3.8 Energy dependency and efficiency and carbon dioxide emissions

	Net energy imports[a]		GDP per unit of energy use		Carbon dioxide emissions							
	% of energy use		2005 PPP $ per kilogram of oil equivalent		Total million metric tons		Carbon intensity kilograms per kilogram of oil equivalent energy use		Per capita metric tons		kilograms per 2005 PPP $ of GDP	
	1990	2006	1990	2006	1990	2005	1990	2005	1990	2005	1990	2005
Afghanistan	..	..	..	..	2.6	0.7	..	..	..	..	..	0.0
Albania	8	47	4.8	8.9	7.3	3.5	2.7	1.5	2.2	1.1	0.6	0.2
Algeria	–337	–372	6.6	6.5	77.0	137.5	3.2	4.0	3.0	4.2	0.5	0.6
Angola	–356	–671	5.4	6.9	4.6	9.0	0.7	0.9	0.4	0.6	0.1	0.2
Argentina	–5	–21	5.3	6.6	109.7	152.7	2.4	2.4	3.4	3.9	0.5	0.4
Armenia	98	67	1.3	5.5	4.2	4.3	0.5	1.7	1.2	1.4	0.4	0.3
Australia	–80	–119	4.6	5.4	293.1	368.9	3.3	3.1	17.2	18.1	0.7	0.6
Austria	68	71	8.0	8.4	57.6	73.6	2.3	2.2	7.5	8.9	0.3	0.3
Azerbaijan	18	–171	1.3	3.6	46.1	36.6	1.8	2.6	6.4	4.4	1.4	1.0
Bangladesh	16	19	6.1	7.0	15.4	40.0	1.2	1.7	0.1	0.3	0.2	0.2
Belarus	92	86	1.5	3.2	107.8	63.3	2.5	2.4	10.6	6.5	1.6	0.8
Belgium	73	75	5.0	5.7	99.1	102.6	2.0	1.7	9.9	9.8	0.4	0.3
Benin	–6	39	3.2	3.8	0.7	2.6	0.4	1.0	0.1	0.3	0.1	0.2
Bolivia	–77	–144	7.4	6.2	5.5	9.3	2.0	1.7	0.8	1.0	0.3	0.3
Bosnia and Herzegovina	35	27	..	4.6	6.9	26.3	1.0	5.2	1.6	6.9	..	1.1
Botswana	29	45	7.3	11.7	2.2	4.6	1.7	2.4	1.6	2.5	0.2	0.2
Brazil	26	8	7.7	7.3	202.6	325.5	1.4	1.5	1.4	1.7	0.2	0.2
Bulgaria	67	46	2.3	3.7	75.3	44.4	2.6	2.2	8.6	5.7	1.1	0.6
Burkina Faso	..	..	..	..	0.6	0.7	..	..	0.1	0.1	0.1	0.1
Burundi	..	..	..	..	0.2	0.2	..	..	0.0	0.0	0.1	0.1
Cambodia	..	29	..	4.5	0.5	0.5	..	0.1	0.0	0.0	..	0.0
Cameroon	–118	–46	5.0	5.1	1.6	3.7	0.3	0.5	0.1	0.2	0.1	0.1
Canada	–31	–53	3.6	4.3	428.5	537.5	2.0	2.0	15.4	16.6	0.6	0.5
Central African Republic	..	..	..	..	0.2	0.3	..	..	0.1	0.1	0.1	0.1
