



5.9 Power and communications

	Electric power		Telephone mainlines ^a							Mobile phones ^a	International telecommunications ^a	
	Consumption per capita kwh 1998	Transmission and losses % of output 1998	per 1,000 people 1999	In largest city per 1,000 people 1999	Waiting list thousands 1999	Waiting time years 1999	per employee 1999	Revenue per line \$ 1999	Cost of local call \$ per 3 minutes 1999		per 1,000 people 1999	Outgoing traffic minutes per subscriber 1999	Cost of call to U.S. $ per 3 minutes 1999
Albania	678	47	36	93	98.5	3.9	32	596	0.02	3	525	4.37
Algeria	563	19	52	55	640.0	6.0	90	166	0.02	2	90	4.70
Angola	60	28	8	21	21.1	1.5	46	1,195	0.06	2	363	5.13
Argentina	1,891	15	201	247	58.2	0.1	373	1,319	0.09	121	62	2.80
Armenia	930	28	155	206	71.0	..	61	153	0.11	2	62	..
Australia	8,717	6	520	516	0.0	0.0	116	1,422	0.16	343	112	0.60
Austria	6,175	6	472	519	0.0	0.0	160	1,249	0.17	514	305	1.60
Azerbaijan	1,584	16	95	184	88.4	3.1	65	84	0.12	23	44	9.80
Bangladesh	81	16	3	24	172.0	4.4	23	591	0.03	1	104	6.00
Belarus	2,761	7	257	341	440.0	2.6	99	61	0.01	2	60	6.10
Belgium	7,249	5	502	501	..	0.0	218	1,009	0.16	314	312	2.00
Benin	46	71	7	36	13.7	4.0	30	1,182	0.11	1	297	6.90
Bolivia	409	12	62	107	7.5	0.1	103	826	0.09	52	65	3.70
Bosnia and Herzegovina	539	22	96	447	70.0	2.2	201	431	0.03	14	264	3.70
Botswana	..	..	77	179	11.8	0.7	71	974	0.02	74	323	3.60
Brazil	1,793	17	149	165	2,400.0	0.7	176	728	0.03	89	24	1.80
Bulgaria	3,166	13	354	564	330.0	3.5	111	131	0.00	42	34	..
Burkina Faso	..	..	4	36	..	..	38	1,137	0.10	0	206	11.00
Burundi	..	..	3	54	10.0	7.9	33	480	0.03	0	129	7.30
Cambodia	..	..	3	16	..	..	38	771	0.03	8	263	..
Cameroon	185	20	6	38	50.0	6.2	43	725	0.06	0	291	3.39
Canada	15,071	7	655	..	0.0	0.0	238	969	..	226	266	1.20
Central African Republic	..	..	3	15	1.8	>10.0	25	1,181	0.49	1	439	8.00
