

Anexo 14

Salidas del REGMHTCB8: Medio Hidrotérmico con Carbón





ETESA
Empresa de Transmisión Eléctrica S.A.

Plan de Expansión del SIN 2008

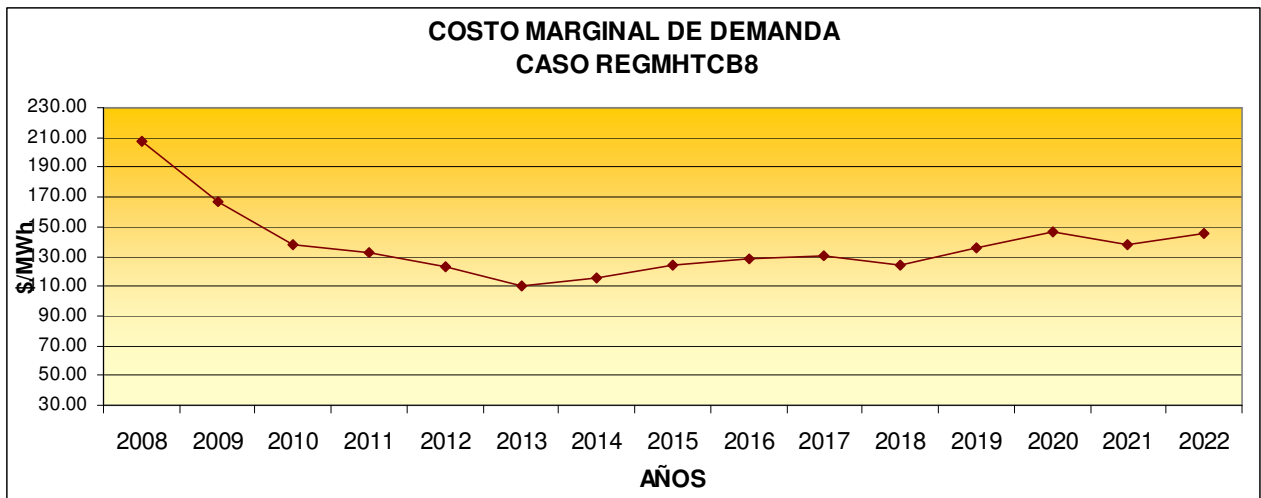
Sistema de Generación

CAPACIDAD FIRME (MW) - ALTER.SIN GAS NATURAL.DEN.MEDIA			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Caso MSIGHT CONVENCIONAL / CASO IF 02 DE ABRIL 2008	Capacidad Efectiva	Factor Disponib.															
MIT CBS																	
EGE FORTUNA	300		284	284	284	284	284	284	284	284	284	284	284	284	284	284	284
Fortuna	300		284	284	284	284	284	284	284	284	284	284	284	284	284	284	284
AES PANAMA	482		305	305	305	305	305	305	305	305	305	305	305	305	305	305	305
Bayano	260		160	160	160	160	160	160	160	160	160	160	160	160	160	160	160
La Estrella	47		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Los Valles	55		18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Carjillones	120		112	112	112	112	112	112	112	112	112	112	112	112	112	112	112
BLM CORP.	280		252	252	252	263	263	263	263	263	263	263	263	263	263	263	263
Bahia las Minas 2	40	0.83	33	33	33	0	0	0	0	0	0	0	0	0	0	0	0
Bahia las Minas 3	40	0.71	28	28	28	0	0	0	0	0	0	0	0	0	0	0	0
Bahia las Minas 4	40	0.89	36	36	36	0	0	0	0	0	0	0	0	0	0	0	0
Bahia las Minas Carbón 2	40	0.90	0	0	0	36	36	36	36	36	36	36	36	36	36	36	36
Bahia las Minas Carbón 3	40	0.90	0	0	0	36	36	36	36	36	36	36	36	36	36	36	36
Bahia las Minas Carbón 4	40	0.90	0	0	0	36	36	36	36	36	36	36	36	36	36	36	36
Ciclo Combinado BLM Diesel Marino	160	0.97	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155
AUTORIDAD DEL CANAL DE PANAMA (ACP)	175		80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
ACP	175		80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
TURBINAS DE GAS PANAMA (EGESA)	43		39	39	39	39	39	39	39	39	39	39	0	0	0	0	0
EGESA	43	0.90	39	39	39	39	39	39	39	39	39	39	0	0	0	0	0
COPESA	44		43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
Copesa	44	0.98	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
PAN-AM GENERATING	96		92	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Pan-Am	96	0.96	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92
PEDREGAL POWER PROJECT	53.5		52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Pacora PP	53.5	0.97	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
PROYECTOS HIDROELECTRICOS	695		0	0	0	164	240	347	350	369	396	420.92	420.92	434.92	434.92	434.92	434.92
Gualaca 1 - Gualaca	28	22.2	0	0	0	22	22	22	22	22	22	22	22	22	22	22	22
Gualaca 2 - Lorena	36	30.62	0	0	0	0	31	31	31	31	31	31	31	31	31	31	31
Gualaca 3 - Prudencia	56	50	0	0	0	0	50	50	50	50	50	50	50	50	50	50	50
Pedregalito	20	3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santamaria	31	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pando	33	20	0	0	0	0	0	0	20	20	20	20	20	20	20	20	20
Monte Lirio	52	27	0	0	0	0	0	0	27	27	27	27	27	27	27	27	27
