



**LA UNION ELECTRIC COOPERATIVE, INC.**  
Sta. Rita East, Aringay, La Union 2503

# **POWER SUPPLY PROCUREMENT PLAN**

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**LA UNION ELECTRIC COOPERATIVE**  
**POWER SUPPLY PROCUREMENT PLAN**

In compliance with the Department of Energy's (DOE) Department Circular No. DC 2018-02-0003, "Adopting and Prescribing the Policy for the Competitive Selection Process in the Procurement by the Distribution Utilities of Power Supply Agreement for the Captive Market" or the Competitive Selection process (CSP) Policy, the Power Supply Procurement Plan (PSPP) Report is hereby created, pursuant to the Section 4 of the said Circular.

The PSPP refers to the DUs' plan for the acquisition of a variety of demand-side and supply-side resources to cost-effectively meet the electricity needs of its customers. The PSPP is an integral part of the Distribution Utilities' Distribution Development Plan (DDP) and must be submitted to the Department of Energy with supported Board Resolution and/or notarized Secretary's Certificate.

The Third-Party Bids and Awards Committee (TPBAC), Joint TPBAC or Third Party Auctioneer (TPA) shall submit to the DOE and in the case of Electric Cooperatives (ECs), through the National Electrification Administration (NEA) the following:

- a. Power Supply Procurement Plan;
- b. Distribution Impact Study/ Load Flow Analysis conducted that served as the basis of the Terms of Reference; and
- c. Due diligence report of the existing generation plant

All Distribution Utilities' shall follow and submit the attached report to the Department of Energy for posting on the DOE CSP Portal. For ECs such reports shall be submitted to DOE and NEA. The NEA shall review the submitted report within ten (10) working days upon receipt prior to its submission to DOE for posting at the DOE CSP Portal.

The content of the PSSP shall be consistent with the DDP. The tables and graph format to be use on the PSPP report is provided on the following sheets. Further, the PSPP shall contain the following sections:

- I. Table of Contents
- II. Introduction
- III. Energy and Demand Forecast (10 year historical and forecast)
- IV. Energy Sales and Purchase
- V. Daily Load Profile and Load Duration Curve
- VI. Existing Contracts & Existing GenCos due diligence report
- VII. Committed Energy and Demand for CSP
- VIII. Currently approved SAGR for Off-Grid ECs to be passed-on to consumers;
- IX. DU's Current Supply and Demand
- X. Distribution Impact Study
- XI. Schedule of Power Supply Procurement
- XII. Timeline of the CSP

For inquiries, please contact us through:

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**NEA:** raonea.gov.ph@gmail.com, telephone numbers (02) 929-1909 local 180

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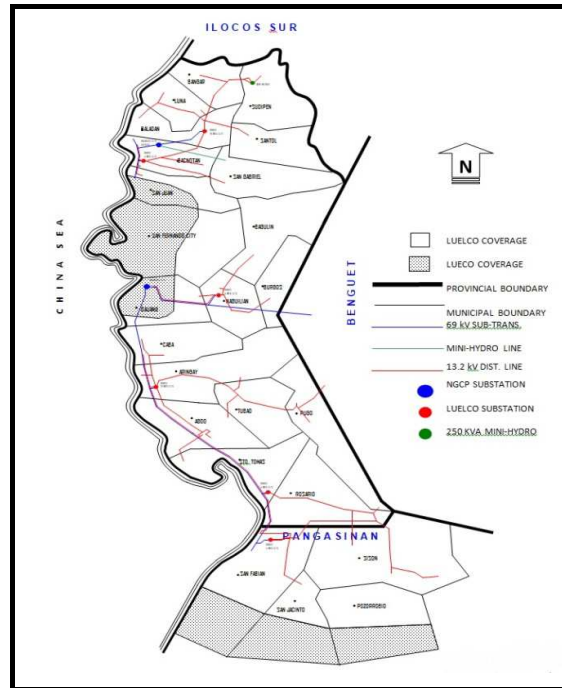
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## INTRODUCTION

### DISTRIBUTION UTILITIES PROFILE

The province of La Union is supplied with power by the La Union Electric Cooperative, Inc. (LUELCO) and the La Union Electric Company, a private electric franchise. Before LUELCO came into existence, power has already been supplied to few towns of La Union by Private Electric Franchises like Milo Electric System in Aringay, the AELAPs in Agoo and several others.

LUELCO, which was founded in August 7, 1971, now under GM Ramon C. Posadas, Ph.D., has a total potential household connections of One Hundred Forty Six Thousand Nine Hundred (146,900) and an actual household connection of One Hundred Forty Six Thousand Five Hundred Eight (146,508) as of December 31, 2017. These members come from the 23 Municipalities and 1 City (19 municipalities and 1 city in La Union and 4 municipalities in Pangasinan) served by LUELCO.



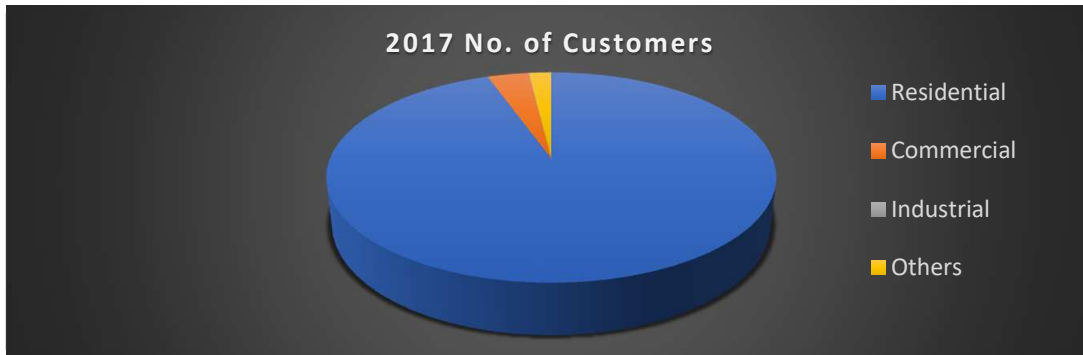
LUELCO, at present, has 6 Area Offices located at Aringay, Agoo, Rosario, Naguilian, Bacnotan and Bangar and 5 Collection Offices situated at the Municipalities of Luna, Balaoan, San Juan-San Gabriel, Tubao, Sto. Tomas, La Union and at Sison, Pangasinan.

There are six (6) Substations which supply the power requirement of the coverage area which are strategically located in Naguilian (10 MVA S/S), Damortis (10 MVA S/S), Balaoan (15 MVA S/S), Aringay (15 MVA S/S), Bacnotan (10 MVA), and in San Fabian, Pangasinan (5 MVA S/S). All these are manned/operated/maintained by the coop's 304 employees.

The customer profile as of December 31, 2017 shows that residential customers are dominant in LUELCO at 128,870 (94.28%) of the total customer population followed by commercial customers at 4,762 (3.48%). In terms of energy share per customer, still residential customers have the biggest piece of the total energy at 130,403 MWh (65.74%). LUELCO's system coincident peak demand registered a high 41.34 MW in 2017 compared to 40.28 MW in 2016.

