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ENERGY REGULATORY OFFICE



ELECTRICITY AND THERMAL ENERGY ANNUAL BALANCE 2020
(reviewed version)

Pristina, June 2020



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INTRUDCUTION

The Annual Balance of Electricity and Thermal Energy 2020 is compiled in accordance with Law no. 05/L-081 on Energy (Article 8), as well as the Methodology on Preparation of Electricity Balances.

This document presents the annual planning of electricity and thermal energy generation and demand as well as the forecast for import and export of electricity and losses in the transmission/transport and distribution network of electricity/ thermal energy.

The purpose of this document is to inform all interested parties on the forecast of energy demand and supply for 2020.

Based on the document "Rule and methodology on preparation of energy Balances", paragraph 7.2 Review of the Annual Electricity Balance, the Annual Electricity Balance is subject to the required review according to the criteria set out in the Rule.

Considering that the change in production planning exceeds 15% of the value from the Annual Balance of Electricity, approved by ERO, KOSTT has worked on a version of the Balance with changes in electricity generation received by KEK. The review was made due to changes in production due to the impossibility of implementing the EU project for the repair of block B1, due to the COVID-19 pandemic. This has imposed the review of maintenance plans of other generating units as well as the change in import planning, in addition to the change in production. The review of the Annual Balance of Electricity was done from March to December 2020.

The basic documents used for compilation of this document were:

- Electricity Balance 2020 (reviewed), compiled by KOSTT;
- Annual Balance 2020, compiled by District Heating Termokos JSC, Pristina;
- Annual Balance 2020, compiled by District Heating Gjakova JSC.

The data presented in this Balance Sheet are based on the data from previous years, current development projections, and relevant documents (strategies, studies).

1 ELECTRICITY ANNUAL BALANCE 2020

The Electricity Annual Balance presents the annual planning of electricity consumption in relation to the available electricity. The Electricity Annual Balance is based on the planned demand for electricity consumption for 2020, which is forecast to be supplied by domestic generation and import of electricity. The Balance also foresees the export of electricity surpluses.

The Electricity Annual Balance contains:

- Planning of electricity generation. The plan shall contain monthly and annual values for the forecasted electricity generation, the energy used for the power plant's own consumption and the co-generation energy (TPP Kosova B);
- Planning of electricity consumption demand in the transmission and distribution network according to the structure of:
 - demand of the company for distribution of electricity;
 - demand of customers connected to 110 kV and above;
 - losses in transmission and distribution network.
- Electricity import and export plan.
- Planning of available capacities at the entry of power plants and required capacities to fulfil the demand for electricity and stability of functioning of the Electro-Energetic System (EES)
- Planning of required amount for the fuels, based on calorific values (calorific capability); for the planned amount of electricity generation from thermal power plants;
- Planning of electricity consumption for mining demand;
- Planning of production, consumption and reserves of coal and fuels;
- Planning of production and transmission equipment overhauls;
- Planning of new plants and facilities that are projected to become operational.

1.1 CAPACITIES AND ELECTRICITY GENERATION PLAN

1.1.1 Electricity installed capacities

The following is a table showing the data of the installed and operational capacities of the generating units:

Generating capacities	Year of Entry into Operation	Installed Capacity MW	Net operational MW
A3	1970	200	144
A4	1971	200	144
A5	1975	210	144
Kosova A		610	432
B1	1983	339	305
B2	1984	339	305
Kosova B		678	610
Ujmani	1981	35	32
HPP Lumbardhi 1	1957/2005	8.08	8.00
HPP Lumbardhi 2		5.4	5.20
EGU Belaja	2015	8.08	7.50
EGU Decani	2015	9.81	9.50
HPP- Kaskada e Lumbardhit		31.37	30.20
KITKA	2018	32.40	32.40
HPP Radavci	1934/2011		0.90
HPP Burimi	1948/2011		0.85
HPP Dikanci	1957/2011/2013		3.34
HPP Brodi 1			2.48
HPP Brodi 2	2015		5.00
HPP Brodi 3			4.70
HPP Restelica 1&2	2015		2.40
HPP Restelica 3			2.35
HPP Hydroline-Albaniku I	2015		1.87
HPP Hydroline-Albaniku II	2015		3.55
HPP Hydroline-Albaniku III			4.22
Hidroenergji (Lepenci 3)			10.00
Matkos grup (HC Brezovica)			2.10
EKO Energji (HC Binqa)			0.60
HPP Sharri			6.45
HPP Vica			4.60
HPP Shterpca			5.30
RENELUAL TAHIRI LLC HPP Dragashi			3.40
RENELUAL TAHIRI LLC HPP ORQUSHA			4.00
Wind Generators (WP)	2010		1.35
Led Light Tehnology	2015		0.10
PS Birra Peja + FF Kosova	2015		6.00
Solar Green Energy	2019		3.00
PS N.t.sh. Eling	2015		0.40
Photovoltaic solar electric plant ONIX	2015		0.50
Total generating capacities			1,216.06

1.1.2 Electricity Generation Plan

The annual generation of electricity in TPPs is planned up to the value of optimum utilization of generation capacities.

Electricity provided at the entry of transmission from TPP Kosova A and TPP Kosova B is planned in an amount of **5,654.7 GWh**, where:

- TPP Kosova A = **1,987.7 GWh**, at the entry of transmission.
- TPP Kosova B = **3,666.9 GWh**, at the entry of transmission.

Consumption of TPP Kosova A and TPP Kosova B from transmission is consumption obtained from transmission for generation needs.

Annual generation of electricity from HPP Ujmani and HPP- Kaskada e Lumbardhit (HPP Lumbardhi 1, HPP Lumbardhi 2, HPP EGU Belaja and HPP EGU Deçani), and from the Wind Park KITKA (Air-Energy) which are connected to the network transmission is planned as follows:

- HPP Ujmani = **97 GWh**.
- HPP-Kaskada e Lumbardhit = **105 GWh**
- Wind Park KITKA=**95.5 GWh**

The annual generation of electricity from hydro power plants, wind sources of energy and solar panels, connected to the distribution system is planned to be in the amount of **258,6 GWh**.

The generation of electricity entering the transmission system, generated from TPP Kosova A, TPP Kosova B, HPP Ujmani, HPP Kaskada e Lumbardhit and Wind Park Kitka for 2020 , is planned in an amount of **5,952.2 GWh**.

Whereas, the entire national generation, including HPPs connected to the distribution and wind generators as well as solar panels is planned in an amount of **6,210.8 GWh**.

Tab. 1.1 Electricity Generation Plan

Months/MWh	Total	January	February	March	April	May	June	July	August	September	October	November	December
TPP Kosova A - Generation at the entry	1,987,763	178,215	164,489	176,391	128,090	176,253	170,942	179,066	177,482	176,586	147,702	137,228	175,319
TPP Kosova B - Generation at the entry	3,666,948	368,538	345,382	370,577	362,002	363,466	158,802	188,194	234,566	323,541	297,630	305,703	348,546
Others connected to Transmission	297,521	22,604	20,350	29,338	36,383	33,405	30,871	19,681	15,505	14,511	21,613	24,019	29,241
RES connected to Distribution	258,603	11,613	16,156	26,982	33,160	34,170	29,162	18,980	12,921	13,196	18,159	21,680	22,424
Total production	6,210,835	580 971	546 377	603 287	559 636	607 294	389 777	405 921	440 474	527 834	485 105	488 629	575 530