El Alto	60	24.7	0	0	0	0	0	0	0	0	25	25	25	25	25	25	25
Bonyic	30	18.5	0	0	0	19	19	19	19	19	19	19	19	19	19	19	19
Bajo Mina	52	29	0	0	0	29	29	29	29	29	29	29	29	29	29	29	29
Changuinola 75	223	118.9	0	0	0	119	119	119	119	119	119	119	119	119	119	119	119
Changuinola 140	132	106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Changuinola 220	126	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mendre	18	4	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4
Tabasará II	35	16	0	0	0	16	16	16	16	16	16	16	16	16	16	16	16
Bañon	86	57	0	0	0	0	57	57	57	57	57	57	57	57	57	57	57
Barro Blanco	20	14	0	0	0	0	0	0	0	0	0	14	14	14	14	14	14
Sindigo	10	3	0	0	0	0	0	0	3	3	3	3	3	3	3	3	3
PROYECTOS TERMoeLECTRICOS	3151		0	120	292	292	504	504	504	504	504	717	717	717	717	929	929
Pana Power 1	68	0.91	0	0	62	62	62	62	62	62	62	62	62	62	62	62	62
Turbina de Gas Diesel 1	100	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turbina de Gas Diesel 2	100	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ciclo Combinado 150	150	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ciclo Combinado 151	150	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ciclo Combinado 250	250	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ciclo Combinado 250	250	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motores Media Velocidad-1	100	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motores Media Velocidad-2	100	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motores Media Velocidad-3	100	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motores Media Velocidad-4	100	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motores Media Velocidad-1F	50	0.93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motores Media Velocidad-2F	50	0.93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gatúatico	130	0.85	0	0	111	111	111	111	111	111	111	111	111	111	111	111	111
Tgirral	50	0.85	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43
Tbalboa	83	0.93	0	77	77	77	77	77	77	77	77	77	77	77	77	77	77
Carbón 1a	150	0.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbón 1b	150	0.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbón 2a	250	0.85	0	0	0	0	213	213	213	213	213	213	213	213	213	213	213
Carbón 2b	250	0.85	0	0	0	0	0	0	0	0	0	213	213	213	213	213	213
Carbón 2c	250	0.85	0	0	0	0	0	0	0	0	0	0	0	0	0	213	213
CARBÓN GLOBELEG	270	0.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
POTENCIA FIRME			1147	1267	1439	1614	1902	2009	2012	2032	2059	2083	2257	2271	2271	2484	2484
Demanda Máxima de Generación			1081	1185	1281	1357	1431	1506	1581	1657	1738	1823	1912	2005	2103	2203	2306
BALANCE			66	81	158	257	471	503	431	375	321	261	345	266	169	281	178
RESERVA			6.13%	6.87%	12.30%	18.95%	32.90%	33.41%	27.26%	22.60%	18.46%	14.29%	18.06%	13.27%	8.02%	12.77%	7.74%