POWER SUPPLY PROCUREMENT PLAN

Number of Customer	ACTUAL	FORECAST									
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Residential	128870	136694	145755	155814	166763	178515	191004	204179	218004	232455	247517
Commercial	4762	4811	4937	5073	5217	5367	5521	5678	5838	5999	6162
Industrial	100	105	113	121	130	138	147	156	165	174	183
Others	2577	2705	2835	2972	3116	3265	3418	3574	3734	3895	4058
Contestable Customers served by RES	1	2	2	2	2	2	2	2	2	2	2
Total (Captive Customers)	136309	144315	153639	163980	175226	187285	200090	213588	227741	242523	257919

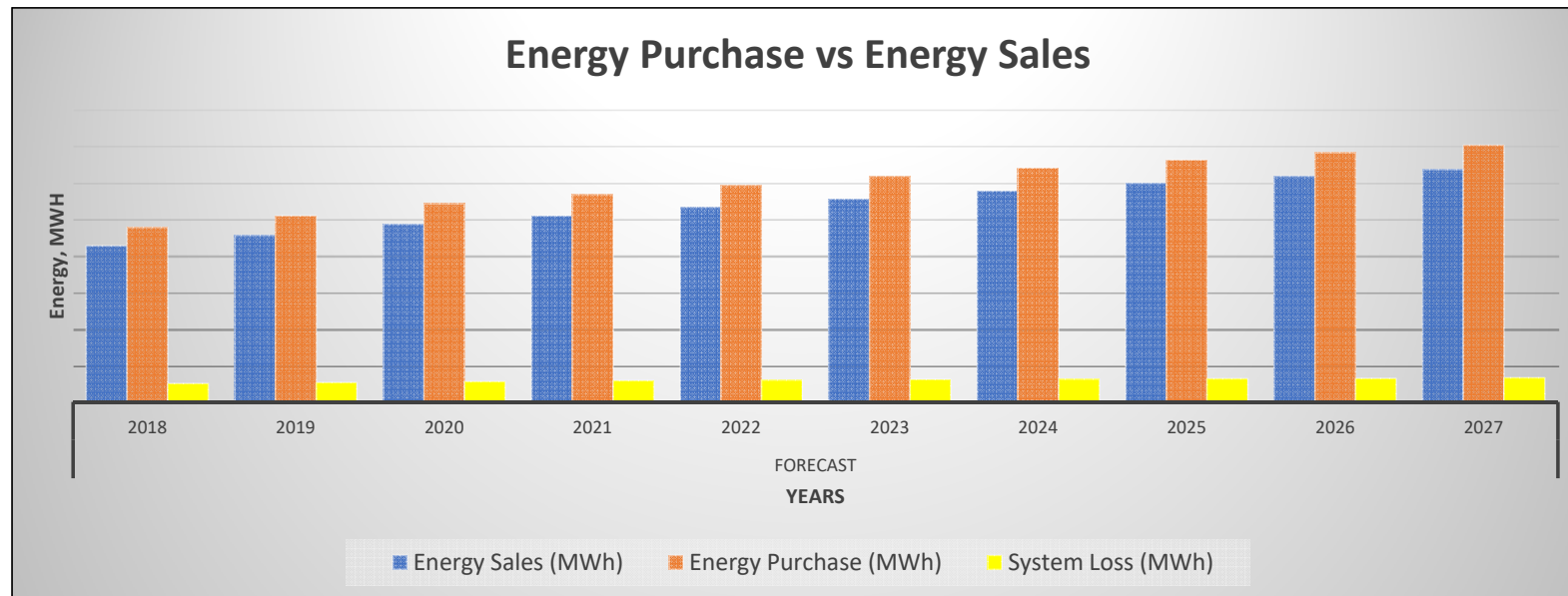


The GN Power Mariveles Coal Plant (GMCP), Ltd. Supplies the baseload requirements of LUELCO for 15 years which started on Dec. 26, 2012 and it will end Dec. 25, 2027. LUELCO contracted a baseload of 27,000 kW with a monthly average of 6,527,250 kWh equivalents. The remaining requirements both for kW Demand & Energy Demand will be sourced from the Renewable Energy Sources, e.g Tubao Mini-Hydro Plant (1.2 MW) and SurePep Biomass Plant (350 kW) and from Solar PV proponents (i.e. Solar Pacific, Sol-Tierra, AirEnergy, etc.) and from the Spot Market (WESM). LUELCO contracted another 8,000 kW from AES, Phils. (MPPCL) for 15 years starting December 26, 2018. The Number of Customers will have an average annual growth rate (AAGR) of 6.6% for the next ten (10) years, 2018 - 2027.

## ENERGY SALES AND PURCHASE

ENERGY SALES AND PURCHASE	HISTORICAL									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Energy Sales (MWh)	112242.54	121723.41	134181.55	135169.95	143050.28	153718.13	154886.55	165784.68	183161.31	198370.76
Energy Purchase (MWh)	130051.25	140286.92	153816.46	154088.27	163402	171027.74	175176.9	186123.64	207444.13	222514.13
System Loss (MWh)	17100.058	17732.552	19616.819	19031.575	19161.232	17309.387	20290.582	20338.824	24282.949	24143.779

ENERGY SALES AND PURCHASE	FORECAST									
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Energy Sales (MWh)	214403.3	228917.1	244102.8	255561.5	267591.2	278947.6	289901.9	300199.6	310053.1	319330.5
Energy Purchase (MWh)	239770.7	255717	272254.9	284938	297819	309942.6	321398.9	332263.3	342599.5	352461.5
System Loss (MWh)	25367	26799	28152	29377	30228	30995	31497	32064	32547	33131

