

Guam Power Authority Electric Rate Preliminary Study Results

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Metering Today

- In 2017 - 52% of residential customers have AMI metering:

Residential Meters in US (EIA 2017 Data)

Total Meters	133,151,163
Meters with AMI	69,474,626
Percent AMI	52%

- Utilities have ability to charge accurate rate structures, but change can be difficult
 - Education staff, education management, education governing body, education intervenors, education customers

Industry Challenges

- **Intervenors**
- **Solar Customers**
- **Solar Installers**
- **Environmental groups**
- **Customers**
- **Low income impacts**
- **Often valid arguments - Not always based on utility costs**
- **Need to maintain bond ratings - evaluation criteria**

Industry Challenges

- Average residential electric usage declining

Change in Residential Consumption

Average Residential Consumption - 2010	952
Average Residential Consumption - 2017	856
Reduction	10.0%

- Installation of Roof Top Solar – EIA 2017

	Capacity MW	Customers	Customers - Storage	mWh Sold Back
Residential Customers on Net Metering	9,487	1,626,283	2,316	430,481
Residential Customers in California	4,129	785,215	1,729	98,134
California as Percent of Total	44%	48%	75%	23%

Market Share - Electric Vehicles

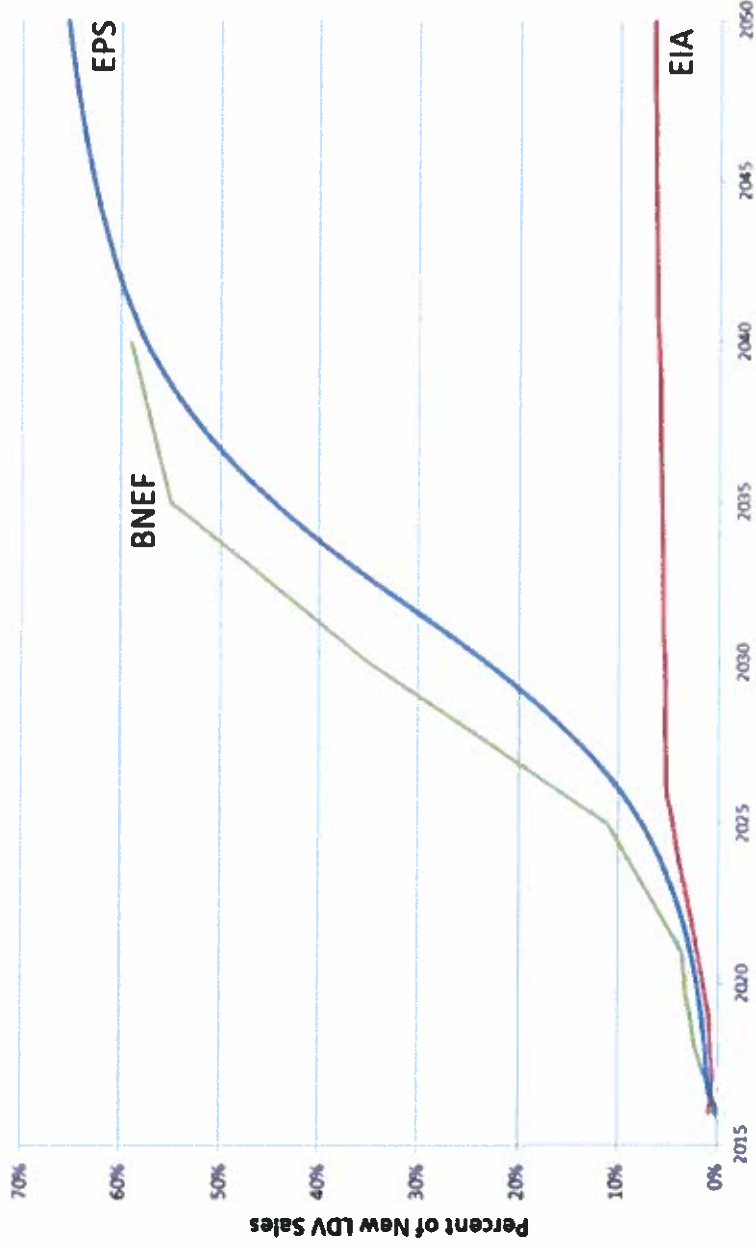


Figure 1. Projections of U.S. market share of EVs from three sources: the Energy Policy Simulator (EPS) 1.3.1 BAU case, the Energy Information Administration (EIA) Annual Energy Outlook 2017 "No Clean Power Plan" side case, and the Bloomberg New Energy Finance (BNEF) Electric Vehicle Outlook 2017.

