



**Response to Energy Commission Consultation on
BELCO Tariff Filing to Introduce a Graduated Facilities Charge**

31 March 2014

Mr. E Michael Leverock
Chairman of the Energy Commission
C/O Department of Energy
Ministry of Economic Development
Corner House 4th Floor, 20 Parliament Street
Hamilton, HM AX

CC: Jeane Nikolai, Director of the Department of Energy
Dr. the Hon. E. Grant Gibbons, JP, MP, Minister of Economic Development

Dear Mr. Leverock,

We are writing to share our views on BELCO's recent application to replace the fixed \$33.00 per month facilities charge with a graduated facilities charge for customers who are currently eligible for BELCO's residential service and associated rate structure.

In providing our feedback, we have given consideration to the topics outlined in Part 3 Section 13(2) of the Energy Act 2009, which we understand the Energy Commission have regard to when issuing a direction:

- (a) the cost to the specified business of the specified commodity;
- (b) the needs of the specified business for adequate working capital and reasonable reserves;
- (c) the need to afford investors a reasonable rate of return on their investment;
- (d) the public interest; and
- (e) any other matters which, to the Commission, appear relevant.

We are also aware that under Part 3 Section 13(3), as the Commission considers any request from a specified business to vary the price or charge for a specified commodity, that the specified business bears the burden of proof to demonstrate that any variation in the price or charge for a specified commodity is just and reasonable.

Finally, in drafting this submission we have considered the Energy Commission's mission statement 'to assist in the development and maintenance of affordable, clean and sustainable energy, for the economic, social and environmental well-being of residents and businesses in Bermuda'.

Overview

We support the intention behind the proposed rate variation, which we understand to be to reduce the cost of maintaining access to electricity for members of the public, particularly for those who consume the least and may be on lower incomes. We also acknowledge the need for BELCO to maintain revenue neutrality and that utility billing structures are not an exact science, and that our existing rates have already been structured to support the social and environmental goals of incentivising reductions in energy consumption.

BELCO's proposed five tier facilities charge

Our main concern with the five tiered facilities charge is that it will make residential electricity billing so complex that the majority of customers will not be able to understand the various charges they are paying. The twelve month rolling average could be quite difficult for many customers to accurately track, particularly once estimated meter readings and abnormal billing periods are taken into account. The complexity of the resulting bills will also increase the risk that customers could be accidentally mischarged without noticing.

Using daily averages based on the past twelve months for the facilities charge tiers at the same time as using monthly consumption for the energy tiers introduces two systems which require a reasonable amount of background knowledge to successfully calculate. The only other utility that we are aware of that uses a similar system is Barbados Light and Power, who use three tiers for their monthly customer charge, which are based on monthly averages using the same monthly tier sizes as the energy (kWh) tiers.

An example of the complexity of an existing bill is provided in Appendix A, which shows a bill where the kWh tiers and facilities charge appear to vary from the tariff previously approved by the Energy Commission. Upon closer inspection, these changes appear to be justified based on a longer than usual billing period, assuming the previous or following billing period was shorter and the kWh tier sizes and facilities charge were therefore reduced accordingly. Dozens of our clients have received bills such as this, with no explanation as to why the kWh tiers and facilities charge are different from the approved rate structure.

This has caused a lot of confusion and in some cases distress on the part of our customers, who often struggle to calculate how the charges were created without assistance. It is important to many members of the public to clearly understand what they are paying for, particularly for an expensive and largely invisible commodity such as electricity, where monthly bills often exceed several hundred dollars and can appear to change without warning as people unwittingly change their patterns of consumption without necessarily understanding the consequences.

Another consideration is that the public are likely to gain the most benefit from a simple rate structure that they can understand easily, so they can adjust their consumption patterns accordingly to benefit from the system. Having to perform monthly calculations to check which tier they are in is likely to discourage many customers from using the new system to their advantage. The existing monthly tier system has the advantage that it can be tracked without the need to perform any calculations of averages.

