Auxiliary Engine (Maneuvering)	1	2,650	2,650	1 & 2 auxiliary		0	91	0	10	0	246	24	5,904	5,904	7A
US Jack Up Feeder 1	Jack up	Main Engine (Transit)	2	2,500	5,000	3 main	NJWP	48	91	8,759	10	876	0	0	0	876	7M
		Main Engine (Maneuvering)	2	2,500	5,000	3 main		0	91	0	10	0	114	24	2,736	2,736	7M
		Auxiliary Engine (Transit)	1	2,500	2,500	1 & 2 auxiliary		48	91	8,759	10	876	0	0	0	876	7A
		Auxiliary Engine (Maneuvering)	1	2,500	2,500	1 & 2 auxiliary		0	91	0	10	0	114	24	2,736	2,736	7A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Trips	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
US Jack Up Feeder 2	Jack up	Main Engine (Transit)	2	2,500	5,000	3 main	NJWP	48	91	8,759	10	876	0	0	0	876	7M
		Main Engine (Maneuvering)	2	2,500	5,000	3 main		0	91	0	10	0	114	24	2,736	2,736	7M
		Auxiliary Engine (Transit)	1	2,500	2,500	1 & 2 auxiliary		48	91	8,759	10	876	0	0	876	7A	
		Auxiliary Engine (Maneuvering)	1	2,500	2,500	1 & 2 auxiliary		0	91	0	10	0	114	24	2,736	2,736	7A
Crew Transfer	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	62	17	2,155	29	76	0	0	0	76	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	29	0	246	24	5,904	5,904	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		62	17	2,155	29	76	0	0	76	4A	
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	29	0	246	24	5,904	5,904	4A
WTG Commissioning SOV	Service Operation Vessel	Main Engine (Transit)	4	1,200	4,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	4	1,200	4,800	1 & 2 main		0	91	0	10	0	246	24	5,904	5,904	3M
		Auxiliary Engine (Transit)	1	800	800	1 & 2 auxiliary		1	91	182	10	18	0	0	18	3A	
		Auxiliary Engine (Maneuvering)	1	800	800	1 & 2 auxiliary		0	91	0	10	0	246	24	5,904	5,904	3A
Export Cable Installation																	
Cable Installation Vessel 1	Cable Installation Vessel	Main Engine (Transit)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main		0	91	0	10	0	174	24	4,176	4,176	3M
		Auxiliary Engine (Transit)	2	1,400	2,800	1 & 2 auxiliary		1	91	182	10	18	0	0	18	3A	
		Auxiliary Engine (Maneuvering)	2	1,400	2,800	1 & 2 auxiliary		0	91	0	10	0	174	24	4,176	4,176	3A
Cable Installation Vessel 2	Cable Installation Vessel	Main Engine (Transit)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	4	2 x 2560kW 2 x 1913kW	8,946	1 & 2 main		0	91	0	10	0	174	24	4,176	4,176	3M
		Auxiliary Engine (Transit)	2	1,400	2,800	1 & 2 auxiliary		1	91	182	10	18	0	0	18	3A	
		Auxiliary Engine (Maneuvering)	2	1,400	2,800	1 & 2 auxiliary		0	91	0	10	0	174	24	4,176	4,176	3A
Support and Jointing Vessel	Support Vessel	Main Engine (Transit)	3	2 x 2350kW 1 x 1786kW	6,486	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	3	2 x 2350kW 1 x 1786kW	6,486	1 & 2 main		0	91	0	10	0	35	24	840	840	3M
		Auxiliary Engine (Transit)	2	994	1,988	1 & 2 auxiliary		1	91	182	10	18	0	0	18	3A	
		Auxiliary Engine (Maneuvering)	2	994	1,988	1 & 2 auxiliary		0	91	0	10	0	35	24	840	840	3A
TSHD	Dredger	Main Engine (Transit)	2	641	1,283	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	5M
		Main Engine (Maneuvering)	2	641	1,283	1 & 2 main		0	91	0	10	0	127	24	3,048	3,048	5M
		Auxiliary Engine (Transit)	1	954	954	1 & 2 auxiliary		1	91	182	10	18	0	0	18	5A	
		Auxiliary Engine (Maneuvering)	1	954	954	1 & 2 auxiliary		0	91	0	10	0	127	24	3,048	3,048	5A
AHTS	Tug	Main Engine (Transit)	2	4,500	9,000	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	11M
		Main Engine (Maneuvering)	2	4,500	9,000	1 & 2 main		0	91	0	10	0	52	24	1,248	1,248	11M
		Auxiliary Engine (Transit)	2	410	820	1 & 2 auxiliary		1	91	182	10	18	0	0	18	11A	
		Auxiliary Engine (Maneuvering)	2	410	820	1 & 2 auxiliary		0	91	0	10	0	52	24	1,248	1,248	11A
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main	Europe	1	250	500	10	50	0	0	0	50	3M
		Main Engine (Maneuvering)	8	4 x 3350kW 4 x 2000kW	21,400	1 & 2 main		0	250	0	10	0	3	24	72	72	3M
		Auxiliary Engine (Transit)	1	2,950	2,950	1 & 2 auxiliary		1	250	500	10	50	0	0	50	3A	
		Auxiliary Engine (Maneuvering)	1	2,950	2,950	1 & 2 auxiliary		0	250	0	10	0	3	24	72	72	3A
Fuel Bunkering																	
Towing Tug	Tug	Main Engine (Transit)	2	2,525	5,050	1 & 2 main	NJWP	12	91	2,190	10	219	0	0	0	219	11M
		Main Engine (Maneuvering)	2	2,525	5,050	1 & 2 main		0	91	0	10	0	80	24	1,920	1,920	11M
		Auxiliary Engine (Transit)	3	79	236	1 & 2 auxiliary		12	91	2,190	10	219	0	0	219	11A	
		Auxiliary Engine (Maneuvering)	3	79	236	1 & 2 auxiliary		0	91	0	10	0	80	24	1,920	1,920	11A
Barge	Barge	Main Engine (Transit)	0	0	0	1 & 2 main	NJWP	12	91	2,190	10	219	0	0	0	219	2M
		Main Engine (Maneuvering)	0	0	0	1 & 2 main		0	91	0	10	0	80	24	1,920	1,920	2M
		Auxiliary Engine (Transit)	1	50	50	1 & 2 auxiliary		12	91	2,190	10	219	0	0	219	2A	
		Auxiliary Engine (Maneuvering)	1	50	50	1 & 2 auxiliary		0	91	0	10	0	80	24	1,920	1,920	2A
Motion Compensation	Motion Compensation	Motion Compensation Engine	1	500	500	Tier 3 Non-Road	NJWP	0	91	0	0	0	80	24	1,920	1,920	17
Commissioning Generators																	
OSS Commissioning Generators	Generator	Marine Tier 3 Generator	4	500	2,000	Tier 4 Non-Road	N/A	0	0	0	0	0	28	12	336	336	31
WTG Commissioning Generators	Generator	Marine Tier 3 Generator	1	240	240	Tier 4 Non-Road	N/A	0	0	0	0	0	246	12	2,952	2,952	32
Miscellaneous																	
Marine Paint	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fuel Evaporation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Construction																			
Foundation Installation (FOU) B02																			
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	0.83	59,503	11.45	0.16	2.63	0.35	0.34	0.01	0.00	0.02	0.0007	738.85	0.00	0.04	0.11	10.55	749.51
		Main Engine (Maneuvering)	0.10	481,761	92.72	1.29	21.26	2.87	2.77	0.12	0.00	0.20	0.0055	5,982.00	0.04	0.29	0.92	85.40	6,068.32
		Auxiliary Engine (Transit)	0.56	2,094	0.40	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.0000	22.21	0.00	0.00	0.00	0.32	22.53
		Auxiliary Engine (Maneuvering)	0.56	140,730	26.59	0.32	5.71	0.74	0.71	0.01	0.00	0.05	0.0006	1,492.33	0.01	0.07	0.23	21.27	1,513.82
Bubble Curtain Support Vessel	Tug	Main Engine (Transit)	0.83	10,639	1.76	0.03	0.42	0.06	0.06	0.01	0.00	0.00	0.0003	118.86	0.00	0.01	0.02	1.71	120.58
		Main Engine (Maneuvering)	0.10	236,008	39.00	0.74	9.38	1.35	1.31	0.14	0.00	0.11	0.0062	2,636.67	0.02	0.13	0.41	37.84	2,674.92
		Auxiliary Engine (Transit)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
Barge 1	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	854	0.19	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.0000	9.61	0.00	0.00	0.00	0.14	9.75
		Auxiliary Engine (Maneuvering)	0.43	4,588	1.00	0.01	0.20	0.03	0.02	0.00	0.00	0.00	0.0000	51.62	0.00	0.00	0.01	0.74	52.36
Barge 2	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	854	0.19	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.0000	9.61	0.00	0.00	0.00	0.14	9.75
		Auxiliary Engine (Maneuvering)	0.43	4,588	1.00	0.01	0.20	0.03	0.02	0.00	0.00	0.00	0.0000	51.62	0.00	0.00	0.01	0.74	52.36
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	0.83	166,545	27.52	0.52	6.62	0.95	0.93	0.10	0.00	0.08	0.0044	1,860.63	0.01	0.09	0.29	26.70	1,887.62
		Main Engine (Maneuvering)	0.10	107,759	17.81	0.34	4.28	0.62	0.60	0.06	0.00	0.05	0.0028	1,203.87	0.01	0.06	0.19	17.28	1,221.34
		Auxiliary Engine (Transit)	0.43	4,032	0.71	0.01	0.17	0.02	0.02	0.00	0.00	0.00	0.0000	45.37	0.00	0.00	0.01	0.65	46.02
		Auxiliary Engine (Maneuvering)	0.43	21,655	3.80	0.05	0.93	0.12	0.12	0.00	0.00	0.01	0.0001	243.63	0.00	0.01	0.04	3.47	247.14
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	0.83	166,545	27.52	0.52	6.62	0.95	0.93	0.10	0.00	0.08	0.0044	1,860.63	0.01	0.09	0.29	26.70	1,887.62
		Main Engine (Maneuvering)	0.10	107,759	17.81	0.34	4.28	0.62	0.60	0.06	0.00	0.05	0.0028	1,203.87	0.01	0.06	0.19	17.28	1,221.34
		Auxiliary Engine (Transit)	0.43	4,032	0.71	0.01	0.17	0.02	0.02	0.00	0.00	0.00	0.0000	45.37	0.00	0.00	0.01	0.65	46.02
		Auxiliary Engine (Maneuvering)	0.43	21,655	3.80	0.05	0.93	0.12	0.12	0.00	0.00	0.01	0.0001	243.63	0.00	0.01	0.04	3.47	247.14
Crew Transfer / PSO / Noise Monitoring Vessel	Crew Transfer Vessel	Main Engine (Transit)	0.83	10,873	1.73	0.03	0.43	0.06	0.06	0.00	0.00	0.00	0.0001	122.32	0.00	0.01	0.02	1.74	124.08
		Main Engine (Maneuvering)	0.10	44,555	7.08	0.11	1.78	0.24	0.23	0.00	0.00	0.02	0.0002	501.24	0.00	0.02	0.08	7.14	508.46
		Auxiliary Engine (Transit)	0.43	146	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.64	0.00	0.00	0.00	0.02	1.66
		Auxiliary Engine (Maneuvering)	0.43	4,955	0.89	0.01	0.21	0.03	0.03	0.00	0.00	0.00	0.0000	55.75	0.00	0.00	0.01	0.79	56.55
Bubble Curtain Power	Air Compressor	Air Compressor	1.00	638,400	19.70	1.87	34.48	0.25	0.25	0.07	0.00	0.17	0.0031	7,286.51	0.30	0.06	7.39	17.62	7,311.52
Hydraulic Hammer Power	Hydraulic Hammer Engine	Hammer Engine	1.00	143,280	14.15	1.75	7.74	0.44	0.44	0.02	0.00	0.02	0.0007	1,635.36	0.07	0.01	1.66	3.95	1,640.97
Offshore Substation Installation (OSS)																			
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	0.83	59,503	11.45	0.16	2.63	0.35	0.34	0.01	0.00	0.02	0.0007	738.85	0.00	0.04	0.11	10.55	749.51
		Main Engine (Maneuvering)	0.10	30,970	5.96	0.08	1.37	0.18	0.18	0.01	0.00	0.01	0.0004	384.56	0.00	0.02	0.06	5.49	390.11
		Auxiliary Engine (Transit)	0.56	2,094	0.40	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.0000	22.21	0.00	0.00	0.00	0.32	22.53
		Auxiliary Engine (Maneuvering)	0.56	9,047	1.71	0.02	0.37	0.05	0.05	0.00	0.00	0.00	0.0000	95.94	0.00	0.00	0.01	1.37	97.32
	Bubble Curtain Support Vessel	Main Engine (Transit)	0.83	10,639	1.76	0.03	0.42	0.06	0.06	0.01	0.00	0.00	0.0003	118.86	0.00	0.01	0.02	1.71	120.58
		Main Engine (Maneuvering)	0.10	15,172	2.51	0.05	0.60	0.09	0.08	0.01	0.00	0.01	0.0004	169.50	0.00	0.01	0.03	2.43	171.96
		Auxiliary Engine (Transit)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
Transport Barge 1	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	75	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.84	0.00	0.00	0.00	0.01	0.85
		Auxiliary Engine (Maneuvering)	0.43	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 2	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	75	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.84	0.00	0.00	0.00	0.01	0.85
		Auxiliary Engine (Maneuvering)	0.43	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 3	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	75	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.84	0.00	0.00	0.00	0.01	0.85
		Auxiliary Engine (Maneuvering)	0.43	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 4	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	75	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.84					

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	0.83	14,573	2.41	0.05	0.58	0.08	0.08	0.01	0.00	0.01	0.0004	162.81	0.00	0.01	0.03	2.34	165.17
		Main Engine (Maneuvering)	0.10	3,849	0.64	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.0001	43.00	0.00	0.00	0.01	0.62	43.62
		Auxiliary Engine (Transit)	0.43	353	0.06	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	3.97	0.00	0.00	0.00	0.06	4.03
		Auxiliary Engine (Maneuvering)	0.43	773	0.14	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.0000	8.70	0.00	0.00	0.00	0.12	8.83
US Towing Tug 3	US Towing Tug	Main Engine (Transit)	0.83	14,573	2.41	0.05	0.58	0.08	0.08	0.01	0.00	0.01	0.0004	162.81	0.00	0.01	0.03	2.34	165.17
		Main Engine (Maneuvering)	0.10	3,849	0.64	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.0001	43.00	0.00	0.00	0.01	0.62	43.62
		Auxiliary Engine (Transit)	0.43	353	0.06	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	3.97	0.00	0.00	0.00	0.06	4.03
		Auxiliary Engine (Maneuvering)	0.43	773	0.14	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.0000	8.70	0.00	0.00	0.00	0.12	8.83
US Towing Tug 4	US Towing Tug	Main Engine (Transit)	0.83	14,573	2.41	0.05	0.58	0.08	0.08	0.01	0.00	0.01	0.0004	162.81	0.00	0.01	0.03	2.34	165.17
		Main Engine (Maneuvering)	0.10	3,849	0.64	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.0001	43.00	0.00	0.00	0.01	0.62	43.62
		Auxiliary Engine (Transit)	0.43	353	0.06	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	3.97	0.00	0.00	0.00	0.06	4.03
		Auxiliary Engine (Maneuvering)	0.43	773	0.14	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.0000	8.70	0.00	0.00	0.00	0.12	8.83
	Crew Transfer Vessel	Main Engine (Transit)	0.83	940	0.15	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.0000	10.57	0.00	0.00	0.00	0.15	10.72
		Main Engine (Maneuvering)	0.10	8,911	1.42	0.02	0.36	0.05	0.05	0.00	0.00	0.00	0.0000	100.25	0.00	0.00	0.02	1.43	101.69
		Auxiliary Engine (Transit)	0.43	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.14	0.00	0.00	0.00	0.00	0.14
		Auxiliary Engine (Maneuvering)	0.43	991	0.18	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.0000	11.15	0.00	0.00	0.00	0.16	11.31
	Bubble Curtain Power	Air Compressor	1.00	51,300	1.58	0.15	2.77	0.02	0.02	0.01	0.00	0.01	0.0002	585.52	0.02	0.00	0.59	1.42	587.53
	Hydraulic Hammer Power	Hammer Engine	1.00	11,514	1.14	0.14	0.62	0.04	0.04	0.00	0.00	0.00	0.0001	131.41	0.01	0.00	0.13	0.32	131.86
Scour Protection																			
	Fall Pipe Vessel	Main Engine (Transit)	0.83	56,402	9.29	0.24	2.15	0.33	0.32	0.08	0.00	0.03	0.0038	621.66	0.00	0.03	0.10	9.04	630.80
		Main Engine (Maneuvering)	0.20	287,039	47.28	1.25	10.96	1.69	1.64	0.42	0.00	0.17	0.0195	3,163.73	0.02	0.15	0.50	46.02	3,210.25
		Auxiliary Engine (Transit)	0.56	5,246	0.90	0.01	0.23	0.03	0.03	0.00	0.00	0.00	0.0000	59.02	0.00	0.00	0.01	0.84	59.87
		Auxiliary Engine (Maneuvering)	0.56	110,792	19.02	0.27	4.77	0.62	0.60	0.01	0.00	0.04	0.0005	1,246.49	0.01	0.06	0.19	17.76	1,264.44
	US Dredger	Main Engine (Transit)	0.83	1,234	0.21	0.01	0.05	0.01	0.01	0.00	0.00	0.00	0.0001	13.50	0.00	0.00	0.00	0.20	13.70
		Main Engine (Maneuvering)	0.20	10,948	1.82	0.05	0.40	0.07	0.06	0.02	0.00	0.01	0.0010	119.83	0.00	0.01	0.02	1.76	121.60
		Auxiliary Engine (Transit)	0.56	619	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.0000	6.97	0.00	0.00	0.00	0.10	7.07
		Auxiliary Engine (Maneuvering)	0.56	22,812	3.90	0.06	0.98	0.13	0.12	0.00	0.00	0.01	0.0001	256.65	0.00	0.01	0.04	3.66	260.35
Inter Array Cable Installation																			
Cable Installation Vessel	Cable Installation Vessel	Main Engine (Transit)	0.83	19,187	3.16	0.08	0.73	0.11	0.11	0.03	0.00	0.01	0.0013	211.48	0.00	0.01	0.03	3.08	214.59
		Main Engine (Maneuvering)	0.20	233,021	38.38	1.01	8.90	1.38	1.33	0.34	0.00	0.14	0.0158	2,568.35	0.02	0.13	0.40	37.36	2,606.11
		Auxiliary Engine (Transit)	0.56	391	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	4.40	0.00	0.00	0.00	0.06	4.46
		Auxiliary Engine (Maneuvering)	0.56	19,717	3.38	0.05	0.85	0.11	0.11	0.00	0.00	0.01	0.0001	221.83	0.00	0.01	0.03	3.16	225.03
Cable Installation Support Activities	Support Vessel/SOV	Main Engine (Transit)	0.16	2,439	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.0002	26.88	0.00	0.00	0.00	0.39	27.27
		Main Engine (Maneuvering)	0.10	50,290	8.28	0.22	1.92	0.30	0.29	0.07	0.00	0.03	0.0034	554.30	0.00	0.03	0.09	8.06	562.45
		Auxiliary Engine (Transit)	0.16	406	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	4.57	0.00	0.00	0.00	0.07	4.64
		Auxiliary Engine (Maneuvering)	0.10	8,382	1.44	0.02	0.36	0.05	0.05	0.00	0.00	0.00	0.0000	94.30	0.00	0.00	0.01	1.34	95.66
Sand Wave Clearance	TSHD (Dredger)	Main Engine (Transit)	0.83	3,380	0.56	0.02	0.12	0.02	0.02	0.01	0.00	0.00	0.0003	37.00	0.00	0.00	0.01	0.54	37.55
		Main Engine (Maneuvering)	0.20	26,978	4.50	0.13	1.00	0.17	0.16	0.05	0.00	0.02	0.0024	295.29	0.00	0.01	0.05	4.33	299.67
		Auxiliary Engine (Transit)	0.56	1,697	0.29	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.0000	19.10	0.00	0.00	0.00	0.27	19.37
		Auxiliary Engine (Maneuvering)	0.56	56,215	9.61	0.14	2.42	0.31	0.30	0.01	0.00	0.02	0.0003	632.46	0.00	0.03	0.10	9.01	641.58
Pre Lay Grapnel Run AHTS 1	AHTS	Main Engine (Transit)	0.83	8,657	1.43	0.03	0.34	0.05	0.05	0.00	0.00	0.00	0.0002	96.72	0.00	0.00	0.02	1.39	98.12
		Main Engine (Maneuvering)	0.20	30,179	4.99	0.09	1.20	0.17	0.17	0.02	0.00	0.01	0.0008	337.16	0.00	0.02	0.05	4.84	342.05
		Auxiliary Engine (Transit)	0.43	409	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	4.60	0.00	0.00	0.00	0.07	4.66
		Auxiliary Engine (Maneuvering)	0.43	5,912	1.04	0.01	0.25	0.03	0.03	0.00	0.00	0.00	0.0000	66.51	0.00	0.00	0.01	0.95	67.47
Pre Lay Grapnel Run AHTS 2	AHTS	Main Engine (Transit)	0.83	8,657	1.43	0.03	0.34	0.05	0.05	0.00	0.00	0.00	0.0002	96.72	0.00	0.00	0.02	1.39	98.12
		Main Engine (Maneuvering)	0.20	30,179	4.99	0.09	1.20	0.17	0.17	0.02	0.00	0.01	0.0008	337.16	0.00	0.02	0.05	4.84	342.05
		Auxiliary Engine (Transit)	0.43	409	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	4.60	0.00	0.00	0.00	0.07	4.66
		Auxiliary Engine (Maneuvering)	0.43	5,912	1.04	0.01	0.25	0.03	0.03	0.00	0.00	0.00	0.0000	66.51	0.00	0.00	0.01	0.95	67.47
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	0.83	56,402	9.29	0.24	2.15	0.33	0.32	0.08	0.00	0.03	0.0038	621.66	0.00	0.03	0.10	9.04	630.80
		Main Engine (Maneuvering)	0.20	13,047	2.15	0.06	0.50	0.08	0.07	0.02	0.00	0.01	0.0009	143.81	0.00	0.01	0.02	2.09	145.92
		Auxiliary Engine (Transit)	0.56	5,246	0.90	0.01	0.23	0.03	0.03	0.00	0.00	0.00	0.0000	59.02	0.00	0.00	0.01	0.84	59.87
		Auxiliary Engine (Maneuvering)	0.56	5,036	0.86	0.01	0.22	0.03	0.03	0.00	0.00	0.00	0.0000	56.66	0.00	0.00	0.01	0.81	57.47
WTG Installation																			
WTG Installation Vessel	Jackup Vessel	Main Engine (Transit)	0.83	19,220	3.70	0.05	0.85	0.11	0.11	0.00	0.00	0.01	0.0002	238.65	0.00	0.01	0.04	3.41	242.09
		Main Engine (Maneuvering)	0.20	1,498,372	2														