CUADRO No.A2.1: Costos marginales del caso REGMHTCB8

COSTO MARGINAL DE DEMANDA EN \$/MWh													
Año	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic	Prom
2008	198.33	201.15	199.63	268.77	262.72	211.23	204.16	200.65	194.18	189.75	178.97	182.29	207.65
2009	176.53	181.63	199.47	225.63	194.60	168.02	154.96	155.08	145.71	136.62	129.74	131.59	166.63
2010	130.73	137.58	141.86	159.91	156.50	140.21	133.54	135.88	131.08	132.39	127.01	127.40	137.84
2011	129.70	137.51	163.88	171.74	144.64	128.16	122.24	122.66	118.88	118.78	119.55	118.79	133.04
2012	119.57	128.17	152.69	179.37	149.90	118.17	112.88	107.84	99.09	100.78	99.20	108.15	122.98
2013	100.43	122.19	137.81	175.80	144.58	106.20	86.62	91.94	80.77	89.56	86.11	95.91	109.83
2014	114.21	128.75	138.43	155.65	137.67	115.47	103.04	105.61	94.03	95.97	87.78	110.50	115.59
2015	124.14	134.48	149.81	157.81	136.95	127.63	112.29	115.85	104.81	103.90	105.85	117.17	124.22
2016	125.72	140.34	153.94	163.38	146.98	123.20	117.10	119.04	110.82	112.06	110.02	122.24	128.74
2017	135.19	143.83	159.77	177.96	157.73	135.21	123.58	113.55	97.23	95.57	103.92	121.80	130.44
2018	121.91	142.16	162.04	189.11	167.12	131.53	100.35	102.96	86.46	91.68	84.77	112.10	124.35
2019	131.16	152.62	182.13	188.59	177.60	144.10	124.25	121.02	97.55	93.47	99.07	114.32	135.49
2020	140.06	158.88	183.03	200.91	187.94	149.54	139.65	140.28	108.76	110.40	114.50	129.64	146.97
2021	134.13	164.35	188.74	185.44	172.09	131.36	123.89	126.85	95.97	101.31	105.92	121.80	137.65
2022	141.75	158.87	191.48	224.62	186.55	141.46	123.21	129.76	100.27	110.73	110.30	132.19	145.93
Prom	134.90	148.83	166.98	188.31	168.24	138.10	125.45	125.93	111.04	112.20	110.85	123.06	



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CUADRO No. A2.2: Informe final de generación del caso REGMHTCB8

