

**Table A1. World total primary energy consumption by region, High Zero-carbon Technology Cost case**

quadrillion British thermal units

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>152.6</b>	<b>152.0</b>	<b>155.8</b>	<b>160.0</b>	<b>164.9</b>	<b>171.1</b>	<b>178.2</b>	<b>0.6%</b>
United States	98.9	97.3	97.5	98.2	99.5	101.7	104.7	0.2%
Canada	14.7	14.5	15.5	16.4	17.5	18.8	20.2	1.1%
Mexico	7.7	7.8	8.4	8.8	9.3	9.8	10.4	1.1%
Brazil	14.9	15.6	16.4	17.3	17.9	18.3	18.7	0.8%
Other Americas	16.4	16.8	18.0	19.3	20.8	22.4	24.2	1.4%
<b>Europe and Eurasia</b>	<b>130.0</b>	<b>132.4</b>	<b>134.0</b>	<b>137.7</b>	<b>142.6</b>	<b>147.9</b>	<b>153.6</b>	<b>0.6%</b>
Western Europe	84.2	85.8	86.6	88.3	90.8	93.3	95.8	0.5%
Russia	33.5	33.8	34.1	35.2	36.4	37.8	39.3	0.6%
Eastern Europe and Eurasia	12.3	12.7	13.3	14.2	15.4	16.8	18.5	1.5%
<b>Asia Pacific</b>	<b>292.6</b>	<b>309.0</b>	<b>336.2</b>	<b>360.0</b>	<b>380.2</b>	<b>402.1</b>	<b>421.7</b>	<b>1.3%</b>
Japan	18.5	18.5	17.0	16.5	16.2	15.9	15.7	-0.6%
South Korea	13.0	13.4	13.8	14.0	14.1	14.2	14.2	0.3%
Australia and New Zealand	7.2	7.2	7.7	8.0	8.4	8.8	9.2	0.9%
China	172.4	179.8	186.9	191.1	192.4	194.4	195.2	0.4%
India	38.3	43.2	55.9	69.2	81.9	95.5	108.5	3.8%
Other Asia Pacific	43.2	46.9	54.8	61.2	67.2	73.3	78.9	2.2%
<b>Africa and Middle East</b>	<b>62.5</b>	<b>66.7</b>	<b>71.3</b>	<b>76.9</b>	<b>83.0</b>	<b>90.1</b>	<b>96.7</b>	<b>1.6%</b>
Africa	24.3	26.0	29.6	33.2	37.4	42.4	47.2	2.4%
Middle East	38.2	40.7	41.6	43.6	45.7	47.7	49.5	0.9%
<b>World</b>	<b>637.7</b>	<b>660.2</b>	<b>697.3</b>	<b>734.6</b>	<b>770.7</b>	<b>811.2</b>	<b>850.2</b>	<b>1.0%</b>

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](http://www.eia.gov/aeo)

Note: Totals may not equal sum of components due to independent rounding. We converted electricity generation from renewable sources such as hydroelectric, wind, or solar to British thermal units at a rate of 8,124 British thermal units per kilowatthour, which reflects the average projected conversion efficiency of the U.S. fossil-fueled generating fleet in the Annual Energy Outlook 2021 over the projection period (2022–2050).

**Table A2. World total primary 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
<b>Americas</b>								
Liquid fuels	57.6	57.7	56.9	56.7	57.5	59.1	61.1	0.2%
Natural gas	45.7	43.7	45.6	45.8	47.6	49.8	52.3	0.5%
Coal	11.3	10.3	7.8	8.2	8.3	8.4	8.3	-1.1%
Nuclear	9.4	9.3	9.6	9.1	8.9	8.6	8.5	-0.3%
Other	28.6	30.9	35.9	40.2	42.7	45.1	48.0	1.9%
<b>Total</b>	<b>152.6</b>	<b>152.0</b>	<b>155.8</b>	<b>160.0</b>	<b>164.9</b>	<b>171.1</b>	<b>178.2</b>	<b>0.6%</b>
<b>Europe and Eurasia</b>								
Liquid fuels	38.0	38.4	37.4	36.6	36.7	37.3	38.2	0.0%
Natural gas	43.7	44.4	45.8	47.0	49.0	51.2	53.8	0.7%
Coal	16.5	16.2	14.7	14.8	14.9	16.1	16.4	0.0%
Nuclear	10.4	10.6	11.1	11.3	11.2	11.0	11.1	0.2%
Other	21.4	22.8	24.9	27.9	30.8	32.2	34.1	1.7%
<b>Total</b>	<b>130.0</b>	<b>132.4</b>	<b>134.0</b>	<b>137.7</b>	<b>142.6</b>	<b>147.9</b>	<b>153.6</b>	<b>0.6%</b>
<b>Asia Pacific</b>								
Liquid fuels	71.4	77.0	83.3	88.5	92.9	97.7	101.8	1.3%
Natural gas	35.2	37.5	40.6	43.2	46.5	50.8	54.7	1.6%
Coal	133.7	133.2	140.3	144.4	144.2	143.0	144.2	0.3%
Nuclear	7.6	8.7	10.5	12.0	13.2	14.0	14.9	2.4%
Other	44.7	52.5	61.6	71.8	83.5	96.7	106.1	3.1%
<b>Total</b>	<b>292.6</b>	<b>309.0</b>	<b>336.2</b>	<b>360.0</b>	<b>380.2</b>	<b>402.1</b>	<b>421.7</b>	<b>1.3%</b>
<b>Africa and Middle East</b>								
Liquid fuels	23.3	24.8	24.7	25.6	27.2	29.0	31.0	1.0%
Natural gas	28.6	29.8	31.2	33.7	36.1	38.6	41.0	1.3%
Coal	4.6	4.5	5.2	5.8	6.4	7.2	7.9	2.0%
Nuclear	0.4	0.6	0.9	1.2	1.4	1.4	1.4	4.9%
Other	5.7	7.1	9.2	10.5	12.0	13.8	15.4	3.6%
<b>Total</b>	<b>62.5</b>	<b>66.7</b>	<b>71.3</b>	<b>76.9</b>	<b>83.0</b>	<b>90.1</b>	<b>96.7</b>	<b>1.6%</b>
<b>World</b>								
Liquid fuels	190.3	197.9	202.3	207.5	214.3	223.2	232.1	0.7%
Natural gas	153.2	155.4	163.2	169.8	179.1	190.5	201.8	1.0%
Coal	166.0	164.3	168.0	173.2	173.7	174.8	176.7	0.2%
Nuclear	27.7	29.3	32.1	33.7	34.7	35.0	35.9	0.9%
Other	100.4	113.4	131.7	150.5	169.0	187.8	203.7	2.6%
<b>Total</b>	<b>637.7</b>	<b>660.2</b>	<b>697.3</b>	<b>734.6</b>	<b>770.7</b>	<b>811.2</b>	<b>850.2</b>	<b>1.0%</b>

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](http://www.eia.gov/aeo)

Note: Totals may not equal sum of components due to independent rounding. We converted electricity generation from renewable sources such as hydroelectric, wind, or solar to British thermal units at a rate of 8,124 British thermal units per kilowatthour, which reflects the average projected conversion efficiency of the U.S. fossil-fueled generating fleet in the Annual Energy Outlook 2021 over the projection period (2022–2050).

**Table A3. World GDP by region expressed in purchasing power parity, High Zero-carbon Technology Cost case**

billion 2015 dollars

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>\$32,285</b>	<b>\$33,660</b>	<b>\$37,264</b>	<b>\$40,967</b>	<b>\$45,221</b>	<b>\$49,883</b>	<b>\$54,952</b>	<b>1.9%</b>
United States	\$20,671	\$21,345	\$23,425	\$25,650	\$28,427	\$31,533	\$34,957	1.9%
Canada	\$1,791	\$1,872	\$2,102	\$2,303	\$2,513	\$2,732	\$2,967	1.8%
Mexico	\$2,367	\$2,483	\$2,739	\$2,999	\$3,260	\$3,529	\$3,811	1.7%
Brazil	\$3,182	\$3,340	\$3,696	\$3,967	\$4,129	\$4,253	\$4,338	1.1%
Other Americas	\$4,273	\$4,620	\$5,302	\$6,048	\$6,892	\$7,835	\$8,878	2.6%
<b>Europe and Eurasia</b>	<b>\$31,730</b>	<b>\$33,221</b>	<b>\$35,920</b>	<b>\$38,537</b>	<b>\$41,427</b>	<b>\$44,494</b>	<b>\$47,808</b>	<b>1.5%</b>
Western Europe	\$26,269	\$27,334	\$29,329	\$31,201	\$33,213	\$35,271	\$37,439	1.3%
Russia	\$3,763	\$3,973	\$4,217	\$4,375	\$4,557	\$4,766	\$4,996	1.0%
Eastern Europe and Eurasia	\$1,698	\$1,914	\$2,375	\$2,961	\$3,657	\$4,458	\$5,374	4.2%
<b>Asia Pacific</b>	<b>\$58,793</b>	<b>\$67,170</b>	<b>\$83,284</b>	<b>\$99,554</b>	<b>\$115,490</b>	<b>\$132,189</b>	<b>\$148,058</b>	<b>3.4%</b>
Japan	\$5,292	\$5,479	\$5,661	\$5,680	\$5,700	\$5,715	\$5,752	0.3%
South Korea	\$2,292	\$2,431	\$2,633	\$2,777	\$2,856	\$2,929	\$2,990	1.0%
Australia and New Zealand	\$1,524	\$1,638	\$1,900	\$2,127	\$2,336	\$2,541	\$2,745	2.1%
China	\$26,404	\$30,398	\$37,482	\$44,347	\$50,300	\$56,333	\$61,155	3.0%
India	\$10,049	\$12,032	\$16,628	\$21,735	\$27,151	\$33,007	\$39,105	5.0%
Other Asia Pacific	\$13,232	\$15,192	\$18,979	\$22,888	\$27,146	\$31,665	\$36,310	3.7%
<b>Africa and Middle East</b>	<b>\$12,838</b>	<b>\$14,048</b>	<b>\$16,061</b>	<b>\$18,204</b>	<b>\$20,322</b>	<b>\$22,382</b>	<b>\$24,380</b>	<b>2.3%</b>
Africa	\$7,050	\$7,692	\$9,019	\$10,431	\$11,898	\$13,422	\$14,982	2.7%
Middle East	\$5,788	\$6,356	\$7,042	\$7,774	\$8,424	\$8,960	\$9,398	1.7%
<b>World</b>	<b>\$135,647</b>	<b>\$148,099</b>	<b>\$172,530</b>	<b>\$197,263</b>	<b>\$222,460</b>	<b>\$248,948</b>	<b>\$275,198</b>	<b>2.6%</b>