Generation share

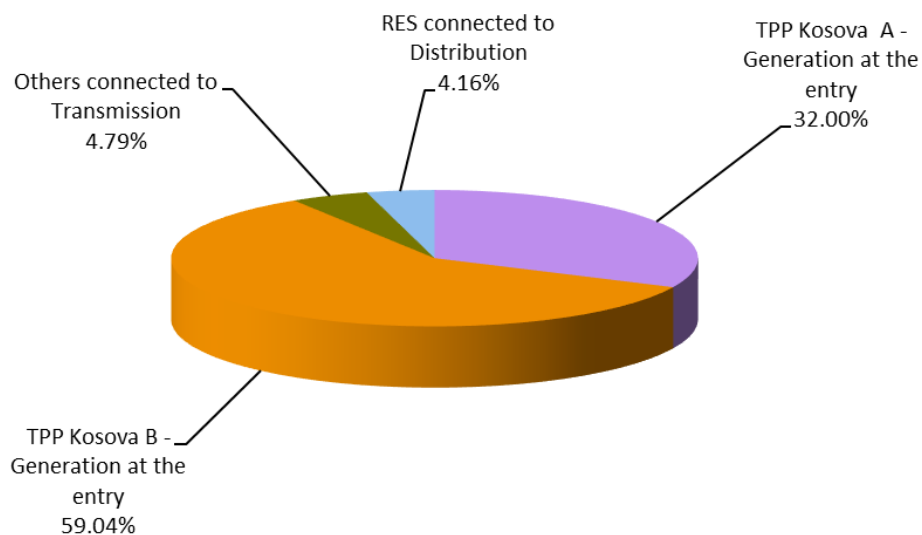


Fig. 1.1. Share of generators in generation of electricity

1.2 PLANNING OF ELECTRICITY DEMAND AND LOSSES

1.2.1 Electricity Consumption Plan

The overall demand for electricity in Kosovo for 2020, including the supply for consumption in the North of Kosovo, is estimated in an amount of **6,404 GWh**. This demand is planned to include the following:

- Net demand in distribution network (household, public lighting, small businesses etc., connected at the voltage level 35 kV, 10 kV and 0.4 kV) is foreseen to be = **4150 GWh**;
Distribution Losses (including the exceeded losses) in an amount of = **1,055 GWh**,
- Mining= **109 GWh**
- Trepça = **26 GWh**,
- Sharr Cem = **70 GWh**,
- NEW.CO. FERRONIKELI = **429 GWh**,
- Generation consumption from transmission **135 GWh** (TPP A =**109.7 GWh**, TPP B= **25.8 GWh**),
- System Losses (Consumption in the North of Kosovo) = **310 GWh**,
- Transmission Losses (including the exceeded losses) in an amount of = **117 GWh**.

1.2.2 Electricity Losses

The planning of entire losses in the transmission system includes the losses incurred by Kosovo consumption load and losses incurred by electricity passing through transit.

Electricity Losses in the transmission network are planned to be **117 GWh** where **114.5 GWh** or **1.667%** are allowed losses, whereas **2.5 GWh** are exceeded losses.

According to the received data, **the electricity losses in the distribution network** are planned to be **1,055 GWh** of which **970.9 GWh** or **18.65%** are allowed losses, whereas **84.3 GWh** are an exceeded value of losses, taking into account the allowed level of losses from ERO.

System losses (Consumption in the North of Kosovo) is the energy consumed in the four northern municipalities of Kosovo. Currently this consumption is not covered by any party, and is treated only as a consumption forecast (Table 1.6), until any new circumstances arise.



1.2.3 Consumption and Losses in Distribution Network

Tab. 1.2 Consumption and losses in the distribution network

(MWh)	Total	January	February	March	April	May	June	July	August	September	October	November	December
Distribution demand	4,947,585	590,905	483,577	454,038	355,204	345,827	306,947	337,318	354,107	325,979	373,424	441,695	578,565
Distributive HPPs and RES	258,603	11,613	16,156	26,982	33,160	34,170	29,162	18,980	12,921	13,196	18,159	21,680	22,424
Total distribution demand	5,206,188	602,518	499,733	481,019	388,364	379,997	336,109	356,298	367,028	339,174	391,583	463,375	600,990
Delivery													
110kV	0												
35kV	57,775	4,095	4,009	5,039	4,536	4,417	4,646	5,246	5,029	4,734	4,995	5,269	5,762
10kV	441,732	38,724	34,557	38,667	34,050	31,184	32,517	35,290	35,899	33,848	36,994	41,269	48,734
0,4kV	403,415	38,377	31,420	37,151	28,844	30,782	30,158	33,857	35,045	30,228	31,624	34,794	41,134
0.4/II kV	645,013	66,785	57,344	58,124	45,670	46,586	45,339	49,934	55,139	47,634	48,278	56,052	68,127
Household	2,573,892	287,242	230,617	241,000	195,001	196,668	179,813	188,372	193,662	179,609	194,794	218,618	268,496
Public lightning	29,103	3,009	2,815	2,698	2,382	1,917	1,888	1,812	1,859	2,120	2,543	2,833	3,227
Net distributive network	4,150,932	438,232	360,762	382,679	310,482	311,553	294,361	314,511	326,633	298,173	319,229	358,835	435,482
Distributive network of regulated consumpti	4,111,270	438,232	360,762	382,679	306,549	307,696	290,313	309,913	322,105	294,042	314,790	354,051	430,138
Technical Losses	658,688	100,280	72,390	62,700	46,584	41,937	31,868	32,551	31,477	30,595	47,625	61,264	99,416
Commercial Losses	312,243	52,230	42,459	32,923	22,979	21,857	8,655	8,509	8,501	9,457	22,255	31,392	51,025
Exceeded Losses	84,326	11,776	24,122	2,717	8,318	4,651	1,225	726	417	950	2,473	11,884	15,067
Total losses in distribution network	1,055,257	164,286	138,972	98,340	77,882	68,445	41,748	41,787	40,395	41,001	72,354	104,540	165,508
35 kV unregulated customers	39,662				3,933	3,856	4,047	4,598	4,529	4,132	4,439	4,784	5,344



1.2.4 Planning of maximal and minimal charges

Charges for maximal customer power are submitted by customers separately.

Based on the basic characteristics of the system elements, the exploitation conditions and the load simulation with the PSS/E (Power System Simulation for Engineering) program, it is estimated that the transmission capacity will be **1850 MW**. This applies to **Criterion N** of network elements. Whereas, for the N-1 criterion, the transmission capacity will be 1200 MW.

Tab. 1.4 *Planning of maximal and minimal charges*

Customers/Charge (MW)	January	February	March	April	May	June	July	August	September	October	November	December
Mining	25	25	25	25	25	25	25	25	25	25	25	25
SharrCem JSC	10.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	10.5
Trepça	5.6	5.5	5.6	5.2	5.2	5.2	5.2	5.1	5.3	5.3	5.4	5.5
New Co Ferronikeli JSC	49	49	49	49	49	49	49	49	49	49	49	49
Direct Customers	65	66	66	66	66	66	66	66	66	66	66	65
Charge of distribution customers	1,050	930	850	730	720	600	630	650	650	740	850	1,040
Expenditures of TPP from Transmiss	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
System Losses (North)	60.0	60.0	55.0	50.0	40.0	25.0	24.0	21.0	30.0	40.0	50.0	65.0
Transmission Losses (technical)	38.0	31.0	31.0	21.0	24.0	17.0	18.0	20.0	22.0	28.0	29.0	38.0
Minimal System Charge	550	471	363	357	315	283	323	326	287	347	411	480
Maximal System Charge	1,258	1,132	1,047	912	895	753	783	802	813	919	1,040	1,253

