

**Table A20. Macroeconomic indicators**  
(billion 2009 chain-weighted dollars, unless otherwise noted)

Indicators	Reference case							Annual growth 2018-2050 (percent)
	2017	2018	2025	2030	2035	2040	2050	
<b>Real gross domestic product .....</b>	<b>17,096</b>	<b>17,582</b>	<b>20,116</b>	<b>22,157</b>	<b>24,348</b>	<b>26,675</b>	<b>32,006</b>	<b>1.9%</b>
<b>Components of real gross domestic product</b>								
Real consumption .....	11,891	12,180	14,087	15,600	17,225	18,975	23,009	2.0%
Real investment .....	2,314	2,450	3,020	3,367	3,794	4,250	5,343	2.5%
Real government spending .....	2,903	2,958	3,070	3,162	3,258	3,358	3,578	0.6%
Real exports .....	2,191	2,310	3,177	3,695	4,321	5,053	6,806	3.4%
Real imports .....	2,813	2,974	3,959	4,398	4,983	5,654	7,383	2.9%
<b>Energy intensity</b> (thousand Btu per 2009 dollar of GDP)								
Delivered energy .....	4.25	4.26	3.76	3.41	3.12	2.91	2.56	-1.6%
Total energy .....	5.70	5.70	4.94	4.48	4.08	3.79	3.33	-1.7%
<b>Price indices</b>								
GDP chain-type price index (2009=1.00) .....	1.13	1.16	1.38	1.54	1.71	1.91	2.42	2.3%
Consumer price index (1982-4=1.00)								
All-urban .....	2.45	2.51	2.96	3.31	3.70	4.14	5.24	2.3%
Energy commodities and services .....	2.05	2.20	2.49	2.77	3.14	3.57	4.66	2.4%
Wholesale price index (1982=1.00)								
All commodities .....	1.94	2.02	2.34	2.58	2.80	3.03	3.59	1.8%
Fuel and power .....	1.64	1.83	2.32	2.74	3.16	3.62	4.74	3.0%
Metals and metal products .....	2.08	2.25	2.43	2.49	2.53	2.58	2.67	0.5%
Industrial commodities excluding energy .....	2.00	2.06	2.32	2.49	2.66	2.84	3.25	1.4%
<b>Interest rates (percent, nominal)</b>								
Federal funds rate .....	1.00	1.83	2.97	2.72	2.72	2.72	2.72	--
10-year treasury note .....	2.33	3.08	3.70	3.68	3.67	3.65	3.65	--
AA utility bond rate .....	3.82	4.35	5.79	5.79	5.84	5.85	5.96	--
<b>Value of shipments (billion 2009 dollars)</b>								
Non-industrial and service sectors .....	22,237	22,924	26,734	29,744	33,383	37,544	46,761	2.3%
Total industrial .....	7,444	7,686	8,803	9,570	10,400	11,299	13,312	1.7%
Agriculture, mining, and construction .....	2,062	2,146	2,504	2,639	2,788	2,938	3,280	1.3%
Manufacturing .....	5,382	5,540	6,298	6,931	7,611	8,360	10,032	1.9%
Energy-intensive .....	1,906	1,950	2,141	2,260	2,377	2,516	2,808	1.1%
Non-energy-intensive .....	3,476	3,590	4,157	4,671	5,234	5,844	7,224	2.2%
<b>Total shipments .....</b>	<b>29,681</b>	<b>30,610</b>	<b>35,537</b>	<b>39,314</b>	<b>43,783</b>	<b>48,843</b>	<b>60,073</b>	<b>2.1%</b>
<b>Population and employment (millions)</b>								
Population, with armed forces overseas .....	326	328	345	355	365	374	389	0.5%
Population, aged 16 and over .....	261	263	278	288	297	305	320	0.6%
Population, aged 65 and over .....	51	53	66	73	78	81	86	1.5%
Employment, nonfarm .....	146	149	155	159	164	169	179	0.6%
Employment, manufacturing .....	12.1	12.3	13.2	13.5	13.8	14.1	14.7	0.6%
<b>Key labor indicators</b>								
Labor force (millions) .....	160	162	170	174	180	185	195	0.6%
Nonfarm labor productivity (2009=1.00) .....	1.08	1.10	1.22	1.33	1.43	1.53	1.76	1.5%
Unemployment rate (percent) .....	4.35	3.87	4.54	4.49	4.58	4.72	4.71	--
<b>Key indicators for energy demand</b>								
Real disposable personal income .....	12,764	13,037	15,379	17,287	19,256	21,290	25,744	2.1%
Housing starts (millions) .....	1.30	1.45	1.57	1.53	1.55	1.52	1.60	0.3%
Commercial floorspace (billion square feet) .....	91	92	99	104	109	115	125	1.0%
Unit sales of light-duty vehicles (millions) .....	17.2	16.9	16.3	16.6	17.3	17.7	18.0	0.2%

GDP = Gross domestic product.