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](http://www.eia.gov/aeo); Oxford Economics, Global Economic Model (February 2023), [www.oxfordeconomics.com](http://www.oxfordeconomics.com) (subscription site)

Note: Totals may not equal sum of components due to independent rounding.

**Table A4. World GDP by region expressed in market exchange rates, High Zero-carbon Technology Cost case**

billion 2015 dollars

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>\$28,078</b>	<b>\$29,177</b>	<b>\$32,209</b>	<b>\$35,336</b>	<b>\$39,001</b>	<b>\$43,029</b>	<b>\$47,417</b>	<b>1.9%</b>
United States	\$20,671	\$21,345	\$23,425	\$25,650	\$28,427	\$31,533	\$34,957	1.9%
Canada	\$1,748	\$1,827	\$2,052	\$2,247	\$2,452	\$2,667	\$2,896	1.8%
Mexico	\$1,242	\$1,303	\$1,437	\$1,574	\$1,711	\$1,852	\$2,000	1.7%
Brazil	\$1,900	\$1,994	\$2,207	\$2,369	\$2,465	\$2,539	\$2,590	1.1%
Other Americas	\$2,516	\$2,708	\$3,088	\$3,496	\$3,945	\$4,437	\$4,974	2.5%
<b>Europe and Eurasia</b>	<b>\$22,949</b>	<b>\$23,896</b>	<b>\$25,657</b>	<b>\$27,292</b>	<b>\$29,102</b>	<b>\$31,023</b>	<b>\$33,081</b>	<b>1.3%</b>
Western Europe	\$20,883	\$21,670	\$23,161	\$24,509	\$25,975	\$27,500	\$29,106	1.2%
Russia	\$1,456	\$1,538	\$1,632	\$1,693	\$1,764	\$1,844	\$1,933	1.0%
Eastern Europe and Eurasia	\$610	\$688	\$864	\$1,091	\$1,363	\$1,678	\$2,042	4.4%
<b>Asia Pacific</b>	<b>\$32,233</b>	<b>\$36,391</b>	<b>\$44,059</b>	<b>\$51,538</b>	<b>\$58,586</b>	<b>\$65,870</b>	<b>\$72,513</b>	<b>2.9%</b>
Japan	\$4,521	\$4,681	\$4,837	\$4,852	\$4,870	\$4,882	\$4,914	0.3%
South Korea	\$1,738	\$1,843	\$1,996	\$2,106	\$2,165	\$2,221	\$2,267	1.0%
Australia and New Zealand	\$1,671	\$1,796	\$2,084	\$2,333	\$2,563	\$2,787	\$3,011	2.1%
China	\$16,177	\$18,624	\$22,964	\$27,171	\$30,817	\$34,514	\$37,469	3.0%
India	\$2,927	\$3,506	\$4,845	\$6,334	\$7,912	\$9,619	\$11,396	5.0%
Other Asia Pacific	\$5,199	\$5,941	\$7,333	\$8,743	\$10,258	\$11,848	\$13,457	3.5%
<b>Africa and Middle East</b>	<b>\$5,526</b>	<b>\$6,049</b>	<b>\$6,888</b>	<b>\$7,792</b>	<b>\$8,692</b>	<b>\$9,567</b>	<b>\$10,425</b>	<b>2.3%</b>
Africa	\$2,723	\$2,964	\$3,471	\$4,014	\$4,585	\$5,180	\$5,789	2.7%
Middle East	\$2,803	\$3,085	\$3,417	\$3,778	\$4,107	\$4,386	\$4,635	1.8%
<b>World</b>	<b>\$88,786</b>	<b>\$95,513</b>	<b>\$108,814</b>	<b>\$121,958</b>	<b>\$135,380</b>	<b>\$149,488</b>	<b>\$163,437</b>	<b>2.2%</b>

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](http://www.eia.gov/aeo); Oxford Economics, Global Economic Model (February 2023), [www.oxfordeconomics.com](http://www.oxfordeconomics.com) (subscription site)

Note: Totals may not equal sum of components due to independent rounding.

**Table A5. World liquid fuels consumption by region, High Zero-carbon Technology Cost case**

million barrels per day

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>30.6</b>	<b>30.8</b>	<b>30.6</b>	<b>30.7</b>	<b>31.1</b>	<b>32.0</b>	<b>33.1</b>	<b>0.3%</b>
United States	19.9	19.9	19.7	19.4	19.4	19.8	20.3	0.1%
Canada	2.3	2.3	2.3	2.4	2.5	2.7	2.8	0.7%
Mexico	1.9	1.9	1.9	1.9	1.9	2.0	2.1	0.4%
Brazil	3.0	3.1	3.1	3.2	3.2	3.3	3.4	0.5%
Other Americas	3.5	3.6	3.7	3.8	4.0	4.3	4.6	0.9%
<b>Europe and Eurasia</b>	<b>18.8</b>	<b>18.9</b>	<b>18.4</b>	<b>18.1</b>	<b>18.1</b>	<b>18.4</b>	<b>18.9</b>	<b>0.0%</b>
Western Europe	14.3	14.2	13.6	13.2	13.0	13.0	13.2	-0.3%
Russia	3.4	3.5	3.6	3.6	3.7	3.9	4.0	0.5%
Eastern Europe and Eurasia	1.1	1.2	1.2	1.3	1.4	1.6	1.7	1.7%
<b>Asia Pacific</b>	<b>36.1</b>	<b>39.0</b>	<b>42.2</b>	<b>44.9</b>	<b>47.2</b>	<b>49.6</b>	<b>51.8</b>	<b>1.3%</b>
Japan	3.4	3.2	3.0	2.8	2.7	2.6	2.5	-1.1%
South Korea	2.6	2.7	2.7	2.7	2.6	2.6	2.5	-0.1%
Australia and New Zealand	1.2	1.3	1.3	1.3	1.3	1.4	1.4	0.4%
China	15.2	16.6	17.5	17.8	17.6	17.5	17.3	0.5%
India	5.1	5.8	7.3	9.0	10.9	12.6	14.3	3.8%
Other Asia Pacific	8.7	9.4	10.3	11.2	12.1	13.0	13.8	1.7%
<b>Africa and Middle East</b>	<b>13.5</b>	<b>14.4</b>	<b>14.5</b>	<b>15.0</b>	<b>15.8</b>	<b>16.8</b>	<b>17.8</b>	<b>1.0%</b>
Africa	4.4	4.7	5.1	5.6	6.2	6.9	7.7	2.0%
Middle East	9.1	9.6	9.3	9.4	9.6	9.8	10.1	0.4%
<b>World</b>	<b>99.0</b>	<b>103.1</b>	<b>105.6</b>	<b>108.5</b>	<b>112.2</b>	<b>116.9</b>	<b>121.6</b>	<b>0.7%</b>

Data source: U.S. Energy Information Administration, World Energy Projection System (2023), run hz\_230821.151430; Annual Energy Outlook 2023 (March 2023), [www.eia.gov/aeo](http://www.eia.gov/aeo); and Short-Term Energy Outlook (April 2023)

Note: Totals may not equal sum of components due to independent rounding. Liquid fuels include motor gasoline, distillate, residual, kerosene, jet fuel, liquid petroleum gases, sequestered petroleum, other petroleum, petroleum coke, crude oil (including lease and plant condensate), ethanol, and other biofuels across all demand sectors. EIA's Glossary includes descriptions of individual liquid fuel components.