the Challenges

- Development of rates reflective of our costs
- Fixed costs to service a meter recovered in the customer charge (controversial)
- Fixed costs of distribution infrastructure recovered in demand charges (education)(Marginal or Embedded)
- Energy rates reflective of costs during on-peak, off peak (critical peak) time periods (Tends to include Power Supply and Transmission Costs)

In other words; identifying fixed costs and variable costs of providing service and offering rate structures reflective of our costs



Ideal Cost Based Residential Rate

Structure

Cost Based Rate Design	Option		Billing Unit
	One	Two	
Production Demand Coincident with System Peak		\$14.12	kW
Distribution Demand Based on Customers Maximum Demand	\$ 2.19	2.19	kW
Energy Charge - Critical Peak	0.165	0.061	kWh
Energy Charge - On-Peak	0.112	0.061	kWh
Energy Charge - Off-Peak	0.048	0.048	kWh
Customer Charge	\$ 21.44	\$ 21.44	Monthly

If this is ideal, how do we get there?

Transition Plans

Demand Charges –
AMI required

Time of Use Rates –
AMI required

Cost Based Customer
charges

Grid access fees

Inverted block rate
structure
differentials are
being minimized

Customer Charges
based on size of
service

Low Income
assistance programs

Movement away
from net metering
for customer
installed renewables



PGE Rate Transition Plan

https://www.pge.com/en_US/residential/rate-plans/how-rates-work/rate-changes/residential-rate-changes/residential-rate-changes.page

2015	2016	2017	2018	2019-2020
Tier Price Adjustment Minimum Bill Increase	New Time-of-Use Rate Options FERA Monthly Fixed Discount Tiers Consolidated from 4 to 3 Tier Price Adjustment Minimum Bill Methodology Change	Tiers Consolidated from 3 to 2 High Usage Surcharge Tier Price Adjustment	Tier Price Adjustment	Transition Most Residential Customers to Time-of-Use Rates

- FERA Family Electric Rate Assistance - Qualified low income program

GPA Financial Projection and Cost of Service Study

Discussion

- Review Financial Projections & Targets
 - Debt Coverage Ratio
 - Minimum Cash
 - Target Operating Income
- Review Cost of Service Results
 - Cost to service each class of customers
 - Monthly Customer Charges
- Condo/Apartment Alternatives



Assumptions

- Annual Inflation 2.5%
- Annual Civilian Growth:
 - 2020 – 0.5%
 - 2021 – -0.1%
 - 2022 – -0.2%
 - 2023 – 1.1%
 - 2024 – 0.6%
- Navy Growth:
 - 2021 – 4.4%
 - 2022 – 1.3%
 - 2023 – 5.1%
 - 2024 – 2%
- Fuel Supply Change
 - 2020 – 2.7%
 - 2021 – 17.4%
 - 2022 – 5.2%
 - 2023 – -12.3%
 - 2024 – 0.5%
- Capital Improvements
 - 2020 – \$71.5M
 - 2021 – \$25.5M
 - 2022 – \$26.25M
 - 2023 – \$22M
 - 2024 – \$22.75M

Coverage Ratios (Current Rates)

Description	Projected 2020	Projected 2021	Projected 2022	Projected 2023	Projected 2024
Debt Coverage Ratio					
Earnings from Operations	\$ 34,058,490	\$ 38,457,749	\$ 36,379,702	\$ 36,183,938	\$ 44,279,572
Add Depreciation/Amortization Expense	42,518,005	43,025,516	41,589,086	40,135,509	40,614,583
Add Interest Income (Net of Const. Fund Interest)	1,414,897	1,429,153	1,440,000	1,340,000	1,360,000
Cash Generated from Operations	\$ 77,991,391	\$ 82,912,418	\$ 79,408,788	\$ 77,659,447	\$ 86,254,155
Debt Service after IPP Debt Service and Aggreko Lease	\$ 47,205,713	\$ 47,708,036	\$ 48,821,833	\$ 28,511,500	\$ 28,506,500
Projected Debt Coverage Ratio (Covenants)	1.65	1.74	1.63	2.72	3.03
Minimum Debt Coverage Ratio	1.40	1.40	1.40	1.40	1.40

