

**Task A: Feasibility Study for Kosovo – Albania 400
kV Transmission Interconnection Project**

Report of Second Phase

Volume 1

**Economic Exchange, Impact of new line on Transmission
network and Economic and Financial Analysis of Kosovo –
Albania 400 kV Interconnection Line**

Annexes A1-A5

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1 Annex 1 Assessment of Economic Exchange of Electric Power among Kosovo and Albanian Systems

1.1 Year 2010 PROMED Simulations Results

Table A 1.1 Year 2010 Albania Production Reference Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GWh
Ulza	14,469	11,400	10,908	10,576	6,428	1,419	4,584	9,304	5,233	4,332	9,664	10,306	98.6
Shkopeti	13,748	10,840	10,180	9,940	5,980	1,419	4,319	8,601	5,037	4,257	9,424	10,002	93.7
Bistrica	14,599	13,202	14,218	13,610	13,491	11,808	11,339	11,170	10,139	10,301	11,664	14,142	149.7
V.Dejes	121,775	88,549	107,295	111,300	74,835	63,417	65,639	64,992	43,996	54,933	67,586	107,489	971.8
Fierza	114,189	139,087	129,824	124,191	100,666	141,600	114,435	54,354	75,465	111,122	123,560	170,790	1,399.3
Komani	192,835	188,773	189,039	201,413	152,616	147,938	116,506	95,864	99,699	122,456	141,211	216,642	1,865.0
Hydropower	471,615	451,851	461,464	471,030	354,016	367,601	316,822	244,285	239,569	307,401	363,109	529,371	4,578.1
Vlora 1	67,691	61,152	67,704	65,520	58,786	0	58,422	67,704	65,513	67,673	65,514	67,702	713.4
Vlora 2	67,691	61,152	67,704	4,186	47,502	63,700	67,704	67,704	65,513	67,673	65,514	67,702	713.7
Vlora 3	67,691	56,602	0	56,238	67,704	65,520	67,704	67,704	65,513	67,673	65,514	67,702	715.6
Thermopower	203,073	178,906	135,408	125,944	173,992	129,220	193,830	203,112	196,539	203,019	196,542	203,106	2,142.7
Total Import	56,542	50,550	55,056	53,286	55,277	54,073	56,544	56,544	54,181	55,797	53,998	55,799	657.6
Total	731,230	681,307	651,928	650,260	583,285	550,894	567,196	503,941	490,289	566,217	613,649	788,276	7,378.5

Table A 1.2 Year 2010 Albania fuel cost Reference Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€
Vlora 1	3,166	2,860	3,166	3,064	2,749	0	2,732	3,166	3,064	3,165	3,064	3,166	33,360
Vlora 2	3,166	2,860	3,166	196	2,221	2,979	3,166	3,166	3,064	3,165	3,064	3,166	33,377
Vlora 3	3,166	2,647	0	2,630	3,166	3,064	3,166	3,166	3,064	3,165	3,064	3,166	33,462
TTP Vlora	9,497	8,366	6,332	5,889	8,136	6,043	9,064	9,498	9,191	9,494	9,191	9,498	100,199
Total Import	4,275	3,822	4,162	4,028	4,179	4,088	4,275	4,275	4,096	4,218	4,082	4,218	49,718
Total	13,771	12,188	10,494	9,918	12,315	10,131	13,339	13,773	13,287	13,713	13,273	13,716	149,917

Table A 1.3 Year 2010 Kosovo Production Reference Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GWh
Unit A3	76,024	65,538	34,249	58,706	77,195	0	0	65,086	27,328	71,934	75,956	78,784	630.8
Unit A4	76,024	70,972	76,292	27,812	0	0	75,713	79,687	78,107	35,374	75,956	78,784	674.7
Unit A5	76,024	70,972	76,292	69,025	39,352	71,340	0	4,752	78,107	71,135	39,235	78,784	675.0
Kosovo A	228,072	207,482	186,833	155,543	116,547	71,340	75,713	149,525	183,542	178,443	191,147	236,352	1,980.5
Unit B1	137,200	125,423	136,751	130,850	0	0	0	137,045	137,003	135,936	134,044	139,702	1,214.0
Unit B2	141,812	130,197	141,091	137,847	149,358	145,768	145,265	0	0	123,918	139,029	145,620	1,399.9
Kosovo B	279,012	255,620	277,842	268,697	149,358	145,768	145,265	137,045	137,003	259,854	273,073	285,322	2,613.9
Ujmani	5,952	7,392	10,560	11,520	9,720	6,408	5,304	5,160	4,224	3,720	5,088	5,952	81.0
Import	55,363	61,315	45,197	19,628	79,609	99,584	99,995	40,442	64,214	44,599	64,656	70,442	745.0
Total	568,399	531,809	520,432	455,388	355,234	323,100	326,277	332,172	388,983	486,616	533,964	598,068	5,420.4

Table A 1.4 Year 2010 Kosovo fuel cost Reference Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€
Unit A3	1,075	925	483	832	1,085	0	0	918	386	1,016	1,072	1,112	8,904
Unit A4	1,075	1,002	1,078	395	0	0	1,063	1,124	1,101	501	1,072	1,112	9,521
Unit A5	1,075	1,002	1,078	979	554	1,001	0	67	1,101	1,005	554	1,112	9,527
TPP Kosovo A	3,224	2,928	2,640	2,206	1,639	1,001	1,063	2,109	2,587	2,522	2,698	3,335	27,952
Unit B1	1,714	1,566	1,709	1,636	0	0	0	1,709	1,709	1,700	1,674	1,744	15,161
Unit B2	1,763	1,616	1,754	1,713	1,848	1,802	1,796	0	0	1,544	1,726	1,806	17,368
TPP Kosovo B	3,477	3,182	3,464	3,349	1,848	1,802	1,796	1,709	1,709	3,243	3,400	3,550	32,529
Total Import	4,185	4,635	3,417	1,484	6,018	7,529	7,560	3,057	4,855	3,372	4,888	5,325	56,325
Total	10,887	10,746	9,521	7,039	9,505	10,332	10,419	6,875	9,151	9,137	10,986	12,210	116,807

Table A 1.5 Year 2010 Albania Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GWh
Ulza	7,728	14,545	14,470	11,907	4,300	1,034	7,532	4,816	7,755	4,669	9,173	11,074	99.0
Shkopeti	7,280	13,665	13,557	11,243	3,708	1,032	7,124	4,587	7,361	4,260	8,635	10,389	92.8
Bistrica	14,505	13,206	14,534	13,635	13,553	11,839	11,549	10,947	10,124	10,286	11,745	14,040	150.0
V.Dejes	100,119	105,208	100,064	85,907	82,450	77,322	83,507	53,338	64,887	59,926	64,892	94,684	972.3
Fierza	128,613	106,978	96,409	89,016	133,587	180,190	137,026	59,868	67,593	90,197	124,811	187,995	1,402.3
Komani	175,353	185,253	171,001	165,959	161,174	187,328	148,734	91,873	103,054	115,438	155,044	205,211	1,865.4
Hydropower	433,598	438,855	410,035	377,667	398,772	458,745	395,472	225,429	260,774	284,776	374,300	523,393	4,581.8
Vlora 1	66,880	60,997	66,808	64,618	60,925	0	58,422	66,946	63,799	65,142	64,251	67,308	706.1
Vlora 2	66,880	60,997	66,808	4,067	47,457	65,520	67,704	66,946	63,799	65,142	64,251	67,308	706.9
Vlora 3	66,880	56,447	0	55,455	67,659	65,520	67,704	66,946	63,799	65,142	64,251	67,308	707.1
Thermopower	200,640	178,441	133,616	124,140	176,041	131,040	193,830	200,838	191,397	195,426	192,753	201,924	2,120.1
Total	634,238	617,296	543,651	501,807	574,813	589,785	589,302	426,267	452,171	480,202	567,053	725,317	6,701.9

Table A 1.6 Year 2010 Albania fuel cost Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€
Vlora 1	3,135	2,854	3,132	3,030	2,849	0	2,732	3,137	2,999	3,069	3,016	3,151	33,103
Vlora 2	3,135	2,854	3,132	191	2,220	3,064	3,166	3,137	2,999	3,069	3,016	3,151	33,133
Vlora 3	3,135	2,641	0	2,600	3,164	3,064	3,166	3,137	2,999	3,069	3,016	3,151	33,142
TTP Vlora	9,404	8,348	6,264	5,821	8,233	6,128	9,064	9,412	8,996	9,207	9,047	9,453	99,378

Table A 1.7 Year 2010 Kosovo Production Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GWh
Unit A3	91,821	76,979	48,957	88,749	83,080	0	0	76,293	30,607	86,766	88,086	92,110	763
Unit A4	91,821	83,179	91,365	39,902	0	0	79,608	92,165	87,421	40,501	88,086	92,110	786
Unit A5	91,821	83,179	91,365	88,501	43,896	74,152	0	5,208	87,421	81,025	46,024	92,110	785
Kosovo A	275,463	243,337	231,687	217,152	126,976	74,152	79,608	173,666	205,449	208,292	222,196	276,330	2,334
Unit B1	151,032	136,416	151,032	145,754	0	0	0	144,942	146,117	147,835	146,100	151,032	1,320
Unit B2	151,032	136,416	151,032	146,160	151,032	146,160	145,754	0	0	134,783	146,160	151,032	1,460
Kosovo B	302,064	272,832	302,064	291,914	151,032	146,160	145,754	144,942	146,117	282,618	292,260	302,064	2,780
Ujmani	5,952	7,392	10,560	11,520	9,720	6,408	5,304	5,160	4,224	3,720	5,088	5,952	81
Total	583,479	523,561	544,311	520,586	287,728	226,720	230,666	323,768	355,790	494,630	519,544	584,346	5,195

Table A 1.8 Year 2010 Kosovo fuel cost Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€
Unit A3	1,286	1,078	686	1,243	1,163	0	0	1,068	429	1,218	1,234	1,290	10,697
Unit A4	1,286	1,165	1,280	559	0	0	1,115	1,291	1,225	569	1,234	1,290	11,014
Unit A5	1,286	1,165	1,280	1,240	615	1,038	0	73	1,225	1,138	645	1,290	10,994
Kosovo A	3,858	3,408	3,246	3,042	1,778	1,038	1,115	2,432	2,880	2,925	3,113	3,870	32,705
Unit B1	1,877	1,696	1,877	1,812	0	0	0	1,802	1,816	1,840	1,816	1,877	16,412
Unit B2	1,867	1,686	1,867	1,807	1,867	1,807	1,802	0	0	1,667	1,807	1,867	18,044
Kosovo B	3,744	3,382	3,744	3,619	1,867	1,807	1,802	1,802	1,816	3,506	3,623	3,744	34,456
Total	7,602	6,790	6,990	6,660	3,645	2,845	2,917	4,233	4,696	6,432	6,736	7,614	67,161

1.2 Year 2015 PROMED Simulations Results

Table A 1.9 Year 2015 Albania Production Reference Scenario

	I MWh	II MWh	III MWh	IV MWh	V MWh	VI MWh	VII MWh	VIII MWh	IX MWh	X MWh	XI MWh	XII MWh	Annual GWh
Fierza	104,357	145,501	113,251	119,119	195,456	181,438	78,538	35,374	51,781	93,596	115,213	158,097	1,392
Komani	177,839	203,738	172,422	201,478	213,549	184,581	97,619	62,711	72,782	114,058	144,736	207,196	1,853
V.Dejes	108,037	115,993	94,274	107,604	100,238	76,447	58,087	47,752	42,356	53,898	59,949	100,686	965
Ulza	12,986	12,096	12,371	13,715	997	767	6,349	8,530	5,309	3,667	7,050	13,108	97
Shkopeti	12,265	11,424	11,619	12,852	944	767	6,062	8,105	4,960	3,599	7,021	12,446	92
Bistrica	14,587	12,782	14,734	13,726	13,551	11,831	11,484	11,011	10,126	10,363	11,752	14,133	150
Bratila	50,054	37,180	46,593	32,079	9,117	6,791	43,495	46,020	27,992	9,441	10,462	31,977	351
Hydropower	480,125	538,714	465,264	500,573	533,852	462,622	301,634	219,503	215,306	288,622	356,183	537,643	4,900
Vlora 1	67,704	61,152	67,704	65,520	63,154	0	56,238	67,704	65,520	67,704	65,520	67,704	716
Vlora 2	67,704	61,152	67,704	6,370	45,318	65,520	67,704	67,704	65,520	67,704	65,520	67,704	716
Vlora 3	67,704	58,786	0	54,054	67,704	65,520	67,704	67,704	65,520	67,704	65,520	67,704	716
Vlora 4	67,704	61,152	67,704	52,234	0	64,974	67,704	67,704	65,520	67,704	65,520	67,704	716
TPP Vlora	270,816	242,242	203,112	178,178	176,176	196,014	259,350	270,816	262,080	270,816	262,080	270,816	2,862
Durres 1	72,709	35,084	69,972	63,143	6,550	14,828	72,626	70,528	65,416	68,922	69,477	72,788	682
Durres 2	72,709	32,144	72,912	63,143	6,550	14,828	72,626	70,528	65,416	68,922	69,477	72,788	682
TPP Durres	145,418	67,228	142,884	126,286	13,100	29,656	145,252	141,056	130,832	137,844	138,954	145,576	1,364
Termolpower	416,234	309,470	345,996	304,464	189,276	225,670	404,602	411,872	392,912	408,660	401,034	416,392	4
Total Import	0	0	0	66	0	0	0	0	0	0	0	0	66
Total	896,359	848,184	811,260	805,103	723,128	688,292	706,236	631,375	608,218	697,282	757,217	954,035	4,970

Table A 1.10 Year 2015 Albania fuel cost Reference Scenario

	I k€	II k€	III k€	IV k€	V k€	VI k€	VII k€	VIII k€	IX k€	X k€	XI k€	XII k€	Annual k€
Vlora 1	2,588	2,338	2,588	2,505	2,414	0	2,150	2,588	2,505	2,588	2,505	2,588	27,356
Vlora 2	2,588	2,338	2,588	244	1,732	2,505	2,588	2,588	2,505	2,588	2,505	2,588	27,356
Vlora 3	2,588	2,247	0	2,066	2,588	2,505	2,588	2,588	2,505	2,588	2,505	2,588	27,356
Vlora 4	2,588	2,338	2,588	1,997	0	2,484	2,588	2,588	2,505	2,588	2,505	2,588	27,356
TPP Vlora	10,352	9,260	7,764	6,811	6,735	7,493	9,914	10,352	10,018	10,352	10,018	10,352	109,423
Durres 1	3,810	1,839	3,667	3,309	343	777	3,806	3,696	3,428	3,612	3,641	3,815	35,743
Durres 2	3,810	1,685	3,821	3,309	343	777	3,806	3,696	3,428	3,612	3,641	3,815	35,743
TPP Durres	7,621	3,523	7,488	6,618	687	1,554	7,612	7,392	6,856	7,224	7,282	7,629	71,487
Total Thermo	17,973	12,783	15,252	13,429	7,421	9,047	17,526	17,745	16,875	17,576	17,300	17,981	180,910
Total Import	0	0	0	5	0	0	0	0	0	0	0	0	5
Total	17,973	12,783	15,252	13,434	7,421	9,047	17,526	17,745	16,875	17,576	17,300	17,981	180,915