Proposal to charge \$33.00 per month for customers with renewable generation facilities

We believe that insufficient evidence has been provided by BELCO to justify charging customers with renewable energy generation facilities up to an additional \$216 per year. We estimate that BELCO's customers pay an additional \$0.005 per kilowatt hour¹ to cover the cost of electricity purchased from residential solar electricity generation systems. This amounts to a total annual cost of \$1.77 for customers falling within the most common bin of residential electricity consumption outlined in Figure 1 of BELCO's rate application.

It is relevant to note that the solar electricity that is purchased by BELCO is then sold on to other customers, resulting in revenue that helps to offset the cost of the purchase, which has already been paid for by electricity customers through the fuel adjustment mechanism, not by BELCO. We agree that BELCO should be allowed a fair rate of return on the cost of metering and delivering solar electricity from one customer to another, though we feel that it is reasonable for the owner of the solar electricity generation facility to expect a fair rate of return on the actual energy their system produces, as they are the one who has made the capital investment in the solar generation plant.

Preventing customers with solar energy systems from being able to pay the lower facilities charge tiers will discourage people who are already energy efficient, or perhaps on lower incomes using less energy, from installing solar panels, in effect penalising them for being efficient while large consumers of electricity would gain the most from installing solar energy systems. The effect would be amplified by the fact that smaller solar energy systems tend to have worse financial performance due to relatively higher fixed costs associated with processing the paperwork required to get a system online. Under the present BELCO rate structure, for example, a two kilowatt system installed on an energy efficient home in the lowest kilowatt hour tier could expect an eight year cash flow break even point and a nine percent internal rate of return², which would just about be considered a worthwhile investment. If this system incurred an additional \$216 per year, the cash flow break even would be over ten years and the internal rate of return would be six percent; effectively not worth financing.

¹ Assuming there are currently close to two hundred customers with solar electricity generation systems of an average size of five kilowatts (DC), which produce one thousand four hundred kilowatt hours per kilowatt of (DC) capacity and feed fifty percent of the electricity produced back into the electrical grid.

² Accounting for the time value of money and allowing for 4.2% annual electricity price inflation.

We also believe that the argument that other customers are subsidising those with solar generation systems may be unfounded, as independently developed models of BELCO's marginal fuel costs suggest that solar electricity purchased from distributed generation systems could actually cost less than the electricity that would otherwise be generated by gas turbines, using more expensive fuel at lower efficiencies than the base load diesel plant, as shown in Appendix B. This would mean that the energy purchased from net metered systems could in fact be subsidising the rest of the customer base.

While net metering is not a sustainable long-term rate structure for the purchase of solar electricity, widespread adoption of a regression-based feed-in-tariff, as outlined in Appendix C, would ensure that solar generation systems would be on track to generate electricity for significantly less than BELCO's current fuel costs, and could in fact subsidise their entire customer base within a few years, helping to reduce the cost of electricity for everyone in Bermuda. Assuming that a tariff similar to the one in Appendix C will be introduced within the next few years, it will be important to continue to encourage as much distributed solar energy generation as possible now, to ensure that electricity costs reduce in the future.

Facilities Charges or Energy Charges?

In reviewing BELCO's application, we considered the case for and against greater revenue generation from fixed monthly service charges as opposed to energy consumption charges. Our conclusion was that the creation of revenue through facilities charges in preference to energy charges is generally not in the public interest for the following reasons:

- Electricity is an essential form of energy required to establish a basic quality of life. When the means by which access to this energy source is controlled by a single company for a fixed monthly cost, members of the public have no choice but to pay this cost to retain access to this essential service.
- Ideally, access to electricity (but not the electricity itself) should be as close to free as possible if we wish for our community to have a consistent basic quality of life. This conclusion is effectively already endorsed by the Government and BELCO, through their arrangement by which the monthly facilities charge is written off for members of the public on financial assistance.
- Provided access to electricity is widely affordable, the electricity itself can be reasonably expensive without adversely affecting people to quite the same extent as fixed monthly access charges can. People can use small amounts of energy very efficiently to meet their basic needs and as energy costs increase, there is a significant amount of elasticity in the way it can be consumed, which allows people to keep expenditure on energy within their means. This is not the case for fixed monthly costs, where the public can do nothing to reduce them.