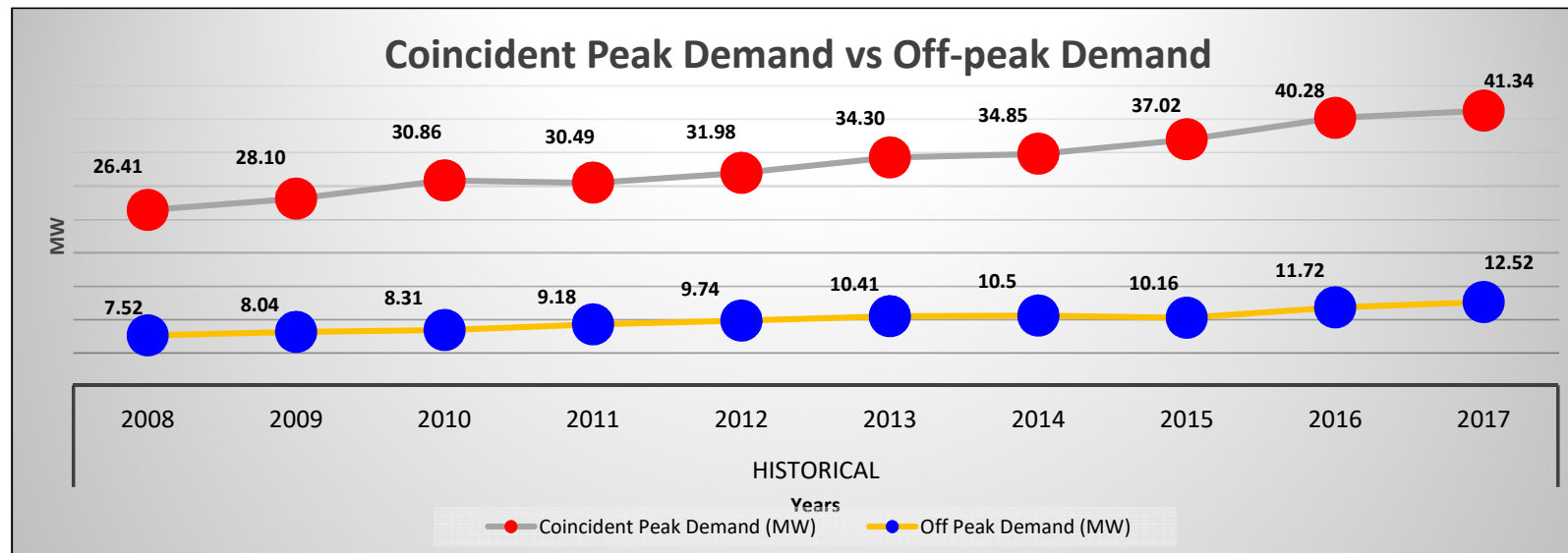


The Gn Power Mariveles Coal Plant (GMCP), Ltd. Supplies the baseload requirements of LUELCO for 15 years which started on Dec. 26, 2012 and it will end Dec. 25, 2027. LUELCO contracted a baseload of 27,000 kW with a monthly average of 6,527,250 kWh equivalent. The remaining requirements both for kW Demand & Energy Demand will be sourced from the Renewable Energy Sources, e.g Tubao Mini-Hydro Plant (1.2 MW) and Surepep Biomass Plant (350 kW) and from the Spot Market (WESM). LUELCO contracted another 8,000 kW from AES, Phils. (MPPCL) for 15 years starting April 2019. The kWh Sales and kWh Purchased will have an average annual growth rate (AAGR) of 4.9% and 4.3%, respectively. The forecasting model used for the MWh Sales and Purchased is  $Y = at^3 + bt^2 + c$ , it is a Cubic Trend with 2 Variables.

## DEMAND

Demand	HISTORICAL									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Coincident Peak Demand (MW)	26.41	28.10	30.86	30.49	31.98	34.30	34.85	37.02	40.28	41.34
Off Peak Demand (MW)	7.52	8.04	8.31	9.18	9.74	10.41	10.5	10.16	11.72	12.52

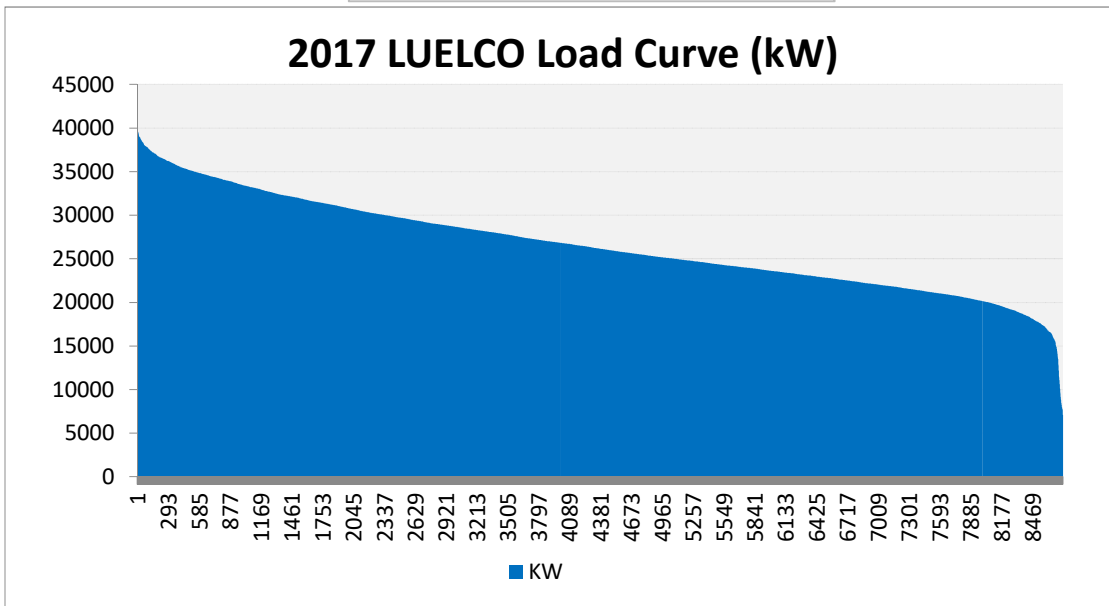
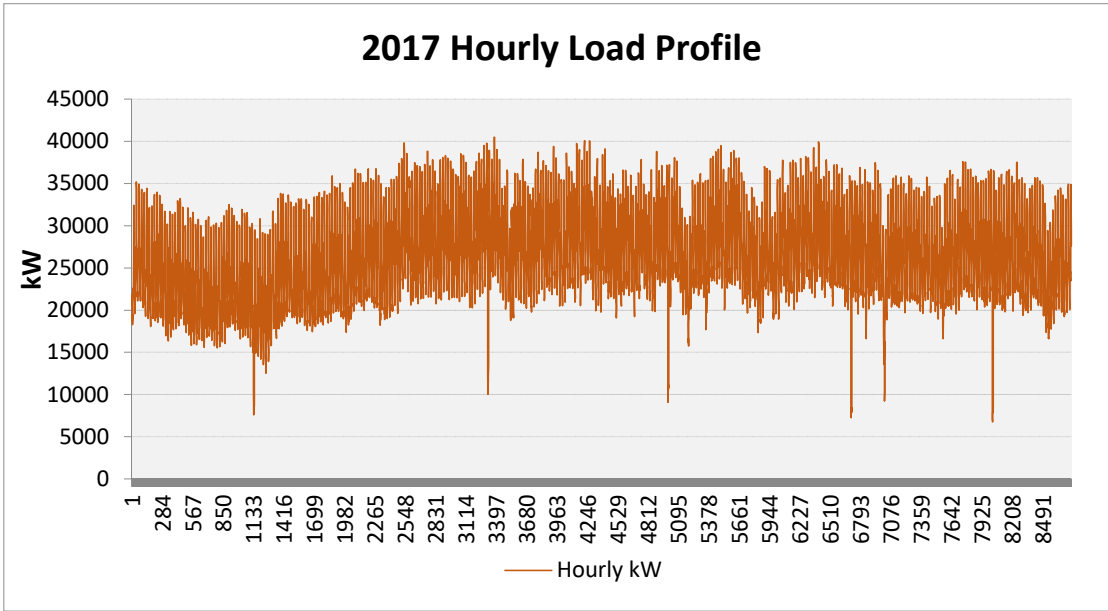
Demand	FORECASTED									
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Coincident Peak Demand (MW)	43.82	46.33	48.84	55.28	58.13	61.11	64.22	67.46	70.82	74.32
Off Peak Demand (MW)	14.68	15.93	17.18	18.43	19.68	20.93	22.18	23.43	24.68	25.93