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
US Jack Up Feeder 2	Jack up	Main Engine (Transit)	0.83	208,816	40.19	0.56	9.22	1.24	1.20	0.05	0.00	0.09	0.0024	2,592.86	0.02	0.12	0.40	37.02	2,630.28
		Main Engine (Maneuvering)	0.20	157,168	30.25	0.42	6.94	0.93	0.90	0.04	0.00	0.07	0.0018	1,951.54	0.01	0.09	0.30	27.86	1,979.71
		Auxiliary Engine (Transit)	0.43	59,801	11.99	0.15	2.57	0.33	0.32	0.01	0.00	0.02	0.0003	672.81	0.00	0.03	0.10	9.59	682.50
		Auxiliary Engine (Maneuvering)	0.43	186,792	37.45	0.45	8.04	1.04	1.01	0.02	0.00	0.07	0.0009	2,101.54	0.01	0.10	0.32	29.95	2,131.82
Crew Transfer	Crew Transfer Vessel	Main Engine (Transit)	0.83	8,322	1.32	0.02	0.33	0.04	0.04	0.00	0.00	0.00	0.0000	93.63	0.00	0.00	0.01	1.33	94.98
		Main Engine (Maneuvering)	0.20	156,578	24.87	0.38	6.25	0.84	0.82	0.02	0.00	0.06	0.0007	1,761.51	0.01	0.08	0.27	25.11	1,786.89
		Auxiliary Engine (Transit)	0.43	112	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	1.25	0.00	0.00	0.00	0.02	1.27
		Auxiliary Engine (Maneuvering)	0.43	8,706	1.57	0.02	0.37	0.05	0.05	0.00	0.00	0.00	0.0000	97.95	0.00	0.00	0.02	1.40	99.37
WTG Commissioning SOV	Service Operation Vessel	Main Engine (Transit)	0.16	890	0.15	0.00	0.03	0.01	0.01	0.00	0.00	0.00	0.0001	9.81	0.00	0.00	0.00	0.14	9.95
		Main Engine (Maneuvering)	0.10	187,446	30.88	0.81	7.16	1.11	1.07	0.28	0.00	0.11	0.0127	2,066.02	0.01	0.10	0.33	30.06	2,096.40
		Auxiliary Engine (Transit)	0.16	148	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.67	0.00	0.00	0.00	0.02	1.69
		Auxiliary Engine (Maneuvering)	0.10	31,241	5.36	0.08	1.34	0.17	0.17	0.00	0.00	0.01	0.0001	351.48	0.00	0.02	0.05	5.01	356.55
Export Cable Installation																			
Cable Installation Vessel 1	Cable Installation Vessel	Main Engine (Transit)	0.83	8,605	1.42	0.04	0.33	0.05	0.05	0.01	0.00	0.01	0.0006	94.85	0.00	0.00	0.01	1.38	96.24
		Main Engine (Maneuvering)	0.20	474,518	78.16	2.06	18.12	2.80	2.72	0.70	0.00	0.28	0.0322	5,230.11	0.03	0.26	0.82	76.09	5,307.02
		Auxiliary Engine (Transit)	0.56	1,817	0.31	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.0000	20.44	0.00	0.00	0.00	0.29	20.74
		Auxiliary Engine (Maneuvering)	0.56	415,853	71.39	1.01	17.90	2.31	2.24	0.04	0.00	0.16	0.0020	4,678.64	0.03	0.22	0.72	66.68	4,746.04
Cable Installation Vessel 2	Cable Installation Vessel	Main Engine (Transit)	0.83	8,605	1.42	0.04	0.33	0.05	0.05	0.01	0.00	0.01	0.0006	94.85	0.00	0.00	0.01	1.38	96.24
		Main Engine (Maneuvering)	0.20	474,518	78.16	2.06	18.12	2.80	2.72	0.70	0.00	0.28	0.0322	5,230.11	0.03	0.26	0.82	76.09	5,307.02
		Auxiliary Engine (Transit)	0.56	1,817	0.31	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.0000	20.44	0.00	0.00	0.00	0.29	20.74
		Auxiliary Engine (Maneuvering)	0.56	415,853	71.39	1.01	17.90	2.31	2.24	0.04	0.00	0.16	0.0020	4,678.64	0.03	0.22	0.72	66.68	4,746.04
Support and Jointing Vessel	Support Vessel	Main Engine (Transit)	0.83	6,239	1.03	0.03	0.24	0.04	0.04	0.01	0.00	0.00	0.0004	68.77	0.00	0.00	0.01	1.00	69.78
		Main Engine (Maneuvering)	0.20	69,202	11.40	0.30	2.64	0.41	0.40	0.10	0.00	0.04	0.0047	762.74	0.00	0.04	0.12	11.10	773.96
		Auxiliary Engine (Transit)	0.56	1,290	0.22	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.0000	14.52	0.00	0.00	0.00	0.21	14.73
		Auxiliary Engine (Maneuvering)	0.56	59,390	10.19	0.14	2.56	0.33	0.32	0.01	0.00	0.02	0.0003	668.19	0.00	0.03	0.10	9.52	677.81
TSHD	Dredger	Main Engine (Transit)	0.83	1,234	0.21	0.01	0.05	0.01	0.01	0.00	0.00	0.00	0.0001	13.50	0.00	0.00	0.00	0.20	13.70
		Main Engine (Maneuvering)	0.20	49,656	8.27	0.24	1.84	0.31	0.29	0.10	0.00	0.03	0.0044	543.51	0.00	0.03	0.09	7.96	551.56
		Auxiliary Engine (Transit)	0.56	619	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.0000	6.97	0.00	0.00	0.00	0.10	7.07
		Auxiliary Engine (Maneuvering)	0.56	103,469	17.69	0.25	4.45	0.57	0.56	0.01	0.00	0.04	0.0005	1,164.10	0.01	0.06	0.18	16.59	1,180.87
AHTS	Tug	Main Engine (Transit)	0.83	8,657	1.43	0.03	0.34	0.05	0.05	0.00	0.00	0.00	0.0002	96.72	0.00	0.00	0.02	1.39	98.12
		Main Engine (Maneuvering)	0.20	142,666	23.57	0.45	5.67	0.82	0.79	0.08	0.00	0.07	0.0038	1,593.85	0.01	0.08	0.25	22.88	1,616.97
		Auxiliary Engine (Transit)	0.43	409	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.0000	4.60	0.00	0.00	0.00	0.07	4.66
		Auxiliary Engine (Maneuvering)	0.43	27,947	4.90	0.07	1.20	0.16	0.15	0.00	0.00	0.01	0.0001	314.42	0.00	0.02	0.05	4.48	318.95
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	0.83	56,402	9.29	0.24	2.15	0.33	0.32	0.08	0.00	0.03	0.0038	621.66	0.00	0.03	0.10	9.04	630.80
		Main Engine (Maneuvering)	0.20	19,571	3.22	0.08	0.75	0.12	0.11	0.03	0.00	0.01	0.0013	215.71	0.00	0.01	0.03	3.14	218.88
		Auxiliary Engine (Transit)	0.56	5,246	0.90	0.01	0.23	0.03	0.03	0.00	0.00	0.00	0.0000	59.02	0.00	0.00	0.01	0.84	59.87
		Auxiliary Engine (Maneuvering)	0.56	7,554	1.30	0.02	0.33	0.04	0.04	0.00	0.00	0.00	0.0000	84.99	0.00	0.00	0.01	1.21	86.21
Fuel Bunkering																			
Towing Tug	Tug	Main Engine (Transit)	0.83	58,291	9.63	0.18	2.32	0.33	0.32	0.03	0.00	0.03	0.0015	651.22	0.00	0.03	0.10	9.35	660.67
		Main Engine (Maneuvering)	0.20	123,153	20.35	0.38	4.89	0.71	0.68	0.07	0.00	0.06	0.0032	1,375.86	0.01	0.07	0.21	19.75	1,395.82
		Auxiliary Engine (Transit)	0.43	1,411	0.25	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.0000	15.88	0.00	0.00	0.00	0.23	16.11
		Auxiliary Engine (Maneuvering)	0.43	12,374	2.17	0.03	0.53	0.07	0.07	0.00	0.00	0.00	0.0001	139.22	0.00	0.01	0.02	1.98	141.22
Barge	Barge	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.20	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	0.43	299	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	3.36	0.00	0.00	0.00	0.05	3.41
		Auxiliary Engine (Maneuvering)	0.43	2,622	0.57	0.01	0.11	0.01	0.01	0.00	0.00	0.00	0.0000	29.50	0.00	0.00	0.00	0.42	29.92
Motion Compensation	Motion Compensation	Motion Compensation Engine	1.00	68,571	4.23	0.52	3.70	0.21	0.21	0.01	0.00	0.01	0.0003	782.65	0.03	0.01	0.79	1.89	785.34
Commissioning Generators																			
OSS Commissioning Generators	Generator	Marine Tier 3 Generator	0.50	24,000	2.15	0.26	1.85	0.04	0.04	0.00	0.00	0.01	0.0001	273.93	0.01	0.00	0.28	0.66	274.87
WTG Commissioning Generators	Generator	Marine Tier 3 Generator	0.50	25,303	2.11	0.25	1.95	0.05	0.05	0.00	0.00	0.01	0.00	288.80	0.01	0.00	0.29	0.70	289.79
Miscellaneous																			
Marine Paint	N/A	N/A	N/A	N/A	N/A	0.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fuel Evaporation	N/A	N/A	N/A	N/A	N/A	0.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Construction																				
Foundation Installation (FOU) B02																				
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	25	10%	5,950	1.15	0.02	0.26	0.04	0.03	0.00	0.00	0.00	0.0001	73.88	0.00	0.00	0.01	1.05	74.95
		Main Engine (Maneuvering)	25	100%	481,761	92.72	1.29	21.26	2.87	2.77	0.12	0.00	0.20	0.0055	5,982.00	0.04	0.29	0.92	85.40	6,068.32
		Auxiliary Engine (Transit)	25	10%	209	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	2.22	0.00	0.00	0.00	0.03	2.25
		Auxiliary Engine (Maneuvering)	25	100%	140,730	26.59	0.32	5.71	0.74	0.71	0.01	0.00	0.05	0.0006	1,492.33	0.01	0.07	0.23	21.27	1,513.82
Bubble Curtain Support Vessel	Tug	Main Engine (Transit)	25	27%	2,915	0.48	0.01	0.12	0.02	0.02	0.00	0.00	0.00	0.0001	32.57	0.00	0.00	0.01	0.47	33.04
		Main Engine (Maneuvering)	25	100%	236,008	39.00	0.74	9.38	1.35	1.31	0.14	0.00	0.11	0.0062	2,636.67	0.02	0.13	0.41	37.84	2,674.92
		Auxiliary Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
Barge 1	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	234	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	2.63	0.00	0.00	0.00	0.04	2.67
		Auxiliary Engine (Maneuvering)	25	100%	4,588	1.00	0.01	0.20	0.03	0.02	0.00	0.00	0.00	0.0000	51.62	0.00	0.00	0.01	0.74	52.36
Barge 2	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	234	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	2.63	0.00	0.00	0.00	0.04	2.67
		Auxiliary Engine (Maneuvering)	25	100%	4,588	1.00	0.01	0.20	0.03	0.02	0.00	0.00	0.00	0.0000	51.62	0.00	0.00	0.01	0.74	52.36
US Towing Tug 1	US Towing Tug	Main Engine (Transit)	25	27%	45,633	7.54	0.14	1.81	0.26	0.25	0.03	0.00	0.02	0.0012	509.80	0.00	0.02	0.08	7.32	517.20
		Main Engine (Maneuvering)	25	100%	107,759	17.81	0.34	4.28	0.62	0.60	0.06	0.00	0.05	0.0028	1,203.87	0.01	0.06	0.19	17.28	1,221.34
		Auxiliary Engine (Transit)	25	27%	1,105	0.19	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.0000	12.43	0.00	0.00	0.00	0.18	12.61
		Auxiliary Engine (Maneuvering)	25	100%	21,655	3.80	0.05	0.93	0.12	0.12	0.00	0.00	0.01	0.0001	243.63	0.00	0.01	0.04	3.47	247.14
US Towing Tug 2	US Towing Tug	Main Engine (Transit)	25	27%	45,633	7.54	0.14	1.81	0.26	0.25	0.03	0.00	0.02	0.0012	509.80	0.00	0.02	0.08	7.32	517.20
		Main Engine (Maneuvering)	25	100%	107,759	17.81	0.34	4.28	0.62	0.60	0.06	0.00	0.05	0.0028	1,203.87	0.01	0.06	0.19	17.28	1,221.34
		Auxiliary Engine (Transit)	25	27%	1,105	0.19	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.0000	12.43	0.00	0.00	0.00	0.18	12.61
		Auxiliary Engine (Maneuvering)	25	100%	21,655	3.80	0.05	0.93	0.12	0.12	0.00	0.00	0.01	0.0001	243.63	0.00	0.01	0.04	3.47	247.14
Crew Transfer / PSO / Noise Monitoring Vessel	Crew Transfer Vessel	Main Engine (Transit)	17	100%	10,873	1.73	0.03	0.43	0.06	0.06	0.00	0.00	0.00	0.0001	122.32	0.00	0.01	0.02	1.74	124.08
		Main Engine (Maneuvering)	17	100%	44,555	7.08	0.11	1.78	0.24	0.23	0.00	0.00	0.02	0.0002	501.24	0.00	0.02	0.08	7.14	508.46
		Auxiliary Engine (Transit)	17	100%	146	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0000	1.64	0.00	0.00	0.00	0.02	1.66
		Auxiliary Engine (Maneuvering)	17	100%	4,955	0.89	0.01	0.21	0.03	0.03	0.00	0.00	0.00	0.0000	55.75	0.00	0.00	0.01	0.79	56.55
Bubble Curtain Power	Air Compressor	Air Compressor	N/A	100%	638,400	19.70	1.87	34.48	0.25	0.25	0.07	0.00	0.17	0.0031	7,286.51	0.30	0.06	7.39	17.62	7,311.52
Hydraulic Hammer Power	Hydraulic Hammer Engine	Hammer Engine	N/A	100%	143,280	14.15	1.75	7.74	0.44	0.44	0.02	0.00	0.02	0.0007	1,635.36	0.07	0.01	1.66	3.95	1,640.97
Offshore Substation Installation (OSS)																				
Medium HLV	Heavy Lift Vessel	Main Engine (Transit)	25	10%	5,950	1.15	0.02	0.26	0.04	0.03	0.00	0.00	0.00	0.00	73.88	0.00	0.00	0.01	1.05	74.95
		Main Engine (Maneuvering)	25	100%	30,970	5.96	0.08	1.37	0.18	0.18	0.01	0.00	0.01	0.00	384.56	0.00	0.02	0.06	5.49	390.11
		Auxiliary Engine (Transit)	25	10%	209	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	0.00	0.00	0.03	2.25
		Auxiliary Engine (Maneuvering)	25	100%	9,047	1.71	0.02	0.37	0.05	0.05	0.00	0.00	0.00	0.00	95.94	0.00	0.00	0.01	1.37	97.32
	Bubble Curtain Support Vessel	Main Engine (Transit)	25	27%	2,915	0.48	0.01	0.12	0.02	0.02	0.00	0.00	0.00	0.00	32.57	0.00	0.00	0.01	0.47	33.04
		Main Engine (Maneuvering)	25	100%	15,172	2.51	0.05	0.60	0.09	0.08	0.01	0.00	0.01	0.00	169.50	0.00	0.01	0.03	2.43	171.96
		Auxiliary Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport Barge 1	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.23
		Auxiliary Engine (Maneuvering)	25	100%	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 2	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.23
		Auxiliary Engine (Maneuvering)	25	100%	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 3	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.23
		Auxiliary Engine (Maneuvering)	25	100%	164	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	0.03	1.87
Transport Barge 4	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00</														

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
US Jack Up Feeder 2	Jack up	Main Engine (Transit)	25	27%	57,215	11.01	0.15	2.53	0.34	0.33	0.01	0.00	0.02	0.00	710.43	0.00	0.03	0.11	10.14	720.68
		Main Engine (Maneuvering)	25	100%	157,168	30.25	0.42	6.94	0.93	0.90	0.04	0.00	0.07	0.00	1,951.54	0.01	0.09	0.30	27.86	1,979.71
		Auxiliary Engine (Transit)	25	27%	16,385	3.28	0.04	0.71	0.09	0.09	0.00	0.00	0.01	0.00	184.35	0.00	0.01	0.03	2.63	187.00
		Auxiliary Engine (Maneuvering)	25	100%	186,792	37.45	0.45	8.04	1.04	1.01	0.02	0.00	0.07	0.00	2,101.54	0.01	0.10	0.32	29.95	2,131.82
Crew Transfer	Crew Transfer Vessel	Main Engine (Transit)	17	100%	8,322	1.32	0.02	0.33	0.04	0.04	0.00	0.00	0.00	0.00	93.63	0.00	0.00	0.01	1.33	94.98
		Main Engine (Maneuvering)	17	100%	156,578	24.87	0.38	6.25	0.84	0.82	0.02	0.00	0.06	0.00	1,761.51	0.01	0.08	0.27	25.11	1,786.89
		Auxiliary Engine (Transit)	17	100%	112	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.02	1.27
		Auxiliary Engine (Maneuvering)	17	100%	8,706	1.57	0.02	0.37	0.05	0.05	0.00	0.00	0.00	0.00	97.95	0.00	0.00	0.02	1.40	99.37
WTG Commissioning SOV	Service Operation Vessel	Main Engine (Transit)	25	27%	244	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.69	0.00	0.00	0.00	0.04	2.73
		Main Engine (Maneuvering)	25	100%	187,446	30.88	0.81	7.16	1.11	1.07	0.28	0.00	0.11	0.01	2,066.02	0.01	0.10	0.33	30.06	2,096.40
		Auxiliary Engine (Transit)	25	27%	41	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.01	0.46
		Auxiliary Engine (Maneuvering)	25	100%	31,241	5.36	0.08	1.34	0.17	0.17	0.00	0.00	0.01	0.00	351.48	0.00	0.02	0.05	5.01	356.55
Export Cable Installation																				
Cable Installation Vessel 1	Cable Installation Vessel	Main Engine (Transit)	25	27%	2,358	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.99	0.00	0.00	0.00	0.38	26.37
		Main Engine (Maneuvering)	25	51%	242,448	39.94	1.05	9.26	1.43	1.39	0.36	0.00	0.14	0.02	2,672.25	0.02	0.13	0.42	38.87	2,711.54
		Auxiliary Engine (Transit)	25	27%	498	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.00	0.00	0.08	5.68
		Auxiliary Engine (Maneuvering)	25	51%	212,474	36.47	0.52	9.15	1.18	1.14	0.02	0.00	0.08	0.00	2,390.48	0.01	0.11	0.37	34.07	2,424.92
Cable Installation Vessel 2	Cable Installation Vessel	Main Engine (Transit)	25	27%	2,358	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.99	0.00	0.00	0.00	0.38	26.37
		Main Engine (Maneuvering)	25	51%	242,448	39.94	1.05	9.26	1.43	1.39	0.36	0.00	0.14	0.02	2,672.25	0.02	0.13	0.42	38.87	2,711.54
		Auxiliary Engine (Transit)	25	27%	498	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.00	0.00	0.08	5.68
		Auxiliary Engine (Maneuvering)	25	51%	212,474	36.47	0.52	9.15	1.18	1.14	0.02	0.00	0.08	0.00	2,390.48	0.01	0.11	0.37	34.07	2,424.92
Support and Jointing Vessel	Support Vessel	Main Engine (Transit)	25	27%	1,709	0.28	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.84	0.00	0.00	0.00	0.27	19.12
		Main Engine (Maneuvering)	25	51%	35,358	5.82	0.15	1.35	0.21	0.20	0.05	0.00	0.02	0.00	389.71	0.00	0.02	0.06	5.67	395.44
		Auxiliary Engine (Transit)	25	27%	354	0.06	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.98	0.00	0.00	0.00	0.06	4.03
		Auxiliary Engine (Maneuvering)	25	51%	30,345	5.21	0.07	1.31	0.17	0.16	0.00	0.00	0.01	0.00	341.40	0.00	0.02	0.05	4.87	346.32
TSHD	Dredger	Main Engine (Transit)	25	27%	338	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.05	3.75
		Main Engine (Maneuvering)	25	51%	25,371	4.23	0.12	0.94	0.16	0.15	0.05	0.00	0.02	0.00	277.70	0.00	0.01	0.04	4.07	281.81
		Auxiliary Engine (Transit)	25	27%	170	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.91	0.00	0.00	0.00	0.03	1.94
		Auxiliary Engine (Maneuvering)	25	51%	52,866	9.04	0.13	2.28	0.29	0.28	0.01	0.00	0.02	0.00	594.78	0.00	0.03	0.09	8.48	603.35
AHTS	Tug	Main Engine (Transit)	25	27%	2,372	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	26.50	0.00	0.00	0.00	0.38	26.88
		Main Engine (Maneuvering)	25	51%	72,893	12.04	0.23	2.90	0.42	0.40	0.04	0.00	0.03	0.00	814.35	0.01	0.04	0.13	11.69	826.17
		Auxiliary Engine (Transit)	25	27%	112	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	0.00	0.00	0.00	0.02	1.28
		Auxiliary Engine (Maneuvering)	25	51%	14,279	2.50	0.03	0.61	0.08	0.08	0.00	0.00	0.01	0.00	160.65	0.00	0.01	0.02	2.29	162.96
Post-Install Rock Protection	Rock Dumping Vessel (Fall Pipe Vessel)	Main Engine (Transit)	25	10%	5,640	0.93	0.02	0.22	0.03	0.03	0.01	0.00	0.00	0.00	62.17	0.00	0.00	0.01	0.90	63.08
		Main Engine (Maneuvering)	25	51%	9,999	1.65	0.04	0.38	0.06	0.06	0.01	0.00	0.01	0.00	110.21	0.00	0.01	0.02	1.60	111.83
		Auxiliary Engine (Transit)	25	10%	525	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.90	0.00	0.00	0.00	0.08	5.99
		Auxiliary Engine (Maneuvering)	25	51%	3,860	0.66	0.01	0.17	0.02	0.02	0.00	0.00	0.00	0.00	43.42	0.00	0.00	0.01	0.62	44.05
Fuel Bunkering																				
Towing Tug	Tug	Main Engine (Transit)	25	27%	15,971	2.64	0.05	0.63	0.09	0.09	0.01	0.00	0.01	0.00	178.43	0.00	0.01	0.03	2.56	181.02
		Main Engine (Maneuvering)	25	100%	123,153	20.35	0.38	4.89	0.71	0.68	0.07	0.00	0.06	0.00	1,375.86	0.01	0.07	0.21	19.75	1,395.82
		Auxiliary Engine (Transit)	25	27%	387	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.06	4.41
		Auxiliary Engine (Maneuvering)	25	100%	12,374	2.17	0.03	0.53	0.07	0.07	0.00	0.00	0.00	0.00	139.22	0.00	0.01	0.02	1.98	141.22
Barge	Barge	Main Engine (Transit)	25	27%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	25	100%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Transit)	25	27%	82	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.01	0.94
		Auxiliary Engine (Maneuvering)	25	100%	2,622	0.57	0.01	0.11	0.01	0.01	0.00	0.00	0.00	0.00	29.50	0.00	0.00	0.00	0.42	29.92
Motion Compensation	Motion Compensation	Motion Compensation Engine	N/A	100%	68,571	4.23	0.52	3.70	0.21	0.21	0.01	0.00	0.01	0.00	782.65	0.03	0.01	0.79	1.89	785.34
Commissioning Generators																				
OSS Commissioning Generators	Generator	Marine Tier 3 Generator	N/A	100%	24,000	2.15	0.26	1.85	0.04	0.04	0.00	0.00	0.01	0.00	273.93	0.01	0.00	0.28	0.66	274.87
WTG Commissioning Generators	Generator	Marine Tier 3 Generator	N/A	100%	25,303	2.11	0.25	1.95	0.05	0.05	0.00	0.00	0.01	0.00	288.80	0.01	0.00	0.29	0.70	289.79
Miscellaneous																				
Marine Paint	N/A	N/A	N/A	100%	N/A	N/A	0.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fuel Evaporation	N/A	N/A	N/A	100%	N/A	N/A	0.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

BOEM Emissions Tool Default Vessel Emissions Factors													
EF Ref	Vessel Type	Engine type	Emission Factors (g/kWh)										
			NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O
1M	Anchor Handling Tugs	Main	9.26	0.24	2.16	0.34	0.33	0.079	4.0E-05	0.033	636.09	0.004	0.031
1A		Auxiliary	9.88	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031
2M	Barge	Main	13.61	0.63	1.40	0.45	0.42	0.362	1.2E-05	0.078	588.90	0.004	0.031
2A		Auxiliary	12.57	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031
3M	Cable Laying	Main	9.49	0.25	2.20	0.34	0.33	0.085	3.9E-05	0.034	635.02	0.004	0.031
3A		Auxiliary	9.89	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031
4M	Crew	Main	9.15	0.14	2.30	0.31	0.30	0.006	4.6E-05	0.022	648.16	0.004	0.031
4A		Auxiliary	10.39	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031
5M	Dredging	Main	9.60	0.28	2.13	0.36	0.34	0.112	3.7E-05	0.038	630.62	0.004	0.031
5A		Auxiliary	9.85	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031
6M	Ice Breaker	Main	9.92	0.45	1.78	0.40	0.38	0.230	2.5E-05	0.057	610.83	0.004	0.031
6A		Auxiliary	10.09	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031
7M	Jackup	Main	10.03	0.14	2.30	0.31	0.30	0.013	4.5E-05	0.022	647.08	0.004	0.031
7A		Auxiliary	11.55	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031
8M	Research / Survey	Main	9.86	0.22	2.25	0.34	0.33	0.066	4.2E-05	0.031	638.26	0.004	0.031
8A		Auxiliary	10.21	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031
9M	Shuttle Tanker	Main	9.05	0.63	1.40	0.45	0.42	0.362	1.2E-05	0.078	588.90	0.004	0.031
9A		Auxiliary	9.80	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031
10M	Supply Ship	Main	9.44	0.17	2.29	0.32	0.31	0.028	4.5E-05	0.025	644.58	0.004	0.031
10A		Auxiliary	10.43	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031
11M	Tug	Main	9.52	0.18	2.29	0.33	0.32	0.033	4.5E-05	0.026	643.66	0.004	0.031
11A		Auxiliary	10.10	0.14	2.48	0.32	0.31	0.006	4.8E-05	0.022	648.20	0.004	0.031

BOEM Emissions Tool Default Helicopter Emissions Factors													
EF Ref	Engine	Size (kW)	Emission Factors (lb/hr)										
			NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O
12	Helicopter	Single	2.32	1.63	1.89	0.07	0.07	0.300	0.0E+00	N/A	956.92	0.030	0.030
13	Helicopter	Twin Light	3.14	3.66	4.28	0.10	0.09	0.500	0.0E+00	N/A	1589.69	0.040	0.050
14	Helicopter	Twin Medium	7.22	3.02	3.48	0.20	0.20	0.780	0.0E+00	N/A	2459.92	0.070	0.080
15	Helicopter	Twin heavy	34.66	2.40	2.67	0.82	0.80	2.110	0.0E+00	N/A	6640.46	0.190	0.220

Load Factors for Main Engines		
Vessel/Engine	Activity	Load Factor
Cat. 3 Main (Propulsion) Engine	Transit/cruise	0.83
Cat. 3 Main (Propulsion) Engine	Maneuvering	0.2
Cat. 3 Main (Propulsion) Engine	Hoteling	0
Cat. 1/2 Main (Propulsion) Engine	Transit/cruise	0.83
Cat. 1/2 Main (Propulsion) Engine	Maneuvering	0.2
Cat. 1/2 Main (Propulsion) Engine	Hoteling	0

Load Factors for Auxiliary Engines on Vessels w/ Cat. 3 Main Engines		
Vessel Type	Maneuver	Hotel
Bulk Carrier	0.45	0.1
Bulk Carrier, Laker	0.45	0.22
Buoy Tender	0.45	0.19
Container	0.48	0.26
Crude Oil Tanker	0.33	0.22
Drilling	0.45	0.22
Fishing	0.45	0.22
Floating Production and Storage Offloading	0.45	0.22
General Cargo	0.45	0.22
Icebreaker	0.45	0.22
Jackup	0.45	0.22
LNG Tanker	0.33	0.26
LPG Tanker	0.33	0.26
Misc.	0.45	0.22
Passenger	0.8	0.64
Pipelaying	0.45	0.22
Reefer	0.67	0.32
Research	0.45	0.22
RORO	0.45	0.26
Supply	0.45	0.22
Support	0.45	0.22
Tanker	0.33	0.26
Tug	0.45	0.22
Vehicle Carrier	0.45	0.22
Well stimulation	0.45	0.22

Table 4-120 of https://www.epa.gov/sites/production/files/2018-07/documents/nei2014v2_tsd_05jul2018.pdf

