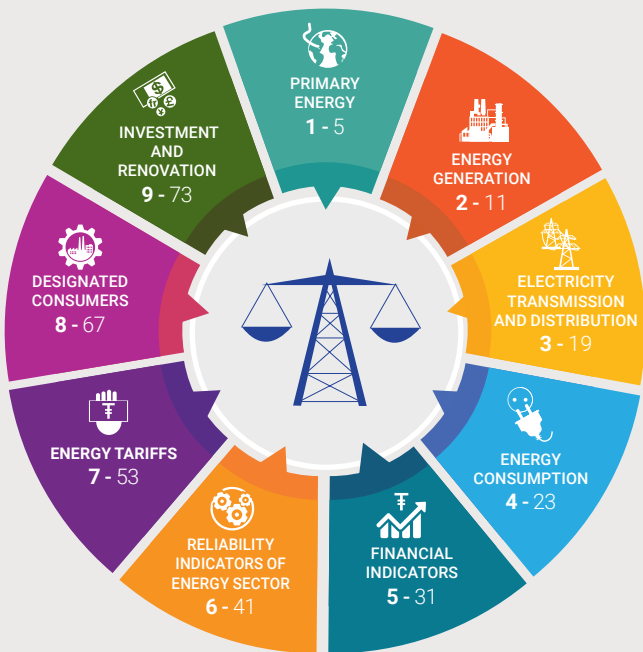


CONTENT

STATISTICS ON ENERGY PERFORMANCE



OPERATIONAL HIGHLIGHTS

In 2020, Mongolia's electricity production has reached a volume of 7,145.7 million kWh, an increase of 2.0 % or 142.4 million kWh compared to the previous year's production. 90.9% of total electricity was produced by thermal power plants, 7.9% by solar and wind, 1.2% by hydro power sources, and 0.03% by diesel generators.

Total heat energy production has been reached a volume of 10,705.1 Thousand Gcal, an increase of 3.8% or 394.2 Thousand Gcal, compared to the previous year.

During the reported period, 1,705.6 million kWh of electricity has been imported making a decrease of 10.2 million kWh or 0.6% compared to the previous year.

CENTRAL REGION INTEGRATED POWER GRID's (CRIPG) total production in 2020 amounted to 6,720.8 million kWh of electricity and the distribution was 5,922.1 million kWh, an increase by 159.7 million kWh or 2.4% compared to the previous year. CRIPS also produced 9,169.5 thousand Gcal of heat energy, an increase by 364.5 thousand Gcal or 4.1% compared to the previous year.

WESTERN REGION INTEGRATED POWER GRID's (WRIPG) electricity consumption totaled 183.0 million kWh, which is an increase by 5.8% (10.7 million kWh) compared to previous year. 27.9% of total demand was supplied by Durgun Hydro station, 72.1% through imports from Russia and China.

EASTERN REGION INTEGRATED POWER GRID's (ERIPG)

electricity consumption has decreased by 3.15% (8.32 million kWh) in 2020. DorCHPP produced 234.0 million kWh of electricity and distributed 201.4 million kWh of electricity and 312.1 thousand Gcal of heat energy. Compared to 2019, there was 2.0% decrease in electricity and 4.8% increase in heat distribution.

ALTAI-ULIASTAI INTEGRATED POWER GRID (AUIPG)

electricity consumption in 2020 totaled 83.9 million kWh, which is an increase by 3.5% (2.9 million kWh) compared to previous year. 49.6 million kWh electricity was purchased from CRIPG an increase by 23.8% (11.84 million kWh) compared to the previous year, and the electricity production from renewable energy sources and diesel generators reached 30.7 million kWh a decrease of 23.0% (9.2 million kWh). The electricity purchase from WRIPG totaled 3.5 million kWh an increase by 8.4% compared to 2019.

Own electricity consumption of CRIPG's CHPPs decreased by 0.33 units to 13.29%, whereas DorCHPP's own consumption increased by 0.28 units to 13.92%.

CRIPG's transmissions and distribution losses decreased by 0.1 units to 13.6%, whereas ERIPG's losses increased by 0.55 units to 4.40% compared to the previous year. The transmission and distribution losses of WRIPG and AUIPG are decreased by 0.9 units to 23.37% and 1.57 units to 19.89% respectively.

LIST OF ABBREVIATIONS

CRIPG	Central Region Integrated Power Grid
WRIPG	Western Region Integrated Power Grid
ERIPG	Eastern Region Integrated Power Grid
AUIPG	Altai-Uliastai Integrated Power Grid
CHPP	Combined Heat and Power Plant
DCHPP	Darkhan Combined Heat and Power Plant
ECHPP	Erdenet Combined Heat and Power Plant
DorCHPP	Dornod Combined Heat and Power Plant
DzCHPP	Dalanzadgad Combined Heat and Power Plant
EFCHPP	Erdenet Factory Combined Heat and Power Plant
SRPDG	Southern Region Power Distribution Network
NPTG	National Power Transmission Network
UBEDN	Ulaanbaatar Power Distribution Network
DSEDN	Darkhan Selenge Power Distribution Network
EBEDN	Erdenet Bulgan Power Distribution Network
BSEREDN	Baganuur South-East Region Electricity Distribution Network
DRES	Dornod Region Energy System
BNTP	Baganuur Thermal Plant
ATP	Amgalan Thermal Plant
TPND	Thermal Plant Nalaikh District
EGC	Electricity Grid Company
EDN	Electricity Distribution Network
E&I	Entity and Industry
Ap	Apartment
GD	Ger District
RBoACC	Regulatory Boards of Aimaks and Capital City /Municipalities/
LH	License Holder
RE	Renewable Energy
LH-RA	License Holder in Rural Areas
UIC	Utilization of Installed Capacity
SOJSC	State Owned Joint Stock Company
SC	Stock Company
ME	Municipal entity
DHPU	Department of Housing and Public Utilities
HPUC	Housing and Public Utilities Company



STATISTICS ON **ENERGY** PERFORMANCE

1 PRIMARY ENERGY

• Coal consumption in Power Generation	6
• Coal Stock of CHPPs in CRIPG	6
• Coal consumption of Rural LHs for Heat Generation, Distribution and Supply	7
• Coal price and coal consumption of Heat Generation LHs by RBoACC	8
• Mazut consumption of CHPPs	9



COAL CONSUMPTION IN POWER GENERATION

ktonne

	Name of plant	2015	2016	2017	2018	2019	2020
1	CHPP-2	225.4	236.7	241.5	261.6	254.1	227.4
2	CHPP-3	1,277.6	1,267.4	1,275.4	1,325.1	1,305.4	1,340.6
3	CHPP-4	3,305.4	3,286.6	3,451.2	3,409.3	3,495.5	3,583.1
4	DCHPP	342.1	371.2	400.8	401.1	433.5	436.6
5	ECHPP	285.6	269.4	326.2	318.4	290.1	256.6
6	EFCHPP	-	-	-	435.9	375.7	346.7
7	DorCHPP	425.3	482.7	500.6	487.4	531.4	527.4
8	DzCHPP	20.1	24.83	25.8	37.1	34.8	66.3
9	BNTP	57.3	61.9	57.8	60.8	61.4	64.8
10	TPND	53.6	50.8	48.9	44.4	43.1	36.7
11	ATP	39.9	109.7	159.0	226.5	229.8	250.2
12	LH-RA	242.8	333.4	364.8	385.5	396.5	398.5
Total coal consumption		6,275.1	6,494.6	6,851.9	7,393.3	7,451.4	7,534.9

COAL STOCK OF CHPPs IN CRIPG

as of January 1st 2020

	Name of plant	2018		2019		2020	
		Days	ktonne	Days	ktonne	Days	ktonne
1	CHPP-2	13	12.1	17	17.3	10	9.1
2	CHPP-3	14	73.1	12	75.1	8	58.7
3	CHPP-4	12	165.2	12	167.2	12	168.7
4	DCHPP	9	16.7	18	37.7	18	28.8
5	ECHPP	13	21.4	34	39.3	31	40.5
6	EFCHPP	13	21.4	45	57.2	43	51.3
7	DorCHPP	-	-	-	-	24	32.9
8	DzCHPP	-	-	-	-	87	21.5



COAL CONSUMPTION OF RURAL LHs FOR HEAT GENERATION, DISTRIBUTION AND SUPPLY

		ktonne	
	Name of LH	2019	2020
1	"Enkh Golomtiin Ilch" Ltd.	29.6	21.9
2	"Erchimbayan-Ulgii" SC	34.5	27.3
3	"Mandal Golomt" Ltd.	25.7	22.8
4	"US DU" ME	9.0	9.6
5	"Dulaan Shariin Gol" SOJSC	13.4	13.1
6	"Gan-Ilch" Ltd.	13.5	15.0
7	"Chandmani Ilch" Ltd.	26.0	29.2
8	"Durvulj" ME	37.4	39.7
9	"Selenge Energo" ME	37.3	45.0
10	"Khutul Energy Dulaan" Ltd.	24.4	23.4
11	"Tuv Chandmani Heat Supply Entity" ME	52.2	53.3
12	"Ulaangom Thermal Plant-2" SOJSC	17.5	16.9
13	"Khovd Thermal Plant" SOJSC	17.3	18.4
14	"Khuvsgul Thermal Plant" SOJSC	24.4	23.2
15	"Khentii-Us" Ltd.	24.7	27.1
16	"Energy Plus" Ltd.	9.6	12.6
TOTAL COAL CONSUMPTION		396.5	398.5

COAL PRICE AND COAL CONSUMPTION OF
HEAT GENERATION LHS BY RBOACC

Name of province		Coal price	Consumption
		(MNT/tonne)	(ktonne)
1	Arkhangai	40.0	8.5
2	Bayan-Ulgii	25.0	7.8
3	Bayankhongor	29.0	49.9
4	Bulgan	86.4	13.0
5	Govi-Altai	22.0	5.9
6	Govisumber	24.2	11.9
7	Darkhan	50.1	7.5
8	Dornogovi	29.9	41.1
9	Dornod	-	-
10	Dundgovi	27.0	5.3
11	Zavkhan	33.0	32.0
12	Erdenet	38.0	348.5
13	Uvurkhangai	29.0	42.2
14	Umnugovi	16.5	18.9
15	Selenge	24.2	68.7
16	Sukhbaatar	35.0	14.4
17	Tuv	60.1	47.5
18	Uvs	23.2	58.4
19	Khentii	10.0	72.5
20	Khovd	36.3	31.9
21	Khuvsgul	23.0	18.3
22	CAPITAL	65.0	67.4
TOTAL COAL CONSUMPTION		-	971.5

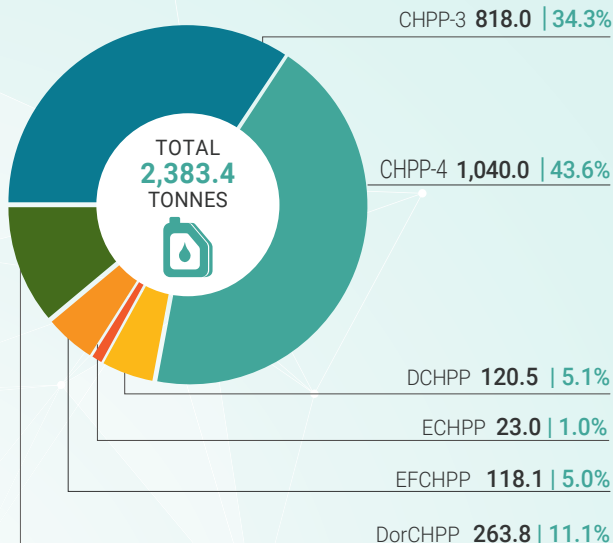


MAZUT CONSUMPTION OF CHPPS

tonne

Name of plant	2015	2016	2017	2018	2019	2020
1 CHPP-2	56.0	94.6	30.0	-	-	-
2 CHPP-3	966.0	989.1	871.1	863.6	896.8	818.0
3 CHPP-4	1,217.0	1,129.0	993.0	1,430.0	1,151.0	1,040.0
4 DCHPP	103.0	98.5	120.2	223.5	149.9	120.5
5 ECHPP	81.0	94.6	78.4	43.3	44.9	23.0
6 DorCHPP	240.0	244.4	313.3	254.0	243.7	263.8
7 EFCHPP	-	-	-	146.1	117.3	118.1

MAZUT CONSUMPTION OF CHPPS IN 2020







STATISTICS ON **ENERGY** PERFORMANCE

2 ENERGY GENERATION

• Electricity Generation	12
• Generation Structure and Imports	12
• Contribution of CHPPs to the Peak Load of CRIPG	13
• Heat Generation by Plants	13
• Heat Distribution	14
• Heat Production of Rural LHs	14
• Utilization of Installed Capacity /countrywide/	15
• Utilization of Installed Capacity of CHPPs	15
• Utilization of Installed Capacity of CHPPs /Peak Load in Winter/	16
• Electricity for Own Use in CHPPs	16
• Specific Fuel Consumption for Energy Generation, in Coal Equivalent	17
• Specific Fuel Consumption for Electricity Generation, in Coal Equivalent	17
• Specific Fuel Consumption for Heat Generation, in Coal Equivalent	18
• Efficiency of CHPPs	18



