

T *Introduction*

The statistics appearing in this chapter have been provided as register records by the Ministry of Energy on two topics of "water" and "electricity".

Water

This section includes information on "underground waters", "reservoir dams", and "length of networks and number of water and sewage extensions". The related statistics have been added to the Statistical Yearbook of Iran since the year 1346.

Statistics on underground waters and reservoir dams have been provided by the Water Resources Management Company and statistics on the length of networks and the number of water and sewage extensions has been obtained from the Water and Sewage Engineering Company.

It is noteworthy that the Central and Internal basin, Hamun basin, and Sarakhs basin were renamed by the Water Resources Management Organization as Central Plateau, Eastern Border and Qareh Qum, respectively, in the year .

Electricity

Data related to the electric power industry was first collected in the year 1343 by the then Ministry of Water and Power (renamed the Ministry of Energy in the year 1353). Since the year 1346, the Ministry has regularly provided the annual statistics on the power industry comprising power generation, transmission, distribution, and consumption. The statistics, a part of which appears in some tables of this yearbook, is presented in various annual.

Moreover, through two successive censuses of population and housing in the years 1365 and 1375, the Statistical Centre of Iran collected data on residential units and households benefiting from piped water and electricity, which are reflected in Chapter 10, "Construction and Housing," of the yearbook.

Definitions and concepts

Water basin: See Chapter 1, Land and climate, Definitions and concepts.

Aquatic year: See Chapter 1, Land and climate, Definitions and concepts.

Water produced: This refers to the amount of water gained from various (surface and underground) water resources such as wells, springs, subterranean canals, dams and river basins.

Dam: See Definition and concepts Chapter five (Agriculture, Forestry, and Fisheries)

Reservoir dam: This is a dam constructed for water storage, managing or controlling the flow of water to meet different needs including irrigation (agriculture), drinking, industry, electricity generation and control of flood.

Large reservoir dam: This refers to all dams with a height of 15 metres or more as well as 10 to 15 metres high, but having a reservoir with a volume of 1 million cubic or more metres and/or a capacity of flood discharge of 2000 or more cubic metres per second.

Inflow: This refers to the volume of water entering the reservoir of a dam through the river during a given time period.

Outflow: This refers to the total volume of water discharged from different outlets of a dam (weir, silt ejector channels, take-out gates, drainage channels) and evaporation during a given time period..

Water extension: This refers to the part of branched-off water pipes, containing pipe, and related accessories, with a profile appropriate to the water meter and the extension capacity of public water, which connects a private water distribution line or public water distribution network from the installation place of the extension valve to the delivery point (valve following the water meter).

Public water distribution network: This refers to a collection of interconnected pipelines to distribute water to the consumers from production or reserving points.

Nominal capacity (registered nominal power): The nominal power of a turbine or generator refers to the maximum expected output of an electricity generator in designing conditions defined by the manufacturer. Nominal power is usually installed in KVA or KW for smaller generators on the generator.

Actual capacity or actual power (registered power): This refers to the maximum amount of

electricity that could be generated by a generator while considering the environmental conditions (altitude, temperature, and relative moisture).

Maximum coincidental power generated: This refers to the sum of electric power generated at the peak of network load during a given time period. The sum of the maximum coincidental power generated might be equal to or less than the total capacity of the plants.

Gross electricity generation of power plants: This refers to the sum of electricity generated by the generators of a power plant, which is measured in kilowatt hours or megawatt hours at the output terminal of the generators during a given period of time.

Net electricity generation of power plants: This refers to the amount of gross generation minus the internal energy consumed in a given time period by kilowatt-hour (kWh) or megawatt-hour (MWh).

Other institutions: They refer to the institutions that generate electricity for their own consumption, but are not affiliated with the Ministry of Energy, and may sell a part of their production to other institutions.

National grid: It refers to a network including all power generation points and electricity consumption regions in the nation, which are connected to each other by power transmission lines and stations, where energy exchange takes place.

Isolated grid (generation and power consumption): It refers to a set of generation and consumption sites which is connected to each other, but not connected to the national grid, and cannot exchange energy with the national grid.

Load-demand: It refers to the power consumed during a given time period in certain point of the network.

Maximum coincidental load consumed: It refers to the maximum coincidental load for a day, a week, a month, or a year out of the sum of load at the peak of consumption in regions in megawatt. If the interconnected system does not cover the total country, the maximum coincidental load may be calculated by adding up the maximum load of the interconnected network and load of separate regions in megawatt simultaneously.

Maximum non-coincidental load consumed: It refers to the sum of the peak of consumption in different areas of the intended region during a given time period, which is not necessarily simultaneous.

Regional power company: It refers to the corporation engaged in the provision, transmission, and distribution of electricity in the field of its activities.

Power plant: It refers to the installation place of generators and related equipment.

Hydroelectric power plant: It refers to a power plant in which the potential energy of water accumulated at dams or flowing energy of rivers water is used for electricity generation.

Thermal power plant: It refers to a power plant in which the energy inherent in solid, liquid, gaseous fuels is used for steam or hot gas (smoke) production and then driving the steam turbine to generate electricity.

Steam power plant: It refers to a thermal power plant in which thermal energy from liquid, solid and gaseous fuels is used for steam production and generating electricity.

Gas power plant: This refers to a power plant in which the thermal energy from gas and liquid fossil fuels is used to produce hot gas (smoke) and in a gas turbine to generate electricity.

Combined-cycle power plant: This refers to a power plant in which, in addition to electric energy produced in gas turbines, the heat in gases coming off the gas turbine is used for the production of steam using a recycling steam kettle. The steam produced is transformed into electric energy in a steam turbo-generator set.

Diesel power plant: This refers to a power plant in which gas oil is used to operate a diesel engine, and mechanical energy produced by a coupled generator with it is turned into electric energy.

Internal consumption: This refers to the sum of electricity consumed internally by units and for non-technical cases, as well as consumption of the lights, etc. in a power plant in a given time period.

Losses: This refers to the energy lost in the transmission of energy from the producer to the consumer.

Sale or consumption of electricity: This refers to the amount of electricity sold to domestic

consumers based on the determined tariffs by the Ministry of Power.

Energy produced by the fuel (thermal value): This refers to the amount of heat (kilocalorie or B.T.U.) produced through the burning of the mass unit of a certain fuel.

Thermal output: This refers to the ratio of thermal energy produced by 1 kWh to the thermal value of the consumed fuel.

Line of power: This refers to a set of circuits installed on bases to transmit the electric power produced from the generation site (power plant) or substation to consumption places in different voltages.

Power transmission line: This refers to a set of conductors, insulators and other peripheral equipment used to transmit high amounts of electricity with very high voltage (230 and 400 kV) in long routes between the source points (power plants or substations) and its receivers.

Sub-transmission line: This refers to a set of conductors, insulators and other peripheral equipment used to transmit high amounts of electricity with very high voltage (66 and 132 kV) in long routes between the source points (power plants or substations) and its receivers.

Electricity customers: They refer to legal or natural people whose request for enjoying power connection service(s) is met according to the by-laws of the electricity company and connection number is assigned to them.

Household uses of power energy: This refers to the amount of electricity that is used to operate common electric appliances and for lighting in residential units.

Public uses of power energy: This refers to the amount of electricity that is used for public services.

Agricultural uses of power energy: This refers to the electricity that is used for pumping surface and underground water or repumping water for the production of crops or carrying out agricultural activities.

Industrial uses of power energy: This refers to the electricity that is used in establishments with manufacturing and mining activities.

Distribution grid of power: This refers to a set of distribution lines with different voltage lines (mainly 33 kV and lower) used for electricity distribution in an area or a locality.

Transmission and sub-transmission network: This refers to a series of substations, lines, cables, and other electrical equipment connected from power plants or high voltage substations to final consumers at a voltage of 63 kV and higher.

Electrical substation or power station: This refers to a site with a set of installations and electrical equipment including transformers, switches, sectionneur, measurement instruments, inflow and outflow lines, a reactor, a capacitor and different bays used for transmission and distribution of electricity.

Selected information

In the aquatic year 1398-1399, the amount of annual discharge of the underground water resources was about 65115 million cu m, which had a 3.9 percent increase in comparison with the aquatic year 1397-1398. It should be noted that out of 6 main basins, the central plateau with 49.9% had the maximum annual discharge.

In the year 1399, the inflow of the large reservoir dams amounted to 48366 million cu m which had a 39.7% decrease in comparison with the last year. In this year, 41254 million cu m of large reservoir dams has been consumed, 59.6 percent of which belong to the agricultural consumptions.

In the same year, over 8392 million cu m of water is produced in the water and sewage companies of the country (urban and rural) out of which about 5960 million cu/m was sold. Sale of water increased by 2.9 percent compared to the preceding year. This is while that the production of water grew by 6.7 percent compared to the previous year (the year 1398).

In the year 1399, there were over 23 million and 511 thousand urban and rural water extensions which had a 2.5 percent increase in comparison with the preceding year. Out of this number, over

17 million and 506 thousand extensions were in urban areas which had a 2.5% increase compared to the previous year.

In the year 1399, the gross electricity generation of institutions affiliated with the Ministry of Energy was 139068 million kilowatt-hours, of which about 43.1 percent has been produced in the steam power plants. Furthermore, the gross electricity generation amount had a 4.9 percent increase compared to the preceding year.

In this year, 290847 million kilowatt-hours of domestic sold electricity was consumed by 37 million and 617 thousand customers. In this respect, the amount of electricity sold and the number of electricity customers increased by about

5.7 and 2.7 percent respectively compared to the preceding year.

Among all electricity customers in the year 1399, the percentage of customers in the house, public, agricultural, and manufacturing sectors was 80.2, 4.8, 1.3, and 0.7 percent, respectively. Also in this year, the percentage of the sold electricity which was consumed in the house, manufacturing, agricultural, public sectors and for the streets lighting was 31.7, 37.2, 14.2, 8.5 and 1.7 percent respectively.

At the end of the year 1399, a number of 57755 villages (over 4.5 million rural households) were electrified which increased by 0.1% in comparison with the previous year.