**Table A6. World natural gas consumption by region, High Zero-carbon Technology Cost case**

trillion cubic feet

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>45.0</b>	<b>43.2</b>	<b>45.1</b>	<b>45.5</b>	<b>47.2</b>	<b>49.5</b>	<b>51.9</b>	<b>0.5%</b>
United States	32.3	30.1	30.3	29.9	30.8	32.3	33.6	0.1%
Canada	4.3	4.4	5.1	5.5	5.9	6.3	6.8	1.7%
Mexico	2.7	2.8	3.1	3.3	3.6	3.8	4.0	1.4%
Brazil	1.3	1.5	1.7	1.6	1.5	1.5	1.5	0.3%
Other Americas	4.3	4.5	4.8	5.1	5.4	5.7	6.0	1.2%
<b>Europe and Eurasia</b>	<b>42.3</b>	<b>43.0</b>	<b>44.4</b>	<b>45.6</b>	<b>47.5</b>	<b>49.6</b>	<b>52.2</b>	<b>0.8%</b>
Western Europe	19.8	20.5	21.6	21.5	21.6	21.8	22.2	0.4%
Russia	17.0	16.8	17.1	18.2	19.2	20.3	21.4	0.8%
Eastern Europe and Eurasia	5.5	5.7	5.7	5.9	6.7	7.6	8.6	1.6%
<b>Asia Pacific</b>	<b>34.9</b>	<b>37.2</b>	<b>40.3</b>	<b>43.0</b>	<b>46.2</b>	<b>50.5</b>	<b>54.3</b>	<b>1.6%</b>
Japan	4.1	4.1	3.9	3.6	3.4	3.4	3.3	-0.7%
South Korea	2.5	2.5	2.4	2.3	2.2	2.2	2.2	-0.4%
Australia and New Zealand	2.0	2.1	2.3	2.3	2.4	2.6	2.8	1.1%
China	14.1	15.1	16.1	17.8	19.9	22.2	24.1	1.9%
India	2.5	2.8	4.1	5.3	6.5	7.6	8.7	4.6%
Other Asia Pacific	9.7	10.6	11.5	11.7	11.8	12.5	13.2	1.1%
<b>Africa and Middle East</b>	<b>28.4</b>	<b>29.5</b>	<b>30.9</b>	<b>33.3</b>	<b>35.6</b>	<b>38.0</b>	<b>40.3</b>	<b>1.3%</b>
Africa	6.2	6.4	6.9	7.6	8.4	9.4	10.5	1.9%
Middle East	22.1	23.1	24.0	25.7	27.2	28.6	29.9	1.1%
<b>World</b>	<b>150.5</b>	<b>152.9</b>	<b>160.7</b>	<b>167.4</b>	<b>176.5</b>	<b>187.7</b>	<b>198.7</b>	<b>1.0%</b>

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](http://www.eia.gov/aeo)

Note: Totals may not equal sum of components due to independent rounding. Natural gas consumption excludes nonhydrocarbon gases.

**Table A7. World coal consumption by region, High Zero-carbon Technology Cost case**

million short tons

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>574</b>	<b>521</b>	<b>386</b>	<b>399</b>	<b>400</b>	<b>404</b>	<b>394</b>	<b>-1.3%</b>
United States	499	454	312	303	279	269	252	-2.4%
Canada	25	15	5	6	6	6	6	-5.2%
Mexico	7	7	13	14	15	15	15	2.7%
Brazil	25	26	26	28	31	29	29	0.6%
Other Americas	17	19	29	49	70	85	92	6.1%
<b>Europe and Eurasia</b>	<b>1,019</b>	<b>995</b>	<b>854</b>	<b>855</b>	<b>849</b>	<b>953</b>	<b>960</b>	<b>-0.2%</b>
Western Europe	642	614	481	487	472	565	560	-0.5%
Russia	238	248	232	219	222	225	228	-0.2%
Eastern Europe and Eurasia	138	133	140	149	156	164	172	0.8%
<b>Asia Pacific</b>	<b>6,694</b>	<b>6,679</b>	<b>7,093</b>	<b>7,321</b>	<b>7,351</b>	<b>7,317</b>	<b>7,405</b>	<b>0.4%</b>
Japan	193	191	134	135	130	125	121	-1.7%
South Korea	110	108	113	117	119	121	121	0.3%
Australia and New Zealand	100	92	104	109	113	114	113	0.4%
China	4,676	4,574	4,527	4,441	4,196	3,951	3,847	-0.7%
India	1,063	1,146	1,461	1,633	1,776	1,851	1,906	2.1%
Other Asia Pacific	551	569	756	886	1,017	1,156	1,298	3.1%
<b>Africa and Middle East</b>	<b>177</b>	<b>171</b>	<b>199</b>	<b>224</b>	<b>247</b>	<b>282</b>	<b>306</b>	<b>2.0%</b>
Africa	165	159	188	213	235	270	294	2.1%
Middle East	12	11	11	12	12	12	12	0.1%
<b>World</b>	<b>8,464</b>	<b>8,366</b>	<b>8,533</b>	<b>8,800</b>	<b>8,849</b>	<b>8,957</b>	<b>9,065</b>	<b>0.2%</b>

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](http://www.eia.gov/aeo)

Note: Totals may not equal sum of components due to independent rounding.

**Table A8. World nuclear energy consumption by region (net nuclear electricity generation), High Zero-carbon Technology Cost case**

billion kilowatthours

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>889</b>	<b>891</b>	<b>912</b>	<b>873</b>	<b>847</b>	<b>824</b>	<b>812</b>	<b>-0.3%</b>
United States	772	782	775	734	734	734	734	-0.2%
Canada	79	71	77	72	51	39	28	-3.7%
Mexico	11	11	20	28	23	17	17	1.4%
Brazil	14	14	23	23	23	18	18	0.9%
Other Americas	12	12	18	15	15	15	15	0.8%
<b>Europe and Eurasia</b>	<b>995</b>	<b>1,003</b>	<b>1,044</b>	<b>1,062</b>	<b>1,055</b>	<b>1,036</b>	<b>1,039</b>	<b>0.2%</b>
Western Europe	734	723	733	727	720	702	702	-0.2%
Russia	217	229	234	234	234	234	227	0.2%
Eastern Europe and Eurasia	44	52	77	101	101	101	111	3.4%
<b>Asia Pacific</b>	<b>746</b>	<b>837</b>	<b>993</b>	<b>1,143</b>	<b>1,253</b>	<b>1,329</b>	<b>1,420</b>	<b>2.3%</b>
Japan	78	115	139	139	121	102	102	0.9%
South Korea	201	228	228	228	228	218	214	0.2%
Australia and New Zealand	0	0	0	0	0	0	0	0.0%
China	383	416	538	674	799	903	998	3.5%
India	41	42	52	67	70	70	70	1.9%
Other Asia Pacific	43	36	36	36	36	36	36	-0.6%
<b>Africa and Middle East</b>	<b>37</b>	<b>54</b>	<b>87</b>	<b>116</b>	<b>135</b>	<b>135</b>	<b>135</b>	<b>4.8%</b>
Africa	13	13	30	43	52	52	52	5.1%
Middle East	24	41	58	73	83	83	83	4.6%
<b>World</b>	<b>2,666</b>	<b>2,786</b>	<b>3,037</b>	<b>3,195</b>	<b>3,290</b>	<b>3,324</b>	<b>3,406</b>	<b>0.9%</b>

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](http://www.eia.gov/aeo)

Note: Totals may not equal sum of components due to independent rounding.



**Table A9. World consumption of renewable energy by region, High Zero-carbon Technology Cost case**

quadrillion British thermal units

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>28.6</b>	<b>30.9</b>	<b>35.9</b>	<b>40.2</b>	<b>42.7</b>	<b>45.1</b>	<b>48.0</b>	<b>1.9%</b>
United States	11.4	13.5	17.1	19.7	20.6	21.1	22.1	2.4%
Canada	4.3	4.4	4.6	4.9	5.6	6.4	7.2	1.8%
Mexico	1.0	0.9	1.1	1.2	1.3	1.5	1.8	2.3%
Brazil	7.4	7.6	8.0	8.9	9.3	9.7	10.1	1.1%
Other Americas	4.5	4.6	5.1	5.5	5.8	6.2	6.9	1.5%
<b>Europe and Eurasia</b>	<b>21.4</b>	<b>22.8</b>	<b>24.9</b>	<b>27.9</b>	<b>30.8</b>	<b>32.2</b>	<b>34.1</b>	<b>1.7%</b>
Western Europe	18.4	19.7	21.8	24.5	27.5	28.9	30.8	1.9%
Russia	2.2	2.1	2.2	2.4	2.2	2.2	2.2	0.1%
Eastern Europe and Eurasia	0.9	1.0	1.0	1.1	1.1	1.1	1.1	0.9%
<b>Asia Pacific</b>	<b>44.7</b>	<b>52.5</b>	<b>61.6</b>	<b>71.8</b>	<b>83.5</b>	<b>96.7</b>	<b>106.1</b>	<b>3.1%</b>
Japan	2.4	2.2	2.4	2.6	3.1	3.3	3.5	1.4%
South Korea	0.6	0.6	0.8	1.0	1.2	1.5	1.6	3.6%
Australia and New Zealand	1.4	1.5	1.7	1.9	2.2	2.4	2.7	2.4%
China	26.6	31.5	35.2	37.3	41.0	45.1	45.8	2.0%
India	7.4	9.2	12.3	17.8	23.2	30.5	38.0	6.0%
Other Asia Pacific	6.3	7.5	9.1	11.2	12.8	13.9	14.5	3.1%
<b>Africa and Middle East</b>	<b>5.7</b>	<b>7.1</b>	<b>9.2</b>	<b>10.5</b>	<b>12.0</b>	<b>13.8</b>	<b>15.4</b>	<b>3.6%</b>
Africa	5.3	6.3	7.9	9.1	10.5	12.2	13.7	3.4%
Middle East	0.4	0.8	1.3	1.4	1.5	1.6	1.6	5.3%
<b>World</b>	<b>100.4</b>	<b>113.4</b>	<b>131.7</b>	<b>150.5</b>	<b>169.0</b>	<b>187.8</b>	<b>203.7</b>	<b>2.6%</b>

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](http://www.eia.gov/aeo)

Note: Totals may not equal sum of components due to independent rounding. We converted electricity generation from renewable sources such as hydroelectric, wind, or solar to British thermal units at a rate of 8,124 British thermal units per kilowatthour, which reflects the average projected conversion efficiency of the U.S. fossil-fueled generating fleet in the Annual Energy Outlook 2021 over the projection period (2022–2050).