Chad	..	..	..	..	0.1	0.1	..	..	0.0	0.0	0.0	0.0
Chile	46	67	6.2	7.0	35.3	66.1	2.5	2.2	2.7	4.1	0.4	0.3
China	–3	7	1.4	3.2	2,399.2	5,547.8	2.8	3.2	2.1	4.3	1.9	1.0
Hong Kong, China	100	100	12.7	14.3	26.2	38.6	2.5	2.1	4.6	5.7	0.2	0.2
Colombia	–95	–180	8.1	11.0	57.4	58.6	2.3	2.0	1.7	1.4	0.3	0.2
Congo, Dem. Rep.	–1	–2	1.9	0.9	4.0	2.1	0.3	0.1	0.1	0.0	0.2	0.1
Congo, Rep.	–997	–1,180	10.5	10.5	1.2	2.0	1.5	1.6	0.5	0.6	0.1	0.2
Costa Rica	49	49	9.5	9.3	2.9	7.3	1.4	1.8	0.9	1.7	0.2	0.2
Cote d'Ivoire	23	–28	5.4	4.1	5.4	8.7	1.2	1.1	0.4	0.5	0.2	0.3
Croatia	43	54	6.0	6.9	24.6	22.9	2.7	2.6	5.1	5.2	0.5	0.4
Cuba	61	53	..	..	32.0	24.3	1.9	2.5	3.0	2.2	..	..
Czech Republic	18	27	3.5	4.8	161.7	119.7	3.3	2.6	15.6	11.7	1.0	0.6
Denmark	44	–41	7.3	8.9	49.8	46.1	2.8	2.3	9.7	8.5	0.4	0.3
Dominican Republic	75	80	5.9	7.2	9.6	18.8	2.3	2.4	1.3	2.0	0.4	0.4
Ecuador	–169	–165	9.2	8.1	16.6	29.3	2.7	2.8	1.6	2.2	0.3	0.3
Egypt, Arab Rep.	–72	–25	5.8	5.7	75.4	173.5	2.4	2.8	1.4	2.4	0.4	0.5
El Salvador	32	44	7.8	7.6	2.6	6.4	1.0	1.4	0.5	1.0	0.1	0.2
Eritrea	*20*	27	*1.9*	4.0	..	0.8	..	1.0	..	0.2	..	0.3
Estonia	47	27	1.7	5.0	28.3	18.2	3.0	3.6	18.1	13.5	1.8	0.8
Ethiopia	7	9	1.8	2.3	3.0	7.9	0.2	0.4	0.1	0.1	0.1	0.2
Finland	58	52	4.1	4.5	50.6	53.2	1.8	1.5	10.1	10.1	0.4	0.3
France	51	50	6.2	7.0	363.3	377.7	1.6	1.4	6.4	6.2	0.3	0.2
Gabon	–1,077	–566	11.2	9.9	6.0	1.5	4.8	0.8	6.5	1.2	0.4	0.1
Gambia, The	..	..	..	..	0.2	0.3	..	..	0.2	0.2	0.2	0.2
Georgia	85	64	2.4	5.2	17.3	4.8	1.4	1.5	3.2	1.1	0.6	0.3
Germany	48	61	5.7	7.6	980.6	784.0	2.8	2.3	12.3	9.5	0.5	0.3
Ghana	18	32	2.5	2.9	3.8	7.3	0.7	0.8	0.2	0.3	0.3	0.3
Greece	59	68	8.0	9.3	72.2	95.4	3.2	3.1	7.1	8.6	0.4	0.3
Guatemala	24	34	6.6	6.6	5.1	11.4	1.1	1.4	0.6	0.9	0.2	0.2
Guinea	..	..	..	..	1.0	1.4	..	..	0.2	0.2	0.2	0.1
Guinea-Bissau	..	..	..	..	0.2	0.3	..	..	0.2	0.2	0.3	0.4
Haiti	21	23	7.3	4.0	1.0	1.8	0.6	0.7	0.1	0.2	0.1	0.2