Btu = British thermal unit.

-- = Not applicable.

Sources: 2017 and 2018: IHS Markit, Macroeconomic and Employment models, August 2018; and IHS Markit, Industry model, May 2018. Projections: U.S. Energy Information Administration, AEO2019 National Energy Modeling System run ref2019.d111618a.

**Table A21. International petroleum and other liquids supply, disposition, and prices**  
(million barrels per day, unless otherwise noted)

Supply, disposition, and prices	Reference case							Annual growth 2018-2050 (percent)
	2017	2018	2025	2030	2035	2040	2050	
<b>Crude oil spot prices</b>								
<b>(2018 dollars per barrel)</b>								
Brent .....	55	74	82	93	100	105	108	1.2%
West Texas Intermediate .....	52	68	78	87	95	100	105	1.3%
<b>(nominal dollars per barrel)</b>								
Brent .....	54	74	97	124	148	174	226	3.5%
West Texas Intermediate .....	51	68	93	116	141	166	219	3.7%
<b>Petroleum and other liquids consumption<sup>1</sup></b>								
OECD								
United States (50 states) .....	19.92	20.40	19.83	19.35	19.09	19.24	20.18	0.0%
United States territories .....	0.25	0.25	0.27	0.28	0.29	0.30	0.33	0.9%
Canada .....	2.44	2.40	2.40	2.36	2.35	2.36	2.43	0.0%
Mexico and Chile .....	2.34	2.34	2.40	2.44	2.52	2.63	2.72	0.5%
OECD Europe <sup>2</sup> .....	14.54	14.52	14.39	14.14	13.99	13.89	13.46	-0.2%
Japan .....	3.89	3.78	3.37	3.30	3.26	3.20	3.13	-0.6%
South Korea .....	2.58	2.64	2.71	2.72	2.76	2.81	2.93	0.3%
Australia and New Zealand .....	1.34	1.39	1.58	1.65	1.70	1.79	2.08	1.3%
<b>Total OECD consumption .....</b>	<b>47.32</b>	<b>47.71</b>	<b>46.95</b>	<b>46.24</b>	<b>45.95</b>	<b>46.21</b>	<b>47.25</b>	<b>0.0%</b>
Non-OECD								
Russia .....	3.68	3.75	3.82	3.67	3.63	3.61	3.53	-0.2%
Other Europe and Eurasia <sup>3</sup> .....	1.86	1.91	1.94	1.89	1.87	1.89	1.93	0.0%
China .....	13.36	13.87	16.56	17.08	17.24	17.18	16.42	0.5%
India .....	4.55	4.79	6.09	7.06	8.51	10.13	12.84	3.1%
Other Asia <sup>4</sup> .....	8.66	8.85	10.37	11.47	12.73	14.18	16.80	2.0%
Middle East .....	8.39	8.45	8.68	8.35	8.74	9.21	10.17	0.6%
Africa .....	4.27	4.38	4.91	5.21	5.65	6.23	7.72	1.8%
Brazil .....	3.04	3.05	3.50	3.66	3.76	3.86	3.99	0.8%
Other Central and South America .....	3.22	3.15	3.40	3.47	3.56	3.71	4.06	0.8%
<b>Total non-OECD consumption .....</b>	<b>51.04</b>	<b>52.21</b>	<b>59.27</b>	<b>61.85</b>	<b>65.68</b>	<b>70.00</b>	<b>77.46</b>	<b>1.2%</b>
<b>Total consumption .....</b>	<b>98.36</b>	<b>99.93</b>	<b>106.22</b>	<b>108.09</b>	<b>111.63</b>	<b>116.21</b>	<b>124.72</b>	<b>0.7%</b>
<b>Petroleum and other liquids production</b>								
OPEC <sup>5</sup>								
Middle East .....	29.76	30.07	31.81	32.36	34.01	35.97	39.78	0.9%
North Africa .....	2.57	2.64	2.20	2.50	2.91	3.38	4.22	1.5%
West Africa .....	4.36	4.40	4.88	4.95	5.07	5.20	6.18	1.1%
South America .....	2.60	1.97	1.08	1.47	1.97	2.56	3.53	1.8%
<b>Total OPEC production .....</b>	<b>39.29</b>	<b>39.09</b>	<b>39.97</b>	<b>41.27</b>	<b>43.96</b>	<b>47.13</b>	<b>53.70</b>	<b>1.0%</b>
Non-OPEC								
OECD								
United States (50 states) .....	15.56	17.63	22.09	22.70	22.67	22.43	20.08	0.4%
Canada .....	4.96	5.12	5.46	5.55	5.85	6.21	7.17	1.1%
Mexico and Chile .....	2.27	2.18	2.13	2.15	2.30	2.61	3.51	1.5%
OECD Europe <sup>2</sup> .....	3.89	3.89	3.94	3.70	3.56	3.33	2.92	-0.9%
Japan and South Korea .....	0.23	0.24	0.29	0.30	0.30	0.29	0.29	0.6%
Australia and New Zealand .....	0.39	0.41	0.54	0.52	0.51	0.60	0.83	2.2%
<b>Total OECD production .....</b>	<b>27.31</b>	<b>29.48</b>	<b>34.44</b>	<b>34.91</b>	<b>35.19</b>	<b>35.48</b>	<b>34.79</b>	<b>0.5%</b>
Non-OECD								
Russia .....	11.20	11.37	10.84	10.69	10.81	11.24	11.75	0.1%
Other Europe and Eurasia <sup>3</sup> .....	3.27	3.37	3.48	3.62	3.70	3.65	3.47	0.1%
China .....	4.78	4.79	5.38	5.45	5.50	5.66	6.04	0.7%
Other Asia <sup>4</sup> .....	3.86	3.80	3.46	3.23	3.20	3.22	3.41	-0.3%
Middle East .....	1.07	1.09	0.97	0.85	0.82	0.81	0.85	-0.8%
Africa .....	1.53	1.48	1.54	1.49	1.48	1.49	1.61	0.3%
Brazil .....	3.36	3.51	4.19	4.65	5.00	5.33	6.18	1.8%
Other Central and South America .....	1.96	1.96	1.96	1.90	1.95	2.20	2.92	1.3%
<b>Total non-OECD production .....</b>	<b>31.03</b>	<b>31.37</b>	<b>31.82</b>	<b>31.90</b>	<b>32.48</b>	<b>33.59</b>	<b>36.23</b>	<b>0.5%</b>
<b>Total petroleum and other liquids production ....</b>	<b>97.63</b>	<b>99.93</b>	<b>106.22</b>	<b>108.09</b>	<b>111.63</b>	<b>116.21</b>	<b>124.72</b>	<b>0.7%</b>
OPEC market share (percent) .....	40.2	39.1	37.6	38.2	39.4	40.6	43.1	--