**Table A10. World carbon dioxide emissions by region, High Zero-carbon Technology Cost case**

million metric tons of carbon dioxide

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>6,991</b>	<b>6,779</b>	<b>6,520</b>	<b>6,518</b>	<b>6,647</b>	<b>6,859</b>	<b>7,071</b>	<b>0.0%</b>
United States	4,842	4,582	4,267	4,161	4,145	4,216	4,297	-0.4%
Canada	548	537	515	536	566	600	631	0.5%
Mexico	419	428	446	457	480	501	524	0.8%
Brazil	439	467	487	490	497	500	504	0.5%
Other Americas	744	766	806	873	958	1,043	1,114	1.5%
<b>Europe and Eurasia</b>	<b>6,363</b>	<b>6,393</b>	<b>6,248</b>	<b>6,254</b>	<b>6,351</b>	<b>6,616</b>	<b>6,821</b>	<b>0.2%</b>
Western Europe	3,805	3,810	3,649	3,576	3,531	3,635	3,667	-0.1%
Russia	1,815	1,829	1,824	1,862	1,930	2,006	2,083	0.5%
Eastern Europe and Eurasia	742	754	775	816	890	975	1,071	1.3%
<b>Asia Pacific</b>	<b>18,703</b>	<b>19,138</b>	<b>20,359</b>	<b>21,218</b>	<b>21,655</b>	<b>22,084</b>	<b>22,678</b>	<b>0.7%</b>
Japan	1,036	1,015	861	822	781	760	737	-1.2%
South Korea	639	647	651	648	642	637	630	0.0%
Australia and New Zealand	404	395	421	428	436	448	458	0.5%
China	11,498	11,556	11,636	11,613	11,198	10,814	10,662	-0.3%
India	2,446	2,673	3,421	3,970	4,489	4,907	5,270	2.8%
Other Asia Pacific	2,680	2,852	3,370	3,737	4,108	4,518	4,920	2.2%
<b>Africa and Middle East</b>	<b>3,606</b>	<b>3,769</b>	<b>3,896</b>	<b>4,136</b>	<b>4,421</b>	<b>4,765</b>	<b>5,090</b>	<b>1.2%</b>
Africa	1,331	1,380	1,515	1,675	1,861	2,098	2,327	2.0%
Middle East	2,275	2,389	2,381	2,461	2,559	2,667	2,763	0.7%
<b>World</b>	<b>35,662</b>	<b>36,079</b>	<b>37,023</b>	<b>38,127</b>	<b>39,074</b>	<b>40,325</b>	<b>41,659</b>	<b>0.6%</b>

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/ao](http://www.eia.gov/ao)

Note: Totals may not equal sum of components due to independent rounding.

**Table A11. World carbon dioxide emissions from liquid fuels use by region, High Zero-carbon Technology Cost case**

million metric tons of carbon dioxide

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>3,501</b>	<b>3,482</b>	<b>3,407</b>	<b>3,367</b>	<b>3,397</b>	<b>3,478</b>	<b>3,584</b>	<b>0.1%</b>
United States	2,189	2,142	2,071	2,006	1,985	1,998	2,034	-0.3%
Canada	271	270	272	280	290	302	312	0.5%
Mexico	253	254	242	241	246	256	271	0.2%
Brazil	310	326	330	337	344	351	356	0.5%
Other Americas	478	491	491	504	533	571	612	0.9%
<b>Europe and Eurasia</b>	<b>2,474</b>	<b>2,495</b>	<b>2,418</b>	<b>2,352</b>	<b>2,338</b>	<b>2,366</b>	<b>2,408</b>	<b>-0.1%</b>
Western Europe	1,905	1,907	1,821	1,750	1,714	1,715	1,731	-0.3%
Russia	435	445	445	441	446	455	462	0.2%
Eastern Europe and Eurasia	134	143	152	162	178	196	215	1.7%
<b>Asia Pacific</b>	<b>4,139</b>	<b>4,474</b>	<b>4,843</b>	<b>5,159</b>	<b>5,439</b>	<b>5,740</b>	<b>6,003</b>	<b>1.3%</b>
Japan	404	387	360	337	320	309	299	-1.1%
South Korea	262	276	275	268	259	252	244	-0.3%
Australia and New Zealand	168	169	176	177	179	184	190	0.4%
China	1,579	1,735	1,824	1,850	1,827	1,820	1,797	0.5%
India	610	702	875	1,076	1,285	1,491	1,680	3.7%
Other Asia Pacific	1,116	1,205	1,334	1,451	1,568	1,685	1,794	1.7%
<b>Africa and Middle East</b>	<b>1,660</b>	<b>1,764</b>	<b>1,751</b>	<b>1,804</b>	<b>1,905</b>	<b>2,034</b>	<b>2,170</b>	<b>1.0%</b>
Africa	597	641	687	752	839	940	1,051	2.0%
Middle East	1,062	1,123	1,064	1,051	1,067	1,093	1,120	0.2%
<b>World</b>	<b>11,773</b>	<b>12,215</b>	<b>12,420</b>	<b>12,682</b>	<b>13,080</b>	<b>13,617</b>	<b>14,166</b>	<b>0.7%</b>

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](http://www.eia.gov/aeo)

Note: Totals may not equal sum of components due to independent rounding.

**Table A12. World carbon dioxide emissions from natural gas use by region, High Zero-carbon Technology Cost case**

million metric tons of carbon dioxide

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>2,405</b>	<b>2,304</b>	<b>2,360</b>	<b>2,369</b>	<b>2,462</b>	<b>2,582</b>	<b>2,706</b>	<b>0.4%</b>
United States	1,724	1,593	1,609	1,585	1,635	1,710	1,787	0.1%
Canada	231	237	230	243	263	284	306	1.0%
Mexico	147	155	172	182	199	210	217	1.4%
Brazil	72	81	95	89	82	81	79	0.3%
Other Americas	231	237	255	270	283	298	315	1.1%
<b>Europe and Eurasia</b>	<b>2,319</b>	<b>2,356</b>	<b>2,431</b>	<b>2,496</b>	<b>2,598</b>	<b>2,717</b>	<b>2,855</b>	<b>0.7%</b>
Western Europe	1,087	1,123	1,187	1,181	1,186	1,197	1,218	0.4%
Russia	931	919	935	994	1,049	1,109	1,170	0.8%
Eastern Europe and Eurasia	300	314	309	321	363	411	467	1.6%
<b>Asia Pacific</b>	<b>1,845</b>	<b>1,984</b>	<b>2,146</b>	<b>2,288</b>	<b>2,459</b>	<b>2,691</b>	<b>2,897</b>	<b>1.6%</b>
Japan	223	226	213	196	184	185	181	-0.7%
South Korea	137	136	130	125	122	121	123	-0.4%
Australia and New Zealand	91	91	95	93	93	99	104	0.5%
China	738	814	869	961	1,074	1,203	1,310	2.1%
India	137	152	226	291	358	419	478	4.6%
Other Asia Pacific	519	565	612	621	629	664	702	1.1%
<b>Africa and Middle East</b>	<b>1,517</b>	<b>1,580</b>	<b>1,657</b>	<b>1,788</b>	<b>1,914</b>	<b>2,049</b>	<b>2,175</b>	<b>1.3%</b>
Africa	331	339	365	404	449	503	559	1.9%
Middle East	1,186	1,240	1,291	1,384	1,466	1,546	1,616	1.1%
<b>World</b>	<b>8,086</b>	<b>8,224</b>	<b>8,595</b>	<b>8,940</b>	<b>9,433</b>	<b>10,039</b>	<b>10,633</b>	<b>1.0%</b>

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](http://www.eia.gov/aeo)

Note: Totals may not equal sum of components due to independent rounding.

