

POWER SUPPLY PROCUREMENT PLAN

QUIRINO ELECTRIC COOPERATIVE

Diffun, Quirino

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 PSPP 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. Currently approved SAGR for Off-Grid ECs to be passed-on to consumers;
- VIII. DU's Current Supply and Demand
- IX. Distribution Impact Study
- X. Schedule of Power Supply Procurement
- XI. Timeline of the CSP

For inquiries, you may send it at doe.csp@gmail.com or you may contact us through telephone numbers (02) 840-2173 and (02) 479-2900 local 202.

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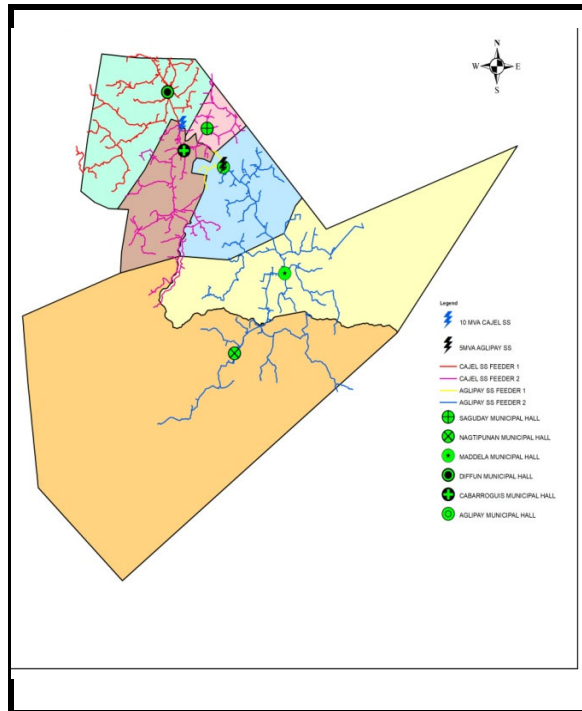
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INTRODUCTION

DISTRIBUTION UTILITIES PROFILE

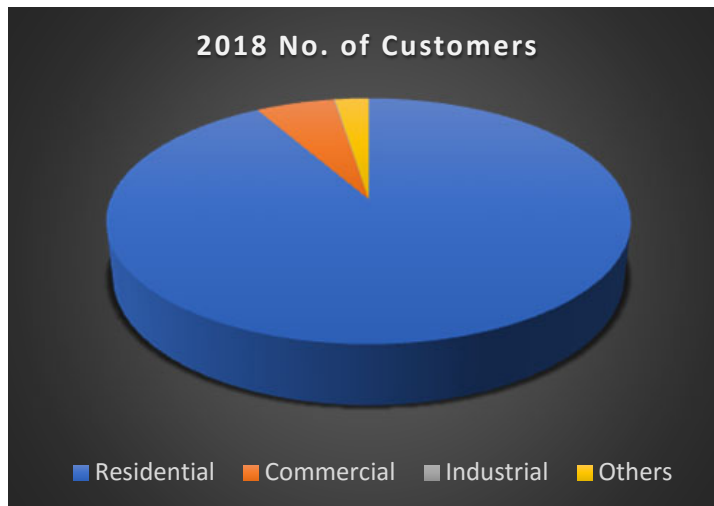
DU's Franchise MAP

QUIRELCO franchise area covers the municipalities of Diffun, Cabarroguis, Saguday, Aglipay, Maddela and Nagtipunan, Quirino Province and 18 barangays of San Agustin, Isabela with customer connections of 53, 615 as of December 2018. The level of electrification is 98.85% for the 150 barangays served. To date, QUIRELCO operates 1-10MVA substation located at Cajel, Diffun and 1-5MVA substation at San Leonardo, Aglipay. The construction of 1-10MVA substation located at Sta. Maria, Maddela with 18kms length of 69kV subtransmission line is on- going which will be operational this year.