Chad	..	..	1	7	0.6	0.5	23	2,199	0.16	0	292	14.07
Chile	2,082	8	207	282	58.3	0.1	223	766	0.12	151	80	2.90
China	746	7	86	294	812.0	0.0	159	259	0.01	34	18	6.70
Hong Kong, China	5,244	12	576	576	0.0	0.0	106	1,760	0.00	636	703	2.60
Colombia	866	21	160	322	1,155.0	1.7	151	413	0.04	75	33	2.20
Congo, Dem. Rep.	110	3	0	..	..	..	..	..	..	0	..	..
Congo, Rep.	83	38	..	..	..	..	..	..	..	1	..	..
Costa Rica	1,450	5	204	478	34.7	0.4	178	333	0.02	35	122	2.00
Côte d'Ivoire	..	..	15	57	33.1	1.1	59	1,911	0.07	18	325	7.86
Croatia	2,463	21	365	324	72.0	0.9	151	473	0.03	66	198	5.66
Cuba	954	18	39	86	..	..	29	1,396	0.09	0	75	7.30
Czech Republic	4,747	8	371	965	74.0	0.2	161	585	0.15	189	96	2.00
Denmark	6,033	6	685	..	0.0	0.0	193	1,140	0.12	495	180	1.77
Dominican Republic	627	28	98	129	..	..	200	..	..	50	234	3.90
Ecuador	625	21	91	339	..	..	164	400	0.01	31	91	4.90
Egypt, Arab Rep.	861	12	75	151	1,290.0	2.3	84	395	0.03	8	32	5.84
El Salvador	559	13	76	198	..	..	50	752	0.06	62	151	2.40
Eritrea	..	..	7	40	19.3	6.8	59	726	0.02	0	92	8.24
Estonia	3,531	18	357	381	39.3	1.5	191	514	0.07	268	143	3.41
Ethiopia	22	10	3	42	225.0	>10.0	30	404	0.03	0	64	7.37
Finland	14,129	4	557	677	0.0	0.0	132	1,417	0.13	651	151	1.75
France	6,287	6	582	..	0.0	0.0	200	836	0.12	366	129	1.00
Gabon	749	10	32	89	10.0	>10.0	36	2,064	0.15	7	491	..
Gambia, The	..	..	23	77	16.9	6.4	31	1,028	0.30	4	219	6.18
Georgia	1,257	14	123	289	105.0	3.0	69	47	..	19	70	..
Germany	5,681	4	590	591	0.0	0.0	215	1,070	0.11	286	152	0.80
Ghana	289	1	8	54	..	..	44	1,078	0.08	4	190	..
Greece	3,739	7	528	727	21.6	0.2	260	891	0.07	367	130	2.59
Guatemala	322	21	55	..	..	..	130	403	0.09	30	140	0.80
Guinea	..	..	6	19	1.3	0.2	56	373	0.10	3	266	9.04
Guinea-Bissau	..	..	7	109	3.0	>10.0	34	1,902	0.15	0	384	..
Haiti	33	54	9	..	100.0	>10.0	20	1,443	0.00	3	203	7.10
Honduras	446	21	44	99	170.0	5.7	72	697	0.06	12	54	4.20