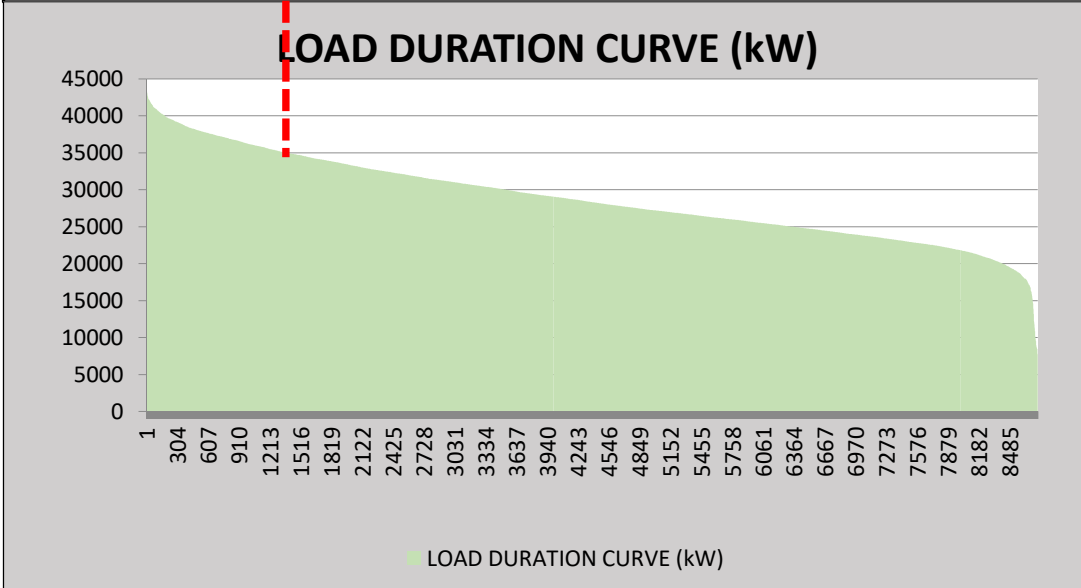
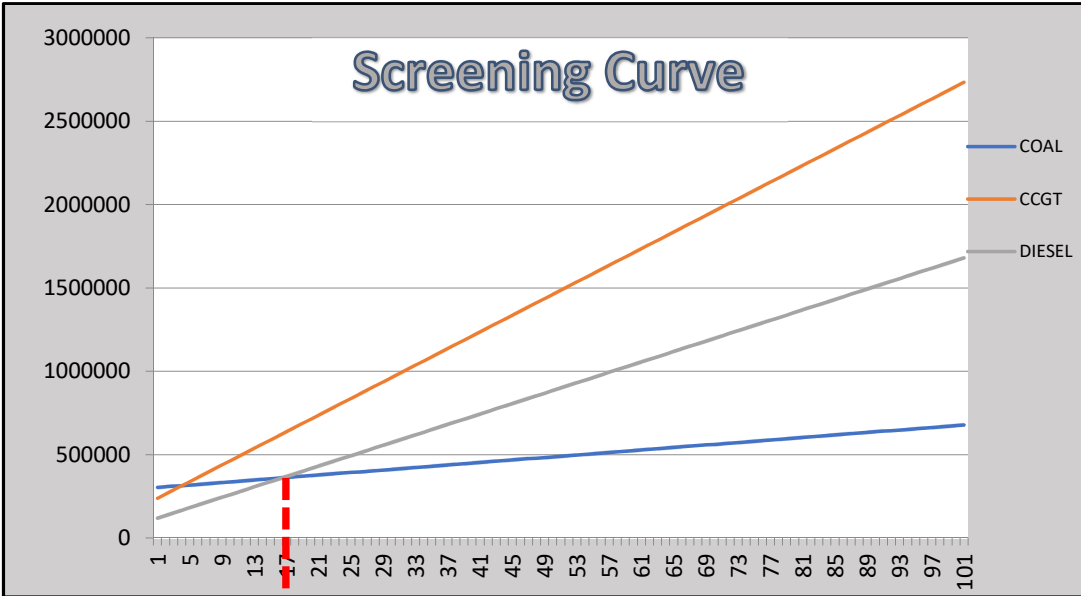
The coincident peak demand for the year 2008 is 26.41 MW and in year 2017 is 41.34 MW which means an increase of 14.93 MW in ten years with an Average Annual Growth Rate (AAGR) of 5.4%. The forecasting model used for the Peak Demand for 2018 to 2027 is  $Y = a \ln t^2 + b \ln t + c t^{-1} + d$ , it is a Quadratic & Logarithmic Trend with Smoothing & Horizon.

## LOAD PROFILE AND LOAD DURATION CURVE



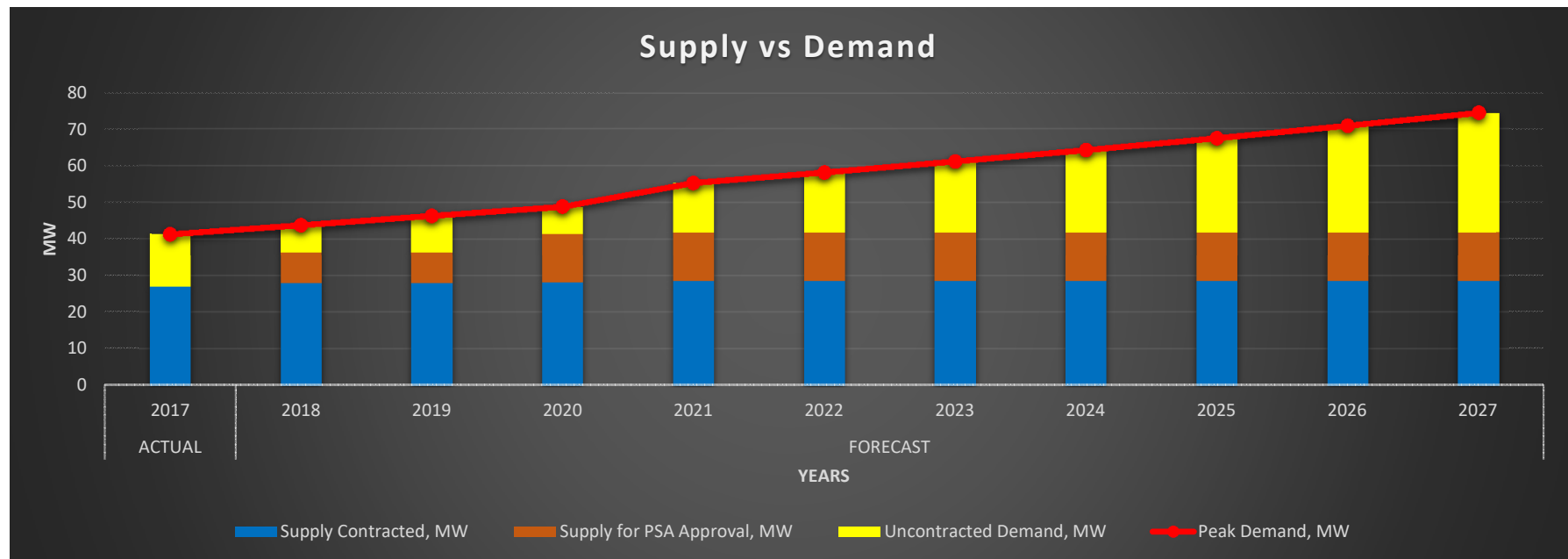
Based on the load duration curve the Base Load of LUELCO is 79.93% which is equal to 35 MW and a Peaking of 20.07% equal to 8.79 MW. LUELCO also has an uncontracted base capacity of 8 MW because of its contracted base capacity of 27 MW. The percent capacity factor is equal to 15.47% which is the intersection between coal and diesel based on their annual levelized cost.