Gaining Perspective on Facilities Charges

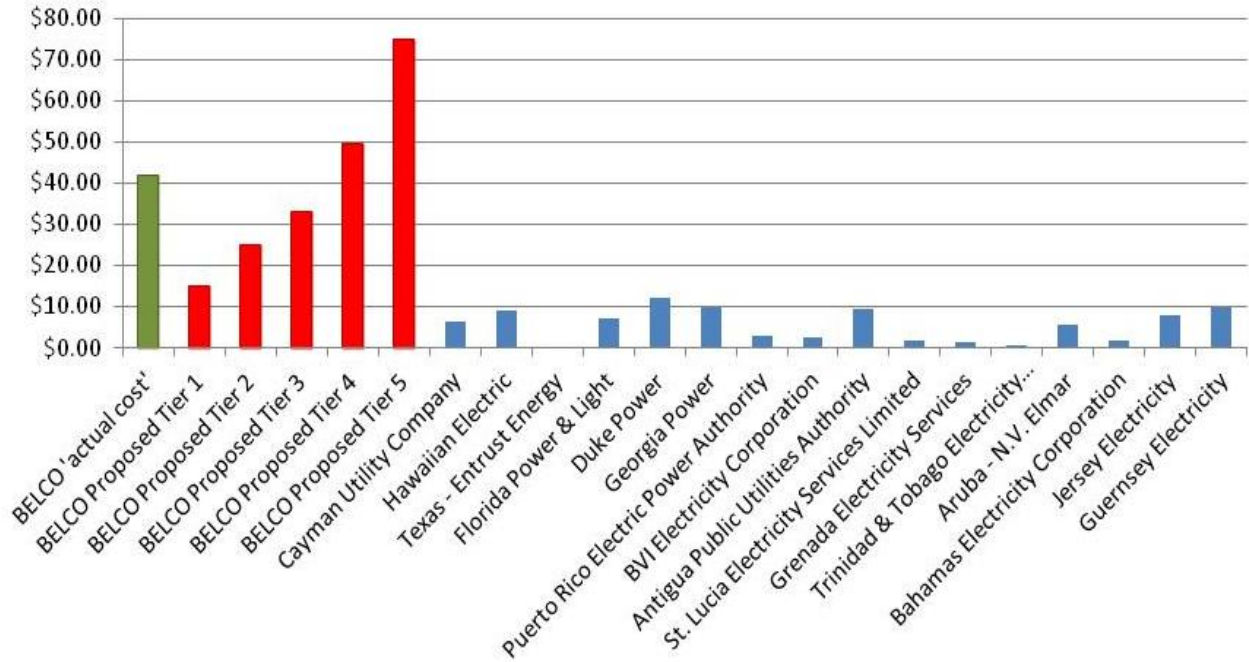
On looking into BELCO's 'actual' reported monthly cost of \$41.84 per customer, we considered that this must be an average cost. The cost is intended to cover meters, meter reading, billing, customer care, customer accounts and service drops, yet the cost is allocated per meter, which has little bearing on the service drop length, capacity or complexity, or upon the amount of customer care and accounting resources that customer may utilise.

Many customers have more than one electrical meter, yet have only one set of lines from the transformer to the meter and their meters can be read at the same time by increasingly automated means. In effect, these customers are paying a disproportionately large amount for the additional meters, which effectively subsidise the cost of service drops and services provided for other customers.

Another interesting comparison may be made between BELCO's 'actual' reported monthly cost, their proposed facilities fee structure and the fixed fee structures of other utilities. We have researched over 15 other power companies across a range of jurisdictions, many being small islands using diesel generation in hurricane prone regions that presumably have similar cost structures to Bermuda. As Figure 1 shows, the vast majority of these utilities charge \$10 or less per month, and some even provide free monthly service.

Figure 1 suggests that BELCO either includes costs in their facilities charge that are normally outside the scope of fixed monthly costs of other utilities, or their costs are significantly higher than the costs of these other utilities. In either case, we believe that it would be in the public interest to reduce Bermuda's facilities charges in line with that seen in other jurisdictions.

