

Table L1. Transportation sector energy consumption by region and fuel, High Zero-carbon Technology Cost case

quadrillion British thermal units

Region and fuel	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
World								
Motor gasoline and E85	46.7	46.7	45.8	45.1	44.9	45.8	47.7	0.1%
Distillate fuel oil and bioDiesel	42.9	43.7	44.0	44.7	45.8	47.7	49.3	0.5%
Residual fuel oil	8.0	8.7	9.2	9.5	9.5	9.4	9.0	0.4%
Liquefied petroleum gas	0.5	0.4	0.3	0.3	0.3	0.3	0.4	-1.3%
Jet fuel	11.1	14.1	15.7	17.3	19.0	20.7	22.3	2.5%
Other liquid fuels	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.3%
Natural gas	4.2	4.5	4.7	4.9	5.3	5.8	6.7	1.7%
Electricity	1.9	2.2	2.7	3.5	4.4	5.2	5.9	4.1%
Total	115.8	120.7	123.0	125.8	129.7	135.4	141.8	0.7%
Americas								
Motor gasoline and E85	21.8	21.2	20.0	19.0	18.6	18.7	19.2	-0.4%
Distillate fuel oil and bioDiesel	11.1	11.1	11.1	11.1	11.2	11.5	11.7	0.2%
Residual fuel oil	1.3	1.2	1.2	1.2	1.2	1.2	1.2	-0.3%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2%
Jet fuel	4.1	4.5	4.8	5.0	5.4	5.8	6.2	1.4%
Other liquid fuels	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1%
Natural gas	1.4	1.3	1.2	1.2	1.3	1.3	1.4	0.1%
Electricity	0.1	0.2	0.3	0.5	0.7	0.9	1.1	8.8%
Total	40.0	39.6	38.7	38.3	38.6	39.5	40.9	0.1%
United States								
Motor gasoline and E85	15.9	15.3	14.3	13.4	12.8	12.7	13.0	-0.7%
Distillate fuel oil and bioDiesel	6.7	6.6	6.3	6.1	6.1	6.1	6.1	-0.4%
Residual fuel oil	0.7	0.5	0.5	0.5	0.4	0.4	0.4	-1.6%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1%
Jet fuel	3.1	3.4	3.5	3.6	3.9	4.1	4.4	1.3%
Other liquid fuels	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1%
Natural gas	1.0	0.9	0.8	0.8	0.8	0.9	1.0	0.0%
Electricity	0.1	0.1	0.2	0.4	0.6	0.7	0.8	9.6%
Total	27.6	26.9	25.7	24.9	24.7	25.0	25.8	-0.2%
Canada								
Motor gasoline and E85	1.4	1.3	1.2	1.1	1.0	1.0	0.9	-1.4%
Distillate fuel oil and bioDiesel	0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.0%
Residual fuel oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.8%
Jet fuel	0.2	0.3	0.3	0.3	0.4	0.4	0.4	2.0%
Other liquid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5%
Natural gas	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.1%
Electricity	0.0	0.0	0.0	0.1	0.1	0.1	0.1	11.7%
Total	2.6	2.6	2.5	2.5	2.5	2.6	2.6	0.1%
Mexico								
Motor gasoline and E85	1.4	1.4	1.4	1.4	1.5	1.6	1.6	0.4%
Distillate fuel oil and bioDiesel	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4%
Residual fuel oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-7.6%
Jet fuel	0.2	0.2	0.2	0.2	0.3	0.3	0.3	2.5%
Other liquid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0%
Natural gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6%
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0%
Total	2.1	2.1	2.1	2.2	2.3	2.4	2.6	0.7%
Brazil								

Motor gasoline and E85	1.5	1.5	1.5	1.5	1.5	1.6	1.6	0.2%
Distillate fuel oil and bioDiesel	1.6	1.7	1.7	1.8	1.8	1.9	1.9	0.6%
Residual fuel oil	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.8%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9%
Jet fuel	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.7%
Other liquid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8%
Natural gas	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-1.2%
Electricity	0.0	0.0	0.0	0.0	0.1	0.1	0.1	3.5%
Total	3.7	3.8	3.9	4.0	4.1	4.1	4.2	0.5%
Other Americas								
Motor gasoline and E85	1.6	1.6	1.6	1.7	1.8	2.0	2.1	1.1%
Distillate fuel oil and bioDiesel	1.5	1.6	1.7	1.8	1.9	2.0	2.1	1.2%
Residual fuel oil	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.9%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2%
Jet fuel	0.4	0.4	0.5	0.5	0.6	0.7	0.7	2.1%
Other liquid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9%
Natural gas	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.4%
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.1	12.2%
Total	4.0	4.3	4.5	4.7	5.0	5.4	5.7	1.2%
Europe and Eurasia								
Motor gasoline and E85	5.6	5.2	4.5	3.8	3.3	2.9	2.7	-2.6%
Distillate fuel oil and bioDiesel	12.1	11.7	10.8	10.2	10.0	10.1	10.3	-0.6%
Residual fuel oil	1.7	1.9	2.0	2.1	2.1	2.1	2.0	0.7%
Liquefied petroleum gas	0.3	0.1	0.1	0.1	0.1	0.2	0.2	-1.0%
Jet fuel	2.9	3.5	3.8	4.1	4.4	4.6	4.9	1.8%
Other liquid fuels	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7%
Natural gas	0.5	0.8	0.9	1.0	1.0	1.1	1.2	2.9%
Electricity	0.8	0.8	0.9	1.2	1.4	1.7	1.8	3.1%
Total	23.9	24.2	23.2	22.6	22.5	22.7	23.2	-0.1%
Western Europe								
Motor gasoline and E85	3.6	3.3	2.7	2.1	1.6	1.2	0.9	-4.9%
Distillate fuel oil and bioDiesel	10.5	10.1	9.1	8.4	8.0	8.0	8.1	-0.9%
Residual fuel oil	1.6	1.8	2.0	2.0	2.0	2.0	2.0	0.8%
Liquefied petroleum gas	0.3	0.1	0.1	0.1	0.1	0.2	0.2	-1.0%
Jet fuel	2.4	3.0	3.2	3.5	3.7	3.9	4.1	1.9%
Other liquid fuels	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7%
Natural gas	0.1	0.2	0.2	0.2	0.3	0.4	0.5	5.4%
Electricity	0.3	0.4	0.5	0.7	1.0	1.2	1.4	5.4%
Total	18.9	18.9	17.8	17.2	17.0	17.1	17.3	-0.3%
Russia								
Motor gasoline and E85	1.5	1.5	1.4	1.3	1.2	1.2	1.1	-1.1%
Distillate fuel oil and bioDiesel	1.1	1.1	1.1	1.1	1.2	1.2	1.2	0.3%
Residual fuel oil	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0%
Jet fuel	0.4	0.5	0.5	0.5	0.6	0.6	0.6	1.2%
Other liquid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8%
Natural gas	0.2	0.3	0.3	0.3	0.3	0.3	0.3	1.4%
Electricity	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-1.1%
Total	3.6	3.7	3.7	3.6	3.6	3.6	3.5	-0.1%
Eastern Europe and Eurasia								
Motor gasoline and E85	0.5	0.5	0.5	0.5	0.5	0.6	0.7	1.1%
Distillate fuel oil and bioDiesel	0.5	0.5	0.6	0.7	0.8	0.9	1.0	2.5%
Residual fuel oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2%
Jet fuel	0.1	0.1	0.1	0.1	0.1	0.2	0.2	2.0%
Other liquid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0%
Natural gas	0.2	0.4	0.4	0.4	0.4	0.3	0.3	2.0%
Electricity	0.1	0.1	0.1	0.1	0.2	0.2	0.2	1.8%