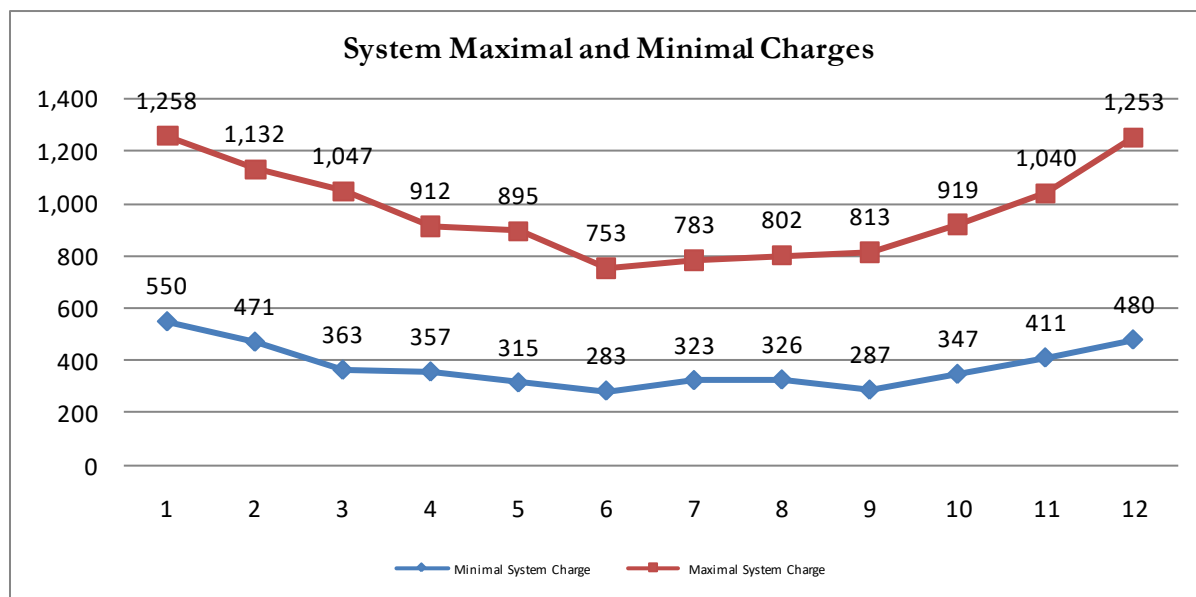


Fig. 1.2. Maximal and Minimal Charges



1.2.5 The planned import of electricity

Through this balance, based on available data and experience from previous years, imports are planned for:

- Inability to cover consumption only from domestic generation, especially during winter season;
- unplanned short interruptions (failure of generating units);
- long planned outages of generating units, transmission and generating unit repairs and revisions;
- Import for universal customers and distribution losses;
- Import to supply the consumption of Ferronikeli, Sharri, Trepça, as unregulated customers;
- Import for transmission losses

The total planned import for 2020 amounts to **916 GWh**.

Tab. 1.5 Forecast of electricity import for 2020

Months/MWh	Total	January	February	March	April	May	June	July	August	September	October	November	December
Import for Universal Consumption	37,139	-	-	-	-	24	-	800	3,629	-	3,953	23,745	4,988
Import for Distribution Losses	311,809	83,290	33,880	3,428	3,000	796	6,750	11,180	14,051	-	22,127	60,135	73,172
Import for Sharrcem	70,000	2,600	5,600	6,400	6,400	6,300	6,200	6,300	6,900	6,900	7,000	5,400	4,000
Import for Trepça	26,400	2,600	2,200	2,400	2,000	2,000	2,000	2,000	2,000	2,000	2,400	2,400	2,400
Import for Ferronikel	429,240	36,456	32,928	36,456	35,280	36,456	35,280	36,456	36,456	35,280	36,456	35,280	36,456
Import for Transmission Losses	41,446	3,762	3,133	3,200	3,168	2,437	3,427	3,953	3,620	418	2,802	4,690	6,835
Total	916,034	128,708	77,741	51,884	49,848	48,013	53,657	60,689	66,656	44,598	74,738	131,650	127,851



1.2.6 The input of Electricity Annual Balance for 2020

Tab.1.6 Electricity Annual Balance 2020

	MWh	Total	January	February	March	April	May	June	July	August	September	October	November	December
1	Kosova A - Production at the entry of transmission	1,956,763	178,215	164,489	141,391	170,090	130,253	119,942	176,066	178,482	173,586	176,702	170,228	177,319
2	Kosova B - Production at the entry of transmission	2,538,276	368,538	345,382	227,057	174,802	188,506	182,466	189,010	191,342	183,645	129,966	176,055	181,506
3	Ujmani + Cascade of Lumbardhi+Wind Park KITKA	297,521	22,604	20,350	29,338	36,383	33,405	30,871	19,681	15,505	14,511	21,613	24,019	29,241
4	Generation with HPP, wind and solar panels in Distribution	258,603	11,613	16,156	26,982	33,160	34,170	29,162	18,980	12,921	13,196	18,159	21,680	22,424
5	(1+2+3+4) National Generation	5,051,163	580,971	546,377	424,767	414,436	386,334	362,441	403,737	398,250	384,938	346,441	391,981	410,490
6	(1+2+3) Generation (entry in transmission)	4,792,560	569,358	530,221	397,785	381,276	352,164	333,279	384,757	385,329	371,743	328,282	370,301	388,066
7	Import of KESCO	870,347	83,290	33,880	93,820	58,500	72,160	45,600	14,450	22,210	12,600	97,290	105,847	230,700
	Import of Ferronikel	429,240	36,456	32,928	36,456	35,280	36,456	35,280	36,456	36,456	35,280	36,456	35,280	36,456
	Sharrceci JSC	70,000	2,600	5,600	6,400	6,400	6,300	6,200	6,300	6,900	6,900	7,000	5,400	4,000
	Import of Trepça	26,400	2,600	2,200	2,400	2,000	2,000	2,000	2,000	2,000	2,000	2,400	2,400	2,400
	Import for transmission losses	55,367	3,762	3,133	7,338	4,340	3,931	2,951	2,923	3,793	2,232	4,176	7,383	9,405
	Total import	1,451,354	128,708	77,741	146,414	106,520	120,847	92,031	62,129	71,359	59,012	147,322	156,310	282,961
8	(6+7) Energy at the entry of transmission	6,243,915	698,066	607,962	544,199	487,796	473,011	425,310	446,886	456,687	430,754	475,603	526,611	671,027
8*	(8+4) Available energy	6,502,517	709,679	624,118	571,181	520,956	507,181	454,472	465,866	469,609	443,950	493,763	548,291	693,452
9	Trepça	26,400	2,600	2,200	2,400	2,000	2,000	2,000	2,000	2,000	2,000	2,400	2,400	2,400
10	Sharrceci JSC	70,000	2,600	5,600	6,400	6,400	6,300	6,200	6,300	6,900	6,900	7,000	5,400	4,000
11	NewCo Ferronikeli JSC	429,240	36,456	32,928	36,456	35,280	36,456	35,280	36,456	36,456	35,280	36,456	35,280	36,456
12	Mining	109,166	11,253	10,349	10,855	9,335	7,506	6,529	6,996	7,854	8,202	9,966	9,605	10,715
13	Expenditures of TPP from transmission	135,579	12,354	11,931	11,567	10,373	9,559	8,448	9,876	13,624	14,272	11,129	9,822	12,625
15	Total distribution losses	1,055,257	164,286	138,972	98,340	77,882	68,445	41,748	41,787	40,395	41,001	72,354	104,540	165,508
16	Net Demand in Distribution	4,150,932	438,232	360,762	382,679	310,482	311,553	294,361	314,511	326,633	298,173	319,229	358,835	435,482
17	(9+10+11+12+13+14+15+16) Net demand	5,976,573	667,780	562,741	548,698	451,752	441,818	394,566	417,926	433,862	405,828	458,533	525,882	667,186
18	Transmission Losses	111,142	12,426	10,822	9,687	8,683	8,420	7,571	7,955	8,129	7,667	8,466	9,374	11,944
19	Transmission Losses (exceeded)	5,864	1,211	799	490	0		0	391	476	336	436	725	1,000
20	Shortage	0												
21	Export	408,939	28,262	49,757	12,307	60,521	56,943	52,335	39,594	27,141	30,119	26,327	12,311	13,322
22	(17+18+19) Total demand with system losses	6,093,579	681,417	574,362	558,874	460,435	450,238	402,137	426,272	442,468	413,831	467,435	535,981	680,130
23	(20+21+22 -8*) Balance	0	0	0	0	0	0	0	0	0	0	0	0	0
24	System Losses (Consumption in the North of Kosovo)	310,464	42,324	35,005	33,927	24,597	18,924	13,880	12,260	12,348	15,459	26,176	32,787	42,776
25	Total demand	6,404,043	723,741	609,366	592,801	485,032	469,162	416,016	438,532	454,815	429,290	493,611	568,768	722,906