Table A 1.11 Year 2015 Kosovo Production Reference Scenario

	I MWh	II MWh	III MWh	IV MWh	V MWh	VI MWh	VII MWh	VIII MWh	IX MWh	X MWh	XI MWh	XII MWh	Annual GWh
Unit A3	24,945	33,747	0	14,310	27,101	0	0	0	25,725	60,831	17,540	35,063	239
Unit A4	37,497	33,747	36,919	19,129	0	0	30,923	12,201	67,533	27,024	35,757	39,739	340
Unit A5	37,497	33,747	36,919	37,197	15,692	29,106	0	1,466	74,283	69,473	18,250	44,371	398
Kosovo A	99,939	101,241	73,838	70,636	42,793	29,106	30,923	13,667	167,541	157,328	71,547	119,173	978
Unit B1	113,746	103,256	84,362	72,985	0	0	0	70,792	131,642	132,939	89,001	116,142	915
Unit B2	124,441	112,770	117,178	107,918	99,160	68,176	68,858	0	0	116,479	115,438	124,933	1,055
Kosovo B	238,187	216,026	201,540	180,903	99,160	68,176	68,858	70,792	131,642	249,418	204,439	241,075	1,970
New Unit B3	177,010	161,407	175,294	163,314	171,378	159,497	158,190	143,551	0	113,875	169,247	178,245	1,771
New Unit B4	177,010	161,407	175,294	163,477	171,378	159,497	158,190	161,379	105,518	0	162,680	178,245	1,774
Kosovo New	354,020	322,814	350,588	326,791	342,756	318,994	316,380	304,930	105,518	113,875	331,927	356,490	3,545
Total Thermal	692,146	640,081	625,966	578,330	484,709	416,276	416,161	389,389	404,701	520,621	607,913	716,738	6,493
Ujmani	5,952	7,320	10,440	11,424	9,816	6,432	5,328	5,184	4,248	3,720	5,016	5,952	81
Import	1,360	1,343	3,043	460	15,071	2,181	1,052	1,102	48,777	36,815	1,650	2,156	115
Total	699,458	648,744	639,449	590,214	509,596	424,889	422,541	395,675	457,726	561,156	614,579	724,846	6,689

Table A 1.12 Year 2015 Kosovo fuel cost Reference Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€
Unit A3	360	486	0	207	383	0	0	0	362	861	253	505	3,418
Unit A4	540	486	532	277	0	0	449	177	953	385	517	572	4,887
Unit A5	540	486	532	538	227	422	0	21	1,050	985	264	639	5,704
Kosovo A	1,440	1,459	1,064	1,023	611	422	449	198	2,365	2,230	1,034	1,716	14,009
Unit B1	1,438	1,305	1,070	929	0	0	0	903	1,646	1,664	1,129	1,467	11,552
Unit B2	1,566	1,419	1,484	1,374	1,257	875	889	0	0	1,454	1,459	1,571	13,347
Kosovo B	3,004	2,724	2,554	2,303	1,257	875	889	903	1,646	3,119	2,588	3,038	24,899
New Unit B3	1,891	1,723	1,874	1,750	1,835	1,712	1,702	1,544	0	1,216	1,809	1,903	18,959
New Unit B4	1,891	1,723	1,874	1,752	1,835	1,712	1,702	1,734	1,125	0	1,739	1,903	18,990
Kosovo New	3,782	3,447	3,748	3,501	3,669	3,423	3,404	3,278	1,125	1,216	3,548	3,807	37,948
Total Thermal	8,226	7,629	7,365	6,827	5,537	4,720	4,742	4,379	5,136	6,565	7,170	8,561	76,857
Import	103	102	230	35	1,139	165	80	83	3,688	2,783	125	163	8,695
Total	8,329	7,731	7,595	6,862	6,676	4,885	4,821	4,462	8,824	9,348	7,295	8,724	85,552

Table A 1.13 Year 2015 Albania Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GWh
Fierza	118,817	105,902	70,413	100,494	156,608	158,330	123,989	43,566	141,701	114,611	84,031	170,234	1,388.7
Komani	175,434	166,278	154,935	165,345	191,323	188,601	124,571	51,551	140,011	181,879	121,979	190,632	1,852.5
V.Dejes	96,532	103,751	89,872	89,042	102,797	76,414	56,847	31,649	65,806	105,632	67,079	79,763	965.2
Ulza	11,870	12,642	13,438	13,722	1,978	257	3,015	5,025	8,339	6,208	9,272	12,141	97.9
Shkopeti	11,127	11,761	12,539	12,975	1,866	236	2,821	4,928	7,930	5,968	8,673	11,536	92.4
Bistrica	14,538	13,252	14,571	13,607	13,504	11,997	11,475	11,025	10,183	10,286	11,754	14,050	150.2
Bratila	33,966	51,442	48,417	32,034	20,426	3,068	23,014	23,384	39,619	31,734	17,236	27,031	351.4
Hydropower	462,284	465,028	404,185	427,219	488,502	438,903	345,732	171,128	413,589	456,318	320,024	505,387	4,898.3
Vlora 1	9,032	0	9,120	8,176	0	0	32,850	54,312	52,560	54,356	52,560	54,585	327.6
Vlora 2	28,318	28,294	44,571	5,110	0	0	32,850	54,312	52,560	54,356	52,560	54,585	407.5
Vlora 3	55,760	50,778	0	29,366	54,426	1,606	32,850	54,312	52,560	54,356	52,560	54,585	493.2
Vlora 4	59,025	53,992	58,465	47,178	0	50,370	54,312	54,312	52,560	54,356	52,560	54,585	591.7
TPP Vlora	152,135	133,064	112,156	89,830	54,426	51,976	152,862	217,248	210,240	217,424	210,240	218,340	1,819.9
Durres 1	0	0	0	0	166	0	0	0	0	0	0	134	0.3
Durres 2	0	0	0	0	166	0	0	0	0	0	0	134	0.3
TPP Durres	0	0	0	0	332	0	0	0	0	0	0	268	0.6
Termopower	152,135	133,064	112,156	89,830	54,758	51,976	152,862	217,248	210,240	217,424	210,240	218,608	1,819.9
Total	614,419	598,092	516,341	517,049	543,260	490,879	498,594	388,376	623,829	673,742	530,264	723,995	4,900.1

Table A 1.14 Year 2015 Albania fuel cost Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	€	€	€	€	€	€	€	€	€	€	€	€	k€
Vlora 1	354	0	356	327	0	0	1,314	2,173	2,103	2,175	2,103	2,182	13,087
Vlora 2	1,111	1,106	1,751	204	0	0	1,314	2,173	2,103	2,175	2,103	2,182	16,222
Vlora 3	2,190	1,990	0	1,175	2,177	64	1,314	2,173	2,103	2,175	2,103	2,182	19,646
Vlora 4	2,319	2,116	2,302	1,888	0	2,015	2,173	2,173	2,103	2,175	2,103	2,182	23,548
TPP Vlora	5,974	5,212	4,410	3,594	2,177	2,080	6,116	8,693	8,412	8,698	8,412	8,726	72,504
Durres 1	0	0	0	0	9	0	0	0	0	0	0	7	16
Durres 2	0	0	0	0	9	0	0	0	0	0	0	7	16
TPP Durres	0	0	0	0	17	0	0	0	0	0	0	14	31
Total	5,974	5,212	4,410	3,594	2,194	2,080	6,116	8,693	8,412	8,698	8,412	8,741	72,535

Table A 1.15 Year 2015 Kosovo fuel cost Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€
Unit A3	1,193	1,057	586	1,021	1,008	0	0	847	366	1,107	1,019	1,098	9,301
Unit A4	1,193	1,101	1,172	460	0	0	882	1,036	1,086	513	1,019	1,098	9,560
Unit A5	1,193	1,101	1,172	1,018	465	810	0	28	1,086	1,069	510	1,098	9,549
Kosovo A	3,579	3,258	2,929	2,499	1,473	810	882	1,912	2,538	2,690	2,548	3,293	28,411
Unit B1	1,803	1,668	1,773	1,695	0	0	0	1,577	1,764	1,798	1,660	1,788	15,526
Unit B2	1,823	1,680	1,798	1,720	1,839	1,784	1,772	0	0	1,547	1,677	1,811	17,451
Kosovo B	3,626	3,348	3,572	3,414	1,839	1,784	1,772	1,577	1,764	3,345	3,337	3,599	32,976
New Unit B3	2,226	2,025	2,218	2,127	2,240	2,169	2,188	1,849	0	1,370	2,050	2,216	22,678
New Unit B4	2,226	2,025	2,218	2,129	2,240	2,169	2,188	2,072	1,274	0	1,963	2,216	22,721
Kosovo New	4,453	4,050	4,436	4,257	4,480	4,338	4,376	3,920	1,274	1,370	4,013	4,433	45,400
Total	11,658	10,656	10,937	10,170	7,792	6,932	7,030	7,409	5,576	7,405	9,897	11,325	106,787

Table A 1.16 Year 2015 Kosovo Production Joint Operation Scenario

	I MWh	II MWh	III MWh	IV MWh	V MWh	VI MWh	VII MWh	VIII MWh	IX MWh	X MWh	XI MWh	XII MWh	Annual GWh
Unit A3	84,861	75,261	41,577	72,139	71,311	0	0	59,764	25,976	78,465	72,000	77,746	659
Unit A4	84,861	78,372	83,282	32,515	0	0	62,345	73,130	77,019	36,320	72,000	77,746	678
Unit A5	84,861	78,372	83,282	71,925	32,862	56,917	0	2,016	77,019	75,768	36,047	77,746	677
Kosovo A	254,583	232,005	208,141	176,579	104,173	56,917	62,345	134,910	180,014	190,553	180,047	233,238	2,014
Unit B1	144,749	134,038	142,202	135,808	0	0	0	126,172	141,698	144,267	132,807	143,447	1,245
Unit B2	147,111	135,853	144,964	138,456	148,539	144,159	142,712	0	0	124,656	134,712	146,039	1,407
Kosovo B	291,860	269,891	287,166	274,264	148,539	144,159	142,712	126,172	141,698	268,923	267,519	289,486	2,652
New Unit B3	210,439	191,490	209,592	201,141	211,797	205,113	206,590	173,924	0	129,273	193,189	209,450	2,142
New Unit B4	210,439	191,490	209,592	201,141	211,797	205,113	206,590	195,014	120,382	0	185,041	209,450	2,146
Kosovo New	420,878	382,980	419,184	402,282	423,594	410,226	413,180	368,938	120,382	129,273	378,230	418,900	4,288
Thermopower	967,321	884,876	914,491	853,125	676,306	611,302	618,237	630,020	442,094	588,749	825,796	941,624	8,954
Ujmani	5,952	7,320	10,440	11,424	9,816	6,432	5,328	5,184	4,248	3,720	5,016	5,952	81
Total	973,273	892,196	924,931	864,549	686,122	617,734	623,565	635,204	446,342	592,469	830,812	947,576	9,035

1.3 Year 2020 PROMED Simulations Results

Table A 1.17 Year 2020 Albania Production Reference Scenario

	I MWh	II MWh	III MWh	IV MWh	V MWh	VI MWh	VII MWh	VIII MWh	IX MWh	X MWh	XI MWh	XII MWh	Annual GWh
Fierza	97,883	131,604	136,653	169,781	106,777	121,944	150,596	81,131	8,190	92,891	125,949	176,616	1,400
Komani	188,394	174,063	187,847	206,369	182,860	154,112	147,857	77,884	71,268	104,032	155,947	207,887	1,859
V.Dejes	126,596	90,789	96,133	96,720	88,060	77,341	73,178	50,022	52,987	52,889	65,237	98,722	969
Ulza	10,737	16,083	11,008	7,685	5,746	2,493	1,790	6,710	10,926	5,007	6,589	13,115	98
Shkopeti	10,066	15,154	10,309	7,127	5,731	2,453	1,739	6,295	10,151	4,747	6,205	12,196	92
Bistrica	14,529	13,596	14,515	13,669	13,545	11,955	11,468	11,008	10,158	10,335	11,745	14,093	151
Bratila	41,347	59,688	32,928	20,599	10,533	23,180	22,265	38,341	45,887	30,169	990	26,575	353
Kalivac	63,560	61,842	48,899	38,074	28,549	15,596	12,248	14,260	17,972	15,286	30,924	50,809	398
Hydropower	553,112	562,819	538,292	560,024	441,801	409,074	421,141	285,651	227,539	315,356	403,586	600,013	5,318
Vlora 1	67,686	63,336	67,704	65,520	63,154	0	56,238	67,704	65,484	67,561	65,412	67,697	717
Vlora 2	67,699	63,336	67,704	65,520	67,704	65,520	6,370	47,502	65,502	67,636	65,464	67,704	718
Vlora 3	67,699	63,336	67,704	65,520	67,704	65,520	67,704	15,106	36,564	67,636	65,464	67,704	718
Vlora 4	67,699	63,336	67,704	52,234	0	64,974	67,704	67,704	65,502	67,636	65,464	67,704	718
TPP Vlora	270,783	253,344	270,816	248,794	198,562	196,014	198,016	198,016	233,052	270,469	261,804	270,809	2,870
Durres 1	74,206	69,600	70,359	35,169	69,114	66,766	68,869	70,627	60,723	62,347	67,208	73,874	789
Durres 2	74,206	69,600	65,709	39,730	69,114	66,766	68,869	70,627	60,723	62,347	67,208	73,874	789
TPP Durres	148,412	139,200	136,068	74,899	138,228	133,532	137,738	141,254	121,446	124,694	134,416	147,748	1,578
Fier 1	71,424	48,192	4,032	69,120	71,424	69,120	71,424	71,424	69,120	71,366	69,114	71,424	757
Fier 2	6,720	29,376	71,424	69,120	71,424	69,120	71,424	71,424	69,120	71,378	69,120	71,424	741
TPP Fier	78,144	77,568	75,456	138,240	142,848	138,240	142,848	142,848	138,240	142,744	138,234	142,848	1,498
Thermal	497,339	470,112	482,340	461,933	479,638	467,786	478,602	482,118	492,738	537,907	534,454	561,405	5,946
Import	131,853	125,737	49,658	38,001	33,480	32,400	33,480	64,902	80,927	65,945	59,828	96,796	813
Total	1,050,451	1,032,931	1,020,632	1,021,957	921,439	876,860	899,743	767,769	720,277	853,263	938,040	1,161,418	12,078

Table A 1.18 Year 2020 Albania fuel cost Reference Scenario

	I k€	II k€	III k€	IV k€	V k€	VI k€	VII k€	VIII k€	IX k€	X k€	XI k€	XII k€	Annual k€
Vlora 1	2,588	2,421	2,588	2,505	2,414	0	2,150	2,588	2,503	2,584	2,501	2,588	27,430
Vlora 2	2,588	2,421	2,588	2,505	2,588	2,505	244	1,816	2,504	2,586	2,503	2,588	27,435
Vlora 3	2,588	2,421	2,588	2,505	2,588	2,505	2,588	577	1,398	2,586	2,503	2,588	27,435
Vlora 4	2,588	2,421	2,588	1,997	0	2,484	2,588	2,588	2,504	2,586	2,503	2,588	27,435
TPP Vlora	10,351	9,684	10,352	9,510	7,590	7,493	7,569	7,569	8,909	10,342	10,010	10,352	109,733
Durres 1	3,889	3,647	3,687	1,843	3,622	3,499	3,609	3,701	3,182	3,267	3,522	3,871	41,341
Durres 2	3,889	3,647	3,444	2,082	3,622	3,499	3,609	3,701	3,182	3,267	3,522	3,871	41,337
TPP Durres	7,778	7,295	7,131	3,925	7,244	6,998	7,218	7,403	6,365	6,535	7,044	7,743	82,678
Fier 1	2,690	1,815	152	2,603	2,690	2,603	2,690	2,690	2,603	2,688	2,603	2,690	28,519
Fier 2	253	1,106	2,690	2,603	2,690	2,603	2,690	2,690	2,603	2,689	2,603	2,690	27,912
TPP Fier	2,943	2,921	2,842	5,207	5,380	5,207	5,380	5,380	5,207	5,377	5,206	5,380	56,431
Thermal	21,072	19,901	20,325	18,642	20,215	19,697	20,168	20,352	20,481	22,253	22,261	23,475	248,842
Import	9,968	9,506	3,754	2,873	2,531	2,449	2,531	4,907	6,118	4,985	4,523	7,318	61,463
Total	31,040	29,407	24,079	21,515	22,746	22,147	22,699	25,259	26,599	27,239	26,784	30,793	310,306

