

**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.