**Table A13. World carbon dioxide emissions from coal use by region, High Zero-carbon Technology Cost case**

million metric tons of carbon dioxide

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>1,085</b>	<b>992</b>	<b>752</b>	<b>782</b>	<b>788</b>	<b>799</b>	<b>781</b>	<b>-1.2%</b>
United States	929	847	587	570	526	509	477	-2.4%
Canada	45	29	13	13	14	14	14	-4.2%
Mexico	19	19	32	34	35	35	36	2.4%
Brazil	57	60	61	65	71	68	69	0.6%
Other Americas	35	38	59	99	142	173	186	6.1%
<b>Europe and Eurasia</b>	<b>1,570</b>	<b>1,542</b>	<b>1,398</b>	<b>1,406</b>	<b>1,415</b>	<b>1,533</b>	<b>1,557</b>	<b>0.0%</b>
Western Europe	813	780	641	646	631	723	718	-0.4%
Russia	449	465	444	427	434	442	450	0.0%
Eastern Europe and Eurasia	308	297	314	333	350	368	389	0.8%
<b>Asia Pacific</b>	<b>12,719</b>	<b>12,680</b>	<b>13,370</b>	<b>13,772</b>	<b>13,756</b>	<b>13,654</b>	<b>13,777</b>	<b>0.3%</b>
Japan	409	402	287	289	278	267	257	-1.7%
South Korea	240	236	245	255	260	264	264	0.3%
Australia and New Zealand	145	134	150	158	163	165	164	0.4%
China	9,181	9,007	8,943	8,801	8,297	7,791	7,555	-0.7%
India	1,699	1,819	2,320	2,603	2,846	2,998	3,112	2.2%
Other Asia Pacific	1,045	1,082	1,424	1,665	1,912	2,169	2,425	3.1%
<b>Africa and Middle East</b>	<b>429</b>	<b>426</b>	<b>488</b>	<b>545</b>	<b>601</b>	<b>682</b>	<b>744</b>	<b>2.0%</b>
Africa	403	400	462	518	574	655	717	2.1%
Middle East	26	26	25	26	27	27	27	0.1%
<b>World</b>	<b>15,804</b>	<b>15,640</b>	<b>16,008</b>	<b>16,505</b>	<b>16,560</b>	<b>16,669</b>	<b>16,860</b>	<b>0.2%</b>

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](http://www.eia.gov/aeo)

Note: Totals may not equal sum of components due to independent rounding.

**Table A14. World carbon dioxide emissions from power generation by region and fossil fuel type, High Zero-carbon Technology Cost case**  
million metric tons of carbon dioxide

Region and fuel	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>								
Liquid fuels	92	110	56	24	11	4	4	-10.4%
Natural gas	852	759	729	681	716	773	819	-0.1%
Coal	907	814	569	598	603	613	592	-1.5%
<b>Total</b>	<b>1,851</b>	<b>1,683</b>	<b>1,355</b>	<b>1,303</b>	<b>1,331</b>	<b>1,390</b>	<b>1,416</b>	<b>-1.0%</b>
United States								
Liquid fuels	8	8	6	6	5	4	4	-2.8%
Natural gas	646	540	518	474	504	561	607	-0.2%
Coal	842	762	504	492	453	439	409	-2.5%
<b>Total</b>	<b>1,496</b>	<b>1,310</b>	<b>1,027</b>	<b>972</b>	<b>962</b>	<b>1,004</b>	<b>1,019</b>	<b>-1.4%</b>
Canada								
Liquid fuels	2	2	0	0	0	0	0	-10.3%
Natural gas	27	29	5	3	5	3	3	-7.2%
Coal	33	16	0	0	0	0	0	-100.0%
<b>Total</b>	<b>61</b>	<b>48</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>-9.8%</b>
Mexico								
Liquid fuels	28	36	19	9	3	0	0	-18.3%
Natural gas	70	73	77	81	92	96	97	1.2%
Coal	7	8	19	21	21	21	21	4.1%
<b>Total</b>	<b>105</b>	<b>117</b>	<b>115</b>	<b>111</b>	<b>116</b>	<b>117</b>	<b>118</b>	<b>0.4%</b>
Brazil								
Liquid fuels	10	14	6	1	0	0	0	-14.9%
Natural gas	28	36	46	37	29	27	25	-0.5%
Coal	9	10	8	9	13	9	9	0.1%
<b>Total</b>	<b>47</b>	<b>60</b>	<b>60</b>	<b>46</b>	<b>43</b>	<b>36</b>	<b>34</b>	<b>-1.2%</b>
Other Americas								
Liquid fuels	44	50	25	8	3	0	0	-17.4%
Natural gas	81	80	84	86	86	86	86	0.3%
Coal	17	19	38	75	115	143	153	8.1%
<b>Total</b>	<b>142</b>	<b>149</b>	<b>147</b>	<b>170</b>	<b>205</b>	<b>230</b>	<b>240</b>	<b>1.9%</b>
<b>Europe and Eurasia</b>								
Liquid fuels	58	80	81	56	43	41	39	-1.3%
Natural gas	701	706	750	772	818	869	931	1.0%
Coal	848	814	663	649	630	721	713	-0.6%
<b>Total</b>	<b>1,607</b>	<b>1,600</b>	<b>1,493</b>	<b>1,476</b>	<b>1,491</b>	<b>1,631</b>	<b>1,683</b>	<b>0.2%</b>
Western Europe								
Liquid fuels	40	57	62	47	35	35	35	-0.5%
Natural gas	263	297	365	353	346	341	341	0.9%
Coal	481	453	323	326	309	399	392	-0.7%
<b>Total</b>	<b>784</b>	<b>807</b>	<b>749</b>	<b>726</b>	<b>690</b>	<b>775</b>	<b>767</b>	<b>-0.1%</b>
Russia								
Liquid fuels	13	19	16	5	4	3	2	-6.8%
Natural gas	315	295	290	323	348	371	394	0.8%
Coal	179	192	166	142	142	142	142	-0.8%
<b>Total</b>	<b>508</b>	<b>507</b>	<b>471</b>	<b>471</b>	<b>493</b>	<b>516</b>	<b>537</b>	<b>0.2%</b>
Eastern Europe and Eurasia								
Liquid fuels	4	4	3	3	3	3	3	-1.0%
Natural gas	123	113	95	96	125	157	196	1.7%
Coal	187	169	174	180	180	180	180	-0.1%
<b>Total</b>	<b>315</b>	<b>286</b>	<b>273</b>	<b>279</b>	<b>308</b>	<b>340</b>	<b>379</b>	<b>0.7%</b>
<b>Asia Pacific</b>								

Liquid fuels	49	55	33	18	10	7	6	-7.4%
Natural gas	618	656	664	657	693	777	841	1.1%
Coal	7,386	7,373	8,088	8,533	8,571	8,472	8,604	0.5%
<b>Total</b>	<b>8,052</b>	<b>8,084</b>	<b>8,785</b>	<b>9,208</b>	<b>9,274</b>	<b>9,256</b>	<b>9,450</b>	<b>0.6%</b>
<b>Japan</b>								
Liquid fuels	9	13	9	5	3	3	3	-4.0%
Natural gas	145	145	134	117	104	105	101	-1.3%
Coal	251	249	147	162	162	162	162	-1.6%
<b>Total</b>	<b>406</b>	<b>406</b>	<b>290</b>	<b>284</b>	<b>269</b>	<b>270</b>	<b>266</b>	<b>-1.5%</b>
<b>South Korea</b>								
Liquid fuels	2	3	4	3	2	2	2	0.5%
Natural gas	69	65	60	55	50	48	48	-1.3%
Coal	130	127	135	143	147	150	150	0.5%
<b>Total</b>	<b>202</b>	<b>196</b>	<b>198</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>0.0%</b>
<b>Australia and New Zealand</b>								
Liquid fuels	1	1	0	0	0	0	0	-7.3%
Natural gas	22	21	23	18	14	15	15	-1.4%
Coal	123	111	125	131	135	136	134	0.3%
<b>Total</b>	<b>145</b>	<b>133</b>	<b>148</b>	<b>149</b>	<b>150</b>	<b>151</b>	<b>149</b>	<b>0.1%</b>
<b>China</b>								
Liquid fuels	2	2	1	0	0	0	0	-11.0%
Natural gas	121	148	157	203	280	365	434	4.7%
Coal	5,206	5,135	5,317	5,458	5,241	4,977	4,980	-0.2%
<b>Total</b>	<b>5,328</b>	<b>5,285</b>	<b>5,475</b>	<b>5,660</b>	<b>5,521</b>	<b>5,342</b>	<b>5,414</b>	<b>0.1%</b>
<b>India</b>								
Liquid fuels	3	2	1	0	0	0	0	-14.5%
Natural gas	24	24	41	45	50	50	50	2.7%
Coal	1,077	1,155	1,492	1,591	1,655	1,617	1,541	1.3%
<b>Total</b>	<b>1,104</b>	<b>1,181</b>	<b>1,534</b>	<b>1,636</b>	<b>1,706</b>	<b>1,668</b>	<b>1,591</b>	<b>1.3%</b>
<b>Other Asia Pacific</b>								
Liquid fuels	33	34	18	10	5	2	0	-14.5%
Natural gas	237	254	249	219	194	194	194	-0.7%
Coal	598	597	872	1,048	1,231	1,430	1,637	3.7%
<b>Total</b>	<b>867</b>	<b>884</b>	<b>1,140</b>	<b>1,277</b>	<b>1,429</b>	<b>1,625</b>	<b>1,831</b>	<b>2.7%</b>
<b>Africa and Middle East</b>								
Liquid fuels	205	230	119	50	21	8	2	-15.2%
Natural gas	587	612	630	696	737	790	838	1.3%
Coal	212	187	217	235	243	269	270	0.9%
<b>Total</b>	<b>1,004</b>	<b>1,030</b>	<b>967</b>	<b>981</b>	<b>1,001</b>	<b>1,067</b>	<b>1,110</b>	<b>0.4%</b>
<b>Africa</b>								
Liquid fuels	31	31	12	2	0	0	0	-16.4%
Natural gas	166	167	172	190	209	239	270	1.8%
Coal	212	187	217	235	243	269	270	0.9%
<b>Total</b>	<b>409</b>	<b>384</b>	<b>401</b>	<b>426</b>	<b>452</b>	<b>509</b>	<b>540</b>	<b>1.0%</b>
<b>Middle East</b>								
Liquid fuels	174	200	107	48	21	8	2	-15.0%
Natural gas	421	445	459	506	528	551	568	1.1%
Coal	0	0	0	0	0	0	0	-6.1%
<b>Total</b>	<b>595</b>	<b>645</b>	<b>566</b>	<b>554</b>	<b>549</b>	<b>558</b>	<b>570</b>	<b>-0.2%</b>
<b>World</b>								
Liquid fuels	404	475	289	147	85	60	51	-7.1%
Natural gas	2,757	2,733	2,773	2,805	2,964	3,209	3,429	0.8%
Coal	9,352	9,189	9,537	10,015	10,048	10,075	10,179	0.3%
<b>Total</b>	<b>12,514</b>	<b>12,396</b>	<b>12,599</b>	<b>12,967</b>	<b>13,097</b>	<b>13,344</b>	<b>13,659</b>	<b>0.3%</b>

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](http://www.eia.gov/aeo)

Note: Totals may not equal sum of components due to independent rounding.

