

## **Anexo 12**

### **Salidas del Caso REGMHTCB9: Medio Hidrotérmico con Carbón**



### Cuadro N° A1.1 Capacidad Firme Caso REGMHTCB9

CAPACIDAD FIRME (MW) - HIDROTERMICO CON CARBÓN/DEM.MEDIA

Caso REGMHTCB9	Capacidad Instalada	Factor Disponib.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>EGE FORTUNA</b>	<b>300</b>		<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>	<b>284</b>
Fortuna	300		284	284	284	284	284	284	284	284	284	284	284	284	284	284	284
<b>AES PANAMA</b>	<b>482</b>		<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>	<b>306</b>
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
Canjilonés	120		113	113	113	113	113	113	113	113	113	113	113	113	113	113	113
<b>ISTMUS HYDROPOWER, S.A.</b>	<b>10</b>		<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
Concepcion	10		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
<b>BLM CORP.</b>	<b>280</b>		<b>169</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>	<b>210</b>
Bahia las Minas 2	40	0.68	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bahia las Minas 3	40	0.53	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bahia las Minas 4	40	0.48	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bahia las Minas Carbón	120	0.90	0	108	108	108	108	108	108	108	108	108	108	108	108	108	108
Ciclo Combinado BLM	160	0.64	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102
<b>AUTORIDAD DEL CANAL DE PANAMA (ACP)</b>	<b>175</b>		<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>	<b>132</b>
ACP	175		132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
<b>TURBINAS DE GAS PANAMA (EGESA)</b>	<b>43</b>		<b>34</b>	<b>34</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
EGESA	43	0.79	34	34	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>COPESA</b>	<b>44</b>		<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>
Copesa	44	0.90	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
<b>PAN AM GENERATING</b>	<b>96</b>		<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>	<b>82</b>
Pan_Am	96	0.85	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
<b>PEDREGAL POWER PROJECT</b>	<b>53.5</b>		<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>	<b>46</b>
Pacora PP	53.5	0.85	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
<b>TERMIC DEL CARIBE, S.A.</b>	<b>50.0</b>		<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>	<b>45</b>
El Giral	50.0	0.90	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
<b>GENERADORA DEL ATLANTICO, S.A.</b>	<b>150.0</b>		<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>
T. Colon	150.0	0.70	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
<b>GDF SUEZ ENERGY</b>	<b>87.0</b>		<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>	<b>78</b>
T. Cativa	87.0	0.90	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78
<b>PROYECTOS HIDROELECTRICOS (FUTUROS)</b>	<b>636</b>		<b>0</b>	<b>4</b>	<b>196</b>	<b>430</b>	<b>485</b>	<b>485</b>	<b>636</b>	<b>636</b>	<b>636</b>	<b>636</b>	<b>636</b>	<b>636</b>	<b>636</b>	<b>636</b>	<b>636</b>
Gualaca	25	22	0	0	22	22	22	22	22	22	22	22	22	22	22	22	22
Lorena	34	31	0	0	31	31	31	31	31	31	31	31	31	31	31	31	31
Prudencia	56	50	0	0	50	50	50	50	50	50	50	50	50	50	50	50	50
Pedregalito	20	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3
Pando	33	25	0	0	0	25	25	25	25	25	25	25	25	25	25	25	25
Monte Lirio	52	32	0	0	0	0	32	32	32	32	32	32	32	32	32	32	32
El Alto	60	25	0	0	0	25	25	25	25	25	25	25	25	25	25	25	25
Bonyic	31	19	0	0	0	19	19	19	19	19	19	19	19	19	19	19	19
Bajo Mina	52	29	0	0	29	29	29	29	29	29	29	29	29	29	29	29	29
Chan I	223	166	0	0	0	166	166	166	166	166	166	166	166	166	166	166	166
Chan II	214	150	0	0	0	0	150	150	150	150	150	150	150	150	150	150	150
Baitún	86	57	0	0	57	57	57	57	57	57	57	57	57	57	57	57	57
Tabasará II	35	12	0	0	0	0	12	12	12	12	12	12	12	12	12	12	12
Mandra	18	4	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Barro Blanco	20	11	0	0	0	0	11	11	11	11	11	11	11	11	11	11	11
<b>PROYECTOS TERMOELECTRICOS (FUTUROS)</b>	<b>1050</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>213</b>	<b>213</b>	<b>213</b>
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	0	0	0	0	0	0	0	0	213	213	213
Carbón 2b	250	0.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbón 2c	250	0.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>PROYECTOS EOLICOS (FUTUROS)</b>	<b>354</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Toabre	150	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anton	105	0.15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Fe	99	0.15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>POTENCIA FIRME</b>			<b>1322</b>	<b>1367</b>	<b>1525</b>	<b>1759</b>	<b>1814</b>	<b>1814</b>	<b>1965</b>	<b>1965</b>	<b>1965</b>	<b>1965</b>	<b>1965</b>	<b>1965</b>	<b>2177</b>	<b>2177</b>	<b>2177</b>
<b>Demanda Máxima de Generación</b>			<b>1112</b>	<b>1184</b>	<b>1240</b>	<b>1293</b>	<b>1356</b>	<b>1411</b>	<b>1472</b>	<b>1528</b>	<b>1584</b>	<b>1644</b>	<b>1706</b>	<b>1769</b>	<b>1827</b>	<b>1887</b>	<b>1949</b>
<b>BALANCE</b>			210	183	285	467	458	404	493	437	381	321	259	196	351	291	229
<b>RESERVA</b>			16.91%	15.48%	23.01%	36.10%	33.81%	28.62%	33.49%	28.63%	24.04%	19.49%	15.14%	11.09%	19.20%	15.40%	11.73%