CASO : REGMHTCB8															
Informe Final de Generación en GWh															
Planta	Total por año														
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Fortuna	1604.5	1544.5	1556.7	1791.9	1617.2	1634.9	1612.3	1645.7	1558.1	1609.2	1513.7	1514.1	1656.2	1593.9	1639.7
Bayano	542.2	516.41	562.43	755.44	508.81	423.76	556.1	405.41	495.59	579.59	462.16	412.89	587.3	458.74	466.88
La Estrella	224.65	246.53	259.73	244.94	252.7	259.13	253.74	240.25	247.09	226.85	256.69	241.85	233.3	241.35	267.96
Los Valles	275.38	297.85	292.18	286.83	294.4	302.92	291.21	277.64	295.78	266.34	295.97	281.8	281.08	279.13	308.5
Estí	902.24	905.64	913.57	927.03	900.46	895.05	909.3	906.85	901.72	896.02	899.36	891.52	912.86	885.82	917.76
Gualaca	0	0	0	183.43	178.67	177.56	180.75	180.04	179.14	178.26	178.82	177.15	181.31	176.18	181.89
Lorena	0	0	0	0	247.29	245.72	250.17	249.21	247.96	246.74	247.51	245.21	250.96	243.86	251.76
Prudencia	0	0	0	0	0	368.81	380.44	378.12	376.86	376.79	374.79	373.71	378.89	366.8	382.53
Pando	0	0	0	0	0	0	0	182.08	189.39	184.3	183.48	184.65	187.92	182.21	187.19
Chan I	0	0	0	1008.8	1266.6	1343.6	1295.4	1342	1268.8	1245.6	1244.1	1251.2	1276.4	1209.4	1349
Bonyic	0	0	0	172.03	171.67	177.59	173.15	178.6	168.36	165.73	171.26	165.79	170.3	168.68	170.8
Bjo Mina	0	0	0	0	349.71	347.17	354.33	345.13	351.62	354.19	350.6	352.13	348.27	347.15	354.85
Siindigo	0	0	0	0	0	0	57.76	55.46	59.827	56.527	56.499	54.987	53.655	57.783	56.884
El Alto	0	0	0	0	0	0	0	0	0	284.47	275.4	282.99	279.7	279.71	288.78
Mendre	0	0	0	114.25	115.06	111.25	115.54	116.1	115.56	108.02	108.16	108.41	108.1	112.93	114.69
Barro Blanco	0	0	0	0	0	0	0	0	0	0	0	98.441	102.46	99.289	106.31
Baitún	0	0	0	0	0	622.71	632.92	605.32	617.66	624.01	617.14	621.62	610.15	615.2	618.34
Monte Lirio	0	0	0	0	0	0	0	0	304.89	300.93	299.55	302.73	304.87	294.07	300.26
Tabasará II	0	0	0	0	165.95	161.22	169.83	156.13	171.5	172.76	166.49	193.81	207.44	196.16	208.37
BLM #2	198.23	86.687	0	0	0	0	0	0	0	0	0	0	0	0	0
BLM #3	197.07	83.86	0	0	0	0	0	0	0	0	0	0	0	0	0
BLM #4	195.62	83.849	0	0	0	0	0	0	0	0	0	0	0	0	0
Ciclo-C BLM	654.44	258.78	8.0792	23.468	19.535	24.416	0	7.8989	4.4259	4.7581	2.6952	4.6946	6.8261	1.9661	18.051
Copesa	70.06	12.887	0	0	1.2679	1.2679	0	0	0	0	0	0	0	0	4.6365
EGESA-TG	5.0632	3.6446	0	0	0	0	0	0	0	0	0	0	0	0	1.2558
PanAm	735.81	673.71	525.63	256.31	166.02	104.2	111.28	126.1	135.96	168.03	150.96	193.92	273.59	184.55	252.45
BLM-Carbón	0	0	946.08	946.08	931.57	889.94	912.04	923.27	923.52	920.73	871.38	887.6	913.36	888.79	888.81
PACORA-PP	421.8	418.5	409.43	296.21	184.36	135	153.55	167.94	188.89	176.68	153.29	197.09	235.96	203.87	224.08
ACP1	339.54	339.54	338.48	336.24	299.57	242.12	271.66	291.88	301.24	283.18	251.97	272.2	305.51	270.36	271.51
ACP 2	58.539	33.051	3.77	7.5535	6.1826	4.4423	2.2029	3.2155	4.5695	7.3925	8.429	10.68	11.576	10.031	13.242
ACP 3	3.0926	3.8856	0	0	0.5962	0	0	0	0	0	0	0	0	0	1.7885
ACP 4	86.795	46.796	2.0153	5.8046	9.1183	6.7584	3.1753	4.4057	5.9287	10.073	13.887	17.791	17.807	15.59	21.2
El Giral	105.94	364.58	261.02	143.69	101.3	75.555	68.121	77.29	88.957	107.13	99.83	115.58	131.32	106.4	128.64
T. Cativá	145.68	679.54	628.24	420.65	270.92	197.66	234.81	242.95	266.96	272.81	252.84	302.53	374.44	305.89	367.59
Termo Colón	0	565.33	960.47	863.63	665.71	506.3	510.32	583.17	608.05	622.99	540.89	644.01	676.55	615.18	573.05
Pana Power	0	0	2.1073	2.5301	2.9001	8.0981	1.3366	3.8364	2.1776	4.6156	7.4902	5.852	31.422	12.921	42.531
CB250a	0	0	0	0	1844.2	1809.8	1823.7	1829.2	1842.6	1834	1835.1	1839.8	1853.1	1855.7	1859.7
CB250b	0	0	0	0	0	0	0	0	0	0	1783.8	1799	1832.4	1844.9	1847.2
CB250c	0	0	0	0	0	0	0	0	0	0	0	0	0	1793.3	1801.1
Total Hidro	3549	3511	3585	5485	6068	7071	7233	7264	7550	7876	7702	7755	8131	7808	8172
Total Term.	3217.7	3654.6	4085.3	3302.2	4503.3	4005.6	4092.2	4261.2	4373.3	4412.4	5972.6	6290.7	6663.9	8109.4	8316.8
Total Gener	6767	7166	7670	8787	10572	11077	11325	11525	11923	12289	13674	14046	14795	15918	16489
Import.	168	338	495	217	29	41	81	103	92	156	54	79	69	24	34
Export.	159	170	207	587	1704	1734	1532	1257	1118	991	1695	1482	1584	2010	1916
Pérdidas	5	10	15	7	1	1	2	3	3	5	2	2	2	1	1
Demanda	6773	7323	7944	8410	8896	9383	9872	10368	10895	11449	12031	12641	13278	13931	14606
Déficit	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0