Figure 1 - Comparison of Fixed Monthly Customer Charges Among Utilities (\$USD)



A Simpler Solution - The People's Rate Structure

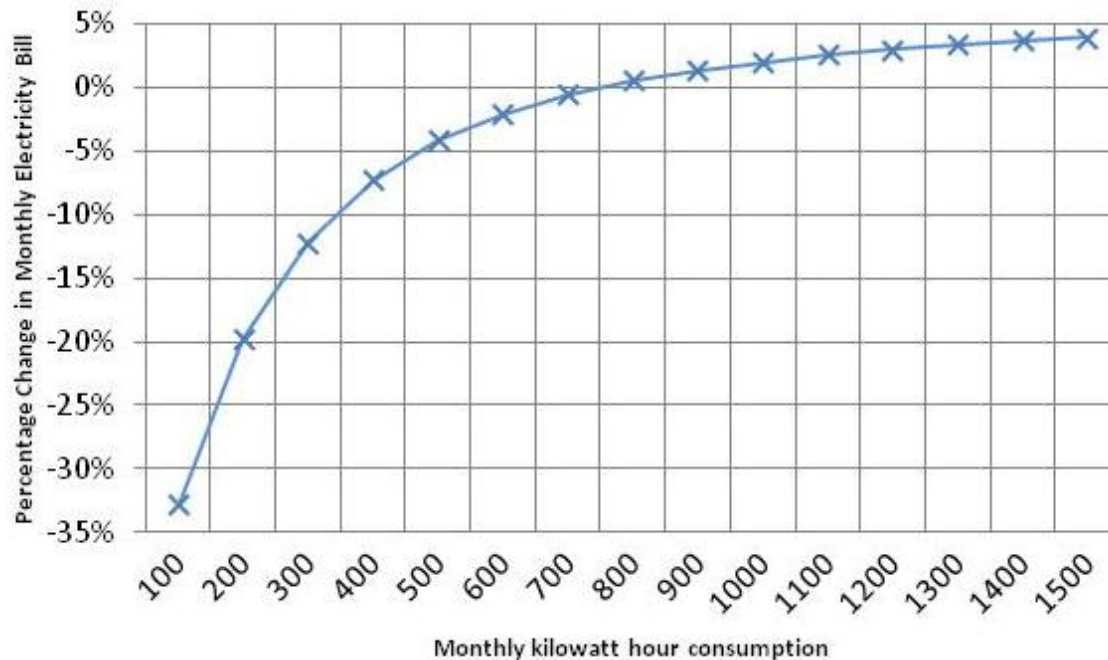
We believe that it should be possible to achieve the same end result as BELCO's proposed tiered facilities charge, with a range of additional benefits, through adopting the simplified rate structure outlined below, which is optimised to provide the maximum benefit to the majority of people in Bermuda:

| Rate Component | Existing BELCO Rate | Proposed People's Rate |
|-------------------|---------------------|------------------------|
| Facilities Charge | \$33.00 | \$10.00 |
| 0-250kWh | \$0.1575 | \$0.1800 |
| 251-700kW | \$0.2400 | \$0.2750 |
| 701kWh+ | \$0.2972 | \$0.3300 |

This structure takes advantage of the existing tiered rates for energy to recoup the revenue that would be lost by reducing the facilities charge from \$33.00 to \$10.00, in line with other jurisdictions. Using the data provided by BELCO in their application, 72% of BELCO's residential customers would save money or pay the same under this rate structure, with those using the least energy saving the most³. Only 28% of customers would see higher electricity bills with this rate structure, and their consumption would in almost all cases be considered far in excess of what is required to provide a basic quality of life, thus these customers would have ample opportunity to reduce their energy consumption through energy conservation, energy efficiency and renewable energy systems if they wished to reduce their bills.

As Figure 2 shows, the People's rate structure disproportionately assists those who use the least energy, with the already high costs of power in the second and third tiers effectively buffering the overall percentage increase experienced by more excessive consumers of electricity. The sheer volume of electricity already being consumed by these super-users means that a small percentage increase in their overall costs provides more than enough revenue to ensure the reduced facilities charge is revenue-neutral.

