

Table J1. World carbon dioxide intensity of energy use by region, High Zero-carbon Technology Cost case

metric tons per billion British thermal units

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
Americas	45.8	44.6	41.8	40.7	40.3	40.1	39.7	-0.5%
United States	49.0	47.1	43.8	42.4	41.6	41.4	41.1	-0.6%
Canada	37.4	36.9	33.2	32.7	32.4	31.9	31.3	-0.6%
Mexico	54.1	54.7	53.0	51.9	51.8	51.2	50.3	-0.3%
Brazil	29.4	30.0	29.6	28.3	27.9	27.3	27.0	-0.3%
Other Americas	45.4	45.6	44.8	45.3	46.1	46.5	46.0	0.0%
Europe and Eurasia	48.9	48.3	46.6	45.4	44.5	44.7	44.4	-0.3%
Western Europe	45.2	44.4	42.1	40.5	38.9	39.0	38.3	-0.6%
Russia	54.1	54.1	53.5	52.8	53.0	53.0	53.0	-0.1%
Eastern Europe and Eurasia	60.3	59.1	58.1	57.4	57.8	57.9	57.8	-0.1%
Asia Pacific	63.9	61.9	60.6	58.9	57.0	54.9	53.8	-0.6%
Japan	55.9	54.9	50.5	49.7	48.3	47.9	46.9	-0.6%
South Korea	49.3	48.1	47.0	46.2	45.4	44.8	44.2	-0.4%
Australia and New Zealand	56.4	54.7	54.7	53.3	51.8	51.0	49.7	-0.5%
China	66.7	64.3	62.2	60.8	58.2	55.6	54.6	-0.7%
India	63.9	61.9	61.2	57.4	54.8	51.4	48.6	-1.0%
Other Asia Pacific	62.0	60.9	61.5	61.1	61.1	61.6	62.4	0.0%
Africa and Middle East	57.7	56.5	54.7	53.8	53.2	52.9	52.6	-0.3%
Africa	54.7	53.1	51.2	50.4	49.8	49.5	49.3	-0.4%
Middle East	59.5	58.7	57.2	56.4	56.1	55.9	55.8	-0.2%
World	55.9	54.7	53.1	51.9	50.7	49.7	49.0	-0.5%

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; Oxford Economics, Global Economic Model (February 2023), www.oxfordeconomics.com (subscription site)

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

Table J2. World energy intensity by region, High Zero-carbon Technology Cost case

thousand British thermal units per 2015 dollar of GDP (PPP)

Region	2022	2025	2030	2035	2040	2045	2050	Average annual percentage change, 2022–2050
Americas	4.7	4.5	4.2	3.9	3.6	3.4	3.2	-1.3%
United States	4.8	4.6	4.2	3.8	3.5	3.2	3.0	-1.7%
Canada	8.2	7.8	7.4	7.1	7.0	6.9	6.8	-0.7%
Mexico	3.3	3.1	3.1	2.9	2.8	2.8	2.7	-0.6%
Brazil	4.7	4.7	4.4	4.4	4.3	4.3	4.3	-0.3%
Other Americas	3.8	3.6	3.4	3.2	3.0	2.9	2.7	-1.2%
Europe and Eurasia	4.1	4.0	3.7	3.6	3.4	3.3	3.2	-0.9%
Western Europe	3.2	3.1	3.0	2.8	2.7	2.6	2.6	-0.8%
Russia	8.9	8.5	8.1	8.1	8.0	7.9	7.9	-0.4%
Eastern Europe and Eurasia	7.3	6.7	5.6	4.8	4.2	3.8	3.4	-2.6%
Asia Pacific	5.0	4.6	4.0	3.6	3.3	3.0	2.8	-2.0%
Japan	3.5	3.4	3.0	2.9	2.8	2.8	2.7	-0.9%
South Korea	5.7	5.5	5.3	5.1	5.0	4.9	4.8	-0.6%
Australia and New Zealand	4.7	4.4	4.0	3.8	3.6	3.5	3.4	-1.2%
China	6.5	5.9	5.0	4.3	3.8	3.5	3.2	-2.5%
India	3.8	3.6	3.4	3.2	3.0	2.9	2.8	-1.1%
Other Asia Pacific	3.3	3.1	2.9	2.7	2.5	2.3	2.2	-1.4%
Africa and Middle East	4.9	4.8	4.4	4.2	4.1	4.0	4.0	-0.7%
Africa	3.4	3.4	3.3	3.2	3.1	3.2	3.1	-0.3%
Middle East	6.6	6.4	5.9	5.6	5.4	5.3	5.3	-0.8%
World	4.7	4.5	4.0	3.7	3.5	3.3	3.1	-1.5%