Emissions Factors for Engines													
EF Ref	Engine	Size (kW)	Emission Factors (g/kWh)										
			NOx ¹	VOC ²	CO	PM10	PM2.5	SO2 ³	Pb	HAPs ⁵	CO2 ⁴	CH4 ⁴	N2O ⁴
16	Air Compressor Engines	~399	2	0.19	3.5	0.025	0.025	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
17	Motion Compensation Engines	500	4	0.495	3.5	0.2	0.2	0.0068	0.00E+00	7.14E-03	739.60	0.030	0.0060
18	Cat C18 Acert	597	6.4	0.8	3.5	0.2	0.2	0.0068	0.00E+00	7.14E-03	739.60	0.030	0.0060
19	Tier 2 Engines 0-8 kW	0-8	7.5	0.929	8	0.8	0.8	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
20	Tier 2 Engines 8-19 kW	8-19	7.5	0.929	6.6	0.8	0.8	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
21	Tier 2 Engines 19-37 kW	19-37	7.5	0.929	5.5	0.6	0.6	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
22	Tier 3 Engines 37-75 kW	37-75	4.7	0.582	5	0.4	0.4	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
23	Tier 3 Engines 75-130 kW	75-130	4	0.495	5	0.3	0.3	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
24	Tier 3 Engines 130-225 kW	130-225	4	0.495	3.5	0.2	0.2	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
25	Tier 3 Engines 225-450 kW	225-450	4	0.495	3.5	0.2	0.2	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
26	Tier 3 Engines 450-560 kW	450-560	4	0.495	3.5	0.2	0.2	0.0068	0.00E+00	7.14E-03	739.60	0.030	0.0060
27	Tier 2 Engines >560 kW	>560	6.4	0.792	3.5	0.2	0.2	0.0068	0.00E+00	7.14E-03	739.60	0.030	0.0060
30	Tier 4 Engine 130-560 kW	130-560	0.67	0.19	3.5	0.02	0.02	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
31	OSS Commissioning Generator	500 kW	5.80	0.70	5.00	0.10	0.10	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
32	WTG Commissioning Generator	240 kW	5.40	0.65	5.00	0.12	0.12	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060

- 1 NOx emission values are assumed to be 100% of the relevant tier standard for NOx+NMHC if no separate NOx standard
- 2 VOC emission values are assumed to be 12% of the relevant tier standard for NOx+NMHC if no separate VOC/NMHC standard
- 3 Based on ULSD Fuel Sulfur of 0.0015%, fuel density of ~7lb/gal, fuel heat content of ~0.14 MMBtu/gal, and SO2:Sulfur ratio of 2.0
- 4 Based on GHG emissions and heat content of ULSD from 40 CFR 98 Tables C-1 and C-2 and an assumed engine efficiency of 10,000 Btu/kW
- 5 HAP Emission Factors are in lb/MMBtu in AP-42 and converted to g/kWh based on an assumed 10,000 btu/kW

Commuting Emissions													
EF Ref	Engine	Fuel	Emission Factors (g/VMT)										
			NOx ¹	VOC ¹	CO ¹	PM10 ¹	PM2.5 ¹	SO2 ²	Pb	HAPs	CO2 ³	CH4 ³	N2O ³
28	Light-duty vehicles	Gasoline	0.289	0.35	3.94	0.012	0.012	0.0025	0.00E+00	N/A	393.61	0.017	0.0034
29	Light-duty trucks	Gasoline	0.478	0.421	5.66	0.014	0.014	0.0025	0.00E+00	N/A	393.61	0.017	0.0034

- 1 2018 values from Table 4-43 "Estimated U.S. Average Vehicle emissions Rates per Vehicle by Vehicle Type Using Gasoline and Diesel" at <https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-vehicle-type-using-gasoline-and>
- 2 Based on 10 ppm sulfur in gasoline, 6.17 lb/gal density, fleet average of 22.3 mpg, and SO2 to Sulfur weight ratio of 2.
- 3 Based on GHG emissions and heat content of motor gasoline from 40 CFR 98 Tables C-1 and C-2 and fleet average of 22.3 mpg
- 4 Fleet average MPG is from Table 4-23M from Bureau of Transportation Statistics found here: <https://www.bts.gov/content/average-fuel-efficiency-us-passenger-cars-and-light-trucks>

Load Factors for Auxiliary Engines on Vessels w/ Cat. 1 & 2 Main	
Vessel Group	Auxiliary Operating Load Factor
Bulk Carrier	0.1
Commercial Fishing	0.43
Container Ship	0.19
Ferry Excursion	0.43
General Cargo	0.22
Government	0.43
Miscellaneous	0.43
Offshore support	0.56
Reefer	0.32
RORO	0.26
Tanker	0.26
Tug	0.43
Work Boat	0.43

Eastern Research Group. 2019. Category 1 and 2 Commercial Marine Vessel 2017 Emissions Inventory (2019). Table 4. Auxiliary and Boiler Power Surrogates.

Load Factors for Auxiliary Engines on Vessels w/ Cat. 3 Main Engines			
EPA Vessel Type (NEI Vessel Types)	Cruise	RSZ	Maneuver
Auto Carrier	0.15	0.3	0.45
Bulk Carrier	0.17	0.27	0.45
Container Ship	0.13	0.25	0.48
Cruise Ship (Passenger)	0.8	0.8	0.8
General Cargo (Supply, Vehicle Carrier)	0.17	0.27	0.45
Miscellaneous (Buoy Tender, Drilling, Fishing, FPSO, Icebreaker, Jackup, Miscellaneous, Pipelaying, Research, Support, Well Stimulation)	0.17	0.27	0.45
OG Tug (Tug)	0.17	0.27	0.45
Reefer	0.2	0.34	0.67
RORO	0.15	0.3	0.45
Tanker (LNG Tanker, LPG Tanker, Crude Oil Tanker)	0.24	0.28	0.33

Sources:
EPA. 2009. Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories: Final
EPA. 2015. Commercial Marine Vessels – 2014 NEI Commercial Marine Vessels Final. Table 4-17: Auxiliary

Fuel Use Factors		
Engine Type	Fuel Use (g/kWh)	Fuel Use (gal/kWh)
Slow-speed Diesel, Marine Diesel Oil ¹	185	0.057
Medium-speed Diesel, Marine Diesel Oil ¹	205	0.064
Medium-speed Diesel, Marine Diesel Oil Auxiliary ¹	217	0.067
Cat. 1 & 2 (main and auxiliary) ²	N/A	0.064

1 From "Current Methodologies and Best Practices in Preparing Port Emission Inventories" April 2009, Table 2-9: Emission Factors for OGV Main Engines, Table 2-16: Auxiliary Engine Emission Factors

2 Calculated from BOEM CO2 emission rate for Cat. 1 & 2 Marine Engines below

Fuel Use Calculations	
Diesel Fuel Density (lb/gal) ¹	7.10
Distillate Fuel No. 2 Higher Heating Value (MMBtu/gal) ²	0.138
Distillate Fuel No. 2 CO2 Emission Factor (kg CO2/MMBtu) ²	73.96
Cat. 1 & 2 Main Engine CO2 Emission Factor (g/kW*hr) ³	648.20
Cat. 1 & 2 (main and auxiliary)) fuel use (gal/kWh)	0.064

1 From Table 3.4-1 AP 42

2 From 40 CFR Part 98 Table C-1: Default CO2 Emission Factors and High Heat Values for Various Types of Fuel

3 From BOEM Offshore Wind Energy Facilities Emission Estimating Tool Technical Documentation Table 3: Weighted Marine Vessel Emission Factors

Global Warming Potentials ¹	
Compound	GWP
CH4	25
N2O	298

1 Table A-1 of 40 CFR 98

Overall Port Distance			
Port Name	Lookup	Port Distance (Mi)	Port Distance (NM)
Atlantic City	Atlantic City	20	17
New Jersey Wind Port	NJWP	105	91
Europe	Europe	288	250
Paulsboro	Paulsboro	145	126

Overall Port Distance in OCS Applicability Zone			
Port Name	Lookup	Port Distance (Mi)	Port Distance (NM)
Atlantic City	Atlantic City	20	17
New Jersey Wind Port	NJWP	29	25
Europe	Europe	29	25
Paulsboro	Paulsboro	29	25

Max Export Cable Included in OCS Area	51%	
measured export cable length max in OCS area	37.74	miles
measured export cable length max	73.86	miles
North Export Cable OCS	29.19	miles
North Export Cable Total	61.86	miles
South Export Cable OCS	8.55	miles
South Export Cable Total	12	miles

2017 NEI HAPs for Marine Vessels		
Pollutant	Basis	Fraction
1,3-Butadiene	VOC	1.01E-03
2,2,4-Trimethylpentane	VOC	7.12E-03
Acenaphthene	VOC	5.09E-05
Acenaphthylene	VOC	1.18E-04
Acetaldehyde	VOC	9.78E-03
Acrolein	VOC	1.85E-03
Ammonia	PM2.5	1.92E-02
Anthracene	VOC	3.44E-04
Antimony	PM2.5	6.15E-04
Arsenic	PM2.5	2.59E-05
Benz[a]Anthracene	PM2.5	8.82E-06
Benzene	VOC	4.74E-03
Benzo[a]Pyrene	PM2.5	4.18E-06
Benzo[b]Fluoranthene	PM2.5	8.35E-06
Benzo[k]Fluoranthene	PM2.5	4.18E-06
Benzo(g,h,i)Fluoranthene	PM2.5	1.32E-04
Cadmium	PM2.5	2.36E-04
Chrysene	PM2.5	1.63E-05
Chromium (VI)	PM2.5	7.24E-09
Dibenzo[a,h]anthracene	PM2.5	8.65E-06
Ethyl Benzene	VOC	4.39E-04
Fluoranthene	PM2.5	8.97E-05
Fluorene	VOC	1.64E-04
Formaldehyde	VOC	4.27E-02
Indeno[1,2,3-c,d]Pyrene	PM2.5	8.35E-06
Lead	PM2.5	1.25E-04
Manganese	PM2.5	3.22E-06
Mercury	PM2.5	4.18E-08
Naphthalene	VOC	3.13E-02
Hexane	VOC	2.79E-03
Nickel	PM2.5	6.87E-04
Polychlorinated Biphenyls	PM2.5	4.18E-07
Phenanthrene	VOC	1.36E-03
Propionaldehyde	VOC	1.52E-03
Pyrene	PM2.5	3.37E-05
Selenium	PM2.5	4.38E-08
Toluene	VOC	2.04E-03
Xylenes (Mixed Isomers)	VOC	1.42E-03
o-Xylene	VOC	5.13E-04
Total Fraction of VOC		0.1093
Total Fraction of PM2.5		0.0213

Stationary Internal Combustion Engine (<600 HP) HAPs from AP-42 Chapter 3.3	
Pollutant	Emission Factor (lb/mmBtu)
Benzene	9.33E-04
Toluene	4.09E-04
Xylenes	2.85E-04
1,3-Butadiene	3.91E-05
Formaldehyde	1.18E-03
Acetaldehyde	7.67E-04
Acrolein	9.25E-05
Total PAH	1.68E-04
Total HAP	3.87E-03

Total HAP Emission Factor	
lb/MMBtu	3.87E-03
g/MMBtu	1.76
Btu/kW	10,000
MMBtu/kW	0.010
g/kW	1.76E-02

Stationary Internal Combustion Engine (>600 HP) HAPs from AP-42 Chapter 3.4	
Pollutant	Emission Factor (lb/mmBtu)
Benzene	7.76E-04
Toluene	2.81E-04
Xylenes	1.93E-04
Formaldehyde	7.89E-05
Acetaldehyde	2.52E-05
Acrolein	7.88E-06
Total PAH	2.12E-04
Total HAP	1.57E-03

Total HAP Emission Factor	
lb/MMBtu	1.57E-03
g/MMBtu	0.71
Btu/kW	10,000
MMBtu/kW	0.010
g/kW	7.14E-03

*Source: EPA 2017 NEI Development Documentation - Methodology Documentation for EPA's Commercial Marine Emissions Estimates

Mode		Yearly Operating Time	Avg. Engine Load Factor	Average Fuel Consumption per Year (L)	% of In Field (maneuvering)	Weighted Maneuvering Load Factor
1	Dynamic Positioning / gangway operations	40%	10%	640,000	42.6%	4.3%
2	Standby in field / hotel	33%	8%	465,000	35.1%	2.8%
3	In field transit	21%	15%	486,000	22.3%	3.4%
4	Transit to/from harbor	2%	16%	46,000	0.0%	0.0%
5	Harbor	4%	4%	28,000	0.0%	0.0%
Maneuvering					100.0%	10.4%

*Preliminary results for assessment of logistics options
~94% of activities in windfarm each year
85 m “standard” European SOV with 60 PAX and diesel electric propulsion system
Total engine capacity of 6,600 kW made up of 4x 1,650 kW generators

CTV Scenario Total Emissions																
Scenario	Fuel Consumption (gal/yr)	Emissions (tons per year)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Project 1 with Overlap	1,723,285.59	289.74	4.52	71.77	9.34	9.04	0.40	0.0014	0.68	0.02	19,852.61	0.14	0.93	3.59	276.21	22,389.34
Project 2 with Overlap	1,251,127.40	208.43	3.30	52.33	6.72	6.50	0.30	0.0010	0.50	0.01	14,422.43	0.11	0.67	2.75	198.70	16,314.06
Sum P1 and P2	2,974,413.00	498.17	7.82	124.10	16.06	15.53	0.70	0.0023	1.18	0.03	34,275.04	0.25	1.59	6.35	474.91	38,703.39
PDE	2,818,112.89	481.44	7.45	118.66	15.30	14.80	0.69	0.0022	1.12	0.03	32,688.68	0.24	1.52	6.10	452.31	36,665.67

SOV Scenario Total Emissions																
Scenario	Fuel Consumption (gal/yr)	Emissions (tons per year)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Project 1 with Overlap	2,018,419.75	344.7	6.2	84.0	11.3	10.9	1.1	0.0	0.9	0.1	23,058.4	0.2	1.1	4.1	323.5	25,643.0
Project 2 with Overlap	1,682,934.55	285.2	5.3	70.0	9.4	9.1	1.0	0.0	0.8	0.0	19,165.8	0.1	0.9	3.5	267.9	21,127.4
Sum P1 and P2	3,701,354.30	629.8	11.5	154.0	20.6	20.0	2.2	0.0	1.7	0.1	42,224.2	0.3	2.0	7.6	591.5	46,770.4
PDE	3,015,549.79	520.8	8.9	127.0	16.7	16.2	1.4	0.0	1.3	0.1	34,795.4	0.3	1.6	6.4	484.0	38,804.4

CTV Scenario OCS Emissions																
Scenario	Fuel Consumption (gal/yr)	Emissions (tons per year)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Project 1 with Overlap	1,422,852.04	232.9	3.7	58.8	7.6	7.3	0.3	0.0	0.6	0.0	16,225.5	0.1	0.8	3.0	224.3	18,709.8
Project 2 with Overlap	1,024,361.04	165.6	2.7	42.6	5.4	5.2	0.2	0.0	0.4	0.0	11,686.1	0.1	0.5	2.3	159.6	13,538.2
PDE	2,226,940.69	369.4	5.8	93.1	11.8	11.4	0.5	0.0	0.9	0.0	25,542.2	0.2	1.2	5.0	350.1	29,415.9

SOV Scenario OCS Emissions																
Scenario	Fuel Consumption (gal/yr)	Emissions (tons per year)														
		NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Project 1 with Overlap	1,717,986.20	287.8	5.4	71.0	9.5	9.2	1.0	0.0	0.8	0.0	19,431.2	0.1	0.9	3.5	271.7	21,963.4
Project 2 with Overlap	1,456,168.18	242.3	4.7	60.2	8.0	7.8	0.9	0.0	0.7	0.0	16,429.5	0.1	0.8	3.1	228.8	18,351.5
PDE	2,424,377.59	408.7 ¹	7.2 ¹	101.4	13.2	12.8	1.2	0.0	1.1	0.1	27,648.9	0.2	1.3	5.3	381.8	31,554.6

¹ These values represent the sum of the emissions from individual activities, however the Project will maintain emissions below 408.1 tons per year NOx and 6.99 tons per year VOC.

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Emissions During Operations (CTV Scenario)																	
WTG and BoP Crew logistics																	
CTV all-year 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	0	434	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV all-year 2	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	0	434	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV all-year 3	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	0	434	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV all-year 4	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	0	434	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV all-year 5	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	0	434	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV Summer Campaign 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	0	216	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 2	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	0	216	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 3	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	0	216	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 4	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	0	216	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 5	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	0	216	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 6	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	0	216	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
WTG heavy logistics / jack-up																	
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	8	91	1,460	10	146	0	0	0	146	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	40	24	960	960	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		8	91	1,460	10	146	0	0	0	146	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	40	24	960	960	7A
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	2	2350	4,700	3 main	NJWP	8	91	1,460	10	146	0	0	0	146	7M
		Main Engine (Maneuvering)	2	2350	4,700	3 main		0	91	0	0	0	40	24	960	960	7M
		Auxiliary Engine (Transit)	2	1000	2,000	3 auxiliary		8	91	1,460	10	146	0	0	0	146	7A
		Auxiliary Engine (Maneuvering)	2	1000	2,000	3 auxiliary		0	91	0	0	0	40	24	960	960	7A
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	Europe	8	250	4,000	10	400	0	0	0	400	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	250	0	0	0	40	24	960	960	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		8	250	4,000	10	400	0	0	0	400	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	250	0	0	0	40	24	960	960	7A
Cable repair vessel - export cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	0.7	91	128	10	13	0	0	0	13	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	25	24	600	600	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		0.7	91	128	10	13	0	0	0	13	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	25	24	600	600	3A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Cable repair vessel - array cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	0.9	91	164	10	16	0	0	0	16	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	11	24	264	264	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		0.9	91	164	10	16	0	0	0	16	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	11	24	264	264	3A
Cable survey vessel - export cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	30	24	720	720	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	30	24	720	720	8A
Cable survey vessel - array cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	13	24	312	312	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	13	24	312	312	8A
Foundation below water inspection																	
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	Atlantic City	5	17	174	10	17	0	0	0	17	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	17	0	0	0	40	24	960	960	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		5	17	174	10	17	0	0	0	17	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	17	0	0	0	40	24	960	960	8A
Other vessels																	
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	12	17	417	20	21	0	0	0	21	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	12	8	96	96	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		12	17	417	20	21	0	0	0	21	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	12	8	96	96	4A
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	4	2,306	9,224	1 & 2 main	NJWP	0.03	91	6	10	1	0	0	0	1	3M
		Main Engine (Maneuvering)	4	2,306	9,224	1 & 2 main		0	91	0	0	0	3	24	72	72	3M
		Auxiliary Engine (Transit)	4	2,000	8,000	1 & 2 auxiliary		0.03	91	6	10	1	0	0	0	1	3A
		Auxiliary Engine (Maneuvering)	4	2,000	8,000	1 & 2 auxiliary		0	91	0	0	0	3	24	72	72	3A
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	0.03	91	6	10	1	0	0	0	1	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	3	24	72	72	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		0.03	91	6	10	1	0	0	0	1	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	3	24	72	72	7A
Miscellaneous																	
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OSS Generators	Generator	Tier 4 Generator	8	500	4,000	Tier 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	500	500	31

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Operations (CTV Scenario)																			
WTG and BoP Crew logistics																			
CTV all-year 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV all-year 2	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV all-year 3	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV all-year 4	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV all-year 5	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV Summer Campaign 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 2	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 3	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 4	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 5	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 6	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
WTG heavy logistics / jack-up																			
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	0.83	139,211	26.79	0.37	6.14	0.83	0.80	0.03	0.00	0.06	0.00	1728.57	0.01	0.08	0	25	1,754
		Main Engine (Maneuvering)	0.20	220,586	42.46	0.59	9.74	1.31	1.27	0.06	0.00	0.09	0.00	2739.01	0.02	0.13	0	39	2,779
		Auxiliary Engine (Transit)	0.43	16,919	3.20	0.04	0.69	0.09	0.09	0.00	0.00	0.01	0.00	179.42	0.00	0.01	0	3	182
		Auxiliary Engine (Maneuvering)	0.43	111,259	21.02	0.25	4.51	0.58	0.56	0.01	0.00	0.04	0.00	1179.81	0.01	0.06	0	17	1,197
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	0.83	32,715	6.30	0.09	1.44	0.19	0.19	0.01	0.00	0.01	0.00	406.21	0.00	0.02	0	6	412
		Main Engine (Maneuvering)	0.20	51,838	9.98	0.14	2.29	0.31	0.30	0.01	0.00	0.02	0.00	643.67	0.00	0.03	0	9	653
		Auxiliary Engine (Transit)	0.45	8,853	1.67	0.02	0.36	0.05	0.04	0.00	0.00	0.00	0.00	93.88	0.00	0.00	0	1	95
		Auxiliary Engine (Maneuvering)	0.45	58,217	11.00	0.13	2.36	0.30	0.30	0.01	0.00	0.02	0.00	617.34	0.00	0.03	0	9	626
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	0.83	381,431	73.41	1.02	16.83	2.27	2.20	0.10	0.00	0.16	0.00</						

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Cable repair vessel - array cable																			
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	6,302	1.04	0.03	0.24	0.04	0.04	0.01	0.00	0.00	0.00	69.47	0.00	0.00	0	1	70
		Main Engine (Maneuvering)	0.20	24,412	4.02	0.11	0.93	0.14	0.14	0.04	0.00	0.01	0.00	269.06	0.00	0.01	0	4	273
		Auxiliary Engine (Transit)	0.56	129	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.45	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.56	2,066	0.35	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	23.24	0.00	0.00	0	0	24
Cable survey vessel - export cable																			
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	3,655	0.63	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	40.49	0.00	0.00	0	1	41
		Main Engine (Maneuvering)	0.20	34,752	5.95	0.13	1.36	0.21	0.20	0.04	0.00	0.02	0.00	384.99	0.00	0.02	0	6	391
		Auxiliary Engine (Transit)	0.43	99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.43	3,893	0.69	0.01	0.17	0.02	0.02	0.00	0.00	0.00	0.00	43.80	0.00	0.00	0	1	44
Cable survey vessel - array cable																			
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	3,655	0.63	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	40.49	0.00	0.00	0	1	41
		Main Engine (Maneuvering)	0.20	15,059	2.58	0.06	0.59	0.09	0.09	0.02	0.00	0.01	0.00	166.83	0.00	0.01	0	2	169
		Auxiliary Engine (Transit)	0.43	99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.43	1,687	0.30	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.98	0.00	0.00	0	0	19
Foundation below water inspection																			
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	0.83	3,481	0.60	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	38.57	0.00	0.00	0	1	39
		Main Engine (Maneuvering)	0.20	46,336	7.93	0.18	1.81	0.27	0.27	0.05	0.00	0.02	0.00	513.32	0.00	0.02	0	7	521
		Auxiliary Engine (Transit)	0.43	94	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.43	5,191	0.92	0.01	0.22	0.03	0.03	0.00	0.00	0.00	0.00	58.40	0.00	0.00	0	1	59
Other vessels																			
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	0.83	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0	0	26
		Main Engine (Maneuvering)	0.20	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0	0	29
		Auxiliary Engine (Transit)	0.43	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0	0	0
		Auxiliary Engine (Maneuvering)	0.43	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0	0	2
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	0.16	57	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0	0	1
		Main Engine (Maneuvering)	0.10	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0	1	49
		Auxiliary Engine (Transit)	0.16	49	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.10	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0	1	43
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	0.83	580	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.20	0.00	0.00	0	0	7
		Main Engine (Maneuvering)	0.20	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0	3	208
		Auxiliary Engine (Transit)	0.45	74	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.45	8,733	1.65	0.02	0.35	0.05	0.04	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0	1	94
Miscellaneous																			
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,519
OSS Generators	Generator	Tier 4 Generator	0.75	107,143	1.11	0.31	5.79	0.05	0.03	0.01	0.00	0.03	0.00	1222.90	0.05	0.01	1	3	1,227

Total/yr		2,818,113	481.44	7.45	118.66	15.30	14.80	0.69	0.00	1.12	0.03	32,688.68	0.24	1.52	6.10	452.31	36,665.67
Total over Project Life		84,543,387	14,443.06	223.65	3,559.95	459.12	444.03	20.65	0.07	33.69	0.95	980,660.36	7.33	45.53	183.13	13,569.30	1,099,970.12
Vessels		2,710,970	480.33	7.14	112.88	15.25	14.77	0.68	0.00	1.09	0.03	31,465.78	0.19	1.51	4.86	449.35	31,920.00
		81,329,101	14,409.82	214.22	3,386.34	457.63	443.04	20.31	0.07	32.82	0.93	943,973.43	5.84	45.24	145.93	13,480.61	957,599.96
Non-vessel		107,143	1.11	0.31	5.79	0.05	0.03	0.01	0.00	0.03	0.00	1,222.90	0.05	0.01	1.24	2.96	4,745.67
		3,214,286	33.23	9.42	173.61	1.49	0.99	0.34	0.00	0.87	0.02	36,686.93	1.49	0.30	37.20	88.69	142,370.16

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Cable repair vessel - array cable																				
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,727	0.28	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	19.03	0.00	0.00	0.00	0.28	19.31
		Main Engine (Maneuvering)	25	100%	24,412	4.02	0.11	0.93	0.14	0.14	0.04	0.00	0.01	0.00	269.06	0.00	0.01	0.04	3.91	273.02
		Auxiliary Engine (Transit)	25	27%	35	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.01	0.40
		Auxiliary Engine (Maneuvering)	25	100%	2,066	0.35	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	23.24	0.00	0.00	0.00	0.33	23.57
Cable survey vessel - export cable																				
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	1,002	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.10	0.00	0.00	0.00	0.16	11.26
		Main Engine (Maneuvering)	25	51%	17,756	3.04	0.07	0.69	0.10	0.10	0.02	0.00	0.01	0.00	196.70	0.00	0.01	0.03	2.85	199.58
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31
		Auxiliary Engine (Maneuvering)	25	51%	1,989	0.35	0.00	0.09	0.01	0.01	0.00	0.00	0.00	0.00	22.38	0.00	0.00	0.00	0.32	22.70
Cable survey vessel - array cable																				
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	1,002	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.10	0.00	0.00	0.00	0.16	11.26
		Main Engine (Maneuvering)	25	100%	15,059	2.58	0.06	0.59	0.09	0.09	0.02	0.00	0.01	0.00	166.83	0.00	0.01	0.03	2.41	169.27
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31
		Auxiliary Engine (Maneuvering)	25	100%	1,687	0.30	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.98	0.00	0.00	0.00	0.27	19.25
Foundation below water inspection																				
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	17	100%	3,481	0.60	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	38.57	0.00	0.00	0.01	0.56	39.13
		Main Engine (Maneuvering)	17	100%	46,336	7.93	0.18	1.81	0.27	0.27	0.05	0.00	0.02	0.00	513.32	0.00	0.02	0.08	7.43	520.83
		Auxiliary Engine (Transit)	17	100%	94	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.02	1.07
		Auxiliary Engine (Maneuvering)	17	100%	5,191	0.92	0.01	0.22	0.03	0.03	0.00	0.00	0.00	0.00	58.40	0.00	0.00	0.01	0.83	59.24
Other vessels																				
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	17	100%	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0.00	0.37	26.19
		Main Engine (Maneuvering)	17	100%	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0.00	0.41	29.06
		Auxiliary Engine (Transit)	17	100%	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.35
		Auxiliary Engine (Maneuvering)	17	100%	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	0.02	1.62
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	25	27%	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.17
		Main Engine (Maneuvering)	25	100%	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0.01	0.70	49.13
		Auxiliary Engine (Transit)	25	27%	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.15
		Auxiliary Engine (Maneuvering)	25	100%	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0.01	0.61	43.48
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	25	27%	159	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.97	0.00	0.00	0.00	0.03	2.00
		Main Engine (Maneuvering)	25	100%	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0.03	2.93	208.39
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.22
		Auxiliary Engine (Maneuvering)	25	100%	8,733	1.65	0.02	0.35	0.05	0.04	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0.01	1.32	93.94
Miscellaneous																				
SF6 Loss	N/A	N/A	N/A	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,518.6
OSS Generators	Generator	Tier 4 Generator	N/A	100%	107,143	1.11	0.31	5.79	0.050	0.033	0.0112	0.000	0.0291	0.00	1,222.90	0.05	0.01	1.24	2.96	1,227.09