Energy dependency and efficiency and carbon dioxide emissions

	Net energy imports[a]		GDP per unit of energy use		Carbon dioxide emissions							
	% of energy use		2005 PPP $ per kilogram of oil equivalent		Total million metric tons		Carbon intensity kilograms per kilogram of oil equivalent energy use		Per capita metric tons		kilograms per 2005 PPP $ of GDP	
	1990	2006	1990	2006	1990	2005	1990	2005	1990	2005	1990	2005
Honduras	30	53	5.4	5.5	2.6	7.4	1.1	1.9	0.5	1.1	0.2	0.3
Hungary	50	63	4.5	6.5	60.1	56.4	2.1	2.0	5.8	5.6	0.5	0.3
India	9	23	3.2	4.7	679.9	1,402.4	2.1	2.6	0.8	1.3	0.7	0.6
Indonesia	–65	–72	3.6	4.2	149.3	419.6	1.5	2.4	0.8	1.9	0.4	0.6
Iran, Islamic Rep.	–161	–81	4.9	4.0	218.3	451.6	3.2	2.9	4.0	6.5	0.6	0.7
Iraq	–451	–216	..	..	48.5	84.5	2.5	2.8	2.6	..	..	..
Ireland	66	90	6.0	10.9	30.6	42.3	3.0	2.8	8.7	10.2	0.5	0.3
Israel	96	88	6.9	7.9	33.1	63.6	2.7	3.0	7.1	9.2	0.4	0.4
Italy	83	85	9.1	9.1	395.7	452.1	2.7	2.4	7.0	7.7	0.3	0.3
Jamaica	84	89	4.2	3.6	8.0	10.2	2.7	2.6	3.3	3.8	0.6	0.6
Japan	83	81	7.2	7.5	1,080.7	1,230.0	2.4	2.3	8.7	9.6	0.3	0.3
Jordan	95	96	3.0	3.5	10.2	20.5	2.9	2.9	3.2	3.8	1.0	0.9
Kazakhstan	–23	–113	1.6	2.4	288.1	180.9	3.9	3.2	17.6	11.9	2.5	1.4
Kenya	20	21	3.0	2.8	5.8	11.1	0.5	0.6	0.2	0.3	0.2	0.2
Korea, Dem. Rep.	13	–3	..	..	244.6	82.6	7.4	3.9	12.1	3.5	..	..
Korea, Rep.	76	80	4.9	5.0	241.6	452.2	2.6	2.1	5.6	9.4	0.5	0.4
Kuwait	–530	–495	*2.8*	4.6	43.4	93.6	5.4	3.3	20.4	36.9	*0.6*	0.8
Kyrgyz Republic	67	47	1.5	3.3	12.6	5.6	1.7	2.0	2.8	1.1	1.1	0.6
Lao PDR	..	..	..	..	0.2	1.4	..	..	0.1	0.3	0.1	0.1
Latvia	86	60	3.4	7.3	14.5	6.5	1.8	1.4	5.4	2.8	0.5	0.2
Lebanon	94	96	6.8	8.1	9.1	16.9	3.9	3.0	3.1	4.2	0.6	0.4
Lesotho	..	..	..	..	..	..	..	..	..	..	..	..
Liberia	..	..	..	..	0.5	0.5	..	..	0.2	0.1	0.4	0.4
Libya	–534	–474	..	4.4	37.8	56.1	3.3	3.2	8.7	9.5	..	0.8
Lithuania	70	59	2.9	6.1	24.3	14.0	1.5	1.6	6.6	4.1	0.5	0.3
Macedonia, FYR	47	47	5.9	5.9	15.5	10.3	5.7	3.7	8.1	5.1	1.0	0.7
Madagascar	..	..	..	..	0.9	2.8	..	..	0.1	0.2	0.1	0.2
Malawi	..	..	..	..	0.6	1.0	..	..	0.1	0.1	0.1	0.1
Malaysia	–116	–43	5.2	4.7	55.3	239.8	2.4	3.6	3.1	9.3	0.5	0.8
Mali	..	..	..	..	0.4	0.6	..	..	0.1	0.0	0.1	0.0
Mauritania	..	..	..	..	2.6	1.6	..	..	1.4	0.6	0.9	0.3
Mauritius	..	..	..	..	1.5	3.4	..	..	1.4	2.7	0.2	0.3
Mexico	–57	–44	6.8	7.7	375.2	421.5	3.1	2.4	4.5	4.1	0.4	0.3
Moldova	99	97	1.7	2.6	23.8	8.1	2.4	2.3	5.4	2.1	1.4	0.9
Mongolia	20	–7	1.4	2.6	10.0	8.8	2.9	3.4	4.7	3.4	2.0	1.3
Morocco	89	95	9.3	8.3	23.5	48.0	3.3	3.6	1.0	1.6	0.4	0.4
Mozambique	6	–22	0.9	1.7	1.0	1.9	0.2	0.2	0.1	0.1	0.2	0.1
Myanmar	0	–55	1.3	*2.9*	4.3	11.3	0.4	0.8	0.1	0.2	0.3	0.3
Namibia	67	79	*8.1*	6.5	0.0	2.6	0.0	1.8	0.0	1.3	0.0	0.3
Nepal	5	11	2.3	2.9	0.6	3.1	0.1	0.3	0.0	0.1	0.0	0.1
Netherlands	10	24	5.8	7.3	139.7	125.8	2.1	1.5	9.3	7.7	0.4	0.2
New Zealand	13	26	4.6	5.9	22.5	29.9	1.6	1.7	6.5	7.2	0.4	0.3
Nicaragua	29	39	3.7	3.8	2.6	3.9	1.2	1.2	0.6	0.7	0.3	0.3
Niger	..	..	..	..	1.0	1.1	..	..	0.1	0.1	0.2	0.1
Nigeria	–112	–124	2.0	2.5	45.3	114.3	0.6	1.1	0.5	0.8	0.3	0.5
Norway	–456	–755	6.4	8.6	30.3	52.9	1.4	1.6	7.1	11.4	0.2	0.2
Oman	–740	–293	5.7	3.6	10.3	31.4	2.3	2.2	5.6	12.5	0.4	0.6
Pakistan	21	23	4.2	4.6	68.0	134.3	1.6	1.8	0.6	0.9	0.4	0.4
Panama	59	72	9.8	11.6	3.1	5.9	2.1	2.3	1.3	1.8	0.2	0.2
Papua New Guinea	..	..	..	..	2.4	4.4	..	..	0.6	0.7	0.3	0.4
Paraguay	–48	–69	5.5	6.0	2.3	3.9	0.7	1.0	0.5	0.7	0.1	0.2
Peru	–6	15	9.8	14.0	21.0	37.0	2.1	2.7	1.0	1.4	0.2	0.2
Philippines	48	43	5.7	6.1	43.9	75.0	1.7	1.7	0.7	0.9	0.3	0.3
Poland	1	20	3.1	5.7	347.6	302.4	3.5	3.3	9.1	7.9	1.1	0.6
Portugal	80	83	9.1	8.7	42.3	62.4	2.5	2.3	4.3	5.9	0.3	0.3
Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..