Number of Customer	ACTUAL	FORECAST									
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Residential	38319	39759	41672	43567	45437	47279	49091	50873	52625	54346	56038
Commercial	2407	2640.5	2767.5	2893.4	3017.6	3139.9	3260.3	3378.6	3494.9	3609.2	3721.6
Industrial	38	42.885	44.948	46.992	49.009	50.996	52.951	54.873	56.762	58.619	60.443
Others	1032	1133.8	1188.3	1242.3	1295.7	1348.2	1399.9	1450.7	1500.6	1549.7	1598
Contestable Customers served by RES											
Total (Captive Customers)											

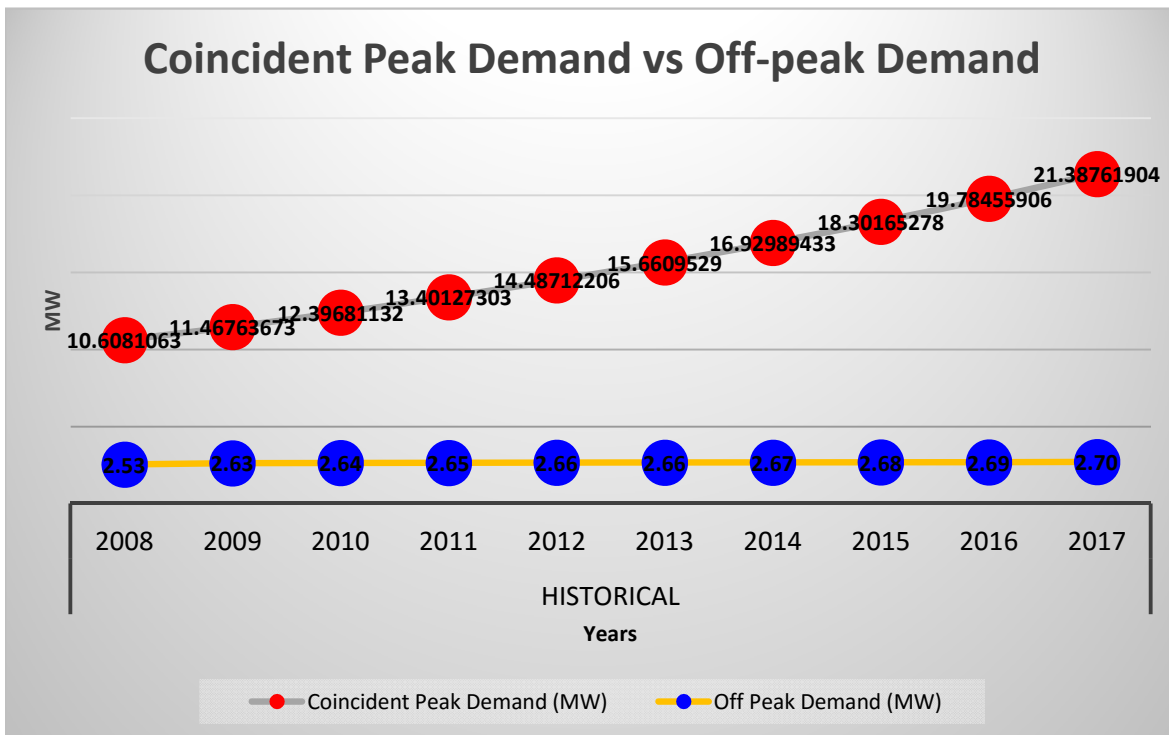
More commercial establishments (like resorts, hotels and restaurants) are to be constructed within next year as well as the continuous construction of wakeboarding which is fully operational in 2018. Developer of industrial plant with an estimated demand of 6-12MW is inquiring the office with its tariff as well as the cost incurring the possibility of extending the 69kV line from Maddela to Nagtipunan area.