9.1. UNDERGROUND WATER RESOURCES AND THEIR ANNUAL DISCHARGE⁽¹⁾ BY MAIN BASINS (mln cu m)

Aquatic year and main basins	Total discharge	Deep well		Semi-deep well		Subterranean canals (Qanat)		Spring	
		Number	Annual discharge	Number	Annual discharge	Number	Annual discharge	Number	Annual discharge
1379-80	69549	118986	30757	314405	13263	33036	7962	49785	17566
1384-85	79837	155800	35843	432943	12778	36307	7527	112787	23690
1389-90	70482	191261	34367	497579	12479	39531	6259	159454	17378
1394-95	61262	194822	33139	599178	12263	41169	4661	174228	11192
1395-96	60592	210689	32998	594968	12485	41011	4515	173452	10595
1396-97	58688	209935	32403	604455	12104	41261	4485	175244	9696
1397-98	62684	221067	32157	627269	11946	41457	4405	169048	14439
1398-99	65115	206327	31902	651083	12162	44174	4534	230519	16517
Caspian Sea	8153	34427	2768	272751	2124	3328	338	79313	2923
Persian Gulf and Oman Sea	18868	46684	6565	118379	3997	5352	699	61711	7607
Lake Orumiyeh	2351	8928	920	93848	951	1986	214	11523	266
Central Plateau	32486	108438	19721	153394	4644	27157	2742	73850	5379
Eastern Border.....	1171	1946	530	8785	338	3454	270	1537	33
Qareh Qum.....	2086	5904	1398	3926	108	2897	271	2585	309

1. Annual discharge for wells, subterranean canals and springs are updated annually based on selected sources.

Source: Ministry of Energy.

9.2. UNDERGROUND WATER RESOURCES AND THEIR ANNUAL DISCHARGE⁽¹⁾ BY REGIONAL WATER ORGANIZATIONS, AQUATIC YEAR 1398-1399 (mln cu m)

Ostan	Total discharge	Deep well		Semi-deep well		Subterranean		Spring	
		Number	Annual discharge	Number	Annual discharge	Number	Annual discharge	Number	Annual discharge
Total	65115	206327	31902	651083	12162	44174	4534	230519	16517
East Azarbayejan.....	1523	6542	552	51048	392	2183	325	5500	254
West Azarbayejan	1885	5130	836	58349	759	543	55	851	235
Ardebil	411	1218	99	4566	123	244	19	4780	170
Esfahan	3843	25653	1908	37724	622	4209	277	12537	1036
Alborz	831	5290	662	10582	44	150	10	1738	115
Ilam	531	1526	268	728	10	7	1	1310	252
Bushehr	424	1999	119	13371	271	54	6	213	28
Tehran	6253	11916	2031	32345	184	567	162	44261	3876
Chaharmahal&Bakhtiyari	2436	2237	320	1767	195	1011	116	4760	1805
South Khorasan.....	904	2552	590	1202	68	6928	208	2844	38
Khorasan-e-Razavi.....	4700	13675	3497	8220	189	6770	576	6473	438
North Khorasan	896	2001	333	4898	84	643	88	2975	391
Khuzestan	1640	3499	897	6987	345	2	1	1088	397
Zanjan	2288	7458	1314	26448	584	1460	67	11788	323
Semnan.....	826	3169	545	1431	15	777	66	1522	200
Sistan&Baluchestan	1982	1446	375	17530	1189	1282	377	897	41
Fars	8144	31545	4294	51995	2417	1756	402	2220	1031
Qazvin	1554	5035	1294	5696	58	347	42	15701	160
Qom	633	1323	499	5068	38	753	81	1397	15
Kordestan	1061	2769	358	15875	180	519	24	38728	499
Kerman	6400	16046	4496	18539	1338	2394	456	1596	110
Kermanshah	2361	7748	770	10153	370	511	62	10250	1159
Kohgiluyeh&Boyerahmad	1487	1129	63	3479	45	87	7	6545	1372
Golestan	769	8871	328	26942	172	344	27	3766	242
Gilan.....	863	1164	191	54073	269	1	0	15782	403
Lorestan.....	992	3333	484	3886	148	1176	31	5692	329
Mazandaran.....	1944	12004	534	134963	604	34	0	14417	806
Markazi	2924	7818	1908	7565	343	4254	497	3159	176
Hormozgan.....	1231	2438	396	26950	674	195	33	750	128
Hamedan	2390	6844	1242	7926	365	2343	335	6592	448
Yazd	989	2949	699	777	67	2630	183	387	40

1. Annual discharge for wells, subterranean canals and springs are updated annually based on selected sources.

Source: Ministry of Energy.

9.3. STATISTICS ON LARGE RESERVOIR DAMS⁽¹⁾ BY REGIONAL WATER ORGANIZATIONS

(mln cu m)

Year and reservoir dams	Inflow ⁽²⁾	Outflow ⁽²⁾			Water consumption ⁽³⁾				
		Total	From turbines ducts for electricity generation	Other ⁽⁴⁾	Total	Agriculture	Drinking	Manufacturing	Other ⁽⁵⁾
1380	30400	27311	18386	8925	11467	8819	1209	382	1058
1385	50873	54716	44913	9803	17157	13233	2276	589	1059
1390	33740	32822	17122	15700	25675	16175	2226	855	6419
1395	40695	39816	49268	-	30301	19694	3182	700	6724
1396	33796	37251	46994	-	28608	19655	3202	698	5106
1397	46382	37888	48051	17558	29347	14236	3086	676	11349
1398	80170	80527	89157	47385	56358	24632	3442	713	27571
1399	48366	51281⁽⁶⁾	64320	21887	41254⁽⁶⁾	24592	3624	729	12309
East Azarbayegan..	4139	4211	3360	4211	2105	1489	50	9	558
Aras ^(2,6,7)	3517	3510	3360	150	1725	1308	0	0	417
Sattarkhan ahar	47	47	0	47	44	26	10	4	3
Sahand	160	150	0	150	48	18	4	0	25
Zonuz	6	7	0	7	7	4	0	0	3
Aydoghamush	91	91	0	91	80	50	0	0	30
Arasbaran	14	1	0	1	0	0	0	0	0
Khodaafarin ⁽²⁾	3615	3552	0	3552	0	0	0	0	0
Alavian	85	94	0	94	92	49	15	5	23
Nahand	28	25	0	25	23	0	21	0	2
Tajyar-e-Sarab	4	2	0	2	2	2	0	0	0
Kord Kandi	5	6	0	6	4	4	0	0	0
Ghale chai	57	53	0	53	52	27	0	0	25
Kalghan	32	31	0	31	30	0	0	0	30
Gol Faraj	2	1	0	1	0	0	0	0	0
West Azarbayegan.	3981	4005	1526	2478	2374	709	300	10	1355
Barun	73	85	0	85	77	64	12	0	0
Shahid Ghanbari	34	34	0	34	31	31	0	0	0
Aras2	5	4	0	4	3	3	0	0	0
Aghchai	112	122	0	122	98	82	0	0	16
Bukan ⁽⁶⁾	1498	1469	0	1469	1422	265	186	3	968
Shahrchay	153	155	0	155	150	50	64	0	35
Mahabad	220	197	149	48	188	90	19	1	79
Hasanlu	31	35	0	35	25	18	0	0	7
Deriq Salmas	24	24	0	24	22	8	0	0	14
Zola	124	130	0	130	126	40	8	0	78
Qiqaj	18	18	0	18	17	17	0	0	0
Saruq	37	40	0	40	12	4	6	0	3
Silveh	196	201	0	201	197	37	0	5	155
Sardasht	1446	1492	1377	115	4	0	4	0	0
Karam Abad	10	0	0	0	0	0	0	0	0
Ardebil	209	206	0	206	187	71	41	0	75
Qurichay	8	9	0	9	8	8	0	0	0
Gilarlu	1	1	0	1	1	1	0	0	0
Moghadasardebili ..	8	7	0	7	5	2	0	0	4
Saqizchi	9	9	0	9	3	3	0	0	0
Yamchi	65	66	0	66	64	23	41	0	0

9.3. STATISTICS ON LARGE RESERVOIR DAMS⁽¹⁾ BY REGIONAL WATER ORGANIZATIONS (continued)

(mln cu m)

Year and reservoir dams	Inflow ⁽²⁾	Outflow ⁽²⁾			Water consumption ⁽³⁾				
		Total	From turbines ducts for electricity generation	Other ⁽⁴⁾	Total	Agriculture	Drinking	Manu- facturing	Other ⁽⁵⁾
Sabalan.....	57	59	0	60	54	31	0	0	24
Giwi.....	52	53	0	53	52	4	0	0	48
Bafraird.....	1	0	0	0	0	0	0	0	0
Tazeh Kand.....	2	1	0	1	0	0	0	0	0
Ahmad Behloo.....	4	0	0	0	0	0	0	0	0
Esfahan.....	1655	1779	1343	436	1446	875	397	59	115
Hana.....	23	15	0	15	11	11	0	0	0
Oareh Aqach.....	9	7	0	7	5	5	0	0	0
Zavandehrud ⁽⁶⁾	1339	1451	1343	108	1419	849	397	59	115
Golpavegan ⁽⁶⁾	266	286	0	286	0	0	0	0	0
Khamiran.....	11	11	0	11	7	7	0	0	0
Aghcheh.....	2	2	0	2	2	2	0	0	0
Kamaneh.....	3	3	0	3	1	1	0	0	0
Baehkal-e-Khansar.....	3	4	0	4	1	1	0	0	0
Ilam.....	254	251	0	252	178	92	20	0	66
Ilam.....	62	56	0	56	43	8	20	0	15
Dobori.....	167	170	0	170	118	81	0	0	37
Kangir.....	17	15	0	16	12	4	0	0	9
Gelal.....	8	10	0	10	5	0	0	0	5
Bushehr.....	305	173	0	173	130	105	0	0	26
Reis Ali delvari.....	305	173	0	173	130	105	0	0	26
Tehran.....	2248	2057	1544	786	2003	671	987	10	336
Lar.....	443	445	219	226	438	81	219	0	138
Taleghan ⁽⁶⁾	531	540	385	154	455	302	147	6	0
Karai ⁽⁶⁾	500	503	499	3	502	66	253	0	183
Lativan ⁽²⁾	440	445	441	4	226	1	211	1	13
Mamlo ⁽²⁾	362	398	0	398	382	220	157	3	3
Chaharmahal&Bakhtiari	34	40	0	40	25	25	0	0	0
Choghakhor.....	30	35	0	35	22	22	0	0	0
Naghan.....	2	3	0	3	2	2	0	0	0
Surak.....	2	1	0	1	1	1	0	0	0
South Khorasan.....	29	27	0	27	16	11	3	0	2
Kerit.....	3	3	0	3	1	1	0	0	0
Darreh Bid.....	4	4	0	4	2	2	0	0	0
Parsa.....	1	1	0	1	1	1	0	0	0
Farrokhi.....	4	2	0	2	1	1	0	0	0
Nahrain.....	10	10	0	10	7	4	3	0	0
Haji Abad.....	4	3	0	3	2	2	0	0	1
Asadvieh.....	3	3	0	3	1	1	0	0	0
Khorasan -e-Razavi.....	793	762	0	763	371	215	135	1	21
Tabarak Abad.....	29	15	0	15	12	6	2	0	4
Shahid Yaghobi.....	21	6	0	6	6	6	0	0	0
Sangerd.....	12	8	0	8	8	8	0	0	0
Komavestan.....	35	35	0	35	2	2	0	0	0
Yam.....	24	25	0	25	2	2	0	0	0