1.3 THE DYNAMICS OF GENERATION AND CONSUMPTION OF COAL, OIL AND HEAVY FUEL OIL

Tab. 1.7 Planning of coal production, consumption and reserves

KEK	Coal Production			Coal consumption			Market *	Demand	Storage	Storage A	Storage B
	Sitnica	SJP	Total	TPP A	TPP B	TPP A+B			500 000	200 000	300 000
1	0	876 243	876 243	290 196	524 742	814 939	12 000	826 939	427 884	171 154	256 730
2	0	624 496	624 496	267 741	489 760	757 500	13 000	770 500	336 003	134 401	201 602
3	0	819 146	819 146	288 469	524 742	813 211	15 000	828 211	322 491	128 996	193 495
4	0	692 285	692 285	207 283	507 251	714 534	20 000	734 534	321 856	128 742	193 114
5	0	600 000	600 000	290 196	507 587	797 784	20 000	817 784	329 843	131 937	197 906
6	0	650 800	650 800	283 287	220 459	503 746	20 000	523 746	362 046	144 819	217 228
7	0	710 000	710 000	295 378	261 228	556 606	20 000	576 606	344 039	137 615	206 423
8	0	750 000	750 000	290 196	322 952	613 148	20 000	633 148	314 276	125 710	188 566
9	0	720 000	720 000	285 014	449 697	734 712	20 000	754 712	315 219	126 088	189 132
10	0	700 000	700 000	238 375	418 650	657 026	15 000	672 026	369 758	147 903	221 855
11	0	700 000	700 000	222 829	435 334	658 164	15 000	673 164	365 702	146 281	219 421
12	0	760 000	760 000	285 014	496 487	781 501	10 000	791 501	449 310	179 323	269 987
Total	0	8602 970	8602 970	3 243 979	5 158 890	8 402 869	200 000	8 602 869			

Specific coal consumption for TPP A=1,52 t/MW; whereas for TPP B=1,267 t/MW

Tab. 1.8. Planning of oil consumption and reserves

Oil consumption and reserves for the generators A3+A4+A5	Total [lit.]	January	February	March	April	May	June	July	August	September	October	November	December
Oil consumption	2,561,036	229,102	211,374	227,739	163,644	229,102	223,647	233,193	229,102	225,011	188,191	175,918	225,011
Oil reserves		199,126	175,693	163,248	184,613	164,442	151,653	183,717	191,725	177,148	196,564	188,751	176,986

Tab. 1.9. Planning of heavy fuel oil consumption and reserves



BILANCI VJETOR I ENERGJISË ELEKTRIKE DHE TERMIKE PËR VITIN 2020

Heavy fuel oil consumption and reserves for the generators B1+B2	Total [ton]	January	February	March	April	May	June	July	August	September	October	November	December
Heavy fuel oil consumption	3,750	381	356	381	369	369	160	190	235	327	304	316	361
Heavy fuel oil reserves		1,560	1,560	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1,380	1,560	1,600

1.4 EMISSION OF AIR POLLUTANTS FROM TPP KOSOVA A AND TPP KOSOVA B

The main air pollutants from power plants are the following combustion products:

- ash (dust particles)
- gasSO₂
- gas NO_x
- gas CO₂

Tab. 1.10 Specific emissions from TPP Kosova A

TPP KOSOVA A							
Month	Realized gross generation of EE [MWh]	Consumed coal [t]	Ash production (t) Ave.0.257(t/MW)	SO ₂ [kg] Ave. 2.512 [kg/MWh]	NO _x [kg] Ave.3.530 [kg/MWh]	CO ₂ [kg] Ave. 1263.3 [kg/MWh]	Emission of ash particles(kg) Mes.0.216(kg/MWh)
1	190 919	290 196	49 066	479 587	673 943	241 187 417	41 238
2	176 145	267 741	45 269	442 476	621 792	222 524 105	38 047
3	189 782	288 469	48 774	476 733	669 931	239 751 777	40 993
4	136 370	207 283	35 047	342 562	481 388	172 276 726	29 456
5	190 919	290 196	49 066	479 587	673 943	241 187 417	41 238
6	186 373	283 287	47 898	468 169	657 896	235 444 859	40 257
7	194 328	295 378	49 942	488 151	685 977	245 494 335	41 975
8	190 919	290 196	49 066	479 587	673 943	241 187 417	41 238
9	187 509	285 014	48 190	471 023	661 908	236 880 499	40 502
10	156 826	238 375	40 304	393 947	553 596	198 118 235	33 874
11	146 598	222 829	37 676	368 255	517 492	185 197 481	31 665
12	187 509	285 014	48 190	471 023	661 908	236 880 499	40 502
1 to 12	2 134 197	3 243 979	548 489	5 361 102	7 533 715	2696 130 767	460 987

Tab. 1.11 Specific Emissions from TPP Kosova B

TPP KOSOVA B							
Month	Realized gross generation of EE [MWh]	Consumed coal [t]	Ash production (t) Ave.0.179(t/MW)	SO ₂ [kg] Ave.2.557 [kg/MWh]	NO _x [kg] Ave.3.354 [kg/MWh]	CO ₂ [kg] Ave.1075 [kg/MWh]	Emission of ash particles (kg) Ave.2.52(kg/MWh)
1	414 161	524 742	74 135	1 059 010	1 389 097	445 223 376	1 043 686
2	386 551	489 760	69 193	988 410	1 296 490	415 541 818	974 107
3	414 161	524 742	74 135	1 059 010	1 389 097	445 223 376	1 043 686
4	400 356	507 251	71 664	1 023 710	1 342 794	430 382 597	1 008 897
5	400 621	507 587	71 711	1 024 389	1 343 684	430 667 996	1 009 566
6	174 001	220 459	31 146	444 920	583 599	187 050 898	438 482
7	206 178	261 228	36 906	527 197	691 521	221 641 329	519 569
8	254 895	322 952	45 626	651 767	854 918	274 012 156	642 335
9	354 931	449 697	63 533	907 558	1 190 438	381 550 725	894 426
10	330 426	418 650	59 146	844 900	1 108 250	355 208 342	832 674
11	343 595	435 334	61 503	878 571	1 152 416	369 364 162	865 858
12	391 860	496 487	70 143	1 001 987	1 314 299	421 249 810	987 488
1 to 12	4 071 736	5 158 890	728 841	10 411 430	13 656 604	4377 116 585	10 260 776