ELECTRICITY GENERATION

GWh

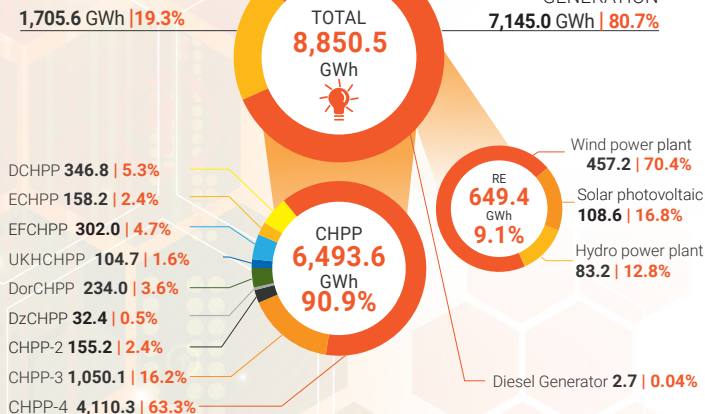
Generation set	2015	2016	2017	2018	2019	2020
Combined heat and power plant	5,415.8	5,555.9	5,826.8	6,152.4	6,346.6	6,493.6
Diesel station	6.0	3.8	3.7	3.6	3.0	2.3
Solar photovoltaic	0.5	0.3	19.6	51.5	109.0	108.6
Hydro power plant	59.3	84.7	84.5	78.2	85.4	83.2
Wind power plant	152.5	157.5	154.4	339.0	459.3	457.2
Total generation	5,634.1	5,802.2	6,089.0	6,624.7	7,003.3	7,145.6
Import	1,393.8	1,419.1	1,522.50	1,683.60	1,715.80	1,705.61

GENERATION STRUCTURE AND IMPORTS

IMPORT

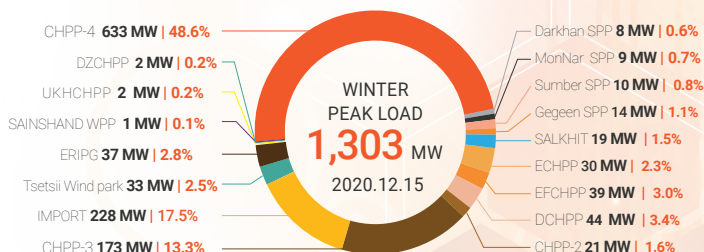
1,705.6 GWh | 19.3%

GENERATION

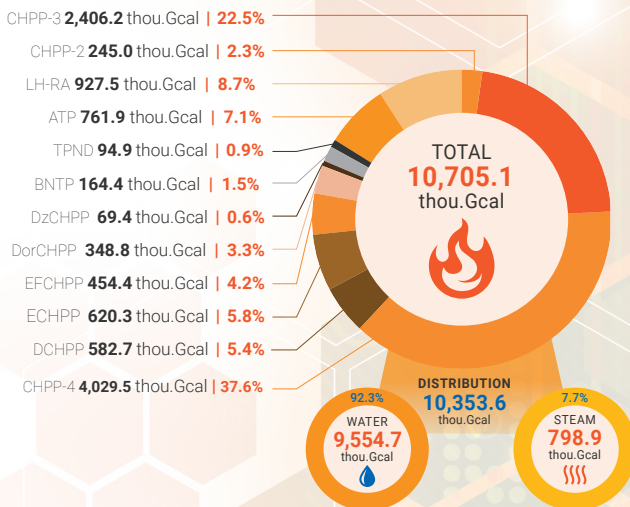
7,145.0 GWh | 80.7%



CONTRIBUTION OF CHPPs TO THE PEAK LOAD OF IPG



HEAT GENERATION BY PLANTS





HEAT DISTRIBUTION

thou.Gcal

Type	2018	2019	2020
Here of	Water	8,739.6	9,095.2
	Steam	788.8	843.4
Total	9,528.4	9,938.6	10,353.6

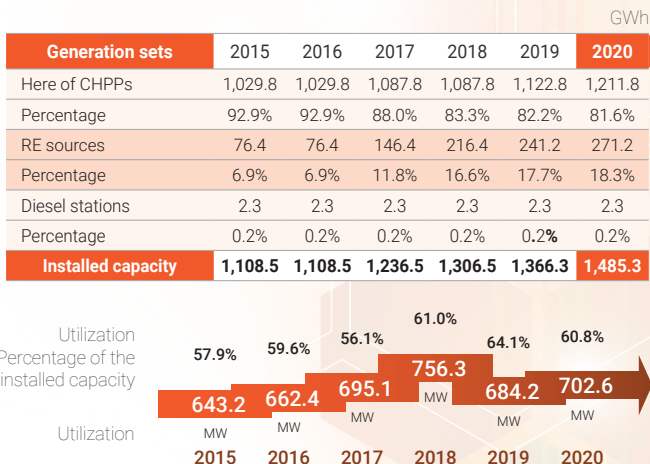
HEAT PRODUCTION OF RURAL LHS FOR HEAT PRODUCTION, DISTRIBUTION AND SUPPLY

thou.Gcal

License holder	2019	2020
1 "Ekh Golomtii Ilch" Ltd	64.4	66.9
2 "Erchimbayan-Ulgii" SC	54.8	62.1
3 "Mandal Golomt" Ltd	66.9	67.3
4 "US DU" ME	11.1	34.2
5 "Dulaan Shariin Gol" SOJSC	38.3	35.6
6 "Gan Ilch" Ltd	70.0	73.1
7 "Chandmani-Ilch" Ltd	55.7	55.6
8 "Durvulj" ME	68.9	69.1
9 "Selenge Energo" ME	92.1	81.6
10 "Khutul Energy Dulaan" Ltd	74.6	39.2
11 "Tuv Chandmani Heat and Supply Entity" ME	96.3	89.7
12 "Ulaangom Thermal Plant-2" SOJSC	41.3	44.9
13 "Khovd Thermal Plant" SOJSC	45.1	49.3
14 "Khuvsgul Thermal Plant" SOJSC	74.1	79.6
15 "Khentii Us" Ltd	52.3	51.3
16 "Energy plus" Ltd	16.1	28.1
TOTAL	922.0	927.5



INSTALLED CAPACITY OF GENERATION UNITS, PERCENTAGE, UTILIZATION /COUNTRY WIDE/



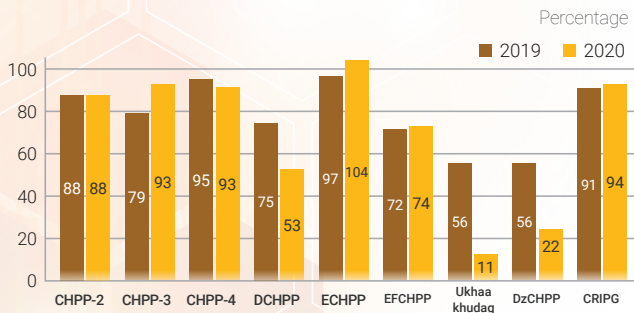
UTILIZATION OF THE INSTALLED CAPACITY OF CHPPS

Percentage

Name of plant	2015	2016	2017	2018	2019	2020
CHPP-2	70.6	73.5	71.9	76.8	75.6	73.8
CHPP-3	61.8	62.7	66.1	66.6	64.7	64.4
CHPP-4	57.9	60.7	63.6	63.3	66.4	61.0
DCHPP	61.2	64.4	65.3	63.2	73.8	47.7
ECHPP	60.9	59.1	64.3	65.0	64.8	62.7
EFCHPP	-	-	-	68.4	69.1	65.1
DorCHPP	58.6	67.7	73.0	73.1	75.4	74.2



UTILIZATION OF INSTALLED CAPACITY OF CHPPS /PEAK LOAD IN WINTER/



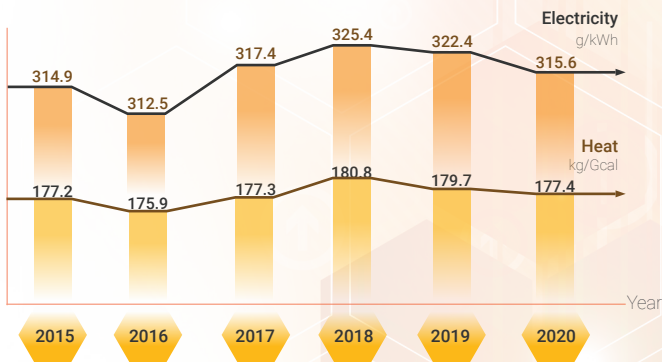
ELECTRICITY FOR OWN USE IN CHPPS

Percentage

Name of plant	2015	2016	2017	2018	2019	2020
CHPP-2	14.29	14.02	13.52	13.21	12.58	12.27
CHPP-3	16.67	16.87	16.31	16.54	16.44	16.86
CHPP-4	12.4	12.48	12.28	12.38	12.09	11.74
DCHPP	17.87	17.47	17.35	17.59	16.38	15.70
ECHPP	19.59	20.36	19.45	18.94	18.16	18.46
EFCHPP	-	-	-	18.35	17.86	15.72
DzCHPP	-	-	-	41.51	39.76	25.35
CRIPG	13.78	13.87	13.57	14.00	13.62	13.29



SPECIFIC FUEL CONSUMPTION FOR ENERGY GENERATION, IN COAL EQUIVALENT



SPECIFIC FUEL CONSUMPTION FOR ELECTRICITY GENERATION, IN COAL EQUIVALENT

	g/kWh					
Name of plant	2015	2016	2017	2018	2019	2020
CHPP-2	630.7	631.3	642.6	652.5	622.6	578.0
CHPP-3	325	309.0	308.3	317.4	314.3	310.8
CHPP-4	291.4	290.1	298.4	285.7	285.6	278.8
DCHPP	427.8	449.5	439.0	433.5	433.6	425.1
ECHPP	325.1	331.0	328.5	344.4	340.3	336.5
EFCHPP	-	-	-	540.1	534.0	495.1
DzCHPP	642.6	636.8	608.2	615.5	638.9	632.9
CRIPG	1,615.7	1,564.6	1,349.2	1,225.3	1,222.4	1,221.5

SPECIFIC FUEL CONSUMPTION FOR
HEAT GENERATION, IN COAL EQUIVALENT

kg/Gcal

Name of plant	2015	2016	2017	2018	2019	2020
CHPP-2	199.6	202.9	203.2	201.7	202.3	190.3
CHPP-3	176.8	175.7	175.5	175.8	176.0	175.6
CHPP4	173.6	173.4	173.1	173.2	172.9	171.7
DCHPP	195.9	182.7	197.0	188.8	189.9	185.7
ECHPP	178.4	178.5	184.6	192.1	190.0	186.5
EFCHPP	-	-	-	222.0	213.4	197.9
DorCHPP	192	191.7	191.6	191.9	192.4	192.0
DzCHPP	529.6	525.7	511.09	398.85	287.823	271.43
BNTF	183.8	190.9	165	178.2	110.7	189.1
TPND	214.7	216.5	215.5	211.4	209.6	201.8
ATP	154.4	162	159.5	167.4	164.2	158.7

EFFICIENCY OF CHPPS

Percentage

	2015	2016	2017	2018	2019	2020
CHPP-2	20.6	20.9	21.6	20.70	21.40	22.9
CHPP-3	40.5	44.0	43.2	41.05	41.50	41.7
CHPP-4	42.2	42.4	41.2	43.01	43.10	44.08
DCHPP	28.8	27.4	28.02	28.37	28.40	28.9
ECHPP	40.5	41.3	40.24	39.46	42.00	41.9
EFCHPP	-	-	-	25.20	23.30	26
DorCHPP	19.1	19.5	20.4	20.30	19.60	19.9



STATISTICS ON **ENERGY** PERFORMANCE

3

ELECTRICITY TRANSMISSION AND DISTRIBUTION

• Peak load of CRIPG	20
• Electricity import and export in CRIPG	20
• Transmission and distribution losses	21
• Transmission and distribution losses of major companies in GRIPG	21
• Transmission and distribution losses of WRIPG	22



PEAK LOAD OF CRIPG



ELECTRICITY IMPORT AND EXPORT IN CRIPG

Indicators	2016	2017	2018	2019	2020
Imported electricity (GWh)	201.4	270.6	304.1	250.8	186.99
Exported electricity (GWh)	33.9	34.1	26.9	26.5	39.85
Guaranteed capacity (MW)	-	-	-	-	-
Average price of import (thou.USD)	0.08	0.08	0.08	0.10	0.09
Payment (thou.USD)	16,441.7	21,352.2	22,695.8	21,541.9	16,741.07



TRANSMISSION AND DISTRIBUTION LOSSES

Percentage

	AUIPG	ERIPG	WRIPG	CRIPG
2015	23.51	7.4	25.35	15.07
2016	23.52	4.97	26.73	15.02
2017	23.4	4.1	25.94	14.73
2018	22.53	4.2	24.77	13.97
2019	21.47	3.85	24.27	13.75
2020	19.9	4.4	23.37	13.60