POWER SUPPLY PROCUREMENT PLAN



### MIXSUPPLY VS DEMAND AND THE OPTIMAL SUPPLY

Supply Demand	ACTUAL	FORECAST									
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
<b>Peak Demand, MW</b>	<b>41.341</b>	<b>43.82406</b>	<b>46.33393</b>	<b>48.84496</b>	<b>55.277703</b>	<b>58.12812</b>	<b>61.10769</b>	<b>64.216902</b>	<b>67.45547</b>	<b>70.82395</b>	<b>74.32322</b>
<b>Supply Contracted, MW</b>	<b>27</b>	<b>28</b>	<b>28</b>	<b>28.2</b>	<b>28.5</b>	<b>28.5</b>	<b>28.5</b>	<b>28.5</b>	<b>28.5</b>	<b>28.5</b>	<b>28.5</b>
GN Power Mariveles, Ltd.	27	27	27	27	27	27	27	27	27	27	27
TUBAO MINI-HYDRO (TMHEC)		1	1	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5
<b>Supply for PSA Approval, MW</b>	<b>0</b>	<b>8.35</b>	<b>8.35</b>	<b>13.35</b>	<b>13.35</b>	<b>13.35</b>	<b>13.35</b>	<b>13.35</b>	<b>13.35</b>	<b>13.35</b>	<b>13.35</b>
GN Power Dinginin Ltd. Co.				5	5	5	5	5	5	5	5
AES, Phils. (MPPCL)		8	8	8	8	8	8	8	8	8	8
SUREPEP		0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
<b>Uncontracted Demand, MW</b>	<b>14.341</b>	<b>7.474063</b>	<b>9.98393</b>	<b>7.294963</b>	<b>13.427703</b>	<b>16.27812</b>	<b>19.25769</b>	<b>22.366902</b>	<b>25.60547</b>	<b>28.97395</b>	<b>32.47322</b>



POWER SUPPLY PROCUREMENT PLAN

List of Existing Contracts and Details

Supply Contracted	Plant Owner/ Operator	Capacity Factor	PSA Effectivity (MM/YR)	PSA Expiration (MM/YR)	Contracted Capacity, MW	Contracted Energy, MWH	Base / Mid-merit / Peaking	Embedded/ Grid Connected	Utility-owned/ NPC/ IPP/ NPC-IPP	Status	Fuel Type	Installed Capacity (MW)	Net Dependable Capacity (MW)
GN Mariveles Coal Power Plant (GMCP)	GNPower; Ltd. Co.		12/2012	12/2027	27	236520	Baseload	Grid Connected	IPP	Running	Coal	600	
Tubao Mini-Hydro Electric Plant	TMHEC, Inc.		12/2016	12/2036	1.5	10512	Baseload / Mid merit	Embedded	IPP	On-going Construction	Mini Hydro	1.5	

**The demand for 2017 is equal to 41.34 MW with an uncontracted demand of 14.34 MW which is purchased from the WESM or Spot Market. Then if the PSA of AES Phils. and SUREPEP will be approved with an equivalent demand of 8.35 MW, the supply contracted for LUELCO will be 36.35 MW for 2018 which will bring a deficit of 7.47 MW. By year 2020 an additional 5 MW will be contracted with the GN Power Dinginin which will bring LUELCO's supply contract to 41.55 MW with a deficiency of 7.29 MW as per forecasted demand. LUELCO will start to bid/look for an additional PSA under the CSP because their will be a high deficit or uncontracted demand for year 2021 to 2027.**

## DISTRIBUTION IMPACT STUDY

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All relevant data from the Distribution System Loss (DSL) – ERC template was modelled and then load flow is prepared for each feeder. The load flow provided information such as percent conductor loading to its capacity, calculated distribution losses, injected current to transformers, line currents, voltage profile and voltage unbalances. Recommendation and project ideas were then made and based on these results. Load flow analysis is conducted monthly per feeder on the base year and conducted the analysis only on the peak month of the forecast year and then allocated the results monthly based on the base year results.

The voltage variation in the distribution system should not exceed +10% of the nominal voltage or equivalent to not less than 0.9 per unit and not more than 1.1 per unit of the nominal value.

For voltage unbalance, it should not exceed 2.5% during normal operation which is computed by dividing the maximum deviation from the average of the three-phase voltages to the average of the three phase voltages.

The Substation capacity loading criteria is compared based on the 100% of ONAN (Natural Oil and Natural Air) rated capacity (MVA) of the power transformer to the forecasted demand (MW) at a power factor of 90% - 98%.

Maximum Short circuit current is computed at fault impedance equivalent to zero and for minimum short circuit current 30 ohms fault impedance is used. The bolted fault current or fault current at zero impedance is used in determining the margin of safety of the equipment with its rated interrupting capacity, a 10% or above margin if safety is acceptable and 10% below is considered unsafe. The minimum fault current is used to compare the setting of the protective devices in the system. If the minimum short circuit currents are below the settings of the upstream protective devices it is considered unsafe.

For system reliability, the criteria is based on the Distribution Code with the System Average Interruption Frequency Index (SAIFI) should not be more 20 hours-interruptions per customer per year and the System Average Interruption Duration Index (SAIDI) should not exceed 45 hours-interruptions per customer per year.



## 10 Year Monthly Forecasted Data

Year	Forecast			Contracted and For PSA Approval Demand and Energy		Uncontracted Demand and Energy		Committed for CSP	
	Coincident Peak Demand (MW)	Off Peak Demand (MW)	Energy Requirement (MWh)	Demand (MW)	Energy (MWh)	Uncontracted Demand (MW)	Uncontracted Energy (MWh)	Demand (MW)	Energy (MWh)
<b>2018</b>									
Jan	37.09	16.75	18,441.26	36.35	27,044.40	0.74	-	-	-
Feb	35.54	14.99	17,831.58	36.35	27,044.40	-	-	-	-
Mar	38.30	18.35	17,622.84	36.35	24,427.20	1.95	-	-	-
Apr	41.60	20.57	20,795.59	36.35	27,044.40	5.25	-	-	-
May	43.82	21.86	21,777.46	36.35	26,172.00	7.47	-	-	-
Jun	43.52	21.40	22,150.71	36.35	27,044.40	7.17	-	-	-
Jul	41.64	17.33	20,122.09	36.35	26,172.00	5.29	-	-	-
Aug	42.86	18.64	21,005.04	36.35	27,044.40	6.51	-	-	-
Sep	41.35	21.00	20,617.09	36.35	27,044.40	5.00	-	-	-
Oct	40.78	14.68	19,216.32	36.35	26,172.00	4.43	-	-	-
Nov	41.17	19.59	20,669.74	36.35	27,044.40	4.82	-	-	-
Dec	40.91	19.33	19,520.94	36.35	26,172.00	4.56	-	-	-
<b>2019</b>									
Jan	39.26	18.27	19,255.24	36.35	27,044.40	2.91	-	-	-
Feb	37.61	16.34	18,622.87	36.35	27,044.40	1.26	-	-	-
Mar	40.52	19.99	18,459.23	36.35	24,427.20	4.17	-	-	-
Apr	43.99	22.40	22,773.91	36.35	27,044.40	7.64	-	-	-
May	46.33	23.79	23,538.55	36.35	26,172.00	9.98	-	-	-
Jun	46.01	23.27	23,685.15	36.35	27,044.40	9.66	-	-	-
Jul	44.00	18.84	21,508.13	36.35	26,172.00	7.65	-	-	-
Aug	45.28	20.25	22,443.79	36.35	27,044.40	8.93	-	-	-
Sep	43.67	22.80	22,021.38	36.35	27,044.40	7.32	-	-	-
Oct	43.06	15.93	20,517.95	36.35	26,172.00	6.71	-	-	-
Nov	43.46	21.24	22,062.10	36.35	27,044.40	7.11	-	-	-
Dec	43.18	20.95	20,828.70	36.35	26,172.00	6.83	-	-	-
<b>2020</b>									
Jan	41.42	19.79	20,538.16	41.55	30,913.20	-	-	-	-
Feb	39.67	17.69	19,856.94	41.55	30,913.20	-	-	-	-
Mar	42.74	21.63	19,675.85	41.55	28,918.80	1.19	-	-	-
Apr	46.39	24.23	24,266.85	41.55	30,913.20	4.84	-	-	-
May	48.84	25.71	25,073.39	41.55	29,916.00	7.29	-	-	-
Jun	48.49	25.15	25,221.35	41.55	30,913.20	6.94	-	-	-
Jul	46.37	20.34	22,895.77	41.55	29,916.00	4.82	-	-	-
Aug	47.70	21.86	23,884.19	41.55	30,913.20	6.15	-	-	-
Sep	46.00	24.60	23,427.30	41.55	30,913.20	4.45	-	-	-
Oct	45.35	17.18	21,821.08	41.55	29,916.00	3.80	-	-	-
Nov	45.75	22.90	23,456.06	41.55	30,913.20	4.20	-	-	-
Dec	45.45	22.58	22,137.97	41.55	29,916.00	3.90	-	-	-
<b>2021</b>									
Jan	46.92	21.31	21,822.56	41.55	30,913.20	2.04	-	-	-