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; Oxford Economics, Global Economic Model (February 2023), www.oxfordeconomics.com (subscription site)

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

Table J3. Gross domestic product per capita expressed in purchasing power parity, 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
Americas	\$31,157	\$31,841	\$34,159	\$36,584	\$39,558	\$42,958	\$46,781	1.5%
United States	\$62,055	\$63,200	\$67,669	\$72,440	\$78,798	\$86,028	\$93,991	1.5%
Canada	\$46,012	\$46,253	\$49,072	\$51,283	\$53,779	\$56,409	\$59,232	0.9%
Mexico	\$18,504	\$19,041	\$20,343	\$21,687	\$23,103	\$24,690	\$26,505	1.3%
Brazil	\$14,748	\$15,254	\$16,497	\$17,416	\$17,939	\$18,401	\$18,791	0.9%
Other Americas	\$13,335	\$14,019	\$15,448	\$17,049	\$18,914	\$21,054	\$23,488	2.0%
Europe and Eurasia	\$34,499	\$35,994	\$38,689	\$41,364	\$44,362	\$47,600	\$51,237	1.4%
Western Europe	\$41,486	\$42,969	\$45,890	\$48,685	\$51,779	\$55,050	\$58,660	1.2%
Russia	\$26,045	\$27,854	\$29,991	\$31,610	\$33,434	\$35,465	\$37,745	1.3%
Eastern Europe and Eurasia	\$11,953	\$13,275	\$15,969	\$19,432	\$23,427	\$27,916	\$33,070	3.7%
Asia Pacific	\$13,714	\$15,412	\$18,616	\$21,793	\$24,888	\$28,188	\$31,422	3.0%
Japan	\$42,134	\$44,172	\$46,819	\$48,386	\$50,156	\$52,016	\$54,196	0.9%
South Korea	\$44,198	\$47,031	\$51,353	\$54,991	\$57,950	\$61,410	\$65,404	1.4%
Australia and New Zealand	\$48,913	\$50,380	\$54,929	\$58,111	\$60,625	\$62,844	\$64,994	1.0%
China	\$18,499	\$21,343	\$26,484	\$31,698	\$36,530	\$41,761	\$46,629	3.4%
India	\$7,066	\$8,263	\$10,966	\$13,853	\$16,836	\$20,046	\$23,402	4.4%
Other Asia Pacific	\$10,767	\$11,966	\$14,213	\$16,400	\$18,730	\$21,166	\$23,650	2.9%
Africa and Middle East	\$7,741	\$7,925	\$8,159	\$8,390	\$8,557	\$8,672	\$8,758	0.4%
Africa	\$5,088	\$5,176	\$5,430	\$5,658	\$5,858	\$6,043	\$6,217	0.7%
Middle East	\$21,225	\$22,184	\$22,899	\$23,819	\$24,493	\$24,899	\$25,149	0.6%
World	\$17,167	\$18,259	\$20,390	\$22,443	\$24,466	\$26,579	\$28,657	1.8%

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; Oxford Economics, Global Economic Model (February 2023), www.oxfordeconomics.com (subscription site)

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

Table J4. 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
Americas	1,036	1,057	1,091	1,120	1,143	1,161	1,175	0.4%
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%
Europe and Eurasia	920	923	928	932	934	935	933	0.1%
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%
Asia Pacific	4,287	4,358	4,474	4,568	4,640	4,690	4,712	0.3%
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%
Africa and Middle East	1,658	1,772	1,968	2,170	2,375	2,581	2,784	1.9%
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%
World	7,901	8,111	8,462	8,789	9,092	9,366	9,603	0.7%

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; Oxford Economics, Global Economic Model (February 2023), www.oxfordeconomics.com (subscription site)

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