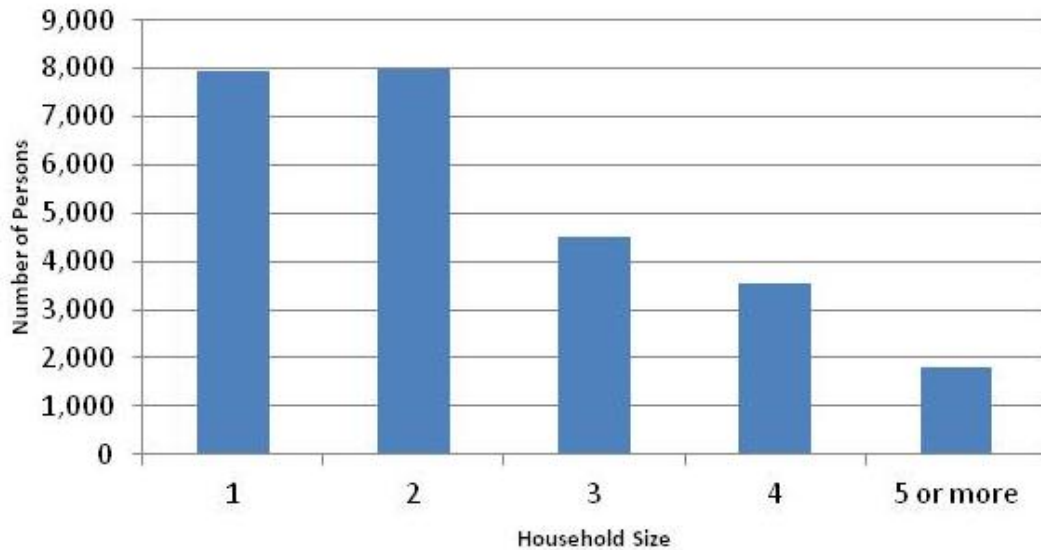
Figure 2 - Percentage change in monthly bill for People's rate structure relative to existing rates



³ A customer using the minimum calculated energy requirement for one person of two hundred kilowatt hours per month would save 19.79% relative to the existing rate structure. This estimate is conservative, if they could use just 100kWh per month they would save 32.81% relative to a customer using the same amount of energy under the existing rate structure.

The foundation for this rate structure was an assessment of Bermuda's population to determine an appropriate level of monthly electricity consumption that would provide a basic quality of life for the majority of people. This was based on the principle that any new rate structure that reduces costs for the masses at the expense of those who consume in excess of their basic requirements would be both popular and fair. As shown in Figure 3, the 2010 census revealed the distribution of household sizes across Bermuda.

Figure 3 - Distribution of Household Size in 2010 Census



We then performed a load analysis to determine the monthly energy requirements of each household size for the provision of hot water for bathing and cleaning, refrigeration, cooking, lighting, laundry and also assumed a light information technology load from a laptop or similar device. The results of this analysis are shown in Figure 4, which shows that five hundred kilowatt hours a month, or a daily average of sixteen point four kilowatt hours should be sufficient for even a large household to achieve a basic quality of life.