1.5 PLANNING THE REPAIRS AND REVISIONS OF GENERATING CAPACITIES

Tab. 1.12 Planning the repairs for TPP Kosova A

TPP KOSOVA A	Generator A3			Generator A4			Generator A5		
	From	To	Days	From	To	Days	From	To	Days
Revision	19.03.2020	31.03.2020	13	01.03.2020	12.03.2020	12	17.02.2020	29.02.2020	13
Revision	01.10.2020	11.10.2020	11	01.06.2020	13.06.2020	13	01.08.2020	13.08.2020	13
Revision	16.12.2020	27.12.2020	12				01.11.2020	12.11.2020	12
Repair	25.06.2020	25.07.2020	31	01.09.2020	15.12.2020	106	01.04.2020	21.05.2020	51
Reserve	01.04.2020	15.04.2020	15	1.01.2020	16.02.2020	47	22.05.2020	31.05.2020	10
Reserve	26.07.2020	31.07.2020	6	13.03.2020	18.03.2020	6	14.08.2020	31.08.2020	18
Reserve	28.12.2020	31.12.2020	4	14.06.2020	24.06.2020	11			
Total TPP A			92			195			117

Tab. 1.13 Planning the repairs for TPP Kosova B

TPP KOSOVA B	Generator B1			Generator B2		
	From	To	Days	From	To	Days
Revision	20.10.2020	31.10.2020	11	23.11.2020	03.12.2020	11
Revision						
Repair	31.05.2020	11.07.2020	42	18.07.2020	17.08.2020	31
Total TPP B			53			42

1.6 TRANSMISSION NETWORK DATA

Tab. 1.14 The data for transmission capacities(lines)

Voltage Level	Total Length km
400 KV	279.5
220 KV	240.8
110 KV	892.5

Tab. 1.15 The data for transformation capacities



BILANCI VJETOR I ENERGJISË ELEKTRIKE DHE TERMIKE PËR VITIN 2020

Voltage level kV/kV	Number of transformers	Installed capacity MVA
400/220	3 x 400	1200
400/110	4 x 300	1200
220/110	9 x 150	1350
220/35	2 x 160	320
220/35/10(20)	2x40	80
220/10(20)	2x40	80
110/35/10(20)	61	2160

1.7 PLANNING THE REPAIR OF INTERCONNECTION LINES AND IMPORTANT LINES FOR INTERCONNECTION

Tab. 1.16 Planning the repair of interconnection lines and important lines for interconnection

No	Line	March	April	May	June	July	August	September	October
1	LP 437/2 SS Peja 3-SS Ribarevina		21-24 dhe 27						
2	LP 205/2 SS Podujeva-SS Krushevc			11-22					
3	LP 407 SS Kosova B-SS Nishi 2				16-19				
4	LP 420/2 SS Ferizaj 2-SS Shkupi 5				22	6			
5	LP 2303 SS Prizreni 2-HPP Fierzë			6-8				8-9	
6	LP 400 kV SS Kosova B-SS Komani		7-8				31		
7	LP 437/1 SS Kosova B-SS Peja 3			25-28					
8	LP 420/1 SS Kosova B-SS Ferizaj 2					8-10			
9	LP 205/1 SS Kosova B-SS Podujeva		14-17						
10	LP SSH Drenasi-SS Drenasi 1		28						
11	LP 293/2 SS Prizreni 2-SS Drenasi 1							1-4	

The interconnection lines repair plan for 2020 has been harmonized with the regional TSOs in the second half of November 2019 at the meeting of the regional working group OPC (Outage Planning Coordination).

1.8 INDICATORS OF THERMAL POWER PLANTS ENERGY EFFICIENCY

- Improve the quality of coal;
- Reduction of specific coal costs in TPPA and TPPB ton/MWh;
- Reduction of TPPA, TPPB and Mines own electricity consumption;
- Reduction of specific fuel costs lit/MWh in TPPA and heavy fuel oil ton/MWh at TPPB by reducing unplanned failures;
- Delivery of replacement parts of adequate quality;
- Maintenance and operation at the required technical level;
- Perform quality and timely repairs.

Content of mining coal:

- Low thermal capacity 6700 – 9210 kJ/kg, projecting value 7325.5 kJ/kg
- Content of ash 14 – 21 %
- Content of humidity 38 – 47 %
- Content of sulphur during combustion is 0.3 %

The calculation of efficiency coefficient at the entry shall be:

- Calculation of the value of coal thermal capacity 7325 kJ/kg
- Specific consumption of coal in TPP Kosova A $h_{sq}=1.52$ ton/MWh at the generator
- Specific consumption of coal in TPP Kosova B $h_{sq}=1.267$ ton/MWh at the generator

Calculating the energy efficiency coefficient of Thermal Power Plants Kosova A and Kosova B

$$\begin{aligned}\text{TPP Kosova A} \quad \eta &= 7325 * 1.52 = 11134 \text{ kJ/kWh} \\ E_f &= E_d / \eta * 100\% = 3600 / 11134 = 32.34 \%\end{aligned}$$

$E_d=3600$ kcal/kWh- specific electric energy

η - average specific energy of the coal at the entry (thermal)

$$\begin{aligned}\text{TPP Kosova B} \quad \eta &= 7325 * 1.267 = 9280 \text{ kJ/kWh} \\ E_f &= E_d / \eta * 100\% = 3600 / 9280 = 38,79 \%\end{aligned}$$

2 THERMAL ENERGY ANNUAL BALANCE 2020

2.1 DH TERMOKOS

2.1.1 Thermal Energy System

DH “Termokos” JSC is the only supplier of thermal energy (district heating) in Prishtina. In addition to district heating, DH “Termokos” JSC also provides central heating system maintenance services to its customers. The demand for district heating provided by DH “Termokos” JSC is extremely high. This is due to the fact that DH “Termokos” JSC offers quality heating, 24 hours throughout the entire heating season, at a cheaper price than other heating alternatives.

Currently, DH “Termokos” JSC provides district heating to 13,700 customers (of which 12,427 are household customers and 1,273 commercial and institutional customers), while the number of potential customers expected to be included in DH Termokos district heating system for the 2019/2020 season is approximately 945 customers (of which 715 household customers and 230 commercial and institutional customers). DH “Termokos” JSC covers the heating demand of existing customers by not fully utilizing the existing capacity. This leads to the conclusion that DH “Termokos” JSC can provide district heating for new customers, of similar categories to existing customers, namely, a customer base with an approximate combination to the profile of household and commercial and institutional customers.

2.1.2 Thermal Energy Production Capacities

The basic unit of thermal energy production is TPP Kosova B, through the cogeneration system. The installed capacity is 140 MW_{TH}, while the operational capacity is estimated to be 137.48 MW_{TH}. For the production of thermal energy, steam is extracted from the PM rate of both turbines at this power plant. The exchange of steam/water energy takes place at the power extraction station - HES, through two exchangers with a capacity of 70MW_{TH}. This station is close to TPP Kosovo B, and is entirely managed by Termokos.

Termokos also possesses its own thermal energy production capacities, heavy fuel oil boilers, which were used before the cogeneration system became operational. These generating units are operational and can be used in specific cases (covering energy demand at peak load, and in case of power cuts by KEK - TPP Kosovo B).

Tab. 2.1 Capacities of thermal energy production plants – DH Termokos

Generation Unit	Installed capacity	η (%)	Operational capacity	Fuel	Kons l.d. Kg/ MWh	Production year/ins	Place
Cogeneration System TPP Kosova B	2x70= 140MW _{TH}	98	137.48 MW _{TH}	Linjit	-	2014	TC Kosova B
Hot water boiler	2x58 = 116MW _{TH}	85	98.6 MW _{TH}	Mazut	105	1978	Termokos
	2x7= 14MW _{TH}	90	12.6 MW _{TH}	Dizel	96	1983	Ngroh. e QKUK
	4 MW _{TH}	90	3.6 MW _{TH}	Mazut	96	2003	Termokos
Total Heating Plant capacity	134 MW _{TH}	85.6	114.8 MW _{TH}	-	-	-	-
Total generating capacity	274 MW _{TH}	92	252.28 MW _{TH}	-	-	-	-

The thermal power transmission network from TPP KOSOVA B to the power station - HRS at DH Termokos is 10.5 km long.