Table A 1.19 Year 2020 Kosovo Production Reference Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GW/h
Unit B1	28,672	57,344	50,548	63,462	0	0	0	2,304	69,003	64,675	16,640	57,344	410
Unit B2	72,981	57,837	67,185	75,058	3,798	0	0	0	0	61,460	32,334	67,248	438
Kosovo B	101,653	115,181	117,733	138,520	3,798	0	0	2,304	69,003	126,135	48,974	124,592	848
New Unit B3	168,112	156,833	67,961	0	144,876	154,800	153,461	147,098	152,159	161,452	157,669	165,227	1,630
New Unit B4	168,112	156,833	164,857	156,445	161,128	154,800	153,461	147,098	89,335	0	152,013	165,227	1,669
Kosovo B New	336,224	313,666	232,818	156,445	306,004	309,600	306,922	294,196	241,494	161,452	309,682	330,454	3,299
New Unit C1	135,798	121,782	150,106	156,445	66,472	0	0	66,303	118,837	161,452	120,989	149,816	1,248
New Unit C2	168,112	156,833	164,857	156,445	137,484	104,874	105,237	22,793	50,285	161,452	157,669	165,227	1,551
Kosovo C	303,910	278,615	314,963	312,890	203,956	104,874	105,237	89,096	169,122	322,904	278,658	315,043	2,799
Thermal	741,787	707,462	665,514	607,855	513,758	414,474	412,159	385,596	479,619	610,491	637,314	770,089	6,946
Ujmani	5,952	7,512	10,440	11,424	9,816	6,432	5,328	5,184	4,248	3,720	5,016	5,952	81
Import	4,902	5,127	3,228	1,558	3,761	4,320	1,473	1,102	5,776	1,968	4,487	4,343	42
Total	752,641	720,101	679,182	620,837	527,335	425,226	418,960	391,882	489,643	616,179	646,817	780,384	7,069

Table A 1.20 Year 2020 Kosovo fuel cost Reference Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€
Unit B1	367	735	646	810	0	0	0	30	882	827	213	735	5,245
Unit B2	942	749	864	961	48	0	0	0	0	790	417	868	5,639
Kosovo B	1,310	1,484	1,509	1,771	48	0	0	30	882	1,618	630	1,603	10,884
New Unit B3	1,802	1,681	730	0	1,557	1,664	1,655	1,591	1,638	1,735	1,693	1,773	17,518
New Unit B4	1,802	1,681	1,769	1,681	1,732	1,664	1,655	1,591	963	0	1,632	1,773	17,942
Kosovo B New	3,603	3,362	2,499	1,681	3,288	3,329	3,310	3,182	2,601	1,735	3,325	3,546	35,461
New Unit C1	1,456	1,307	1,611	1,680	714	0	0	720	1,130	1,735	1,299	1,608	13,262
New Unit C2	1,802	1,681	1,769	1,681	1,478	1,128	1,136	246	319	1,735	1,693	1,773	16,441
Kosovo C	3,258	2,988	3,381	3,361	2,192	1,128	1,136	966	1,449	3,470	2,993	3,381	29,702
Thermal	8,171	7,835	7,389	6,813	5,528	4,457	4,445	4,177	4,932	6,822	6,948	8,530	76,047
Import	371	388	244	118	284	327	111	83	437	149	339	328	3,179
Total	8,542	8,222	7,633	6,931	5,812	4,784	4,557	4,261	5,369	6,971	7,287	8,858	79,225

Table A 1.21 Year 2020 Albania Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GW/h
Fierza	113,470	122,274	97,149	108,286	115,290	110,031	111,934	92,516	165,071	93,810	70,888	201,960	1,403
Komani	174,979	192,281	164,725	171,434	149,405	149,733	121,672	81,852	163,094	159,384	120,561	209,588	1,859
V.Dejes	111,426	107,401	89,231	86,259	59,013	78,176	61,718	41,365	79,684	102,268	70,340	81,941	969
Ulza	13,283	12,987	12,034	9,574	2,572	3,268	1,911	1,927	8,904	9,854	10,000	11,541	98
Shkopeti	12,239	11,986	11,271	8,992	2,445	3,239	1,794	1,737	8,454	9,265	9,404	10,861	92
Bistrica	14,554	13,676	14,590	13,720	13,509	12,015	11,513	10,947	10,209	10,366	11,714	14,116	151
Bratila	48,161	48,727	38,012	18,233	1,713	27,931	27,663	24,951	29,607	49,680	21,644	15,998	352
Kalivac	57,238	54,209	49,230	42,455	34,533	19,005	12,281	8,879	16,699	22,034	36,494	45,397	398
Hydropower	545,350	563,541	476,242	458,953	378,480	403,398	350,486	264,174	481,722	456,661	351,045	591,402	5,321
Vlora 1	54,384	51,261	54,589	52,802	50,698	0	45,114	54,465	54,456	56,466	53,969	57,521	586
Vlora 2	33,872	32,832	32,824	0	0	0	0	1,314	38,580	41,580	34,018	45,522	261
Vlora 3	54,347	51,138	3,363	41,781	54,338	52,560	54,312	54,312	52,734	54,464	52,562	56,091	582
Vlora 4	54,312	51,056	54,510	32,105	0	48,326	54,312	54,312	52,675	54,438	52,560	56,044	565
TPP Vlora	196,915	186,287	145,286	126,688	105,036	100,886	153,738	164,403	198,445	206,948	193,109	215,178	1,993
Durres 1	0	104	174	0	3	0	0	0	211	162	0	5,082	6
Durres 2	0	104	174	173	3	0	0	0	211	162	0	5,082	6
TPP Durres	0	208	348	173	6	0	0	0	422	324	0	10,164	12
Fier 1	54,312	36,753	3,066	52,688	54,335	52,560	54,312	54,312	52,659	54,473	52,560	56,392	578
Fier 2	54,312	50,997	54,516	34,332	16,352	47,596	53,290	54,312	19,126	22,361	52,560	56,220	516
TPP Fier	108,624	87,750	57,582	87,020	70,687	100,156	107,602	108,624	71,785	76,834	105,120	112,612	1,094
Thermal	305,539	274,245	203,216	213,881	175,729	201,042	261,340	273,027	270,652	284,106	298,229	337,954	3,099
Total	850,889	837,786	679,458	672,834	554,209	604,440	611,826	537,201	752,374	740,767	649,274	929,356	8,420

Table A 1.22 Year 2020 Albania fuel cost Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€
Vlora 1	2,175	2,047	2,182	2,111	2,028	0	1,805	2,178	2,162	2,240	2,147	2,273	23,347
Vlora 2	1,355	1,313	1,312	0	0	0	0	53	1,543	1,663	1,361	1,809	10,408
Vlora 3	2,174	2,043	135	1,670	2,174	2,103	2,173	2,173	2,108	2,178	2,103	2,228	23,263
Vlora 4	2,173	2,041	2,179	1,283	0	1,934	2,173	2,173	2,107	2,177	2,103	2,227	22,570
TPP Vlora	7,878	7,443	5,808	5,064	4,202	4,037	6,151	6,577	7,920	8,258	7,714	8,536	79,589
Durres 1	0	5	9	0	0	0	0	0	11	8	0	266	301
Durres 2	0	5	9	9	0	0	0	0	11	8	0	266	310
TPP Durres	0	11	18	9	0	0	0	0	22	17	0	533	610
Fier 1	2,163	1,463	122	2,097	2,164	2,093	2,163	2,096	2,168	2,093	2,227	23,013	23,013
Fier 2	2,163	2,029	2,169	1,367	651	1,896	2,122	2,163	762	890	2,093	2,222	20,529
TPP Fier	4,326	3,492	2,291	3,464	2,815	3,989	4,285	4,326	2,858	3,058	4,187	4,449	43,542
Total	12,204	10,946	8,118	8,538	7,018	8,026	10,437	10,903	10,800	11,333	11,901	13,518	123,741

Table A 1.23 Year 2020 Kosovo fuel cost Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GWh
Unit B1	129,815	123,465	113,791	98,022	0	0	0	125,436	137,324	136,765	126,337	138,561	1,130
Unit B2	137,936	130,872	136,532	131,176	136,632	134,424	137,595	0	0	118,945	128,872	140,454	1,333
Kosovo B	267,751	254,337	250,323	229,198	136,632	134,424	137,595	125,436	137,324	255,710	255,209	279,015	2,463
New Unit B3	201,079	192,683	199,824	189,125	197,862	195,567	197,829	175,288	0	122,396	184,517	204,533	2,061
New Unit B4	201,079	192,683	199,824	189,125	197,862	195,567	197,829	195,721	116,827	0	177,253	204,533	2,068
Kosovo B New	402,158	385,366	399,648	378,250	395,724	391,134	395,658	371,009	116,827	122,396	361,770	409,066	4,129
New Unit C1	201,079	192,683	199,824	189,125	183,963	0	0	136,828	197,505	196,724	184,517	204,533	1,887
New Unit C2	201,079	192,683	199,824	189,125	197,862	195,567	197,829	43,720	64,718	196,724	184,517	204,533	2,068
Kosovo C	402,158	385,366	399,648	378,250	381,825	195,567	197,829	180,548	262,223	393,448	369,034	409,066	3,955
Thermal	1,072,067	1,025,069	1,049,619	985,698	914,181	721,125	731,082	676,993	516,374	771,554	986,013	1,097,147	10,547
Ujmani	5,952	7,512	10,440	11,424	9,816	6,432	5,328	5,184	4,248	3,720	5,016	5,952	81
Total	1,078,019	1,032,581	1,060,059	997,122	923,997	727,557	736,410	682,177	520,622	775,274	991,029	1,103,099	10,628

Table A 1.24 Year 2020 Kosovo Production Joint Operation Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	k€	€	k€
Unit B1	1,628	1,546	1,439	1,250	0	0	0	1,569	1,713	1,709	1,583	1,730	14,167
Unit B2	1,719	1,629	1,703	1,637	1,704	1,674	1,714	0	0	1,482	1,611	1,747	16,620
Kosovo B	3,346	3,175	3,142	2,887	1,704	1,674	1,714	1,569	1,713	3,192	3,194	3,478	30,787
New Unit B3	2,132	2,041	2,120	2,009	2,100	2,073	2,100	1,862	0	1,301	1,963	2,167	21,869
New Unit B4	2,132	2,041	2,120	2,009	2,100	2,073	2,100	2,079	1,239	0	1,885	2,167	21,945
Kosovo B new	4,265	4,082	4,240	4,018	4,200	4,147	4,200	3,941	1,239	1,301	3,848	4,334	43,814
New Unit C1	2,132	2,041	2,120	2,008	1,953	0	0	1,454	1,812	2,089	1,963	2,167	19,738
New Unit C2	2,132	2,041	2,120	2,009	2,100	2,073	2,100	464	404	2,089	1,963	2,167	21,663
Kosovo C	4,265	4,082	4,240	4,017	4,053	2,073	2,100	1,918	2,216	4,178	3,925	4,334	41,400
Total	11,876	11,338	11,621	10,921	9,958	7,894	8,014	7,428	5,167	8,670	10,967	12,146	116,002

1.4 Year 2020 PROMED Simulations Results PX Scenarios

Table A 1.25 Year 2020 Albania Production PX Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GWh
Fierza	81,450	163,341	106,344	105,069	171,175	142,481	120,413	75,834	100,913	49,045	74,765	212,751	1,404
Komani	179,603	198,237	168,209	183,469	187,456	158,227	124,898	80,046	120,910	120,078	120,477	217,064	1,859
V.Dejes	122,748	102,333	89,093	99,188	71,411	80,124	63,076	39,855	72,044	78,661	64,198	85,862	969
Ulza	13,685	12,793	11,854	11,368	934	3,189	1,830	1,884	8,957	11,948	10,183	9,438	98
Shkopeti	12,677	11,846	11,107	10,530	867	3,058	1,700	1,781	8,359	11,138	9,502	8,782	91
Bistrica	14,624	13,754	14,596	13,745	13,577	11,949	11,472	11,017	10,107	10,454	11,782	14,152	151
Bratila	61,565	38,377	34,879	30,256	4,205	13,611	27,467	25,176	38,420	51,707	11,064	15,721	352
Kalivac	57,284	54,206	51,078	46,687	28,456	18,902	12,466	8,464	14,357	24,631	36,781	45,006	398
Hydropoer	543,636	594,887	487,160	500,312	478,081	431,541	363,322	244,057	374,067	357,662	338,752	608,776	5,322
Vlora 1	62,067	57,776	58,530	47,700	8,503	0	51,738	61,792	59,760	62,005	59,152	61,853	591
Vlora 2	62,067	57,776	58,530	52,956	55,896	60,048	5,974	43,570	59,760	62,005	59,152	61,853	640
Vlora 3	62,067	57,776	53,283	19,944	0	3,642	59,828	13,846	33,378	62,005	59,152	61,853	487
Vlora 4	62,067	57,776	58,530	36,409	0	59,610	62,088	61,792	59,760	62,005	59,152	61,853	641
TPP Vlora	248,268	231,104	228,873	157,009	64,399	123,300	179,628	181,000	212,658	248,020	236,608	247,412	2,358
Durres 1	5,836	2,549	983	67	255	3,147	4,122	6,525	7,900	13,500	7,784	7,580	60
Durres 2	5,836	2,549	983	226	255	3,147	4,122	6,525	7,900	13,500	7,784	7,580	60
TPP Durres	11,672	5,098	1,966	293	510	6,294	8,244	13,050	15,800	27,000	15,568	15,160	121
Fier 1	64,225	43,270	3,740	56,298	63,865	62,128	64,248	63,880	61,760	64,170	61,142	64,164	673
Fier 2	64,225	60,008	63,588	56,298	63,865	62,128	64,248	63,880	22,806	26,308	61,142	64,164	673
TPP Fier	128,450	103,278	67,328	112,596	127,730	124,256	128,496	127,760	84,566	90,478	122,284	128,328	1,346
Thermal	388,390	339,480	298,167	269,898	192,639	253,850	316,368	321,810	313,024	365,498	374,460	390,900	3,824
Total	932,026	934,367	785,327	770,210	670,720	685,391	679,690	565,867	687,091	723,160	713,212	999,676	9,147