Feb	44.93	19.04	21,092.42	41.55	30,913.20	0.19	-	-	-
Mar	48.38	23.28	20,893.87	41.55	27,921.60	3.40	-	-	-
Apr	52.51	26.06	25,761.51	41.55	30,913.20	7.23	-	-	-
May	55.28	27.64	26,609.99	41.55	29,916.00	9.81	-	-	-
Jun	54.86	27.02	26,759.32	41.55	30,913.20	9.42	-	-	-
Jul	52.45	21.85	24,285.01	41.55	29,916.00	7.18	-	-	-
Aug	53.95	23.47	25,326.25	41.55	30,913.20	8.58	-	-	-
Sep	52.01	26.40	24,834.83	41.55	30,913.20	6.77	-	-	-
Oct	51.27	18.43	23,125.71	41.55	29,916.00	6.08	-	-	-
Nov	51.71	24.55	24,851.62	41.55	30,913.20	6.49	-	-	-
Dec	51.36	24.20	23,448.74	41.55	29,916.00	6.16	-	-	-
<b>2022</b>									
Jan	49.38	22.83	23,108.45	41.55	30,913.20	4.20	-	-	-
Feb	44.95	20.39	22,329.33	41.55	30,913.20	2.26	-	-	-
Mar	48.40	24.92	22,113.30	41.55	27,921.60	5.62	-	-	-
Apr	52.52	27.88	27,257.90	41.55	30,913.20	9.62	-	-	-
May	55.28	29.57	28,148.37	41.55	29,916.00	12.32	-	-	-
Jun	54.85	28.90	28,299.06	41.55	30,913.20	11.90	-	-	-
Jul	52.43	23.35	25,675.85	41.55	29,916.00	9.54	-	-	-
Aug	53.92	25.08	26,769.98	41.55	30,913.20	11.00	-	-	-
Sep	51.98	28.20	26,243.99	41.55	30,913.20	9.10	-	-	-
Oct	51.22	19.68	24,431.84	41.55	29,916.00	8.36	-	-	-
Nov	51.66	26.21	26,248.79	41.55	30,913.20	8.79	-	-	-
Dec	51.29	25.82	24,761.03	41.55	29,916.00	8.43	-	-	-
<b>2023</b>									
Jan	51.94	24.35	24,395.81	41.55	30,913.20	6.37	-	-	-
Feb	49.72	21.74	23,567.66	41.55	30,913.20	4.32	-	-	-
Mar	53.53	26.56	23,334.12	41.55	27,921.60	7.83	-	-	-
Apr	58.06	29.71	28,756.00	41.55	30,913.20	12.02	-	-	-
May	61.11	31.50	29,688.51	41.55	29,916.00	14.83	-	-	-
Jun	60.63	30.77	29,840.57	41.55	30,913.20	14.38	-	-	-
Jul	57.94	24.86	27,068.28	41.55	29,916.00	11.91	-	-	-
Aug	59.58	26.69	28,215.36	41.55	30,913.20	13.42	-	-	-
Sep	57.42	30.00	27,654.76	41.55	30,913.20	11.42	-	-	-
Oct	56.57	20.93	25,739.47	41.55	29,916.00	10.64	-	-	-
Nov	57.05	27.86	27,647.57	41.55	30,913.20	11.08	-	-	-
Dec	56.63	27.44	26,074.82	41.55	29,916.00	10.70	-	-	-
<b>2024</b>									
Jan	54.62	25.88	25,684.65	41.55	30,913.20	8.54	-	-	-
Feb	52.27	23.09	24,807.41	41.55	30,913.20	6.39	-	-	-
Mar	56.27	28.20	24,556.35	41.55	28,918.80	10.05	-	-	-
Apr	61.03	31.54	30,255.83	41.55	30,913.20	14.41	-	-	-
May	64.22	33.43	31,230.42	41.55	29,916.00	17.34	1,314.42	-	-
Jun	63.70	32.64	31,383.86	41.55	30,913.20	16.86	470.66	-	-
Jul	60.87	26.37	28,462.32	41.55	29,916.00	14.27	-	-	-
Aug	62.58	28.30	29,662.40	41.55	30,913.20	15.84	-	-	-
Sep	60.30	31.80	29,067.16	41.55	30,913.20	13.75	-	-	-
Oct	59.40	22.18	27,048.60	41.55	29,916.00	12.92	-	-	-
Nov	59.89	29.52	29,047.95	41.55	30,913.20	13.37	-	-	-
Dec	59.45	29.06	27,390.11	41.55	29,916.00	12.97	-	-	-