**Table A15. World population by region, High Zero-carbon Technology Cost case**

million persons

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>1,036</b>	<b>1,057</b>	<b>1,091</b>	<b>1,120</b>	<b>1,143</b>	<b>1,161</b>	<b>1,175</b>	<b>0.4%</b>
United States	333	338	346	354	361	367	372	0.4%
Canada	39	40	43	45	47	48	50	0.9%
Mexico	128	130	135	138	141	143	144	0.4%
Brazil	216	219	224	228	230	231	231	0.2%
Other Americas	320	330	343	355	364	372	378	0.6%
<b>Europe and Eurasia</b>	<b>920</b>	<b>923</b>	<b>928</b>	<b>932</b>	<b>934</b>	<b>935</b>	<b>933</b>	<b>0.1%</b>
Western Europe	633	636	639	641	641	641	638	0.0%
Russia	144	143	141	138	136	134	132	-0.3%
Eastern Europe and Eurasia	142	144	149	152	156	160	162	0.5%
<b>Asia Pacific</b>	<b>4,287</b>	<b>4,358</b>	<b>4,474</b>	<b>4,568</b>	<b>4,640</b>	<b>4,690</b>	<b>4,712</b>	<b>0.3%</b>
Japan	126	124	121	117	114	110	106	-0.6%
South Korea	52	52	51	51	49	48	46	-0.4%
Australia and New Zealand	31	33	35	37	39	40	42	1.1%
China	1,427	1,424	1,415	1,399	1,377	1,349	1,312	-0.3%
India	1,422	1,456	1,516	1,569	1,613	1,647	1,671	0.6%
Other Asia Pacific	1,229	1,270	1,335	1,396	1,449	1,496	1,535	0.8%
<b>Africa and Middle East</b>	<b>1,658</b>	<b>1,772</b>	<b>1,968</b>	<b>2,170</b>	<b>2,375</b>	<b>2,581</b>	<b>2,784</b>	<b>1.9%</b>
Africa	1,386	1,486	1,661	1,843	2,031	2,221	2,410	2.0%
Middle East	273	287	308	326	344	360	374	1.1%
<b>World</b>	<b>7,901</b>	<b>8,111</b>	<b>8,462</b>	<b>8,789</b>	<b>9,092</b>	<b>9,366</b>	<b>9,603</b>	<b>0.7%</b>

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](http://www.eia.gov/aeo); Oxford Economics, Global Economic Model (February 2023), [www.oxfordeconomics.com](http://www.oxfordeconomics.com) (subscription site)

Note: Totals may not equal sum of components due to independent rounding.



**Table A16. World gross output by region and sector, High Zero-carbon Technology Cost case**

billion 2015 dollars

Region and sector	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>								
Energy-intensive manufacturing	\$4,946	\$5,113	\$5,611	\$6,039	\$6,501	\$7,016	\$7,575	1.5%
Non-energy-intensive manufacturing	\$6,357	\$6,785	\$7,641	\$8,485	\$9,460	\$10,533	\$11,743	2.2%
Nonmanufacturing	\$5,265	\$5,623	\$6,121	\$6,672	\$7,291	\$7,960	\$8,674	1.8%
Services	\$40,510	\$43,119	\$47,624	\$52,162	\$57,345	\$62,948	\$68,969	1.9%
<b>Total</b>	<b>\$57,077</b>	<b>\$60,640</b>	<b>\$66,996</b>	<b>\$73,358</b>	<b>\$80,596</b>	<b>\$88,456</b>	<b>\$96,961</b>	<b>1.9%</b>
<b>United States</b>								
Energy-intensive manufacturing	\$2,388	\$2,425	\$2,610	\$2,768	\$2,983	\$3,240	\$3,524	1.4%
Non-energy-intensive manufacturing	\$3,493	\$3,784	\$4,268	\$4,753	\$5,371	\$6,063	\$6,848	2.4%
Nonmanufacturing	\$2,394	\$2,630	\$2,842	\$3,114	\$3,474	\$3,884	\$4,337	2.1%
Services	\$28,881	\$30,823	\$33,768	\$36,852	\$40,657	\$44,890	\$49,533	1.9%
<b>Total</b>	<b>\$37,155</b>	<b>\$39,662</b>	<b>\$43,488</b>	<b>\$47,487</b>	<b>\$52,485</b>	<b>\$58,078</b>	<b>\$64,243</b>	<b>2.0%</b>
<b>Canada</b>								
Energy-intensive manufacturing	\$256	\$266	\$305	\$340	\$376	\$413	\$451	2.0%
Non-energy-intensive manufacturing	\$332	\$358	\$412	\$458	\$503	\$548	\$595	2.1%
Nonmanufacturing	\$498	\$500	\$542	\$585	\$628	\$669	\$710	1.3%
Services	\$1,724	\$1,830	\$2,071	\$2,268	\$2,480	\$2,705	\$2,952	1.9%
<b>Total</b>	<b>\$2,810</b>	<b>\$2,954</b>	<b>\$3,330</b>	<b>\$3,651</b>	<b>\$3,986</b>	<b>\$4,336</b>	<b>\$4,707</b>	<b>1.9%</b>
<b>Mexico</b>								
Energy-intensive manufacturing	\$535	\$557	\$616	\$669	\$721	\$784	\$864	1.7%
Non-energy-intensive manufacturing	\$983	\$1,048	\$1,142	\$1,246	\$1,371	\$1,525	\$1,720	2.0%
Nonmanufacturing	\$466	\$490	\$537	\$576	\$609	\$640	\$670	1.3%
Services	\$1,999	\$2,095	\$2,327	\$2,564	\$2,804	\$3,047	\$3,291	1.8%
<b>Total</b>	<b>\$3,982</b>	<b>\$4,189</b>	<b>\$4,622</b>	<b>\$5,055</b>	<b>\$5,505</b>	<b>\$5,996</b>	<b>\$6,546</b>	<b>1.8%</b>
<b>Brazil</b>								
Energy-intensive manufacturing	\$868	\$910	\$996	\$1,053	\$1,078	\$1,094	\$1,101	0.9%
Non-energy-intensive manufacturing	\$612	\$660	\$752	\$827	\$878	\$921	\$957	1.6%
Nonmanufacturing	\$710	\$748	\$817	\$873	\$915	\$955	\$993	1.2%
Services	\$3,392	\$3,568	\$3,941	\$4,220	\$4,376	\$4,480	\$4,533	1.0%
<b>Total</b>	<b>\$5,583</b>	<b>\$5,886</b>	<b>\$6,506</b>	<b>\$6,972</b>	<b>\$7,246</b>	<b>\$7,451</b>	<b>\$7,585</b>	<b>1.1%</b>
<b>Other Americas</b>								
Energy-intensive manufacturing	\$899	\$956	\$1,083	\$1,209	\$1,343	\$1,484	\$1,634	2.2%
Non-energy-intensive manufacturing	\$937	\$935	\$1,067	\$1,201	\$1,337	\$1,475	\$1,623	2.0%
Nonmanufacturing	\$1,197	\$1,254	\$1,384	\$1,523	\$1,665	\$1,811	\$1,964	1.8%
Services	\$4,514	\$4,804	\$5,517	\$6,259	\$7,029	\$7,824	\$8,659	2.4%
<b>Total</b>	<b>\$7,546</b>	<b>\$7,949</b>	<b>\$9,051</b>	<b>\$10,192</b>	<b>\$11,374</b>	<b>\$12,595</b>	<b>\$13,880</b>	<b>2.2%</b>
<b>Europe and Eurasia</b>								
Energy-intensive manufacturing	\$6,107	\$6,280	\$6,469	\$6,797	\$7,185	\$7,602	\$8,050	1.0%
Non-energy-intensive manufacturing	\$9,080	\$9,659	\$10,285	\$11,053	\$11,890	\$12,759	\$13,664	1.5%
Nonmanufacturing	\$6,410	\$6,609	\$7,169	\$7,601	\$8,043	\$8,444	\$8,849	1.2%
Services	\$36,030	\$37,798	\$40,899	\$43,834	\$47,095	\$50,628	\$54,528	1.5%
<b>Total</b>	<b>\$57,627</b>	<b>\$60,346</b>	<b>\$64,823</b>	<b>\$69,285</b>	<b>\$74,213</b>	<b>\$79,433</b>	<b>\$85,091</b>	<b>1.4%</b>
<b>Western Europe</b>								
Energy-intensive manufacturing	\$4,982	\$5,026	\$5,102	\$5,288	\$5,516	\$5,751	\$6,018	0.7%
Non-energy-intensive manufacturing	\$8,440	\$8,933	\$9,506	\$10,206	\$10,955	\$11,722	\$12,521	1.4%
Nonmanufacturing	\$4,377	\$4,531	\$4,828	\$5,078	\$5,329	\$5,548	\$5,773	1.0%
Services	\$31,098	\$32,468	\$35,042	\$37,346	\$39,811	\$42,370	\$45,089	1.3%
<b>Total</b>	<b>\$48,897</b>	<b>\$50,958</b>	<b>\$54,478</b>	<b>\$57,917</b>	<b>\$61,610</b>	<b>\$65,390</b>	<b>\$69,401</b>	<b>1.3%</b>
<b>Russia</b>								
Energy-intensive manufacturing	\$895	\$988	\$1,053	\$1,134	\$1,220	\$1,313	\$1,396	1.6%
Non-energy-intensive manufacturing	\$544	\$606	\$636	\$683	\$743	\$813	\$882	1.7%