2.1.3 Distribution Network- DH Termokos

The primary distribution network with an 82 km pipeline length and a water capacity of about 3,500 m³, was installed mainly in the 1970s in the urbanized part of Prishtina. Despite investments especially in recent years, about 60% of the network is with pre-insulated young pipes whereas the rest with amortized pipes.

Tab. 2.2 Main characteristics of primary distribution network- DH Termokos

Distribution network and substations DH Termokos		
Number of substations	Length of the network- pipeline (km)	Number of meters at thermal substations
475 total (465 active and 10 passive)	82	From 465 active substations, in 339 substations are placed the meters which are functional, whereas in 126 substations (mainly small capacity substations and passive substations) there is no meter or is not operational.

2.1.4 Planning of thermal energy system development – DH Termokos

Termokos bases its long-term plans for thermal energy production on the cogeneration system, as a safe, economically advantageous and convenient source in terms of environmental protection. The current capacity of 140 MW_{TH} (2x70 MW_{TH}) and the transmission capacity of the thermal conductors (Thermal Power Transmission Network) TPP Kosovo B - Termokos of 160 MW, are limiting factors for greater energy extraction.



In the upcoming years, major investments are expected in the rehabilitation and expansion of the distribution network, which results in the increase of the heating area connected to Termokos district heating system. The details are shown in the following table:

Tab. 2.3 Scenario 1. Medium Projection - DH Termokos

Year	Investments/ mil €	Expansion of the area m2	Current connected area	Total connected area
2019	1-2.5	40,000	1,294,249	1,334,249
2020	2.5-3	100,000	1,334,249	1,434,249
Total 2018/2019	2.5 - 4	140,000	1,270,798	1,323,913

2.1.5 Forecast of thermal energy demand- DH Termokos

The development projections of DH Termokos district heating system mainly include the plans for expansion of the distribution network and consequently the increase of the customer base/heating area, which are the determining factors for the increase of heat consumption.

Forecasting thermal energy demand can be based on increasing demand/consumption in the last three seasons. In previous seasons (prior to functionality of cogeneration) the supply of heat from DH Termokos was not at an adequate level, so the demand for connection to the district heating system was insignificant.

The number of new customers, in addition to the feasibility of expanding the network in certain parts of the city, is also determined by the energy capacity available from the cogeneration system, which is currently 140MW_{TH}.

The medium projection (scenario) was taken into account for compiling this balance. As shown in Table 2.3, an increase in the heating area of about 100,000 m² is projected for 2020. This growth forecast is mainly based on the ongoing network rehabilitation and expansion project of the European Commission.

The following table shows the annual planning of demand, respectively the thermal energy supply, divided by months for 2020.

Tab. 2.4 Forecast of thermal energy demand - DH Termokos in 2020

CUSTOMERS THERMAL ENERGY DEMAND – YEAR 2020									
	Household customers			Commercial and Institutional Customers			Total customers		
	Heating Area (m ²)	Thermal Capacity (MW)	Thermal energy amount (MWh)	Heating Area (m ²)	Thermal Capacity (MW)	Thermal Energy Amount (MWh)	Heating Area (m ²)	Thermal Capacity (MW)	Thermal Energy Amount (MWh)
January	808,413	73	23,586	570,836	63	25,551	1,379,249	136	49,137
February	808,413	73	19,164	570,836	63	20,761	1,379,249	136	39,924
March	808,413	73	17,690	570,836	63	19,164	1,379,249	136	36,855
April	808,413	73	6,486	570,836	63	7,026	1,379,249	136	13,512
October	838,413	75	7,371	580,836	64	7,985	1,419,249	139	15,355
November	838,413	75	19,164	585,836	64	20,761	1,424,249	140	39,925
December	838,413	75	23,586	595,836	66	25,552	1,434,249	141	49,138
Total/Ave	821,270	74	117,046	577,978	64	126,800	1,399,249	137	243,846

The following table shows the planned demand for thermal energy including network losses.

Tab. 2.5 Forecast of thermal energy demand plus network losses in 2020

THERMAL ENERGY DEMAND (CUSTOMERS DEMAND PLUS NETWORK LOSSES) - YEAR 2020								
Description	January	February	March	April	October	November	December	Total
Thermal energy customers demand (MWh)	49,136.92	39,924.43	36,854.56	13,511.93	15,355.25	39,924.91	49,137.64	243,845.64
Quantitative losses in distribution network (MWh)	3,512.90	2,881.16	2,668.67	999.51	1,126.14	2,880.20	3,360.68	17,429.27
Total consumption demand plus losses (MWh)	52,649.82	42,805.59	39,523.23	14,511.44	16,481.39	42,805.11	52,498.33	261,274.91

2.1.6 Forecast of network losses- DH Termokos

Network losses include losses in the thermal energy transmission network (TPP Kosovo B - DH Termokos) and in the thermal energy distribution network.

Losses in thermal energy transmission network TPP Kosova B - DH Termokos, are expected to be 2% or 5,206 MWh.

In 2020, the distribution network foresees a loss rate of 6.7%, which represents an average reduction of the loss rate of 0.10% compared to the previous year season.

It is expected that the execution of the ongoing network rehabilitation and expansion project of European Commission will have an impact in the reduction of losses in the distribution network - a number of network segments are completed in 2019 whereas the other segments are planned to be completed by 2020.

The table below presents the details on the losses in transmission network (cogeneration, TPP Kosovo B - DH Termokos) and the losses in distribution network for 2020.

Tab. 2.6 Losses in thermal energy transmission and distribution network – DH Termokos in 2020

Month	Quantitative Losses in Transmission network	Losses in transmission network (%)	Quantitative Losses in Transmission Network (MWh _{TH})	Distribution Network Losses (%)	Total Network Losses (MWh _{TH})	Total Network Losses (%)
Janar	1049	2.0%	3,513	6.7%	4,562	8.7%
Shkurt	856	2.0%	2,881	6.7%	3737	8.7%
Mars	792	2.0%	2,669	6.7%	3,461	8.7%
Prill	294	2.0%	999	6.7%	1293	8.7%
Tetor	332	2.0%	1,126	6.7%	1,458	8.7%
Nëntor	857	2.0%	2,880	6.7%	3,737	8.7%
Dhjetor	1026	2.0%	3,361	6.7%	4,387	8.7%
Total	5,206	2.0%	17,429	6.7%	22,635	8.7%

2.1.7 Thermal Energy Production- DH Termokos

The planning for thermal energy production is generally evaluated to cover the forecast thermal energy demand (consumption). In addition to this, the planning for thermal power production also reflects network losses as well as energy efficiency.

As stated above, DH Termokos bases its thermal energy production on the cogeneration plants at TPP Kosova B with a nominal capacity of 140MW_{TH}. However, DH Termokos has its own reserve production capacity with a nominal capacity of 134 MW_{TH}, which are planned to be used only for short periods of time, only in the event of unplanned outages of cogeneration plants in TPP Kosova B. Forecast gross production from DH Termokos heating plant is 6,819 MWh_{TH} taking into account boiler efficiency of 85%, while gross thermal energy production from cogeneration plants, as the main generator, is much greater, namely 260,284 MWh_{TH}.

The table below presents the annual forecasts (for 2020) of gross thermal energy production from cogeneration and from the production capacities of the heating plant.

Tab. 2.7 Annual gross production of thermal energy - DH Termokos 2020

Gross Production of Thermal Energy	
Thermal Energy Production from Cogeneration-TPP Kosova B (MWh _{TH})	260,284
Thermal energy production at the heating plant (MWh _{TH})	6,819
Total gross production (MWh_{TH})	267,103

The following table presents the data for gross and net thermal energy production by months for 2020.