Description	Projected 2020	Projected 2021	Projected 2022	Projected 2023	Projected 2024
Fixed Cost Coverage Ratio					
Cash Available for Debt Service	\$ 77,991,391	\$ 82,912,418	\$ 79,408,788	\$ 77,659,447	\$ 86,254,155
Off System Debt	-	-	-	-	-
Total Available	\$ 77,991,391	\$ 82,912,418	\$ 79,408,788	\$ 77,659,447	\$ 86,254,155
Debt Service Including Off System Debt	\$ 56,135,105	\$ 49,952,884	\$ 48,821,833	\$ 65,003,952	\$ 68,316,448
Fixed Costs Coverage Ratio	1.39	1.66	1.63	1.19	1.26
Minimum Fixed Costs Coverage Ratio	1.30	1.30	1.30	1.30	1.30



Minimum Cash Recommendation

Description	Projected 2020	Projected 2021	Projected 2022	Projected 2023	Projected 2024
Minimum Cash Reserve Allocation					
Operation & Maintenance Less Depreciation Expense	12.3%	12.3%	12.3%	12.3%	12.3%
Historical Rate Base	1%	1%	1%	1%	1%
Current Portion of Debt Service Payment Paid Monthly	8.33%	8.33%	8.33%	8.33%	8.33%
Five Year Capital Improvements - Net of bond proceeds	20%	20%	20%	20%	20%
Calculated Minimum Cash Level					
Operation & Maintenance Less Depreciation Expense	\$ 41,826,426	\$ 46,961,509	\$ 49,279,582	\$ 45,735,082	\$ 45,302,830
Historical Rate Base	12,024,385	12,279,697	12,542,667	12,763,527	12,991,012
Current Portion of Debt Service Payment	4,162,740	4,068,486	5,416,996	5,693,037	5,699,016
Five Year Capital Improvements - Net of bond proceeds	24,290,027	24,290,027	24,290,027	24,290,027	24,290,027
Minimum Cash Reserve Levels	\$ 82,303,579	\$ 87,599,718	\$ 91,529,272	\$ 88,481,673	\$ 88,282,885
Projected Cash Reserves	\$ 70,442,695	\$ 74,370,471	\$ 74,866,152	\$ 61,640,706	\$ 55,543,461

Summary Projection without Rate Change

Fiscal Year	Base Rate Adjustment	Debt Coverage Ratio	Fixed Coverage Ratio	Adjusted Operating Income	Projected Cash Balances	Recommended Minimum Cash
2020	0.0%	1.65	1.39	\$ 34,058,490	\$ 70,442,695	\$ 82,303,579
2021	0.0%	1.74	1.66	\$ 38,457,749	\$ 74,370,471	87,599,718
2022	0.0%	1.63	1.63	\$ 36,379,702	\$ 74,866,152	91,529,272
2023	0.0%	2.72	1.19	\$ 36,183,938	\$ 61,640,706	88,481,673
2024	0.0%	3.03	1.26	\$ 44,279,572	\$ 55,543,461	88,282,885

Summary Projection with Rate Change

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2020	0.0%	1.65	1.39	\$ 34,058,490	\$ 70,442,695	\$ 82,303,579
2021	0.0%	1.74	1.66	\$ 38,457,749	\$ 74,370,471	\$ 87,599,718
2022	0.0%	1.63	1.63	\$ 36,379,702	\$ 74,866,152	\$ 91,529,272
2023	8.4%	3.70	1.62	\$ 64,015,256	\$ 89,472,024	\$ 88,481,673
2024	0.0%	4.01	1.67	\$ 72,275,136	\$ 111,370,342	\$ 88,282,885