TRANSMISSION AND DISTRIBUTION
LOSSES OF MAJOR COMPANIES IN CRIPG

Percentage

Grid Companies	2015	2016	2017	2018	2019	2020
"NPTG" SOJSC	3.15	3.32	3.35	3.15	3.17	3.45
"UBEDN" SOJSC	16.08	15.91	15.79	15.11	14.9	14.72
"DSEDN" Ltd	13.41	14.20	13.65	13.11	10.1	9.09
"EBEDN" SOJSC	3.64	3.43	3.16	2.93	3.35	3.56
"BSEREDN" SOJSC	9.48	9.93	8.15	6.84	7.78	5.10
"Khuvsgul-Energy" Ltd	18.58	18.83	17.97	17.26	16.7	18.71
"Bayankhongor-Energy distribution" Ltd	13.68	13.17	15.77	12.95	13.1	13.35
"SRPDG" SOJSC	17.04	14.77	12.77	11.89	9.74	6.99
Total losses	15.07	15.02	14.73	13.97	13.75	13.6

TRANSMISSION AND DISTRIBUTION
LOSSES OF WRIPG

Percentage

	2015	2016	2017	2018	2019	2020
WRES SOJSC	9.89	9.40	9.44	8.79	8.72	8.97
Bayan-Ulgii EGC	15.4	18.11	17.13	18.05	17.39	16.67
UVS EDN	17.36	18.9	18.57	17.52	17.25	17.03
Khovd EDN	19.3	20.1	18.9	17.05	16.53	14.1



STATISTICS ON **ENERGY** PERFORMANCE

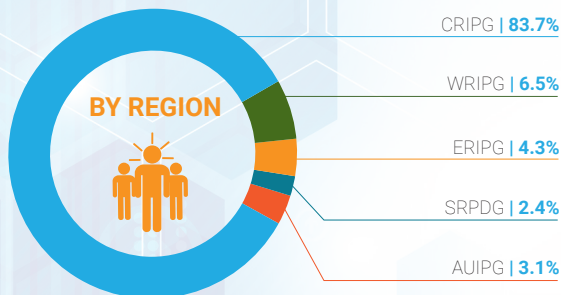
4 ENERGY CONSUMPTION

• Electricity consumers	24
• Heat consumers	26
• Electricity Sales Volume	28
• Structure of Electricity Sales	29



NUMBER OF ELECTRICITY/ENERGY CONSUMERS

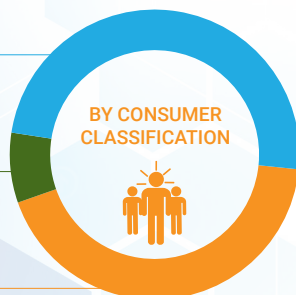
Grid	2015	2016	2017	2018	2019	2020
CRIPG	493,959	523,208	547,348	575,168	602,484	617,092
WRIPG	42,811	28,764	42,898	44,379	46,243	47,705
ERIPG	24,373	22,997	27,604	28,522	30,069	31,597
SRPDG	10,629	11,442	12,284	14,393	16,779	17,867
AUIPG	20,677	20,571	21,884	22,775	23,121	23,136
TOTAL	592,449	606,982	652,018	685,237	718,696	737,397



GER DISTRICT | **49.2%**

ENTITY AND INDUSTRY | **7.8%**

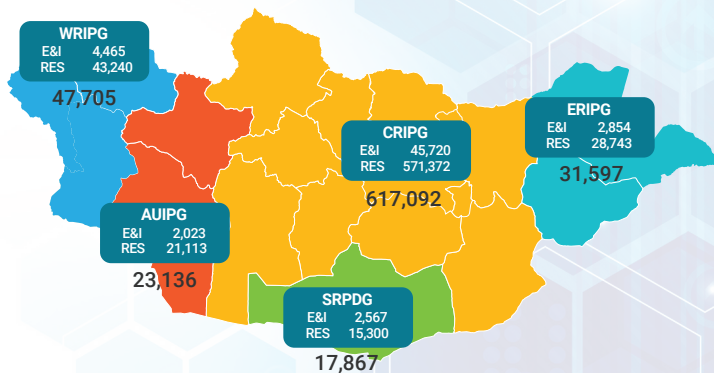
APARTMENT | **43.0%**





NUMBER OF ELECTRICITY CONSUMERS

Grid	Entity and industry	Residential		Total number of consumers
		Apartment	Ger district	
CRIPG	45,720	298,245	273,127	617,092
WRIPG	4,465	5,728	37,512	47,705
ERIPG	2,854	8,135	20,608	31,597
SRPDG	2,567	2,191	13,109	17,867
AUIPG	2,023	2,696	18,417	23,136
Total	57,629	316,995	362,773	737,397





NUMBER OF HEAT CONSUMERS

Numbers for	Residential	Entity and industry	Total
Ulaanbaatar	250,033	18,049	268,082
Erdenet	13,417	1,548	14,965
Darkhan	14,150	1,658	15,808
Dornod	7,660	678	8,338
Dalanzadgad	1,243	280	1,523
Rural areas	57,923	7,363	65,286
Total	344,426	29,576	374,002

RURAL AREAS 65,286 | 17.5%

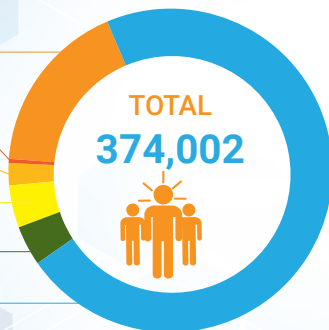
DALANZADGAD 1,523 | 0.4%

DORNOD 8,338 | 2.2%

DARKHAN 15,808 | 4.2%

ERDENET 14,965 | 4.0%

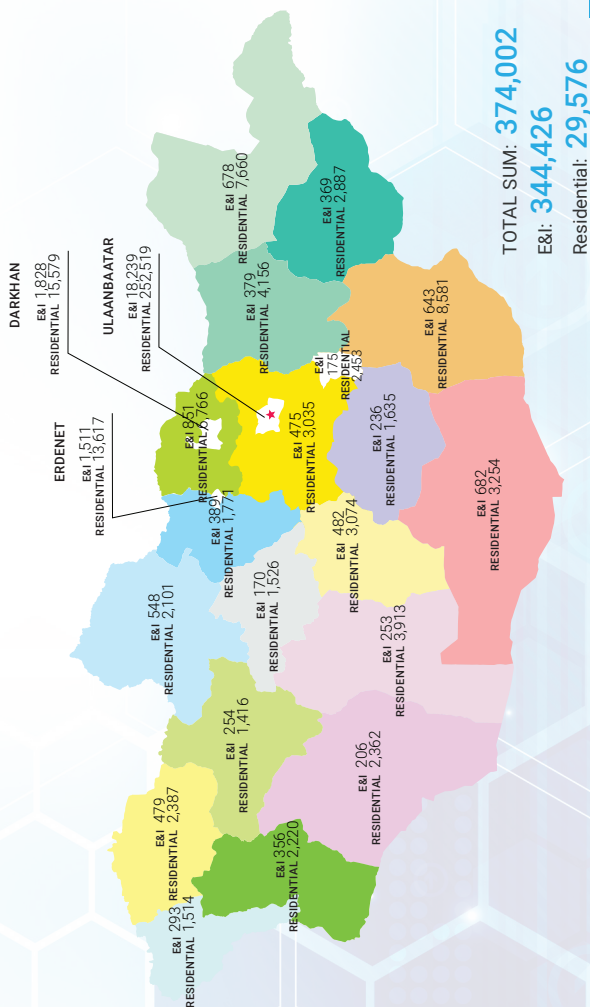
ULAAANBAATAR 268,082 | 71.7%



Note: It is displayed the number of consumers of relatively large central heating systems and rural areas.



NUMBER OF HEAT CONSUMERS





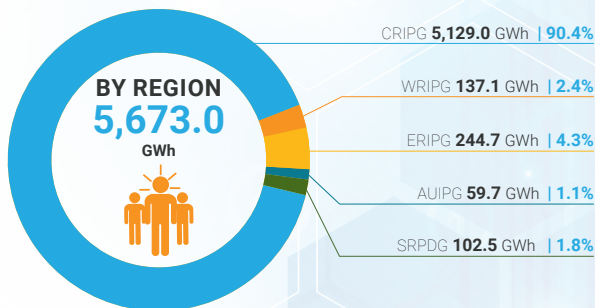
ELECTRICITY SALES VOLUME

GWh

Grid	Classification	2015	2016	2017	2018	2019	2020
CRIPG	E&I	2,939.3	2,987.5	3,150	3,498	3,653.3	3,594.1
	Ap	438.5	493.2	527.5	541.9	586.1	639.8
	GD	632.6	624.6	669.9	748.9	793.7	895.1
	Total	4,010.4	4,105.2	4,347	4,789	5,033.2	5,129.0
WRIPG	E&I	49.4	46.4	48.8	54.6	60.3	63.5
	Ap	8.5	10.1	11.2	12.5	13.1	14.4
	GD	46.2	47.4	48.7	49.8	54.3	59.3
	Total	104.1	103.9	108.7	116.9	127.7	137.1
ERIPG	E&I	116.0	179.6	205.5	204.3	214.8	199.5
	Ap	10.3	10.7	11.6	12.5	12.5	14.5
	GD	21.5	23.0	24.6	26.3	27.0	30.7
	Total	147.8	213.4	241.7	243.1	254.3	244.7
AUIPG	E&I	22.8	25.8	26.3	27.3	32.5	28.3
	Ap	5.1	6.4	9.7	5.4	6.3	6.1
	GD	20.0	19.7	17.2	22.2	24.0	25.3
	Total	47.9	51.9	53.2	54.9	62.7	59.7
SRPDG	E&I	19.2	18.7	21.0	35.4	57.8	71.8
	Ap	1.7	2.2	2.7	3.3	3.8	4.6
	GD	12.4	13.1	14.0	16.5	20.2	26.1
	Total	33.3	34.0	37.7	55.2	81.8	102.5
Total for the Sector	E&I	3,146.7	3,258.0	3,451.6	3,819.6	4,018.7	3,957.2
	Ap	464.1	522.6	562.7	575.6	621.9	679.3
	GD	732.7	727.8	774.4	863.7	919.0	1,036.5
	Total	4,343.5	4,508.4	4,788.7	5,258.9	5,559.6	5,673.0



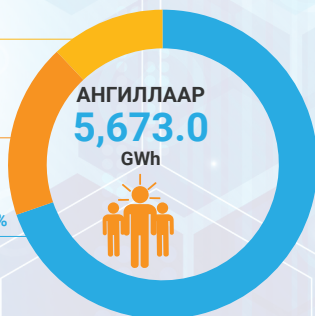
STRUCTURE OF ELECTRICITY SALES



APARTMENT **679.3** GWh | **12.0%**

GER DISTRICT **1,036.5** GWh | **18.3%**

ENTITY AND INDUSTRY **3,957.2** GWh | **69.8%**







STATISTICS ON **ENERGY** PERFORMANCE

5 FINANCIAL INDICATORS

• Revenue from Operations of Energy Companies	32
• Profit and Losses of Energy Companies	32
• Receivables of Energy Companies, structure of receivables	34
• Liabilities of Energy Companies, structure of liabilities	35
• Payables of CHPPs to Coal-Mines	36
• Single Buyer's Electricity Sales Revenue Collection	37
• Tax Payments and Fees of Energy Companies to State and Local Budgets	38
• Government Subsidies to Energy Companies	39