3.8 Energy dependency and efficiency and carbon dioxide emissions

	Net energy imports[a]		GDP per unit of energy use		Carbon dioxide emissions							
	% of energy use		2005 PPP $ per kilogram of oil equivalent		Total million metric tons		Carbon intensity kilograms per kilogram of oil equivalent energy use		Per capita metric tons		kilograms per 2005 PPP $ of GDP	
	1990	2006	1990	2006	1990	2005	1990	2005	1990	2005	1990	2005
Romania	35	30	2.9	5.4	155.1	89.1	2.5	2.3	6.7	4.1	0.9	0.4
Russian Federation	–46	–80	2.1	2.7	2,261.7	1,503.3	2.6	2.3	15.3	10.5	1.2	0.9
Rwanda	..	..	..	..	0.5	0.6	..	..	0.1	0.1	0.1	0.1
Saudi Arabia	–505	–291	5.1	3.5	197.4	381.1	3.2	2.7	12.1	16.5	0.6	0.8
Senegal	48	59	5.8	6.2	3.1	5.1	1.7	1.7	0.4	0.4	0.3	0.3
Serbia	31[b]	38	5.1[b]	4.1	65.4[b]	52.5[b]	3.0[b]	..	6.2[b]	6.5[b]	..	..
Sierra Leone	..	..	..	..	0.3	0.9	..	..	0.1	0.2	0.1	0.3
Singapore	100	100	5.4	6.5	41.9	56.3	3.1	1.8	13.8	13.2	0.6	0.3
Slovak Republic	75	65	3.1	5.1	51.4	36.6	2.4	1.9	9.7	6.8	0.8	0.4
Slovenia	48	54	5.9	6.8	18.0	14.8	3.2	2.0	9.0	7.4	0.6	0.3
Somalia	..	..	..	..	0.0	0.6	..	..	0.0	0.1	..	..
South Africa	–26	–22	3.0	3.2	331.9	408.8	3.6	3.2	9.4	8.7	1.2	1.0
Spain	62	78	8.4	8.5	211.8	343.7	2.3	2.4	5.5	7.9	0.3	0.3
Sri Lanka	24	41	6.3	8.0	3.8	11.0	0.7	1.2	0.2	0.6	0.1	0.2
Sudan	18	–73	2.5	3.9	5.4	10.6	0.5	0.6	0.2	0.3	0.2	0.2
Swaziland	..	..	..	..	0.4	1.0	..	..	0.6	0.8	0.1	0.2
Sweden	38	36	4.4	5.9	49.5	48.5	1.0	0.9	5.8	5.4	0.2	0.2
Switzerland	61	57	9.1	9.7	42.7	41.2	1.7	1.5	6.4	5.5	0.2	0.2
Syrian Arab Republic	–91	–40	3.2	4.2	35.8	68.4	3.1	3.7	2.8	3.6	1.0	0.9
Tajikistan	64	59	2.9	2.8	23.4	5.2	4.2	1.5	4.4	0.8	1.4	0.5
Tanzania	8	7	2.2	2.1	2.3	4.7	0.2	0.2	0.1	0.1	0.1	0.1
Thailand	40	46	5.1	4.5	95.7	270.9	2.2	2.7	1.8	4.3	0.4	0.6
Timor-Leste	..	..	..	..	..	0.2	..	..	..	0.2	..	0.2
Togo	19	15	2.6	2.0	0.8	1.3	0.6	0.6	0.2	0.2	0.2	0.3
Trinidad and Tobago	–109	–142	2.1	2.0	16.9	32.7	2.8	2.6	13.8	24.7	1.4	1.3
Tunisia	–11	24	6.4	7.8	13.3	22.0	2.6	2.6	1.6	2.2	0.4	0.3