<b>2025</b>									
Jan	57.41	27.40	26,974.97	41.55	30,913.20	10.70	-	-	-
Feb	54.94	24.45	26,048.58	41.55	30,913.20	8.45	-	-	-
Mar	59.12	29.84	25,779.99	41.55	27,921.60	12.26	-	-	-
Apr	64.11	33.37	31,757.38	41.55	30,913.20	16.81	844.18	-	-
May	67.46	35.35	32,774.10	41.55	29,916.00	19.85	2,858.10	-	-
Jun	66.90	34.52	32,928.91	41.55	30,913.20	19.34	2,015.71	-	-
Jul	63.92	27.87	29,857.95	41.55	29,916.00	16.63	-	-	-
Aug	65.71	29.91	31,111.10	41.55	30,913.20	18.26	-	-	-
Sep	63.31	33.60	30,481.17	41.55	30,913.20	16.07	-	-	-
Oct	62.36	23.43	28,359.24	41.55	29,916.00	15.21	-	-	-
Nov	62.86	31.17	30,449.94	41.55	30,913.20	15.67	-	-	-
Dec	62.39	30.68	28,706.92	41.55	29,916.00	15.24	-	-	-
<b>2026</b>									
Jan	60.31	28.92	28,266.76	41.55	30,913.20	12.87	-	-	-
Feb	57.70	25.80	27,291.18	41.55	30,913.20	10.52	-	-	-
Mar	62.09	31.49	27,005.02	41.55	27,921.60	14.48	-	-	-
Apr	67.33	35.19	33,260.64	41.55	30,913.20	19.20	2,347.44	-	-
May	70.82	37.28	34,319.55	41.55	29,916.00	22.36	4,403.55	-	-
Jun	70.23	36.39	34,475.73	41.55	30,913.20	21.83	3,562.53	-	-
Jul	67.10	29.38	31,255.18	41.55	29,916.00	19.00	1,339.18	-	-
Aug	68.96	31.51	32,561.47	41.55	30,913.20	20.68	1,648.27	-	-
Sep	66.43	35.40	31,896.80	41.55	30,913.20	18.40	983.60	-	-
Oct	65.43	24.68	29,671.37	41.55	29,916.00	17.49	-	-	-
Nov	65.95	32.82	31,853.53	41.55	30,913.20	17.96	940.33	-	-
Dec	65.44	32.30	30,025.23	41.55	29,916.00	17.50	109.23	-	-
<b>2027</b>									
Jan	63.32	30.44	29,560.04	41.55	30,913.20	15.04	-	-	-
Feb	60.58	27.15	28,535.20	41.55	30,913.20	12.58	-	-	-
Mar	65.18	33.13	28,231.46	41.55	27,921.60	16.70	309.86	-	-
Apr	70.66	37.02	34,765.63	41.55	30,913.20	21.60	3,852.43	-	-
May	74.32	39.21	35,866.77	41.55	29,916.00	24.87	5,950.77	-	-
Jun	73.70	38.26	36,024.32	41.55	30,913.20	24.31	5,111.12	-	-
Jul	70.40	30.88	32,654.01	41.55	29,916.00	21.36	2,738.01	-	-
Aug	72.34	33.12	34,013.49	41.55	30,913.20	23.10	3,100.29	-	-
Sep	69.68	37.20	33,314.06	41.55	30,913.20	20.72	2,400.86	-	-
Oct	68.62	25.93	30,985.01	41.55	29,916.00	19.77	1,069.01	-	-
Nov	69.16	34.48	33,258.73	41.55	30,913.20	20.25	2,345.53	-	-
Dec	68.62	33.92	31,345.05	41.55	29,916.00	19.77	1,429.05	-	-

## 10 Year Monthly Historical Data

Year	Historical			Contracted and For PSA Approval Demand and Energy		Uncontracted Demand and Energy		Committed for CSP	
	Coincident Peak Demand (MW)	Off Peak Demand (MW)	Energy Requirement (MWh)	Demand (MW)	Energy (MWh)	Uncontracted Demand (MW)	Uncontracted Energy (MWh)	Demand (MW)	Energy (MWh)
<b>2008</b>									
Jan	26.36		10,427.05	UNDER NAPOCOR (NPC)					
Feb	24.60		10,116.46	UNDER NAPOCOR (NPC)					
Mar	26.19		9,949.44	UNDER NAPOCOR (NPC)					
Apr	27.01		11,963.15	UNDER NAPOCOR (NPC)					
May	27.44		10,234.12	UNDER NAPOCOR (NPC)					
Jun	26.28		10,945.48	UNDER NAPOCOR (NPC)					
Jul	27.06		11,234.21	UNDER NAPOCOR (NPC)					
Aug	25.89		10,463.84	UNDER NAPOCOR (NPC)					
Sep	26.55		11,586.84	UNDER NAPOCOR (NPC)					
Oct	26.76		11,063.28	UNDER NAPOCOR (NPC)					
Nov	25.81		11,459.45	UNDER NAPOCOR (NPC)					
Dec	26.17		10,607.93	UNDER NAPOCOR (NPC)					
<b>2009</b>									
Jan	26.70		10,241.80	UNDER NAPOCOR (NPC)					
Feb	25.38		11,028.68	UNDER NAPOCOR (NPC)					
Mar	26.75		11,070.99	UNDER NAPOCOR (NPC)					
Apr	28.91		12,786.57	UNDER NAPOCOR (NPC)					
May	28.97		11,587.22	UNDER NAPOCOR (NPC)					
Jun	28.29		12,448.71	UNDER NAPOCOR (NPC)					
Jul	28.84		12,422.80	UNDER NAPOCOR (NPC)					
Aug	28.88		12,671.38	UNDER NAPOCOR (NPC)					
Sep	28.76		12,792.36	UNDER NAPOCOR (NPC)					
Oct	27.95		10,264.48	UNDER NAPOCOR (NPC)					
Nov	28.10		12,037.37	UNDER NAPOCOR (NPC)					
Dec	27.86		10,934.55	UNDER NAPOCOR (NPC)					
<b>2010</b>									
Jan	27.28	10.18	11,055.11	21.14	10,157.20	6.14	897.91	-	-
Feb	26.12	11.50	11,648.17	19.76	9,995.20	6.36	1,652.97	-	-
Mar	27.95	11.94	11,519.33	20.51	9,870.80	7.44	1,648.53	-	-
Apr	30.67	12.24	13,909.39	21.44	10,886.50	9.23	3,022.89	-	-
May	31.58	12.89	14,965.23	21.73	10,840.20	9.85	4,125.03	-	-
Jun	31.57	12.56	14,487.05	20.72	10,386.50	10.85	4,100.55	-	-
Jul	30.02	12.05	13,186.36	20.88	10,060.90	9.14	3,125.46	-	-
Aug	28.95	12.03	13,185.93	20.55	9,809.70	8.40	3,376.23	-	-
Sep	29.49	11.48	13,065.98	20.12	10,044.60	9.37	3,021.38	-	-
Oct	30.30	10.02	12,116.17	20.02	9,672.40	10.28	2,443.77	-	-
Nov	29.08	11.98	13,273.57	20.10	9,886.80	8.98	3,386.77	-	-