9.3. STATISTICS ON LARGE RESERVOIR DAMS⁽¹⁾ BY REGIONAL WATER ORGANIZATIONS (continued)

(mln cu m)

Year and reservoir Dams	Inflow ⁽²⁾	Outflow ⁽²⁾			Water consumption ⁽³⁾				
		Total	From turbines ducts for electricity generation	Other ⁽⁴⁾	Total	Agriculture	Drinking	Manu-facturing	Other ⁽⁵⁾
Dusti ^(4,7)	481	486	0	486	218	121	97	0	0
Toroq.....	27	24	0	24	22	2	20	0	0
Kardeh.....	14	11	0	11	11	9	0	0	3
Dehqan-e-Taybad	6	5	0	5	4	4	0	0	0
Fariman	21	20	0	20	14	14	0	0	0
Zavin Kalat.....	2	3	0	3	1	1	0	0	0
Chali Darreh.....	1	1	0	1	1	1	0	0	0
Dolatabad	11	10	0	10	8	5	0	0	3
Daroungar.....	2	2	0	2	2	2	0	0	0
Sad-e- Khaf	10	15	0	15	7	7	0	0	0
Ardak Chenaran	40	44	0	44	30	13	17	1	0
Qareh Tikan.....	18	16	0	16	11	3	0	0	8
Chahchahe.....	21	23	0	23	10	10	0	0	0
Bar.....	17	12	0	12	2	0	0	0	2
Abivard.....	1	1	0	1	0	0	0	0	0
Dahan Qaleh.....	0	0	0	0	0	0	0	0	0
North Khorasan.....	173	164	0	164	109	59	25	0	25
Bidvaz	40	39	0	39	29	15	8	0	6
Barzu	38	40	0	40	35	24	4	0	7
Shirin Darreh.....	69	64	0	64	37	17	14	0	6
Chary.....	7	7	0	7	4	2	0	0	2
Gelul.....	1	0	0	0	0	0	0	0	0
Sumbar	12	5	0	5	2	2	0	0	0
Gezel Dash.....	15	12	0	12	4	0	0	0	4
Khuzestan	22212	24351	51621	3182	22997	15390	734	594	6278
Karkheh ^(2,6)	4390	5730	4887	843	5489	3618	248	28	1595
Dez	6043	6385	5667	717	6000	4690	12	48	1250
Shahid Abbaspour ^(2,8,9) ...	8928	8551	8475	75	0	0	0	0	0
Karun 3 ^(2,9)	6822	7059	6993	66	0	0	0	0	0
Marun.....	1371	1072	872	201	1035	852	24	16	143
Masjed-Soleyman ⁽²⁾	9233	9244	9243	12	0	0	0	0	0
Gotvand-e-Olia ^(2,9)	10296	10714	10260	455	10325	6098	450	502	3275
Jareh	159	161	0	161	147	132	0	0	15
Seymareh ^(2,6)	2322	2364	1752	605	0	0	0	0	0
Karun 4 ^(2,9,10)	3552	3516	3472	47	0	0	0	0	0
Zanjan.....	208	215	0	215	207	12	32	0	163
Tahem	25	28	0	28	26	0	25	0	1
Golabar.....	18	15	0	15	10	10	0	0	0
Kineh Vers	37	37	0	37	36	2	7	0	27
Talevar	127	136	0	136	136	0	0	0	135
Semnan.....	36	29	0	29	19	12	4	0	3
Kalpush	1	2	0	2	0	0	0	0	0
Damghan	26	26	0	26	18	11	4	0	3
Mojen	9	1	0	1	1	1	0	0	0

9.3. STATISTICS ON LARGE RESERVOIR DAMS⁽¹⁾ BY REGIONAL WATER ORGANIZATIONS (continued)

(mln cu m)

Year and reservoir Dams	Inflow ⁽²⁾	Outflow ⁽³⁾			Water consumption ⁽⁴⁾				
		Total	From turbines ducts for electricity generation	Other ⁽⁵⁾	Total	Agriculture	Drinking	Manu-facturing	Other ⁽⁵⁾
Sistan&Baluchestan.....	799	1152	0	1818	671	355	75	3	238
Mashkid-e-Olia	12	10	0	10	0	0	0	0	0
Chahehnimeh 4 ⁽²⁾	534	528	0	528	242	193	0	1	47
Pishin.....	143	174	0	174	99	38	8	0	53
Shai Kelk.....	0	4	0	4	0	0	0	0	0
Zirdan.....	146	162	0	162	128	0	4	0	124
Kheirabad.....	30	33	0	33	4	0	4	0	0
Chahehnimeh 3 ⁽²⁾	309	383	0	383	52	0	40	0	12
Chahehnimeh 1, 2 ⁽²⁾	399	525	0	525	146	124	20	2	1
Fars.....	978	1045	301	814	784	548	91	14	131
Salman Farsi	228	289	0	289	174	111	23	0	40
Tangab	28	44	0	44	10	0	0	0	10
Rudbal Darab.....	104	112	0	112	27	1	5	0	21
Dorudzan ⁽²⁾	555	577	267	310	531	395	63	14	58
Izadhast.....	3	3	0	3	1	1	0	0	0
Mollasadra ⁽²⁾	185	80	34	46	39	37	0	0	2
Sivand	0	0	0	0	0	0	0	0	0
Cheshmeh Ashegh	5	9	0	9	3	3	0	0	0
Qom	319	306	0	306	245	80	141	0	24
Panzdah Khordad.....	45	39	0	39	25	18	7	0	0
Kucheri ^(b)	273	267	0	267	221	62	134	0	24
Kordestan.....	786	852	199	653	406	21	72	1	311
Sural.....	15	14	0	14	7	1	0	0	6
Sang siyah.....	8	9	0	9	5	1	0	0	4
Qeshleq.....	103	108	0	108	73	9	48	1	15
Zarivar.....	23	25	0	25	0	0	0	0	0
Baneh.....	6	7	0	7	7	0	6	0	1
Azad.....	170	214	199	15	201	2	6	0	193
Garan.....	54	60	0	60	10	0	0	0	10
Zivieh.....	14	8	0	8	7	6	0	0	1
Siazakh.....	214	232	0	232	50	0	0	0	50
Cheragh Veis.....	152	149	0	149	32	0	6	0	26
Abbas Abad Kela.....	22	24	0	24	14	2	6	0	5
Qoocham.....	6	1	0	1	0	0	0	0	0
Kerman.....	745	892	387	504	855	169	17	1	668
Jiroft.....	477	606	387	219	584	106	0	0	479
Tanguiyeh.....	33	18	0	18	14	3	12	0	0
Nesa.....	191	220	0	220	210	53	0	0	157
Baft.....	45	48	0	48	46	7	5	1	32
Kermanshah.....	2032	2074	1273	833	875	331	31	0	513
Gavshan ^(2,b)	121	145	0	145	122	75	31	0	16
Soleymanshah ⁽²⁾	78	69	0	69	63	31	0	0	32
Gilangharb.....	2	9	0	9	7	7	0	0	0
Shiyan.....	5	6	0	6	6	5	0	0	1
Azadi.....	35	23	0	23	17	5	0	0	12
Zagros.....	45	49	0	49	40	40	0	0	0

9.3. STATISTICS ON LARGE RESERVOIR DAMS⁽¹⁾ BY REGIONAL WATER

ORGANIZATIONS (continued)

(mln cu m)

Year and reservoir Dams	Inflow ⁽²⁾	Outflow ⁽³⁾			Water consumption ⁽⁴⁾				
		Total	From turbines ducts for electricity generation	Other ⁽⁵⁾	Total	Agriculture	Drinking	Manu- facturing	Other ⁽⁵⁾
Tang-e-Hammam	43	42	0	42	27	8	0	0	19
Darian	1296	1283	1273	10	250	0	0	0	250
Sarab- e- Gilangharb.....	11	12	0	12	11	9	0	0	2
Zimakan	19	21	0	21	16	0	0	0	16
Jamishan	42	52	0	52	44	13	0	0	31
Sharafshah.....	54	66	0	66	51	43	0	0	9
Ezgeleh	327	330	0	330	222	96	0	0	126
Kohgiluyeh&Boyerahmad	514	483	0	483	309	51	171	3	84
Kosar ⁽⁶⁾	499	470	0	470	304	46	171	3	84
Shah Qasem	14	13	0	13	5	4	0	0	0
Golestan.....	368	399	0	468	314	171	0	3	139
Voshmgir ⁽²⁾	171	179	0	179	170	74	0	0	96
Golestan ⁽²⁾	133	133	0	133	67	45	0	2	19
Alagol	57	62	0	62	6	0	0	1	5
Bustan	42	46	0	46	33	24	0	0	9
Nomel (Kosar)	11	12	0	12	11	8	0	0	3
Daneshmand	16	22	0	22	14	11	0	0	3
Negarestan	15	14	0	14	13	9	0	0	4
Gilan.....	3283	3302	1834	1468	3184	2547	126	10	501
Sefidrud.....	3075	3091	1651	1440	3038	2538	16	10	475
Shahr-e-Bijar.....	208	211	183	28	146	9	111	0	26
Lorestan.....	822	817	608	210	313	122	0	0	192
Maruk.....	77	102	0	102	100	59	0	0	41
Tanghaleh	0	1	0	1	0	0	0	0	0
Kaznar.....	0	1	0	1	1	0	0	0	1
Khanabad	11	17	0	17	16	9	0	0	8
Eyvashan.....	38	58	0	58	57	41	0	0	16
Hozian.....	24	15	0	15	14	12	0	0	2
Rudbar.....	671	623	608	16	124	0	0	0	124
Mazandaran	557	551	186	365	463	242	49	0	172
Shahid Rajaei	251	259	186	73	256	167	22	0	67
Shiyadeh	3	4	0	4	3	3	0	0	0
Berenjestanak.....	8	7	0	7	7	3	0	0	4
Meijeran	28	28	0	28	24	8	11	0	5
Salaheddinkola.....	1	1	0	1	0	0	0	0	0
Farimsahra.....	2	1	0	1	1	1	0	0	0
Sonbolrud.....	6	6	0	6	4	4	0	0	0
Alimalat.....	4	4	0	4	1	1	0	0	0
Alborz	151	152	0	152	121	53	16	0	53
Gelevarid Neka.....	104	90	0	90	46	3	0	0	43
Markazi.....	277	327	136	191	212	115	45	10	42
Kamal Saleh.....	66	71	0	71	44	0	34	10	0
Saveh.....	211	256	136	120	168	115	11	0	42
Hormozgan.....	471	658	0	658	389	96	35	0	258
Esteqlal	181	226	0	226	88	40	11	0	37