Table A 1.26 Year 2020 Kosovo Production PX Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GWh
Unit B1	139,848	133,227	138,363	129,033	0	0	0	132,319	145,639	142,544	131,961	143,786	1,237
Unit B2	140,565	137,173	140,126	134,671	141,196	140,534	141,652	0	0	123,219	133,443	145,837	1,378
Kosovo B	280,413	270,400	278,489	263,704	141,196	140,534	141,652	132,319	145,639	265,763	265,404	289,623	2,615
New Unit B3	208,882	197,538	205,842	196,424	207,869	204,535	209,830	187,205	0	129,790	194,284	210,037	2,152
New Unit B4	208,882	197,538	205,842	196,424	207,869	204,535	209,830	208,295	122,547	0	186,409	210,037	2,158
Kosovo B New	417,764	395,076	411,684	392,848	415,738	409,070	419,660	395,500	122,547	129,790	380,693	420,074	4,310
New Unit C1	208,882	197,538	205,842	196,424	193,619	0	0	145,751	205,191	206,656	194,284	210,037	1,964
New Unit C2	208,882	197,538	205,842	196,424	207,869	204,535	209,830	46,584	66,684	206,656	194,284	210,037	2,155
Kosovo C	417,764	395,076	411,684	392,848	401,488	204,535	209,830	192,335	271,875	413,312	388,568	420,074	4,119
Thermal	1,115,941	1,060,552	1,101,857	1,049,400	958,422	754,139	771,142	720,154	540,061	808,865	1,034,665	1,129,771	11,045
Ujmani	5,952	7,512	10,440	11,424	9,816	6,432	5,328	5,184	4,248	3,720	5,016	5,952	81
Total	1,121,893	1,068,064	1,112,297	1,060,824	968,238	760,571	776,470	725,338	544,309	812,585	1,039,681	1,135,723	11,126

Table A 1.27 Year 2020 Kosovo Production PX_500 Scenario

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	GWh
Unit B1	135,542	117,805	107,085	96,464	0	0	0	133,214	140,304	134,901	109,994	126,651	1,102
Unit B2	138,823	130,982	134,881	123,606	116,158	139,395	143,147	0	0	116,795	129,560	140,674	1,314
Kosovo B	274,365	248,787	241,966	220,070	116,158	139,395	143,147	133,214	140,304	251,696	239,554	267,325	2,416
New Unit B3	209,961	197,435	206,774	195,372	203,882	204,887	211,740	190,025	0	122,263	195,628	209,245	2,147
New Unit B4	209,961	197,435	206,774	195,372	203,882	204,887	211,740	211,115	122,375	0	188,284	209,245	2,161
Kosovo B N	419,922	394,870	413,548	390,744	407,764	409,774	423,480	401,140	122,375	122,263	383,912	418,490	4,308
New Unit C1	329,459	311,551	324,755	307,813	298,866	0	0	233,595	322,382	313,736	308,464	330,077	3,081
New Unit C2	329,459	311,551	324,755	307,813	321,597	325,071	335,723	74,562	102,441	313,736	308,464	330,077	3,385
Kosovo C	658,918	623,102	649,510	615,626	620,463	325,071	335,723	308,157	424,823	627,472	616,928	660,154	6,466
Thermal	1,353,205	1,266,759	1,305,024	1,226,440	1,144,385	874,240	902,350	842,511	687,502	1,001,431	1,240,394	1,345,969	13,190
Ujmani	5,952	7,512	10,440	11,424	9,816	6,432	5,328	5,184	4,248	3,720	5,016	5,952	81
Total	1,359,157	1,274,271	1,315,464	1,237,864	1,154,201	880,672	907,678	847,695	691,750	1,005,151	1,245,410	1,351,921	13,271

Table A 1.28 Year 2020 Kosovo Production PX_500_it1 Scenario

	I MWh	II MWh	III MWh	IV MWh	V MWh	VI MWh	VII MWh	VIII MWh	IX MWh	X MWh	XI MWh	XII MWh	Annual GWh
Unit B1	137,192	130,495	132,274	102,148	0	0	0	131,368	141,408	136,263	110,980	127,442	1,150
Unit B2	138,726	132,110	138,248	131,581	137,742	144,417	147,832	0	0	118,673	130,109	141,390	1,361
Kosovo B	275,918	262,605	270,522	233,729	137,742	144,417	147,832	131,368	141,408	254,936	241,089	268,832	2,510
New Unit B3	207,446	197,714	208,749	198,184	206,225	205,200	212,036	187,181	0	125,645	193,201	209,953	2,152
New Unit B4	207,446	197,714	208,749	198,184	206,225	205,200	212,036	208,271	122,537	0	185,763	209,953	2,162
Kosovo B New	414,892	395,428	417,498	396,368	412,450	410,400	424,072	395,452	122,537	125,645	378,964	419,906	4,314
New Unit C1	326,429	313,051	328,412	312,317	302,271	0	0	229,542	325,275	320,577	306,055	331,316	3,095
New Unit C2	326,429	313,051	328,412	312,353	325,021	327,447	338,143	74,337	104,400	320,577	306,055	331,316	3,408
Kosovo C	652,858	626,102	656,824	624,670	627,292	327,447	338,143	303,879	429,675	641,154	612,110	662,632	6,503
Thermal	1,343,668	1,284,135	1,344,844	1,254,767	1,177,484	882,264	910,047	830,699	693,620	1,021,735	1,232,163	1,351,370	13,327
Ujmani	5,952	7,512	10,440	11,424	9,816	6,432	5,328	5,184	4,248	3,720	5,016	5,952	81
Total	1,349,620	1,291,647	1,355,284	1,266,191	1,187,300	888,696	915,375	835,883	697,868	1,025,455	1,237,179	1,357,322	13,408

Table A 1.29 Year 2020 Kosovo Production PX_500_it2 Scenario

	I MWh	II MWh	III MWh	IV MWh	V MWh	VI MWh	VII MWh	VIII MWh	IX MWh	X MWh	XI MWh	XII MWh	Annual GWh
Unit B1	138,212	131,536	134,241	123,191	0	0	0	132,839	143,846	139,059	128,137	136,436	1,207
Unit B2	139,386	133,515	139,647	133,293	139,163	143,269	143,488	0	0	120,390	130,372	143,192	1,366
Kosovo B	277,598	265,051	273,888	256,484	139,163	143,269	143,488	132,839	143,846	259,449	258,509	279,628	2,573
New Unit B3	208,964	197,976	209,264	198,278	207,089	205,197	211,799	189,600	0	128,804	193,076	210,706	2,161
New Unit B4	208,964	197,976	209,264	198,278	207,089	205,197	211,799	210,690	122,550	0	185,304	210,706	2,168
Kosovo B New	417,928	395,952	418,528	396,556	414,178	410,394	423,598	400,290	122,550	128,804	378,380	421,412	4,329
New Unit C1	327,972	313,951	329,588	312,653	303,541	0	0	232,958	327,065	326,325	305,780	333,862	3,114
New Unit C2	327,972	313,951	329,588	312,809	326,291	327,253	335,817	74,403	105,935	326,325	305,780	333,862	3,420
Kosovo C	655,944	627,902	659,176	625,462	629,832	327,253	335,817	307,361	433,000	652,650	611,560	667,724	6,534
Thermal	1,351,470	1,288,905	1,351,592	1,278,502	1,183,173	880,916	902,903	840,490	699,396	1,040,903	1,248,449	1,368,764	13,435
Ujmani	5,952	7,512	10,440	11,424	9,816	6,432	5,328	5,184	4,248	3,720	5,016	5,952	81
Total	1,357,422	1,296,417	1,362,032	1,289,926	1,192,989	887,348	908,231	845,674	703,644	1,044,623	1,253,465	1,374,716	13,516

2 Annex 2 Probabilistic Reliability Study

2.1 Results of Probabilistic Reliability Study: Year 2010

Table A 2.1 Year 2010 Reliability Indices Reference Case

Weather Conditions	Reliability Indices Reference Case									
	Lack of Power		Isolated Node		Network Splitting		Line Overload		Lack of Interconnection	
	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP
Normal	0.0000	0.0000	107.7000	0.0127	19.2000	0.0023	89.0000	0.0407	0.0000	0.0000
Bad	0.0000	0.0000	25.4000	0.0960	5.3000	0.0210	4.9000	0.0650	0.0000	0.0000
Stormy	0.0000	0.0000	5.9000	0.2000	1.5000	0.0600	1.0000	0.1000	0.0000	0.0000

Table A 2.2 Year 2010 Reliability Indices JO Scenario

Weather Conditions	Reliability Indices Joint Operation Scenario									
	Lack of Power		Isolated Node		Network Splitting		Line Overload		Lack of Interconnection	
	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP
Normal	0.0000	0.0000	105.2000	0.0124	21.8000	0.0026	66.7000	0.0349	0.0000	0.0000
Bad	0.0000	0.0000	21.9000	0.0820	6.9000	0.0270	4.2000	0.0620	0.0000	0.0000
Stormy	0.0000	0.0000	6.4000	0.2300	1.5000	0.0600	0.8000	0.1000	0.0000	0.0000

Table A 2.3 Year 2010 Load Shedding JO Scenario

Code	Area code	Area name	Lack of Power	Isolated Node	Network Splitting	Line Overload	Lack of Interconn.	Total
1	A	ALBANIA	0	573	153	134	2	863
2	K	KOSOVO	0	469	74	13	0	556
5	G	GREECE	0	0	0	15,169	0	15,169
3	T	MONTENEGRO	0	0	0	593	0	593
14	O	AUSTRIA	0	49	0	133	0	182
10	M	HUNGARY	0	54	0	0	0	54
6	V	BULGARIA	0	0	0	47	0	47
4	Y	MACEDONIA	0	0	0	22	0	22
12	L	SLOVENIA	0	0	0	17	0	17
7	W	BOSNIA	0	14	0	0	0	14

Table A 2.4 Year 2010 Expected Electricity Wheeling

Year 2010 Wheeling of Electric Energy			
Power System	Reference Case	New 400 kV line	Incremental
	GWh/year	GWh/year	GWh/year
Albania	1,774	2,159	385
Kosovo	3,511	3,172	-339
TOTAL	5,284	5,331	46

Table A 2.5 Year 2010 Expected Cost Claim for Kosovo from Cross-Border Trade

KOSOVO	Year 2010				
	Demand	Transit	"Transit key"	HN Annual Cost	Expected Cost claim
	MWh	MWh	%	M€	M€
New Line Kosovo B - Kashar	5,545,898	3,171,556	36.4	9.06	3.2968
No new Line	5,545,898	3,510,554	38.8	8.12	3.1478

Table A 2.6 Year 2010 Expected Cost Claim for Albania from Cross-Border Trade

ALBANIA	Year 2010				
	Demand	Transit	"Transit key"	HN Annual Cost	Expected Cost claim
	MWh	MWh	%	M€	M€
New Line Kosovo B - Kashar	7,379,241	2,159,146	22.6	21.04	4.7618
No new Line	7,379,241	1,773,880	19.4	17.59	3.4082

2.2 Results of Probabilistic Reliability Study: Year 2015

Table A 2.7 Year 2015 Reliability Indices Reference Case

Weather Conditions	Reliability Indices Reference Case									
	Lack of Power		Isolated Node		Network Splitting		Line Overload		Lack of Interconnection	
	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP
Normal	0.0000	0.0000	111.1000	0.0131	25.4000	0.0030	208.7000	0.1069	0.0000	0.0000
Bad	0.0000	0.0000	25.9000	0.0980	7.0000	0.0270	11.2000	0.1510	0.0000	0.0000
Stormy	0.0000	0.0000	4.1000	0.1300	0.9000	0.0400	2.2000	0.2400	0.0000	0.0000

Table A 2.8 Year 2015 Reliability Indices JO Scenario

Weather Conditions	Reliability Indices Joint Operation Scenario									
	Lack of Power		Isolated Node		Network Splitting		Line Overload		Lack of Interconnection	
	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP
Normal	0.0000	0.0000	111.1000	0.0131	22.9000	0.0027	187.8000	0.0958	0.0000	0.0000
Bad	0.0000	0.0000	22.1000	0.0830	7.5000	0.0290	9.2000	0.1370	0.0000	0.0000
Stormy	0.0000	0.0000	3.6000	0.1200	0.6000	0.0300	1.8000	0.2100	0.0000	0.0000

Table A 2.9 Year 2015 Load Shedding JO Scenario

Code	Area code	Area name	Lack of Power	Isolated Node	Network Splitting	Line Overload	Lack of Interconn.	Total
1	A	ALBANIA	0	947	280	676	0	1,903
2	K	KOSOVO	0	606	100	54	0	760
6	V	BULGARIA	0	0	25	15,700	0	15,725
5	G	GREECE	0	0	0	12,520	0	12,520
11	R	ROMANIA	0	0	0	552	0	552
7	W	BOSNIA	0	538	0	0	0	538
14	O	AUSTRIA	0	116	0	0	0	116
3	T	MONTENEGRO	0	0	8	30	0	38
4	Y	MACEDONIA	0	0	0	28	0	28

Table A 2.10 Year 2015 Expected Electricity Wheeling

Year 2015 Wheeling of Electric Energy			
Power System	Reference Case	New 400 kV line	Incremental
	GWh/year	GWh/year	GWh/year
Albania	481	1,042	562
Kosovo	2,599	3,071	471
TOTAL	3,080	4,113	1,033

Table A 2.11 Year 2015 Expected Cost Claim for Kosovo from Cross-Border Trade

KOSOVO		Year 2015				
		Demand	Transit	"Transit key"	HN Annual Cost	Expected Cost claim
		MWh	MWh	%	M€	M€
New Line	Kosovo B - Kashar	6,620,384	3,070,587	31.7	9.48	3.0035
No new Line		6,620,384	2,599,437	28.2	8.54	2.4073

Table A 2.12 Year 2015 Expected Cost Claim for Albania from Cross-Border Trade

ALBANIA		Year 2015				
		Demand	Transit	"Transit key"	HN Annual Cost	Expected Cost claim
		MWh	MWh	%	M€	M€
New Line	Kosovo B - Kashar	9,125,707	1,042,424	10.3	21.08	2.1612
No new Line		9,125,707	480,573	5.0	17.63	0.8820

2.3 Results of Probabilistic Reliability Study: Year 2020

Table A 2.13 Year 2020 Reliability Indices Reference Case

Weather Conditions	Reliability Indices Reference Case									
	Lack of Power		Isolated Node		Network Splitting		Line Overload		Lack of Interconnection	
	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP
Normal	0.5000	0.0012	85.6000	0.0101	25.4000	0.0030	2100.3000	0.8292	0.6000	0.6000
Bad	0.0000	0.0000	23.4000	0.0880	6.7000	0.0270	72.2000	0.8360	0.2000	0.2000
Stormy	0.0000	0.0100	4.8000	0.1600	2.0000	0.0800	8.4000	0.9100	0.0000	0.0000

Table A 2.14 Year 2020 Reliability Indices JO Scenario

Weather Conditions	Reliability Indices Joint Operation Scenario									
	Lack of Power		Isolated Node		Network Splitting		Line Overload		Lack of Interconnection	
	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP	LOLE	LOLP
Normal	0.0000	0.0000	92.4000	0.0109	19.5000	0.0023	172.6000	0.3246	0.0000	0.0000
Bad	0.0000	0.0000	23.4000	0.0900	5.7000	0.0230	15.1000	0.3810	0.0000	0.0000
Stormy	0.0000	0.0000	5.1000	0.1700	2.0000	0.0800	1.6000	0.4300	0.0000	0.0000

Table A 2.15 Year 2020 Load Shedding JO Scenario

Code	Area code	Area name	Lack of Power	Isolated Node	Network Splitting	Line Overload	Lack of Interconn.	Total
1	A	ALBANIA	0	1,070	340	4,788	0	6,197
2	K	KOSOVO	0	671	58	477	0	1,204
6	V	BULGARIA	0	0	0	32,733	0	32,733
11	R	ROMANIA	0	0	0	1,327	0	1,327
5	G	GREECE	0	17	0	723	0	741
4	Y	MACEDONIA	0	0	0	438	0	438
7	W	BOSNIA	0	387	0	0	0	387
10	M	HUNGARY	0	0	0	376	0	376
14	O	AUSTRIA	0	36	0	11	0	47
3	T	MONTENEGRO	0	0	0	8	0	8
8	J	SERBIA	0	0	0	2	0	2