Turkey	51	72	8.3	8.9	141.5	247.9	2.7	2.9	2.5	3.4	0.3	0.3
Turkmenistan	–281	–257	..	1.4	32.0	41.6	1.6	2.5	8.7	8.6	..	1.8
Uganda	..	..	..	..	0.8	2.3	..	..	0.0	0.1	0.1	0.1
Ukraine	47	40	1.6	2.1	684.0	327.1	2.7	2.3	13.2	6.9	1.6	1.2
United Arab Emirates	–375	–278	4.1	4.7	54.7	123.7	2.4	2.7	29.3	30.1	0.6	0.6
United Kingdom	2	19	6.4	8.6	569.2	546.4	2.7	2.3	9.9	9.1	0.4	0.3
United States	14	29	4.1	5.5	4,797.5	5,776.4	2.5	2.5	19.2	19.5	0.6	0.5
Uruguay	49	75	9.7	10.3	3.9	5.6	1.7	1.9	1.3	1.7	0.2	0.2
Uzbekistan	17	–20	0.9	1.2	125.3	112.4	2.7	2.4	6.1	4.3	3.1	2.1
Venezuela, RB	–239	–214	4.3	4.7	117.4	148.1	2.7	2.5	5.9	5.6	0.6	0.6
Vietnam	–2	–38	2.5	3.7	21.4	101.8	0.9	2.0	0.3	1.2	0.4	0.6
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	–266	–164	8.5	6.7	9.6	20.1	3.7	2.9	0.8	1.0	0.4	0.4
Zambia	10	9	1.8	2.0	2.4	2.4	0.4	0.3	0.3	0.2	0.2	0.2
Zimbabwe	9	9	..	..	16.6	11.5	1.8	1.2	1.6	0.9	..	..
World	**–2[c] w**	**–2[c] w**	**4.2 w**	**5.2 w**	**22,584.9[d] t**	**29,257.0[d] t**	**2.6[d] w**	**2.6[d] w**	**4.3[d] w**	**4.5[d] w**	**0.6[d] w**	**0.5[d] w**
Low income	–13	–28	2.5	3.2	518.7	722.5	1.3	1.3	0.7	0.6	0.3	0.4
Middle income	–22	–21	3.0	4.2	9,675.3	13,842.1	2.5	2.7	2.8	3.3	0.9	0.7
Lower middle income	–15	–9	2.6	3.9	4,882.2	9,447.7	2.5	2.9	1.8	2.8	1.0	0.8
Upper middle income	–29	–42	3.5	4.8	4,793.1	4,393.3	2.6	2.4	6.9	5.5	0.8	0.5
Low & middle income	–21	–21	3.0	4.1	10,193.8	14,564.1	2.4	2.6	2.4	2.7	0.8	0.6
East Asia & Pacific	–7	0	2.0	3.4	3,029.7	6,769.2	2.7	3.1	1.9	3.6	1.3	0.9
Europe & Central Asia	–10	–36	2.3	3.5	4,365.8	3,087.2	2.6	2.4	10.4	7.0	1.1	0.7
Latin America & Carib.	–33	–35	6.8	7.3	1,020.2	1,360.7	2.2	2.1	2.3	2.5	0.3	0.3
Middle East & N. Africa	–196	–115	5.5	5.0	565.4	1,112.6	3.0	3.0	2.5	3.7	0.5	0.6
South Asia	11	23	3.4	4.8	770.5	1,592.6	2.0	2.4	0.7	1.1	0.6	0.5
Sub-Saharan Africa	–52	–63	2.7	3.0	463.4	649.3	1.5	1.4	0.9	0.8	0.6	0.5
High income	16	18	5.2	6.3	11,003.2	13,099.7	2.5	2.3	11.8	12.6	0.5	0.4
Euro area	56	64	6.6	7.7	2,529.7	2,585.0	2.4	2.0	8.4	8.1	0.4	0.3