9.3. STATISTICS ON LARGE RESERVOIR DAMS⁽¹⁾ BY REGIONAL WATER

ORGANIZATIONS (continued)

(mln cu m)

Year and reservoir Dams	Inflow ⁽²⁾	Outflow ⁽³⁾			Water consumption ⁽⁴⁾				
		Total	From turbines ducts for electricity generation	Other ⁽⁵⁾	Total	Agriculture	Drinking	Manu- facturing	Other ⁽⁵⁾
Jegin.....	130	191	0	191	84	37	5	0	42
Shamil & Nian.....	157	223	0	223	205	19	8	0	178
Sarney.....	2	18	0	18	12	0	12	0	0
Hamedan.....	139	153	0	153	65	10	42	0	13
Ekbatan ⁽²⁾	59	67	0	67	50	4	34	0	12
Abshineh ⁽²⁾	8	7	0	7	4	0	4	0	0
Shirinsu.....	2	4	0	4	0	0	0	0	0
Kalan-e-Malayer.....	46	49	0	49	4	3	0	0	1
Sarabi.....	13	14	0	14	6	3	3	0	0
Shanjur.....	11	13	0	13	1	1	0	0	0

1. The information refers to the 198 large reservoir dams (based on the ICOLD definition) with a capacity of 49.6 bln.cu.m, almost equaling over 95% of the total volume of the dams under use.

2. Total inflow and outflow are calculated through omission of the influence of being a chain of (Latiyan and Mamlo dams in Tehran Ostan), (Shahid Abbaspur, Karun3, Karun 4, Masjed-Soleyman and Gotvand-e-Olia dams in Khuzestan Ostan), (Dorudzan and Mollasadra in Fars Ostan), (Seymareh in Ilam Ostan and Karkkeh in Khuzestan Ostan), (Golestan1, Golestan2, and Voshmgir in Golestan Ostan), (Chahehnimeh 1,2,3 and 4 in Sistan&Baluchestan Ostan), (Ekbatan and Abshineh in Hamedan Ostan), (Soleymanshah and Gavshan in Kermanshah Ostan) and (Aras and Khoda Afarin in East-Azarbayejan Ostan). Moreover, inflow volume is calculated through a balance of volume changes in the reservoir and the amount of outflow.

3. The amount of water included for different consumption is the volume of water released for different consumption. With respect to the location of dams and the distance between them and consumption place, specially in agricultural sector, the water released for the agriculture is different from the volume of the water delivered to this sector. The difference is due to different reasons including middle basin, midway offtake, penetration, evaporation, etc.. Moreover, drinking water is the volume of water discharged from the dam.

4. Other outflows include evaporation, weir, dam take-out gates, slit ejection, direct pumping from reservoir, drainage and leaking. Moreover, difference between total and sum of parts is due to existence of some chain dams.

5. Other consumption includes the water at the time of stability of flow of the river.

6. Main difference between consumption (41.25 bln cu m) and net outflow (51.28 bln cu m) is related to the outflow of border dams for neighboring countries, evaporation from all dams, weirs, and other non-consumable outflows (Row 232).

a. Aras, Bukan, Zayanderud, Taleghan, Karaj, Karkkeh, Golpayegan, Gavshan and Kusar dams supply water both for mentioned Ostans in above table and other Ostans.

b. Seymareh dam is located in Ilam Ostan and the Company for Development of Water Resources and Energy of Iran is responsible for this dam but due to its aquatic relationship with Karkkeh dam, it is classified in Khuzestan Ostan.

c. Kucheri dam is located in Esfahan Ostan and Tehran Regional Company is responsible for this dam; however, due to supplying drinking water for Qom city accounting for the major consumption of the dam, the related statistics are included in Qom Ostan.

7. The outflow of the Aras dam and Dusti dam is equal to the total outflow of the dam, and consumptions only include I.R Iran consumption.

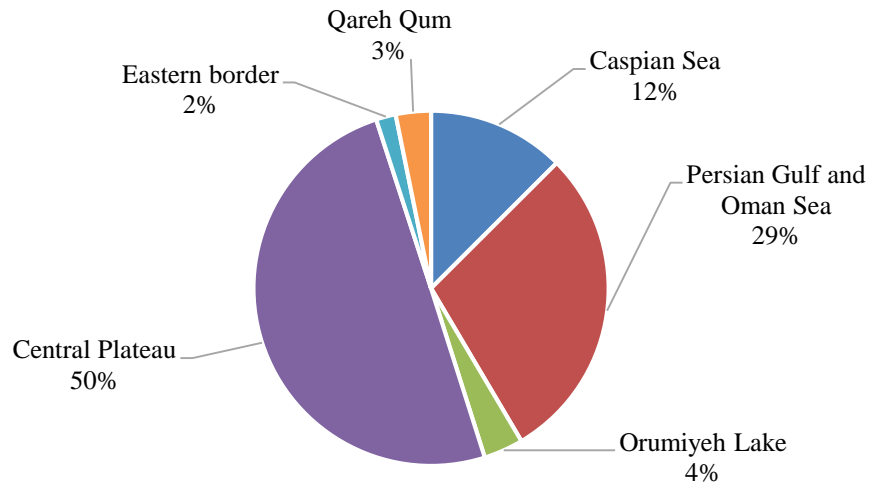
8. The net output of the turbine with the removal of successive dams is 30549 million cubic meters. (Row 233).

9. The consumption from the chain dams of Shahid Abbaspour, Karun 3, Karun 4, and Gotvand-e-Olya is included in the consumption of Gotvand- e-Olya dam.

10. Karun 4 reservoir dam is located in Chaharmahal & Bakhtiyari Ostan. However, since it is located on the Karun river, it is included in Khuzestan Ostan.

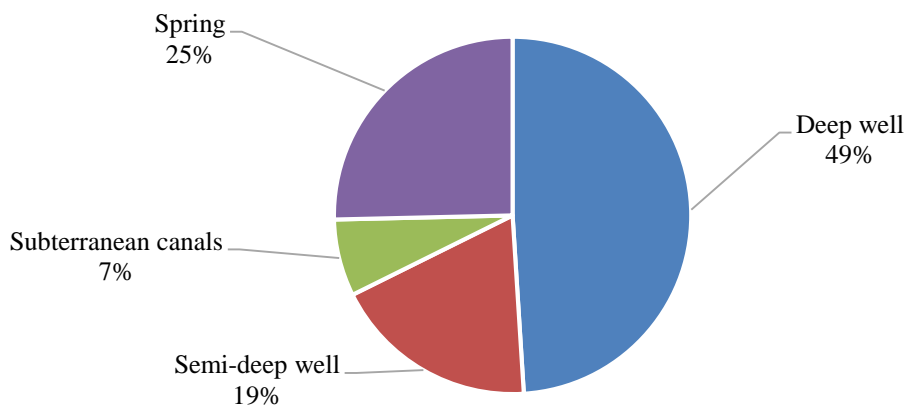
Source: Ministry of Energy.

9.1. ANNUAL DISCHARGE FROM UNDERGROUND WATER RESOURCES BY MAIN BASINS, THE AQUATIC YEAR 1398-99



For data see Table 9.1.

9.2. PERCENTAGE OF ANNUAL DISCHARGE FROM UNDERGROUND WATER RESOURCES, THE YEAR 1398-99



For data see Table 9.1.

9.4. DATA FOR CAPACITY OF RESERVOIRS, URBAN WATER DISTRIBUTION AND TRANSMISSION NETWORK

(cu m / km)

Year and Ostan	Capacity of reservoirs in the network	Length of the network for water distribution	Length of pipelines for water transmission
1380.....	8402485	77955	13458
1385.....	10914721	119059	18500
1390.....	13101344	133163	25475
1395.....	14760389	151108	28984
1396.....	15000546	154058	29379
1397.....	15239714	157120	29399
1398.....	15448925	162919	29725
1399.....	15527998	166051	30698
East Azarbayejan.....	912430	9600	1173
West Azarbayejan	399830	5019	759
Ardebil	235060	2533	479
Esfahan.....	1130085	14154	2955
Alborz	462629	4388	587
Ilam	133900	1346	532
Bushehr	304950	3303	881
Tehran	3225425	15771	2515
Chaharmahal&Bakhtiyari	175300	2023	372
South Khorasan	141900	2325	602
Khorasan-e-Razavi.....	1194810	11877	2487
North Khorasan	189950	1620	400
Khuzestan.....	811187	10195	1802
Zanjan.....	168670	1676	299
Semnan.....	213883	2505	611
Sistan&Baluchestan	283440	4845	1368
Fars.....	957745	11201	2792
Qazvin	250592	2425	289
Qom.....	350800	2276	153
Kordestan	219090	4845	403
Kerman.....	706120	10749	2333
Kermanshah	307644	3102	570
Kohgiluyeh&Boyerahmad	112100	1511	318
Golestan	272070	2838	538
Gilan.....	387368	6100	787
Lorestan.....	284680	2728	605
Mazandaran.....	422212	7702	1130
Markazi	283170	3454	677
Hormozgan.....	374526	5373	1146
Hamedan	299705	2721	477
Yazd	316727	5844	659

Source: Water and Sewage Engineering Company.