Table A 2.16 Year 2020 Expected Electricity Wheeling

Year 2020 Wheeling of Electric Energy			
Power System	Reference Case	New 400 kV line	Incremental
	GWh/year	GWh/year	GWh/year
Albania	609	762	153
Kosovo	3,548	3,679	131
TOTAL	4,157	4,441	284

Table A 2.17 Annual Cost of Horizontal network of the transformers(Current M€)

	Year 2005		Year 2010		Year 2015		Year 2020	
	Total Overall Network	Horizontal Network	Total Overall Network	Horizontal Network	Total Overall Network	Horizontal Network	Total Overall Network	Horizontal Network
	M€	M€	M€	M€	M€	M€	M€	M€
Albania	0.437	0.437	0.875	0.875	0.875	0.875	1.094	1.094
Kosovo	0.810	0.810	0.810	0.810	1.080	1.080	1.350	1.350

Table A 2.18 Year 2020 Expected Cost Claim for Kosovo from Cross-Border Trade

KOSOVO	Year 2020				
	Demand	Transit	"Transit key"	HN Annual Cost	Expected Cost claim
	MWh	MWh	%	M€	M€
New Line Kosovo B - Kashar	6,963,889	3,678,851	34.6	9.75	3.3700
No new Line	6,963,889	3,547,887	33.8	8.81	2.9729

Table A 2.19 Year 2020 Expected Cost Claim for Albania from Cross-Border Trade

ALBANIA	Year 2020				
	Demand	Transit	"Transit key"	HN Annual Cost	Expected Cost claim
	MWh	MWh	%	M€	M€
New Line Kosovo B - Kashar	12,071,997	762,136	5.9	21.53	1.2783
No new Line	12,071,997	609,311	4.8	18.08	0.8685

3 Annex 3 Steady State Analysis

3.1 Results of Load-Flow Study: Year 2010

Table A 3.1 Year 2010 Electricity Balance in Kosovo peak load condition

Kosovo Power Supply	Active Power	Reactive Power	1/2 Transit Active	Losses Reactive
	(MW)	(MVA _r)	(MVA _r)	(MVA _r)
Generation	794	57		
Load	469	191		
Exchange with Albania	215.9	-76.1	1.1	-58.6
Exchange with Montenegro	43.0	34.5	0.0	-19.5
Exchange with Macedonia	228.0	-82.2	0.4	-15.5
Exchange with Serbia	-172.7	115.5	1.1	-28.7
Total Exchange	314.2	-8.3	2.6	-122.3

Table A 3.2 Year 2010 Power Losses in Kosovo peak load condition

Power Losses in Kosovo	P	Q
	(MW)	(MVA _r)
Total Losses of 400 kV lines	0.1	-25.3
Total Losses of 220 kV lines	1.3	-30.1
Total Losses of 110 kV lines	2.5	-34.8
Total transmission line Losses	3.9	-90.3
Total Transformer Losses	4.4	87.4
Total Transmission Network Losses	8.4	-2.8

Table A 3.3 Year 2010 Electricity Balance in Albania peak load condition

Albania Power Supply	Active Power	Reactive Power	1/2 Transit Active	Losses Reactive
	(MW)	(MVA _r)	(MVA _r)	(MVA _r)
Generation	991	610		
Load	1,381	544		
Exchange with Kosovo	-215.9	76.1	1.1	-58.6
Exchange with Montenegro	-204.9	119.7	0.7	-43.2
Exchange with Greece	-9.0	-39.0	0.0	-28.7
Total Exchange	-429.8	156.8	1.8	-130.6

Table A 3.4 Year 2010 Power Losses in Albania peak load condition

Power Losses in Albania	P	Q
	(MW)	(MVA _r)
Total Losses of 400 kV lines	0.6	-81.6
Total Losses of 220 kV lines	13.7	-80.5
Total Losses of 110 kV lines	13.2	-22.9
Total transmission line Losses	27.4	-185.1
Total Transformer Losses	11.0	225.1
Total Transmission Network Losses	38.4	40.0

Table A 3.5 Year 2010 Electricity Balance in Kosovo light load condition

Kosovo Power Supply	Active Power	Reactive Power	1/2 Transit	Losses
	(MW)	(MVA _r)	Active (MVA _r)	Reactive (MVA _r)
Generation	340	-103		
Load	348	142		
Exchange with Albania	98.3	-76.9	0.3	-66.8
Exchange with Montenegro	-14.1	5.6	0.0	-19.7
Exchange with Macedonia	151.9	-27.3	0.2	-17.7
Exchange with Serbia	-251.1	30.0	0.7	-31.0
Total Exchange	-15.0	-68.6	1.2	-135.2

Table A 3.6 Year 2010 Power Losses in Kosovo light load condition

Power Losses in Kosovo	P	Q
	(MW)	(MVA _r)
Total Losses of 400 kV lines	0.0	-26.2
Total Losses of 220 kV lines	0.4	-34.9
Total Losses of 110 kV lines	1.7	-36.8
Total transmission line Losses	2.1	-97.8
Total Transformer Losses	3.7	56.3
Total Transmission Network Losses	5.8	-41.5

Table A 3.7 Year 2010 Electricity Balance in Albania light load condition

Albania Power Supply	Active Power	Reactive Power	1/2 Transit	Losses
	(MW)	(MVA _r)	Active (MVA _r)	Reactive (MVA _r)
Generation	341	142		
Load	456	181		
Exchange with Kosovo	-98.3	76.9	0.3	-66.8
Exchange with Montenegro	-137.1	132.2	0.4	-46.3
Exchange with Greece	108.8	89.2	0.2	-26.1
Total Exchange	-126.6	298.3	0.9	-139.2

Table A 3.8 Year 2010 Power Losses in Albania light load condition

Power Losses in Albania	P	Q
	(MW)	(MVA _r)
Total Losses of 400 kV lines	0.5	-84.5
Total Losses of 220 kV lines	1.8	-133.7
Total Losses of 110 kV lines	2.9	-44.6
Total transmission line Losses	5.2	-262.8
Total Transformer Losses	5.4	64.5
Total Transmission Network Losses	10.6	-198.3

3.2 Results of Load-Flow Study: Year 2015

Table A 3.9 Year 2015 Electricity Balance in Kosovo peak load condition

Kosovo Power Supply	Active Power	Reactive Power	1/2 Transit Active	Losses Reactive
	(MW)	(MVA _r)	(MVA _r)	(MVA _r)
Generation Kosovo	1,350	133		
Load	552	226		
Exchange with Albania	391.6	-93.5	3.0	-40.4
Exchange with Montenegro	153.2	28.0	0.2	-17.6
Exchange with Macedonia	442.7	-112.6	0.6	-1.8
Exchange with Serbia	-209.6	96.6	1.1	-27.4
Total Exchange	777.9	-81.5	4.8	-87.2

Table A 3.10 Year 2015 Power Losses in Kosovo peak load condition

Power Losses in Kosovo	P	Q
	(MW)	(MVA _r)
Total Losses of 400 kV lines	2.3	-25.8
Total Losses of 220 kV lines	2.6	-18.8
Total Losses of 110 kV lines	3.8	-31.7
Total transmission line Losses	8.6	-76.2
Total Transformer Losses	6.1	152.0
Total Transmission Network Losses	14.8	75.7

Table A 3.11 Year 2015 Electricity Balance in Albania peak load condition

Albania Power Supply	Active Power	Reactive Power	1/2 Transit Active	Losses Reactive
	(MW)	(MVA _r)	(MVA _r)	(MVA _r)
Generation	931	816		
Load	1,664	649		
Exchange with Kosovo	-391.6	93.5	3.0	-40.4
Exchange with Montenegro	-265.0	105.2	1.0	-40.0
Exchange with Greece	-136.1	-65.0	0.2	-26.6
Total Exchange	-792.7	133.7	4.2	-107.1

Table A 3.12 Year 2015 Power Losses in Albania peak load condition

Power Losses in Albania	P	Q
	(MW)	(MVA _r)
Total Losses of 400 kV lines	0.6	-79.2
Total Losses of 220 kV lines	19.9	-50.7
Total Losses of 110 kV lines	21.8	-10.5
Total transmission line Losses	42.3	-140.4
Total Transformer Losses	13.0	280.8
Total Transmission Network Losses	55.4	140.4

Table A 3.13 Year 2015 Electricity Balance in Kosovo light load condition

Kosovo Power Supply	Active Power (MW)	Reactive Power (MVar)	1/2 Transit Losses Active (MVar)
Generation	432	-123	
Load	439	179	
Exchange with Albania	85.0	-112.0	0.4
Exchange with Montenegro	77.7	-31.1	0.1
Exchange with Macedonia	129.4	-14.4	0.1
Exchange with Serbia	-309.1	19.3	1.1
Total Exchange	-17.0	-138.2	1.6

Table A 3.14 Year 2015 Power Losses in Kosovo light load condition

Power Losses in Kosovo	P (MW)	Q (MVar)
Total Losses of 400 kV lines	0.6	-43.3
Total Losses of 220 kV lines	0.5	-34.0
Total Losses of 110 kV lines	2.1	-37.6
Total transmission line Losses	3.1	-114.8
Total Transformer Losses	4.7	70.7
Total Transmission Network Losses	7.9	-44.1

Table A 3.15 Year 2015 Electricity Balance in Albania light load condition

Albania Power Supply	Active Power (MW)	Reactive Power (MVar)	1/2 Transit Losses Active (MVar)	Losses Reactive (MVar)
Generation	502	211		
Load	486	191		
Exchange with Kosovo	-85.0	112.0	0.4	-66.3
Exchange with Montenegro	24.1	112.8	0.2	-48.6
Exchange with Greece	59.2	114.8	0.2	-26.5
Total Exchange	-1.7	339.6	0.7	-141.5

Table A 3.16 Year 2015 Power Losses in Albania light load condition

Power Losses in Albania	P (MW)	Q (MVar)
Total Losses of 400 kV lines	0.2	-88.1
Total Losses of 220 kV lines	4.3	-127.6
Total Losses of 110 kV lines	6.5	-41.7
Total transmission line Losses	11.0	-257.5
Total Transformer Losses	6.1	79.1
Total Transmission Network Losses	17.2	-178.4

3.3 Results of Load-Flow Study: Year 2020

Table A 3.17 Year 2020 Electricity Balance in Kosovo peak load condition

Kosovo Power Supply	Active Power	Reactive Power	1/2 Transit Active	Losses Reactive
	(MW)	(MVA _r)	(MVA _r)	(MVA _r)
Generation	1,497	428		
Load	652	266		
Exchange with Albania	437.0	2.1	3.9	-25.9
Exchange with Montenegro	272.9	72.1	0.6	-12.6
Exchange with Macedonia	376.5	-116.9	0.5	-3.4
Exchange with Serbia	-265.7	164.1	2.2	-17.5
Total Exchange	820.7	121.4	7.1	-59.4

Table A 3.18 Year 2020 Power Losses in Kosovo peak load condition

Power Losses in Kosovo	P	Q
	(MW)	(MVA _r)
Total Losses of 400 kV lines	2.5	-22.7
Total Losses of 220 kV lines	3.3	-17.3
Total Losses of 110 kV lines	4.0	-33.0
Total transmission line Losses	9.7	-73.0
Total Transformer Losses	6.8	172.7
Total Transmission Network Losses	16.6	99.7

Table A 3.19 Year 2020 Electricity Balance in Albania peak load condition

Albania Power Supply	Active Power	Reactive Power	1/2 Transit Active	Losses Reactive
	(MW)	(MVA _r)	(MVA _r)	(MVA _r)
Generation	1,819	1,332		
Load	2,521	982		
Exchange with Kosovo	-437.0	-2.1	3.9	-25.9
Exchange with Montenegro	-163.6	41.9	0.4	-41.3
Exchange with Greece	-215.9	-209.7	0.9	-20.5
Total Exchange	-816.5	-169.9	5.2	-87.6

Table A 3.20 Year 2020 Power Losses in Albania peak load condition

Power Losses in Albania	P	Q
	(MW)	(MVA _r)
Total Losses of 400 kV lines	1.4	-67.3
Total Losses of 220 kV lines	43.1	82.1
Total Losses of 110 kV lines	42.3	38.3
Total transmission line Losses	86.7	53.2
Total Transformer Losses	22.8	554.5
Total Transmission Network Losses	109.5	607.7

Table A 3.21 Year 2020 Electricity Balance in Kosovo light load condition

Kosovo Power Supply	Active Power	Reactive Power	1/2 Transit	Losses
	(MW)	(MVar)	Active (MVar)	Reactive (MVar)
Generation	812	-102		
Load	585	239		
Exchange with Albania	216.8	-194.0	1.4	-56.9
Exchange with Montenegro	142.0	-59.3	0.2	-17.6
Exchange with Macedonia	144.2	-19.7	0.1	-7.1
Exchange with Serbia	-290.4	46.3	1.3	-23.7
Total Exchange	212.6	-226.7	3.0	-105.4

Table A 3.22 Year 2020 Power Losses in Kosovo light load condition

Power Losses in Kosovo	P	Q
	(MW)	(MVar)
Total Losses of 400 kV lines	1.0	-37.9
Total Losses of 220 kV lines	1.6	-26.1
Total Losses of 110 kV lines	3.8	-33.7
Total transmission line Losses	6.4	-97.7
Total Transformer Losses	5.3	89.5
Total Transmission Network Losses	11.7	-8.2

Table A 3.23 Year 2020 Electricity Balance in Albania light load condition

Albania Power Supply	Active Power	Reactive Power	1/2 Transit	Losses
	(MW)	(MVar)	Active (MVar)	Reactive (MVar)
Generation	438	608		
Load	650	255		
Exchange with Kosovo	-216.8	194.0	1.4	-56.9
Exchange with Montenegro	-39.7	170.5	0.4	-47.1
Exchange with Greece	12.7	220.9	0.5	-21.0
Total Exchange	-243.8	585.4	2.3	-125.0

Table A 3.24 Year 2020 Power Losses in Albania light load condition

Power Losses in Albania	P	Q
	(MW)	(MVar)
Total Losses of 400 kV lines	0.7	-80.9
Total Losses of 220 kV lines	7.7	-118.2
Total Losses of 110 kV lines	13.0	-34.3
Total transmission line Losses	21.4	-233.4
Total Transformer Losses	8.1	125.9
Total Transmission Network Losses	29.4	-107.5