Natural gas	0.2	0.2	0.3	0.5	0.6	0.7	0.9	6.1%
Electricity	0.1	0.1	0.2	0.2	0.3	0.3	0.5	4.4%
Total	5.1	5.7	7.4	9.4	11.6	13.6	15.4	4.1%
Other Asia Pacific								
Motor gasoline and E85	3.8	4.1	4.5	5.2	5.9	6.6	7.2	2.4%
Distillate fuel oil and bioDiesel	3.6	3.9	4.3	4.6	5.0	5.3	5.6	1.6%
Residual fuel oil	2.4	2.6	2.8	2.9	2.9	2.8	2.7	0.4%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-6.8%
Jet fuel	0.9	1.5	1.8	2.1	2.4	2.7	2.9	4.3%
Other liquid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4%
Natural gas	0.2	0.2	0.2	0.3	0.3	0.5	0.7	4.6%
Electricity	0.0	0.0	0.0	0.1	0.1	0.2	0.3	11.8%
Total	10.9	12.4	13.8	15.2	16.6	18.1	19.5	2.1%
Africa and Middle East								
Motor gasoline and E85	5.5	5.8	6.1	6.6	7.2	7.9	8.7	1.6%
Distillate fuel oil and bioDiesel	5.0	5.2	5.4	5.7	6.1	6.5	7.0	1.2%
Residual fuel oil	1.2	1.4	1.5	1.5	1.5	1.5	1.4	0.7%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-14.1%
Jet fuel	1.1	1.4	1.6	1.9	2.2	2.5	2.8	3.3%
Other liquid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8%
Natural gas	0.5	0.5	0.5	0.5	0.5	0.6	0.7	1.5%
Electricity	0.0	0.0	0.1	0.1	0.1	0.2	0.2	5.8%
Total	13.3	14.3	15.2	16.3	17.6	19.1	20.8	1.6%
Africa								
Motor gasoline and E85	2.4	2.6	3.0	3.4	3.9	4.5	5.2	2.8%
Distillate fuel oil and bioDiesel	2.6	2.8	3.0	3.3	3.6	4.0	4.5	1.9%
Residual fuel oil	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.8%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-30.3%
Jet fuel	0.3	0.4	0.5	0.6	0.7	0.8	0.9	3.7%
Other liquid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8%
Natural gas	0.1	0.1	0.2	0.2	0.2	0.3	0.3	3.7%
Electricity	0.0	0.0	0.0	0.0	0.1	0.1	0.1	3.6%
Total	5.7	6.2	6.9	7.8	8.7	9.9	11.2	2.5%
Middle East								
Motor gasoline and E85	3.2	3.2	3.2	3.2	3.3	3.4	3.5	0.4%
Distillate fuel oil and bioDiesel	2.3	2.3	2.4	2.4	2.4	2.5	2.5	0.3%
Residual fuel oil	1.0	1.2	1.3	1.3	1.3	1.3	1.2	0.7%
Liquefied petroleum gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-11.2%
Jet fuel	0.8	1.0	1.1	1.3	1.5	1.6	1.8	3.2%
Other liquid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7%
Natural gas	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.2%
Electricity	0.0	0.0	0.0	0.0	0.1	0.1	0.1	9.1%
Total	7.7	8.1	8.3	8.6	8.8	9.2	9.6	0.8%

Data source: U.S. Energy Information Administration, World Energy Projection System (2023), run hz_230821.151430 and Annual Energy Outlook 2023 (March 2023), www.eia.gov/aeo

Note: Totals may not equal sum of components due to independent rounding. Quantities for the United States, Americas, and World include energy used for U.S. military transportation and the energy content of lubricants.