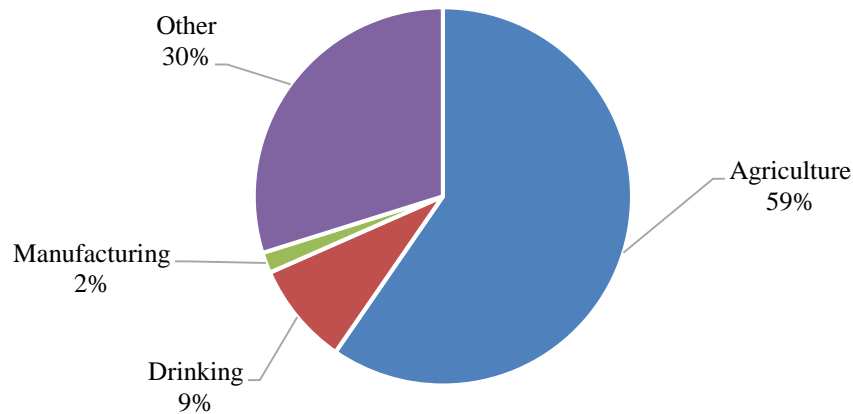
9.5. DATA FOR WATER SUPPLY, PRODUCTION AND SALE CAPACITIES AND NUMBER OF EXTENTIONS OF URBAN WATER

Year and Ostan	Max. capacity of water supply (litre/second)	Production (1000 cu m)	Sale ⁽¹⁾ (1000 cu m)	Extensions (number)
1380.....	165328	4008252	2617518	8060690
1385.....	214154	5094428	3464452	10115430
1390.....	247392	5323362	3900727	12891481
1395.....	261971	6045392	4502617	15827243
1396.....	247786	6162225	4633556	16270684
1397.....	251613	6186201	4586475	16684340
1398.....	254836	6262386	4737186	17073629
1399.....	269019	6647224	4882146	17506614
East Azarbayejan.....	10567	262480	211911	1220403
West Azarbayejan	10266	221155	167047	680009
Ardebil	3057	87417	66257	353072
Esfahan	19511	423380	353347	1325871
Alborz	10269	275543	215627	432867
Ilam.....	1574	46989	34852	156756
Bushehr	3352	104010	65533	297139
Tehran.....	63450	1490424	1158269	1906494
Chaharmahal&Bakhtiyari	2444	56740	42222	246666
South Khorasan	2203	51909	32780	205742
Khorasan-e-Razavi.....	16475	416503	301598	1724571
North Khorasan	1521	43817	30033	208268
Khuzestan.....	23592	666070	392860	1084283
Zanjan	3466	69808	53664	248774
Semnan.....	2858	62395	46763	253936
Sistan&Baluchestan	6918	147342	107409	373305
Fars.....	12383	345521	251490	1181732
Qazvin	3397	92072	72994	319012
Qom.....	5897	121916	99731	338281
Kordestan	5332	127799	88801	395316
Kerman	9109	200475	139196	648494
Kermanshah	8396	159216	106177	405084
Kohgiluyeh&Boyerahmad	2127	60999	31397	184017
Golestan	3803	103056	69511	292181
Gilan	5813	174317	121475	519483
Lorestan	4414	127700	95464	433180
Mazandaran.....	10097	240532	166939	645205
Markazi	5124	126203	93410	327024
Hormozgan.....	4068	126250	99166	261411
Hamedan	3902	102194	79791	402095
Yazd	3635	112992	86434	435943

1. Water sale refers to water consumption.

Source: Water and Sewage Engineering Company.

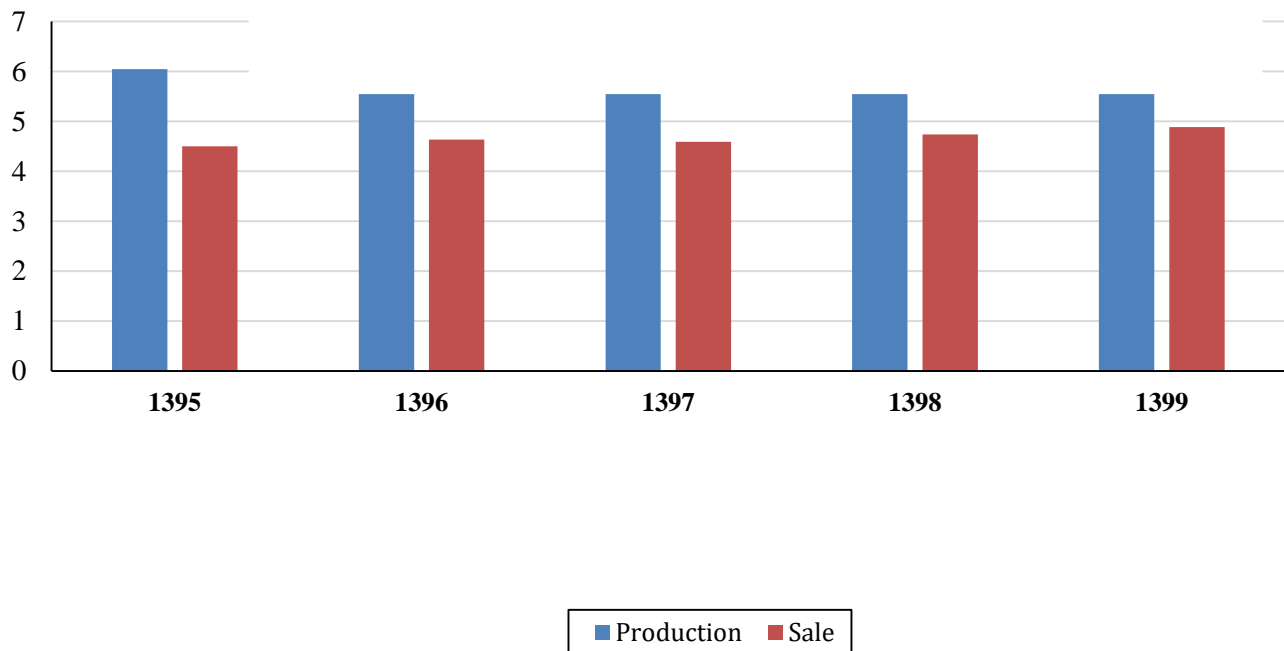
9.3. WATER CONSUMPTION OF LARGE RESERVOIR DAMS BY TYPE OF USE, THE YEAR 1399



For data see Table 9.3.

9.4. PRODUCTION AND SALE OF WATER IN URBAN AREAS BY URBAN WATER AND SEWAGE COMPANIES

Billion cu / m



For data see Table 9.5.

9.6. DATA FOR WATER SUPPLY, PRODUCTION AND SALE CAPACITIES AND NUMBER OF EXTENTIONS OF RURAL WATER

Year and Ostan	Max. capacity of water supply (litre/second)	Production (1000 cu m)	Sale ⁽¹⁾ (1000 cu m)	Extensions (number)
1385.....	51242	1019180	652929	3200860
1390.....	77038	1160295	794211	4415236
1395.....	81054	1382449	947807	5392903
1396.....	84306	1441038	975704	5564715
1397.....	101178	1489105	992694	5739206
1398.....	108058	1601729	1055400	5873870
1399.....	170230	1744762	1077794	6005284
East Azarbayejan.....	17319	85057	47996	335982
West Azarbayej an	3154	101782	75150	300845
Ardebil	4047	38105	22000	124907
Esfahan.....	2351	65893	45811	257401
Alborz	3764	21042	9686	64870
Ilam	589	15668	11207	60910
Bushehr	1345	41383	23934	102691
Tehran	4361	51185	33379	163128
Chaharmahal&Bakhtiyari	4135	28926	17289	96570
South Khorasan.....	998	33639	17086	136703
Khorasan-e-Razavi.....	4263	150981	99098	614468
North Khorasan.....	1091	35886	20989	128051
Khuzestan.....	11690	94281	57316	195280
Zanjan	1911	40422	23029	111964
Semnan.....	268	16540	9920	69294
Sistan&Baluchestan	43736	51324	31363	183992
Fars.....	6764	124753	86829	443899
Qazvin	1574	37576	24360	122819
Qom.....	2215	17352	7907	36378
Kordestan	5957	36540	24571	132642
Kerman.....	2739	107656	51892	278891
Kermanshah	3818	39887	25580	144145
Kohgiluyeh & Boyerahmad	7559	26196	8716	66927
Golestan	3920	69700	43991	243802
Gilan.....	5446	78320	39745	333327
Lorestan.....	6932	46891	31664	139270
Mazandaran.....	5800	105687	72882	457296
Markazi	4311	39716	28121	158275
Hormozgan.....	2486	72200	40140	209792
Hamedan	4366	48764	32666	172232
Yazd	1317	21410	13477	118533

1. Water sale refers to water consumption.

Source: Water and Sewage Engineering Company

9.7. DATA FOR CAPACITY OF RESERVOIRS, RURAL WATER DISTRIBUTION AND TRANSMISSION NETWORK

(cu m / km)

Year and Ostan	Capacity of reservoirs in the network	Length of the network for water distribution	Length of pipelines for water transmission
1385.....	2914866	116474	64500
1390.....	3292684	155248	87848
1395.....	3628788	172980	103705
1396.....	3803553	178848	105215
1397.....	3865387	181638	107583
1398.....	3971542	194229	109708
1399.....	3974936	186833	110830
East Azarbayejan.....	225298	8510	7592
West Azarbayejan	155845	7066	5189
Ardebil	109884	3734	2548
Esfahan	140635	5451	3086
Alborz	48625	1273	679
Ilam	71609	1446	1725
Bushehr	71380	3512	1999
Tehran	128780	2726	1285
Chaharmahal&Bakhtiyari	66104	3432	1847
South Khorasan.....	166237	4086	4550
Khorasan-e-Razavi.....	331735	13318	9154
North Khorasan	88611	2900	2150
Khuzestan	157373	12802	8684
Zanjan	95284	3367	2501
Semnan.....	42214	1203	815
Sistan &Baluchestan	191201	9765	6892
Fars	284924	13936	7665
Qazvin	73368	2623	1835
Qom	55840	584	663
Kordestan	90653	2725	3189
Kerman	224001	13464	6258
Kermanshah	127591	5372	3499
Kohgiluyeh & Boyerahmad	114582	3770	2858
Golestan	80125	5151	3000
Gilan.....	145475	18236	4202
Lorestan.....	70684	4589	2835
Mazandaran.....	181844	12401	2454
Markazi	100085	3727	2327
Hormozgan.....	107575	7218	4869
Hamedan	121217	3916	2641
Yazd	106160	4526	1838

Source: Water and Sewage Engineering Company.