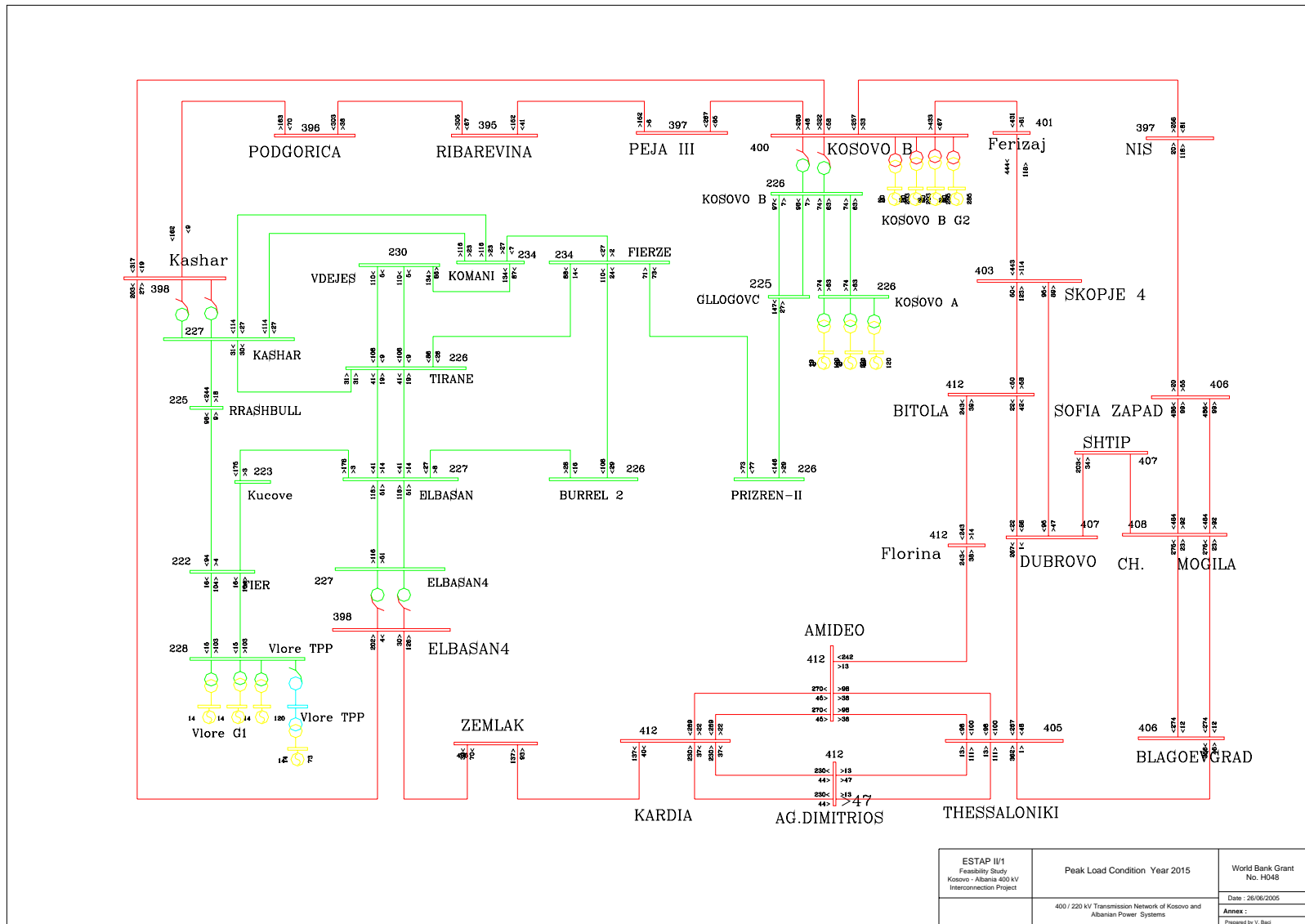


Figure A 3.3 Year 2015 Peak load Power flow on 400/220 kV interconnected network

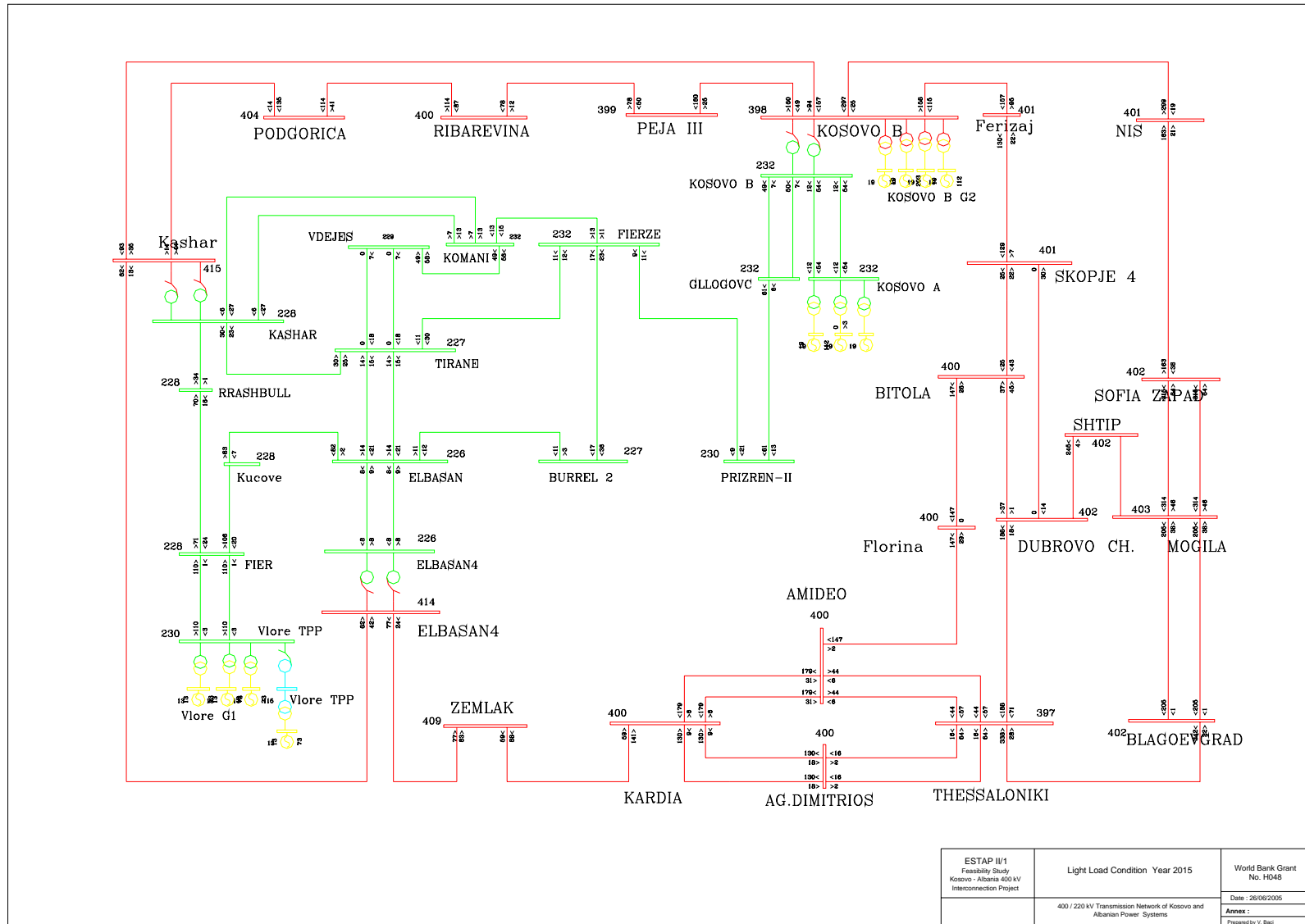


Figure A 3.4 Year 2015 Light load Power flow on 400/220 kV interconnected network

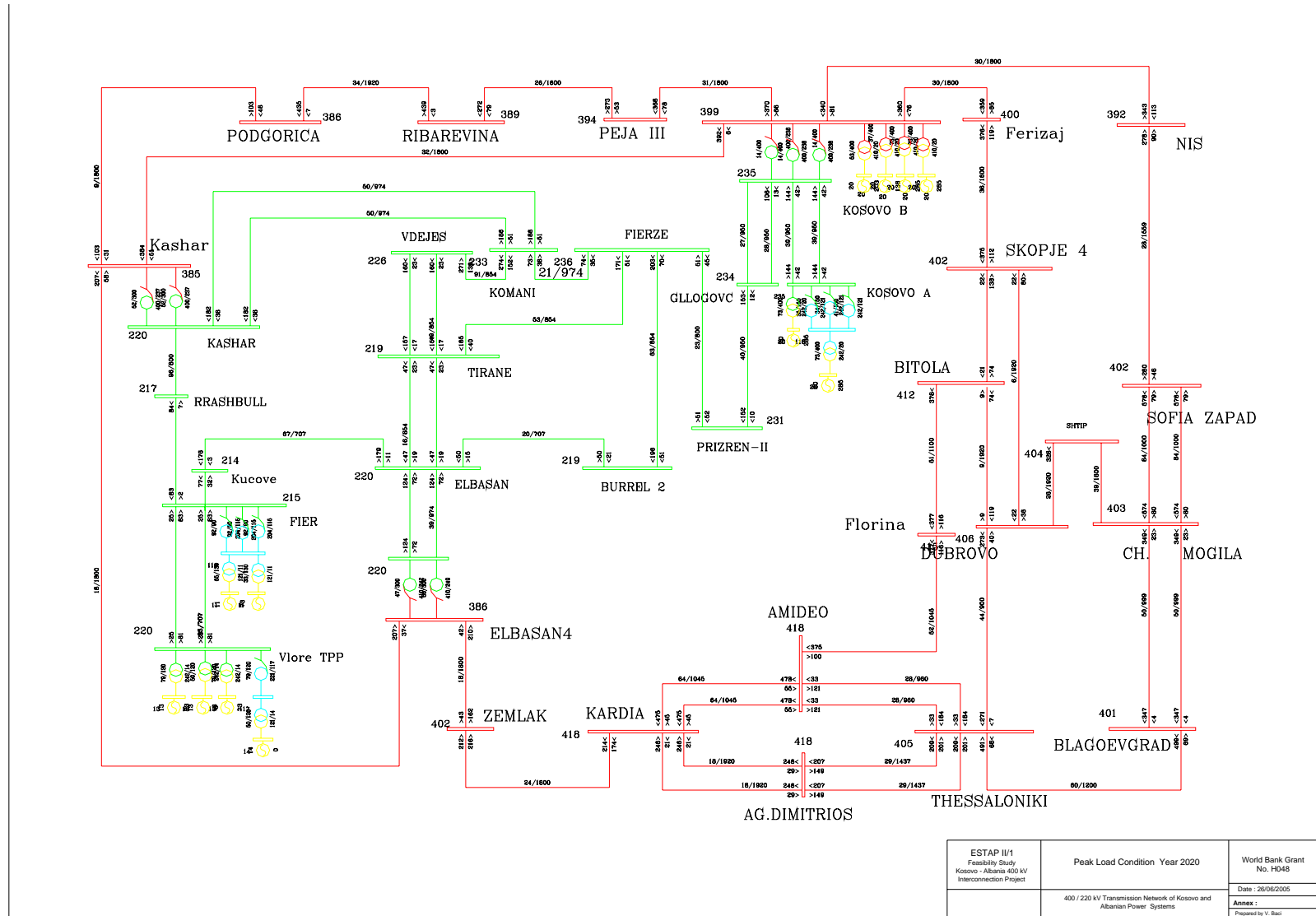


Figure A 3.5 Year 2020 Peak load Power flow on 400/220 kV interconnected network

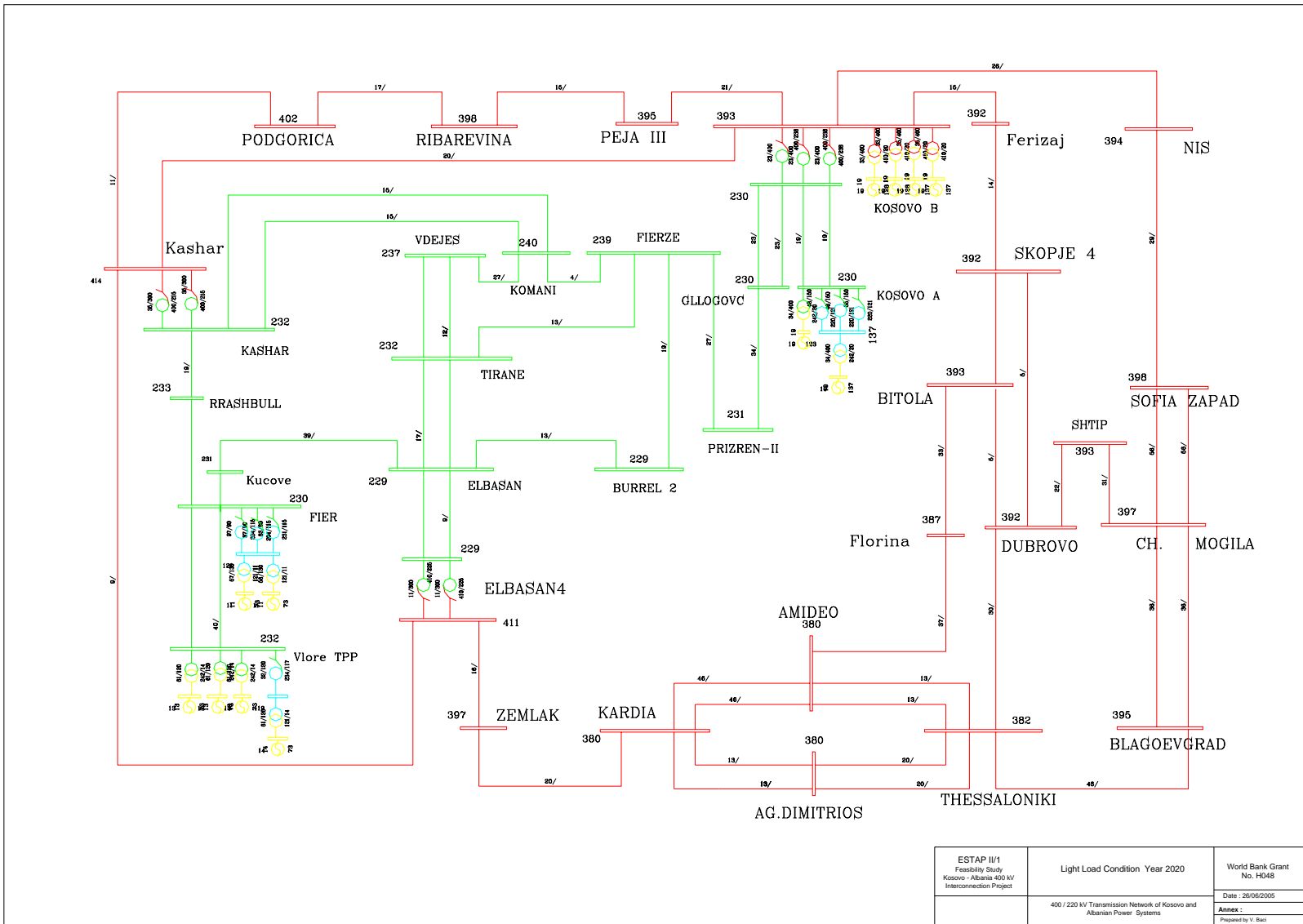


Figure A 3.6 Year 2020 Light load Power flow on 400/220 kV interconnected network