DEMAND

Demand	HISTORICAL									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Coincident Peak Demand (MW)	4.818	5.282	5.772	5.931	6.638	7.273	7.605	8.384	8.891	9.813
Off Peak Demand (MW)										

Demand	FORECAST									
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Coincident Peak Demand (MW)	10.61	11.47	12.4	13.4	14.49	15.66	16.93	18.3	19.78	21.39
Off Peak Demand (MW)	2.53	2.63	2.64	2.65	2.66	2.66	2.67	2.68	2.69	2.70

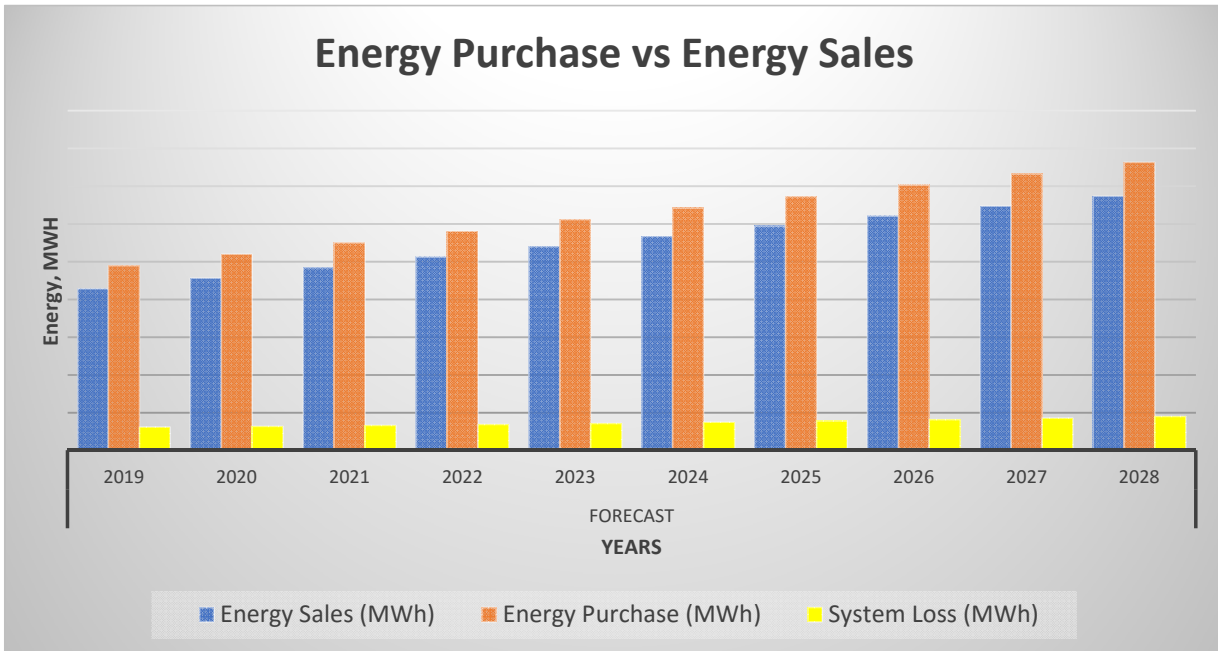


The annual average growth rate of demand for the past nine years is 8.10%

ENERGY SALES AND PURCHASE

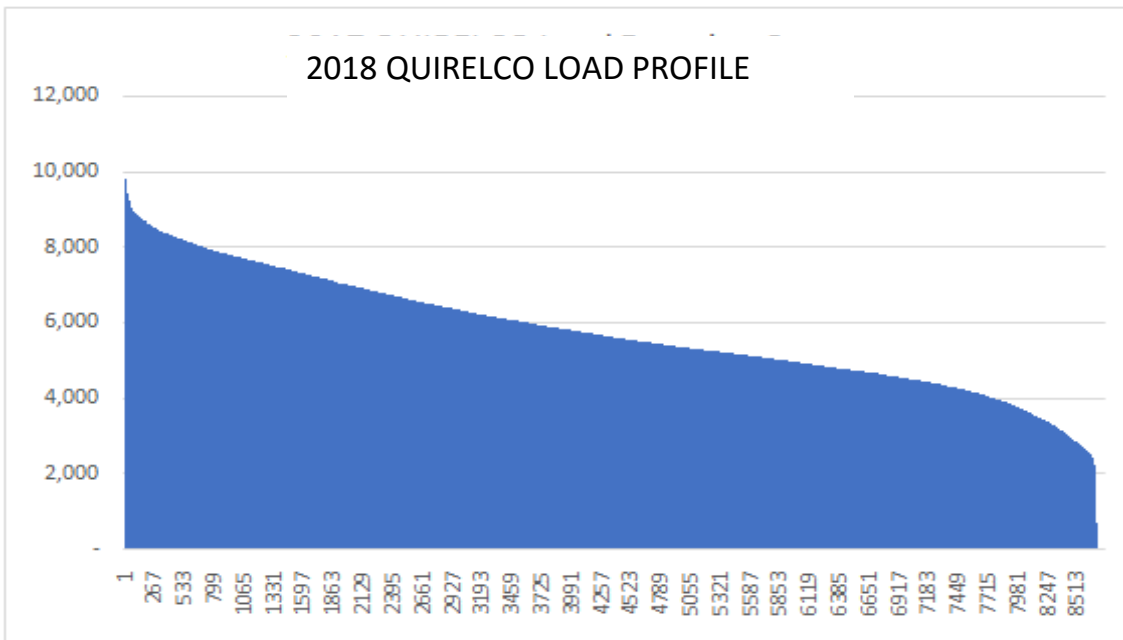
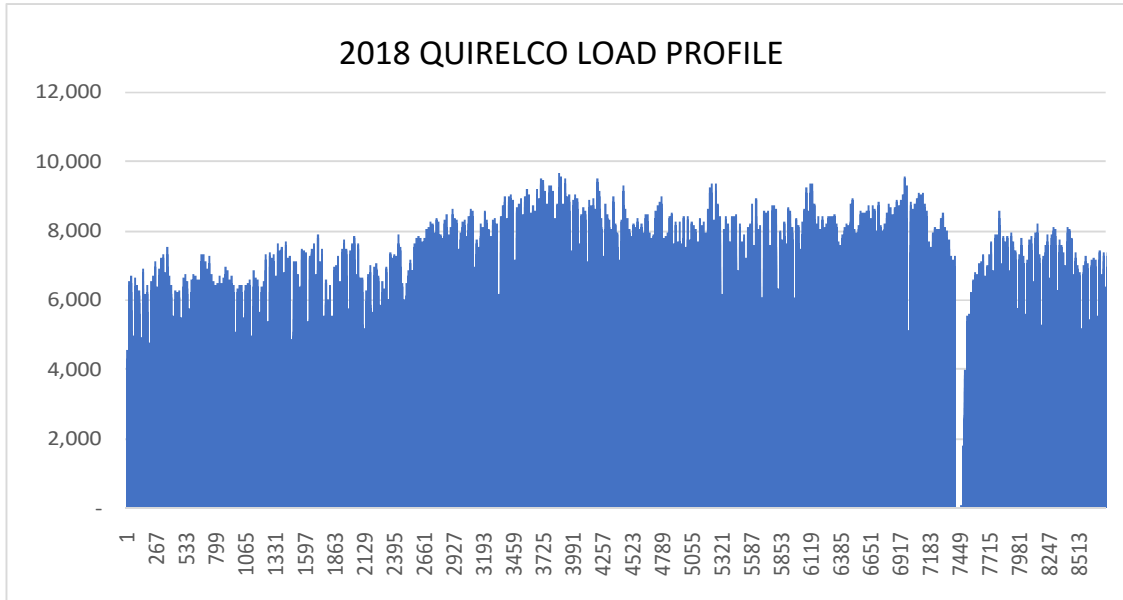
ENERGY SALES AND PURCHASE	HISTORICAL									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Energy Sales (MWh)	17672	19575	19759	22304	24858	28258	30632	34897	36924	39689
Energy Purchase (MWh)	21131	23941	23682	26835	29730	33699	36201	41565	43018	46880
System Loss (MWh)	3458	4367	3923	4531	4872	5441	5570	6668	6094	7191

ENERGY SALES AND PURCHASE	FORECAST									
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Energy Sales (MWh)	42768	45607	48418	51202	53958	56686	59387	62060	64706	67323
Energy Purchase (MWh)	48939	51981	55022	58064	61106	64148	67189	70231	73273	76314
System Loss (MWh)	6171	6374	6604	6862	7148	7461	7802	8171	8567	8991



An average growth rate of 9.81% in energy purchase for the past seven years. The projected energy sales for the next five years is around 6.22% with 4.56% customer connection rate