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	Electric power		Telephone mainlines ^a							Mobile phones ^a	International telecommunications ^a	
	Consumption per capita kwh 1998	Transmission and distribution losses % of output 1998	per 1,000 people 1999	In largest city per 1,000 people 1999	Waiting list thousands 1999	Waiting time years 1999	per employee 1999	Revenue per line \$ 1999	Cost of local call \$ per 3 minutes 1999	per 1,000 people 1999	Outgoing traffic minutes per subscriber 1999	Cost of call to U.S. \$ per 3 minutes 1999
Hungary	2,888	13	371	557	77.2	0.2	215	616	0.13	162	61	1.68
India	384	18	27	131	3,680.0	0.9	63	138	0.01	2	18	4.20
Indonesia	320	12	29	163	..	..	135	275	0.02	11	41	4.20
Iran, Islamic Rep.	1,343	15	125	286	1,200.0	1.4	177	218	0.01	7	24	7.71
Iraq	1,359	0	30	75	..	..	..	..	..	0	..	..
Ireland	4,760	9	478	..	..	..	118	1,637	0.17	447	573	1.54
Israel	5,475	6	471	..	22.0	0.2	422	1,089	0.05	472	279	3.30
Italy	4,431	7	462	..	0.0	0.0	335	1,129	0.13	528	117	1.40
Jamaica	2,252	10	199	..	183.0	3.5	160	908	0.06	56	137	5.20
Japan	7,322	3	558	814	0.0	0.0	392	1,613	0.09	449	28	2.10
Jordan	1,205	10	87	232	29.7	0.4	97	708	0.03	18	258	..
Kazakhstan	2,399	17	108	224	172.0	..	53	148	..	3	60	2.68
Kenya	129	25	10	71	121.0	9.6	20	1,044	0.05	1	85	11.17
Korea, Dem. Rep.	..	..	46	..	..	..	..	..	..	0	..	..
Korea, Rep.	4,497	7	438	521	0.0	0.0	298	768	0.04	500	43	1.80
Kuwait	13,800	..	240	47	0.0	0.0	60	841	0.00	158	394	5.41
Kyrgyz Republic	1,430	32	76	197	66.9	>10.0	50	64	..	1	65	15.48
Lao PDR	..	..	7	..	8.3	1.7	30	662	..	2	230	4.00
Latvia	1,879	20	300	403	19.7	..	161	452	0.12	112	77	3.00
Lebanon	1,820	16	201	96	..	..	124	580	0.07	194	124	4.45
Lesotho	..	..	10	58	20.0	>10.0	33	655	0.02	5	1,707	..
Libya	3,677	..	101	94	80.0	1.4	32	619	0.03	4	78	..
Lithuania	1,909	9	312	400	74.9	1.4	166	188	0.06	90	44	5.49
Macedonia, FYR	..	..	234	235	40.0	1.2	128	342	0.01	24	188	4.13
Madagascar	..	..	3	7	7.3	2.0	17	1,084	0.08	1	192	11.16
Malawi	..	..	4	37	31.6	>10.0	8	877	0.03	2	236	12.45
Malaysia	2,554	7	203	282	160.0	0.7	174	559	0.02	137	156	2.80
Mali	..	..	3	18	..	..	20	2,196	0.14	0	444	17.59
Mauritania	..	..	6	17	47.8	>10.0	34	1,730	0.09	0	489	..
Mauritius	..	..	224	306	29.1	1.2	145	473	0.04	89	122	4.60
Mexico	1,513	15	112	135	137.0	0.2	130	1,000	0.14	79	143	3.00
Moldova	688	26	127	304	118.0	..	73	71	0.02	4	70	3.53
Mongolia	..	..	39	101	39.6	6.0	22	329	0.02	13	40	5.65
Morocco	443	4	53	115	17.9	0.2	104	592	0.08	13	150	4.50
Mozambique	54	10	4	24	39.7	7.0	35	988	0.09	1	222	..
Myanmar	64	33	6	29	84.4	3.6	32	2,726	0.48	0	70	26.86
Namibia	..	..	64	317	5.4	0.7	63	840	0.05	18	572	..
Nepal	47	23	11	..	275.0	5.9	54	268	0.01	0	99	..
Netherlands	5,908	4	607	..	0.0	0.0	279	1,130	0.14	436	224	0.30
New Zealand	8,215	13	496	..	0.0	0.0	239	968	0.00	366	397	0.90
Nicaragua	281	29	30	74	108.0	8.4	65	635	0.09	9	339	3.20
Niger	..	..	2	18	..	..	19	1,243	..	0	340	..
Nigeria	85	32	4	11	42.0	..	35	3,738	..	0	141	..
Norway	24,607	8	709	823	0.0	0.0	133	1,546	0.08	613	178	1.05
Oman	2,828	16	90	165	3.9	0.5	106	1,552	0.07	49	463	..
Pakistan	337	25	22	62	298.0	1.5	51	349	0.02	2	29	..
Panama	1,211	23	164	250	..	..	106	764	..	86	116	4.40
Papua New Guinea	..	..	13	..	..	..	23	2,428	..	2	422	..
Paraguay	756	3	55	129	20.1	0.5	51	782	0.05	196	116	6.10
Peru	642	13	67	132	29.6	0.4	294	819	0.07	40	66	2.40
Philippines	451	16	39	146	..	..	219	690	0.00	38	45	4.80
Poland	2,458	11	263	199	1,800.0	1.5	121	578	0.07	102	61	3.65
Portugal	3,395	8	423	711	25.6	0.2	215	1,123	0.10	467	129	1.88
Puerto Rico	..	..	333	..	..	..	168	1,163	..	209	723	0.87
Romania	1,626	12	167	357	740.0	3.9	83	203	0.09	61	41	4.29
Russian Federation	3,937	11	210	448	6,530.0	3.9	71	133	0.02	9	33	6.12