OCS Total Ton/yr	2,226,941	369.4	5.8	93.1	11.8	11.4	0.5	0.002	0.9	0.02	25,542.2	0.2	1.2	5.0	350.1	29,415.9
OCS Total Tons over life	66,808,221	11,082.16	174.25	2,793.52	355.05	343.28	14.62	0.05	26.15	0.67	766,265.74	6.00	35.25	149.95	10,504.39	882,477.41

Vessels	2,119,798	368.3	5.5	87.3	11.8	11.4	0.5	0.002	0.84	0.02	24,319.3	0.2	1.2	3.8	347.2	24,670.2
	63,593,935	11,048.92	164.82	2,619.91	353.56	342.29	14.28	0.05	25.28	0.66	729,578.81	4.51	34.95	112.75	10,415.70	740,107.25

Non-vessel	107,143	1.11	0.31	5.79	0.05	0.03	0.01	0.00	0.03	0.00	1,222.90	0.05	0.01	1.24	2.96	4,745.67
	3,214,286	33.23	9.42	173.61	1.49	0.99	0.34	0.00	0.87	0.02	36,686.93	1.49	0.30	37.20	88.69	142,370.16

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Emissions During Operations (CTV Scenario)																	
WTG and BoP Crew logistics																	
CTV all-year 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	434	4A	
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV all-year 2	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	434	4A	
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV all-year 3	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	434	4A	
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV all-year 4	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	434	4A	
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV Summer Campaign 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	216	4A	
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 2	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	216	4A	
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 3	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	216	4A	
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 4	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	216	4A	
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 5	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	216	4A	
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
WTG heavy logistics / jack-up																	
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	4	91	730	10	73	0	0	0	73	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	17	24	408	408	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		4	91	730	10	73	0	0	0	73	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	17	24	408	408	7A
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	2	2350	4,700	3 main	NJWP	4	91	730	10	73	0	0	0	73	7M
		Main Engine (Maneuvering)	2	2350	4,700	3 main		0	91	0	0	0	17	24	408	408	7M
		Auxiliary Engine (Transit)	2	1000	2,000	3 auxiliary		4	91	730	10	73	0	0	0	73	7A
		Auxiliary Engine (Maneuvering)	2	1000	2,000	3 auxiliary		0	91	0	0	0	17	24	408	408	7A
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	Europe	4	250	2,000	10	200	0	0	0	200	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	250	0	0	0	17	24	408	408	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		4	250	2,000	10	200	0	0	200	7A	
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	250	0	0	0	17	24	408	408	7A
Cable repair vessel - export cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	7	24	168	168	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	7	24	168	168	3A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Cable repair vessel - array cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	9	24	216	216	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	9	24	216	216	3A
Cable survey vessel - export cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	14	24	336	336	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	14	24	336	336	8A
Cable survey vessel - array cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	17	24	408	408	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	17	24	408	408	8A
Foundation below water inspection																	
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	Atlantic City	3	17	104	10	10	0	0	0	10	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	17	0	0	0	19	24	456	456	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		3	17	104	10	10	0	0	0	10	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	17	0	0	0	19	24	456	456	8A
Other vessels																	
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	12	17	417	20	21	0	0	0	21	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	12	8	96	96	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		12	17	417	20	21	0	0	0	21	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	12	8	96	96	4A
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	4	2,306	9,224	1 & 2 main	NJWP	0.03	91	6	10	1	0	0	0	1	3M
		Main Engine (Maneuvering)	4	2,306	9,224	1 & 2 main		0	91	0	0	0	3	24	72	72	3M
		Auxiliary Engine (Transit)	4	2,000	8,000	1 & 2 auxiliary		0.03	91	6	10	1	0	0	0	1	3A
		Auxiliary Engine (Maneuvering)	4	2,000	8,000	1 & 2 auxiliary		0	91	0	0	0	3	24	72	72	3A
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	0.03	91	6	10	1	0	0	0	1	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	3	24	72	72	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		0.03	91	6	10	1	0	0	0	1	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	3	24	72	72	7A
Miscellaneous																	
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OSS Generators	Generator	Tier 4 Generator	4	500	2,000	Tier 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	500	500	31

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Operations (CTV Scenario)																			
WTG and BoP Crew Logistics																			
CTV all-year 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV all-year 2	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV all-year 3	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV all-year 4	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV Summer Campaign 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 2	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 3	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 4	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 5	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
WTG heavy logistics / jack-up																			
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	0.83	69,605	13.40	0.19	3.07	0.41	0.40	0.02	0.00	0.03	0.00	864.29	0.01	0.04	0	12	877
		Main Engine (Maneuvering)	0.20	93,749	18.04	0.25	4.14	0.56	0.54	0.02	0.00	0.04	0.00	1164.08	0.01	0.06	0	17	1,181
		Auxiliary Engine (Transit)	0.43	8,460	1.60	0.02	0.34	0.04	0.04	0.00	0.00	0.00	0.00	89.71	0.00	0.00	0	1	91
		Auxiliary Engine (Maneuvering)	0.43	47,285	8.93	0.11	1.92	0.25	0.24	0.00	0.00	0.02	0.00	501.42	0.00	0.02	0	7	509
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	0.83	16,357	3.15	0.04	0.72	0.10	0.09	0.00	0.00	0.01	0.00	203.11	0.00	0.01	0	3	206
		Main Engine (Maneuvering)	0.20	22,031	4.24	0.06	0.97	0.13	0.13	0.01	0.00	0.01	0.00	273.56	0.00	0.01	0	4	278
		Auxiliary Engine (Transit)	0.45	4,427	0.84	0.01	0.18	0.02	0.02	0.00	0.00	0.00	0.00	46.94	0.00	0.00	0	1	48
		Auxiliary Engine (Maneuvering)	0.45	24,742	4.68	0.06	1.00	0.13	0.13	0.00	0.00	0.01	0.00	262.37	0.00	0.01	0	4	266
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	0.83	190,715	36.71	0.51	8.42	1.13	1.10	0.05	0.00	0.08	0.00	2368.10	0.01	0.11	0	34	2,402
		Main Engine (Maneuvering)	0.20	93,749	18.04	0.25	4.14	0.56	0.54	0.02	0.00	0.04	0.00	1164.08	0.01	0.06	0	17	1,181
		Auxiliary Engine (Transit)	0.43	23,179	4.38	0.05	0.94	0.12	0.12	0.00	0.00	0.01	0.00	245.79	0.00	0.01	0	4	249
		Auxiliary Engine (Maneuvering)	0.43	47,285	8.93	0.11	1.92	0.25	0.24	0.00	0.00	0.02	0.00	501.42	0.00	0.02	0	7	509
Cable repair vessel - export cable																			
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	7,003	1.15	0.03	0.27	0.04	0.04	0.01	0.00	0.00	0.00	77.18	0.00	0.00	0	1	78
		Main Engine (Maneuvering)	0.20	15,535	2.56	0.07	0.59	0.09	0.09	0.02	0.00	0.01	0.00	171.22	0.00	0.01	0	2	174
		Auxiliary Engine (Transit)	0.56	143	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0	0	2
		Auxiliary Engine (Maneuvering)	0.56	1,314	0.23	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.00	14.79	0.00	0.00	0	0	15

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Cable repair vessel - array cable																			
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	7,003	1.15	0.03	0.27	0.04	0.04	0.01	0.00	0.00	0.00	77.18	0.00	0.00	0	1	78
		Main Engine (Maneuvering)	0.20	19,973	3.29	0.09	0.76	0.12	0.11	0.03	0.00	0.01	0.00	220.14	0.00	0.01	0	3	223
		Auxiliary Engine (Transit)	0.56	143	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0	0	2
		Auxiliary Engine (Maneuvering)	0.56	1,690	0.29	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	19.01	0.00	0.00	0	0	19
Cable survey vessel - export cable																			
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	3,655	0.63	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	40.49	0.00	0.00	0	1	41
		Main Engine (Maneuvering)	0.20	16,218	2.78	0.06	0.63	0.10	0.09	0.02	0.00	0.01	0.00	179.66	0.00	0.01	0	3	182
		Auxiliary Engine (Transit)	0.43	99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.43	1,817	0.32	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.00	20.44	0.00	0.00	0	0	21
Cable survey vessel - array cable																			
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	7,311	1.25	0.03	0.29	0.04	0.04	0.01	0.00	0.00	0.00	80.99	0.00	0.00	0	1	82
		Main Engine (Maneuvering)	0.20	19,693	3.37	0.08	0.77	0.12	0.11	0.02	0.00	0.01	0.00	218.16	0.00	0.01	0	3	221
		Auxiliary Engine (Transit)	0.43	197	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	0.00	0	0	2
		Auxiliary Engine (Maneuvering)	0.43	2,206	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.82	0.00	0.00	0	0	25
Foundation below water inspection																			
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	0.83	2,089	0.36	0.01	0.08	0.01	0.01	0.00	0.00	0.00	0.00	23.14	0.00	0.00	0	0	23
		Main Engine (Maneuvering)	0.20	22,010	3.77	0.08	0.86	0.13	0.13	0.03	0.00	0.01	0.00	243.83	0.00	0.01	0	4	247
		Auxiliary Engine (Transit)	0.43	56	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.43	2,466	0.44	0.01	0.11	0.01	0.01	0.00	0.00	0.00	0.00	27.74	0.00	0.00	0	0	28
Other vessels																			
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	0.83	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0	0	26
		Main Engine (Maneuvering)	0.20	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0	0	29
		Auxiliary Engine (Transit)	0.43	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0	0	0
		Auxiliary Engine (Maneuvering)	0.43	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0	0	2
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	0.16	57	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0	0	1
		Main Engine (Maneuvering)	0.10	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0	1	49
		Auxiliary Engine (Transit)	0.16	49	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.10	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0	1	43
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	0.83	580	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.20	0.00	0.00	0	0	7
		Main Engine (Maneuvering)	0.20	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0	3	208
		Auxiliary Engine (Transit)	0.45	74	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.45	8,733	1.65	0.02	0.35	0.05	0.04	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0	1	94
Miscellaneous																			
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2,257
OSS Generators	Generator	Tier 4 Generator	0.75	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	1	1	614

Total/yr	1,723,286	289.74	4.52	71.77	9.34	9.04	0.40	0.00	0.68	0.02	19,852.61	0.14	0.93	3.59	276.21	22,389.34
Total over Project Life	51,698,568	8,692.06	135.67	2,153.08	280.32	271.15	11.99	0.04	20.50	0.55	595,578.42	4.31	27.81	107.82	8,286.35	671,680.08

Vessels	1,669,714	289.18	4.37	68.88	9.32	9.02	0.39	0.00	0.67	0.02	19,241.17	0.12	0.92	2.97	274.73	19,518.87
	50,091,425	8,675.44	130.95	2,066.28	279.58	270.66	11.82	0.04	20.06	0.54	577,234.95	3.57	27.66	89.22	8,242.01	585,566.18

Non-vessel	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	0.62	1.48	2,870.46
	1,607,143	16.62	4.71	86.81	0.74	0.50	0.17	0.00	0.44	0.01	18,343.47	0.74	0.15	18.60	44.35	86,113.90

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)															
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e	
Emissions During Operations (CTV Scenario)																					
WTG and BoP Crew Logistics																					
CTV all-year 1	Crew Transfer Vessel	Main Engine (Transit)	17	100%	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73	
		Main Engine (Maneuvering)	17	100%	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97	
		Auxiliary Engine (Transit)	17	100%	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31	
		Auxiliary Engine (Maneuvering)	17	100%	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49	
CTV all-year 2	Crew Transfer Vessel	Main Engine (Transit)	17	100%	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73	
		Main Engine (Maneuvering)	17	100%	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97	
		Auxiliary Engine (Transit)	17	100%	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31	
		Auxiliary Engine (Maneuvering)	17	100%	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49	
CTV all-year 3	Crew Transfer Vessel	Main Engine (Transit)	17	100%	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73	
		Main Engine (Maneuvering)	17	100%	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97	
		Auxiliary Engine (Transit)	17	100%	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31	
		Auxiliary Engine (Maneuvering)	17	100%	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49	
CTV all-year 4	Crew Transfer Vessel	Main Engine (Transit)	17	100%	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73	
		Main Engine (Maneuvering)	17	100%	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97	
		Auxiliary Engine (Transit)	17	100%	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31	
		Auxiliary Engine (Maneuvering)	17	100%	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49	
CTV Summer Campaign 1	Crew Transfer Vessel	Main Engine (Transit)	17	100%	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0.04	3.80	270.68	
		Main Engine (Maneuvering)	17	100%	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0.07	6.33	450.35	
		Auxiliary Engine (Transit)	17	100%	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0.00	0.05	3.63	
		Auxiliary Engine (Maneuvering)	17	100%	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0.00	0.35	25.04	
CTV Summer Campaign 2	Crew Transfer Vessel	Main Engine (Transit)	17	100%	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0.04	3.80	270.68	
		Main Engine (Maneuvering)	17	100%	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0.07	6.33	450.35	
		Auxiliary Engine (Transit)	17	100%	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0.00	0.05	3.63	
		Auxiliary Engine (Maneuvering)	17	100%	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0.00	0.35	25.04	
CTV Summer Campaign 3	Crew Transfer Vessel	Main Engine (Transit)	17	100%	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0.04	3.80	270.68	
		Main Engine (Maneuvering)	17	100%	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0.07	6.33	450.35	
		Auxiliary Engine (Transit)	17	100%	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0.00	0.05	3.63	
		Auxiliary Engine (Maneuvering)	17	100%	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0.00	0.35	25.04	
CTV Summer Campaign 4	Crew Transfer Vessel	Main Engine (Transit)	17	100%	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0.04	3.80	270.68	
		Main Engine (Maneuvering)	17	100%	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0.07	6.33	450.35	
		Auxiliary Engine (Transit)	17	100%	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0.00	0.05	3.63	
		Auxiliary Engine (Maneuvering)	17	100%	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0.00	0.35	25.04	
CTV Summer Campaign 5	Crew Transfer Vessel	Main Engine (Transit)	17	100%	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0.04	3.80	270.68	
		Main Engine (Maneuvering)	17	100%	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0.07	6.33	450.35	
		Auxiliary Engine (Transit)	17	100%	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0.00	0.05	3.63	
		Auxiliary Engine (Maneuvering)	17	100%	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0.00	0.35	25.04	
WTG heavy logistics / jack-up																					
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	25	27%	19,072	3.67	0.05	0.84	0.11	0.11	0.00	0.00	0.01	0.00	236.81	0.00	0.01	0.04	3.38	240.23	
		Main Engine (Maneuvering)	25	100%	93,749	18.04	0.25	4.14	0.56	0.54	0.02	0.00	0.04	0.00	1,164.08	0.01	0.06	0.18	16.62	1,180.88	
		Auxiliary Engine (Transit)	25	27%	2,318	0.44	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.58	0.00	0.00	0.00	0.35	24.93	
		Auxiliary Engine (Maneuvering)	25	100%	47,285	8.93	0.11	1.92	0.25	0.24	0.00	0.00	0.02	0.00	501.42	0.00	0.02	0.08	7.15	508.64	
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	25	27%	4,482	0.86	0.01	0.20	0.03	0.03	0.00	0.00	0.00	0.00	55.65	0.00	0.00	0.01	0.79	56.45	
		Main Engine (Maneuvering)	25	100%	22,031	4.24	0.06	0.97	0.13	0.13	0.01	0.00	0.01	0.00	273.56	0.00	0.01	0.04	3.91	277.51	
		Auxiliary Engine (Transit)	25	27%	1,213	0.23	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.00	12.86	0.00	0.00	0.00	0.18	13.05	
		Auxiliary Engine (Maneuvering)	25	100%	24,742	4.68	0.06	1.00	0.13	0.13	0.00	0.00	0.01	0.00	262.37	0.00	0.01	0.04	3.74	266.15	
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	25	10%	19,072	3.67	0.05	0.84	0.11	0.11	0.00	0.00	0.01	0.00	236.81	0.00	0.01	0.04	3.38	240.23	
		Main Engine (Maneuvering)	25	100%	93,749	18.04	0.25	4.14	0.56	0.54	0.02	0.00	0.04	0.00	1,164.08	0.01	0.06	0.18	16.62	1,180.88	
		Auxiliary Engine (Transit)	25	10%	2,318	0.44	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.58	0.00	0.00	0.00	0.35	24.93	
		Auxiliary Engine (Maneuvering)	25	100%	47,285	8.93	0.11	1.92	0.25	0.24	0.00	0.00	0.02	0.00	501.42	0.00	0.02	0.08	7.15	508.64	
Cable repair vessel - export cable																					
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,919	0.32	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	21.15	0.00	0.00	0.00	0.31	21.46	
		Main Engine (Maneuvering)	25	51%	7,937	1.31	0.03	0.30	0.05	0.05	0.01	0.00	0.00	0.00	87.48	0.00	0.00	0.01	1.27	88.77	
		Auxiliary Engine (Transit)	25	27%	39	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.01	0.45	
		Auxiliary Engine (Maneuvering)	25	51%	672	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.56	0.00	0.00	0.00	0.11	7.66	

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)															
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e	
Cable repair vessel - array cable																					
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,919	0.32	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	21.15	0.00	0.00	0.00	0.31	21.46	
		Main Engine (Maneuvering)	25	100%	19,973	3.29	0.09	0.76	0.12	0.11	0.03	0.00	0.01	0.00	220.14	0.00	0.01	0.03	3.20	223.38	
		Auxiliary Engine (Transit)	25	27%	39	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.01	0.45	
		Auxiliary Engine (Maneuvering)	25	100%	1,690	0.29	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	19.01	0.00	0.00	0.00	0.27	19.29	
Cable survey vessel - export cable																					
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	1,002	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.10	0.00	0.00	0.00	0.16	11.26	
		Main Engine (Maneuvering)	25	51%	8,286	1.42	0.03	0.32	0.05	0.05	0.01	0.00	0.00	0.00	91.80	0.00	0.00	0.01	1.33	93.14	
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31	
		Auxiliary Engine (Maneuvering)	25	51%	928	0.16	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	10.44	0.00	0.00	0.00	0.15	10.59	
Cable survey vessel - array cable																					
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	2,003	0.34	0.01	0.08	0.01	0.01	0.00	0.00	0.00	0.00	22.19	0.00	0.00	0.00	0.32	22.51	
		Main Engine (Maneuvering)	25	100%	19,693	3.37	0.08	0.77	0.12	0.11	0.02	0.00	0.01	0.00	218.16	0.00	0.01	0.03	3.16	221.35	
		Auxiliary Engine (Transit)	25	27%	54	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.01	0.62	
		Auxiliary Engine (Maneuvering)	25	100%	2,206	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.82	0.00	0.00	0.00	0.35	25.18	
Foundation below water inspection																					
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	17	100%	2,089	0.36	0.01	0.08	0.01	0.01	0.00	0.00	0.00	0.00	23.14	0.00	0.00	0.00	0.33	23.48	
		Main Engine (Maneuvering)	17	100%	22,010	3.77	0.08	0.86	0.13	0.13	0.03	0.00	0.01	0.00	243.83	0.00	0.01	0.04	3.53	247.39	
		Auxiliary Engine (Transit)	17	100%	56	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.01	0.64	
		Auxiliary Engine (Maneuvering)	17	100%	2,466	0.44	0.01	0.11	0.01	0.01	0.00	0.00	0.00	0.00	27.74	0.00	0.00	0.00	0.40	28.14	
Other vessels																					
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	17	100%	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0.00	0.37	26.19	
		Main Engine (Maneuvering)	17	100%	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0.00	0.41	29.06	
		Auxiliary Engine (Transit)	17	100%	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.35	
		Auxiliary Engine (Maneuvering)	17	100%	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	0.02	1.62	
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	25	27%	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.17	
		Main Engine (Maneuvering)	25	100%	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0.01	0.70	49.13	
		Auxiliary Engine (Transit)	25	27%	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.15	
		Auxiliary Engine (Maneuvering)	25	100%	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0.01	0.61	43.48	
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	25	27%	159	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.97	0.00	0.00	0.00	0.03	2.00	
		Main Engine (Maneuvering)	25	100%	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0.03	2.93	208.39	
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.22	
		Auxiliary Engine (Maneuvering)	25	100%	8,733	1.65	0.02	0.35	0.05	0.04	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0.01	1.32	93.94	
Miscellaneous																					
SF6 Loss	N/A	N/A	N/A	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2,256.92	
OSS Generators	Generator	Tier 4 Generator	N/A	100%	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	0.62	1.48	613.55	

OCS Total Ton/yr	1,422,852	232.89	3.68	58.81	7.58	7.33	0.29	0.00	0.55	0.01	16,225.46	0.12	0.75	3.03	224.35	18,709.76
OCS Total Tons over life	42,685,561	6,986.59	110.40	1,764.20	227.43	219.94	8.80	0.03	16.65	0.40	486,763.72	3.64	22.59	90.98	6,730.48	561,292.67
Vessels	1,369,281	232.33	3.52	55.91	7.56	7.31	0.29	0.00	0.54	0.01	15,614.01	0.10	0.75	2.41	222.87	15,839.29
	41,078,418	6,969.98	105.69	1,677.39	226.68	219.45	8.63	0.03	16.21	0.40	468,420.26	2.90	22.44	72.38	6,686.14	475,178.77
Non-vessel	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	0.62	1.48	2,870.46
	1,607,143	16.62	4.71	86.81	0.74	0.50	0.17	0.00	0.44	0.01	18,343.47	0.74	0.15	18.60	44.35	86,113.90

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Emissions During Operations (CTV Scenario)																	
WTG and BoP Crew logistics																	
CTV all-year 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	0	434	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV all-year 2	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	0	434	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV all-year 3	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	0	434	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV Summer Campaign 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	0	216	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 2	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	0	216	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
CTV Summer Campaign 3	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	124	17	4,310	20	216	0	0	0	216	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	124	12	1,488	1,488	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		124	17	4,310	20	216	0	0	0	216	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	124	12	1,488	1,488	4A
WTG heavy logistics / jack-up																	
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	3	91	547	10	55	0	0	0	55	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	12	24	288	288	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		3	91	547	10	55	0	0	0	55	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	12	24	288	288	7A
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	2	2350	4,700	3 main	NJWP	3	91	547	10	55	0	0	0	55	7M
		Main Engine (Maneuvering)	2	2350	4,700	3 main		0	91	0	0	0	12	24	288	288	7M
		Auxiliary Engine (Transit)	2	1000	2,000	3 auxiliary		3	91	547	10	55	0	0	0	55	7A
		Auxiliary Engine (Maneuvering)	2	1000	2,000	3 auxiliary		0	91	0	0	0	12	24	288	288	7A
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	Europe	3	250	1,500	10	150	0	0	0	150	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	250	0	0	0	12	24	288	288	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		3	250	1,500	10	150	0	0	0	150	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	250	0	0	0	12	24	288	288	7A
Cable repair vessel - export cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	5	24	120	120	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	5	24	120	120	3A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Cable repair vessel - array cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	7	24	168	168	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	7	24	168	168	3A
Cable survey vessel - export cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	10	24	240	240	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	10	24	240	240	8A
Cable survey vessel - array cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	12	24	288	288	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	12	24	288	288	8A
Foundation below water inspection																	
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	Atlantic City	2	17	70	10	7	0	0	0	7	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	17	0	0	0	13	24	312	312	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		2	17	70	10	7	0	0	0	7	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	17	0	0	0	13	24	312	312	8A
Other vessels																	
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	12	17	417	20	21	0	0	0	21	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	12	8	96	96	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		12	17	417	20	21	0	0	0	21	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	12	8	96	96	4A
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	4	2,306	9,224	1 & 2 main	NJWP	0.03	91	6	10	1	0	0	0	1	3M
		Main Engine (Maneuvering)	4	2,306	9,224	1 & 2 main		0	91	0	0	0	3	24	72	72	3M
		Auxiliary Engine (Transit)	4	2,000	8,000	1 & 2 auxiliary		0.03	91	6	10	1	0	0	0	1	3A
		Auxiliary Engine (Maneuvering)	4	2,000	8,000	1 & 2 auxiliary		0	91	0	0	0	3	24	72	72	3A
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	0.03	91	6	10	1	0	0	0	1	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	3	24	72	72	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		0.03	91	6	10	1	0	0	0	1	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	3	24	72	72	7A
Miscellaneous																	
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OSS Generators	Generator	Tier 4 Generator	4	500	2,000	Tier 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	500	500	31