LOAD PROFILE AND LOAD DURATION CURVE

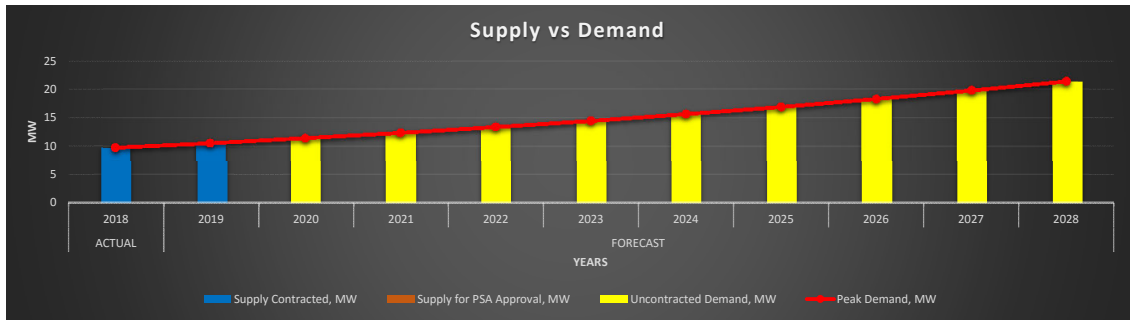


Brief highlight:

Base on the load curve identify the base-load, mid-merit and peaking. As such the data can be used for the strategy in contracting the DUs demand requirement.

MIXSUPPLY VS DEMAND AND THE OPTIMAL SUPPLY

Supply Demand	ACTUAL	FORECAST									
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Peak Demand, MW	9.813	10.608106	11.46764	12.39681132	13.40127	14.48712206	15.66095	16.92989	18.301653	19.78456	21.38762
Supply Contracted, MW	9.813	10.61	0	0	0	0	0	0	0	0	0
SN ABOITIZ POWER MAGAT INC.	9.813										
SNAP MAGAT INC. (1 yr extension)		10.61									
Generation Plant Name 3											
Supply for PSA Approval, MW	0	0	0	0	0	0	0	0	0	0	0
POWER SUPPLIER											
POWER SUPPLIER											
POWER SUPPLIER											
Uncontracted Demand, MW	0	0	11.46764	12.39681132	13.40127	14.48712206	15.66095	16.92989	18.301653	19.78456	21.38762

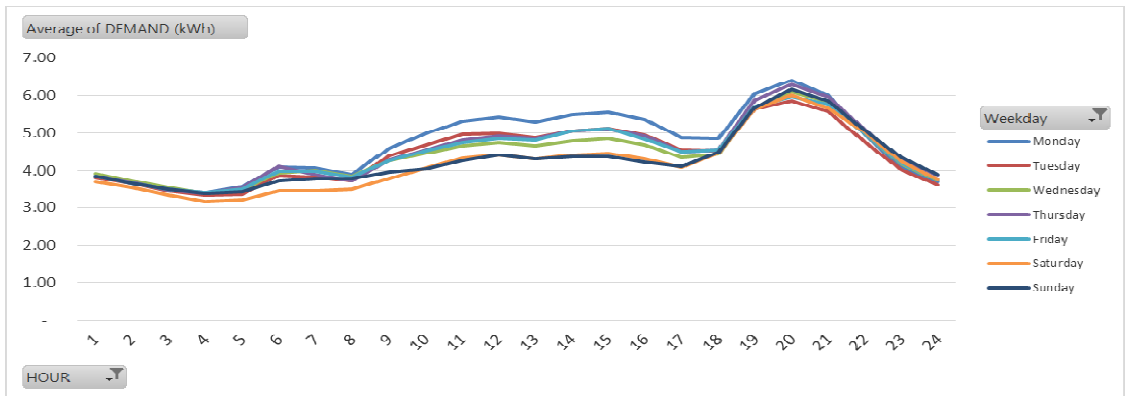


List of Existing Contracts and Details

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)
GenCo 1	SN Aboitiz Power-Magat, Inc.	0.3	26-Jun-13	25-Jun-18	9MW	280,567.76MWH	Peaking	Grid Connected	IPP		Hydro	360MW	360MW
GenCo 2													
GenCo 3													
GenCo 4													
GenCo 5													

The existing power generator counter-party of Quirino Electric Cooperative, Inc. (QUIRELCO), namely SN Aboitiz Power-Magat, Inc. (SNAP-Magat), was able to meet the full baseload, mid-merit and peaking supply requirements of QUIRELCO. SNAP-Magat also did not avail of supplier outage allowance during the contract to the advantage of QUIRELCO as it did not expose QUIRELCO to the price volatility of the spot market.