4 Annex 4 Steady State Security Analysis

4.1 Results of Static Security analysis for year 2010

Table A 4.1 Year 2010 Summary of Security Analysis Line Contingencies

Faulted element				Vnom	Violation			Voltage profile		Maximum overload	
End 1		End 2			kV	Nodes	Lines	Tranf.	Vmin [p.u.]	Vmax [p.u.]	Lines
Code	Name	Code	Name								
EL4A111	ELBASAN4	ZEMA111	ZEMLAJ	400	17	0	0	0.95	1.11		
EL4A111	ELBASAN4	KASA111	Kashar	400	21	0	0	0.95	1.12		
BRRA211	BURREL 2	FRZA211	FIERZE	220	17	0	0	0.95	1.11		
FRZA211	FIERZE	KMNA211	KOMANI	220	21	0	0	0.95	1.12		
FRZA211	FIERZE	TRNA211	TIRANE	220	17	0	0	0.95	1.11		
KASA211	KASHAR	KMNA211	KOMANI	220	19	0	0	0.95	1.12		
KASA211	KASHAR	KMNA211	KOMANI	220	19	0	0	0.95	1.12		
KMNA211	KOMANI	VDJA211	VDEJES	220	18	0	0	0.95	1.11		
TRNA211	TIRANE	VDJA211	VDEJES	220	22	0	0	0.95	1.12		
TRNA211	TIRANE	VDJA211	VDEJES	220	22	0	0	0.95	1.12		
KASA211	KASHAR	RRAA211	RRASHBULL	220	19	1	2	0.94	1.12	1.02	1.1
BRRA211	BURREL 2	ELBA211	ELBASAN	220	22	0	0	0.95	1.12		
ELBA211	ELBASAN	TRNA211	TIRANE	220	21	0	0	0.95	1.12		
ELBA211	ELBASAN	TRNA211	TIRANE	220	21	0	0	0.95	1.12		
EL4A211	ELBASAN4	ELBA211	ELBASAN	220	21	0	0	0.95	1.12		
EL4A211	ELBASAN4	ELBA211	ELBASAN	220	21	0	0	0.95	1.12		
KASA211	KASHAR	TRNA211	TIRANE	220	21	0	0	0.95	1.12		
FRIA211	FIER	RRAA211	RRASHBULL	220	19	0	0	0.95	1.12		
ELBA211	ELBASAN	KCVA211	Kucove	220	20	0	0	0.95	1.12		
FRIA211	FIER	VTPA211	Vlore TPP	220	19	0	0	0.95	1.12		
FRIA211	FIER	VTPA211	Vlore TPP	220	19	0	0	0.95	1.12		
FRIA211	FIER	KCVA211	Kucove	220	21	0	0	0.95	1.12		
KA4G111	KARDIA	ZEMA111	ZEMLAJ	400	17	0	0	0.95	1.11		
KASA111	Kashar	PDGT111	PODGORICA	400	20	0	0	0.95	1.11		
PDGT211	PODGORICA	VDJA211	VDEJES	220	30	0	0	0.95	1.13		
BL1V111	BLAGOEVGRAD	TH2G111	THESSALONIKI	400	15	0	0	0.95	1.12		
KASA111	Kashar	KSBK111	KOSOVO B	400	15	0	0	0.95	1.11		
FRZA211	FIERZE	PR2K211	PRIZREN-II	220	25	0	0	0.95	1.12		
KSBK111	KOSOVO B	NI1J110	NIS	400	21	0	0	0.95	1.12		
BESK211	BESIANA	KRUJ210	KRUSEVAC	220	22	0	0	0.95	1.12		
KSBK111	KOSOVO B	PJ3K111	PEJA III	400	21	0	0	0.95	1.12		
FR2K211	FERIZAJ II	KSAK211	KOSOVO A	220	21	0	0	0.95	1.12		
FR2K211	FERIZAJ II	KSAK211	KOSOVO A	220	21	0	0	0.95	1.12		
BESK211	BESIANA	KSBK211	KOSOVO B	220	22	0	0	0.94	1.12		
KSBK211	KOSOVO B	PS4K211	PRISHTINA	220	21	0	0	0.95	1.12		
KSBK211	KOSOVO B	PS4K211	PRISHTINA	220	21	0	0	0.95	1.12		
FRNK211	FERRONIKEL	GLLK211	GLLOGOVC	220	21	0	0	0.95	1.12		
FRNK211	FERRONIKEL	GLLK211	GLLOGOVC	220	21	0	0	0.95	1.12		
GLLK211	GLLOGOVC	KSBK211	KOSOVO B	220	21	0	0	0.95	1.12		
GLLK211	GLLOGOVC	KSBK211	KOSOVO B	220	21	0	0	0.95	1.12		
GLLK211	GLLOGOVC	PR2K211	PRIZREN-II	220	21	0	0	0.95	1.12		
KSAK211	KOSOVO A	KSBK211	KOSOVO B	220	21	0	0	0.95	1.12		
KSAK211	KOSOVO A	KSBK211	KOSOVO B	220	21	0	0	0.95	1.12		
PJ3K111	PEJA III	RIBT111	RIBAREVINA	400	21	0	0	0.94	1.12		
KSBK111	KOSOVO B	SK4Y111	SKOPJE 4	400	21	0	0	0.95	1.12		
PDGT111	PODGORICA	TR1W110	RP TREBINJE	400	14	0	0	0.93	1.11		
NI1J110	NIS	SO1V111	SOFIA ZAPAD	400	21	0	0	0.95	1.12		
DUBY111	DUBROVO	TH2G111	THESSALONIKI	400	21	0	0	0.95	1.11		
KMOV111	CH. MOGILA	SHTY111	SHTIP	400	15	0	0	0.95	1.12		

Table A 4.2 Year 2010 Summary of Security Analysis Transformer Contingencies

Faulted element				Vnom1	Vnom2	Violation			Voltage profile		Maximum overload	
End 1		End 2										
Code	Name	Code	Name	kV	kV	Nodes	Lines	Tranf.	Vmin [p.u.]	Vmax [p.u.]	Lines	Tranf.
EL4A111	ELBASAN4	EL4A211	"AT2 "	400	220	19	0	0	0.95	1.11		
KASA111	Kashar	KASA211	"AT4 "	400	220	21	0	0	0.95	1.12		
ZEMA111	ZEMLAK	ZEMA311	"AT2 "	400	110	21	0	0	0.95	1.12		
BRRA211	BURREL 2	BRRA311	"AT1 "	220	110	22	0	1	0.95	1.12		1.05
ELBA211	ELBASAN	ELBA311	"AT-1"	220	110	21	0	0	0.95	1.12		
FRIA211	FIER	FRIA311	"AT2 "	220	110	19	0	2	0.95	1.12		1.14
FRZA211	FIERZE	FRZA311	"AT2 "	220	110	21	0	0	0.95	1.12		
KASA211	KASHAR	KASA311	"AT2 "	220	110	21	0	1	0.95	1.12		1.11
KCVA211	Kucove	KCVA311	"AT1 "	220	110	21	0	0	0.95	1.12		
TRNA211	TIRANE	TRNA311	"AT2 "	220	110	21	0	3	0.95	1.12		1.11
VDJA211	VDEJES	VDJA311	"AT1 "	220	110	18	0	0	0.95	1.11		
VTPA211	Vlore TPP	VTPA311	"AT1 "	220	110	19	0	3	0.95	1.12		1.08
PJ3K111	PEJA III	PJ3K311	"ATR1"	400	110	21	0	0	0.95	1.12		
FR2K211	FERIZAJ II	FR2K311	"ATR1"	220	110	21	0	0	0.95	1.12		
FR2K211	FERIZAJ II	FR2K311	"ATR2"	220	110	21	0	0	0.95	1.12		
GLLK211	GLLOGOVC	GLLK311	"ATR1"	220	110	21	0	0	0.95	1.12		
KSAK211	KOSOVO A	KSAK311	"ATR1"	220	110	21	0	0	0.95	1.12		
KSAK211	KOSOVO A	KSAK311	"ATR2"	220	110	21	0	0	0.95	1.12		
KSAK211	KOSOVO A	KSAK311	"ATR3"	220	110	21	0	0	0.95	1.12		

4.2 Results of Static Security analysis for year 2015

Table A 4.3 Year 2015 Summary of Security Analysis Line Contingencies

Faulted element				Vnom	Violation			Voltage profile		Maximum overload	
End 1		End 2									
Code	Name	Code	Name	kV	Nodes	Lines	Tranf.	Vmin [p.u.]	Vmax [p.u.]	Line	Tranf.
EL4A111	ELBASAN4	ZEMA111	ZEMLAK	400	17	0	0	0.93	1.11		
EL4A111	ELBASAN4	KASA111	Kashar	400	16	0	0	0.94	1.11		
KASA111	Kashar	PDGT111	PODGORICA	400	16	0	0	0.94	1.11		
KASA111	Kashar	KSBK111	KOSOVO B	400	13	0	0	0.93	1.11		
BRRA211	BURREL 2	FRZA211	FIERZE	220	17	0	0	0.93	1.11		
FRZA211	FIERZE	KMNA211	KOMANI	220	17	0	0	0.94	1.11		
FRZA211	FIERZE	TRNA211	TIRANE	220	17	0	0	0.94	1.11		
KASA211	KASHAR	KMNA211	KOMANI	220	17	0	0	0.94	1.11		
KMNA211	KOMANI	VDJA211	VDEJES	220	17	0	0	0.94	1.11		
TRNA211	TIRANE	VDJA211	VDEJES	220	17	0	0	0.94	1.11		
TRNA211	TIRANE	VDJA211	VDEJES	220	17	0	0	0.94	1.11		
KASA211	KASHAR	RRAA211	RRASHBULL	220	17	5	3	0.93	1.11	1.67	1.06
BRRA211	BURREL 2	ELBA211	ELBASAN	220	17	0	0	0.94	1.11		
ELBA211	ELBASAN	TRNA211	TIRANE	220	17	0	0	0.94	1.11		
EL4A211	ELBASAN4	ELBA211	ELBASAN	220	17	0	0	0.94	1.11		
KASA211	KASHAR	TRNA211	TIRANE	220	17	0	0	0.94	1.11		
FRIA211	FIER	RRAA211	RRASHBULL	220	17	0	0	0.93	1.11		
ELBA211	ELBASAN	KCVA211	Kucove	220	17	3	0	0.92	1.11	1.43	
FRIA211	FIER	VTPA211	Vlore TPP	220	17	0	0	0.93	1.11		
FRIA211	FIER	KCVA211	Kucove	220	17	2	0	0.93	1.11	1.12	
FRZA211	FIERZE	PR2K211	PRIZREN-II	220	16	0	0	0.94	1.11		
KA4G111	KARDIA	ZEMA111	ZEMLAK	400	18	0	0	0.93	1.11		
NI1J110	NIS	SO1V111	SOFIA ZAPAD	400	17	0	0	0.94	1.11		
BBAJ210	BAJINA BASTA	PLJT211	PLJEVLJA	220	17	0	0	0.94	1.11		

Faulted element				Vnom	Violation			Voltage profile		Maximum overload	
End 1		End 2			kV	Nodes	Lines	Tranf.	Vmin [p.u.]	Vmax [p.u.]	Line
Code	Name	Code	Name								
KSBK111	KOSOVO B	NI1J110	NIS	400	16	0	0	0.94	1.11		
FR2K111	Ferizaj	KSBK111	KOSOVO B	400	17	0	0	0.94	1.11		
KSBK111	KOSOVO B	PJ3K111	PEJA III	400	17	0	0	0.93	1.11		
PJ3K111	PEJA III	RIBT111	RIBAREVINA	400	17	0	0	0.94	1.11		
FR2K111	Ferizaj	SK4Y111	SKOPJE 4	400	17	0	0	0.94	1.11		
BESK211	BESIANA	KRUJ210	KRUSEVAC	220	17	0	0	0.94	1.11		
FR2K211	FERIZAJ II	KSAK211	KOSOVO A	220	17	0	0	0.94	1.11		
FR2K211	FERIZAJ II	KSAK211	KOSOVO A	220	17	0	0	0.94	1.11		
BESK211	BESIANA	KSBK211	KOSOVO B	220	18	0	0	0.94	1.11		
KSBK211	KOSOVO B	PS4K211	PRISHTINA	220	17	0	0	0.94	1.11		
KSBK211	KOSOVO B	PS4K211	PRISHTINA	220	17	0	0	0.94	1.11		
FRNK211	FERRONIKEL	GLLK211	GLLOGOVC	220	17	0	0	0.94	1.11		
FRNK211	FERRONIKEL	GLLK211	GLLOGOVC	220	17	0	0	0.94	1.11		
GLLK211	GLLOGOVC	KSBK211	KOSOVO B	220	17	0	0	0.94	1.11		
GLLK211	GLLOGOVC	KSBK211	KOSOVO B	220	17	0	0	0.94	1.11		
GLLK211	GLLOGOVC	PR2K211	PRIZREN-II	220	17	0	0	0.94	1.11		
KSAK211	KOSOVO A	KSBK211	KOSOVO B	220	17	0	0	0.94	1.11		
KSAK211	KOSOVO A	KSBK211	KOSOVO B	220	17	0	0	0.94	1.11		
PDGT111	PODGORICA	TR1W110	RP TREBINJE	400	14	0	0	0.93	1.11		
PDGT211	PODGORICA	VDJA211	VDEJES	220	18	0	0	0.94	1.11		
BL1V111	BLAGOEVRAD	TH2G111	THESSALONIKI	400	10	0	0	0.94	1.11		
CMOV111	CH. MOGILA	SHTY111	SHTIP	400	12	0	0	0.94	1.11		
BITY111	BITOLA	FLOG111	Florina	400	12	0	0	0.94	1.11		
DUBY111	DUBROVO	TH2G111	THESSALONIKI	400	17	0	0	0.94	1.11		

Table A 4.4 Year 2015 Summary of Security Analysis Transformer Contingencies

Faulted element				Vnom1	Vnom2	Violation			Voltage profile		Maximum overload	
End 1		End 2				kV	kV	Nodes	Lines	Tranf.	Vmin [p.u.]	Vmax [p.u.]
Code	Name	Code	Name									
EL4A111	ELBASAN4	EL4A211	"AT2 "	400	220	17	0	1	0.94	1.11		1.11
KASA111	Kashar	KASA211	"AT3 "	400	220	17	0	2	0.92	1.11		1.2
KASA111	Kashar	KASA211	"AT4 "	400	220	17	0	2	0.92	1.11		1.2
ZEMA111	ZEMLAK	ZEMA311	"AT1 "	400	110	17	0	0	0.94	1.11		
BRR211	BURREL 2	BRR311	"AT2 "	220	110	17	0	1	0.94	1.11		1.11
ELBA211	ELBASAN	ELBA311	"AT-1"	220	110	17	0	0	0.93	1.11		
FRIA211	FIER	FRIA311	"AT3 "	220	110	17	0	0	0.94	1.11		
FRZA211	FIERZE	FRZA311	"AT2 "	220	110	17	0	0	0.94	1.11		
KASA211	KASHAR	KASA311	"AT1 "	220	110	17	0	0	0.94	1.11		
KASA211	KASHAR	KASA311	"AT2 "	220	110	17	0	0	0.94	1.11		
KASA211	KASHAR	KASA311	"AT5 "	220	110	17	0	2	0.92	1.11		1.2
KCVA211	Kucove	KCVA311	"AT1 "	220	110	17	0	0	0.94	1.11		
KCVA211	Kucove	KCVA311	"AT2 "	220	110	17	0	0	0.94	1.11		
RRAA211	RRASHBULL	RRAA311	"AT1 "	220	110	17	0	0	0.94	1.11		
RRAA211	RRASHBULL	RRAA311	"AT2 "	220	110	17	0	0	0.94	1.11		
TRNA211	TIRANE	TRNA311	"AT1 "	220	110	17	0	0	0.94	1.11		
TRNA211	TIRANE	TRNA311	"AT2 "	220	110	17	0	0	0.94	1.11		
VDJA211	VDEJES	VDJA311	"AT3 "	220	110	17	0	0	0.94	1.11		
VTPA211	Vlore TPP	VTPA311	"AT1 "	220	110	17	0	0	0.94	1.11		
FR2K111	Ferizaj	FR2K211	"ATR3"	400	220	17	0	0	0.94	1.11		
KSBK111	KOSOVO B	KSBK211	"ATR3"	400	220	17	0	0	0.94	1.11		
PJ3K111	PEJA III	PJ3K311	"ATR1"	400	110	17	0	0	0.94	1.11		
FR2K211	FERIZAJ II	FR2K311	"ATR2"	220	110	17	0	0	0.93	1.11		
GLLK211	GLLOGOVC	GLLK311	"ATR1"	220	110	17	0	0	0.94	1.11		
KSAK211	KOSOVO A	KSAK311	"ATR2"	220	110	17	0	0	0.94	1.11		
PR2K211	PRIZREN-II	PR2K311	"ATR1"	220	110	17	0	0	0.94	1.11		
PS4K211	PRISHTINA	PS4K311	"ATR1"	220	110	17	0	0	0.94	1.11		