## POWER SUPPLY PROCUREMENT PLAN

ANNEX B

Dec	30.12	11.27	12,589.20	20.61	9,328.90	9.51	3,260.30	-	-
<b>2011</b>									
Jan	29.58	10.49	12,047.72	21.21	10,242.80	8.37	1,804.92	-	-
Feb	27.31	9.81	11,701.31	20.15	10,101.80	7.16	1,599.51	-	-
Mar	29.57	11.51	11,064.24	20.80	10,109.90	8.77	954.34	-	-
Apr	30.05	11.63	13,386.44	21.58	11,048.10	8.47	2,338.34	-	-
May	31.20	12.46	14,207.02	21.88	10,984.80	9.32	3,222.22	-	-
Jun	31.17	10.49	14,114.99	20.83	10,498.90	10.34	3,616.09	-	-
Jul	30.64	11.47	12,953.67	20.95	10,184.10	9.69	2,769.57	-	-
Aug	29.96	10.60	13,375.18	20.60	9,891.70	9.36	3,483.48	-	-
Sep	28.47	9.18	12,826.37	20.14	10,130.10	8.33	2,696.27	-	-
Oct	29.81	12.33	11,996.90	20.02	9,742.70	9.79	2,254.20	-	-
Nov	29.32	12.26	13,711.00	20.16	9,934.10	9.16	3,776.90	-	-
Dec	29.61	12.75	12,840.32	20.79	9,463.40	8.82	3,376.92	-	-
<b>2012</b>									
Jan	29.01	11.84	12,635.37	21.29	10,388.50	7.72	2,246.87	-	-
Feb	27.83	11.06	12,331.05	20.47	10,245.60	7.36	2,085.45	-	-
Mar	29.15	12.57	12,484.51	21.06	10,248.60	8.09	2,235.91	-	-
Apr	30.03	10.57	14,578.42	21.73	11,261.00	8.30	3,317.42	-	-
May	32.70	13.75	14,601.59	22.01	11,324.50	10.69	3,277.09	-	-
Jun	30.70	12.26	14,224.65	20.96	10,587.30	9.74	3,637.35	-	-
Jul	30.66	12.19	13,348.36	21.08	10,281.70	9.58	3,066.66	-	-
Aug	28.68	10.50	12,804.97	20.68	10,002.00	8.00	2,802.97	-	-
Sep	29.76	12.59	13,351.64	20.23	10,247.20	9.53	3,104.44	-	-
Oct	29.64	12.53	13,191.45	20.07	9,841.10	9.57	3,350.35	-	-
Nov	29.58	9.04	13,469.00	20.25	10,008.70	9.33	3,460.30	-	-
Dec	29.36	12.46	12,886.35	20.99	9,582.20	8.37	3,304.15	-	-
<b>2013</b>									
Jan	29.77	10.42	12,632.50	21.35	10,522.10	8.42	2,110.40	-	-
Feb	29.75	11.37	12,673.87	20.63	10,409.50	9.12	2,264.37	-	-
Mar	29.85	13.16	12,429.82	21.42	10,372.30	8.43	2,057.52	-	-
Apr	30.15	15.32	16,036.99	21.87	11,491.60	8.28	4,545.39	-	-
May	30.32	13.82	15,763.73	22.11	11,577.80	8.21	4,185.93	-	-
Jun	30.54	13.87	15,613.33	21.20	10,639.60	9.34	4,973.73	-	-
Jul	32.84	13.73	14,772.06	21.22	10,360.70	11.62	4,411.36	-	-
Aug	32.73	10.56	14,350.49	20.76	10,083.20	11.97	4,267.29	-	-
Sep	32.06	13.03	14,608.54	20.33	10,331.80	11.73	4,276.74	-	-
Oct	31.13	13.56	14,004.57	20.06	9,910.70	11.07	4,093.87	-	-
Nov	31.36	13.64	14,282.51	20.37	10,056.60	10.99	4,225.91	-	-
Dec	30.55	13.91	13,859.32	21.20	9,677.00	9.35	4,182.32	-	-
<b>2014</b>									
Jan	28.70	9.78	12,225.62	27.00	20,088.00	1.70	-	-	-
Feb	27.40	10.65	12,202.00	27.00	20,088.00	0.40	-	-	-
Mar	30.26	12.80	12,168.20	27.00	18,144.00	3.26	-	-	-
Apr	34.25	15.06	16,221.44	27.00	20,088.00	7.25	-	-	-
May	34.32	15.43	16,243.25	27.00	19,440.00	7.32	-	-	-

Jun	35.56	13.77	16,098.04	27.00	20,088.00	8.56	-	-	-
Jul	34.27	15.43	15,206.40	27.00	19,440.00	7.27	-	-	-
Aug	33.08	14.50	15,342.21	27.00	20,088.00	6.08	-	-	-
Sep	33.38	10.39	14,553.04	27.00	20,088.00	6.38	-	-	-
Oct	32.23	13.06	15,211.23	27.00	19,440.00	5.23	-	-	-
Nov	32.67	14.66	15,404.92	27.00	20,088.00	5.67	-	-	-
Dec	31.09	13.43	14,300.57	27.00	19,440.00	4.09	-	-	-
<b>2015</b>									
Jan	30.91	10.98	13,466.96	27.00	20,088.00	3.91	-	-	-
Feb	29.60	10.71	13,145.87	27.00	20,088.00	2.60	-	-	-
Mar	31.14	12.82	13,021.03	27.00	18,144.00	4.14	-	-	-
Apr	33.39	15.50	16,322.81	27.00	20,088.00	6.39	-	-	-
May	36.44	16.74	17,414.44	27.00	19,440.00	9.44	-	-	-
Jun	37.75	14.90	17,619.46	27.00	20,088.00	10.75	-	-	-
Jul	34.84	10.16	14,868.97	27.00	19,440.00	7.84	-	-	-
Aug	36.73	12.90	17,177.59	27.00	20,088.00	9.73	-	-	-
Sep	35.14	17.03	17,138.16	27.00	20,088.00	8.14	-	-	-
Oct	35.13	11.32	14,124.14	27.00	19,440.00	8.13	-	-	-
Nov	34.74	14.90	16,443.01	27.00	20,088.00	7.74	-	-	-
Dec	33.63	14.15	15,381.20	27.00	19,440.00	6.63	-	-	-
<b>2016</b>			-						
Jan	32.74	14.43	15,423.24	27.00	20,880.00	5.74	-	-	-
Feb	31.77	13.72	15,014.84	27.00	20,088.00	4.77	-	-	-
Mar	34.89	14.87	15,258.37	27.00	18,792.00	7.89	-	-	-
Apr	38.50	16.39	18,737.83	27.00	20,088.00	11.50	-	-	-
May	40.28	18.71	19,662.28	27.00	19,440.00	13.28	222.28	-	-
Jun	38.90	18.19	19,170.16	27.00	20,088.00	11.90	-	-	-
Jul	38.09	16.80	17,417.19	27.00	19,440.00	11.09	-	-	-
Aug	38.88	15.92	17,605.10	27.00	20,088.00	11.88	-	-	-
Sep	36.36	16.45	17,100.59	27.00	20,088.00	9.36	-	-	-
Oct	36.97	11.72	16,408.90	27.00	19,440.00	9.97	-	-	-
Nov	36.70	17.48	18,189.71	27.00	20,088.00	9.70	-	-	-
Dec	37.50	17.58	17,455.93	27.00	19,440.00	10.50	-	-	-
<b>2017</b>									
Jan	36.59	15.53	17,253.07	27.00	20,088.00	9.59	-	-	-
Feb	34.80	12.52	16,286.21	27.00	20,088.00	7.80	-	-	-
Mar	37.55	17.38	15,881.07	27.00	18,144.00	10.55	-	-	-
Apr	40.56	18.89	19,651.61	27.00	20,088.00	13.56	-	-	-
May	41.19	18.76	19,780.61	27.00	19,440.00	14.19	340.61	-	-
Jun	41.34	19.76	20,421.77	27.00	20,088.00	14.34	333.77	-	-
Jul	40.06	15.72	19,128.63	27.00	19,440.00	13.06	-	-	-
Aug	40.71	17.33	19,576.49	27.00	20,088.00	13.71	-	-	-
Sep	40.71	18.91	19,614.35	27.00	20,088.00	13.71	-	-	-
Oct	38.87	13.54	18,201.66	27.00	19,440.00	11.87	-	-	-
Nov	38.63	16.63	18,817.21	27.00	20,088.00	11.63	-	-	-
Dec	38.51	16.62	17,901.46	27.00	19,440.00	11.51	-	-	-