QUIRELCO has a baseload requirement based on 2018 data of 3.93MW which is 40.01% of its consumption, mid-merit requirement of 6.67MW which is 28.01% of its consumption and peak requirement of 9.81MW which is 31.98% of its consumption. Although majority of QUIRELCO's consumption is baseload, it needs a generator that is flexible, such as hydro plants, to supply QUIRELCO's mid-merit and peak requirements between 9AM - 11PM daily. An illustration of the demand curve of QUIRELCO is attached for reference.



DISTRIBUTION IMPACT STUDY

QUIRELCO's existing connected capacity is 15MVA with 9.813MW peak demand for the year 2018. Additional 10MVA S/S is currently constructed at Maddela to accommodate future loads. Conductor size for the backbone line is #2/0 with adequate capacity for the increased loading.

POWER SUPPLY PROCUREMENT PLAN

Year	Forecast			Contracted and For PSA Approval Demand and Energy		Contracted Demand and Energy		Committed for CSP	
	Coinciden t Peak Demand (MW)	Off Peak Demand (MW)	Energy Requirement (MWh)	Demand (MW)	Energy (MWh)	Uncontracte d Demand (MW)	Uncontracte d Energy (MWh)	Demand (MW)	Energy (MWh)
2019									
Jan	7.69	2.53	3,287.63	7.69	3,287.63	-	-	7.69	3,287.63
Feb	8.34	2.72	3,374.70	8.34	3,374.70	-	-	8.34	3,374.70
Mar	8.29	2.62	3,355.82	8.29	3,355.82	-	-	8.29	3,355.82
Apr	8.64	3.19	3,976.34	8.64	3,976.34	-	-	8.64	3,976.34
May	10.05	4.18	4,724.69	10.05	4,724.69	-	-	10.05	4,724.69
Jun	10.61	4.01	5,068.54	10.61	5,068.54	-	-	10.61	5,068.54
Jul	9.35	4.02	4,351.36	9.35	4,351.36	-	-	9.35	4,351.36
Aug	10.08	4.31	4,702.49	10.08	4,702.49	-	-	10.08	4,702.49
Sep	9.13	3.42	4,377.79	9.13	4,377.79	-	-	9.13	4,377.79
Oct	10.34	3.40	4,492.49	10.34	4,492.49	-	-	10.34	4,492.49
Nov	7.86	2.62	3,439.78	7.86	3,439.78	-	-	7.86	3,439.78
Dec	8.93	3.32	3,787.38	8.93	3,787.38	-	-	8.93	3,787.38
2020									
Jan	8.31	2.71	3,491.97	8.31	3,491.97	-	-	8.31	3,491.97
Feb	9.02	3.03	3,584.45	9.02	3,584.45	-	-	9.02	3,584.45
Mar	8.96	2.82	3,564.39	8.96	3,564.39	-	-	8.96	3,564.39
Apr	9.34	3.44	4,223.48	9.34	4,223.48	-	-	9.34	4,223.48
May	10.87	4.87	5,018.34	10.87	5,018.34	-	-	10.87	5,018.34
Jun	11.47	4.48	5,383.56	11.47	5,383.56	-	-	11.47	5,383.56
Jul	10.11	4.47	4,621.81	10.11	4,621.81	-	-	10.11	4,621.81
Aug	10.90	4.73	4,994.77	10.90	4,994.77	-	-	10.90	4,994.77
Sep	9.87	3.66	4,649.88	9.87	4,649.88	-	-	9.87	4,649.88