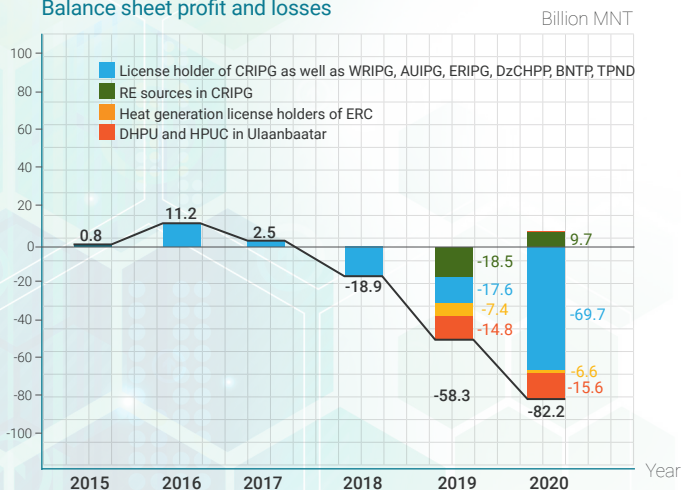


REVENUE FROM OPERATIONS OF ENERGY COMPANIES



PROFIT AND LOSSES OF ENERGY COMPANIES

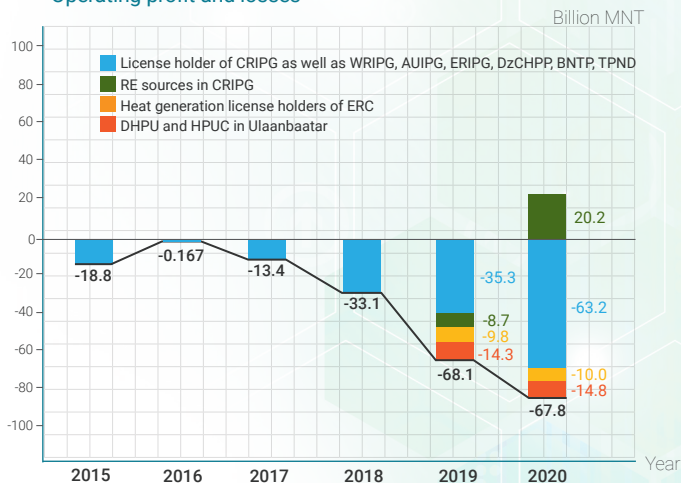
Balance sheet profit and losses





RECEIVABLES AND LIABILITIES OF ENERGY COMPANIES

Operating profit and losses

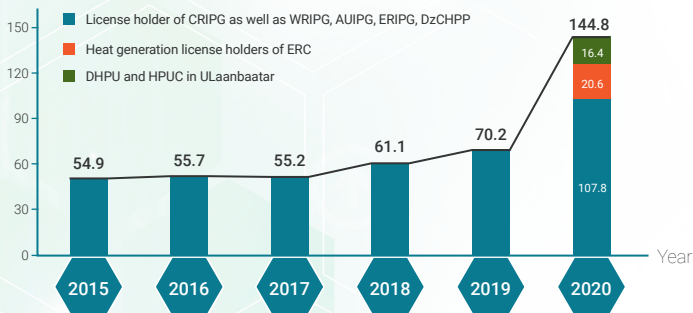




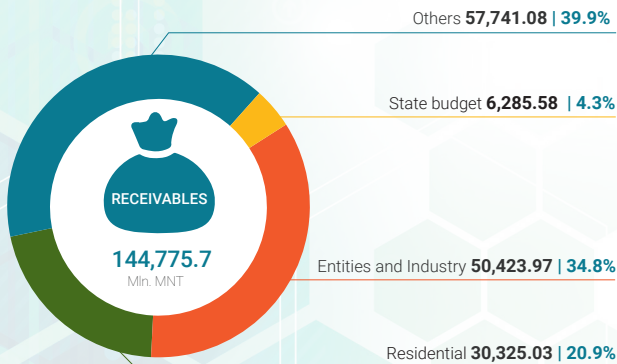
RECEIVABLES OF ENERGY COMPANIES

RECEIVABLES

Billion MNT



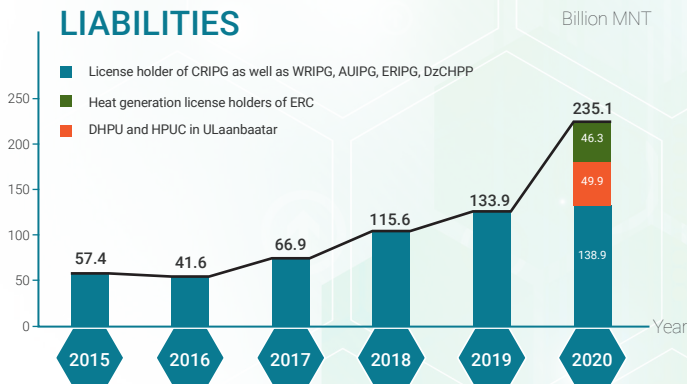
STRUCTURE OF RECEIVABLES





LIABILITIES OF ENERGY COMPANIES

LIABILITIES



STRUCTURE OF LIABILITIES

Project loan, loan interest **99,071.8** | **42.1%**

Taxes **29,603.6** | **12.6%**

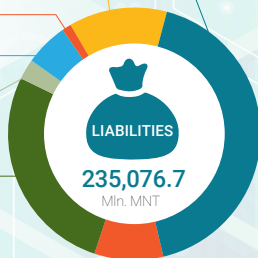
Transportation **2,750.4** | **1.2%**

Payables for Coal **12,986.6** | **5.5%**

Import electricity **6,162.9** | **2.6%**

Supplier **63,751.4** | **27.1%**

Bank credits, credit interests **20,750.0** | **8.8%**





PAYABLES OF CHPPS TO COAL-MINES

Mln.MNT

Plant name	2015	2016	2017	2018	2019	2020
CHPP-2	1,332.5	-	449.9	747.7	747.0	423.8
CHPP-3	(158.2)	-	-	312.1	5,054.7	-
CHPP-4	4,111.7	2,100.4	1,511.6	1,196.8	1,555.2	2,432.2
DCHPP	513.5	34.0	372.5	222.8	2,748.9	738.4
ECHPP	250.6	-	-	19.8	-	-
ATP	-	-	-	1,420.2	961.8	1,291.9
ERIPG	(4.2)	295.6	244.2	783.5	1,031.7	678.8
DzCHPP	279.0	244.0	2,126.2	244.2	244.2	244.2
BNTP	2,555.9	2,743.8	1,549.3	1,224.8	362.6	-
TPND	2,408.1	1,392.5	-	704.0	500.2	577.5
RURAL HEAT PLANT	-	-	-	-	-	6,599.7
Total	1,288.9	6,810.4	6,253.7	6,875.9	13,206.4	12,986.6

Mln.MNT

Mine	2015	2016	2017	2018	2019	2020
Shivee-Ovoo	2,722.0	2,100.4	1,851.2	2,041.5	1,961.2	1,140.7
Baganuur	5,729.7	2,756.8	2,177.9	3,257.7	7,442.8	3,007.2
Shariin Gol	460.5	24.1	826.5	17.9	2,298.6	738.4
Aduun-chuluun	(4.2)	295.6	-	783.5	1,031.8	329.1
Tavantolgoi	279.0	244.0	244.2	244.2	244.2	244.2
Other	2,102.0	1,389.5	1,153.9	531.1	227.9	7,527.0
Total	11,288.9	6,810.4	6,253.7	6,875.9	13,206.4	12,986.6



SINGLE BUYER'S ELECTRICITY SALES, REVENUE COLLECTION



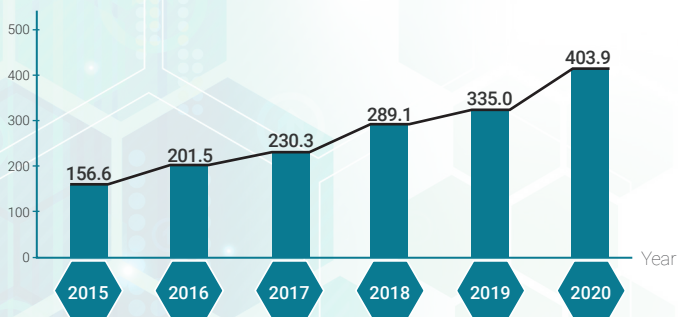


TAX PAYMENTS AND FEES OF MAJOR ENERGY COMPANIES TO STATE AND LOCAL BUDGETS

Billion MNT

Type of taxes and fees	2015	2016	2017	2018	2019	2020
Value added tax	93.5	124.3	145.0	197.3	193.5	263.9
Income Tax of E&I	1.5	2.6	2.8	2.4	1.3	7.3
Social Insurance Fee	39.2	46.1	53.0	59.9	111.5	80.4
Personal Income Tax	14.3	19.8	21.1	23.2	22.0	27.6
Other Fees and Taxes	8.1	8.7	8.4	6.3	6.8	24.7
Total	156.6	201.5	230.3	289.1	335.0	403.9

Billion MNT



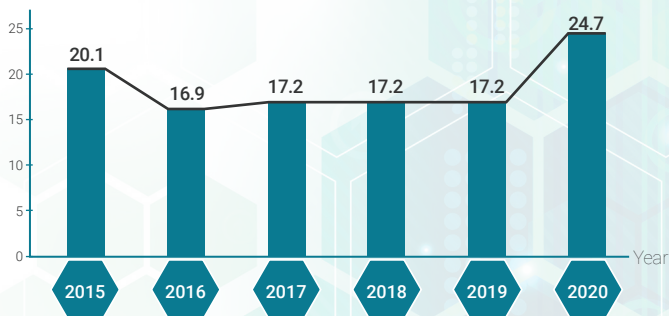


GOVERNMENT SUBSIDIES TO ENERGY COMPANIES

Mln.MNT

Name of LHs	2015	2016	2017	2018	2019	2020
"WRES" SOJSC	8,600.0	8,600.0	8,600.0	8,600.0	8,600.0	16,700.0
"ERIPG" SOJSC	2,200.0	-	-	-	-	-
"DzCHPP" SOJSC	1,600.0	1,600.0	1,600.0	1,600.0	1,600.0	1,447.1
"AUIPG" SOJSC	4,150.0	3,150.0	3,150.0	3,150.0	3,150.0	3,150.0
"BNTP" SOJSC	1,100.0	1,100.0	1,100.0	1,100.0	1,100.0	1,010.0
"TPND" SOJSC	1,400.0	1,400.0	1,400.0	1,400.0	1,400.0	1,238.0
"DSHG" SOJSC	500.0	500.0	500.0	500.0	500.0	482.0
"Selenge Energo" ME	500.0	500.0	500.0	500.0	500.0	428.0
"Khentii-US" Ltd	-	-	300.0	300.0	300.0	269.6
TOTAL	20,050.0	16,850.0	7,150.0	17,150.0	17,150.0	24,724.7

Mln.MNT







STATISTICS ON **ENERGY** PERFORMANCE

6 RELIABILITY INDICATORS

• Main components of CHPPs	42
• Reports on Outages of Main Components of CHPPs	49
• Length of Power Transmission, Distribution Lines	50
• Number of Power Transmission and Distribution Substations	50
• Reliability Indicators of Power Supply	51



MAIN COMPONENTS OF CHPPS

"CHPP-2" SOJSC

BOILER

Boiler type		Commissioning year	Capacity t/h	Steam pressure kgf/cm ²	Steam temperature °C
1	TC-35-39	1961	35	39	440
2	TC-35-39	1961	35	39	440
3	BKZ-75-39	1969	75	39	440
4	BKZ-75-39	1969	75	39	440

TURBINE

Turbine type		Commissioning year	Capacity t/h	Steam pressure kgf/cm ²	Steam temperature °C
1	AK-6-35	1961	6	35	435
2	N-6/35	2015	6	35	435
3	PT-12-35/10	1969	12	35	435

GENERATOR

Generator type		Capacity MW	Voltage kV
1	TQC-5466-2	6	6.3
2	TQC-5466-2	6	6.3
3	T2-12-2	12	6.3



MAIN COMPONENTS OF CHPPS

BOILER

CHPP-3 SOJSC

	Boiler type	Commissioning year	Capacity t/h	Steam pressure kgf/cm ²	Steam temperature °C
1	BKZ-75-39FB	1968	75	39	440
2	BKZ-75-39FB	1969	75	39	440
3	BKZ-75-39FB	1969	75	39	440
4	BKZ-75-39FB	1969	75	39	440
5	BKZ-75-39FB	1973	75	39	440
6	BKZ-75-39FB	1975	75	39	440
7	BKZ-220-100-4C	1976	220	100	540
8	BKZ-220-100-4C	1977	220	100	540
9	BKZ-220-100-4C	1978	220	100	540
10	BKZ-220-100-4C	1979	220	100	540
11	BKZ-220-100-4C	1979	220	100	540
12	BKZ-220-100-4C	1980	220	100	540
13	BK3-220-100-4C	1981	220	100	540

TURBINE

GENERATOR

	Turbine type	Commissioning year	Capacity, MW	Steam pressure kgf/cm ²	Steam temperature °C	Generator type	Capacity, MW	Voltage, kV
1	PT-12-35/10M	1973	12	35	435	T2-12-2	12	6.3
2	PT-12-35/10M	1973	12	35	435	T2-12-2	12	6.3
3	PT-12-35/10M	1974	12	35	435	T2-12-2	12	6.3
4	PT-12-35/10M	1975	12	35	435	T2-12-2	12	6.3
5	PT-25-90/10M	1977	25	90	535	TBC-32	25	6.3
6	PT-25-90/10M	1977	25	90	535	TBC-32	25	6.3
7	PT-25-90/10M	1978	25	90	535	TBC-32	25	6.3
8	PT-25-90/10M	1979	25	90	535	TBC-32	25	6.3
9	C50-8.83/0.294	2014	50	90	535	QF-50/60-2	50	6.3

As the TBC-32 generators' cooling system was modified from a hydrogen cooler to an air-cooler, the capacity was reduced to 22 MW respectively, bringing the plant's installed capacity to 136 MW.