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	Electric power		Telephone mainlines ^a						Mobile phones ^a	International telecommunications ^a		
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Rwanda	2	40	8.0	>10.0	45	1,424	0.04	2	376	..
Saudi Arabia	4,692	8	129	253	927.0	3.1	117	1,445	0.02	40	305	6.41
Senegal	111	11	18	48	24.0	1.0	118	1,099	0.12	9	220	4.48
Sierra Leone	..	..	4	18	25.0	>10.0	18	129	0.03	0	236	..
Singapore	6,771	4	482	482	0.0	0.0	222	1,313	0.02	419	719	1.70
Slovak Republic	3,899	8	307	670	69.3	0.5	116	269	0.12	170	98	2.10
Slovenia	5,096	6	378	661	5.7	0.2	225	481	0.03	309	197	5.56
South Africa	3,832	8	125	415	116.0	0.3	112	717	0.08	120	84	..
Spain	4,195	10	410	485	4.3	0.0	354	980	0.09	306	117	1.88
Sri Lanka	244	19	36	245	225.0	1.6	61	461	0.05	12	67	4.49
Sudan	47	31	9	45	355.0	7.0	95	403	0.02	0	99	7.79
Sweden	13,955	7	665	..	0.0	0.0	205	1,260	0.13	583	257	0.90
Switzerland	6,980	6	699	966	0.0	0.0	203	1,670	0.13	411	481	1.00
Syrian Arab Republic	838	..	99	140	2,820.0	>10.0	78	219	0.01	0	76	26.71
Tajikistan	2,045	14	35	150	49.1	..	52	48	0.00	0	42	8.16
Tanzania	53	22	5	28	29.6	1.6	40	840	0.08	2	77	13.30
Thailand	1,345	9	86	371	420.0	1.2	154	351	0.08	38	57	2.50
Togo	..	..	8	33	17.0	3.6	44	1,209	0.10	4	222	11.44
Trinidad and Tobago	3,478	8	216	200	10.0	0.5	100	814	0.04	30	243	3.30
Tunisia	824	11	90	90	83.7	0.9	129	445	0.03	6	165	6.47
Turkey	1,353	19	278	405	500.0	0.4	249	267	0.10	125	39	3.31
Turkmenistan	859	10	82	155	58.6	8.5	48	104	..	1	46	..
Uganda	..	..	3	37	9.2	3.0	34	1,522	0.15	3	179	8.60
Ukraine	2,350	17	199	418	2,650.0	9.6	80	82	0.00	4	38	..
United Arab Emirates	9,892	9	332	373	0.6	0.0	119	1,730	0.00	283	988	3.77
United Kingdom	5,327	8	567	..	0.0	0.0	167	1,505	0.19	457	180	1.10
United States	11,832	7	664	..	0.0	0.0	172	1,463	0.09	312	155	..
Uruguay	1,788	15	271	336	0.0	0.0	154	970	0.18	95	96	5.00
Uzbekistan	1,618	9	66	231	38.8	1.7	56	153	..	2	44	..
Venezuela, RB	2,566	23	109	329	392.0	..	218	1,461	0.09	143	63	5.20
Vietnam	232	16	27	133	..	..	17	304	0.08	4	22	..
West Bank and Gaza	..	..	72	..	38.8	0.8	..	302	0.05	14	165	0.61
Yemen, Rep.	96	26	17	77	131.0	4.5	61	273	0.02	2	109	..
Yugoslavia, FR (Serb./Mont.)	..	..	214	455	119.0	1.8	155	147	0.01	57	89	12.08
Zambia	539	11	9	24	12.3	7.2	24	1,346	0.05	3	170	2.60
Zimbabwe	896	17	21	75	109.0	5.1	33	640	0.03	15	275	2.81
World	2,085 w	9 w	158 w	231 w	38,167.9 s	1.4 m	198 m	935 w	0.06 m	86 w	129 m	4.00 m
Low income	362	17	26	125	7,727.8	5.9	72	212	0.06	3	141	..
Middle income	1,367	11	121	293	28,593.8	1.0	166	447	0.05	55	94	4.36
Lower middle income	1,064	10	102	293	21,600.7	1.5	148	267	0.05	33	77	4.50
Upper middle income	2,482	12	190	..	7,402.7	0.5	207	809	0.07	136	116	3.73
Low & middle income	913	12	79	211	37,980.2	2.0	152	412	0.05	32	105	4.70
East Asia & Pacific	787	8	82	265	1,901.9	1.2	178	355	0.03	42	51	5.30
Europe & Central Asia	2,652	13	213	378	12,480.6	2.0	126	256	0.07	47	61	3.97
Latin America & Carib.	1,452	16	130	..	4,139.2	0.5	189	847	0.09	82	116	3.20
Middle East & N. Africa	1,263	12	87	..	6,314.0	1.4	126	467	0.03	12	124	..
South Asia	341	19	23	118	4,352.5	1.6	61	174	0.02	2	67	5.45
Sub-Saharan Africa	454	10	14	29	1,158.2	6.0	99	793	0.07	5	222	..
High income	8,353	6	583	..	63.7	0.0	230	1,312	0.10	377	189	1.78
Europe EMU	5,504	6	526	..	29.9	0.0	248	1,037	0.13	383	152	1.67