**Table A21. International petroleum and other liquids supply, disposition, and prices (continued)**  
(million barrels per day, unless otherwise noted)

Supply, disposition, and prices	Reference case							Annual growth 2018-2050 (percent)
	2017	2018	2025	2030	2035	2040	2050	
<b>Selected world production subtotals:</b>								
Crude oil and equivalents <sup>6</sup> .....	81.06	82.50	86.73	87.89	91.00	95.13	103.24	0.7%
Tight oil.....	5.42	6.87	9.77	10.58	10.75	11.18	12.71	1.9%
Bitumen <sup>7</sup> .....	2.53	2.76	3.38	3.55	3.73	3.92	4.33	1.4%
Refinery processing gain <sup>8</sup> .....	2.59	2.62	2.92	3.02	3.13	3.25	3.45	0.9%
Natural gas plant liquids.....	10.60	11.18	12.80	13.26	13.41	13.49	13.53	0.6%
Liquids from renewable sources <sup>9</sup> .....	2.32	2.39	2.62	2.88	3.09	3.34	3.45	1.1%
Liquids from coal <sup>10</sup> .....	0.30	0.30	0.18	0.20	0.22	0.24	0.29	-0.1%
Liquids from natural gas <sup>11</sup> .....	0.23	0.23	0.41	0.41	0.42	0.42	0.44	2.0%
Liquids from kerogen <sup>12</sup> .....	0.01	0.01	0.01	0.01	0.01	0.01	0.01	1.0%
<b>Crude oil production<sup>6</sup></b>								
<b>OPEC<sup>5</sup></b>								
Middle East.....	26.48	26.77	28.41	28.98	30.64	32.62	36.45	1.0%
North Africa.....	2.20	2.29	1.86	2.08	2.40	2.77	3.29	1.1%
West Africa.....	4.24	4.27	4.71	4.77	4.90	5.02	5.99	1.1%
South America.....	2.53	1.93	1.05	1.43	1.93	2.53	3.49	1.9%
<b>Total OPEC production.....</b>	<b>35.46</b>	<b>35.25</b>	<b>36.03</b>	<b>37.27</b>	<b>39.87</b>	<b>42.94</b>	<b>49.23</b>	<b>1.0%</b>
<b>Non-OPEC</b>								
<b>OECD</b>								
United States (50 states).....	9.36	10.74	14.09	14.46	14.33	14.05	11.86	0.3%
Canada.....	3.98	4.15	4.42	4.45	4.74	5.10	6.05	1.2%
Mexico and Chile.....	1.98	1.92	1.86	1.88	2.02	2.34	3.23	1.6%
OECD Europe <sup>2</sup> .....	2.92	2.91	2.72	2.43	2.28	2.02	1.57	-1.9%
Japan and South Korea.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.0%
Australia and New Zealand.....	0.29	0.32	0.40	0.38	0.38	0.47	0.70	2.5%
<b>Total OECD production.....</b>	<b>18.54</b>	<b>20.04</b>	<b>23.50</b>	<b>23.61</b>	<b>23.75</b>	<b>23.98</b>	<b>23.41</b>	<b>0.5%</b>
<b>Non-OECD</b>								
Russia.....	10.58	10.75	10.17	10.03	10.14	10.58	11.09	0.1%
Other Europe and Eurasia <sup>3</sup> .....	3.05	3.13	3.22	3.35	3.43	3.38	3.19	0.1%
China.....	3.84	3.77	4.24	4.24	4.22	4.24	4.54	0.6%
Other Asia <sup>4</sup> .....	3.03	2.96	2.53	2.24	2.18	2.15	2.27	-0.8%
Middle East.....	1.04	1.06	0.95	0.83	0.81	0.79	0.83	-0.8%
Africa.....	1.32	1.27	1.23	1.18	1.16	1.17	1.28	0.0%
Brazil.....	2.62	2.67	3.31	3.67	3.91	4.13	4.94	1.9%
Other Central and South America.....	1.59	1.59	1.54	1.48	1.52	1.77	2.47	1.4%
<b>Total non-OECD production.....</b>	<b>27.06</b>	<b>27.21</b>	<b>27.20</b>	<b>27.01</b>	<b>27.37</b>	<b>28.20</b>	<b>30.60</b>	<b>0.4%</b>
<b>Total crude oil production<sup>6</sup>.....</b>	<b>81.06</b>	<b>82.50</b>	<b>86.73</b>	<b>87.89</b>	<b>91.00</b>	<b>95.13</b>	<b>103.24</b>	<b>0.7%</b>
OPEC market share (percent).....	43.7	42.7	41.5	42.4	43.8	45.1	47.7	0.3%