MAIN COMPONENTS OF CHPPS

"CHPP-4" SOJSC

BOILER

	Boiler type	Commissioning year	Capacity t/h	Steam pressure kgf/cm ²	Steam temperature °C
1	BKZ-420-140-10C	1983	420	140	560
2	BKZ-420-140-10C	1984	420	140	560
3	BKZ-420-140-10C	1984	420	140	560
4	BKZ-420-140-10C	1985	420	140	560
5	BKZ-420-140-10C	1986	420	140	560
6	BKZ-420-140-10C	1987	420	140	560
7	BKZ-420-140-10C	1990	420	140	560
8	BKZ-420-140-10C	1991	420	140	560

TURBINE

GENERATOR

	Turbine type	Commissioning year	Capacity, MW	Steam pressure kgf/cm ²	Steam temperature, °C	Generator type	Capacity, MW	Voltage, kV
1	PT-80/100-130-13	1983	80	130	555	TVF-120-2UZ	80	10.5
2	T-100/120-130-4	1984	100	130	555	TVF-120-2UZ	100	10.5
3	T-100/120-130-4	1985	100	130	555	TVF-120-2UZ	100	10.5
4	T-100/120-130-4	1986	100	130	555	TVF-120-2UZ	100	10.5
5	PT-80/100-130-13	1990	100	130	535	TVF-110-2UZ	80	10.5
6	PT-80/100-130-13	1991	80	130	535	TVF-110-2UZ	80	10.5
7	T-120/130-130-8MO	2015	123	130	535	TVF-125-2UZ	80	10.5



MAIN COMPONENTS OF CHPPS

"CHPP-Darkhan" SOJSC

BOILER

	Boiler type	Commissioning year	Capacity t/h	Steam pressure kgf/cm ²	Steam temperature °C
1	BKZ-75-39FB	1965	75	39	440
2	BKZ-75-39FB	1965	75	39	440
3	BKZ-75-39FB	1965	75	39	440
4	BKZ-75-39FB	1965	75	39	440
5	BKZ-75-39FB	1966	75	39	440
6	BKZ-75-39FB	1966	75	39	440
7	BKZ-75-39FB	1986	75	39	440
8	BKZ-75-39FB	1986	75	39	440
9	BKZ-75-39FB	1986	75	39	440

TURBINE

GENERATOR

	Turbine type	Commissioning year	Capacity, MW	Steam pressure kgf/cm ²	Steam temperature °C	Generator type	Capacity, MW	Voltage, kV
1	APT-12-35/10	1965	12	35	435	T2-12-2	12	6.3
2	APT-12-35/10	1965	12	35	435	T2-12-2	12	6.3
3	APT-12-35/10	1965	12	35	435	T2-12-2	12	6.3
4	APT-12-35/10	1965	12	35	435	T2-12-2	12	6.3



MAIN COMPONENTS OF CHPPS

"CHPP-Erdenet" SOJSC

BOILER

	Boiler type	Commissioning year	Capacity t/h	Steam pressure kgf/cm ²	Steam temperature °C
1	BKZ-75-39FB	1986	75	39	440
2	BKZ-75-39FB	1987	75	39	440
3	BKZ-75-39FB	1987	75	39	440
4	BKZ-75-39FB	1988	75	39	440
5	BKZ-75-39FB	1988	75	39	440
6	BKZ-75-39FB	1989	75	39	440
7	BKZ-75-39FB	1989	75	39	540

TURBINE

GENERATOR

	Turbine type	Commissioning year	Capacity, MW	Steam pressure kgf/cm ²	Steam temperature, °C	Generator type	Capacity, MW	Voltage, kV
1	PT-12-35/10M	1987	12	35	435	T-12-2Y3	12	6.3
2	R-12-35/5M	1988	12	35	435	T-12-2Y3	12	6.3
3	R-12-35/5M	1989	12	35	435	T-12-2Y3	12	6.3

The installed capacity of the 2 back pressure turbines, type R-12-35 / 5M, was redefined by a project, 28.8 MW for each.



MAIN COMPONENTS OF CHPPS

"Eastern region integrated power grid" SOJSC

BOILER

	Boiler type	Commissioning year	Capacity t/h	Steam pressure kgf/cm ²	Steam temperature °C
1	ТП-35У	1969	35	39	440
2	ТП-35У	1969	35	39	440
3	ТП-35У	1970	35	39	440
4	БКЗ-75-39ФБ	1979	75	39	440
5	БКЗ-75-39ФБ	1980	75	39	440
6	БКЗ-75-39ФБ	1982	75	39	440

"Dalanzadgad CHPP" SOJSC

1	UG-27/3,63M	2000	27	36.3	376.6
2	UG-27/3,63M	2000	27	36.3	376.6
3	SHX25-2.43/400-M	2011	25	36.3	376.6

"Eastern region integrated power grid" SOJSC

TURBINE

GENERATOR

	Turbine type	Commissioning year	Capacity, MW	Steam pressure kgf/cm ²	Steam temperature °C	Generator type	Capacity, MW	Voltage, kV
1	AP-6-35-5	1969	6	35	435	T2-6-2	6	6.3
2	AP-6-35-5	1969	6	35	435	T2-6-2	6	6.3
3	PT-12-35-10M	1980	12	35	435	T12-2	12	6.3
4	PT-12-35-10M	1982	12	35	435	T12-2	12	6.3

"Dalanzadgad CHPP" SOJSC

1	DNG-61-55	2000	3	36	376	YEC-114-1979	3	6.3
2	DNG-61-55	2000	3	36	376	YEC-114-1980	3	6.3
3	N3-2.35	2011	3	36	376	QF-3-2	3	6.3



MAIN COMPONENTS OF CHPPS

CHPP-Erdenet factory SOC

BOILER

	Boiler type	Commissioning year	Capacity t/h	Steam pressure kgf/cm ²	Steam temperature °C
1	BKZ-75-39FB	1976	75	39	440
2	BKZ-75-39FB	1977	75	39	440
3	BKZ-75-39FB	1977	75	39	440
4	BKZ-75-39FB	1978	75	39	440
5	BKZ-75-39FB	1979	75	39	440
6	BKZ-75-39FB	1979	75	39	440

TURBINE

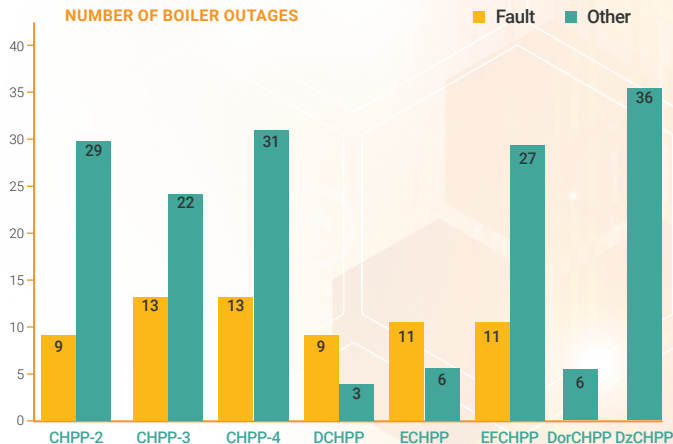
GENERATOR

	Turbine type	Commissioning year	Capacity, MW	Steam pressure kgf/cm ²	Steam temperature, °C	Generator type	Capacity, MW	Voltage, kV
1	Murray T5837	2012	2.5	35	435	KATO-20850	2.5	6.3
2	Murray T5837	2012	2.5	35	435	KATO-20850	2.5	6.3
3	CC12-3.43/1.2/0.6	2017	12	35	435	QFW2-12-2	12	6.3
4	N12-3.43-20	2017	12	35	435	QFW2-12-2	12	6.3
5	CC12-3.43/1.2/0.6	2017	12	35	435	QFW2-12-2	12	6.3
6	N12-3.43-20	2017	12	35	435	QFW2-12-2	12	6.3

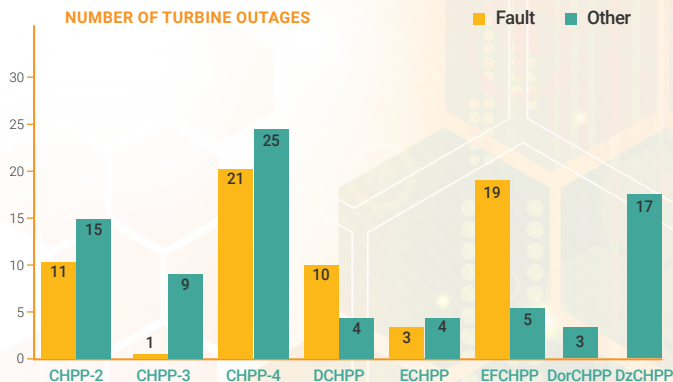


RECORDS ON OUTAGES OF MAIN COMPONENTS OF CHPPS

NUMBER OF BOILER OUTAGES



NUMBER OF TURBINE OUTAGES





LENGTH OF POWER TRANSMISSION AND DISTRIBUTION LINES

km

Voltage level		Central region	Western region	AUIPG	Eastern region	South region	Total
1	220 kV	1,956.9	-	-	-	-	1,956.9
2	110 kV	3,675.9	797.4	393.3	1,475.5	-	6,342.1
3	35 kV	6,284.8	1,013.8	919.2	1,817.7	450.0	10,485.6
4	15-20 kV	2,002.0	923.7	1,016.0	922.3	173.4	5,037.4
5	6-10kV	12,953.5	1,468.8	344.0	907.1	427.1	16,100.5
6	0.22-0.4kV	8,677.0	1,490.8	273.0	567.6	9,295.1	20,303.5
TOTAL		29,931.3	3,883.3	2,945.3	5,690.2	10,345.6	52,795.6

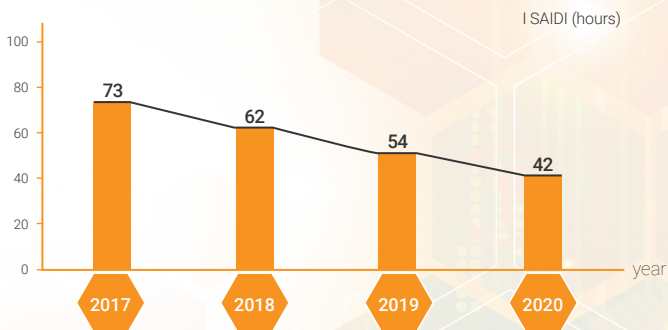
NUMBER OF POWER TRANSMISSION AND DISTRIBUTION SUBSTATIONS

Voltage level		Central region	Western region	AUIPG	Eastern region	South region	Total
1	220 kV	10	-	-	-	-	10
2	110 kV	72	9	4	10	-	95
3	35 kV	418	22	18	20	35	513
4	15-20 kV	124	74	43	78	28	347
5	6-10kV	9,928	710	187	369	240	11,434
TOTAL		10,552	784	252	477	303	12,368



RELIABILITY INDICATORS OF POWER SUPPLY

Region	2017 oH			2018 oH			2019 oH			2020		
	I SAIDI	I SAIFI	I CAIDI	I SAIDI	I SAIFI	I CAIDI	I SAIDI	I SAIFI	I CAIDI	I SAIDI	I SAIFI	I CAIDI
Central region	81	10	8	61	16	4	54	9	6	39	7	6
Western region	11	5	2	126	15	9	103	12	8	119	30	4
AUIPG	54	5	10	26	7	4	22	3	9	19	5	4
Eastern region	4	1	5	3	1	5	10	2	6	11	3	4
Total	73	8	9	62	15	4	54	9	6	42	8	5



Definition:

I SAIDI: System average interruption duration index (in hour)

I SAIFI: System average interruption frequency index





STATISTICS ON **ENERGY** PERFORMANCE

7 ENERGY TARIFFS

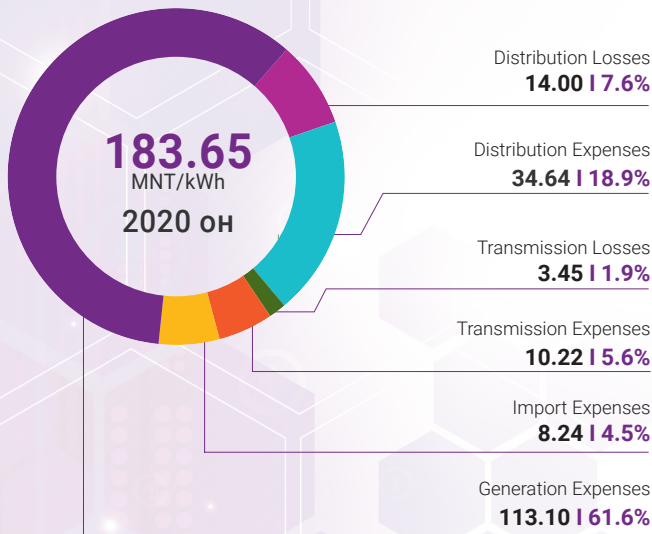
• Electricity Price Structure in CRIPG	54
• Electricity Price Structure in WRIPG	55
• Cost and Expense Structure	55
• Electricity Price Changes in CRIPG	56
• Change of Space Heating Prices in Ulaanbaatar, Darkhan and Erdenet	56
• Change of Heat Prices for Heating of Tap Hot Water	57
• Coal Price Changes	57
• Comparison of End User Tariffs of some Asian Countries	58
• Comparison of End User Electricity Tariffs of Developed Countries	58
• Comparison of End User Electricity Tariffs of ERRa member countries	59
• End User Electricity Tariffs	60
• End User Heat Tariffs	64
• Heat Tariffs Approved by RBoACC	65
• Heat Energy Retail Tariffs of Local/Rural Heat Distribution, Supply LHs	66