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Operations (CTV Scenario)																			
WTG and BoP Crew logistics																			
CTV all-year 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV all-year 2	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV all-year 3	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0	8	546
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0	13	908
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0	0	7
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0	1	50
CTV Summer Campaign 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 2	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
CTV Summer Campaign 3	Crew Transfer Vessel	Main Engine (Transit)	0.83	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0	4	271
		Main Engine (Maneuvering)	0.20	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0	6	450
		Auxiliary Engine (Transit)	0.43	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0	0	4
		Auxiliary Engine (Maneuvering)	0.43	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0	0	25
WTG heavy logistics / jack-up																			
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	0.83	52,204	10.05	0.14	2.30	0.31	0.30	0.01	0.00	0.02	0.00	648.21	0.00	0.03	0	9	658
		Main Engine (Maneuvering)	0.20	66,176	12.74	0.18	2.92	0.39	0.38	0.02	0.00	0.03	0.00	821.70	0.01	0.04	0	12	834
		Auxiliary Engine (Transit)	0.43	6,345	1.20	0.01	0.26	0.03	0.03	0.00	0.00	0.00	0.00	67.28	0.00	0.00	0	1	68
		Auxiliary Engine (Maneuvering)	0.43	33,378	6.31	0.08	1.35	0.17	0.17	0.00	0.00	0.01	0.00	353.94	0.00	0.02	0	5	359
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	0.83	12,268	2.36	0.03	0.54	0.07	0.07	0.00	0.00	0.01	0.00	152.33	0.00	0.01	0	2	155
		Main Engine (Maneuvering)	0.20	15,551	2.99	0.04	0.69	0.09	0.09	0.00	0.00	0.01	0.00	193.10	0.00	0.01	0	3	196
		Auxiliary Engine (Transit)	0.45	3,320	0.63	0.01	0.13	0.02	0.02	0.00	0.00	0.00	0.00	35.20	0.00	0.00	0	1	36
		Auxiliary Engine (Maneuvering)	0.45	17,465	3.30	0.04	0.71	0.09	0.09	0.00	0.00	0.01	0.00	185.20	0.00	0.01	0	3	188
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	0.83	143,037	27.53	0.38	6.31	0.85	0.82	0.04	0.00	0.06	0.00	1776.08	0.01	0.09	0	25	1,802
		Main Engine (Maneuvering)	0.20	66,176	12.74	0.18	2.92	0.39	0.38	0.02	0.00	0.03	0.00	821.70	0.01	0.04	0	12	834
		Auxiliary Engine (Transit)	0.43	17,384	3.28	0.04	0.71	0.09	0.09	0.00	0.00	0.01	0.00	184.35	0.00	0.01	0	3	187
		Auxiliary Engine (Maneuvering)	0.43	33,378	6.31	0.08	1.35	0.17	0.17	0.00	0.00	0.01	0.00	353.94	0.00	0.02	0	5	359
Cable repair vessel - export cable																			
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	7,003	1.15	0.03	0.27	0.04	0.04	0.01	0.00	0.00	0.00	77.18	0.00	0.00	0	1	78
		Main Engine (Maneuvering)	0.20	11,096	1.83	0.05	0.42	0.07	0.06	0.02	0.00	0.01	0.00	122.30	0.00	0.01	0	2	124
		Auxiliary Engine (Transit)	0.56	143	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0	0	2
		Auxiliary Engine (Maneuvering)	0.56	939	0.16	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	10.56	0.00	0.00	0	0	11

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Cable repair vessel - array cable																			
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	7,003	1.15	0.03	0.27	0.04	0.04	0.01	0.00	0.00	0.00	77.18	0.00	0.00	0	1	78
		Main Engine (Maneuvering)	0.20	15,535	2.56	0.07	0.59	0.09	0.09	0.02	0.00	0.01	0.00	171.22	0.00	0.01	0	2	174
		Auxiliary Engine (Transit)	0.56	143	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0	0	2
		Auxiliary Engine (Maneuvering)	0.56	1,314	0.23	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.00	14.79	0.00	0.00	0	0	15
Cable survey vessel - export cable																			
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	3,655	0.63	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	40.49	0.00	0.00	0	1	41
		Main Engine (Maneuvering)	0.20	11,584	1.98	0.04	0.45	0.07	0.07	0.01	0.00	0.01	0.00	128.33	0.00	0.01	0	2	130
		Auxiliary Engine (Transit)	0.43	99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.43	1,298	0.23	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.00	14.60	0.00	0.00	0	0	15
Cable survey vessel - array cable																			
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	3,655	0.63	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	40.49	0.00	0.00	0	1	41
		Main Engine (Maneuvering)	0.20	13,901	2.38	0.05	0.54	0.08	0.08	0.02	0.00	0.01	0.00	154.00	0.00	0.01	0	2	156
		Auxiliary Engine (Transit)	0.43	99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.43	1,557	0.28	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	17.52	0.00	0.00	0	0	18
Foundation below water inspection																			
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	0.83	1,392	0.24	0.01	0.05	0.01	0.01	0.00	0.00	0.00	0.00	15.43	0.00	0.00	0	0	16
		Main Engine (Maneuvering)	0.20	15,059	2.58	0.06	0.59	0.09	0.09	0.02	0.00	0.01	0.00	166.83	0.00	0.01	0	2	169
		Auxiliary Engine (Transit)	0.43	38	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0	0	0
		Auxiliary Engine (Maneuvering)	0.43	1,687	0.30	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.98	0.00	0.00	0	0	19
Other vessels																			
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	0.83	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0	0	26
		Main Engine (Maneuvering)	0.20	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0	0	29
		Auxiliary Engine (Transit)	0.43	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0	0	0
		Auxiliary Engine (Maneuvering)	0.43	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0	0	2
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	0.16	57	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0	0	1
		Main Engine (Maneuvering)	0.10	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0	1	49
		Auxiliary Engine (Transit)	0.16	49	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.10	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0	1	43
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	0.83	580	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.20	0.00	0.00	0	0	7
		Main Engine (Maneuvering)	0.20	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0	3	208
		Auxiliary Engine (Transit)	0.45	74	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.45	8,733	1.65	0.02	0.35	0.05	0.05	0.04	0.00	0.00	0.00	92.60	0.00	0.00	0	1	94
Miscellaneous																			
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,690
OSS Generators	Generator	Tier 4 Generator	0.75	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	1	1	614

Total/yr	1,251,127	208.43	3.30	52.33	6.72	6.50	0.30	0.00	0.50	0.01	14,422.43	0.11	0.67	2.75	198.70	16,314.06
Total over Project Life	37,533,822	6,253.03	99.01	1,570.04	201.53	194.87	8.91	0.03	14.87	0.41	432,672.92	3.31	20.00	82.65	5,960.91	489,421.70
Vessels	1,197,556	207.88	3.14	49.44	6.69	6.48	0.29	0.00	0.48	0.01	13,810.98	0.09	0.66	2.13	197.22	14,010.34
	35,926,679	6,236.41	94.30	1,483.23	200.78	194.38	8.74	0.03	14.43	0.40	414,329.45	2.56	19.85	64.05	5,916.57	420,310.07
Non-vessel	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	0.62	1.48	2,303.72
	1,607,143	16.62	4.71	86.81	0.74	0.50	0.17	0.00	0.44	0.01	18,343.47	0.74	0.15	18.60	44.35	69,111.63

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Operations (CTV Scenario)																				
WTG and BoP Crew logistics																				
CTV all-year 1	Crew Transfer Vessel	Main Engine (Transit)	17	100%	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73
		Main Engine (Maneuvering)	17	100%	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97
		Auxiliary Engine (Transit)	17	100%	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31
		Auxiliary Engine (Maneuvering)	17	100%	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49
CTV all-year 2	Crew Transfer Vessel	Main Engine (Transit)	17	100%	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73
		Main Engine (Maneuvering)	17	100%	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97
		Auxiliary Engine (Transit)	17	100%	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31
		Auxiliary Engine (Maneuvering)	17	100%	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49
CTV all-year 3	Crew Transfer Vessel	Main Engine (Transit)	17	100%	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73
		Main Engine (Maneuvering)	17	100%	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97
		Auxiliary Engine (Transit)	17	100%	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31
		Auxiliary Engine (Maneuvering)	17	100%	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49
CTV Summer Campaign 1	Crew Transfer Vessel	Main Engine (Transit)	17	100%	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0.04	3.80	270.68
		Main Engine (Maneuvering)	17	100%	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0.07	6.33	450.35
		Auxiliary Engine (Transit)	17	100%	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0.00	0.05	3.63
		Auxiliary Engine (Maneuvering)	17	100%	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0.00	0.35	25.04
CTV Summer Campaign 2	Crew Transfer Vessel	Main Engine (Transit)	17	100%	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0.04	3.80	270.68
		Main Engine (Maneuvering)	17	100%	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0.07	6.33	450.35
		Auxiliary Engine (Transit)	17	100%	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0.00	0.05	3.63
		Auxiliary Engine (Maneuvering)	17	100%	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0.00	0.35	25.04
CTV Summer Campaign 3	Crew Transfer Vessel	Main Engine (Transit)	17	100%	23,719	3.77	0.06	0.95	0.13	0.12	0.00	0.00	0.01	0.00	266.84	0.00	0.01	0.04	3.80	270.68
		Main Engine (Maneuvering)	17	100%	39,463	6.27	0.10	1.58	0.21	0.21	0.00	0.00	0.01	0.00	443.96	0.00	0.02	0.07	6.33	450.35
		Auxiliary Engine (Transit)	17	100%	318	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58	0.00	0.00	0.00	0.05	3.63
		Auxiliary Engine (Maneuvering)	17	100%	2,194	0.40	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.69	0.00	0.00	0.00	0.35	25.04
WTG heavy logistics / jack-up																				
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	25	27%	14,304	2.75	0.04	0.63	0.09	0.08	0.00	0.00	0.01	0.00	177.61	0.00	0.01	0.03	2.54	180.17
		Main Engine (Maneuvering)	25	100%	66,176	12.74	0.18	2.92	0.39	0.38	0.02	0.00	0.03	0.00	821.70	0.01	0.04	0.13	11.73	833.56
		Auxiliary Engine (Transit)	25	27%	1,738	0.33	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.43	0.00	0.00	0.00	0.26	18.70
		Auxiliary Engine (Maneuvering)	25	100%	33,378	6.31	0.08	1.35	0.17	0.17	0.00	0.00	0.01	0.00	353.94	0.00	0.02	0.05	5.04	359.04
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	25	27%	3,361	0.65	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	41.74	0.00	0.00	0.01	0.60	42.34
		Main Engine (Maneuvering)	25	100%	15,551	2.99	0.04	0.69	0.09	0.09	0.00	0.00	0.01	0.00	193.10	0.00	0.01	0.03	2.76	195.89
		Auxiliary Engine (Transit)	25	27%	910	0.17	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	9.65	0.00	0.00	0.00	0.14	9.78
		Auxiliary Engine (Maneuvering)	25	100%	17,465	3.30	0.04	0.71	0.09	0.09	0.00	0.00	0.01	0.00	185.20	0.00	0.01	0.03	2.64	187.87
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	25	10%	14,304	2.75	0.04	0.63	0.09	0.08	0.00	0.00	0.01	0.00	177.61	0.00	0.01	0.03	2.54	180.17
		Main Engine (Maneuvering)	25	100%	66,176	12.74	0.18	2.92	0.39	0.38	0.02	0.00	0.03	0.00	821.70	0.01	0.04	0.13	11.73	833.56
		Auxiliary Engine (Transit)	25	10%	1,738	0.33	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.43	0.00	0.00	0.00	0.26	18.70
		Auxiliary Engine (Maneuvering)	25	100%	33,378	6.31	0.08	1.35	0.17	0.17	0.00	0.00	0.01	0.00	353.94	0.00	0.02	0.05	5.04	359.04
Cable repair vessel - export cable																				
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,919	0.32	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	21.15	0.00	0.00	0.00	0.31	21.46
		Main Engine (Maneuvering)	25	51%	5,669	0.93	0.02	0.22	0.03	0.03	0.01	0.00	0.00	0.00	62.49	0.00	0.00	0.01	0.91	63.41
		Auxiliary Engine (Transit)	25	27%	39	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.01	0.45
		Auxiliary Engine (Maneuvering)	25	51%	480	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.40	0.00	0.00	0.00	0.08	5.47

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)															
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e	
Cable repair vessel - array cable																					
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,919	0.32	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	21.15	0.00	0.00	0.00	0.31	21.46	
		Main Engine (Maneuvering)	25	100%	15,535	2.56	0.07	0.59	0.09	0.09	0.02	0.00	0.01	0.00	171.22	0.00	0.01	0.03	2.49	173.74	
		Auxiliary Engine (Transit)	25	27%	39	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.01	0.45	
		Auxiliary Engine (Maneuvering)	25	100%	1,314	0.23	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.00	14.79	0.00	0.00	0.00	0.21	15.00	
Cable survey vessel - export cable																					
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	1,002	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.10	0.00	0.00	0.00	0.16	11.26	
		Main Engine (Maneuvering)	25	51%	5,919	1.01	0.02	0.23	0.03	0.03	0.01	0.00	0.00	0.00	65.57	0.00	0.00	0.01	0.95	66.53	
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31	
		Auxiliary Engine (Maneuvering)	25	51%	663	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.46	0.00	0.00	0.00	0.11	7.57	
Cable survey vessel - array cable																					
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	1,002	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.10	0.00	0.00	0.00	0.16	11.26	
		Main Engine (Maneuvering)	25	100%	13,901	2.38	0.05	0.54	0.08	0.08	0.02	0.00	0.01	0.00	154.00	0.00	0.01	0.02	2.23	156.25	
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31	
		Auxiliary Engine (Maneuvering)	25	100%	1,557	0.28	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	17.52	0.00	0.00	0.00	0.25	17.77	
Foundation below water inspection																					
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	17	100%	1,392	0.24	0.01	0.05	0.01	0.01	0.00	0.00	0.00	0.00	15.43	0.00	0.00	0.00	0.22	15.65	
		Main Engine (Maneuvering)	17	100%	15,059	2.58	0.06	0.59	0.09	0.09	0.02	0.00	0.01	0.00	166.83	0.00	0.01	0.03	2.41	169.27	
		Auxiliary Engine (Transit)	17	100%	38	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.01	0.43	
		Auxiliary Engine (Maneuvering)	17	100%	1,687	0.30	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.98	0.00	0.00	0.00	0.27	19.25	
Other vessels																					
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	17	100%	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0.00	0.37	26.19	
		Main Engine (Maneuvering)	17	100%	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0.00	0.41	29.06	
		Auxiliary Engine (Transit)	17	100%	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.35	
		Auxiliary Engine (Maneuvering)	17	100%	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	0.02	1.62	
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	25	27%	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.17	
		Main Engine (Maneuvering)	25	100%	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0.01	0.70	49.13	
		Auxiliary Engine (Transit)	25	27%	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.15	
		Auxiliary Engine (Maneuvering)	25	100%	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0.01	0.61	43.48	
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	25	27%	159	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.97	0.00	0.00	0.00	0.03	2.00	
		Main Engine (Maneuvering)	25	100%	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0.03	2.93	208.39	
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.22	
		Auxiliary Engine (Maneuvering)	25	100%	8,733	1.65	0.02	0.35	0.05	0.04	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0.01	1.32	93.94	
Miscellaneous																					
SF6 Loss	N/A	N/A	N/A	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,690.17	
OSS Generators	Generator	Tier 4 Generator	N/A	100%	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	0.62	1.48	613.55	

OCS Total Ton/yr	1,024,361	165.56	2.66	42.56	5.39	5.21	0.21	0.00	0.40	0.01	11,686.09	0.09	0.54	2.33	159.57	13,538.17
OCS Total Tons over life	30,730,831	4,966.90	79.87	1,276.73	161.60	156.22	6.45	0.02	11.96	0.30	350,582.79	2.80	16.06	69.94	4,787.03	406,144.98
Vessels	970,790	165.01	2.51	39.66	5.36	5.19	0.21	0.00	0.38	0.01	11,074.64	0.07	0.53	1.71	158.09	11,234.44
	29,123,688	4,950.28	75.16	1,189.92	160.86	155.72	6.28	0.02	11.52	0.29	332,239.33	2.05	15.92	51.34	4,742.68	337,033.35
Non-vessel	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	0.62	1.48	2,303.72
	1,607,143	16.62	4.71	86.81	0.74	0.50	0.17	0.00	0.44	0.01	18,343.47	0.74	0.15	18.60	44.35	69,111.63

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Emissions During Operations (SOV Scenario)																	
WTG and BoP Crew logistics																	
CTV All-Year 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	0	434	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
CTV All-Year 2	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	250	17	8,690	20	434	0	0	0	434	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	250	12	3,000	3,000	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		250	17	8,690	20	434	0	0	0	434	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	250	12	3,000	3,000	4A
SOV All-Year 1	Service Operation Vessel	Main Engine (Transit)	4	2,306	9,224	1 & 2 main	Atlantic City	24	17	834	20	42	0	0	0	42	3M
		Main Engine (Maneuvering)	4	2,306	9,224	1 & 2 main		0	17	0	0	0	341	24	8,184	8,184	3M
		Auxiliary Engine (Transit)	4	2,000	8,000	1 & 2 auxiliary		24	17	834	20	42	0	0	0	42	3A
		Auxiliary Engine (Maneuvering)	4	2,000	8,000	1 & 2 auxiliary		0	17	0	0	0	341	24	8,184	8,184	3A
SOV Daughter Craft 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	N/A	0	0	0	20	0	0	0	0	0	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	0	0	0	0	220	8	1,760	1,760	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		0	0	0	20	0	0	0	0	0	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	0	0	0	0	220	8	1,760	1,760	4A
WTG heavy logistics / jack-up																	
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	8	91	1,460	10	146	0	0	0	146	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	40	24	960	960	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		8	91	1,460	10	146	0	0	0	146	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	40	24	960	960	7A
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	2	2350	4,700	3 main	NJWP	8	91	1,460	10	146	0	0	0	146	7M
		Main Engine (Maneuvering)	2	2350	4,700	3 main		0	91	0	0	0	40	24	960	960	7M
		Auxiliary Engine (Transit)	2	1000	2,000	3 auxiliary		8	91	1,460	10	146	0	0	0	146	7A
		Auxiliary Engine (Maneuvering)	2	1000	2,000	3 auxiliary		0	91	0	0	0	40	24	960	960	7A
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	Europe	8	250	4,000	10	400	0	0	0	400	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	250	0	0	0	40	24	960	960	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		8	250	4,000	10	400	0	0	0	400	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	250	0	0	0	40	24	960	960	7A
Cable repair vessel - export cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	0.7	91	128	10	13	0	0	0	13	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	25	24	600	600	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		0.7	91	128	10	13	0	0	0	13	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	25	24	600	600	3A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Cable repair vessel - array cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	0.9	91	164	10	16	0	0	0	16	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	11	24	264	264	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		0.9	91	164	10	16	0	0	0	16	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	11	24	264	264	3A
Cable survey vessel - export cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	30	24	720	720	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	30	24	720	720	8A
Cable survey vessel - array cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	13	24	312	312	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	13	24	312	312	8A
Foundation below water inspection																	
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	Atlantic City	5	17	174	10	17	0	0	0	17	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	17	0	0	0	40	24	960	960	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		5	17	174	10	17	0	0	0	17	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	17	0	0	0	40	24	960	960	8A
Other vessels																	
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	12	17	417	20	21	0	0	0	21	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	12	8	96	96	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		12	17	417	20	21	0	0	0	21	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	12	8	96	96	4A
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	4	2,306	9,224	1 & 2 main	NJWP	0.03	91	6	10	1	0	0	0	1	3M
		Main Engine (Maneuvering)	4	2,306	9,224	1 & 2 main		0	91	0	0	0	3	24	72	72	3M
		Auxiliary Engine (Transit)	4	2,000	8,000	1 & 2 auxiliary		0.03	91	6	10	1	0	0	0	1	3A
		Auxiliary Engine (Maneuvering)	4	2,000	8,000	1 & 2 auxiliary		0	91	0	0	0	3	24	72	72	3A
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	0.03	91	6	10	1	0	0	0	1	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	3	24	72	72	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		0.03	91	6	10	1	0	0	0	1	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	3	24	72	72	7A
Miscellaneous																	
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OSS Generators	Generator	Tier 4 Generator	8	500	4,000	Tier 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	500	500	31

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Operations (SOV Scenario)																			
WTG and BoP Crew logistics																			
CTV All-Year 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49
CTV All-Year 2	Crew Transfer Vessel	Main Engine (Transit)	0.83	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73
		Main Engine (Maneuvering)	0.20	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97
		Auxiliary Engine (Transit)	0.43	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31
		Auxiliary Engine (Maneuvering)	0.43	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49
SOV All-Year 1	Service Operation Vessel	Main Engine (Transit)	0.16	3,910	0.64	0.02	0.15	0.02	0.02	0.01	0.00	0.00	0.00	43.09	0.00	0.00	0.01	0.63	43.72
		Main Engine (Maneuvering)	0.10	499,313	82.25	2.17	19.07	2.95	2.86	0.74	0.00	0.30	0.03	5,503.40	0.03	0.27	0.87	80.06	5,584.33
		Auxiliary Engine (Transit)	0.16	3,391	0.58	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	38.15	0.00	0.00	0.01	0.54	38.70
		Auxiliary Engine (Maneuvering)	0.10	433,055	74.34	1.05	18.64	2.41	2.33	0.05	0.00	0.16	0.00	4,872.18	0.03	0.23	0.75	69.44	4,942.37
SOV Daughter Craft 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.20	46,676	7.41	0.11	1.86	0.25	0.24	0.00	0.00	0.02	0.00	525.11	0.00	0.03	0.08	7.48	532.68
		Auxiliary Engine (Transit)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	0.43	2,595	0.47	0.01	0.11	0.01	0.01	0.00	0.00	0.00	0.00	29.20	0.00	0.00	0.00	0.42	29.62
WTG heavy logistics / jack-up																			
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	0.83	139,211	26.79	0.37	6.14	0.83	0.80	0.03	0.00	0.06	0.00	1,728.57	0.01	0.08	0.27	24.68	1,753.52
		Main Engine (Maneuvering)	0.20	220,586	42.46	0.59	9.74	1.31	1.27	0.06	0.00	0.09	0.00	2,739.01	0.02	0.13	0.42	39.10	2,778.54
		Auxiliary Engine (Transit)	0.43	16,919	3.20	0.04	0.69	0.09	0.09	0.00	0.00	0.01	0.00	179.42	0.00	0.01	0.03	2.56	182.00
		Auxiliary Engine (Maneuvering)	0.43	111,259	21.02	0.25	4.51	0.58	0.56	0.01	0.00	0.04	0.00	1,179.81	0.01	0.06	0.18	16.81	1,196.81
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	0.83	32,715	6.30	0.09	1.44	0.19	0.19	0.01	0.00	0.01	0.00	406.21	0.00	0.02	0.06	5.80	412.08
		Main Engine (Maneuvering)	0.20	51,838	9.98	0.14	2.29	0.31	0.30	0.01	0.00	0.02	0.00	643.67	0.00	0.03	0.10	9.19	652.96
		Auxiliary Engine (Transit)	0.45	8,853	1.67	0.02	0.36	0.05	0.04	0.00	0.00	0.00	0.00	93.88	0.00	0.00	0.01	1.34	95.23
		Auxiliary Engine (Maneuvering)	0.45	58,217	11.00	0.13	2.36	0.30	0.30	0.01	0.00	0.02	0.00	617.34	0.00	0.03	0.10	8.80	626.24
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	0.83	381,431	73.41	1.02	16.83	2.27	2.20	0.10	0.00	0.16	0.00	4,736.20	0.03	0.23	0.73	67.62	4,804.55
		Main Engine (Maneuvering)	0.20	220,586	42.46	0.59	9.74	1.31	1.27	0.06	0.00	0.09	0.00	2,739.01	0.02	0.13	0.42	39.10	2,778.54
		Auxiliary Engine (Transit)	0.43	46,358	8.76	0.11	1.88	0.24	0.24	0.00	0.00	0.02	0.00	491.59	0.00	0.02	0.08	7.01	498.67
		Auxiliary Engine (Maneuvering)	0.43	111,259	21.02	0.25	4.51	0.58	0.56	0.01	0.00	0.04	0.00	1,179.81	0.01	0.06	0.18	16.81	1,196.81
Cable repair vessel - export cable																			
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	4,902	0.81	0.02	0.19	0.03	0.03	0.01	0.00	0.00	0.00	54.03	0.00	0.00	0.01	0.79	54.82
		Main Engine (Maneuvering)	0.20	55,481	9.14	0.24	2.12	0.33	0.32	0.08	0.00	0.03	0.00	611.51	0.00	0.03	0.10	8.90	620.50
		Auxiliary Engine (Transit)	0.56	100	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.02	1.14
		Auxiliary Engine (Maneuvering)	0.56	4,695	0.81	0.01	0.20	0.03	0.03	0.00	0.00	0.00	0.00	52.82	0.00	0.00	0.01	0.75	53.58

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Cable repair vessel - array cable																			
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	6,302	1.04	0.03	0.24	0.04	0.04	0.01	0.00	0.00	0.00	69.47	0.00	0.00	0.01	1.01	70.49
		Main Engine (Maneuvering)	0.20	24,412	4.02	0.11	0.93	0.14	0.14	0.04	0.00	0.01	0.00	269.06	0.00	0.01	0.04	3.91	273.02
		Auxiliary Engine (Transit)	0.56	129	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.45	0.00	0.00	0.00	0.02	1.47
		Auxiliary Engine (Maneuvering)	0.56	2,066	0.35	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	23.24	0.00	0.00	0.00	0.33	23.57
Cable survey vessel - export cable																			
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	3,655	0.63	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	40.49	0.00	0.00	0.01	0.59	41.09
		Main Engine (Maneuvering)	0.20	34,752	5.95	0.13	1.36	0.21	0.20	0.04	0.00	0.02	0.00	384.99	0.00	0.02	0.06	5.57	390.62
		Auxiliary Engine (Transit)	0.43	99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0.00	0.02	1.13
		Auxiliary Engine (Maneuvering)	0.43	3,893	0.69	0.01	0.17	0.02	0.02	0.00	0.00	0.00	0.00	43.80	0.00	0.00	0.01	0.62	44.43
Cable survey vessel - array cable																			
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	3,655	0.63	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	40.49	0.00	0.00	0.01	0.59	41.09
		Main Engine (Maneuvering)	0.20	15,059	2.58	0.06	0.59	0.09	0.09	0.02	0.00	0.01	0.00	166.83	0.00	0.01	0.03	2.41	169.27
		Auxiliary Engine (Transit)	0.43	99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0.00	0.02	1.13
		Auxiliary Engine (Maneuvering)	0.43	1,687	0.30	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.98	0.00	0.00	0.00	0.27	19.25
Foundation below water inspection																			
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	0.83	3,481	0.60	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	38.57	0.00	0.00	0.01	0.56	39.13
		Main Engine (Maneuvering)	0.20	46,336	7.93	0.18	1.81	0.27	0.27	0.05	0.00	0.02	0.00	513.32	0.00	0.02	0.08	7.43	520.83
		Auxiliary Engine (Transit)	0.43	94	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.02	1.07
		Auxiliary Engine (Maneuvering)	0.43	5,191	0.92	0.01	0.22	0.03	0.03	0.00	0.00	0.00	0.00	58.40	0.00	0.00	0.01	0.83	59.24
Other vessels																			
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	0.83	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0	0	26
		Main Engine (Maneuvering)	0.20	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0	0	29
		Auxiliary Engine (Transit)	0.43	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0	0	0
		Auxiliary Engine (Maneuvering)	0.43	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0	0	2
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	0.16	57	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0	0	1
		Main Engine (Maneuvering)	0.10	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0	1	49
		Auxiliary Engine (Transit)	0.16	49	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.10	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0	1	43
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	0.83	580	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.20	0.00	0.00	0	0	7
		Main Engine (Maneuvering)	0.20	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0	3	208
		Auxiliary Engine (Transit)	0.45	74	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.45	8,733	1.65	0.02	0.35	0.05	0.04	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0	1	94
Miscellaneous																			
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,519
OSS Generators	Generator	Tier 4 Generator	0.75	107,143	1.11	0.31	5.79	0.05	0.03	0.01	0.00	0.03	0.00	1222.90	0.05	0.01	1	3	1,227.1