Tab. 2.8 Gross and net thermal energy production by months - DH Termokos in 2020

THERMAL ENERGY PRODUCTION - YEAR 2020								
Description/Month	January	February	March	April	October	November	December	Total/Average
Energy from fuel (MWh)	1,337	1,337	1,337	669	669	1,337	1,337	8,023
Thermal efficiency of production plants at the heating (%)	85%	85%	85%	85%	85%	85%	85%	85%
Gross production in the production plants at the heating (MWh)	1,137	1,137	1,137	568	568	1,137	1,137	6,820
Gross Production in the cogeneration plant (if applicable)	52,455	42,823	39,598	14,677	16,606	42,816	51,308	260,284
Total gross production of thermal energy (MWh)	53,592	43,960	40,734	15,246	17,174	43,952	52,445	267,103
Quantitative losses in transmission network (if applicable) (MWh)	1,049	856	792	294	332	856	1,026	5,206
Own consumption (MWh)	112	101	112	34	34	108	122	623
Net production of thermal energy (MWh)	52,431	43,002	39,831	14,918	16,808	42,988	51,296	261,275

2.1.8 Thermal Energy Annual Balance- DH Termokos

Tab. 2.9 Thermal Energy Annual Balance - DH Termokos in 2020

Nr.	Description	Unit	Amount
1	Energy from fuel - heavy fuel oil	(MWh _{TH})	8,023
2	Thermal efficiency of the production plants at the Heating	(%)	85%
3	Gross production of thermal energy in production plants at the Heating	(MWh _{TH})	6,820
4	Gross production of thermal energy in cogeneration plants	(MWh _{TH})	260,284
5	Total gross production of thermal energy	(MWh _{TH})	267,103
6	Quantitative losses in transport network (cogeneration network)	(MWh _{TH})	5,206
7	Share of losses in transport network	(%)	2.0%
8	Own consumption	(MWh _{TH})	623
9	Net production of thermal energy/thermal energy entering the distribution network	(MWh _{TH})	261,275
10	Quantitative Losses in distribution network	(MWh _{TH})	17,429
11	Share of losses in distribution network	(%)	6.7%
12	Thermal energy supply	(MWh _{TH})	243,846
13	Fuel consumption	(ton)	710
14	Heating area - the annual average	m ²	1,399,249
15	Number of thermal substations (active / passive)	-	465/10
16	Installed production capacity	MW	274
17	Length of network pipeline	km	82

2.2 DH GJAKOVA

2.2.1 Thermal Energy System

District Heating JSC in Gjakova provides district heating services operating in the public, commercial and household sector in the city of Gjakova.

Due to the high cost of fuel - the fuel oil – for operation of boilers, which presents difficulties in the financial aspect, DH Gjakova offers a reduced supply. A normal and independent operation can be achieved by changing the fuel regarding which a new heating plant and thermal cogeneration unit is being planned to be build, which will be funded by European Commission funds, as part of the IPA II program (2015).

2.2.2 Thermal Energy Production Capacities

District Heating JSC Gjakova has two boilers with a total installed capacity of 38.6 MW_{TH} utilizing heavy fuel oil; technical characteristics as follows:

Tab. 2.10 Technical characteristics of the boilers- DH Gjakova

DATA FOR THERMAL ENERGY PRODUCTION CAPACITY						
Production Unit	Year of Entry into Operation	Thermal Installed Capacity (MW)	Available Thermal Capacity (MW)	Thermal Efficiency (%)	Type of fuel	Fuel Consumption (kg/MWh)
Kaldaja 1 VKLM-16 TPK Zagreb	1981	18.6	13.02	70%	Mazut	130.50
Kaldaja 1 VKLM-20 TPK Zagreb	1994	20	14.8	74%	Mazut	113.75
Total		38.6	27.82	72%		122.125

Boilers are very amortized with frequent technical defects that create difficulties in operation. Particularly problematic are the economizer pipes, whose frequent leakage is one of the main causes of low thermal efficiency, namely large production losses.

2.2.3 Distribution Network- DH Gjakova

Distribution Network of District Heating JSC in Gjakova is divided into two branches, as shown in the table below.

Tab. 2.11 Distribution network characteristics – DH Gjakova

	Old Network	New Network
Orientation	Northern part	Southern part
Direction	From the Primary School Zekeria Rexha	From City Hospital
Year of commencement	1980	2001
Type of network	Classic- in concrete channel	With preinsulated pipes

Heat Supply is carried out by indirect heating system (through heat exchangers in thermal substations).

The network system is two-pipes-indirect; based on recent feasibility study it is estimated that the primary distribution network is approximately 15.5 km long track/31 km pipeline. The total number of substations is 302, while there are currently 180 active thermal substations.

2.2.4 Forecast of thermal energy system development – DH Gjakova

DH Gjakova bases its long-term thermal energy production plans in the current project, which is in the final phase of obtaining the relevant permits and commencing construction for the new heating plant that also includes the biomass fueled cogeneration unit. This project will have an impact on creating a safe, economically advantageous and suitable resource in terms of environmental protection. Current production capacities planned under the current project are:

- Units (boilers) for the production of thermal energy only with a nominal capacity of $2 \times 5.5 \text{ MW}_{\text{TH}}$;
- Electricity and thermal energy cogeneration unit with capacities of $1.2 \text{ MW}_{\text{EL}}$ and 4 MW_{TH} ;

As the project implementation plan has been postponed due to the procedures, the completion of works for the new heater is expected by the end of 2020, therefore during 2020 it is planned that the production of thermal energy will be based on existing boilers with heavy fuel oil.

As a follow-up activity to the project for the new heating plant, significant investments in the heating network, rehabilitation and extension of the network are expected in the upcoming years, which will result in the expansion of the customer base, respectively, the increase of the heating area connected to the central heating system of DH Gjakova.

However, in 2020 some emergency repairs to boilers/heaters shall be undertaken in order to increase the thermal efficiency of the boilers as well as in the distribution network in order to increase the thermal efficiency of the boilers, respectively to reduce network losses. A small increase in the heating area of about $7,000 \text{ m}^2$ is also planned - details are shown in the following table:

Tab. 2.12 Planned expansion of heating area – DH Gjakova in 2020

Year	Current Heating Area (m ²)	Expansion of Heating Area (m ²)	Total Connected Heating Area (m ²)
2019	80,000	-	80,000
2020	80,000	7,000	87,000

2.2.5 Forecast of thermal energy demand – DH Gjakova

Long-term development projections of DH Gjakova district heating system for thermal energy production are mainly based on the current project for the new heating plant that includes the cogeneration unit with biomass fuel. Also, these development projections include plans for rehabilitation of the existing network and expansion of the distribution network. This will affect the return of customers (currently "passive") and increase the customer base, and consequently increase the heating area, which are the determining factors for the increase of heat consumption. Also, development projections will affect the reduction of losses in the network and in the system in general.

However, as noted above, due to the dynamic plan for implementation of the new heating project which is expected to be completed in December 2020, a reduced supply is foreseen this year reflecting the limited opportunities for the provision of heavy fuel oil and consequently even limited production of thermal energy.

2.2.6 Details on the forecast of long-term demand – DH Gjakova

Forecast of demand is mainly based on limited financial opportunities for ensuring the provision of fuel, and consequently reduced production and supply. However, a very small increase in the number of customers is planned (switching the status from passive to active). So, by 2020 a very small increase in the heating area of only about 7,000 m² is foreseen (table 2.12 above).

The following table shows the annual planning of demand, respectively the supply of thermal energy.