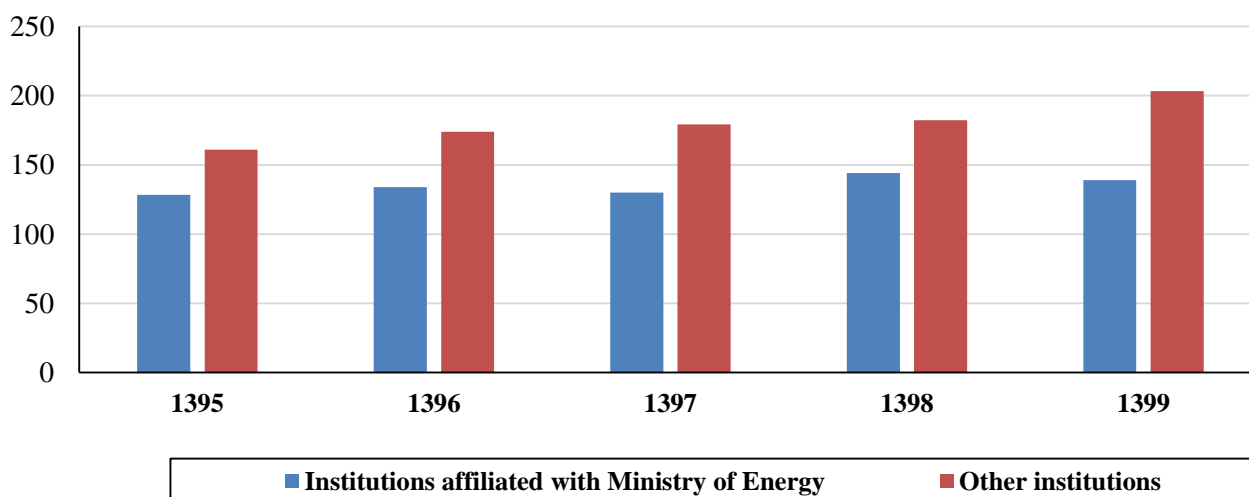
9.8. NOMINAL CAPACITY AND GROSS ELECTRICITY GENERATION OF INSTALLED GENERATORS

Year	Nominal capacity (1000 kW)			Gross electricity generation (mln kW h)		
	Total	Institutions affiliated with the Ministry of Energy	Other institutions	Total	Institutions affiliated with the Ministry of Energy	Other institutions
1380.....	34233	28043	6190	129996	124275	5721
1385.....	45151	40909	4242	192534	181538	10996
1390.....	65212	52252	12960	240063	208413	31650
1395.....	76428	35764	40664	289196	128291	160905
1396.....	78794	36511	42283	307968	133934	174034
1397.....	80467	36625	43842	309182	129920	179262
1398.....	83506	37276	46230	326431	144069	182362
1399.....	85432	37474	47958	342365	139068	203297

Source: Ministry of Energy.

9.5. GROSS ELECTRICITY GENERATION IN THE COUNTRY

Billion cu / m



For data see Table 9.8.

9.9. CAPACITY OF INSTALLED GENERATORS AND MAXIMUM POWER GENERATED AT THE POINT OF PEAK CONSUMPTION IN THE POWER PLANTS (1000 kW)

Year and type of generator	Nominal capacity (nominal power)	Actual capacity (actual capacity)	Power generated at the point of peak consumption
1380.....	28944	26496	21853
1385.....	45288	40985	32997
1390.....	65212	57522	42245
1395.....	76428	66598	51579
1396.....	78794	68321	54016
1397.....	80467	69864	48831
1398.....	83506	72532	57017
1399.....	85432	74273	58076
Ministry of energy	37474	34103	27670
Hydroelectric.....	12193	12193	9024
Steam	11241	10630	8710
Gas	6757	5313	4517
Combined cycle.....	5725	4564	4456
Diesel	439	284	41
Atomic	1020	1020	903
Renewable.....	99	99	21
Large scale industries	6065	5016	1208
Steam.....	589	490	288
Gas	5476	4526	920
Private sector	41893	35153	29197
Steam.....	4000	3772	3313
Gas	11757	9826	7171
Combined cycle.....	25454	20872	18630
Renewable.....	683	683	83

Source: Ministry of Energy.

9.10. CAPACITY OF INSTALLED GENERATORS AND GROSS ELECTRICITY GENERATION OF POWER PLANTS, THE YEAR 1399

Ostan	Nominal capacity (1000 kW)	Actual capacity (1000 kW)	Gross generation (mln kW h)
Total	85432	74273	342365
East Azarbayejan.....	2116	1910	9583
West Azarbayejan	1822	1521	7360
Ardebil	1185	967	3446
Esfahan	5347	4784	28340
Alborz	1812	1534	7639
Ilam	678	646	538
Bushehr	5720	4933	15662
Tehran	7011	5684	28780
Chaharmahal&Bakhtiari	1056	1055	1541
South Khorasan.....	804	604	2773
Khorasan-e-Razavi.....	3832	3268	16936
North Khorasan.....	1480	1190	5404
Khuzestan	15686	14510	45517
Zanjan	739	591	3107
Semnan.....	719	582	2394
Sistan &Baluchestan	1602	1286	6392
Fars	5243	4078	25658
Qazvin	2246	2039	12648
Qom	791	672	4823
Kordestan	1020	832	5705
Kerman	3899	3037	20609
Kermanshah	2242	1991	8559
Kohgiluyeh & Boyerahmad	46	46	50
Golestan	1026	935	3470
Gilan.....	2863	2649	14212
Lorestan.....	911	807	2140
Mazandaran.....	4076	3899	13571
Markazi	1374	1289	8380
Hormozgan.....	4164	3539	16792
Hamedan	1066	1066	7070
Yazd	2858	2327	13265

Source: Ministry of Energy.

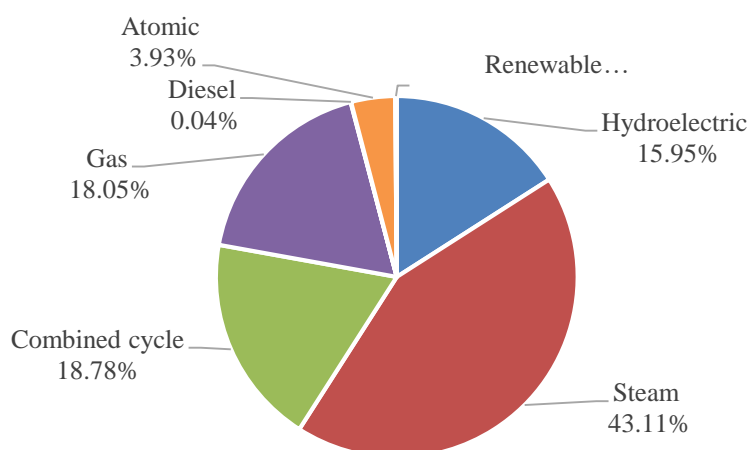
9.11. ELECTRICITY GENERATION AND INTERNAL CONSUMPTION OF THE POWER PLANTS

(mln kWh)

Year and type of generator	Gross generation	Internal consumption of plants	Net generation
1380.....	127169	6123	121046
1385.....	192535	7773	184762
1390.....	240063	8442	231621
1395.....	289196	8285	280911
1396.....	307968	8810	299159
1397.....	309182	8703	300479
1398.....	326431	8871	317559
1399.....	342365	10850	331515
Ministry of energy	139068	5222	133846
Hydroelectric.....	22182	91	22092
Steam	59955	4319	55637
Combined cycle.....	26115	589	25526
Gas	25101	219	24882
Diesel	59	4	54
Atomic	5462	0	5462
Renewable.....	194	1	193
Large scale industries	6120	238	5881
Steam.....	2134	210	1924
Gas	3986	28	3958
Private sector	197177	5389	191788
Steam.....	22721	1796	20925
Gas	42343	243	42100
Combined cycle.....	131071	3342	127729
Renewable.....	1043	10	1034

Source: Ministry of Energy

9.6. SHARE OF ELECTRICITY GENERATORS TYPES OF THE POWER PLANTS AFFILIATED TO THE MINISTRY OF ENERGY FROM GROSS GENERATION OF POWER , THE YEAR 1399



For data see Table 9.11.

9.12. GROSS ELECTRICITY GENERATION OF HYDROELECTRIC POWER PLANTS BY REGIONAL WATER ORGANIZATION AND TYPE OF DAM (1000 kWh)

Year and regional water organization	Total		Concrete arch		Earth		Other	
	Number	Generation	Number	Generation	Number	Generation	Number	Generation
1380.....	13	5056652	8	4902159	5	154493	-	-
1385.....	29	18168964	13	12634896	18	5550129	12	182164
1390.....	46	13287425	26	8489912	9	4707067	11	90446
1395.....	52	16419181	28	9412166	13	6945188	11	61827
1396.....	58	15051012	28	7946516	15	7020383	15	84113
1397.....	59	15765098	28	8120216	15	7530619	16	114263
1398.....	66	31081847	28	15517630	16	15412177	22	152040
1399.....	67	22182496	28	10909560	16	11060169	23	212767
East Azarbayejan.....	0	0	0	0	0	0	0	0
West Azarbayejan	3	600849	0	0	3	600849	0	0
Ardebil	1	64574	0	0	0	0	1	64574
Esfahan.....	2	179364	2	179364	0	0	0	0
Alborz	3	233512	1	174131	1	59381	1	0
Ilam	1	461488	1	461488	0	0	0	0
Tehran	3	374609	2	200482	1	174127	0	0
Chaharmahal & Bakhtiari..	3	1524172	2	1524172	0	0	1	0
Khorasan-e-Razavi.....	3	0	2	0	0	0	1	0
Khuzestan.....	8	15876394	3	7834575	4	8041500	1	319
Semnan.....	1	24994	0	0	0	0	1	24994
Fars.....	3	48566	1	10984	2	37582	0	0
Qom.....	1	22864	0	0	0	0	1	22864
Kordestan	1	48155	0	0	1	48155	0	0
Kerman.....	1	142566	1	142566	0	0	0	0
Kermanshah	2	378101	1	0	1	378101	0	0
Kohgiluyeh & Boyer-Ahmad.	5	50182	3	30240	0	0	2	19942
Gilan.....	7	320089	2	289052	1	29469	4	1568
Lorestan.....	5	654825	3	0	1	653876	1	949
Mazandaran.....	9	1096755	3	40758	1	1037129	5	18868
Markazi	4	80437	1	21748	0	0	3	58689
Hamedan	1	0	0	0	0	0	1	0

Source: Ministry of Energy.