Nonmanufacturing	\$1,282	\$1,252	\$1,311	\$1,333	\$1,346	\$1,363	\$1,378	0.3%
Services	\$3,823	\$4,069	\$4,252	\$4,386	\$4,568	\$4,801	\$5,089	1.0%
<b>Total</b>	<b>\$6,544</b>	<b>\$6,916</b>	<b>\$7,252</b>	<b>\$7,535</b>	<b>\$7,877</b>	<b>\$8,290</b>	<b>\$8,744</b>	<b>1.0%</b>
<b>Eastern Europe and Eurasia</b>								
Energy-intensive manufacturing	\$230	\$266	\$314	\$375	\$450	\$538	\$636	3.7%
Non-energy-intensive manufacturing	\$96	\$119	\$143	\$165	\$192	\$224	\$261	3.6%
Nonmanufacturing	\$750	\$825	\$1,030	\$1,191	\$1,368	\$1,534	\$1,698	3.0%
Services	\$1,109	\$1,261	\$1,606	\$2,102	\$2,716	\$3,457	\$4,350	5.0%
<b>Total</b>	<b>\$2,185</b>	<b>\$2,472</b>	<b>\$3,093</b>	<b>\$3,833</b>	<b>\$4,726</b>	<b>\$5,753</b>	<b>\$6,945</b>	<b>4.2%</b>
<b>Asia Pacific</b>								
Energy-intensive manufacturing	\$21,179	\$23,849	\$28,155	\$32,549	\$36,783	\$41,250	\$45,521	2.8%
Non-energy-intensive manufacturing	\$42,102	\$47,919	\$57,377	\$65,984	\$73,194	\$79,846	\$84,887	2.5%
Nonmanufacturing	\$24,048	\$26,247	\$30,794	\$34,708	\$38,184	\$41,666	\$44,655	2.2%
Services	\$58,764	\$67,671	\$85,863	\$104,589	\$123,298	\$142,947	\$161,727	3.7%
<b>Total</b>	<b>\$146,093</b>	<b>\$165,685</b>	<b>\$202,189</b>	<b>\$237,830</b>	<b>\$271,459</b>	<b>\$305,709</b>	<b>\$336,791</b>	<b>3.0%</b>
<b>Japan</b>								
Energy-intensive manufacturing	\$941	\$965	\$939	\$906	\$885	\$864	\$847	-0.4%
Non-energy-intensive manufacturing	\$2,737	\$3,005	\$3,155	\$3,215	\$3,242	\$3,260	\$3,284	0.7%
Nonmanufacturing	\$670	\$682	\$700	\$697	\$693	\$687	\$684	0.1%
Services	\$5,761	\$5,988	\$6,190	\$6,202	\$6,219	\$6,235	\$6,278	0.3%
<b>Total</b>	<b>\$10,110</b>	<b>\$10,640</b>	<b>\$10,983</b>	<b>\$11,020</b>	<b>\$11,038</b>	<b>\$11,046</b>	<b>\$11,093</b>	<b>0.3%</b>
<b>South Korea</b>								
Energy-intensive manufacturing	\$1,067	\$1,123	\$1,152	\$1,160	\$1,142	\$1,117	\$1,085	0.1%
Non-energy-intensive manufacturing	\$1,692	\$1,796	\$2,032	\$2,169	\$2,257	\$2,341	\$2,419	1.3%
Nonmanufacturing	\$362	\$376	\$384	\$395	\$400	\$405	\$408	0.4%
Services	\$2,565	\$2,715	\$2,930	\$3,092	\$3,181	\$3,265	\$3,335	0.9%
<b>Total</b>	<b>\$5,686</b>	<b>\$6,010</b>	<b>\$6,498</b>	<b>\$6,817</b>	<b>\$6,980</b>	<b>\$7,128</b>	<b>\$7,247</b>	<b>0.9%</b>
<b>Australia and New Zealand</b>								
Energy-intensive manufacturing	\$173	\$187	\$204	\$218	\$233	\$247	\$260	1.5%
Non-energy-intensive manufacturing	\$130	\$137	\$148	\$158	\$168	\$176	\$183	1.2%
Nonmanufacturing	\$590	\$626	\$728	\$805	\$874	\$941	\$1,002	1.9%
Services	\$1,958	\$2,123	\$2,454	\$2,751	\$3,025	\$3,289	\$3,549	2.1%
<b>Total</b>	<b>\$2,852</b>	<b>\$3,073</b>	<b>\$3,534</b>	<b>\$3,932</b>	<b>\$4,300</b>	<b>\$4,653</b>	<b>\$4,993</b>	<b>2.0%</b>
<b>China</b>								
Energy-intensive manufacturing	\$10,799	\$12,196	\$13,641	\$14,683	\$15,315	\$15,841	\$16,038	1.4%
Non-energy-intensive manufacturing	\$25,771	\$29,890	\$35,519	\$40,341	\$43,687	\$46,393	\$47,536	2.2%
Nonmanufacturing	\$12,744	\$13,870	\$15,867	\$17,321	\$18,369	\$19,425	\$20,102	1.6%
Services	\$25,046	\$29,136	\$37,761	\$46,715	\$55,070	\$63,732	\$71,205	3.8%
<b>Total</b>	<b>\$74,360</b>	<b>\$85,092</b>	<b>\$102,788</b>	<b>\$119,061</b>	<b>\$132,441</b>	<b>\$145,391</b>	<b>\$154,881</b>	<b>2.7%</b>
<b>India</b>								
Energy-intensive manufacturing	\$3,724	\$4,306	\$6,021	\$8,084	\$10,242	\$12,613	\$15,052	5.1%
Non-energy-intensive manufacturing	\$3,007	\$3,411	\$4,769	\$6,346	\$8,040	\$9,889	\$11,820	5.0%
Nonmanufacturing	\$4,474	\$5,019	\$6,312	\$7,614	\$8,819	\$10,038	\$11,185	3.3%
Services	\$7,664	\$9,685	\$13,872	\$18,557	\$23,629	\$29,112	\$34,856	5.6%
<b>Total</b>	<b>\$18,869</b>	<b>\$22,420</b>	<b>\$30,974</b>	<b>\$40,601</b>	<b>\$50,730</b>	<b>\$61,651</b>	<b>\$72,912</b>	<b>4.9%</b>
<b>Other Asia Pacific</b>								
Energy-intensive manufacturing	\$4,475	\$5,072	\$6,199	\$7,496	\$8,967	\$10,569	\$12,239	3.7%
Non-energy-intensive manufacturing	\$8,764	\$9,680	\$11,754	\$13,755	\$15,800	\$17,786	\$19,646	2.9%
Nonmanufacturing	\$5,207	\$5,674	\$6,802	\$7,876	\$9,028	\$10,170	\$11,275	2.8%
Services	\$15,770	\$18,023	\$22,656	\$27,272	\$32,175	\$37,314	\$42,505	3.6%
<b>Total</b>	<b>\$34,217</b>	<b>\$38,450</b>	<b>\$47,411</b>	<b>\$56,399</b>	<b>\$65,970</b>	<b>\$75,840</b>	<b>\$85,665</b>	<b>3.3%</b>
<b>Africa and Middle East</b>								
Energy-intensive manufacturing	\$2,921	\$3,129	\$3,509	\$3,954	\$4,392	\$4,829	\$5,267	2.1%
Non-energy-intensive manufacturing	\$1,721	\$1,867	\$2,124	\$2,427	\$2,742	\$3,047	\$3,350	2.4%
Nonmanufacturing	\$5,582	\$6,016	\$6,560	\$7,101	\$7,641	\$8,164	\$8,654	1.6%
Services	\$12,133	\$13,191	\$15,219	\$17,343	\$19,366	\$21,231	\$23,000	2.3%
<b>Total</b>	<b>\$22,357</b>	<b>\$24,202</b>	<b>\$27,411</b>	<b>\$30,825</b>	<b>\$34,141</b>	<b>\$37,271</b>	<b>\$40,271</b>	<b>2.1%</b>
<b>Africa</b>								