CUADRO N° A1.1: Costos Marginales del Caso REGMHTCB9

COSTO MARGINAL DE DEMANDA EN \$/MWh													
Año	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic	Prom
<b>2009</b>	89.15	98.56	108.52	119.77	188.52	99.75	93.64	96.98	86.83	83.41	78.42	77.52	<b>101.75</b>
<b>2010</b>	77.64	82.79	97.64	111.17	98.70	80.00	79.09	73.07	70.11	68.49	65.82	64.58	<b>80.76</b>
<b>2011</b>	64.66	66.03	67.82	70.90	67.08	64.30	62.38	62.07	60.97	59.81	58.57	53.85	<b>63.20</b>
<b>2012</b>	57.77	61.42	63.98	64.56	62.38	58.63	57.30	54.29	47.18	47.73	48.08	52.51	<b>56.32</b>
<b>2013</b>	52.42	55.81	60.14	60.26	57.24	53.98	49.46	49.04	42.98	44.30	44.96	45.64	<b>51.35</b>
<b>2014</b>	49.84	54.28	59.69	58.93	56.24	53.15	50.28	46.85	46.59	44.33	43.76	46.51	<b>50.87</b>
<b>2015</b>	49.33	53.85	60.53	59.59	56.01	49.69	41.33	36.55	33.85	35.26	36.35	36.03	<b>45.70</b>
<b>2016</b>	42.97	49.48	61.57	66.85	53.14	48.32	39.42	40.59	39.91	39.26	37.28	38.73	<b>46.46</b>
<b>2017</b>	44.48	49.92	64.45	62.23	55.72	47.94	46.03	45.66	43.90	42.10	43.28	43.70	<b>49.12</b>
<b>2018</b>	44.43	48.86	53.38	54.38	51.96	49.59	46.14	45.57	42.64	41.91	43.08	41.25	<b>46.93</b>
<b>2019</b>	44.23	49.88	54.73	55.91	54.64	50.16	48.13	45.34	44.81	42.89	44.51	43.21	<b>48.20</b>
<b>2020</b>	47.63	53.00	59.08	61.98	58.98	55.08	51.22	46.71	44.50	42.68	43.65	42.56	<b>50.59</b>
<b>2021</b>	45.50	51.66	66.09	75.27	60.24	53.57	47.39	45.25	41.42	41.97	42.76	45.04	<b>51.35</b>
<b>2022</b>	48.61	55.68	73.45	80.55	63.06	55.22	51.85	49.99	45.91	44.95	44.50	45.14	<b>54.91</b>
<b>2023</b>	46.56	52.35	57.89	58.67	56.71	50.51	49.18	47.46	45.92	44.61	41.94	42.96	<b>49.56</b>
<b>Prom</b>	<b>53.68</b>	<b>58.90</b>	<b>67.26</b>	<b>70.73</b>	<b>69.37</b>	<b>57.99</b>	<b>54.19</b>	<b>52.36</b>	<b>49.17</b>	<b>48.25</b>	<b>47.80</b>	<b>47.95</b>	