9.13. GROSS ELECTRICITY GENERATION, FUEL CONSUMPTION, ENERGY GENERATION AND OUTPUT OF THERMAL POWER PLANTS AFFILIATED WITH THE MINISTRY OF ENERGY, LARGE SCALE INDUSTRIES AND PRIVATE SECTOR

Year and type of ownership of the power plant	Gross electricity generation (mln kWh)	Fuel consumed			Energy generated from fuel consumption (bln kcal)	Thermal energy consumed to generate one kWh of electricity (kcal)	Output (percent)
		Gas oil (mln lit)	Fuel oil (mln lit)	Natural gas (mln cu m)			
1380.....	122081	1618	6799	24012	295114	2414	35.6
1385.....	174280	4362	7587	32168	393246	2403	35.8
1390.....	227428	9406	12019	38901	530623	2333	36.9
1395.....	265774	5867	4483	61782	604856	2276	37.8
1396.....	284988	4841	3687	69382	651960	2288	37.6
1397.....	285256	5970	3451	67356	644067	2258	38.1
1398.....	287521	10253	5398	60243	641325	2231	38.6
1399.....	313483	10188	5891	67318	690647	2203	39.0
Power plants affiliated with the Ministry of Energy	111230	2166	5358	23620	260384	2341	36.7
Large scale industries	6120	6	0	1841	18008	2943	29.2
Private sector	196134	8016	533	41856	412255	2102	40.9

Source: Ministry of Energy.

9.14. GENERATION, INTERNAL CONSUMPTION OF POWER PLANTS, PURCHASE, LOSSES AND SALES OF ELECTRIC POWER OF INSTITUTIONS AFFILIATED WITH THE MINISTRY OF ENERGY (mln kWh)

Description	Year							
	1380	1385	1390	1395	1396	1397	1398	1399
Gross generation	124275	181538	208414	128292	133934	129920	144069	139068
Less: Internal consumption of plants	5942	7064	7985	4520	4887	4777	4848	5222
Net generation	118333	174474	200429	123772	129047	125143	139219	133846
Plus: Electricity purchased from large-scale industries ⁽¹⁾	5721	10997	23637	149743	164071	171406	174776	197669
Less: Distribution and transmission networks losses	20857	35566	34102	33513	33772	32853	32550	33358
Net sales	97476	144831	188917	239903	259346	263696	281959	297643
Net exports	305	233	5012	2467	4320	3708	6865	6796
Domestic sales.....	97171	144598	183905	237436	255026	259723	275094	290847

1. Other institutions include large scale industries and private plants.

Source: Ministry of Energy.

9.15. MAXIMUM COINCIDENTAL AND NON-COINCIDENTAL LOADS OF REGIONAL POWER COMPANIES (1000 kWh)

Description	Maximum coincidental load
1380.....	23220
1385.....	33453
1390.....	41481
1395.....	50926
1396.....	53414
1397.....	48999
1398.....	55839
1399.....	57023
Azarbajejan Regional Power Company	3180
Esfahan Regional Power Company	3600
Bakhtar Regional Power Company	2769
Tehran Regional Power Company	9301
Khorasan Regional Power Company	3686
Khuzestan Regional Power Company	7549
Zanjan Regional Power Company	1503
Semnan Regional Power Company	473
Sistan&Baluchestan Regional Power Company	1452
Gharb Regional Power Company	1845
Fars Regional Power Company	5417
Kerman Regional Power Company	2054
Gilan Regional Power Company	1784
Mazandaran Regional Power Company	4051
Hormozgan Regional Power Company	2404
Yazd Regional Power Company	1228
Kish Water and Power Company.....	166
Large scale industries.....	4563

Source: Ministry of Energy.

9.16. ELECTRIC POWER TRANSMISSION LINES (km circuits)

Year	Transmission lines		Sub-transmission lines	
	400 kV	230 kV	132 kV	63 and 66 kV
1380.....	9924	20731	13857	29400
1385.....	12404	25634	18582	37974
1390.....	18625	29158	22092	44956
1395.....	20477	31324	23413	48063
1396.....	20617	31589	23504	48295
1397.....	20893	32411	23821	49524
1398.....	21329	32571	23939	50205
1399.....	21880	32861	24589	50710

Source: Ministry of Energy.

9.17. CAPACITY OF POWER TRANSMISSION SUB-STATIONS OF THE COUNTRY (MVA)

Year and Ostan	Transmission sub-stations		Sub-transmission sub-stations	
	400 kV	230 kV	132 kV	63 and 66 kV
1380	22458	37287	12762	31265
1385	29633	53816	18489	43987
1390	46708	67412	25352	59759
1395	62183	80470	30865	69456
1396	64093	82045	32251	72794
1397	67523	84876	33321	75619
1398	75008	88535	36227	78306
1399	79058	92595	37137	80208
East-Azarbayejan.....	1715	3435	3310	1060
West-Azarbayejan	945	1805	2849	15
Ardebil.....	815	1245	0	902
Esfahan	6860	5895	0	7901
Alborz.....	1000	2236	0	3005
Ilam.....	0	1255	559	770
Bushehr.....	5245	2376	1907	2067
Tehran.....	10900	11800	0	14205
Chaharmahal&Bakhtiari.....	1810	0	0	1203
South Khorasan.....	1275	0	850	0
Khorasan-e-Razavi	4758	160	6755	1036
North Khorasan.....	1200	0	1008	0
Khuzestan	9680	8297	12293	0
Zanjan	2030	1615	0	2232
Semnan	2000	2010	0	1623
Sistan&Baluchestan.....	945	3386	30	3005
Fars	6040	4655	765	7325
Qazvin.....	800	1555	0	2370
Qom	70	1490	0	1815
Kordestan.....	0	1885	80	1160
Kerman	4835	5850	4357	360
Kermanshah.....	1230	2665	0	2316
Kohgiluyeh&Boyerahmad.....	400	540	639	0
Golestan.....	700	2070	0	1978
Gilan	1000	3405	120	3331
Lorestan	1000	2060	0	2052
Mazandaran	2830	4615	0	4783
Markazi.....	2000	2925	0	3338
Hormozgan	3490	8186	1215	5643
Hamedan.....	600	1815	0	2132
Yazd.....	2885	3364	400	2581

Source: Ministry of Energy.

9.18. NUMBER OF CUSTOMERS OF THE NATION'S OSTANS BY TYPE OF CONSUMPTION

(consumer)

Year and Ostan	Total	Household	Public	Agricultural	Industrial	Other
1380.....	16345450	13682563	523505	77556	91468	1970358
1385.....	20559946	16989284	748964	138137	152202	2531359
1390.....	27164768	22224100	1082528	284781	174255	3399104
1395.....	33824208	27354153	1543440	400257	225296	4301062
1396.....	34835756	28100586	1611382	422260	236372	4465156
1397.....	35688115	28749257	1665987	444212	245939	4582720
1398.....	36643985	29426885	1732289	463718	254807	4766286
1399.....	37617583	30170016	1788087	481682	259943	4917855
East Azarbayejan.....	1932127	1491770	85902	21947	16396	316112
West Azarbayejan	1303099	1054753	35688	21888	6452	184318
Ardebil	581597	476915	26523	4673	3612	69874
Esfahan.....	2740382	2143038	107396	48774	34854	406320
Alborz	1406339	1132044	90457	5331	6982	171525
Ilam	238546	197675	9138	3178	1133	27422
Bushehr	494573	399529	19200	5660	2801	67383
Tehran	6970433	5343772	550116	12673	44173	1019699
Chaharmahal & Bakhtiari	385128	320964	12972	7190	3001	41001
South Khorasan	383554	320393	16163	5636	2630	38732
Khorasan-e-Razavi.....	2979176	2453876	115216	23519	21500	365065
North Khorasan.....	375302	316354	13703	3874	1899	39472
Khuzestan.....	1698444	1399901	58510	10875	4875	224283
Zanjan	471385	378900	17605	8958	3639	62283
Semnan.....	391289	299935	23589	6899	5579	55287
Sistan & Baluchestan	877439	737341	30141	13629	3039	93289
Fars.....	2148333	1756412	76348	46420	14622	254531
Qazvin	619320	492812	40876	6616	4948	74068
Qom.....	587978	473144	22840	4071	6775	81148
Kordestan	680143	564492	23509	10924	3079	78139
Kerman.....	1251914	1061565	36302	17143	6206	130698
Kermanshah	791215	661188	28493	7987	3259	90288
Kohgiluyeh & Boyerahmad	268986	225163	9533	3197	1368	29725
Golestan	761480	625307	30665	12177	3241	90090
Gilan.....	1509447	1180008	76010	23853	6360	223216
Lorestan.....	669920	569714	18475	8990	2769	69972
Mazandaran.....	2101187	1655825	96478	91277	14764	242843
Markazi	753578	617515	31129	10697	8031	86206
Hormozgan.....	767676	625252	37338	9847	3671	91568
Hamedan	768046	621569	31094	13043	6138	96202
Yazd	709546	572890	16678	10737	12145	97096

Source: Ministry of Energy.

9.19. DOMESTIC SALE OF ELECTRICITY OF THE NATION'S OSTANS BY TYPE OF CONSUMPTION

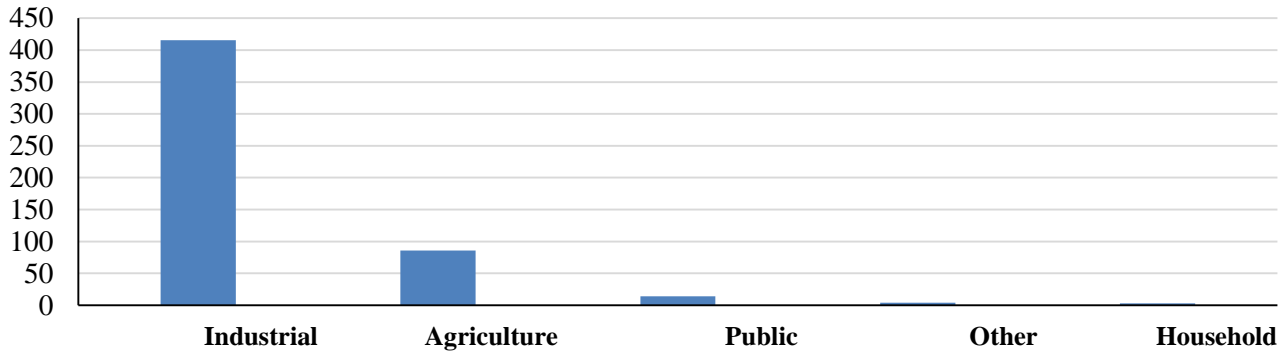
(mln KWh)