Figure 4 - Minimum energy requirements for a basic quality of life

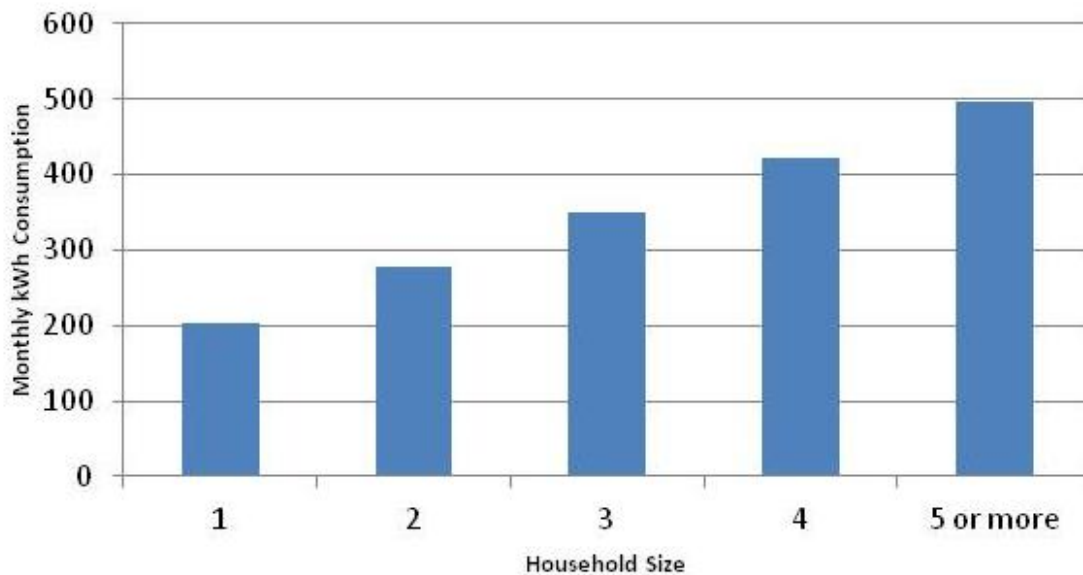
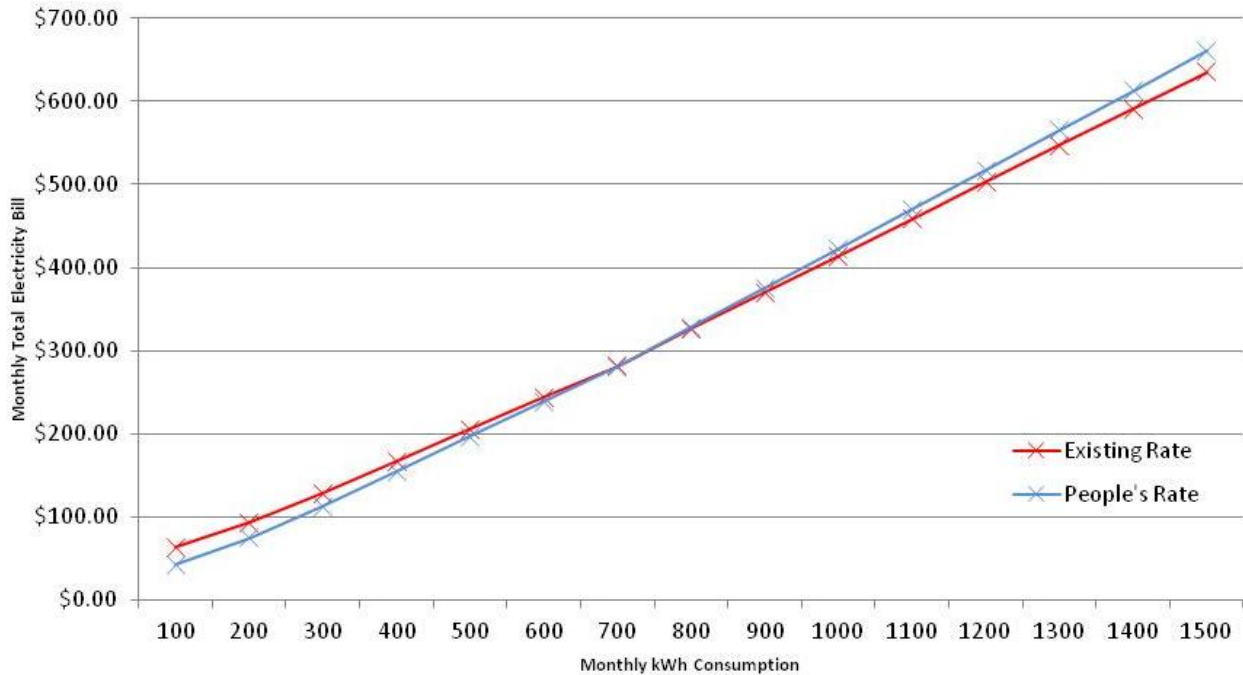


Figure 5 - Monthly electricity bill for People's rate structure relative to existing rates



In terms of the impact on BELCO, as table 2 shows, the proposed rate structure would effectively be revenue-neutral, with revenue lost through the facilities charge more than recouped through increased kilowatt hour tier rates.