CUADRO N° A1.2: Informe Final de Generación del Caso REGMHTCB9

<b>CASO REGMHTCB9</b>															
<b>Informe Final de Generación en GWh</b>															
<b>Planta</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>Fortuna</b>	1728	1626	1602	1486	1673	1394	1473	1585	1539	1624	1585	1652	1629	1584	1430
<b>Bayano</b>	698	558	587	479	510	448	604	476	579	456	524	673	548	522	544
<b>La Estrella</b>	236	268	245	248	252	250	232	235	248	261	259	238	250	252	228
<b>Los Valles</b>	286	309	292	289	287	285	285	279	289	306	293	282	290	293	271
<b>Esti</b>	621	612	612	613	618	616	620	618	621	623	620	615	616	617	618
<b>Concepción</b>	60	61	61	60	60	61	61	61	63	62	61	60	60	62	61
<b>Algarrobos</b>	0	56	56	56	53	52	55	57	58	60	56	54	53	53	52
<b>B. Blanco</b>	0	0	0	59	104	104	101	103	107	106	104	104	102	105	101
<b>Baitún</b>	0	0	329	417	401	406	400	418	436	433	420	411	413	416	406
<b>Bajo Mina</b>	0	109	278	275	271	275	269	275	284	283	277	273	274	278	274
<b>Bonyic</b>	0	0	68	172	181	174	160	174	171	176	177	176	172	173	181
<b>Chan I</b>	0	0	134	1279	1283	1235	1196	1252	1246	1208	1259	1329	1233	1304	1270
<b>Chan II</b>	0	0	0	0	0	0	1014	1078	1082	1036	1105	1165	1087	1140	1111
<b>Cochea</b>	0	77	83	79	76	80	76	78	81	78	81	81	76	78	76
<b>El Alto</b>	0	0	0	266	264	262	267	276	284	278	273	265	262	269	265
<b>Gualaca</b>	0	62	121	122	122	122	123	122	123	124	123	122	122	122	122
<b>Lorena</b>	0	14	163	163	164	164	165	164	165	166	165	164	164	164	164
<b>Macano</b>	0	0	27	27	27	27	27	27	27	27	27	27	27	27	27
<b>Mendre</b>	0	116	106	112	108	113	104	115	111	111	108	105	105	107	108
<b>Monte Lirio</b>	0	0	0	45	221	212	221	223	236	237	226	219	217	225	217
<b>Pando</b>	0	0	0	113	155	150	151	154	165	167	159	152	155	159	152
<b>Pedregalito</b>	0	0	94	103	99	103	100	107	107	107	103	100	98	105	102
<b>Perlas N</b>	0	0	61	60	60	61	61	61	63	62	61	60	60	62	61
<b>Perlas S</b>	0	0	61	60	60	61	61	61	63	62	61	60	60	62	61
<b>Porven N</b>	0	0	20	20	20	20	20	20	21	21	20	20	20	20	20
<b>Potrерillos</b>	0	23	24	23	22	23	22	23	23	23	23	23	21	23	22
<b>Prudencia</b>	0	0	203	284	282	285	284	282	287	287	287	285	279	283	284
<b>Sindigo</b>	0	0	0	0	0	0	0	59	59	62	56	53	54	52	52
<b>Tabasará II</b>	0	0	0	20	198	200	189	201	207	209	201	203	196	213	203
<b>Toabré</b>	0	135	429	430	428	426	428	427	429	431	427	424	428	427	427
<b>BUNKER</b>	3048	2638	1715	1223	880	905	996	1100	1303	870	931	1203	1025	1231	749
<b>DIESEL M.</b>	162	108	1	0	0	0	3	27	14	0	0	6	32	37	0
<b>DIESEL L.</b>	13	5	0	0	0	0	0	2	0	0	0	0	0	7	0
<b>CARBON</b>	158	946	930	823	712	722	529	421	496	541	609	660	2315	2495	2411
<b>ACP1</b>	150	61	1	0	0	0	0	6	1	0	0	0	11	9	0
<b>ACP2</b>	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>ACP3</b>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>ACP4</b>	2	2	0	0	0	0	0	0	0	0	0	0	0	1	0
<b>Total Hidro</b>	3629	3890	5229	6929	7569	7184	8339	8584	8744	8654	8713	8972	8645	8766	8483
<b>Total Term.</b>	3536	3760	2647	2046	1592	1627	1528	1556	1814	1411	1540	1869	3383	3780	3160
<b>Total Eólico</b>	0	135	429	430	428	426	428	427	429	431	427	424	428	427	427
<b>Total Gener</b>	7165	7786	8305	9405	9588	9236	10295	10567	10987	10496	10680	11264	12456	12973	12070
<b>Import.</b>	32	64	30	5	41	228	76	136	136	409	578	465	176	166	754
<b>Export.</b>	359	573	710	1456	1258	718	1218	1174	1211	577	525	597	1133	1251	436
<b>Pérdidas</b>	1	2	1	0	1	7	2	4	4	12	17	14	5	5	23
<b>Demanda</b>	6838	7274	7625	7954	8369	8739	9150	9526	9909	10316	10716	11118	11493	11882	12366
<b>Deficit</b>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0