Tab. 2.13 Forecast of thermal energy supply/demand - DH Gjakova in 2020

THERMAL ENERGY CUSTOMER DEMAND – YEAR 2020									
	Household Customers			Com. and Ins. Customers			Total Customers		
	Heating Area (m ²)	Thermal Capacity (MW)	Thermal Energy Amount (MWh)	Heating Area (m ²)	Thermal Capacity (MW)	Thermal Energy Amount (MWh)	Heating Area (m ²)	Thermal Capacity (MW)	Thermal Energy Amount (MWh)
January	34,534	3.45	753	45,100	5.41	1,031	79,634	8.87	1,784
February	34,534	3.45	736	45,100	5.41	884	79,634	8.87	1,620
March	-	-	-	-	-	-	-	-	-
April	-	-	-	-	-	-	-	-	-
October	-	-	-	-	-	-	-	-	-
November	35,100	3.51	230	52,000	6.24	427	87,100	9.75	657
December	35,100	3.51	566	52,000	6.24	941	87,100	9.75	1,507
Total Average	34,817	3.48	2,285	48,550	5.83	3,283	83,367	9.31	5,568

As shown in the table, in order to use heavy fuel oil more rationally, a reduction in supply is foreseen in the few months of the warmest season. In March, April and October it is not planned the provision of thermal power supply, while in November it is planned the supply only in the second half of this month - due to insufficient amount of available fuel.

The following table presents the thermal energy planned demand including network losses.

Tab. 2.14 Forecast of thermal energy demand plus network losses in 2020

THERMAL ENERGY DEMAND (CUSTOMER DEMAND PLUS NETWORK LOSSES) – YEAR 2020								
Description	January	February	March	April	October	November	December	Total
Customer Demand for Thermal Energy (MWh)	1,784	1,620	-	-	-	657	1,507	5,568
Total amount of network losses (MWh)	446	405	-	-	-	164	377	1,392
Total customer demand plus losses (MWh)	2,230	2,025	-	-	-	821	1,884	6,960

2.2.7 Forecast of network losses- DH Gjakova

In 2020 the level of losses in the distribution network is estimated to be around 20%, more specifically the quantitative losses in the network are expected to be 1,392 MWh_{TH}, which is mainly due to the obsolete pipes network (in the northeast part of the city), water leakage in pipelines etc.

In 2020, emergency repairs and rehabilitation of the most damaged parts of the network are planned to be undertaken, i.e. preventive measures so that the situation does not become more deteriorated, respectively to not exceed this projected level of network losses.

The following table presents annual forecasts by months for quantitative losses and share of losses in the distribution network.

Tab. 2.15 Forecast of losses in distribution network - DH Gjakova in 2020

NETWORK LOSSES - YEAR 2020								
Description	January	February	March	April	October	November	December	Total/Average
Quantitative losses in transmission network (if applicable) (MWh)	-	-	-	-	-	-	-	-
Share of losses in transmission network (%)	-	-	-	-	-	-	-	-
Quantitative losses in distribution network (MWh)	445.80	404.80	-	-	-	164.20	376.80	1,391.60
Share of losses in distribution network (%)	20.00%	20.00%	-	-	-	20.00%	20.00%	20.00%
Total quantitative losses in the network (MWh)	445.80	404.80	-	-	-	164.20	376.80	1,391.60
Share of total losses in the network(%)	20.00%	20.00%	-	-	-	20.00%	20.00%	20.00%

2.2.8 Forecast of net and gross production of thermal energy – DH Gjakova

Given that the operation of old boilers with heavy fuel oil will continue in 2020 as well, due to the high price, the provision of heavy fuel oil will largely depend on subsidies from the Kosovo Budget. Therefore,



the forecast of thermal energy production is mainly based on limited financial opportunities for provision of fuel and consequently there will be reduced production.

Also, the planning for thermal energy production in 2020 also reflects network losses as well as the thermal efficiency of boilers. The table below shows the forecast of gross and net thermal energy production, by months for 2020.

Tab. 2.16 Forecast of gross and net thermal energy production - DH Gjakova in 2020

THERMAL ENERGY PRODUCTION - year 2020								
Description/Month	January	February	March	April	October	November	December	Total/Ave
Energy from fuel (MWh)	3,267	2,945	-	-	-	1,258	2,754	10,224
Thermal Efficiency of the production plants at the heating (%)	72%	72%	-	-	-	72%	72%	72%
Gross production at the production plant at the heating (MWh)	2,352	2,120	-	-	-	906	1,983	7,361
Gross production in cogeneration plants (if applicable) (MWh)	-	-	-	-	-	-	-	-
Total Gross Production of Thermal Energy (MWh)	2,352	2,120	-	-	-	906	1,983	7,361
Quantitative losses in transmission network (if applicable) (MWh)	-	-	-	-	-	-	-	-
Own-consumption (MWh)	121	96	-	-	-	85	99	401
Net production of thermal energy (MWh)	2,231	2,024	-	-	-	821	1,884	6,960

2.2.9 Thermal Energy Annual Balance – DH Gjakova

Tab. 2.17 Thermal Energy Annual Balance – Gjakova 2020



BILANCI VJETOR I ENERGJISË ELEKTRIKE DHE TERMIKE PËR VITIN 2020

GENERAL THERMAL ENERGY BALANCE - YEAR 2020			
No.	Description	Unit	Value
1	Energy from fuel- heavy fuel oil	(MWh _{TH})	10,224
2	Thermal efficiency of production plants at the Heating	(%)	72%
3	Gross production of thermal energy in the production plants at the Heating	(MWh _{TH})	7,361
4	Gross Production of Thermal Energy at the cogeneration plant	(MWh _{TH})	-
5	Total gross production of thermal energy	(MWh _{TH})	7,361
6	Quantitative losses in transmission network (cogeneration network)	(MWh _{TH})	-
7	Share of losses in transmission network	(%)	-
8	Own-consumption	(MWh _{TH})	401
9	Net production of thermal energy/energy entering the distribution network	(MWh _{TH})	6,960
10	Quantitative losses at the distribution network	(MWh _{TH})	1,392
11	Share of losses in distribution network	(%)	20.00%
12	Demand/ thermal energy supply	(MWh _{TH})	5,568
13	Fuel consumption	(ton)	900
14	Heating Area	m ²	87,120
15	Number of thermal substations (passive/active)	-	302/180
16	Installed Production Capacity	MW	38.6
17	Length of pipeline network	km	31

2.3 Thermal Energy General Annual Balance 2020

Tab. 2.18 Thermal energy general balance 2020

No.	Description	Unit	DH Termokos	DH Gjakova	Total -Sector
1	Energy from fuel - Heavy fuel oil	(MWh _{TH})	8,023	10,224	18,247
2	Gross production of thermal energy in production plant	(MWh _{TH})	6,820	7,361	14,181
3	Gross production of thermal energy in cogeneration plants	(MWh _{TH})	260,284	-	260,284
4	Total gross production of thermal energy	(MWh _{TH})	267,103	7,361	274,465
5	Quantitative losses in transmission network (cogeneration network)	(MWh _{TH})	5,206	-	5,206
6	Share of losses in transmission network	(%)	2.00%	-	2.00%
7	Own-consumption	(MWh _{TH})	623	401	1,024
8	Net production of thermal energy/ thermal energy entering the distribution system	(MWh _{TH})	261,275	6,960	268,235
9	Quantitative Losses in Distribution Network	(MWh _{TH})	17,429	1,392	18,821
10	Share of losses in Distribution Network	(%)	6.7%	20.0%	7.0%
11	Thermal Energy Supply	(MWh _{TH})	243,846	5,568	249,414
12	Fuel consumption	(ton)	710	900	1,610
13	Heating Area	m ²	1,399,249	87,120	1,486,369
14	Number of thermal substations (active/passive)	-	465/10	302/180	767 / 190
15	Installed Production Capacity	MW _{TH}	274	38.6	312.6
16	Length of network pipeline	km	82	31	113



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