ELECTRICITY PRICE STRUCTURE IN CRIPG

MNT/kWh

	Generation expenses	Import expenses	Transmission losses	Transmission expenses	Distribution losses	Distribution expenses	Unit cost	Average price for consumer
MNT/kWh	113.10	+ 8.24	+ 3.45	+ 10.22	+ 14.00	+ 34.64	= 183.65	176.91
Percentage	61.6%	+ 4.5%	+ 1.9%	+ 5.6%	+ 7.6%	+ 18.9%	= 100.0%	95.9%



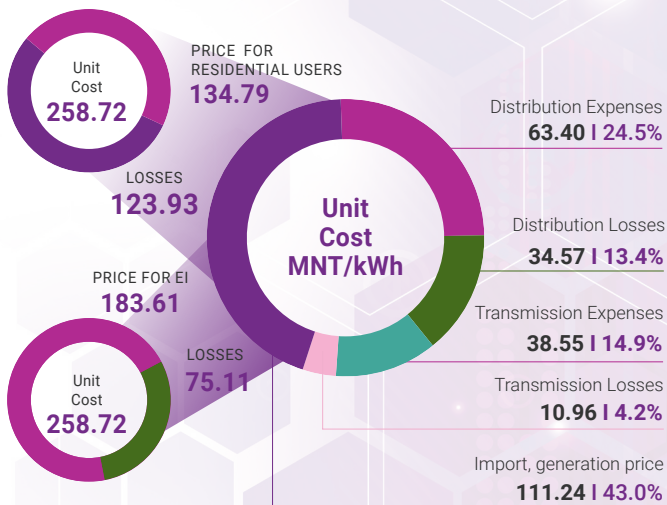


ELECTRICITY STRUCTURE IN WRIPG

MNT/kWh

	Average of import price and generation costs	Transmission losses	Transmission expenses	Distribution losses	Distribution expenses	Unit cost	End user tariff	Losses per unit
Entity and Industry	111.24	10.96	38.55	34.57	63.40	258.72	183.61	75.11
	43.0%	4.2%	14.9%	13.4%	24.5%	100.0%	70.97%	29.0%
Residential	111.24	10.96	38.55	34.57	63.40	258.72	134.79	123.93
	43.0%	4.2%	14.9%	13.4%	24.5%	100.0%	52.10%	47.9%


COST AND EXPENSE STRUCTURE





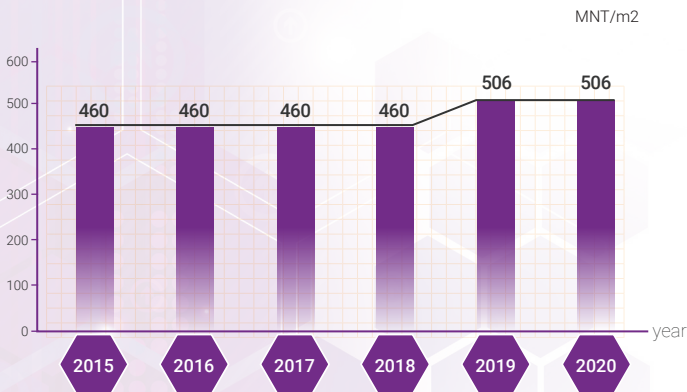
ELECTRICITY PRICE CHANGES IN CRIPG /Renewable Energy Levy Included/

MNT/kWh

	 MINING	 ENTITY AND INDUSTRY	 APARTMENT & GER DISTRICT
2015	159.90	132.50	122.50
2016	159.85	132.45	122.15
2017	167.78	140.38	130.08
2018	167.78	140.38	130.08
2019	179.69	164.38	154.08
2020	179.69	164.38	154.08

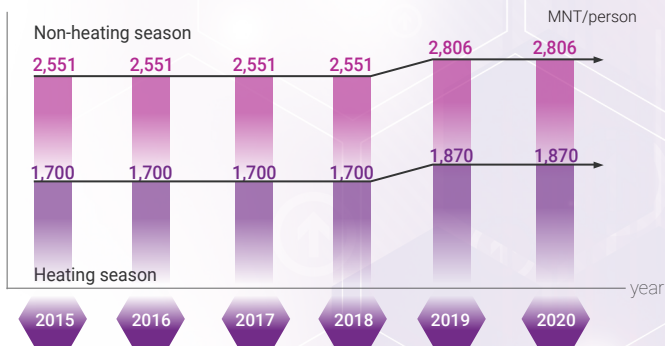
Note: Taken into account only consumer with simple (single-tariff meter) meter.

CHANGE OF SPACE HEATING PRICES IN ULAANBAATAR, DARKHAN AND ERDENET








CHANGE OF HEAT PRICES FOR HEATING OF TAP HOT WATER



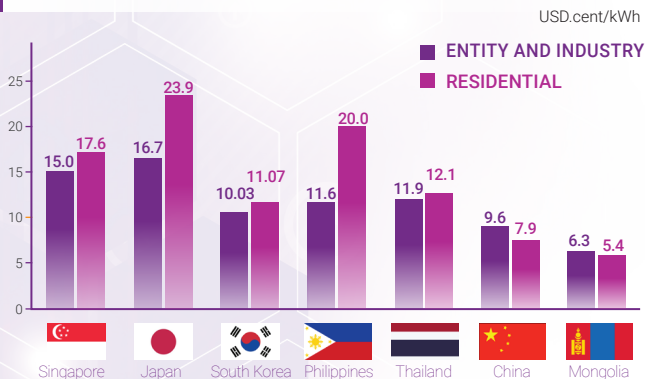
COAL PRICE CHANGES

MNT/tonne

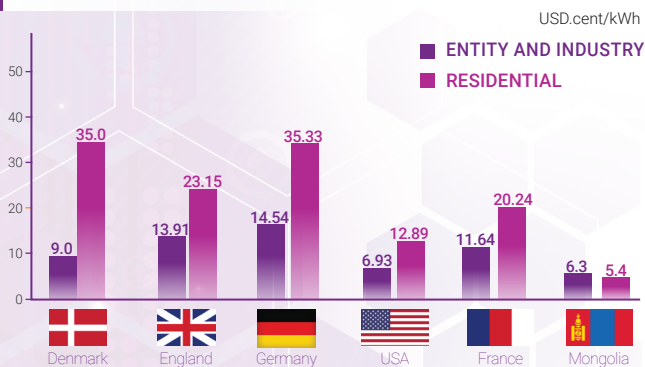
	 Shariin gol	 Baganuur	 Shivee-Ovoo	 Aduun chuluun
2015	30,000.0	25,500.0	21,060.0	12,600.0
2016	36,500.0	29,500.0	24,560.0	12,600.0
2017	36,500.0	29,500.0	24,710.0	12,600.0
2018	38,500.0	31,500.0	27,060.0	12,600.0
2019	40,500.0	33,500.0	29,060.0	12,600.0
2020	44,500.0	33,500.0	29,060.0	12,600.0



COMPARISON OF END USER ELECTRICITY TARIFFS OF SOME ASIAN COUNTRIES



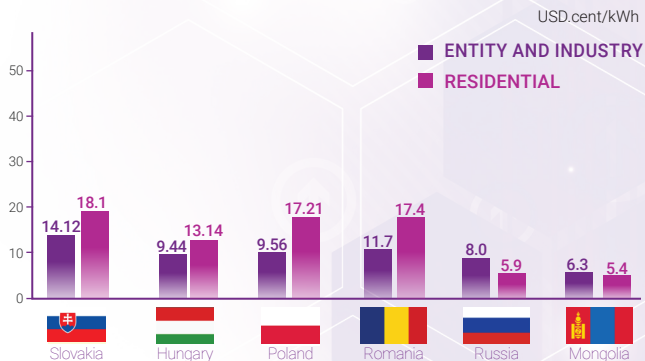
COMPARISON OF END USER ELECTRICITY TARIFFS OF DEVELOPED COUNTRIES



Note: Exchange rate USD to MNT 1:2,849.89



COMPARISON OF END USER ELECTRICITY TARIFFS OF ERRA MEMBER COUNTRIES



Note: Exchange rate USD to MNT 1: 2,849.89



ELECTRICITY END USER TARIFFS FOR CENTRAL AND SOUTH REGIONS

Single rate tariff /VAT excluded/

MNT/kWh

CONSUMER CATEGORY	TARIFFS
INDUSTRIAL	
Mining, processing industry	179.69
Other industries, business entities and organizations	164.38
RESIDENTIAL	
Monthly consumption below 150 kWh	134.28
Monthly consumption above 150 kWh	154.08

Included the renewable energy levy (23.79 MNT/kWh)
Capacity tariff of other industries 9,000 MNT/kW/month
Capacity tariff for mining industry 25,000 MNT/kW/month
Basic fee for residential consumer 2,000 MNT/month

Time of use electricity tariffs /VAT excluded/

MNT/kWh

CONSUMER CATEGORY	TARIFFS	
INDUSTRIAL	Mining industry	Others
Shoulder from 6 am until 5 pm	179.69	164.38
Peak from 5 pm until 10 pm	299.79	245.68
Off peak from 10 pm until 6 am	100.89	112.98
RESIDENTIAL		
Shoulder from 6 am until 9 pm	140.18	
Off peak from 9pm until 6 am	112.98	

Included the renewable energy levy (23.79 MNT/kWh)



ELECTRICITY END USER TARIFFS FOR EASTERN REGION

Single rate tariff /VAT excluded/

MNT/kWh

CONSUMER CATEGORY	TARIFFS
INDUSTRIAL	
Mining, processing industry	155.90
Other industries, business entities and organizations	140.59
RESIDENTIAL	
Monthly consumption below 150 kWh	110.49
Monthly consumption above 150 kWh	130.29

Capacity tariff of other industries 9,000 MNT/kW/month

Capacity tariff for mining industry 25,000 MNT/kW/month

Basic fee for residential consumer 2,000 MNT/month

Time of use electricity tariffs /VAT excluded/

MNT/kWh

CONSUMER CATEGORY	TARIFFS	
INDUSTRIAL	Mining industry	Others
Shoulder from 6 am until 5 pm	155.90	140.59
Peak from 5 pm until 10 pm	276.00	221.89
Off peak from 10 pm until 6 am	77.10	89.19
RESIDENTIAL		
Shoulder from 6 am until 9 pm	116.39	
Off peak from 9pm until 6 am	89.19	

ELECTRICITY END USER TARIFFS FOR ALTAI-ULIASTAI
INTEGRATED POWER GRID

Single rate tariff /VAT excluded/

MNT/kWh

CONSUMER CATEGORY	TARIFFS
INDUSTRIAL	
Mining, processing industry	163.48
Other industries, business entities and organizations	160.08
RESIDENTIAL	
Monthly consumption below 150 kWh	129.98
Monthly consumption above 150 kWh	149.78

Included the renewable energy levy (11.88 MNT/kWh)
 Capacity tariff of other industries 9,000 MNT/kW/month
 Capacity tariff for mining industry 25,000 MNT/kW/month
 Basic fee for residential consumer 2,000 MNT/month

Time of use electricity tariffs /VAT excluded/

MNT/kWh

CONSUMER CATEGORY	TARIFFS	
INDUSTRIAL	Mining industry	Others
	Shoulder from 6 am until 5 pm	163.48 160.08
	Peak from 5 pm until 10 pm	283.58 241.38
	Off peak from 10 pm until 6 am	84.68 108.68
RESIDENTIAL		
	Shoulder from 6 am until 9 pm	135.88
	Off peak from 9pm until 6 am	108.68

Included the renewable energy levy (11.88 MNT/kWh)



ELECTRICITY END USER TARIFFS FOR WESTERN REGION INTEGRATED POWER GRID

/VAT excluded/

MNT/kWh

CONSUMER CATEGORY	TARIFFS
Mining industry	163.48
Other industries, entity and industries	160.08
Residential	122.68

Included the renewable energy levy (11.88 MNT/kWh)

Capacity tariff of other industries 9,000 MNT/kW/month

Capacity tariff for mining industry 25,000 MNT/kW/month

Basic fee for residential consumer 2,000 MNT/month

ELECTRICITY END USER TARIFF FOR VULNERABLE GROUP

/VAT excluded/

MNT/kWh

Consumer category	Monthly consumption (kWh)	Others
Ulaanbaatar	100 kWh below	60.29
	101 kWh above	81.39
Darkhan, Erdenet	75 kWh below	60.29
	76 kWh above	81.39
Others Aimaks and Souns	50 kWh below	60.29
	51 kWh above	81.39

Note: Electricity consumer tariffs for vulnerable group applied only for residential users belonging to the vulnerable group. The renewable energy levy pursued in the specific region should be taken into account.