Year and Ostan	Total	Household	Public	Agricultural	Industrial	Streets lighting	Other
1380.....	96811	32891	11951	11079	30379	4117	6394
1385.....	144598	48085	18329	17666	46590	4608	9320
1390.....	183905	56771	16808	29965	63945	3752	12664
1395.....	237436	78378	22914	36222	77603	4699	17620
1396.....	255026	83403	24328	39379	84218	5017	18681
1397.....	259723	85098	24073	38033	88540	4987	18990
1398.....	275094	88500	25589	38764	97081	5017	20143
1399.....	290847	92283	24586	41288	108074	4876	19741
East Azarbayejan.....	10415	2634	640	1218	4945	213	766
West Azarbayejan	6605	2098	423	1288	2203	143	451
Ardebil	2110	742	190	328	627	68	154
Esfahan	27363	4713	1148	3141	16765	320	1276
Alborz	7657	2519	687	795	2777	109	769
Ilam	1691	756	126	371	303	34	101
Bushehr	7385	4605	999	430	791	123	437
Tehran	37229	12900	6360	2873	8364	515	6216
Chaharmahal&Bakhtiyari	2418	543	118	701	870	85	102
South Khorasan	1798	501	153	500	471	74	100
Khorasan-e-Razavi.....	17947	4706	1039	4588	6113	350	1152
North Khorasan	2183	502	103	375	1074	36	94
Khuzestan	31620	15945	2418	2679	8670	494	1413
Zanjan	4504	670	165	685	2770	57	156
Semnan.....	3550	555	196	593	2003	61	142
Sistan&Baluchestan	7152	3649	1251	1089	613	164	386
Fars	18553	5393	1191	5316	5275	334	1044
Qazvin	4890	928	258	965	2454	69	216
Qom	4065	1342	373	469	1478	60	343
Kordestan	2909	1070	183	618	811	57	171
Kerman	17717	3744	733	4094	8454	204	489
Kermanshah	4222	1487	609	525	1248	102	251
Kohgiluyeh&Boyerahmad	1785	866	301	180	254	71	113
Golestan	3749	1705	297	701	694	81	271
Gilan.....	6393	2556	515	602	1939	169	613
Lorestan.....	3925	1155	446	871	1133	141	179
Mazandaran.....	9143	3982	743	1107	2226	252	833
Markazi	9033	1170	259	1262	5979	130	232
Hormozgan.....	17438	6416	2124	996	7011	144	748
Hamedan	4616	1217	277	1190	1597	97	238
Yazd	10781	1213	263	740	8163	118	284

Source: Ministry of Energy.

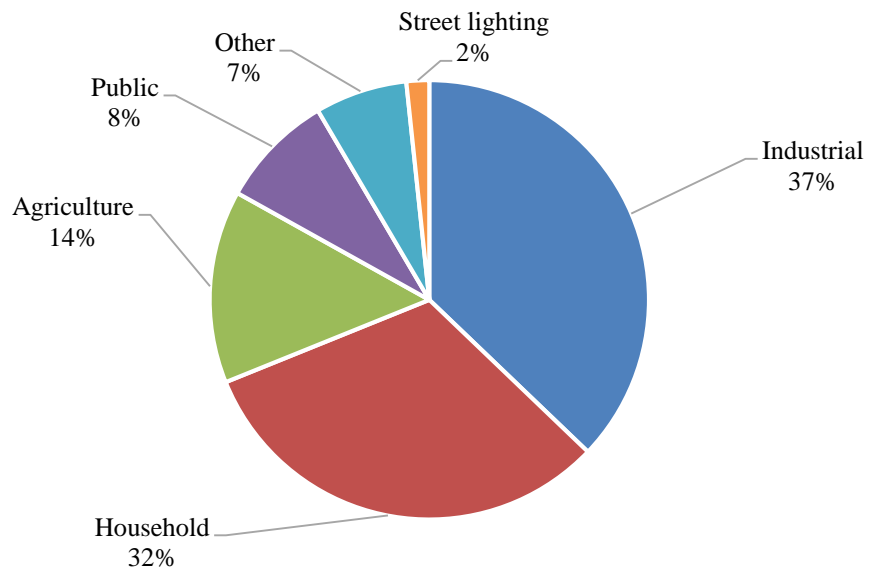
9.7. AVERAGE ELECTRICITY CONSUMPTION BY TYPE OF CUSTOMERS, THE YEAR 1399

1000 Kw/h



For data see Tables 9.18 and 9.19.

9.8. DOMESTIC SALE OF ELECTRICITY BY TYPE OF USE, THE YEAR 1399



For data see Table 9.19.

9.20. NUMBER OF VILLAGES, RURAL HOUSEHOLDS ENJOYING ELECTRICITY AND CHARACTERISTICS OF ELECTRICITY TRANSMITTING INSTALLATIONS TO VILLAGES

Year and Ostan	Village	Household enjoying electricity	Length of power distribution lines with medium pressure (km)	Length of power distribution lines with low pressure (km)	Number of distribution transformers	Capacity of distribution transformers (MVA)
1380.....	45359	4056072	120580	89359	54162	5688
1385.....	50985	4427849	138330	93464	64718	6812
1390.....	54116	4452795	139429	98390	72186	7283
1395.....	56793	4492752	145049	99958	76735	7687
1396.....	57030	4496797	145421	100091	77003	7698
1397.....	57280	4500250	145895	100224	77316	7713
1398.....	57420	4502045	146172	100305	77503	7717
1399.....	57755	4506485	146744	100468	77911	7734
East Azarbayejan.....	2894	297784	8541	5663	3064	319
West Azarbayejan	2930	210769	5749	4090	3030	290
Ardebil	1622	70536	4564	3591	1621	117
Esfahan	1771	296966	4836	4541	3045	274
Alborz	225	21849	515	490	238	30
Ilam	632	44806	1468	810	699	72
Bushehr	519	39946	1504	1231	835	113
Tehran	603	152981	1279	1629	1095	153
Chaharmahal&Bakhtiyari	768	85829	605	999	547	60
South Khorasan	1501	125057	3506	2312	1763	130
Khorasan-e-Razavi.....	3289	327777	7313	4622	3604	311
North Khorasan	960	94333	3317	1914	1161	85
Khuzestan	3807	207602	8032	3539	7857	1136
Zanjan	931	91631	3855	2043	1028	118
Semnan.....	503	35966	2822	954	479	51
Sistan&Baluchestan	4558	245056	15522	6314	6537	587
Fars	3251	283878	9141	5934	4670	433
Qazvin	861	73011	2634	2241	1126	169
Qom	191	18252	412	249	191	17
Kordestan	1786	127467	5348	2163	1868	188
Kerman	5250	240995	12969	7902	8222	662
Kermanshah	2546	127648	4388	2564	2630	259
Kohgiluyeh&Boyerahmad	1670	54987	3354	1416	2161	231
Golestan	898	106284	1631	1198	1018	69
Gilan.....	3033	287710	4548	10203	4800	422
Lorestan.....	2758	103278	5643	2722	2608	192
Mazandaran.....	3009	262249	4665	5948	3075	221
Markazi	1193	124359	4702	4089	1390	173
Hormozgan.....	1720	127095	8174	5019	4428	581
Hamedan	1128	165032	3403	2982	2075	195
Yazd	948	55352	2304	1098	1046	75

Source: Ministry of Energy.

9.21. EXCHANGE OF ELECTRICITY WITH NEIGHBORING COUNTRIES (mln kWh)

Year	Exports				
	Total	Nakhjavan	Turkey	Armenia	Azerbaijan
1380.....	1049	389	251	224	185
1385.....	2774	561	576	316	11
1390.....	8668	56	1118	57	0
1395.....	6688	48	297	105	1
1396.....	8130	40	0	51	3
1397.....	6295	28	0	58	1
1398.....	000	000	000	000	000
1399.....	000	000	000	000	000

Year	Exports			
	Turkminestan	Pakistan	Afghanistan	Iraq
1380.....	0	0	0	0
1385.....	2	172	134	1002
1390.....	8	271	557	6601
1395.....	0	482	731	5024
1396.....	0	570	662	6803
1397.....	0	511	756	4942
1398.....	000	000	000	000
1399.....	000	000	000	000

Year	Energy exchange	Imports			
		Total	Nakhjavan	Turkey	Armenia
1380.....	305	745	0	0	315
1385.....	233	2541	0	0	428
1390.....	5012	3656	57	0	1508
1395.....	2467	4221	51	0	1133
1396.....	4278	3852	38	0	1412
1397.....	3708	2587	27	0	1241
1398.....	000	000	000	000	000
1399.....	000	000	000	000	000

Year	Imports				
	Azerbaijan	Turkminestan	Pakistan	Afghanistan	Iraq
1380.....	430	0	0	0	0
1385.....	536	1576	0	0	0
1390.....	2	2089	0	0	0
1395.....	4	3033	0	0	0
1396.....	2	2399	0	0	0
1397.....	49	1270	0	0	0
1398.....	000	000	000	000	000
1399.....	000	000	000	000	000

Source: Ministry of Energy.

9.22. SPECIFICATIONS OF THE ELECTRICITY DISTRIBUTION NETWORK OF THE COUNTRY BY OSTAN AT THE END OF THE YEAR 1399

Ostan	Length of power distribution network lines with medium voltage (km)	Length of power distribution network lines with low voltage (km)	Number of distribution network transformers	Capacity of distribution network transformers (MVA)
Total	442837	380339	773576	131282
East Azarbayejan.....	18480	16287	27530	4218
West Azarbayejan	15512	12531	20570	2681
Ardebil	7524	6300	7251	991
Esfahan	27040	27828	48023	9019
Alborz	5260	7099	18431	4500
Ilam	5042	2623	6528	1030
Bushehr	8868	7022	18376	4233
Tehran	22472	42628	74046	21747
Chaharmahal&Bakhtiari	6681	5220	9004	1133
South Khorasan.....	12892	5805	9956	1071
Khorasan-e-Razavi.....	34328	25158	45255	7562
North Khorasan.....	7025	4810	7813	897
Khuzestan	23132	20555	59588	14404
Zanjan	8547	5970	10450	1588
Semnan.....	7647	4161	8598	1462
Sistan&Baluchestan	25964	14716	26389	3138
Fars	38274	26170	76962	9798
Qazvin	7346	5370	12940	2034
Qom	4134	3906	7743	1820
Kordestan	10849	6238	14209	1499
Kerman	32493	22857	46341	5510
Kermanshah	11987	7115	18408	2198
Kohgiluyeh&Boyerahmad	5080	3740	8210	1248
Golestan	8129	8058	20028	2632
Gilan.....	9443	20144	23127	3695
Lorestan.....	10554	6286	17247	2012
Mazandaran.....	18068	25751	50499	6522
Markazi	11970	8650	17749	2544
Hormozgan.....	16448	10202	28036	5612
Hamedan	10636	8353	17505	2358
Yazd	11011	8789	16764	2128

Source: Ministry of Energy.