Total/yr	3,015,550	520.8	8.9	127.0	16.7	16.2	1.4	0.0	1.3	0.1	34,795.4	0.3	1.6	6.4	484.0	38,804.4
Total over Project Life	90,466,494	15,623.2	266.9	3,808.5	501.0	484.9	42.0	0.1	39.3	1.9	1,043,860.9	7.7	48.7	193.4	14,519.0	1,164,130.7
Vessels	2,908,407	519.7	8.6	121.2	16.6	16.1	1.4	0.0	1.3	0.1	33,572.5	0.2	1.6	5.2	481.0	34,058.7
	87,252,208	15,589.9	257.4	3,634.9	499.5	483.9	41.6	0.1	38.4	1.9	1,007,174.0	6.2	48.4	156.2	14,430.3	1,021,760.5
Non-vessel	107,143	1.11	0.31	5.79	0.05	0.03	0.01	0.00	0.03	0.00	1,222.90	0.05	0.01	1.24	2.96	4,745.67
	3,214,286	33.2	9.4	173.6	1.5	1.0	0.3	0.0	0.9	0.0	36,686.9	1.5	0.3	37.2	88.7	142,370.2

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Operations (SOV Scenario)																				
WTG and BoP Crew logistics																				
CTV All-Year 1	Crew Transfer Vessel	Main Engine (Transit)	17	100%	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73
		Main Engine (Maneuvering)	17	100%	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97
		Auxiliary Engine (Transit)	17	100%	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31
		Auxiliary Engine (Maneuvering)	17	100%	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49
CTV All-Year 2	Crew Transfer Vessel	Main Engine (Transit)	17	100%	47,820	7.59	0.12	1.91	0.26	0.25	0.00	0.00	0.02	0.00	537.98	0.00	0.03	0.08	7.67	545.73
		Main Engine (Maneuvering)	17	100%	79,562	12.64	0.19	3.18	0.43	0.41	0.01	0.00	0.03	0.00	895.08	0.01	0.04	0.14	12.76	907.97
		Auxiliary Engine (Transit)	17	100%	641	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.21	0.00	0.00	0.00	0.10	7.31
		Auxiliary Engine (Maneuvering)	17	100%	4,424	0.80	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.77	0.00	0.00	0.01	0.71	50.49
SOV All-Year 1	Service Operation Vessel	Main Engine (Transit)	17	100%	3,910	0.64	0.02	0.15	0.02	0.02	0.01	0.00	0.00	0.00	43.09	0.00	0.00	0.01	0.63	43.72
		Main Engine (Maneuvering)	17	100%	499,313	82.25	2.17	19.07	2.95	2.86	0.74	0.00	0.30	0.03	5,503.40	0.03	0.27	0.87	80.06	5,584.33
		Auxiliary Engine (Transit)	17	100%	3,391	0.58	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	38.15	0.00	0.00	0.01	0.54	38.70
		Auxiliary Engine (Maneuvering)	17	100%	433,055	74.34	1.05	18.64	2.41	2.33	0.05	0.00	0.16	0.00	4,872.18	0.03	0.23	0.75	69.44	4,942.37
SOV Daughter Craft 1	Crew Transfer Vessel	Main Engine (Transit)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Main Engine (Maneuvering)	N/A	100%	46,676	7.41	0.11	1.86	0.25	0.24	0.00	0.00	0.02	0.00	525.11	0.00	0.03	0.08	7.48	532.68
		Auxiliary Engine (Transit)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Auxiliary Engine (Maneuvering)	N/A	100%	2,595	0.47	0.01	0.11	0.01	0.01	0.00	0.00	0.00	0.00	29.20	0.00	0.00	0.00	0.42	29.62
WTG heavy logistics / jack-up																				
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	25	27%	38,143	7.34	0.10	1.68	0.23	0.22	0.01	0.00	0.02	0.00	473.62	0.00	0.02	0.07	6.76	480.46
		Main Engine (Maneuvering)	25	100%	220,586	42.46	0.59	9.74	1.31	1.27	0.06	0.00	0.09	0.00	2,739.01	0.02	0.13	0.42	39.10	2,778.54
		Auxiliary Engine (Transit)	25	27%	4,636	0.88	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.16	0.00	0.00	0.01	0.70	49.87
		Auxiliary Engine (Maneuvering)	25	100%	111,259	21.02	0.25	4.51	0.58	0.56	0.01	0.00	0.04	0.00	1,179.81	0.01	0.06	0.18	16.81	1,196.81
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	25	27%	8,964	1.73	0.02	0.40	0.05	0.05	0.00	0.00	0.00	0.00	111.30	0.00	0.01	0.02	1.59	112.91
		Main Engine (Maneuvering)	25	100%	51,838	9.98	0.14	2.29	0.31	0.30	0.01	0.00	0.02	0.00	643.67	0.00	0.03	0.10	9.19	652.96
		Auxiliary Engine (Transit)	25	27%	2,426	0.46	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	25.72	0.00	0.00	0.00	0.37	26.09
		Auxiliary Engine (Maneuvering)	25	100%	58,217	11.00	0.13	2.36	0.30	0.30	0.01	0.00	0.02	0.00	617.34	0.00	0.03	0.10	8.80	626.24
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	25	10%	38,143	7.34	0.10	1.68	0.23	0.22	0.01	0.00	0.02	0.00	473.62	0.00	0.02	0.07	6.76	480.46
		Main Engine (Maneuvering)	25	100%	220,586	42.46	0.59	9.74	1.31	1.27	0.06	0.00	0.09	0.00	2,739.01	0.02	0.13	0.42	39.10	2,778.54
		Auxiliary Engine (Transit)	25	10%	4,636	0.88	0.01	0.19	0.02	0.02	0.00	0.00	0.00	0.00	49.16	0.00	0.00	0.01	0.70	49.87
		Auxiliary Engine (Maneuvering)	25	100%	111,259	21.02	0.25	4.51	0.58	0.56	0.01	0.00	0.04	0.00	1,179.81	0.01	0.06	0.18	16.81	1,196.81
Cable repair vessel - export cable																				
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,343	0.22	0.01	0.05	0.01	0.01	0.00	0.00	0.00	0.00	14.80	0.00	0.00	0.00	0.22	15.02
		Main Engine (Maneuvering)	25	51%	28,347	4.67	0.12	1.08	0.17	0.16	0.04	0.00	0.02	0.00	312.44	0.00	0.02	0.05	4.55	317.04
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.31
		Auxiliary Engine (Maneuvering)	25	51%	2,399	0.41	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	26.99	0.00	0.00	0.00	0.38	27.37

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Cable repair vessel - array cable																				
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,727	0.28	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	19.03	0.00	0.00	0.00	0.28	19.31
		Main Engine (Maneuvering)	25	100%	24,412	4.02	0.11	0.93	0.14	0.14	0.04	0.00	0.01	0.00	269.06	0.00	0.01	0.04	3.91	273.02
		Auxiliary Engine (Transit)	25	27%	35	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.01	0.40
		Auxiliary Engine (Maneuvering)	25	100%	2,066	0.35	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	23.24	0.00	0.00	0.00	0.33	23.57
Cable survey vessel - export cable																				
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	1,002	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.10	0.00	0.00	0.00	0.16	11.26
		Main Engine (Maneuvering)	25	51%	17,756	3.04	0.07	0.69	0.10	0.10	0.02	0.00	0.01	0.00	196.70	0.00	0.01	0.03	2.85	199.58
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31
		Auxiliary Engine (Maneuvering)	25	51%	1,989	0.35	0.00	0.09	0.01	0.01	0.00	0.00	0.00	0.00	22.38	0.00	0.00	0.00	0.32	22.70
Cable survey vessel - array cable																				
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	1,002	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.10	0.00	0.00	0.00	0.16	11.26
		Main Engine (Maneuvering)	25	100%	15,059	2.58	0.06	0.59	0.09	0.09	0.02	0.00	0.01	0.00	166.83	0.00	0.01	0.03	2.41	169.27
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31
		Auxiliary Engine (Maneuvering)	25	100%	1,687	0.30	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.98	0.00	0.00	0.00	0.27	19.25
Foundation below water inspection																				
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	17	100%	3,481	0.60	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	38.57	0.00	0.00	0.01	0.56	39.13
		Main Engine (Maneuvering)	17	100%	46,336	7.93	0.18	1.81	0.27	0.27	0.05	0.00	0.02	0.00	513.32	0.00	0.02	0.08	7.43	520.83
		Auxiliary Engine (Transit)	17	100%	94	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.02	1.07
		Auxiliary Engine (Maneuvering)	17	100%	5,191	0.92	0.01	0.22	0.03	0.03	0.00	0.00	0.00	0.00	58.40	0.00	0.00	0.01	0.83	59.24
Other vessels																				
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	17	100%	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0.00	0.37	26.19
		Main Engine (Maneuvering)	17	100%	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0.00	0.41	29.06
		Auxiliary Engine (Transit)	17	100%	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.35
		Auxiliary Engine (Maneuvering)	17	100%	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	0.02	1.62
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	25	27%	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.17
		Main Engine (Maneuvering)	25	100%	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0.01	0.70	49.13
		Auxiliary Engine (Transit)	25	27%	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.15
		Auxiliary Engine (Maneuvering)	25	100%	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0.01	0.61	43.48
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	25	27%	159	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.97	0.00	0.00	0.00	0.03	2.00
		Main Engine (Maneuvering)	25	100%	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0.03	2.93	208.39
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.22
		Auxiliary Engine (Maneuvering)	25	100%	8,733	1.65	0.02	0.35	0.05	0.04	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0.01	1.32	93.94
Miscellaneous																				
SF6 Loss	N/A	N/A	N/A	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,518.58
OSS Generators	Generator	Tier 4 Generator	N/A	100%	107,143	1.11	0.31	5.79	0.050	0.033	0.011	0.000	0.029	0.001	1,222.90	0.05	0.01	1.24	2.96	1,227.09

OCS Total Ton/yr	2,424,378	408.7	7.2	101.4	13.2	12.8	1.2	0.002	1.06	0.06	27,648.9	0.21	1.3	5.3	381.8	31,554.6
OCS Total Tons over life	72,731,328	12,262.3	217.5	3,042.1	396.9	384.1	35.9	0.1	31.7	1.7	829,466.3	6.4	38.4	160.2	11,454.1	946,637.9

Vessels	2,317,235	407.6	6.9	95.6	13.2	12.8	1.2	0.002	1.03	0.05	26,426.0	0.16	1.3	4.1	378.8	26,808.9
	69,517,042	12,229.0	208.0	2,868.5	395.4	383.1	35.6	0.1	30.9	1.6	792,779.3	4.9	38.1	123.0	11,365.4	804,267.8

Non-vessel	107,143	1.1	0.3	5.8	0.0	0.0	0.0	0.000	0.03	0.00	1,222.9	0.05	0.0	1.2	3.0	4,745.7
	3,214,286	33.2	9.4	173.6	1.5	1.0	0.3	0.0	0.9	0.0	36,686.9	1.5	0.3	37.2	88.7	142,370.2

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Emissions During Operations (SOV Scenario)																	
WTG and BoP Crew logistics																	
CTV All-Year 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	170	17	5,909	20	295	0	0	0	295	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	170	12	2,040	2,040	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		170	17	5,909	20	295	0	0	0	295	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	170	12	2,040	2,040	4A
CTV All-Year 2	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	170	17	5,909	20	295	0	0	0	295	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	170	12	2,040	2,040	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		170	17	5,909	20	295	0	0	0	295	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	170	12	2,040	2,040	4A
SOV All-Year 1	Service Operation Vessel	Main Engine (Transit)	4	2,306	9,224	1 & 2 main	Atlantic City	24	17	834	20	42	0	0	0	42	3M
		Main Engine (Maneuvering)	4	2,306	9,224	1 & 2 main		0	17	0	0	0	341	24	8,184	8,184	3M
		Auxiliary Engine (Transit)	4	2,000	8,000	1 & 2 auxiliary		24	17	834	20	42	0	0	0	42	3A
		Auxiliary Engine (Maneuvering)	4	2,000	8,000	1 & 2 auxiliary		0	17	0	0	0	341	24	8,184	8,184	3A
SOV Daughter Craft 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	N/A	0	0	0	20	0	0	0	0	0	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	0	0	0	0	150	8	1,200	1,200	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		0	0	0	20	0	0	0	0	0	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	0	0	0	0	150	8	1,200	1,200	4A
WTG heavy logistics / jack-up																	
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	4	91	730	10	73	0	0	0	73	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	17	24	408	408	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		4	91	730	10	73	0	0	0	73	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	17	24	408	408	7A
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	2	2350	4,700	3 main	NJWP	4	91	730	10	73	0	0	0	73	7M
		Main Engine (Maneuvering)	2	2350	4,700	3 main		0	91	0	0	0	17	24	408	408	7M
		Auxiliary Engine (Transit)	2	1000	2,000	3 auxiliary		4	91	730	10	73	0	0	0	73	7A
		Auxiliary Engine (Maneuvering)	2	1000	2,000	3 auxiliary		0	91	0	0	0	17	24	408	408	7A
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	Europe	4	250	2,000	10	200	0	0	0	200	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	250	0	0	0	17	24	408	408	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		4	250	2,000	10	200	0	0	0	200	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	250	0	0	0	17	24	408	408	7A
Cable repair vessel - export cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	7	24	168	168	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	7	24	168	168	3A
Cable repair vessel - array cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	9	24	216	216	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	9	24	216	216	3A
Cable survey vessel - export cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	14	24	336	336	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	14	24	336	336	8A
Cable survey vessel - array cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	2	91	365	10	36	0	0	0	36	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	17	24	408	408	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		2	91	365	10	36	0	0	0	36	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	17	24	408	408	8A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Foundation below water inspection																	
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	Atlantic City	3	17	104	10	10	0	0	0	10	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	17	0	0	0	19	24	456	456	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		3	17	104	10	10	0	0	0	10	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	17	0	0	0	19	24	456	456	8A
Other vessels																	
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	12	17	417	20	21	0	0	0	21	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	12	8	96	96	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		12	17	417	20	21	0	0	0	21	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	12	8	96	96	4A
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	4	2,306	9,224	1 & 2 main	NJWP	0.03	91	6	10	1	0	0	0	1	3M
		Main Engine (Maneuvering)	4	2,306	9,224	1 & 2 main		0	91	0	0	0	3	24	72	72	3M
		Auxiliary Engine (Transit)	4	2,000	8,000	1 & 2 auxiliary		0.03	91	6	10	1	0	0	0	1	3A
		Auxiliary Engine (Maneuvering)	4	2,000	8,000	1 & 2 auxiliary		0	91	0	0	0	3	24	72	72	3A
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	0.03	91	6	10	1	0	0	0	1	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	3	24	72	72	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		0.03	91	6	10	1	0	0	0	1	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	3	24	72	72	7A
Miscellaneous																	
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OSS Generators	Generator	Tier 4 Generator	4	500	2,000	Tier 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	500	500	31

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)															
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e	
Emissions During Operations (SOV Scenario)																				
WTG and BoP Crew logistics																				
CTV All-Year 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	32,518	5.16	0.08	1.30	0.17	0.17	0.00	0.00	0.01	0.00	0.00	365.83	0.00	0.02	0.06	5.21	371.10
		Main Engine (Maneuvering)	0.20	54,102	8.59	0.13	2.16	0.29	0.28	0.01	0.00	0.02	0.00	608.65	0.00	0.03	0.09	8.67	617.42	
		Auxiliary Engine (Transit)	0.43	436	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.90	0.00	0.00	0.00	0.07	4.97	
		Auxiliary Engine (Maneuvering)	0.43	3,008	0.54	0.01	0.13	0.02	0.02	0.00	0.00	0.00	0.00	33.85	0.00	0.00	0.01	0.48	34.33	
CTV All-Year 2	Crew Transfer Vessel	Main Engine (Transit)	0.83	32,518	5.16	0.08	1.30	0.17	0.17	0.00	0.00	0.01	0.00	0.00	365.83	0.00	0.02	0.06	5.21	371.10
		Main Engine (Maneuvering)	0.20	54,102	8.59	0.13	2.16	0.29	0.28	0.01	0.00	0.02	0.00	608.65	0.00	0.03	0.09	8.67	617.42	
		Auxiliary Engine (Transit)	0.43	436	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.90	0.00	0.00	0.00	0.07	4.97	
		Auxiliary Engine (Maneuvering)	0.43	3,008	0.54	0.01	0.13	0.02	0.02	0.00	0.00	0.00	0.00	33.85	0.00	0.00	0.01	0.48	34.33	
SOV All-Year 1	Service Operation Vessel	Main Engine (Transit)	0.16	3,910	0.64	0.02	0.15	0.02	0.02	0.01	0.00	0.00	0.00	43.09	0.00	0.00	0.01	0.63	43.72	
		Main Engine (Maneuvering)	0.10	499,313	82.25	2.17	19.07	2.95	2.86	0.74	0.00	0.30	0.03	5,503.40	0.03	0.27	0.87	80.06	5,584.33	
		Auxiliary Engine (Transit)	0.16	3,391	0.58	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	38.15	0.00	0.00	0.01	0.54	38.70	
		Auxiliary Engine (Maneuvering)	0.10	433,055	74.34	1.05	18.64	2.41	2.33	0.05	0.00	0.16	0.00	4,872.18	0.03	0.23	0.75	69.44	4,942.37	
SOV Daughter Craft 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		Main Engine (Maneuvering)	0.20	31,825	5.05	0.08	1.27	0.17	0.17	0.00	0.00	0.01	0.00	358.03	0.00	0.02	0.06	5.10	363.19	
		Auxiliary Engine (Transit)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		Auxiliary Engine (Maneuvering)	0.43	1,770	0.32	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.00	19.91	0.00	0.00	0.00	0.28	20.20	
WTG heavy logistics / jack-up																				
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	0.83	69,605	13.40	0.19	3.07	0.41	0.40	0.02	0.00	0.03	0.00	864.29	0.01	0.04	0.13	12.34	876.76	
		Main Engine (Maneuvering)	0.20	93,749	18.04	0.25	4.14	0.56	0.54	0.02	0.00	0.04	0.00	1,164.08	0.01	0.06	0.18	16.62	1,180.88	
		Auxiliary Engine (Transit)	0.43	8,460	1.60	0.02	0.34	0.04	0.04	0.00	0.00	0.00	0.00	89.71	0.00	0.00	0.01	1.28	91.00	
		Auxiliary Engine (Maneuvering)	0.43	47,285	8.93	0.11	1.92	0.25	0.24	0.00	0.00	0.02	0.00	501.42	0.00	0.02	0.08	7.15	508.64	
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	0.83	16,357	3.15	0.04	0.72	0.10	0.09	0.00	0.00	0.01	0.00	203.11	0.00	0.01	0.03	2.90	206.04	
		Main Engine (Maneuvering)	0.20	22,031	4.24	0.06	0.97	0.13	0.13	0.01	0.00	0.01	0.00	273.56	0.00	0.01	0.04	3.91	277.51	
		Auxiliary Engine (Transit)	0.45	4,427	0.84	0.01	0.18	0.02	0.02	0.00	0.00	0.00	0.00	46.94	0.00	0.00	0.01	0.67	47.62	
		Auxiliary Engine (Maneuvering)	0.45	24,742	4.68	0.06	1.00	0.13	0.13	0.00	0.00	0.01	0.00	262.37	0.00	0.01	0.04	3.74	266.15	
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	0.83	190,715	36.71	0.51	8.42	1.13	1.10	0.05	0.00	0.08	0.00	2,368.10	0.01	0.11	0.37	33.81	2,402.28	
		Main Engine (Maneuvering)	0.20	93,749	18.04	0.25	4.14	0.56	0.54	0.02	0.00	0.04	0.00	1,164.08	0.01	0.06	0.18	16.62	1,180.88	
		Auxiliary Engine (Transit)	0.43	23,179	4.38	0.05	0.94	0.12	0.12	0.00	0.00	0.01	0.00	245.79	0.00	0.01	0.04	3.50	249.34	
		Auxiliary Engine (Maneuvering)	0.43	47,285	8.93	0.11	1.92	0.25	0.24	0.00	0.00	0.02	0.00	501.42	0.00	0.02	0.08	7.15	508.64	
Cable repair vessel - export cable																				
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	7,003	1.15	0.03	0.27	0.04	0.04	0.01	0.00	0.00	0.00	77.18	0.00	0.00	0.01	1.12	78.32	
		Main Engine (Maneuvering)	0.20	15,535	2.56	0.07	0.59	0.09	0.09	0.02	0.00	0.01	0.00	171.22	0.00	0.01	0.03	2.49	173.74	
		Auxiliary Engine (Transit)	0.56	143	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.02	1.63	
		Auxiliary Engine (Maneuvering)	0.56	1,314	0.23	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.00	14.79	0.00	0.00	0.00	0.21	15.00	
Cable repair vessel - array cable																				
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	7,003	1.15	0.03	0.27	0.04	0.04	0.01	0.00	0.00	0.00	77.18	0.00	0.00	0.01	1.12	78.32	
		Main Engine (Maneuvering)	0.20	19,973	3.29	0.09	0.76	0.12	0.11	0.03	0.00	0.01	0.00	220.14	0.00	0.01	0.03	3.20	223.38	
		Auxiliary Engine (Transit)	0.56	143	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.02	1.63	
		Auxiliary Engine (Maneuvering)	0.56	1,690	0.29	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	19.01	0.00	0.00	0.00	0.27	19.29	
Cable survey vessel - export cable																				
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	3,655	0.63	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	40.49	0.00	0.00	0.01	0.59	41.09	
		Main Engine (Maneuvering)	0.20	16,218	2.78	0.06	0.63	0.10	0.09	0.02	0.00	0.01	0.00	179.66	0.00	0.01	0.03	2.60	182.29	
		Auxiliary Engine (Transit)	0.43	99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0.00	0.02	1.13	
		Auxiliary Engine (Maneuvering)	0.43	1,817	0.32	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.00	20.44	0.00	0.00	0.00	0.29	20.73	
Cable survey vessel - array cable																				
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	7,311	1.25	0.03	0.29	0.04	0.04	0.01	0.00	0.00	0.00	80.99	0.00	0.00	0.01	1.17	82.17	
		Main Engine (Maneuvering)	0.20	19,693	3.37	0.08	0.77	0.12	0.11	0.02	0.00	0.01	0.00	218.16	0.00	0.01	0.03	3.16	221.35	
		Auxiliary Engine (Transit)	0.43	197	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	0.00	0.00	0.03	2.25	
		Auxiliary Engine (Maneuvering)	0.43	2,206	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.82	0.00	0.00	0.00	0.35	25.18	

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation below water inspection																			
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	0.83	2,089	0.36	0.01	0.08	0.01	0.01	0.00	0.00	0.00	0.00	23.14	0.00	0.00	0.00	0.33	23.48
		Main Engine (Maneuvering)	0.20	22,010	3.77	0.08	0.86	0.13	0.13	0.03	0.00	0.01	0.00	243.83	0.00	0.01	0.04	3.53	247.39
		Auxiliary Engine (Transit)	0.43	56	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.01	0.64
		Auxiliary Engine (Maneuvering)	0.43	2,466	0.44	0.01	0.11	0.01	0.01	0.00	0.00	0.00	0.00	27.74	0.00	0.00	0.00	0.40	28.14
Other vessels																			
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	0.83	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0	0	26
		Main Engine (Maneuvering)	0.20	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0	0	29
		Auxiliary Engine (Transit)	0.43	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0	0	0
		Auxiliary Engine (Maneuvering)	0.43	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0	0	2
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	0.16	57	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0	0	1
		Main Engine (Maneuvering)	0.10	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0	1	49
		Auxiliary Engine (Transit)	0.16	49	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.10	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0	1	43
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	0.83	580	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.20	0.00	0.00	0	0	7
		Main Engine (Maneuvering)	0.20	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0	3	208
		Auxiliary Engine (Transit)	0.45	74	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.45	8,733	1.65	0.02	0.35	0.05	0.04	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0	1	94
Miscellaneous																			
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2,257
OSS Generators	Generator	Tier 4 Generator	0.75	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	1	1	613.5

Total/yr	2,018,420	344.7	6.2	84.0	11.3	10.9	1.1	0.0	0.9	0.1	23,058.4	0.2	1.1	4.1	323.5	25,643.0
Total over Project Life	60,552,593	10,339.9	186.0	2,519.0	338.0	327.3	33.6	0.0	27.2	1.5	691,751.9	4.9	32.6	123.2	9,706.0	769,288.6

Vessels	1,964,848	344.1	6.0	81.1	11.2	10.9	1.1	0.0	0.9	0.1	22,446.9	0.1	1.1	3.5	322.1	22,772.5
	58,945,450	10,323.3	181.3	2,432.2	337.2	326.8	33.4	0.0	26.8	1.5	673,408.4	4.2	32.4	104.6	9,661.7	683,174.7