HEAT TARIFFS

/VAT excluded/

Area	Residential (MNT/ m ²)	EI (MNT/m ³)	Tap hot water (MNT per- son/month)	By meter (MNT/GJ)	
				Residential	EI
Ulaanbaatar	506	472	1,870/2,806*	3,421	7,277
Darkhan	506	470	1,870/2,806*	3,421	6,419
Erdenet	506	504	1,870/2,806*	3,421	7,854
Dornod	506	769	1,870/2,806*	3,421	6,698
Dalanzadgad	506	961	1,870/2,806*	-	20,843
Nalaikh	600	860-1,290	2,875/4,025*	-	25,813
Baganuur	660	1,145-1,239	3,163/4,428*	8,711	18,310-19,795

NOTE: *- Non heating season

Area	Classification	Unit	Residential	EI
Ulaanbaatar	Heat tariff for tap hot water /water consumption/	MNT/m ³	2,060	1,632

HEAT CONSUMPTION TARIFF FOR SOME APPLICATION

/VAT excluded/

Classification	Unit	Tariff		
		Ulaanbaatar	Darkhan	Erdenet
Ventilation	MNT/GJ	3,703	-	3,042
Tap hot water for entity consumers	MNT/ person	5,955	4,865	5,955
Industrial hot water use	MNT/GJ	3,703	3,394	-
Steam for industrial use	MNT/GJ	5,397	6,061-5,360 (8-13 ата) 6,569 (20 ата)	8,533



HEAT TARIFFS APPROVED BY RBOACCC

Regulatory Boards of	Flat heating tariffs		Meter based heating tariff		Tariffs for heating of THW
	Residential	PO and EI	Residential	EI	
	MNT/m ²	MNT/m ³	MNT/Gcal	MNT/Gcal	MNT/m ³
Архангай	540-810	845 - 2,044	-	-	6,425
Баян-Өлгий	1720	1,180 - 1,420	-	-	-
Баянхонгор	450	1,500 - 1,690	12,500	145,000	-
Булган	300-540	1,300 - 1,900	10,200	110,700	3,000
Говь-Алтай	400-800	1,100 - 1,750	-	-	1,380
Говьсүмбэр	360-400	950-1,400	-	-	1,000
Дархан-уул	450-480	1,450 - 1,920	13,200	115,000	-
Дорноговь	460-600	1,450 - 1,900	68,700	138,040	-
Дундговь	455	1,450	-	17,145 MNT/GJ	-
Завхан	500	1,400 - 1,650	-	-	-
Орхон	200	900	-	38,388 MNT/GJ	-
Өвөрхангай	660	660 - 1,197	-	-	-
Өмнөговь	460	800 - 1,100	-	-	-
Сүхбаатар	320-800	1,000 - 1,500	-	93,000	-
Сэлэнгэ	387	908 - 1,796	25,000	129,600	1,080
Төв	350	900 - 1,450	-	29,875 MNT/GJ	-
Увс	450-1,000	727 - 1,360	20,000	60,000	1,800
Ховд	400	1,320 - 1,450	-	106,700	2,500
Хөвсгөл	250	700 - 1,580	-	-	-
Хэнтий	620-800	1,000 - 1,700	-	-	3,200
Нийслэл	460-1,100	1,100 - 1,500	3,200 MNT/GJ	21,480 MNT/GJ	5,040

HEAT ENERGY RETAIL TARIFFS OF LOCAL
/RURAL HEAT DISTRIBUTION, SUPPLY LHS/

	LH-RA name	Tariffs		
		Residential (MNT/m ²)	Public organization (MNT/m ³)	EI (MNT/m ³)
1	"Ekh Golomtiin Ilch" LTD	810	2,044	2,044
2	"Erchimbayan Ulgii" LTD	780	1,411	1,411
3	"Mandal Golomt" LTD	560	1,800	1,800
4	"Dulaan Shariin Gol" SOJSC	576	1,870	1,700
5	"Chandmani Ilch" LTD	350	1,188	990
6	"Gan Ilch" LTD	500	1,600	1,600
7	"Durvulj" ME	560	1,900	1,080
8	"Selenge Energo" ME	486.5	2,166.1	2,166.1
9	"Tsement shokhoi" LTD	506	1,292.2	1,192.2
10	"Tuv Chandmani" ME	455	1,900	1,020
11	"Khovd thermal plant" SOJSC	500	1,650	1,350
12	"Khuvs gul thermal plant" SOJSC	400	1,560	850
13	"Khentii Us" LTD	620	1,300	1,300
14	"Uvs thermal plant No.2" SOJSC	390	1,700	1,300



STATISTICS ON **ENERGY** PERFORMANCE

8

DESIGNATED CONSUMERS

- Number of Designated Consumer and Energy Consumption
- Comparison of energy consumption of designated consumer

68

71

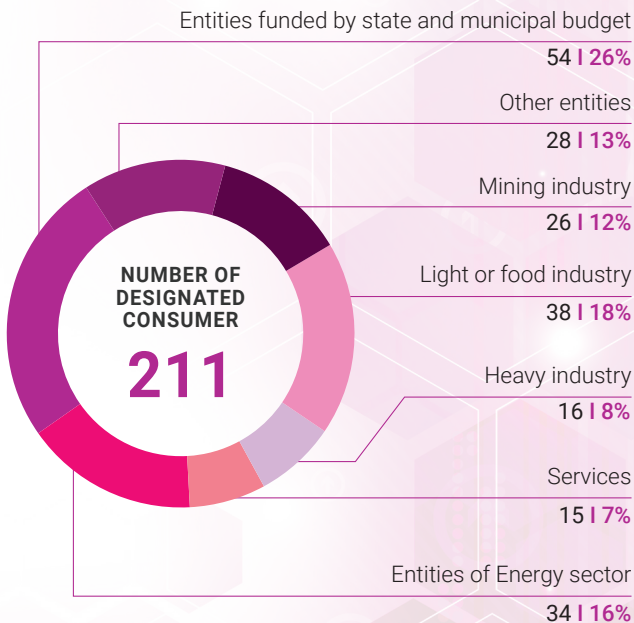


NUMBER OF DESIGNATED CONSUMER AND ENERGY CONSUMPTION

2019	Number	Electricity consumption Mln.kWh/annum	Heat consumption Thou.Gcal/annum	Energy consumption Mln.kWh/annum
Building				
Entities funded by state and municipal budget	54	45.5	113.5	177.5
Other entities	28	68.8	45.4	121.6
Total	82	114.3	158.9	299.1
Energy consumer				
Mining industry	26	2,791.6	605.8	3,496.1
Light or food industry	38	159.5	251.5	452.0
Heavy industry	16	267.1	31.8	304.1
Services	15	171.4	22.0	197.0
Total	95	3389.6	911.1	4,449.2
Entities of Energy sector	34	-	-	-
Sum	211	3,503.9	1,069.7	4,748.3
2020	Number	Electricity consumption Mln.kWh/annum	Heat consumption Thou.Gcal/annum	Energy consumption Mln.kWh/annum
Building				
Entities funded by state and municipal budget	54	40.3	160.2	226.6
Other entities	28	57.8	85.8	157.6
Total	82	98.1	246.0	384.2
Energy consumer				
Mining industry	26	2,793.7	632.9	3,529.8
Light or food industry	38	130.4	262.3	435.5
Heavy industry	16	207.4	35.3	248.5
Services	15	173.2	40.9	220.8
Total	95	3,304.7	971.4	4,434.4
Entities of Energy sector	34	-	-	-
Sum	211	3,402.8	1,217.4	4,818.6



NUMBER OF DESIGNATED CONSUMER AND ENERGY CONSUMPTION





STATISTICS ON ENERGY PERFORMANCE

Mining industry

3,496.1 | 73.6%

Light or food industry

452.0 | 9.5%

Heavy industry

304.1 | 6.4%

Services

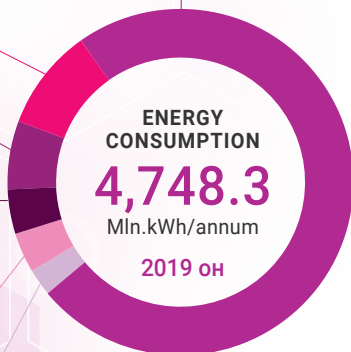
197.0 | 4.1%

Entities funded by state
and municipal budget

177.5 | 3.7%

Other entities

121.6 | 2.6%



Mining industry

3,529.8 | 73.3%

Light or food industry

435.5 | 9.0%

Heavy industry

248.5 | 5.2%

Services

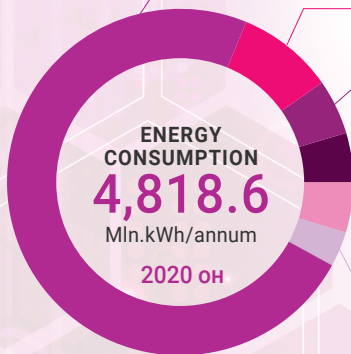
220.8 | 4.6%

Entities funded by state
and municipal budget

226.6 | 4.7%

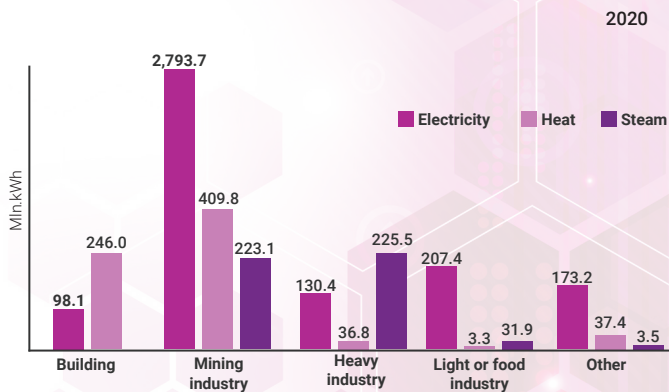
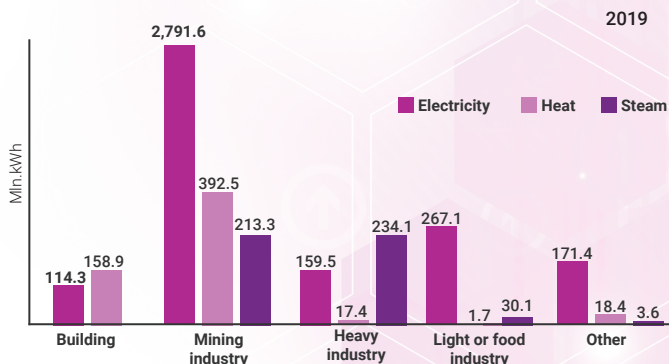
Other entities

157.6 | 3.3%





COMPARISON OF ENERGY CONSUMPTION OF DESIGNATED CONSUMER







STATISTICS ON
ENERGY
PERFORMANCE

9

INVESTMENTS AND RENOVATION

• Major achievements of energy sector in 2020

74



MAJOR PROJECTS AND TECHNOLOGICAL INNOVATIONS IN THE ENERGY SECTOR

1. The 220/110/35 KV 2x125 MVA “SONGINO” substation was put into operation and connected to the Central Power Grid resulting all stations of “IKH TOIROG” system becoming operational.

With this large-scale construction work of the “Songino” substation and connecting it to the 220 kV substations of CHPP-4 SOJSC, Dundgovi, Umnugovi, Erdenet and Darkhan, and also to the power system of Russia and China, the reliability of Mongolia's power system is increased significantly.

Within the IKH TOIROG project, one 220 KV, eight 110 KV substations, a 110 km long 110 kV double transmission lines with a total installed capacity of 580 MW were built and put into operation.



2. Tavan Tolgoi and Oyutolgoi substations were updated to 220 KV level and started using 30 MVAR SVC.



These updates enabled to increase Central Power Grid's transmission capacity to 250 MW ensuring reliable energy supply to users such as strategic deposits of Oyu Tolgoi, Tavan Tolgoi and Tsagaan Suvarga and other power consumers.

110/10 KV Tavan Tolgoi fuel substation was put into operation.

A complete SCADA system with Microscada 9.4 version and an automated relay protection device compliant to IEC 61850, which is an international standard defining communication protocols for intelligent electronic devices at electrical substations are installed.



3. A load shedding automated system covering 5 substations was put into operation, and an automatic unit for synchronizing 220 KV power lines numbered 257 and 258 went operational.

In connection with the decision to increase imported electricity from Russia to a total of 345 MW, power transmission lines numbered 257 and 258 were equipped with АПОЛ (automatic load shedding by line disconnection) for the first time, which enables a load shedding of 182.2 MW within 35 seconds in case of an overload of overhead lines. And with the installation of АТБС, an automatic restart and synchronizing equipment, the stability of the integrated power grid was ensured effectively.





4. "CHPP-4" SOJSC

Aiming to implement the Government of Mongolia's action plan for 2016-2020, Government of Mongolia issued Resolution No.1 on Jan 3, 2018 decreeing renewal of turbines of the CHPP-4 SOJSC, and the project was realized successfully within the shortest possible time.

CHPP-4 SOJSC's turbines renewal project was financed through Russia's VNE-SHECONOM bank's export support soft loan in cooperation with the Development Bank of Mongolia. Ural Turbine Plant in Yekaterinburg, Russia has acted as the general contractor of the project, and has completed renewal of turbines numbered 1 and 4 in 2019, and turbines numbered 2 and 3 in 2020.

Outputs of the turbine renewal project at the CHPP-4 SOJSC:

- The life span of turbine aggregates No. 1-4 is prolonged to 220 Thousand hours which is equivalent to the life span of new turbines.
- The installed capacity of the plant is increased by 89 MW in electricity production, and by 62 Gcal in heat production.
- Efficiency of turbine aggregates No. 1-4 will increase by 2.5%-3.0%.
- The increase in production capacity and efficiency will be beneficial to the energy supply of the grid to meet the ever growing energy demand before projects related to constructing new energy sources, renewal of other power plants and ensuring Mongolia's power supply safety.