Electric Cost of Service Results

Customer Class	Cost of Service	Projected Rate		Projected LEAC		Projected Revenues	% Change
		Revenue	Revenue	Revenue	Revenue		
Residential (R)	\$ 148,939,030	\$ 48,257,671	\$ 77,953,487	\$ 126,211,158			18.0%
Small General (G 1φ)	11,339,693	6,028,481	6,460,535	12,489,016			-9.2%
Small General (G 3φ)	12,457,385	6,142,248	7,348,304	13,490,552			-7.7%
Small Govt. (S 1φ)	1,643,672	959,180	866,744	1,825,923			-10.0%
Small Govt. (S 3φ)	2,066,786	1,114,738	1,242,041	2,356,779			-12.3%
General Service (J 1φ)	2,359,078	1,132,261	1,373,753	2,506,014			-5.9%
General Service (J 3φ)	41,580,441	20,056,660	26,102,741	46,159,401			-9.9%
Large Power (P)	71,804,117	31,131,633	47,077,759	78,209,392			-8.2%
Small Govt. (K 1φ)	584,731	347,143	320,950	668,092			-12.5%
Small Govt. (K 3φ)	22,386,975	12,626,883	14,486,586	27,113,468			-17.4%
Large Govt. (L)	17,503,306	9,297,553	11,361,256	20,658,809			-15.3%
Navy (N)	70,040,361	19,905,605	50,544,393	70,449,997			-0.6%
IPP (I)	194,910	48,891	65,077	113,968			71.0%
Condos	5,777,881	2,654,392	3,676,318	6,330,710			-8.7%
Total	\$ 414,743,525	\$ 164,340,467	\$ 250,403,058	\$ 414,743,525			0.0%

Customer Charges (Base Charges)

Cost Component Recovery

Recovers cost
for
connection
to Grid at
zero kWh
consumption

- Meter operation, maintenance and replacement costs
- Meter reading costs or AMR installation costs
- Billing Costs
- Customer Service Department
- Service into customers facilities
- **Portion of Distribution System based on minimum system**

Customer Charges Cost Component Recovery

Increasing customer charges helps stabilize revenue recovery for utility

Reduces subsidy between year-round customers and seasonal customers

Will impact low use customers

Low income compared with low use

Low income customers are not always low use customers

Monthly Charge

Customer Class	COS Customer Charge	Current Average Customer Charge
Residential (R)	\$ 32.36	\$ 15.00
Small General (G 1φ)	32.36	14.16
Small General (G 3φ)	63.28	14.16
Small Govt. (S 1φ)	32.36	14.16
Small Govt. (S 3φ)	63.28	14.16
General Service (J 1φ)	157.18	38.33
General Service (J 3φ)	157.64	38.33
Large Power (P)	310.62	59.25
Small Govt. (K 1φ)	157.18	38.33
Small Govt. (K 3φ)	157.64	38.33
Large Govt. (L)	310.62	59.25
Navy (N)	714.70	610.56
IPP (I)	145.64	59.25
Condos	214.54	45.61



Distribution Charges

Customer Class	Monthly Customer Charge	Distribution Rate	Billing Basis
Residential (R)	\$ 32.36	\$ 0.0354	kWh
Small General (G 1φ)	32.36	0.0320	kWh
Small General (G 3φ)	63.28	0.0270	kWh
Small Govt. (S 1φ)	32.36	0.0348	kWh
Small Govt. (S 3φ)	63.28	0.0290	kWh
Private Outdoor Lighting (H)	39.61	0.0274	kWh
Public Street Lights (F)	237.65	0.2586	kWh
General Service (J 1φ)	157.18	8.62	kW
General Service (J 3φ)	157.64	8.40	kW
Large Power (P)	310.62	10.08	kW
Small Govt. (K 1φ)	157.18	8.99	kW
Small Govt. (K 3φ)	157.64	8.96	kW
Large Govt. (L)	310.62	10.65	kW
Navy (N)	714.70	8.36	kW
IPP (I)	145.64	9.79	kW
Condos	214.54	12.00	kW