Non-vessel	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	0.62	1.48	2,870.46
	1,607,143	16.6	4.7	86.8	0.7	0.5	0.2	0.0	0.4	0.0	18,343.5	0.7	0.1	18.6	44.3	86,113.9

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Operations (SOV Scenario)																				
WTG and BoP Crew logistics																				
CTV All-Year 1	Crew Transfer Vessel	Main Engine (Transit)	17	100%	32,518	5.16	0.08	1.30	0.17	0.17	0.00	0.00	0.01	0.00	365.83	0.00	0.02	0.06	5.21	371.10
		Main Engine (Maneuvering)	17	100%	54,102	8.59	0.13	2.16	0.29	0.28	0.01	0.00	0.02	0.00	608.65	0.00	0.03	0.09	8.67	617.42
		Auxiliary Engine (Transit)	17	100%	436	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.90	0.00	0.00	0.00	0.07	4.97
		Auxiliary Engine (Maneuvering)	17	100%	3,008	0.54	0.01	0.13	0.02	0.02	0.00	0.00	0.00	0.00	33.85	0.00	0.00	0.01	0.48	34.33
CTV All-Year 2	Crew Transfer Vessel	Main Engine (Transit)	17	100%	32,518	5.16	0.08	1.30	0.17	0.17	0.00	0.00	0.01	0.00	365.83	0.00	0.02	0.06	5.21	371.10
		Main Engine (Maneuvering)	17	100%	54,102	8.59	0.13	2.16	0.29	0.28	0.01	0.00	0.02	0.00	608.65	0.00	0.03	0.09	8.67	617.42
		Auxiliary Engine (Transit)	17	100%	436	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.90	0.00	0.00	0.00	0.07	4.97
		Auxiliary Engine (Maneuvering)	17	100%	3,008	0.54	0.01	0.13	0.02	0.02	0.00	0.00	0.00	0.00	33.85	0.00	0.00	0.01	0.48	34.33
SOV All-Year 1	Service Operation Vessel	Main Engine (Transit)	17	100%	3,910	0.64	0.02	0.15	0.02	0.02	0.01	0.00	0.00	0.00	43.09	0.00	0.00	0.01	0.63	43.72
		Main Engine (Maneuvering)	17	100%	499,313	82.25	2.17	19.07	2.95	2.86	0.74	0.00	0.30	0.03	5,503.40	0.03	0.27	0.87	80.06	5,584.33
		Auxiliary Engine (Transit)	17	100%	3,391	0.58	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	38.15	0.00	0.00	0.01	0.54	38.70
		Auxiliary Engine (Maneuvering)	17	100%	433,055	74.34	1.05	18.64	2.41	2.33	0.05	0.00	0.16	0.00	4,872.18	0.03	0.23	0.75	69.44	4,942.37
SOV Daughter Craft 1	Crew Transfer Vessel	Main Engine (Transit)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Main Engine (Maneuvering)	N/A	100%	31,825	5.05	0.08	1.27	0.17	0.17	0.00	0.00	0.01	0.00	358.03	0.00	0.02	0.06	5.10	363.19
		Auxiliary Engine (Transit)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Auxiliary Engine (Maneuvering)	N/A	100%	1,770	0.32	0.00	0.08	0.01	0.01	0.00	0.00	0.00	0.00	19.91	0.00	0.00	0.00	0.28	20.20
WTG heavy logistics / jack-up																				
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	25	27%	19,072	3.67	0.05	0.84	0.11	0.11	0.00	0.00	0.01	0.00	236.81	0.00	0.01	0.04	3.38	240.23
		Main Engine (Maneuvering)	25	100%	93,749	18.04	0.25	4.14	0.56	0.54	0.02	0.00	0.04	0.00	1,164.08	0.01	0.06	0.18	16.62	1,180.88
		Auxiliary Engine (Transit)	25	27%	2,318	0.44	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.58	0.00	0.00	0.00	0.35	24.93
		Auxiliary Engine (Maneuvering)	25	100%	47,285	8.93	0.11	1.92	0.25	0.24	0.00	0.00	0.02	0.00	501.42	0.00	0.02	0.08	7.15	508.64
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	25	27%	4,482	0.86	0.01	0.20	0.03	0.03	0.00	0.00	0.00	0.00	55.65	0.00	0.00	0.01	0.79	56.45
		Main Engine (Maneuvering)	25	100%	22,031	4.24	0.06	0.97	0.13	0.13	0.01	0.00	0.01	0.00	273.56	0.00	0.01	0.04	3.91	277.51
		Auxiliary Engine (Transit)	25	27%	1,213	0.23	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.00	12.86	0.00	0.00	0.00	0.18	13.05
		Auxiliary Engine (Maneuvering)	25	100%	24,742	4.68	0.06	1.00	0.13	0.13	0.00	0.00	0.01	0.00	262.37	0.00	0.01	0.04	3.74	266.15
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	25	10%	19,072	3.67	0.05	0.84	0.11	0.11	0.00	0.00	0.01	0.00	236.81	0.00	0.01	0.04	3.38	240.23
		Main Engine (Maneuvering)	25	100%	93,749	18.04	0.25	4.14	0.56	0.54	0.02	0.00	0.04	0.00	1,164.08	0.01	0.06	0.18	16.62	1,180.88
		Auxiliary Engine (Transit)	25	10%	2,318	0.44	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.58	0.00	0.00	0.00	0.35	24.93
		Auxiliary Engine (Maneuvering)	25	100%	47,285	8.93	0.11	1.92	0.25	0.24	0.00	0.00	0.02	0.00	501.42	0.00	0.02	0.08	7.15	508.64
Cable repair vessel - export cable																				
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,919	0.32	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	21.15	0.00	0.00	0.00	0.31	21.46
		Main Engine (Maneuvering)	25	51%	7,937	1.31	0.03	0.30	0.05	0.05	0.01	0.00	0.00	0.00	87.48	0.00	0.00	0.01	1.27	88.77
		Auxiliary Engine (Transit)	25	27%	39	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.01	0.45
		Auxiliary Engine (Maneuvering)	25	51%	672	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.56	0.00	0.00	0.00	0.11	7.66
Cable repair vessel - array cable																				
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,919	0.32	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	21.15	0.00	0.00	0.00	0.31	21.46
		Main Engine (Maneuvering)	25	100%	19,973	3.29	0.09	0.76	0.12	0.11	0.03	0.00	0.01	0.00	220.14	0.00	0.01	0.03	3.20	223.38
		Auxiliary Engine (Transit)	25	27%	39	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.01	0.45
		Auxiliary Engine (Maneuvering)	25	100%	1,690	0.29	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	19.01	0.00	0.00	0.00	0.27	19.29
Cable survey vessel - export cable																				
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	1,002	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.10	0.00	0.00	0.00	0.16	11.26
		Main Engine (Maneuvering)	25	51%	8,286	1.42	0.03	0.32	0.05	0.05	0.01	0.00	0.00	0.00	91.80	0.00	0.00	0.01	1.33	93.14
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31
		Auxiliary Engine (Maneuvering)	25	51%	928	0.16	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	10.44	0.00	0.00	0.00	0.15	10.59
Cable survey vessel - array cable																				
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	2,003	0.34	0.01	0.08	0.01	0.01	0.00	0.00	0.00	0.00	22.19	0.00	0.00	0.00	0.32	22.51
		Main Engine (Maneuvering)	25	100%	19,693	3.37	0.08	0.77	0.12	0.11	0.02	0.00	0.01	0.00	218.16	0.00	0.01	0.03	3.16	221.35
		Auxiliary Engine (Transit)	25	27%	54	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.01	0.62
		Auxiliary Engine (Maneuvering)	25	100%	2,206	0.39	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	24.82	0.00	0.00	0.00	0.35	25.18

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation below water inspection																				
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	17	100%	2,089	0.36	0.01	0.08	0.01	0.01	0.00	0.00	0.00	0.00	23.14	0.00	0.00	0.00	0.33	23.48
		Main Engine (Maneuvering)	17	100%	22,010	3.77	0.08	0.86	0.13	0.13	0.03	0.00	0.01	0.00	243.83	0.00	0.01	0.04	3.53	247.39
		Auxiliary Engine (Transit)	17	100%	56	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.01	0.64
		Auxiliary Engine (Maneuvering)	17	100%	2,466	0.44	0.01	0.11	0.01	0.01	0.00	0.00	0.00	0.00	27.74	0.00	0.00	0.00	0.40	28.14
Other vessels																				
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	17	100%	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0.00	0.37	26.19
		Main Engine (Maneuvering)	17	100%	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0.00	0.41	29.06
		Auxiliary Engine (Transit)	17	100%	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.35
		Auxiliary Engine (Maneuvering)	17	100%	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	0.02	1.62
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	25	27%	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.17	
		Main Engine (Maneuvering)	25	100%	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0.01	0.70	49.13
		Auxiliary Engine (Transit)	25	27%	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.15
		Auxiliary Engine (Maneuvering)	25	100%	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0.01	0.61	43.48
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	25	27%	159	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1.97	0.00	0.00	0.00	0.03	2.00	
		Main Engine (Maneuvering)	25	100%	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0.03	2.93	208.39
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.22
		Auxiliary Engine (Maneuvering)	25	100%	8,733	1.65	0.02	0.35	0.05	0.04	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0.01	1.32	93.94
Miscellaneous																				
SF6 Loss	N/A	N/A	N/A	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2,256.92
OSS Generators	Generator	Tier 4 Generator	N/A	100%	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	0.62	1.48	613.55

OCS Total Ton/yr	1,717,986	287.81	5.36	71.00	9.50	9.20	1.01	0.00	0.78	0.05	19,431.24	0.14	0.91	3.54	271.67	21,963.37
OCS Total Tons over life	51,539,586	8,634.45	160.74	2,130.09	285.08	276.05	30.43	0.04	23.34	1.40	582,937.22	4.25	27.35	106.35	8,150.16	658,901.21

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Emissions During Operations (SOV Scenario)																	
WTG and BoP Crew logistics																	
CTV All-Year 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	119	17	4,136	20	207	0	0	0	207	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	119	12	1,428	1,428	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		119	17	4,136	20	207	0	0	0	207	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	119	12	1,428	1,428	4A
SOV All-Year 1	Service Operation Vessel	Main Engine (Transit)	4	2,306	9,224	1 & 2 main	Atlantic City	24	17	834	20	42	0	0	0	42	3M
		Main Engine (Maneuvering)	4	2,306	9,224	1 & 2 main		0	17	0	0	0	341	24	8,184	8,184	3M
		Auxiliary Engine (Transit)	4	2,000	8,000	1 & 2 auxiliary		24	17	834	20	42	0	0	0	42	3A
		Auxiliary Engine (Maneuvering)	4	2,000	8,000	1 & 2 auxiliary		0	17	0	0	0	341	24	8,184	8,184	3A
SOV Daughter Craft 1	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	N/A	0	0	0	20	0	0	0	0	0	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	0	0	0	0	105	8	840	840	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		0	0	0	20	0	0	0	0	0	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	0	0	0	0	105	8	840	840	4A
WTG heavy logistics / jack-up																	
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	3	91	547	10	55	0	0	0	55	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	12	24	288	288	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		3	91	547	10	55	0	0	0	55	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	12	24	288	288	7A
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	2	2350	4,700	3 main	NJWP	3	91	547	10	55	0	0	0	55	7M
		Main Engine (Maneuvering)	2	2350	4,700	3 main		0	91	0	0	0	12	24	288	288	7M
		Auxiliary Engine (Transit)	2	1000	2,000	3 auxiliary		3	91	547	10	55	0	0	0	55	7A
		Auxiliary Engine (Maneuvering)	2	1000	2,000	3 auxiliary		0	91	0	0	0	12	24	288	288	7A
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	Europe	3	250	1,500	10	150	0	0	0	150	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	250	0	0	0	12	24	288	288	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		3	250	1,500	10	150	0	0	0	150	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	250	0	0	0	12	24	288	288	7A
Cable repair vessel - export cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	5	24	120	120	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	5	24	120	120	3A
Cable repair vessel - array cable																	
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	1	7,280	7,280	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	3M
		Main Engine (Maneuvering)	1	7,280	7,280	1 & 2 main		0	91	0	0	0	7	24	168	168	3M
		Auxiliary Engine (Transit)	1	220	220	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	3A
		Auxiliary Engine (Maneuvering)	1	220	220	1 & 2 auxiliary		0	91	0	0	0	7	24	168	168	3A
Cable survey vessel - export cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	10	24	240	240	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	10	24	240	240	8A
Cable survey vessel - array cable																	
Cable survey vessel	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	NJWP	1	91	182	10	18	0	0	0	18	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	91	0	0	0	12	24	288	288	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		1	91	182	10	18	0	0	0	18	8A
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	91	0	0	0	12	24	288	288	8A

Activity	Representative Vessel Type	Engine Type	Engine Count	Engine Size (kW)	Total Size (kW)	Engine Category	Home Port	Vessel Round Trips (per year)	One-Way Trip Distance (NM)	Total Distance Traveled (NM)	Vessel Transit Speed (knots)	Hours in Transit/Year	Operating Days in WTA/Year	Operating Hours/Day	Total Non-Transit Hours	Total Operating Hours	Emission Factors Ref
Foundation below water inspection																	
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	2	1,900	3,800	1 & 2 main	Atlantic City	2	17	70	10	7	0	0	0	7	8M
		Main Engine (Maneuvering)	2	1,900	3,800	1 & 2 main		0	17	0	0	0	13	24	312	312	8M
		Auxiliary Engine (Transit)	2	99	198	1 & 2 auxiliary		2	17	70	10	7	0	0	7	8A	
		Auxiliary Engine (Maneuvering)	2	99	198	1 & 2 auxiliary		0	17	0	0	0	13	24	312	312	8A
Other vessels																	
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	4	522	2,088	1 & 2 main	Atlantic City	12	17	417	20	21	0	0	0	21	4M
		Main Engine (Maneuvering)	4	522	2,088	1 & 2 main		0	17	0	0	0	12	8	96	96	4M
		Auxiliary Engine (Transit)	2	27	54	1 & 2 auxiliary		12	17	417	20	21	0	0	0	21	4A
		Auxiliary Engine (Maneuvering)	2	27	54	1 & 2 auxiliary		0	17	0	0	0	12	8	96	96	4A
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	4	2,306	9,224	1 & 2 main	NJWP	0.03	91	6	10	1	0	0	0	1	3M
		Main Engine (Maneuvering)	4	2,306	9,224	1 & 2 main		0	91	0	0	0	3	24	72	72	3M
		Auxiliary Engine (Transit)	4	2,000	8,000	1 & 2 auxiliary		0.03	91	6	10	1	0	0	0	1	3A
		Auxiliary Engine (Maneuvering)	4	2,000	8,000	1 & 2 auxiliary		0	91	0	0	0	3	24	72	72	3A
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	5	4000	20,000	3 main	NJWP	0.03	91	6	10	1	0	0	0	1	7M
		Main Engine (Maneuvering)	5	4000	20,000	3 main		0	91	0	0	0	3	24	72	72	7M
		Auxiliary Engine (Transit)	1	4000	4,000	3 auxiliary		0.03	91	6	10	1	0	0	0	1	7A
		Auxiliary Engine (Maneuvering)	1	4000	4,000	3 auxiliary		0	91	0	0	0	3	24	72	72	7A
Miscellaneous																	
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OSS Generators	Generator	Tier 4 Generator	4	500	2,000	Tier 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	500	500	31

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Operations (SOV Scenario)																			
WTG and BoP Crew logistics																			
CTV All-Year 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	22,762	3.62	0.06	0.91	0.12	0.12	0.00	0.00	0.01	0.00	256.08	0.00	0.01	0.04	3.65	259.77
		Main Engine (Maneuvering)	0.20	37,872	6.01	0.09	1.51	0.20	0.20	0.00	0.00	0.01	0.00	426.06	0.00	0.02	0.07	6.07	432.19
		Auxiliary Engine (Transit)	0.43	305	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.43	0.00	0.00	0.00	0.05	3.48
		Auxiliary Engine (Maneuvering)	0.43	2,106	0.38	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	23.69	0.00	0.00	0.00	0.34	24.03
SOV All-Year 1	Service Operation Vessel	Main Engine (Transit)	0.16	3,910	0.64	0.02	0.15	0.02	0.02	0.01	0.00	0.00	0.00	43.09	0.00	0.00	0.01	0.63	43.72
		Main Engine (Maneuvering)	0.10	499,313	82.25	2.17	19.07	2.95	2.86	0.74	0.00	0.30	0.03	5,503.40	0.03	0.27	0.87	80.06	5,584.33
		Auxiliary Engine (Transit)	0.16	3,391	0.58	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	38.15	0.00	0.00	0.01	0.54	38.70
		Auxiliary Engine (Maneuvering)	0.10	433,055	74.34	1.05	18.64	2.41	2.33	0.05	0.00	0.16	0.00	4,872.18	0.03	0.23	0.75	69.44	4,942.37
SOV Daughter Craft 1	Crew Transfer Vessel	Main Engine (Transit)	0.83	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Main Engine (Maneuvering)	0.20	22,277	3.54	0.05	0.89	0.12	0.12	0.00	0.00	0.01	0.00	250.62	0.00	0.01	0.04	3.57	254.23
		Auxiliary Engine (Transit)	0.43	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Auxiliary Engine (Maneuvering)	0.43	1,239	0.22	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.00	13.94	0.00	0.00	0.00	0.20	14.14
WTG heavy logistics / jack-up																			
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	0.83	52,204	10.05	0.14	2.30	0.31	0.30	0.01	0.00	0.02	0.00	648.21	0.00	0.03	0.10	9.25	657.57
		Main Engine (Maneuvering)	0.20	66,176	12.74	0.18	2.92	0.39	0.38	0.02	0.00	0.03	0.00	821.70	0.01	0.04	0.13	11.73	833.56
		Auxiliary Engine (Transit)	0.43	6,345	1.20	0.01	0.26	0.03	0.03	0.00	0.00	0.00	0.00	67.28	0.00	0.00	0.01	0.96	68.25
		Auxiliary Engine (Maneuvering)	0.43	33,378	6.31	0.08	1.35	0.17	0.17	0.00	0.00	0.01	0.00	353.94	0.00	0.02	0.05	5.04	359.04
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	0.83	12,268	2.36	0.03	0.54	0.07	0.07	0.00	0.00	0.01	0.00	152.33	0.00	0.01	0.02	2.17	154.53
		Main Engine (Maneuvering)	0.20	15,551	2.99	0.04	0.69	0.09	0.09	0.00	0.00	0.01	0.00	193.10	0.00	0.01	0.03	2.76	195.89
		Auxiliary Engine (Transit)	0.45	3,320	0.63	0.01	0.13	0.02	0.02	0.00	0.00	0.00	0.00	35.20	0.00	0.00	0.01	0.50	35.71
		Auxiliary Engine (Maneuvering)	0.45	17,465	3.30	0.04	0.71	0.09	0.09	0.00	0.00	0.01	0.00	185.20	0.00	0.01	0.03	2.64	187.87
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	0.83	143,037	27.53	0.38	6.31	0.85	0.82	0.04	0.00	0.06	0.00	1,776.08	0.01	0.09	0.27	25.36	1,801.71
		Main Engine (Maneuvering)	0.20	66,176	12.74	0.18	2.92	0.39	0.38	0.02	0.00	0.03	0.00	821.70	0.01	0.04	0.13	11.73	833.56
		Auxiliary Engine (Transit)	0.43	17,384	3.28	0.04	0.71	0.09	0.09	0.00	0.00	0.01	0.00	184.35	0.00	0.01	0.03	2.63	187.00
		Auxiliary Engine (Maneuvering)	0.43	33,378	6.31	0.08	1.35	0.17	0.17	0.00	0.00	0.01	0.00	353.94	0.00	0.02	0.05	5.04	359.04
Cable repair vessel - export cable																			
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	7,003	1.15	0.03	0.27	0.04	0.04	0.01	0.00	0.00	0.00	77.18	0.00	0.00	0.01	1.12	78.32
		Main Engine (Maneuvering)	0.20	11,096	1.83	0.05	0.42	0.07	0.06	0.02	0.00	0.01	0.00	122.30	0.00	0.01	0.02	1.78	124.10
		Auxiliary Engine (Transit)	0.56	143	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.02	1.63
		Auxiliary Engine (Maneuvering)	0.56	939	0.16	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	10.56	0.00	0.00	0.00	0.15	10.72
Cable repair vessel - array cable																			
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	0.83	7,003	1.15	0.03	0.27	0.04	0.04	0.01	0.00	0.00	0.00	77.18	0.00	0.00	0.01	1.12	78.32
		Main Engine (Maneuvering)	0.20	15,535	2.56	0.07	0.59	0.09	0.09	0.02	0.00	0.01	0.00	171.22	0.00	0.01	0.03	2.49	173.74
		Auxiliary Engine (Transit)	0.56	143	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.02	1.63
		Auxiliary Engine (Maneuvering)	0.56	1,314	0.23	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.00	14.79	0.00	0.00	0.00	0.21	15.00
Cable survey vessel - export cable																			
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	3,655	0.63	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	40.49	0.00	0.00	0.01	0.59	41.09
		Main Engine (Maneuvering)	0.20	11,584	1.98	0.04	0.45	0.07	0.07	0.01	0.00	0.01	0.00	128.33	0.00	0.01	0.02	1.86	130.21
		Auxiliary Engine (Transit)	0.43	99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0.00	0.02	1.13
		Auxiliary Engine (Maneuvering)	0.43	1,298	0.23	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.00	14.60	0.00	0.00	0.00	0.21	14.81
Cable survey vessel - array cable																			
Cable survey vessel	Survey Vessel	Main Engine (Transit)	0.83	3,655	0.63	0.01	0.14	0.02	0.02	0.00	0.00	0.00	0.00	40.49	0.00	0.00	0.01	0.59	41.09
		Main Engine (Maneuvering)	0.20	13,901	2.38	0.05	0.54	0.08	0.08	0.02	0.00	0.01	0.00	154.00	0.00	0.01	0.02	2.23	156.25
		Auxiliary Engine (Transit)	0.43	99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0.00	0.02	1.13
		Auxiliary Engine (Maneuvering)	0.43	1,557	0.28	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	17.52	0.00	0.00	0.00	0.25	17.77

Activity	Representative Vessel Type	Engine Type	Load Factor	Fuel Consumption (gal)	Emissions (tons)														
					NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation below water inspection																			
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	0.83	1,392	0.24	0.01	0.05	0.01	0.01	0.00	0.00	0.00	0.00	15.43	0.00	0.00	0.00	0.22	15.65
		Main Engine (Maneuvering)	0.20	15,059	2.58	0.06	0.59	0.09	0.09	0.02	0.00	0.01	0.00	166.83	0.00	0.01	0.03	2.41	169.27
		Auxiliary Engine (Transit)	0.43	38	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.01	0.43
		Auxiliary Engine (Maneuvering)	0.43	1,687	0.30	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.98	0.00	0.00	0.00	0.27	19.25
Other vessels																			
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	0.83	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0	0	26
		Main Engine (Maneuvering)	0.20	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0	0	29
		Auxiliary Engine (Transit)	0.43	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0	0	0
		Auxiliary Engine (Maneuvering)	0.43	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0	0	2
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	0.16	57	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0	0	1
		Main Engine (Maneuvering)	0.10	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0	1	49
		Auxiliary Engine (Transit)	0.16	49	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.10	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0	1	43
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	0.83	580	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.20	0.00	0.00	0	0	7
		Main Engine (Maneuvering)	0.20	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0	3	208
		Auxiliary Engine (Transit)	0.45	74	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0	0	1
		Auxiliary Engine (Maneuvering)	0.45	8,733	1.65	0.02	0.35	0.05	0.05	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0	1	94
Miscellaneous																			
SF6 Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,690
OSS Generators	Generator	Tier 4 Generator	0.75	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	1	1	613.5

Total/yr	1,682,935	285.2	5.3	70.0	9.4	9.1	1.0	0.0	0.8	0.0	19,165.8	0.1	0.9	3.5	267.9	21,127.4
Total over Project Life	50,488,036	8,555.3	159.3	2,100.1	281.3	272.4	31.0	0.0	23.1	1.4	574,973.8	4.2	27.0	105.1	8,038.0	633,822.1
Vessels	1,629,363	284.6	5.2	67.1	9.4	9.1	1.0	0.0	0.8	0.0	18,554.3	0.1	0.9	2.9	266.5	18,823.7
	48,880,894	8,538.7	154.6	2,013.3	280.5	271.9	30.8	0.0	22.7	1.4	556,630.3	3.5	26.8	86.5	7,993.7	564,710.5
Non-vessel	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	0.62	1.48	2,303.72
	1,607,143	16.6	4.7	86.8	0.7	0.5	0.2	0.0	0.4	0.0	18,343.5	0.7	0.1	18.6	44.3	69,111.6