Energy-intensive manufacturing	\$1,364	\$1,503	\$1,761	\$2,050	\$2,361	\$2,694	\$3,048	2.9%
Non-energy-intensive manufacturing	\$885	\$975	\$1,137	\$1,313	\$1,502	\$1,700	\$1,898	2.8%
Nonmanufacturing	\$3,002	\$3,248	\$3,607	\$3,979	\$4,353	\$4,719	\$5,074	1.9%
Services	\$6,408	\$6,817	\$8,005	\$9,207	\$10,437	\$11,679	\$12,927	2.5%
<b>Total</b>	<b>\$11,659</b>	<b>\$12,543</b>	<b>\$14,509</b>	<b>\$16,549</b>	<b>\$18,653</b>	<b>\$20,791</b>	<b>\$22,947</b>	<b>2.4%</b>
<b>Middle East</b>								
Energy-intensive manufacturing	\$1,557	\$1,625	\$1,748	\$1,904	\$2,031	\$2,135	\$2,219	1.3%
Non-energy-intensive manufacturing	\$836	\$892	\$987	\$1,114	\$1,240	\$1,347	\$1,452	2.0%
Nonmanufacturing	\$2,580	\$2,768	\$2,952	\$3,121	\$3,288	\$3,446	\$3,580	1.2%
Services	\$5,725	\$6,374	\$7,214	\$8,137	\$8,929	\$9,552	\$10,073	2.0%
<b>Total</b>	<b>\$10,697</b>	<b>\$11,659</b>	<b>\$12,902</b>	<b>\$14,276</b>	<b>\$15,488</b>	<b>\$16,480</b>	<b>\$17,324</b>	<b>1.7%</b>
<b>World</b>								
Energy-intensive manufacturing	\$35,153	\$38,370	\$43,744	\$49,340	\$54,862	\$60,696	\$66,413	2.3%
Non-energy-intensive manufacturing	\$59,259	\$66,230	\$77,427	\$87,948	\$97,286	\$106,185	\$113,645	2.4%
Nonmanufacturing	\$41,304	\$44,494	\$50,644	\$56,081	\$61,158	\$66,234	\$70,831	1.9%
Services	\$147,437	\$161,778	\$189,604	\$217,928	\$247,104	\$277,753	\$308,224	2.7%
<b>Total</b>	<b>\$283,153</b>	<b>\$310,873</b>	<b>\$361,419</b>	<b>\$411,298</b>	<b>\$460,409</b>	<b>\$510,869</b>	<b>\$559,114</b>	<b>2.5%</b>

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](http://www.eia.gov/aeo); Oxford Economics, Global Industry Model (March 2023), [www.oxfordeconomics.com](http://www.oxfordeconomics.com) (subscription site)

Note: Totals may not equal sum of components due to independent rounding. Gross output is sales or revenue, including final and intermediate goods and services, measured in purchasing power parity. Nonmanufacturing includes agriculture, construction, and mining; energy-intensive manufacturing includes food, pulp and paper, basic chemicals, refining, iron and steel, nonferrous metals, and nonmetallic minerals; non-energy-intensive manufacturing includes all other manufacturing industries; services includes all other non-industrial output.

**Table A17. World employment by region, High Zero-carbon Technology Cost case**

million persons

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>467</b>	<b>487</b>	<b>504</b>	<b>519</b>	<b>531</b>	<b>541</b>	<b>547</b>	<b>0.6%</b>
United States	158	162	165	169	174	178	182	0.5%
Canada	20	20	21	23	23	24	25	0.9%
Mexico	57	59	62	64	66	67	68	0.6%
Brazil	98	102	105	106	106	104	102	0.1%
Other Americas	134	144	151	157	162	167	171	0.9%
<b>Europe and Eurasia</b>	<b>415</b>	<b>418</b>	<b>421</b>	<b>419</b>	<b>416</b>	<b>410</b>	<b>403</b>	<b>-0.1%</b>
Western Europe	289	291	292	291	288	285	282	-0.1%
Russia	72	71	70	69	67	64	60	-0.6%
Eastern Europe and Eurasia	54	55	58	59	60	61	60	0.4%
<b>Asia Pacific</b>	<b>1,855</b>	<b>1,920</b>	<b>1,983</b>	<b>2,027</b>	<b>2,044</b>	<b>2,058</b>	<b>2,051</b>	<b>0.4%</b>
Japan	67	68	65	62	57	53	50	-1.0%
South Korea	28	28	28	26	25	23	21	-1.0%
Australia and New Zealand	16	17	19	20	21	22	23	1.2%
China	750	758	754	741	706	675	633	-0.6%
India	481	508	548	584	620	654	683	1.3%
Other Asia Pacific	512	541	570	594	615	630	641	0.8%
<b>Africa and Middle East</b>	<b>547</b>	<b>593</b>	<b>671</b>	<b>755</b>	<b>842</b>	<b>928</b>	<b>1,014</b>	<b>2.2%</b>
Africa	470	511	584	662	745	829	913	2.4%
Middle East	77	82	87	93	97	99	101	1.0%
<b>World</b>	<b>3,283</b>	<b>3,417</b>	<b>3,579</b>	<b>3,721</b>	<b>3,832</b>	<b>3,937</b>	<b>4,015</b>	<b>0.7%</b>

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](http://www.eia.gov/aeo); Oxford Economics, Global Economic Model (February 2023), [www.oxfordeconomics.com](http://www.oxfordeconomics.com) (subscription site)

Note: Totals may not equal sum of components due to independent rounding.

**Table A18. World disposable income per capita by region, High Zero-carbon Technology Cost case**

2015 dollars per person (PPP)

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
<b>Americas</b>	<b>\$21,783</b>	<b>\$22,267</b>	<b>\$23,218</b>	<b>\$24,468</b>	<b>\$25,851</b>	<b>\$27,349</b>	<b>\$28,912</b>	<b>1.0%</b>
United States	\$46,720	\$49,179	\$51,491	\$54,268	\$57,596	\$61,178	\$64,734	1.2%
Canada	\$27,994	\$28,072	\$29,526	\$31,240	\$32,955	\$34,701	\$36,520	1.0%
Mexico	\$16,588	\$15,606	\$16,547	\$17,598	\$18,693	\$19,928	\$21,357	0.9%
Brazil	\$11,919	\$11,581	\$11,784	\$12,427	\$12,803	\$13,125	\$13,416	0.4%
Other Americas	\$3,825	\$3,709	\$3,996	\$4,276	\$4,527	\$4,759	\$4,996	1.0%
<b>Europe and Eurasia</b>	<b>\$20,359</b>	<b>\$20,753</b>	<b>\$21,962</b>	<b>\$23,334</b>	<b>\$24,878</b>	<b>\$26,566</b>	<b>\$28,465</b>	<b>1.2%</b>
Western Europe	\$24,026	\$24,228	\$25,354	\$26,673	\$28,189	\$29,818	\$31,616	1.0%
Russia	\$15,436	\$16,286	\$17,933	\$19,152	\$20,256	\$21,449	\$22,767	1.4%
Eastern Europe and Eurasia	\$9,016	\$9,839	\$11,191	\$13,088	\$15,309	\$17,826	\$20,728	3.0%
<b>Asia Pacific</b>	<b>\$8,187</b>	<b>\$9,145</b>	<b>\$11,152</b>	<b>\$13,277</b>	<b>\$15,415</b>	<b>\$17,714</b>	<b>\$19,997</b>	<b>3.2%</b>
Japan	\$22,970	\$24,036	\$25,238	\$25,963	\$26,810	\$27,721	\$28,763	0.8%
South Korea	\$22,258	\$22,966	\$24,506	\$26,301	\$27,735	\$29,325	\$31,165	1.2%
Australia and New Zealand	\$32,814	\$32,360	\$35,481	\$37,646	\$39,314	\$40,755	\$42,136	0.9%
China	\$10,529	\$12,236	\$15,487	\$19,158	\$22,898	\$27,105	\$31,370	4.0%
India	\$5,497	\$6,309	\$8,260	\$10,437	\$12,682	\$15,092	\$17,572	4.2%
Other Asia Pacific	\$5,851	\$6,319	\$7,422	\$8,397	\$9,398	\$10,405	\$11,373	2.4%
<b>Africa and Middle East</b>	<b>\$2,228</b>	<b>\$2,283</b>	<b>\$2,401</b>	<b>\$2,518</b>	<b>\$2,653</b>	<b>\$2,790</b>	<b>\$2,927</b>	<b>1.0%</b>
Africa	\$1,652	\$1,703	\$1,824	\$1,951	\$2,090	\$2,229	\$2,371	1.3%
Middle East	\$5,155	\$5,289	\$5,519	\$5,723	\$5,977	\$6,252	\$6,510	0.8%
<b>World</b>	<b>\$10,136</b>	<b>\$10,677</b>	<b>\$11,858</b>	<b>\$13,113</b>	<b>\$14,365</b>	<b>\$15,680</b>	<b>\$16,962</b>	<b>1.9%</b>

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](http://www.eia.gov/aeo); Oxford Economics, Global Economic Model (February 2023), [www.oxfordeconomics.com](http://www.oxfordeconomics.com) (subscription site)

Note: Totals may not equal sum of components due to independent rounding. PPP=purchasing power parity.