a. Negative values indicate that a country is a net exporter. b. Includes Kosovo and Montenegro. c. Deviation from zero is due to statistical errors and changes in stock. d. Includes emissions not allocated to specific countries.

Energy dependency and efficiency and carbon dioxide emissions 3.8

About the data

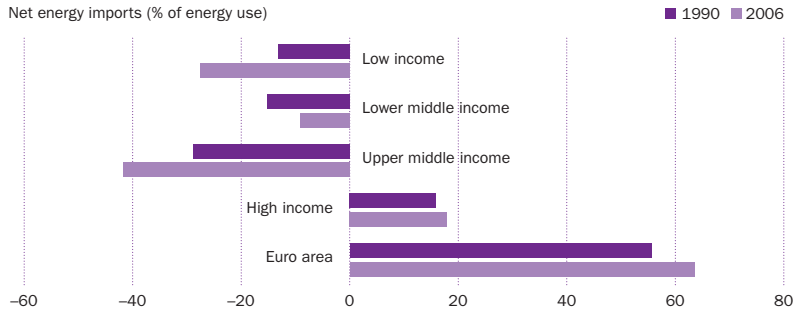
Because commercial energy is widely traded, its production and use need to be distinguished. Net energy imports show the extent to which an economy's use exceeds its production. High-income economies are net energy importers; middle-income economies are their main suppliers.