a. Data are from the International Telecommunication Union's (ITU) *World Telecommunication Development Report 2000*. Please cite the ITU for third-party use of these data.



Power and communications 5.9

About the data

An economy's production and consumption of electricity is a basic indicator of its size and level of development. Although a few countries export electric power, most production is for domestic consumption. Expanding the supply of electricity to meet the growing demand of increasingly urbanized and industrialized economies without incurring unacceptable social, economic, and environmental costs is one of the great challenges facing developing countries.

Data on electric power production and consumption are collected from national energy agencies by the International Energy Agency (IEA) and adjusted by the IEA to meet international definitions (for data on electricity production see table 3.9). Electricity consumption is equivalent to production less power plants' own use and transmission, distribution, and transformation losses. It includes consumption by auxiliary stations, losses in transformers that are considered integral parts of those stations, and electricity produced by pumping installations. It covers electricity generated by primary sources of energy—coal, oil, gas, nuclear, hydro, geothermal, wind, tide and wave, and combustible renewables—where data are available. Neither production nor consumption data capture the reliability of supplies, including break-downs, load factors, and frequency of outages.

Over the past decade privatization and liberalization have spurred dramatic growth in telecommunications in many countries. The table presents some common performance indicators for telecommunications, including measures of supply and demand, service quality, productivity, economic and financial performance, and tariffs. The quality of data varies among reporting countries as a result of differences in regulatory obligations for the provision of data.

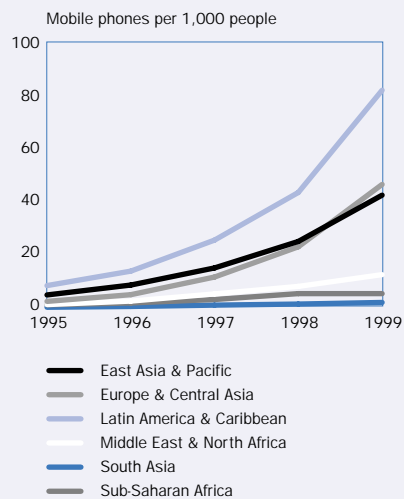
Demand for telecommunications is often measured by the sum of telephone mainlines and registered applicants for new connections. (A mainline is normally identified by a unique number that is the one billed.) In some countries the list of registered applicants does not reflect real current pending demand, which is often hidden or suppressed, reflecting an extremely short supply that has discouraged potential applicants from applying for telephone service. And in some cases waiting lists may overstate demand because applicants have placed their names on the list several times to improve their chances. Waiting time is calculated by dividing the number of applicants on the waiting list by the average number of mainlines added each year over the past three years. The number of mainlines no longer reflects a telephone system's full capacity because mobile telephones—whose

use has been expanding rapidly in most countries, rich and poor—provide an alternative point of access.

The table includes four measures of efficiency in telecommunications: waiting list, waiting time, mainlines per employee, and revenue per mainline. Caution should be used in interpreting the estimates of mainlines per employee because firms often subcontract part of their work. The cross-country comparability of revenue per mainline may also be limited because, for example, some countries do not require telecommunications providers to submit financial information; the data usually do not include revenues from cellular and mobile phones or radio, paging, and data services; and there are definitional and accounting differences between countries.

Figure 5.9

Latin America leads developing regions in mobile phones



Source: Table 5.9 based on International Telecommunication Union data.

Mobile phone use is growing rapidly in all developing regions, but especially in Latin America, where there are about 60 percent as many mobile phones as there are fixed telephone lines. Mobile phones are even beginning to reach the poor and isolated, helping them participate in the global economy.

Definitions

- **Electric power consumption** measures the production of power plants and combined heat and power plants less transmission, distribution, and transformation losses and own use by heat and power plants.
- **Electric power transmission and distribution losses** are losses in transmission between sources of supply and points of distribution and in distribution to consumers, including pilferage.
- **Telephone mainlines** are telephone lines connecting a customer's equipment to the public switched telephone network. Data are presented for the entire country and for the largest city.
- **Waiting list** shows the number of applications for a connection to a mainline that have been held up by a lack of technical capacity.
- **Waiting time** is the approximate number of years applicants must wait for a telephone line.
- **Mainlines per employee** are calculated by dividing the number of mainlines by the number of telecommunications staff (with part-time staff converted to full-time equivalents) employed by telecommunications enterprises providing public telecommunications services.
- **Revenue per line** is the revenue received by firms per mainline for providing telecommunications services.
- **Cost of local call** is the cost of a three-minute call within the same exchange area using the subscriber's equipment (that is, not from a public phone).
- **Mobile phones** refer to users of portable telephones subscribing to an automatic public mobile telephone service using cellular technology that provides access to the public switched telephone network, per 1,000 people.
- **Outgoing traffic** is the telephone traffic, measured in minutes per subscriber, that originates in the country and has a destination outside the country.
- **Cost of call to U.S.** is the cost of a three-minute peak rate call from the country to the United States.

Data sources

The data on electricity consumption and losses are from the IEA's *Energy Statistics and Balances of Non-OECD Countries 1997–98*, the IEA's *Energy Statistics of OECD Countries 1997–98*, and the United Nations Statistics Division's *Energy Statistics Yearbook*. The telecommunications data are from the International Telecommunication Union's (ITU) *World Telecommunication Development Report 2000*, except for the data on telephone traffic, which are from *Direction of Traffic 1999*, published by TeleGeography and the ITU.