<sup>1</sup>Estimated consumption. Includes both OPEC and non-OPEC consumers in the regional breakdown.

<sup>2</sup>OECD Europe = Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and United Kingdom. (Note: Israel is included in OECD Europe for statistical reporting purposes. Latvia became an OECD member country on July 16, 2016, but it is not reported in OECD Europe for AEO2018.)

<sup>3</sup>Other Europe and Eurasia = Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Faroe Islands, Georgia, Gibraltar, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Malta, Moldova, Montenegro, Romania, Serbia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. (Note: Latvia became an OECD member country on July 16, 2016, but it is reported in Other Europe and Eurasia for AEO2018.)

<sup>4</sup>Other Asia = Afghanistan, Bangladesh, Bhutan, Brunei, Burma (Myanmar), Cambodia (Kampuchea), Cook Islands, Fiji, French Polynesia, Hawaiian Trade Zone, Hong Kong, India (for production), Indonesia, Kiribati, Laos, Macau, Malaysia, Maldives, Mongolia, Nauru, Nepal, New Caledonia, Niue, North Korea, Pakistan, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Sri Lanka, Taiwan, Thailand, Timor-Leste (East Timor), Tonga, Vanuatu, Vietnam, and Wake Islands.

<sup>5</sup>OPEC = Algeria, Angola, Ecuador, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

<sup>6</sup>Includes crude oil, lease condensate, tight oil (shale oil), extra-heavy oil, and bitumen (oil sands).

<sup>7</sup>Includes diluted and upgraded/synthetic bitumen (syncrude).

<sup>8</sup>The volumetric amount by which total output is greater than input due to the processing of crude oil into products which, in total, have a lower specific gravity than the crude oil processed.

<sup>9</sup>Includes liquids produced from energy crops.

<sup>10</sup>Includes liquids converted from coal via the Fischer-Tropsch coal-to-liquids process.

<sup>11</sup>Includes liquids converted from natural gas via the Fischer-Tropsch gas-to-liquids process.

<sup>12</sup>Includes liquids produced from kerogen (oil shale, not to be confused with tight oil (shale oil)).

OECD = Organization for Economic Cooperation and Development.

OPEC = Organization of the Petroleum Exporting Countries.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2017 are model results and may differ from official EIA data reports.

Sources: 2017 Brent and West Texas Intermediate crude oil spot prices: Thomson Reuters. 2017 quantities and projections: EIA, AEO2019 National Energy Modeling System run ref2019.d111618a and EIA, Generate World Oil Balance application.