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Emissions During Operations (SOV Scenario)																				
WTG and BoP Crew logistics																				
CTV All-Year 1	Crew Transfer Vessel	Main Engine (Transit)	17	100%	22,762	3.62	0.06	0.91	0.12	0.12	0.00	0.00	0.01	0.00	256.08	0.00	0.01	0.04	3.65	259.77
		Main Engine (Maneuvering)	17	100%	37,872	6.01	0.09	1.51	0.20	0.20	0.00	0.00	0.01	0.00	426.06	0.00	0.02	0.07	6.07	432.19
		Auxiliary Engine (Transit)	17	100%	305	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.43	0.00	0.00	0.00	0.05	3.48
		Auxiliary Engine (Maneuvering)	17	100%	2,106	0.38	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	23.69	0.00	0.00	0.00	0.34	24.03
SOV All-Year 1	Service Operation Vessel	Main Engine (Transit)	17	100%	3,910	0.64	0.02	0.15	0.02	0.02	0.01	0.00	0.00	0.00	43.09	0.00	0.00	0.01	0.63	43.72
		Main Engine (Maneuvering)	17	100%	499,313	82.25	2.17	19.07	2.95	2.86	0.74	0.00	0.30	0.03	5,503.40	0.03	0.27	0.87	80.06	5,584.33
		Auxiliary Engine (Transit)	17	100%	3,391	0.58	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	38.15	0.00	0.00	0.01	0.54	38.70
		Auxiliary Engine (Maneuvering)	17	100%	433,055	74.34	1.05	18.64	2.41	2.33	0.05	0.00	0.16	0.00	4,872.18	0.03	0.23	0.75	69.44	4,942.37
SOV Daughter Craft 1	Crew Transfer Vessel	Main Engine (Transit)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Main Engine (Maneuvering)	N/A	100%	22,277	3.54	0.05	0.89	0.12	0.12	0.00	0.00	0.01	0.00	250.62	0.00	0.01	0.04	3.57	254.23
		Auxiliary Engine (Transit)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Auxiliary Engine (Maneuvering)	N/A	100%	1,239	0.22	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.00	13.94	0.00	0.00	0.00	0.20	14.14
WTG heavy logistics / jack-up																				
US Jack-Up	Jack-Up Vessel	Main Engine (Transit)	25	27%	14,304	2.75	0.04	0.63	0.09	0.08	0.00	0.00	0.01	0.00	177.61	0.00	0.01	0.03	2.54	180.17
		Main Engine (Maneuvering)	25	100%	66,176	12.74	0.18	2.92	0.39	0.38	0.02	0.00	0.03	0.00	821.70	0.01	0.04	0.13	11.73	833.56
		Auxiliary Engine (Transit)	25	27%	1,738	0.33	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.43	0.00	0.00	0.00	0.26	18.70
		Auxiliary Engine (Maneuvering)	25	100%	33,378	6.31	0.08	1.35	0.17	0.17	0.00	0.00	0.01	0.00	353.94	0.00	0.02	0.05	5.04	359.04
US Feeder Vessel	Feeder/Jack-up	Main Engine (Transit)	25	27%	3,361	0.65	0.01	0.15	0.02	0.02	0.00	0.00	0.00	0.00	41.74	0.00	0.00	0.01	0.60	42.34
		Main Engine (Maneuvering)	25	100%	15,551	2.99	0.04	0.69	0.09	0.09	0.00	0.00	0.01	0.00	193.10	0.00	0.01	0.03	2.76	195.89
		Auxiliary Engine (Transit)	25	27%	910	0.17	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	9.65	0.00	0.00	0.00	0.14	9.78
		Auxiliary Engine (Maneuvering)	25	100%	17,465	3.30	0.04	0.71	0.09	0.09	0.00	0.00	0.01	0.00	185.20	0.00	0.01	0.03	2.64	187.87
European Jack-up	Jack-Up Vessel	Main Engine (Transit)	25	10%	14,304	2.75	0.04	0.63	0.09	0.08	0.00	0.00	0.01	0.00	177.61	0.00	0.01	0.03	2.54	180.17
		Main Engine (Maneuvering)	25	100%	66,176	12.74	0.18	2.92	0.39	0.38	0.02	0.00	0.03	0.00	821.70	0.01	0.04	0.13	11.73	833.56
		Auxiliary Engine (Transit)	25	10%	1,738	0.33	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.43	0.00	0.00	0.00	0.26	18.70
		Auxiliary Engine (Maneuvering)	25	100%	33,378	6.31	0.08	1.35	0.17	0.17	0.00	0.00	0.01	0.00	353.94	0.00	0.02	0.05	5.04	359.04
Cable repair vessel - export cable																				
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,919	0.32	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	21.15	0.00	0.00	0.00	0.31	21.46
		Main Engine (Maneuvering)	25	51%	5,669	0.93	0.02	0.22	0.03	0.03	0.01	0.00	0.00	0.00	62.49	0.00	0.00	0.01	0.91	63.41
		Auxiliary Engine (Transit)	25	27%	39	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.01	0.45
		Auxiliary Engine (Maneuvering)	25	51%	480	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	5.40	0.00	0.00	0.00	0.08	5.47
Cable repair vessel - array cable																				
Cable repair vessel	Cable Lay Vessel	Main Engine (Transit)	25	27%	1,919	0.32	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.00	21.15	0.00	0.00	0.00	0.31	21.46
		Main Engine (Maneuvering)	25	100%	15,535	2.56	0.07	0.59	0.09	0.09	0.02	0.00	0.01	0.00	171.22	0.00	0.01	0.03	2.49	173.74
		Auxiliary Engine (Transit)	25	27%	39	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.01	0.45
		Auxiliary Engine (Maneuvering)	25	100%	1,314	0.23	0.00	0.06	0.01	0.01	0.00	0.00	0.00	0.00	14.79	0.00	0.00	0.00	0.21	15.00
Cable survey vessel - export cable																				
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	1,002	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.10	0.00	0.00	0.00	0.16	11.26
		Main Engine (Maneuvering)	25	51%	5,919	1.01	0.02	0.23	0.03	0.03	0.01	0.00	0.00	0.00	65.57	0.00	0.00	0.01	0.95	66.53
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31
		Auxiliary Engine (Maneuvering)	25	51%	663	0.12	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	7.46	0.00	0.00	0.00	0.11	7.57
Cable survey vessel - array cable																				
Cable survey vessel	Survey Vessel	Main Engine (Transit)	25	27%	1,002	0.17	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	11.10	0.00	0.00	0.00	0.16	11.26
		Main Engine (Maneuvering)	25	100%	13,901	2.38	0.05	0.54	0.08	0.08	0.02	0.00	0.01	0.00	154.00	0.00	0.01	0.02	2.23	156.25
		Auxiliary Engine (Transit)	25	27%	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31
		Auxiliary Engine (Maneuvering)	25	100%	1,557	0.28	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	17.52	0.00	0.00	0.00	0.25	17.77

Activity	Representative Vessel Type	Engine Type	OCS Trip Distance (NM)	Percentage OCS	Fuel Consumption (gal)	OCS Emissions (tons)														
						NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	H2SO4	CO2	CH4	N2O	CH4 as CO2e	N2O as CO2e	CO2e
Foundation below water inspection																				
Vessel for subsea inspection	Survey Vessel	Main Engine (Transit)	17	100%	1,392	0.24	0.01	0.05	0.01	0.01	0.00	0.00	0.00	0.00	15.43	0.00	0.00	0.00	0.22	15.65
		Main Engine (Maneuvering)	17	100%	15,059	2.58	0.06	0.59	0.09	0.09	0.02	0.00	0.01	0.00	166.83	0.00	0.01	0.03	2.41	169.27
		Auxiliary Engine (Transit)	17	100%	38	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.01	0.43
		Auxiliary Engine (Maneuvering)	17	100%	1,687	0.30	0.00	0.07	0.01	0.01	0.00	0.00	0.00	0.00	18.98	0.00	0.00	0.00	0.27	19.25
Other vessels																				
Environmental monitoring vessel	Crew Transfer Vessel	Main Engine (Transit)	17	100%	2,295	0.36	0.01	0.09	0.01	0.01	0.00	0.00	0.00	0.00	25.82	0.00	0.00	0.00	0.37	26.19
		Main Engine (Maneuvering)	17	100%	2,546	0.40	0.01	0.10	0.01	0.01	0.00	0.00	0.00	0.00	28.64	0.00	0.00	0.00	0.41	29.06
		Auxiliary Engine (Transit)	17	100%	31	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.35
		Auxiliary Engine (Maneuvering)	17	100%	142	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	0.02	1.62
SOV campaign (e.g., for retrofit campaign)	Service Operation Vessel	Main Engine (Transit)	25	27%	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.17
		Main Engine (Maneuvering)	25	100%	4,393	0.72	0.02	0.17	0.03	0.03	0.01	0.00	0.00	0.00	48.42	0.00	0.00	0.01	0.70	49.13
		Auxiliary Engine (Transit)	25	27%	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.15
		Auxiliary Engine (Maneuvering)	25	100%	3,810	0.65	0.01	0.16	0.02	0.02	0.00	0.00	0.00	0.00	42.86	0.00	0.00	0.01	0.61	43.48
OSS repair vessel (major repair)	Jack-Up Vessel	Main Engine (Transit)	25	27%	159	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.97	0.00	0.00	0.00	0.03	2.00
		Main Engine (Maneuvering)	25	100%	16,544	3.18	0.04	0.73	0.10	0.10	0.00	0.00	0.01	0.00	205.43	0.00	0.01	0.03	2.93	208.39
		Auxiliary Engine (Transit)	25	27%	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.22
		Auxiliary Engine (Maneuvering)	25	100%	8,733	1.65	0.02	0.35	0.05	0.04	0.00	0.00	0.00	0.00	92.60	0.00	0.00	0.01	1.32	93.94
Miscellaneous																				
SF6 Loss	N/A	N/A	N/A	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,690.17
OSS Generators	Generator	Tier 4 Generator	N/A	100%	53,571	0.55	0.16	2.89	0.02	0.02	0.01	0.00	0.01	0.00	611.45	0.02	0.00	0.62	1.48	613.55

OCS Total Ton/yr	1,456,168	242.31	4.67	60.23	8.04	7.79	0.95	0.00	0.67	0.04	16,429.45	0.12	0.77	3.08	228.80	18,351.51
OCS Total Tons over life	43,685,046	7,269.20	140.17	1,806.78	241.34	233.71	28.50	0.03	20.19	1.31	492,883.62	3.70	23.03	92.42	6,864.14	550,545.41

Vessels													
EF Ref	Vessel Type	Engine type	Emission Factors (g/kWh)										
			NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O
1M	Anchor Handling Tugs	Main	9.26	0.24	2.16	0.34	0.33	0.079	4.0E-05	3.32E-02	636.09	0.004	0.031
1A		Auxiliary	9.88	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031
2M	Barge	Main	13.61	0.63	1.40	0.45	0.42	0.362	1.2E-05	7.78E-02	588.90	0.004	0.031
2A		Auxiliary	12.57	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031
3M	Cable Laying	Main	9.49	0.25	2.20	0.34	0.33	0.085	3.9E-05	3.43E-02	635.02	0.004	0.031
3A		Auxiliary	9.89	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031
4M	Crew	Main	9.15	0.14	2.30	0.31	0.30	0.006	4.6E-05	2.17E-02	648.16	0.004	0.031
4A		Auxiliary	10.39	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031
5M	Dredging	Main	9.60	0.28	2.13	0.36	0.34	0.112	3.7E-05	3.78E-02	630.62	0.004	0.031
5A		Auxiliary	9.85	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031
6M	Ice Breaker	Main	9.92	0.45	1.78	0.40	0.38	0.230	2.5E-05	5.72E-02	610.83	0.004	0.031
6A		Auxiliary	10.09	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031
7M	Jackup	Main	10.03	0.14	2.30	0.31	0.30	0.013	4.5E-05	2.17E-02	647.08	0.004	0.031
7A		Auxiliary	11.55	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031
8M	Research / Survey	Main	9.86	0.22	2.25	0.34	0.33	0.066	4.2E-05	3.10E-02	638.26	0.004	0.031
8A		Auxiliary	10.21	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031
9M	Shuttle Tanker	Main	9.05	0.63	1.40	0.45	0.42	0.362	1.2E-05	7.78E-02	588.90	0.004	0.031
9A		Auxiliary	9.80	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031
10M	Supply Ship	Main	9.44	0.17	2.29	0.32	0.31	0.028	4.5E-05	2.52E-02	644.58	0.004	0.031
10A		Auxiliary	10.43	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031
11M	Tug	Main	9.52	0.18	2.29	0.33	0.32	0.033	4.5E-05	2.65E-02	643.66	0.004	0.031
11A		Auxiliary	10.10	0.14	2.48	0.32	0.31	0.006	4.8E-05	2.19E-02	648.20	0.004	0.031

Helicopters													
EF Ref	Engine	Size (kW)	Emission Factors (lb/hr)										
			NOx	VOC	CO	PM10	PM2.5	SO2	Pb	HAPs	CO2	CH4	N2O
12	Helicopter	Single	2.32	1.63	1.89	0.07	0.07	0.300	0.0E+00	N/A	956.92	0.030	0.030
13	Helicopter	Twin Light	3.14	3.66	4.28	0.10	0.09	0.500	0.0E+00	N/A	1589.69	0.040	0.050
14	Helicopter	Twin Medium	7.22	3.02	3.48	0.20	0.20	0.780	0.0E+00	N/A	2459.92	0.070	0.080
15	Helicopter	Twin heavy	34.66	2.40	2.67	0.82	0.80	2.110	0.0E+00	N/A	6640.46	0.190	0.220

Load Factors for Main Engines		
Vessel/Engine	Activity	Load Factor
Cat. 3 Main (Propulsion) Engine	Transit/cruise	0.83
Cat. 3 Main (Propulsion) Engine	Maneuvering	0.2
Cat. 3 Main (Propulsion) Engine	Hoteling	0
Cat. 1/2 Main (Propulsion) Engine	Transit/cruise	0.83
Cat. 1/2 Main (Propulsion) Engine	Maneuvering	0.2
Cat. 1/2 Main (Propulsion) Engine	Hoteling	0

Load Factors for Auxiliary Engines on Vessels w/ Cat. 3 Main Engines		
Vessel Type	Maneuver	Hotel
Bulk Carrier	0.45	0.1
Bulk Carrier, Laker	0.45	0.22
Buoy Tender	0.45	0.19
Container	0.48	0.26
Crude Oil Tanker	0.33	0.22
Drilling	0.45	0.22
Fishing	0.45	0.22
Floating Production and Storage Offloading	0.45	0.22
General Cargo	0.45	0.22
Icebreaker	0.45	0.22
Jackup	0.45	0.22
LNG Tanker	0.33	0.26
LPG Tanker	0.33	0.26
Misc.	0.45	0.22
Passenger	0.8	0.64
Pipelaying	0.45	0.22
Reefer	0.67	0.32
Research	0.45	0.22
RORO	0.45	0.26
Supply	0.45	0.22
Support	0.45	0.22
Tanker	0.33	0.26
Tug	0.45	0.22
Vehicle Carrier	0.45	0.22
Well stimulation	0.45	0.22

Table 4-120 of https://www.epa.gov/sites/production/files/2018-07/documents/nei2014v2_tsd_05jul2018.pdf

Engines													
EF Ref	Engine	Size (kW)	Emission Factors (g/kWh)										
			NOx ¹	VOC ²	CO	PM10	PM2.5	SO2 ³	Pb	HAPs ⁵	CO2 ⁴	CH4 ⁴	N2O ⁴
16	Air Compressor Engines	~399	2	0.19	3.5	0.025	0.025	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
17	Motion Compensation Engines	500	4	0.495	3.5	0.2	0.2	0.0068	0.00E+00	7.14E-03	739.60	0.030	0.0060
18	Cat C18 Acert	597	6.4	0.8	3.5	0.2	0.2	0.0068	0.00E+00	7.14E-03	739.60	0.030	0.0060
19	Tier 2 Engines 0-8 kW	0-8	7.5	0.929	8	0.8	0.8	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
20	Tier 2 Engines 8-19 kW	8-19	7.5	0.929	6.6	0.8	0.8	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
21	Tier 2 Engines 19-37 kW	19-37	7.5	0.929	5.5	0.6	0.6	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
22	Tier 3 Engines 37-75 kW	37-75	4.7	0.582	5	0.4	0.4	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
23	Tier 3 Engines 75-130 kW	75-130	4	0.495	5	0.3	0.3	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
24	Tier 3 Engines 130-225 kW	130-225	4	0.495	3.5	0.2	0.2	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
25	Tier 3 Engines 225-450 kW	225-450	4	0.495	3.5	0.2	0.2	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
26	Tier 3 Engines 450-560 kW	450-560	4	0.495	3.5	0.2	0.2	0.0068	0.00E+00	7.14E-03	739.60	0.030	0.0060
27	Tier 2 Engines >560 kW	>560	6.4	0.792	3.5	0.2	0.2	0.0068	0.00E+00	7.14E-03	739.60	0.030	0.0060
30	Tier 4 Engine 130-560 kW	130-560	0.67	0.19	3.5	0.02	0.02	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
31	OSS Generator	500 kW	0.67	0.19	3.5	0.03	0.02	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060
32	WTG Generator	240 kW	5.40	0.65	5.00	0.12	0.12	0.0068	0.00E+00	1.76E-02	739.60	0.030	0.0060

1 NOx emission values are assumed to be 100% of the the relevant tier standard for NOx+NMHC
2 VOC emission values are assumed to be 12% of the the relevant tier standard for NOx+NMHC

3 Based on ULSD Fuel Sulfur of 0.0015%, fuel density of ~7 lb/gal, fuel heat content of ~0.14 MMBtu/gal, and SO2:Sulfur ratio of 2.0
4 Based on GHG emissions and heat content of ULSD from 40 CFR 98 Tables C-1 and C-2 and an assumed engine efficiency of 10,000 Btu/kW
5 HAP Emission Factors are in lb/MMBtu in AP-42 and converted to g/kWh based on an assumed 10,000 btu/kW

Commuting Emissions													
EF Ref	Engine	Fuel	Emission Factors (g/VMT)										
			NOx ¹	VOC ¹	CO ¹	PM10 ¹	PM2.5 ¹	SO2 ²	Pb	HAPs	CO2 ³	CH4 ³	N2O ³
28	Light-duty vehicles	Gasoline	0.289	0.35	3.94	0.012	0.012	0.0025	0.00E+00	N/A	393.61	0.017	0.0034
29	Light-duty trucks	Gasoline	0.478	0.421	5.66	0.014	0.014	0.0025	0.00E+00	N/A	393.61	0.017	0.0034

1 2018 values from Table 4-43 "Estimated U.S. Average Vehicle emissions Rates per Vehicle by Vehicle Type Using Gasoline and Diesel" at <https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-vehicle-type-using-gasoline-and>
2 Based on 10 ppm sulfur in gasoline, 6.07 lb/gal density, fleet average of 22.3 mpg, and SO2 to Sulfur weight ratio of 2.
3 Based on GHG emissions and heat content of motor gasoline from 40 CFR 98 Tables C-1 and C-2 and fleet average of 22.3 mpg
4 Fleet average MPG is from Table 4-23M from Bureau of Transportation Statistics found here: <https://www.bts.gov/content/average-fuel-efficiency-us-passenger-cars-and-light-trucks>

Load Factors for Auxiliary Engines on Vessels w/ Cat. 1 & 2 Main	
Vessel Group	Auxiliary Operating Load Factor
Bulk Carrier	0.1
Commercial Fishing	0.43
Container Ship	0.19
Ferry Excursion	0.43
General Cargo	0.22
Government	0.43
Miscellaneous	0.43
Offshore support	0.56
Reefer	0.32
RORO	0.26
Tanker	0.26
Tug	0.43
Work Boat	0.43

Eastern Research Group. 2019. Category 1 and 2 Commercial Marine Vessel 2017 Emissions Inventory (2019). Table 4. Auxiliary and Boiler Power Surrogates.

Load Factors for Auxiliary Engines on Vessels w/ Cat. 3 Main Engines			
EPA Vessel Type (NEI Vessel Types)	Cruise	RSZ	Maneuver
Auto Carrier	0.15	0.3	0.45
Bulk Carrier	0.17	0.27	0.45
Container Ship	0.13	0.25	0.48
Cruise Ship (Passenger)	0.8	0.8	0.8
General Cargo (Supply, Vehicle Carrier)	0.17	0.27	0.45
Miscellaneous (Buoy Tender, Drilling, Fishing, FPSO, Icebreaker, Jackup, Miscellaneous, Pipelaying, Research, Support, Well Stimulation)	0.17	0.27	0.45
OG Tug (Tug)	0.17	0.27	0.45
Reefer	0.2	0.34	0.67
RORO	0.15	0.3	0.45
Tanker (LNG Tanker, LPG Tanker, Crude Oil Tanker)	0.24	0.28	0.33

Sources:
EPA. 2009. Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories: Final
EPA. 2015. Commercial Marine Vessels – 2014 NEI Commercial Marine Vessels Final. Table 4-17: Auxiliary

Fuel Use Factors		
Engine Type	Fuel Use (g/kWh)	Fuel Use (gal/kWh)
Slow-speed Diesel, Marine Diesel Oil ¹	185	0.057
Medium-speed Diesel, Marine Diesel Oil ¹	205	0.064
Medium-speed Diesel, Marine Diesel Oil Auxiliary ¹	217	0.067
Cat. 1 & 2 (main and auxiliary) ²	N/A	0.064

1 From "Current Methodologies and Best Practices in Preparing Port Emission Inventories" April 2009, Table 2-9: Emission Factors for OGV Main Engines, Table 2-16: Auxiliary Engine Emission Factors

2 Calculated from BOEM CO2 emission rate for Cat. 1 & 2 Marine Engines below

Fuel Use Calculations	
Diesel Fuel Density (lb/gal) ¹	7.10
Distillate Fuel No. 2 Higher Heating Value (MMBtu/gal) ²	0.138
Distillate Fuel No. 2 CO2 Emission Factor (kg CO2/MMBtu) ²	73.96
Cat. 1 & 2 Maine Engine CO2 Emission Factor (g/kW*hr) ³	648.20
Cat. 1 & 2 (main and auxiliary)) fuel use (gal/kWh)	0.064

1 From Table 3.4-1 AP 42

2 From 40 CFR Part 98 Table C-1: Default CO2 Emission Factors and High Heat Values for Various Types of Fuel

3 From BOEM Offshore Wind Energy Facilities Emission Estimating Tool Technical Documentation Table 3: Weighted Marine Vessel Emission Factors

Global Warming Potentials ¹	
Compound	GWP
CH4	25
N2O	298
SF6	22800

1 Table A-1 of 40 CFR 98

Port Name	Lookup	Port Distance (Mi)	Port Distance (NM)
Atlantic City	Atlantic City	20	17
New Jersey Wind Port	NJWP	105	91
Europe	Europe	288	250
Paulsboro	Paulsboro	145	126

Overall COP South Port Distance in OCS Applicability Zone			
Port Name	Lookup	Port Distance (Mi)	Port Distance (NM)
Atlantic City	Atlantic City	20	17
New Jersey Wind Port	NJWP	29	25
Europe	Europe	29	25
Paulsboro	Paulsboro	29	25

Max Export Cable Included in OCS Area	51%	
measured export cable length max in OCS area	37.74	miles
measured export cable length max	73.86	miles
North Export Cable OCS	29.19	miles
North Export Cable Total	61.86	miles
South Export Cable OCS	8.55	miles
South Export Cable Total	12	miles

2017 NEI HAPs for Marine Vessels		
Pollutant	Basis	Fraction
1,3-Butadiene	VOC	1.01E-03
2,2,4-Trimethylpentane	VOC	7.12E-03
Acenaphthene	VOC	5.09E-05
Acenaphthylene	VOC	1.18E-04
Acetaldehyde	VOC	9.78E-03
Acrolein	VOC	1.85E-03
Ammonia	PM2.5	1.92E-02
Anthracene	VOC	3.44E-04
Antimony	PM2.5	6.15E-04
Arsenic	PM2.5	2.59E-05
Benz[a]Anthracene	PM2.5	8.82E-06
Benzene	VOC	4.74E-03
Benzo[a]Pyrene	PM2.5	4.18E-06
Benzo[b]Fluoranthene	PM2.5	8.35E-06
Benzo[k]Fluoranthene	PM2.5	4.18E-06
Benzo(g,h,i)Fluoranthene	PM2.5	1.32E-04
Cadmium	PM2.5	2.36E-04
Chrysene	PM2.5	1.63E-05
Chromium (VI)	PM2.5	7.24E-09
Dibenzo[a,h]anthracene	PM2.5	8.65E-06
Ethyl Benzene	VOC	4.39E-04
Fluoranthene	PM2.5	8.97E-05
Fluorene	VOC	1.64E-04
Formaldehyde	VOC	4.27E-02
Indeno[1,2,3-c,d]Pyrene	PM2.5	8.35E-06
Lead	PM2.5	1.25E-04
Manganese	PM2.5	3.22E-06
Mercury	PM2.5	4.18E-08
Naphthalene	VOC	3.13E-02
Hexane	VOC	2.79E-03
Nickel	PM2.5	6.87E-04
Polychlorinated Biphenyls	PM2.5	4.18E-07
Phenanthrene	VOC	1.36E-03
Propionaldehyde	VOC	1.52E-03
Pyrene	PM2.5	3.37E-05
Selenium	PM2.5	4.38E-08
Toluene	VOC	2.04E-03
Xylenes (Mixed Isomers)	VOC	1.42E-03
o-Xylene	VOC	5.13E-04
Total Fraction of VOC		0.1093
Total Fraction of PM2.5		0.0213

Stationary Internal Combustion Engine (<600 HP) HAPs from AP-42 Chapter 3.3	
Pollutant	Emission Factor (lb/mmBtu)
Benzene	9.33E-04
Toluene	4.09E-04
Xylenes	2.85E-04
1,3-Butadiene	3.91E-05
Formaldehyde	1.18E-03
Acetaldehyde	7.67E-04
Acrolein	9.25E-05
Total PAH	1.68E-04
Total HAP	3.87E-03

Total HAP Emission Factor	
lb/MMBtu	3.87E-03
g/MMBtu	1.76
Btu/kW	10,000
MMBtu/kW	0.010
g/kW	1.76E-02

Stationary Internal Combustion Engine (>600 HP) HAPs from AP-42 Chapter 3.4	
Pollutant	Emission Factor (lb/mmBtu)
Benzene	7.76E-04
Toluene	2.81E-04
Xylenes	1.93E-04
Formaldehyde	7.89E-05
Acetaldehyde	2.52E-05
Acrolein	7.88E-06
Total PAH	2.12E-04
Total HAP	1.57E-03

Total HAP Emission Factor	
lb/MMBtu	1.57E-03
g/MMBtu	0.71
Btu/kW	10,000
MMBtu/kW	0.010
g/kW	7.14E-03

*Source: EPA 2017 NEI Development Documentation - Methodology Documentation for EPA's Commerical Marine Emissions Estimates

Mode		Yearly Operating Time	Avg. Engine Load Factor	Average Fuel Consumption per Year (L)	% of In Field (maneuvering)	Weighted Maneuvering Load Factor
1	Dynamic Positioning / gangway operations	40%	10%	640,000	42.6%	4.3%
2	Standby in field / hotel	33%	8%	465,000	35.1%	2.8%
3	In field transit	21%	15%	486,000	22.3%	3.4%
4	Transit to/from harbor	2%	16%	46,000	0.0%	0.0%
5	Harbor	4%	4%	28,000	0.0%	0.0%
Maneuvering					100.0%	10.4%

*Preliminary results for assessment of logistics options

~94% of activities in windfarm each year

85 m “standard” European SOV with 60 PAX and diesel electric propulsion system

Total engine capacity of 6,600 kW made up of 4x 1,650 kW generators