The ratio of gross domestic product (GDP) to energy use indicates energy efficiency. To produce comparable and consistent estimates of real GDP across economies relative to physical inputs to GDP—that is, units of energy use—GDP is converted to 2005 constant international dollars using purchasing power parity (PPP) rates. Differences in this ratio over time and across economies reflect structural changes in an economy, changes in sectoral energy efficiency, and differences in fuel mixes.

Carbon dioxide emissions, largely by-products of energy production and use (see table 3.7), account for the largest share of greenhouse gases, which are associated with global warming. Anthropogenic carbon dioxide emissions result primarily from fossil fuel combustion and cement manufacturing. In combustion different fossil fuels release different amounts of carbon dioxide for the same level of energy use: oil releases about 50 percent more carbon dioxide than natural gas, and coal releases about twice as much. Cement manufacturing releases about half a metric ton of carbon dioxide for each metric ton of cement produced.

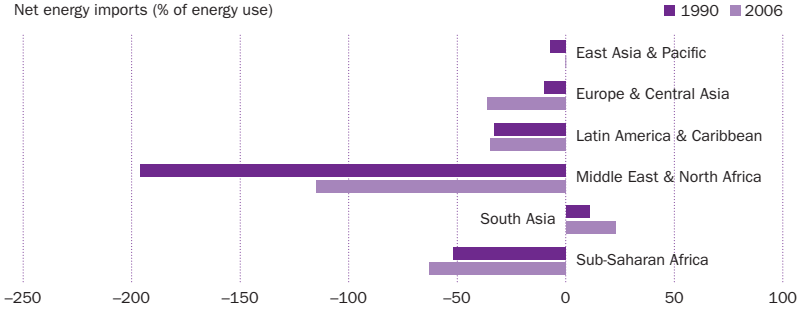
The U.S. Department of Energy's Carbon Dioxide Information Analysis Center (CDIAC) calculates annual anthropogenic emissions from data on fossil fuel consumption (from the United Nations Statistics Division's World Energy Data Set) and world cement manufacturing (from the U.S. Bureau of Mines's Cement Manufacturing Data Set). Carbon dioxide emissions, often calculated and reported as elemental carbon, were converted to actual carbon dioxide mass by multiplying them by 3.664 (the ratio of the mass of carbon to that of carbon dioxide). Although estimates of global carbon dioxide emissions are probably accurate within 10 percent (as calculated from global average fuel chemistry and use), country estimates may have larger error bounds. Trends estimated from a consistent time series tend to be more accurate than individual values. Each year the CDIAC recalculates the entire time series since 1949, incorporating recent findings and corrections. Estimates exclude fuels supplied to ships and aircraft in international transport because of the difficulty of apportioning the fuels among benefiting countries. The ratio of carbon dioxide per unit of energy shows carbon intensity, which is the amount of carbon dioxide emitted as a result of using one unit of energy in the process of production. The proportion of carbon dioxide per unit of GDP indicates how clean production processes are.

High-income economies depend on imported energy . . . **3.8a**



Note: Negative values indicate that the income group is a net energy exporter.
Source: Table 3.8.

. . . mostly from middle-income economies in the Middle East and North Africa and Latin America and the Caribbean **3.8b**



Note: Negative values indicate that the region is a net energy exporter.
Source: Table 3.8.

Definitions

• **Net energy imports** are estimated as energy use less production, both measured in oil equivalents. • **GDP per unit of energy use** is the ratio of gross domestic product (GDP) per kilogram of oil equivalent of energy use, with GDP converted to 2005 constant international dollars using purchasing power parity (PPP) rates. An international dollar has the same purchasing power over GDP that a U.S. dollar has in the United States. Energy use refers to the use of primary energy before transformation to other end-use fuel, which is equal to indigenous production plus imports and stock changes minus exports and fuel supplied to ships and aircraft engaged in international transport (see *About the data* for table 3.7). • **Carbon dioxide emissions** are emissions from the burning of fossil fuels and the manufacture of cement and include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.

Data sources

Data on energy use are from the electronic files of the International Energy Agency. Data on carbon dioxide emissions are from the CDIAC, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States.