5. “Erdenet Combined Heat and Power Plant” SOJSC

Erdenet CHPP SOJSC's installed capacity will be increased by 35 MW through a project co-financed by a soft loan of the Technique Import Bank of the PRC and a partial investment of the Government of Mongolia. Project's general contractor is China's "Hunan Industrial Equipment Installation" company. According to the plan, new turbine will be put into operation by June 25, 2021. Currently, overall project progress is by 86%, in detail, earth construction work is by 98%, installation 40%, equipment procurement 100%, and testing and configuration 20%.

The scope of the project covers followings:

- New CC-50 MW turbine generator installation,
- Chemical water treatment will be renewed completely to reverse osmosis technology,
- New grid boiler installation,
- New cooling tower construction,
- Connecting to the 220kV substation of Khangai region of the National Power Transmission Network SOJSC via a 3.5 km long 110kV overhead transmission line

Expected deliverables of the project:

- Installed capacity will be doubled, while electricity production will be even tripled reducing Cost of Goods Sold (COGS) of electricity;
- Obsolete chemical water treatment system will be upgraded to Euro-standard state-of-the-art techniques;
- Erdenet CHPP SOJSC will become a power plant with 71 MW installed capacity, able to supply a maximum consumption of 67 MW having 3-4 MW reserved capacity;





6. “Eastern Region Integrated Power Grid” SOJSC

In accordance to the Government of Mongolia's action plan for 2016-2020, on July 4, 2018, GoM gave the green light to start the project aiming to expand Choibalsan Combined Heat and Power Plant's installed capacity by 50 MW.

ERIPG SOJSC's expansion project will be co-financed from state budget and through a soft loan of Development bank of the PRC mediated by the Development bank of Mongolia. Project's general contractor will be China's "TBEA" company. Overall building construction has advanced to 37.5%, equipment production to 58%, and the turbine aggregate will become operational by 2023.

Through the expansion, Eastern region's electricity supply reliability and safety will be improved, and new state-of-the-art technology and techniques will be introduced.





7. "Darkhan Heat Network" SOJSC

Since 2017, Darkhan city's centralized heat supply system has been upgraded gradually to a partially automated system using M172 sensors for HVAC (heating and ventilation) system produced by the company Schneider Electric from France. Utilizing the sensors, 40% of pump stations and heat distribution centers have been automated. Centrally monitored and managed by the Schneider Electric's Citect SCADA software, remote facilities, substations, and heat distribution centers have become remotely controllable and configurable.

Centrally monitoring and managing DHN's pump stations and heat distribution centers through an automated control system, operational effectiveness has improved. Following benefits were also the result of the technological upgrade.

- Increased precision of calculation of heat energy consumption and heat balance;
- Decreasing water leakage and heat loss of the network;
- Adapting consumers to an efficient usage of energy;
- Reducing 20 operational manpower resulting a saving of 28 million tugriks of wages;
- 20-30% electricity saving is achieved by adjustments during the repair and maintenance work;
- Dispatchers became able to remotely monitor operational status of the pumps and modify configurations;

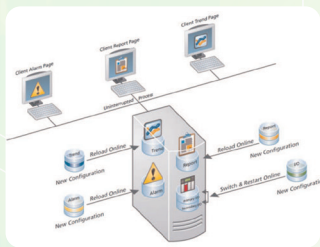




STATISTICS ON ENERGY PERFORMANCE

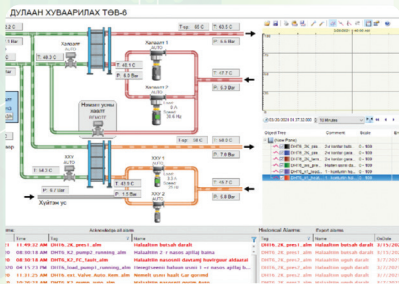
In order to collect operational status information of equipment and devices at substations and to control pump motors, additional controllers and sensors are required. Thus, Schneider Electric's special use, programmable logic controllers have been installed. These 42 input signal and 28 relay output signal controllers are universally utilizable. Such controllers have been installed in the main control panels of substations, and controllers are able to read and collect operational status information of all devices and equipment in substations enabling a remote controlling of drivers and electrical disconnectors.

The SCADA control system will be structurally a single server connected with all the peripheral devices and located in the control center and will be constantly monitored by the general operator. With a web license, which can

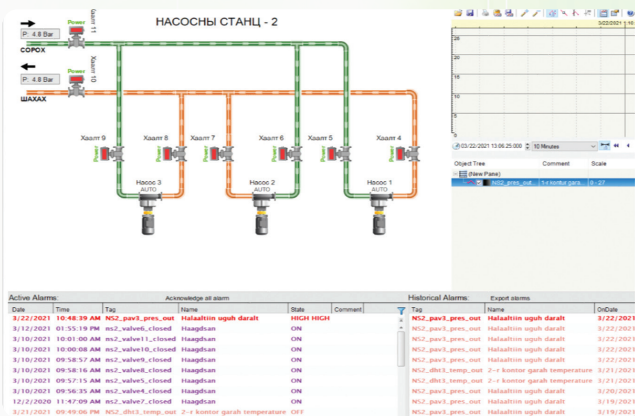


be additionally obtained a control operator is provided with access to view required information. It is compatible with all standard industrial communication protocols, and can be expanded and also integrated with other systems as well as additional devices can be connected. With the main functions of the SCADA system such as I / O (input / output or device connection), trend view (graphical analysis), reporting, and alarm serv-

ers which are functioning independently/separately the system reliability can be improved, the server capacity can be optimized and the flexibly managed, and assuring a normal operation without any interruption during configuration is another advantage of the system.



Information on the operator's screen; From the screen parameters of transmission medium of the substation can be monitored and devices can be controlled.



The control system of Darkhan city heat supply system from CHPP to end user.





NEW RENEWAL ENERGY SOURCES BECAME OPERATIONAL

1. A 30 MW solar power plant went into operation

"Desert Solar Power One" LLC built a 30 MW solar power plant named "GOBI" in Sainshand soum, Dornogovi aimag, and started producing electricity and supplying to the Central Region Integrated Power Grid after issuance of electricity generation license on Oct 16, 2020.

With the operation of the solar plant, annual saving of 6,834 tons of coal and 262,243 tons of fresh water will be achieved, as well as 16,401 tons of carbon dioxide emissions can be avoided.



Active Network Management System as an advanced technology was installed in Mongolia for the first time

The Active Network Management System (ANM) is designed to ensure operational reliability through processing all relevant parameters such as power flow, voltage level etc. of sensor equipment installed in 220/110/35/6 kV "Choir" substation, 110/35/10 kV "Airag" substation, 110/35/10 kV "Sainshand" substation and "Gobi" solar power plant, which assemble the "Choir-Airag-Sainshand" power line system.



This Active Network Management System (ANM) is a state-of-the-art smart technology for monitoring active and reactive power, voltage level and other related parameters with the aim to manage and limit power generation if necessary.

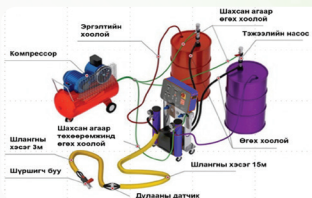


NOTABLE ACHIEVEMENTS IN THE FIELD OF ENERGY EFFICIENCY

EXPERIENCES IN UTILIZING NEW EQUIPMENTS IN INSULATING HEAT TRANSMISSION PIPES

1. "ULAANBAATAR HEATING NETWORK" SOJSC

Key measures of energy efficiency improvement by the major heat transmission company were reduction of loss by transporting heat and water. In 2020, foam spray equipment with complete accessory, the **GRACO REACTOR-2 E30**, was put into operation which is used for thermally insulating heat pipes, and 12 casting molds for fabricating Ø150- Ø 1200 mm diameter insulation parts were installed by the company.



The newly introduced equipment uses spray foam (penopoliurethane) which has the ability to cling on different types of surface enabling thermal insulation of building and transmission pipes, and halt of water leakage.

The new insulation material completely hardens in 3-5 minutes after spray-ing if used in the outside. It has high density, and is resistant against mildew and fungus. It has no adverse effects on human health compared to basalt, asbestos, fiberglass and other types of insulation widely used in the heat supply, but it has the same thermal insulation properties. Following maintenance works were performed using the equipment.

- 6 large diameter shut-off valves installed along the heat network and 7 manholes of the Combined Heat and Power Plant-2 SOJSC were insulated using the new equipment which instigated a sharp drop of heat loss and decrease of inside air temperature in the manholes. According to the heat loss and energy efficiency calculations, an annual saving of 324,4 Gcal thermal energy was achieved and significantly improved productivity of employees. Through the use of new spray foam, the inside air temperature in the manholes dropped to 18°C to 34°C.



STATISTICS ON ENERGY PERFORMANCE

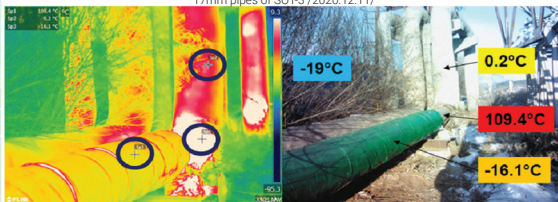
Insulation of shut-off valves



Using the above mentioned 12 different type casting molds for fabricating Ø150- Ø 1200 mm diameter insulation parts, the heat pipe and equipment maintenance unit of CHPP-2 SOJSC produced 360 insulation parts each 1 m in length. Produced parts were used for newly insulating or renewing insulation of old pipe networks. By using this penopoliurethane spray foam for heat pipe and equipment insulation, an annual heat power loss reduction of 766.6 Gcal is achieved.



Picture shows the heat loss measurement of penopoliurethane insulated area of 17mm pipes of SOT-3 /2020.12.11/



Д/д	Хэмжилт	Температур
1	Гадна агаарын температур	-19°C
2	Дулаалгагүй ил хэсэг	109.4°C
3	Шилэн ховон, азбест, цемент	0.2°C
4	Пенополиуритан	-16.1°C



2. "Ulaanbaatar Railway" Joint Venture Company

In 2019, Ulaanbaatar Railway Company established a Fuel and energy council covering all 60 organizational units of the company for the aim of improving energy saving and efficiency, and reducing the consumption of all types of fuels and lubricants. Council's activities have reached notable results in 2020.

- **Training and awareness rising activities:** in order to increase awareness of employees, the council launched a social network web page, and posted 12 informative posters and 4 video presentations related to energy saving and efficiency, and reached 24,300 views.
- **Limiting electricity consumption:** Annual amount of fuel and energy consumption is planned and budgeted for all 60 organizational units of the company and performance is monitored. In result, although the freight volume has increased by 6.6% compared to the previous year, the electricity consumption has just increased by 2%.

Year	Freight transportation	Specific electricity consumption	Electricity
	Mln. tons	kWh/t	Mln.kWh
2015	19,151	1.7	31,975
2016	19,989	1.6	32,965
2017	22,765	1.5	33,132
2018	25,697	1.3	34,388
2019	28,143	1.3	36,154
2020	30,010	1.2	36,900

- Replacing incandescent lamps: Within the expansion and renovation work of railway stations and railroad junctions, it was foreseen to replace the old glowing lighting with low electricity consumption LED lighting. Accordingly, at the Chuluut railway station 15 lightings were replaced within the expansion of the arrival track of the station, 126 lightings were installed at Bayan station in association with the construction of "Eastern region compressed fuel factory". As a result, 300 thousand kWh of electricity will be saved annually.



STATISTICS ON ENERGY PERFORMANCE

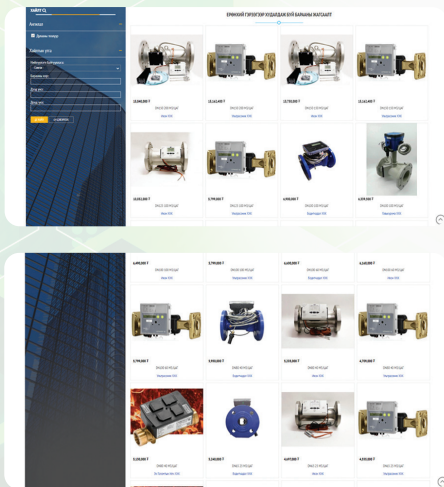
3. Electronic tendering and procurement - Heat meters

The Government Resolution No. 144 of 2020 "On equipping metering devices in state and local owned legal entities and budgetary organizations" has established basic conditions for improving energy efficiency of public sector buildings and accurately measuring consumption.

Within the scope of implementing the resolution, in consultation with the Ministry of Finance, the Public Procurement Agency organized a bidding process to select a supplier of heat meters. 5 companies were selected and signed a General Agreement for supplying 20 different devices. These companies are represented in the Agency's e-shop web system, and government organizations and state entities can directly buy from the e-shop the listed devices and install in their facilities.

The e-shop lists Ø32-150 diameter heat meters provided by Ikon" LLC, "Ultra-sonic" LLC, "Bodit Chada" LLC, "Ekh Golomtyn Ilch" LLC, and "Govikuruma" LLC.

www.tender.gov.mn/mn/eshop



NOTES