Oct	11.18	3.75	4,771.71	11.18	4,771.71	-	-	11.18	4,771.71
Nov	8.50	2.63	3,653.58	8.50	3,653.58	-	-	8.50	3,653.58
Dec	9.66	3.72	4,022.78	9.66	4,022.78	-	-	9.66	4,022.78
2021									
Jan	8.99	2.90	3,696.30	8.99	3,696.30	-	-	8.99	3,696.30
Feb	9.75	3.38	3,794.20	9.75	3,794.20	-	-	9.75	3,794.20
Mar	9.69	3.04	3,772.96	9.69	3,772.96	-	-	9.69	3,772.96
Apr	10.10	3.71	4,470.62	10.10	4,470.62	-	-	10.10	4,470.62
May	11.75	5.67	5,312.00	11.75	5,312.00	-	-	11.75	5,312.00
Jun	12.40	5.01	5,698.59	12.40	5,698.59	-	-	12.40	5,698.59
Jul	10.93	4.98	4,892.26	10.93	4,892.26	-	-	10.93	4,892.26
Aug	11.78	5.20	5,287.04	11.78	5,287.04	-	-	11.78	5,287.04
Sep	10.67	3.91	4,921.97	10.67	4,921.97	-	-	10.67	4,921.97
Oct	12.09	4.14	5,050.93	12.09	5,050.93	-	-	12.09	5,050.93
Nov	9.19	2.64	3,867.37	9.19	3,867.37	-	-	9.19	3,867.37
Dec	10.44	4.17	4,258.18	10.44	4,258.18	-	-	10.44	4,258.18
2022									
Jan	9.72	3.10	3,900.64	9.72	3,900.64	-	-	9.72	3,900.64
Feb	10.54	3.76	4,003.94	10.54	4,003.94	-	-	10.54	4,003.94
Mar	10.48	3.27	3,981.54	10.48	3,981.54	-	-	10.48	3,981.54
Apr	10.92	4.01	4,717.76	10.92	4,717.76	-	-	10.92	4,717.76
May	12.70	6.60	5,605.65	12.70	5,605.65	-	-	12.70	5,605.65
Jun	13.40	5.60	6,013.61	13.40	6,013.61	-	-	13.40	6,013.61
Jul	11.82	5.54	5,162.71	11.82	5,162.71	-	-	11.82	5,162.71
Aug	12.74	5.71	5,579.31	12.74	5,579.31	-	-	12.74	5,579.31
Sep	11.53	4.18	5,194.07	11.53	5,194.07	-	-	11.53	5,194.07
Oct	13.07	4.57	5,330.15	13.07	5,330.15	-	-	13.07	5,330.15
Nov	9.93	2.65	4,081.16	9.93	4,081.16	-	-	9.93	4,081.16
Dec	11.28	4.66	4,493.57	11.28	4,493.57	-	-	11.28	4,493.57
2023									
Jan	10.50	3.32	4,104.98	10.50	4,104.98	-	-	10.50	4,104.98
Feb	11.39	4.19	4,213.69	11.39	4,213.69	-	-	11.39	4,213.69
Mar	11.32	3.53	4,190.11	11.32	4,190.11	-	-	11.32	4,190.11

POWER SUPPLY PROCUREMENT PLAN

Apr	11.80	4.33	4,964.90	11.80	4,964.90	-	-	11.80	4,964.90
May	13.73	7.69	5,899.30	13.73	5,899.30	-	-	13.73	5,899.30
Jun	14.49	6.25	6,328.64	14.49	6,328.64	-	-	14.49	6,328.64
Jul	12.78	6.17	5,433.16	12.78	5,433.16	-	-	12.78	5,433.16
Aug	13.77	6.26	5,871.59	13.77	5,871.59	-	-	13.77	5,871.59
Sep	12.47	4.47	5,466.16	12.47	5,466.16	-	-	12.47	5,466.16
Oct	14.13	5.05	5,609.37	14.13	5,609.37	-	-	14.13	5,609.37
Nov	10.74	2.66	4,294.95	10.74	4,294.95	-	-	10.74	4,294.95
Dec	12.20	5.22	4,728.97	12.20	4,728.97	-	-	12.20	4,728.97