Power Supply Charges

Customer Class	Demand	Billing Basis	Energy	Billing Basis
Residential (R)	\$ 0.0653	kWh	\$ 0.1626	kWh
Small General (G 1φ)	0.0503	kWh	0.1626	kWh
Small General (G 3φ)	0.0477	kWh	0.1626	kWh
Small Govt. (S 1φ)	0.0575	kWh	0.1626	kWh
Small Govt. (S 3φ)	0.0485	kWh	0.1626	kWh
Private Outdoor Lighting (H)	0.0016	kWh	0.1626	kWh
Public Street Lights (F)	0.0016	kWh	0.1626	kWh
General Service (J 1φ)	18.19	KW	0.1626	kWh
General Service (J 3φ)	16.61	KW	0.1626	kWh
Large Power (P)	22.58	KW	0.1626	kWh
Small Govt. (K 1φ)	11.18	KW	0.1626	kWh
Small Govt. (K 3φ)	16.91	KW	0.1626	kWh
Large Govt. (L)	16.64	KW	0.1626	kWh
Navy (N)	28.85	KW	0.1552	kWh
IPP (I)	8.55	KW	0.1552	kWh
Condos	25.34	KW	0.1626	kWh

Cost of Service Charges

Customer Class	COS Customer Charge	Demand	Energy
Residential (R)	\$ 32.36	\$ -	0.2633
Small General (G 1φ)	32.36	-	0.2448
Small General (G 3φ)	63.28	-	0.2372
Small Govt. (S 1φ)	32.36	-	0.2548
Small Govt. (S 3φ)	63.28	-	0.2401
Private Outdoor Lighting (H)	39.61	-	0.1915
Public Street Lights (F)	237.65	-	0.4228
General Service (J 1φ)	157.18	26.81	0.1626
General Service (J 3φ)	157.64	25.01	0.1626
Large Power (P)	310.62	32.66	0.1626
Small Govt. (K 1φ)	157.18	20.17	0.1626
Small Govt. (K 3φ)	157.64	25.88	0.1626
Large Govt. (L)	310.62	27.29	0.1626
Navy (N)	714.70	37.21	0.1552
IPP (I)	145.64	18.34	0.1552
Condos	214.54	37.34	0.1626

Load Research Data

Customer Class Type	Load Factors for NCP				System Coincidence Factors			
	Summer	Winter	Inter-2	Inter-4	Summer	Winter	Inter-2	Inter-4
Residential (R)	64%	69%	63%	70%	100%	95%	95%	99%
Small General (G 1φ)	61%	64%	61%	66%	70%	69%	69%	72%
Small General (G 3φ)	73%	75%	73%	76%	76%	79%	75%	77%
Small Govt. (S 1φ)	62%	70%	64%	72%	85%	87%	86%	86%
Small Govt. (S 3φ)	71%	76%	74%	77%	78%	82%	85%	76%
Private Outdoor Lighting (H)	45%	45%	45%	45%	0%	0%	0%	0%
Public Street Lights (F)	45%	45%	45%	45%	0%	0%	0%	0%
General Service (J 1φ)	50%	46%	47%	47%	87%	85%	86%	88%
General Service (J 3φ)	47%	45%	46%	47%	77%	77%	75%	79%
Large Power (P)	62%	60%	63%	61%	86%	88%	88%	88%
Small Govt. (K 1φ)	29%	29%	32%	31%	70%	58%	75%	55%
Small Govt. (K 3φ)	50%	48%	52%	52%	81%	76%	81%	77%
Large Govt. (L)	50%	49%	52%	50%	66%	62%	66%	62%
Navy (N)	86%	85%	83%	85%	92%	89%	88%	90%
IPP (I)	3%	8%	7%	17%	0%	0%	0%	0%
Condos	66%	65%	56%	67%	97%	99%	98%	95%

Condo/Apartments

- Current billed in three rate classes:

	Units J3	Units P	Units G1
Customers	14	10	1
Energy Usage	5,725,954	16,642,461	1,244,529
Demand - kW	13,343	33,661	3,186

- Option: Movement to Cost of Service Based Rates would lower the charges by 8.7% and reduce GPA's revenue recovery by \$553,000

Revenue Recovery Options:

- Increase all rate classes (Except Navy) by 0.4%
- Residential Impact \$0.35/Month
- Apply increase only to residential class:
 - Residential Impact \$1.05/Month
- Postpone adjustment until 2023:
 - Base rate adjustment of 8.4% is anticipated
 - Fuel costs are projected to decline 13.1%
 - Anticipated overall residential rate reduction of 8.1%

Questions