4.3 Results of Static Security analysis for year 2020

Table A 4.5 Year 2020 Summary of Security Analysis Line Contingencies

Faulted element				Vnom kV	Violation			Voltage profile		Maximum overload	
End 1		End 2			Nodes	Lines	Tranf.	Vmin [p.u.]	Vmax [p.u.]	Lines	Tranf.
Code	Name	Code	Name								
EL4A111	ELBASAN4	ZEMA111	ZEMLAKE	400	29	2	8	0.89	1.11	1.01	1.04
EL4A111	ELBASAN4	KASA111	Kashar	400	19	1	8	0.93	1.11	1.01	1.06
KASA111	Kashar	PDGT111	PODGORICA	400	19	0	8	0.92	1.11	1.05	
KASA111	Kashar	KSBK111	KOSOVO B	400	29	0	5	0.91	1.11	1.05	
ZEMA111	ZEMLAKE	KA4G111	KARDIA	400	71	4	8	0.81	1.11	1.11	1.07
BRAA211	BURREL 2	FRZA211	FIERZE	220	25	3	8	0.88	1.11	1.07	1.12
FRZA211	FIERZE	KMNA211	KOMANI	220	20	0	8	0.93	1.11	1.03	
FRZA211	FIERZE	TRNA211	TIRANE	220	21	2	5	0.92	1.11	1.05	1.03
KASA211	KASHAR	KMNA211	KOMANI	220	19	1	5	0.92	1.11	1.13	1.06
KMNA211	KOMANI	VDJA211	VDEJES	220	22	1	5	0.92	1.11	1.02	1.06
TRNA211	TIRANE	VDJA211	VDEJES	220	19	0	8	0.92	1.11	1.04	
KASA211	KASHAR	RRAA211	RRASHBULL	220	23	7	6	0.92	1.11	2.2	1.32
BRAA211	BURREL 2	ELBA211	ELBASAN	220	20	0	8	0.93	1.11	1.02	
ELBA211	ELBASAN	TRNA211	TIRANE	220	18	0	8	0.93	1.11	1.05	
EL4A211	ELBASAN4	ELBA211	ELBASAN	220	18	0	8	0.93	1.11	1.04	
KASA211	KASHAR	TRNA211	TIRANE	220	20	0	5	0.93	1.11	1.13	
FRIA211	FIER	RRAA211	RRASHBULL	220	18	1	8	0.93	1.11	1.03	1.13
ELBA211	ELBASAN	KCVA211	Kucove	220	23	5	11	0.93	1.11	1.54	1.08
FRIA211	FIER	VTPA211	Vlore TPP	220	20	0	8	0.93	1.11	1.04	
FRIA211	FIER	KCVA211	Kucove	220	19	2	8	0.93	1.11	1.11	1.05
FRZA211	FIERZE	PR2K211	PRIZREN-II	220	11	0	8	0.93	1.11	1.04	
RRAA311	RRASHBULL	SHKA311	SHKOZET	110	18	1	8	0.93	1.11	1.16	1.04
BSHA311	Bushat	SH2A311	Shkodra 2	110	18	0	8	0.93	1.11	1.04	
KASA311	KASHAR	KS1A311	KASHAR 1	110	19	0	8	0.93	1.11	1.06	
KASA311	KASHAR	SLTA311	SELITE	110	19	1	5	0.93	1.11	1.16	1.06
NI1J110	NIS	SO1V111	SOFIA ZAPAD	400	18	0	8	0.93	1.11	1.04	
KSBK111	KOSOVO B	NI1J110	NIS	400	17	0	8	0.93	1.11	1.05	
FR2K111	Ferizaj	KSBK111	KOSOVO B	400	20	0	8	0.93	1.11	1.04	
KSBK111	KOSOVO B	PJ3K111	PEJA III	400	20	0	8	0.92	1.11	1.04	
PJ3K111	PEJA III	RIBT111	RIBAREVINA	400	20	0	8	0.92	1.11	1.04	
FR2K111	Ferizaj	SK4Y111	SKOPJE 4	400	21	0	8	0.92	1.11	1.04	
BESK211	BESIANA	KRUJ210	KRUSEVAC	220	20	0	8	0.93	1.11	1.04	
FR2K211	FERIZAJ II	KSAK211	KOSOVO A	220	17	0	8	0.93	1.11	1.04	
FR2K211	FERIZAJ II	KSAK211	KOSOVO A	220	17	0	8	0.93	1.11	1.04	
BESK211	BESIANA	KSBK211	KOSOVO B	220	21	0	8	0.93	1.11	1.04	
KSBK211	KOSOVO B	PS4K211	PRISHTINA	220	18	0	8	0.93	1.11	1.04	
KSBK211	KOSOVO B	PS4K211	PRISHTINA	220	18	0	8	0.93	1.11	1.04	
FRNK211	FERRONIKEL	GLLK211	GLLOGOVC	220	18	0	8	0.93	1.11	1.04	
GLLK211	GLLOGOVC	KSBK211	KOSOVO B	220	18	0	8	0.93	1.11	1.04	
GLLK211	GLLOGOVC	PR2K211	PRIZREN-II	220	19	0	8	0.93	1.11	1.05	
KSAK211	KOSOVO A	KSBK211	KOSOVO B	220	18	0	8	0.93	1.11	1.04	
PDGT111	PODGORICA	TR1W110	RP TREBINJE	400	20	0	8	0.92	1.11	1.05	
PDGT211	PODGORICA	VDJA211	VDEJES	220	14	0	8	0.93	1.11	1.04	
BL1V111	BLAGOEVRAD	TH2G111	THESSALONIKI	400	20	0	8	0.93	1.11	1.04	
CMOV111	CH. MOGILA	SHTY111	SHTIP	400	18	0	8	0.93	1.11	1.04	
BITY111	BITOLA	FLOG111	Florina	400	19	0	8	0.93	1.11	1.04	
DUBY111	DUBROVO	TH2G111	THESSALONIKI	400	17	0	8	0.93	1.11	1.04	

Table A 4.6 Year 2020 Summary of Security Analysis Transformer Contingencies

Faulted element				Vnom1	Vnom2	Violation			Voltage profile		Maximum overload	
End 1		End 2				Nodes	Lines	Tranf.	Vmin [p.u.]	Vmax [p.u.]	Lines	Tranf.
Code	Name	Code	Name	kV	kV							
EL4A111	ELBASAN4	EL4A211	"AT1 "	400	220	21	1	8	0.92	1.11	1	1.05
EL4A111	ELBASAN4	EL4A211	"AT2 "	400	220	20	0	8	0.92	1.11	1.05	
KASA111	Kashar	KASA211	"AT3 "	400	220	22	0	5	0.92	1.11	1.05	
ZEMA111	ZEMLAK	ZEMA311	"AT2 "	400	110	21	0	9	0.93	1.11	1.13	
BRRA211	BURREL 2	BRRA311	"AT1 "	220	110	22	0	9	0.91	1.11	1.4	
ELBA211	ELBASAN	ELBA311	"AT-2"	220	110	18	0	10	0.93	1.11	1.11	
FRIA211	FIER	FRIA311	"AT1 "	220	110	18	0	10	0.93	1.11	1.18	
FRZA211	FIERZE	FRZA311	"AT1 "	220	110	20	0	9	0.92	1.11	1.5	
KASA211	KASHAR	KASA311	"AT2 "	220	110	20	0	7	0.92	1.11	1.25	
KCVA211	Kucove	KCVA311	"AT1 "	220	110	18	0	8	0.93	1.11	1.05	
RRAA211	RRASHBULL	RRAA311	"AT2 "	220	110	18	1	7	0.93	1.11	1.01	1.59
TRNA211	TIRANE	TRNA311	"AT1 "	220	110	22	0	7	0.92	1.11	1.28	
VDJA211	VDEJES	VDJA311	"AT2 "	220	110	20	0	10	0.93	1.11	1.35	
VTPA211	Vlore TPP	VTPA311	"AT1 "	220	110	18	0	11	0.93	1.11	1.18	
FR2K111	Ferizaj	FR2K211	"ATR3"	400	220	20	0	8	0.93	1.11	1.04	
KSBK111	KOSOVO B	KSBK211	"ATR2"	400	220	18	0	8	0.93	1.11	1.04	
PJ3K111	PEJA III	PJ3K311	"ATR1"	400	110	17	0	8	0.93	1.11	1.04	
FR2K211	FERIZAJ II	FR2K311	"ATR1"	220	110	18	0	8	0.93	1.11	1.04	
GLLK211	GLLOGOVC	GLLK311	"ATR1"	220	110	18	0	8	0.93	1.11	1.04	
KSAK211	KOSOVO A	KSAK311	"ATR1"	220	110	18	0	8	0.93	1.11	1.04	
PR2K211	PRIZREN-II	PR2K311	"ATR1"	220	110	18	0	8	0.93	1.11	1.04	
PS4K211	PRISHTINA	PS4K311	"ATR1"	220	110	18	0	8	0.93	1.11	1.04	

5 Annex 5 Construction of 400 kV lines

Table A 5.1 Detailed unit costs of 400 kV single circuit / twin bundle

400 kV Single circuit / twin bundle	Meas. Unit	Quantity	Unit cost	Average Total Cost	%	Foreign cost	%	Local cost
Supply and local transport								
Towers	kg	22,000	1.1	€ 24,200	90%	€ 21,780	10%	€ 2,420
Conductors	m	6,000	6	€ 36,000	90%	€ 32,400	10%	€ 3,600
Insulators 160	n	284	14	€ 3,969	90%	€ 3,572	10%	€ 397
Insulators 210	n	54	21	€ 1,134	90%	€ 1,021	10%	€ 113
Conductor fittings (suspension)	n	9	220	€ 1,980	90%	€ 1,782	10%	€ 198
Conductor fittings (tension)	n	3	650	€ 1,950	90%	€ 1,755	10%	€ 195
Earthwire	m	1,000	2	€ 2,000	90%	€ 1,800	10%	€ 200
Earthwire fittings	n	3	75	€ 225	90%	€ 203	10%	€ 23
Optical Ground Wire (OPGW)	m	1,000	6	€ 6,000	90%	€ 5,400	10%	€ 600
OPGW fittings	n	3	150	€ 450	90%	€ 405	10%	€ 45
Midspan joints	n	6	50	€ 300	90%	€ 270	10%	€ 30
Spacers	n	45	25	€ 1,125	90%	€ 1,013	10%	€ 113
Accessories	n	1	500	€ 500	90%	€ 450	10%	€ 50
				€ 79,833		€ 71,850		€ 7,983
Works								
Line route and profile	km	50	55	€ 2,750	57%	€ 1,568	43%	€ 1,183
Site yard mobilization	n	1	1,000	€ 1,000	57%	€ 570	43%	€ 430
Excavation & earthing installation	mc	300	15	€ 4,500	57%	€ 2,565	43%	€ 1,935
Concreting	mc	40	180	€ 7,200	57%	€ 4,104	43%	€ 3,096
Tower erection	h	733	22	€ 16,133	57%	€ 9,196	43%	€ 6,937
Stringing and sagging	h	1,200	24	€ 28,800	57%	€ 16,416	43%	€ 12,384
Accessories installation	h	100	27	€ 2,700	57%	€ 1,539	43%	€ 1,161
Damages	n	1	5,000	€ 5,000	0%	€ 0	100%	€ 5,000
				€ 68,083		€ 35,958		€ 32,126
Engineering								
Works direction	h	50	60	€ 3,000	57%	€ 1,710	43%	€ 1,290
design	h	150	60	€ 9,000	57%	€ 5,130	43%	€ 3,870
				€ 12,000		€ 6,840		€ 5,160
Other costs								
site office		68,083	3%	€ 2,043	10%	€ 204	90%	€ 1,838
International transport		79,833	3%	€ 2,395	100%	€ 2,395	0%	€ 0
Transport insurance		79,833	1%	€ 798	100%	€ 798	0%	€ 0
Travels, training, relations with local authorities		147,916	2%	€ 2,958	57%	€ 1,686	43%	€ 1,272
bank costs		147,916	3%	€ 4,437	57%	€ 2,529	43%	€ 1,908
bond and guarantee		147,916	1%	€ 1,479	57%	€ 843	43%	€ 636
				€ 14,111		€ 8,456		€ 5,654
				€ 174,027		€ 123,104		€ 50,924
Commissioning		€ 174,027	1%	€ 1,740	57%	€ 992	43%	€ 748
Right of way		€ 174,027	4%	€ 6,961	0%	0	100%	€ 6,961
Unexpected costs		€ 174,027	10%	€ 17,403	50%	€ 8,701	50%	€ 8,701
TOTAL				€ 200,131		€ 132,797		€ 67,334

Table A 5.2 Detailed unit costs of 400 kV single circuit / twin bundle

400 kV Double circuit / twin bundle	Meas. Unit	Quantity	Unit cost	Average Total Cost	%	Foreign cost	%	Local cost
Supply and transport								
Conductors	m	6,000	6	€ 36,000	90%	€ 32,400	10%	€ 3,600
Insulators 160	n	189	14	€ 2,646	90%	€ 2,381	10%	€ 265
Insulators 210	n	54	21	€ 1,134	90%	€ 1,021	10%	€ 113
Conductor fittings (suspension)	n	9	220	€ 1,980	90%	€ 1,782	10%	€ 198
Conductor fittings (tension)	n	3	650	€ 1,950	90%	€ 1,755	10%	€ 195
Optical Ground Wire (OPGW)	m	1,000	6	€ 6,000	90%	€ 5,400	10%	€ 600
OPGW fittings	n	3	150	€ 450	90%	€ 405	10%	€ 45
Midspan joints	n	6	50	€ 300	90%	€ 270	10%	€ 30
Spacers	n	45	25	€ 1,125	90%	€ 1,013	10%	€ 113
Accessories	n	1	500	€ 500	90%	€ 450	10%	€ 50
				€52,085		€46,877		€5,209
Works								
Stringing and sagging	h	,200	24	€ 28,800	57%	€ 16,416	43%	€ 12,384
Accessories installation	h	50	28	€ 1,400	57%	€ 798	43%	€ 602
				€30,200		€17,214		€12,986
TOTAL				€82,285		€64,091		€18,195

Table A 5.3 400 kV Substation Bay Cost air-insulated solution

400 kV Substation Bay Cost air-insulated solution	Measure	Quantity	Unit cost	Total Cost	%	Foreign cost	%	Local cost
Electrical components								
Line Bay components (CB, Disc., CT, VT, SA)	n	2	215,000	€ 430,000	90%	€ 387,000	10%	€ 43,000
				€430,000		€387,000		€43,000
Works								
structural works (per bay)	n	2	15,000	€ 30,000	10%	€ 3,000	90%	€ 27,000
installation (per bay)	n	2	38,000	€ 76,000	10%	€ 7,600	90%	€ 68,400
civil works (per bay)	n	2	62,000	€ 124,000	10%	€ 12,400	90%	€ 111,600
				€230,000		€23,000		€207,000
TOTAL				€660,000		€410,000		€250,000