Table 2 - Annual Revenue Impact of Existing Rate Vs Proposed People's Rate

| Rate Component | Existing Rate | Annual Quantity | Annual Revenue | BE Proposed People's Rate | Annual Quantity | Annual Revenue | Change |
|-------------------|---------------|-----------------|----------------|---------------------------|-----------------|----------------|---------|
| Facilities Charge | \$33.00 | 390,500 | \$12,886,500 | \$10.00 | 390,500 | \$3,905,000 | -69.70% |
| 0-250kWh | \$0.1575 | 84,000,000 | \$13,230,000 | \$0.1800 | 84,000,000 | \$15,120,000 | +14.29% |
| 251-700kW | \$0.2400 | 135,000,000 | \$32,400,000 | \$0.2750 | 135,000,000 | \$37,125,000 | +14.58% |
| 701kWh+ | \$0.2972 | 72,624,847 | \$21,584,105 | \$0.3300 | 72,624,847 | \$23,966,200 | +11.04% |
| Fuel Adjustment | \$0.1450 | 249,749,000 | \$36,213,605 | \$0.1450 | 249,749,000 | \$36,213,605 | 0.00% |
| | | Total | \$116,314,210 | | Total | \$116,329,805 | |

Conclusion

We believe that while BELCO's proposal has merit, it is not ultimately in the public interest due to an unnecessarily complex structure that consumers will struggle to understand, and the fact that it will discourage the development of clean and sustainable energy systems in energy efficient homes. We also do not feel that BELCO have provided sufficient evidence that the relative cost increase for solar customers is just and reasonable.

Our proposed rate structure supports the Energy Commission's mission in assisting in the development and maintenance of affordable, clean and sustainable energy, for the economic, social and environmental well-being of residents in Bermuda by providing similar if not greater financial relief for those who use modest amounts of energy to meet their basic needs, while providing BELCO with adequate working capital, affording their investors a reasonable return on investment by maintaining revenue neutrality, and ensuring that investors in small solar photovoltaic systems can achieve a reasonable rate of return.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Chris Worboys', enclosed in a thin black rectangular border.

Chris Worboys

Business Development and Strategy
Bermuda Engineering Company Limited

A handwritten signature in black ink, appearing to read 'Nick Duffy', written in a cursive style.

Nick Duffy

Divisional Manager
Bermuda Alternate Energy Limited

Appendix A - BELCO Bill Showing Confusing Kilowatt Hour Tiers and Facilities Charge



BERMUDA ELECTRIC LIGHT COMPANY
P.O. BOX HM 1026, HAMILTON HM DX
www.belco.bm
Customer Enquiries:
Phone: (441) 299 2800
E-mail: info@belco.bm

Consumption Comparisons

| | KWH | DAYS | KWH/DAY |
|----------------------|-------|------|---------|
| CURRENT MONTH | 1,326 | 36 | 36.83 |
| PREVIOUS MONTH | 667 | 31 | 21.52 |
| SAME MONTH LAST YEAR | | | |



Electricity Usage

| METER NUMBER | PREVIOUS METER READING DATE | PREVIOUS METER READING READING | CURRENT METER READING DATE | CURRENT METER READING READING | CURRENT MONTH CONSUMPTION |
|--------------|-----------------------------|--------------------------------|----------------------------|-------------------------------|---------------------------|
| | Jul 16 12 | 6268 | Aug 21 12 | 7594 | 1326 |

Charges

| | | |
|------------------------------|------------------|-----------------|
| PREVIOUS BALANCE | | \$616.17 |
| PAYMENT RECEIVED | | \$616.17 CR |
| DISCOUNT GIVEN | | \$0.00 |
| OUTSTANDING BALANCE | | \$0.00 |
| BILLING CHARGES: | | |
| FIRST 300 KWHS | \$0.1575 per kWh | \$47.25 |
| NEXT 301 - 840 KWHS | \$0.2400 per kWh | \$129.60 |
| OVER 841 KWHS | \$0.2804 per kWh | \$136.27 |
| TOTAL USAGE CHARGES | | \$313.12 |
| FACILITIES CHARGE | | \$36.00 |
| FUEL ADJUSTMENT | \$0.1975 per kWh | \$261.89 |
| TOTAL BILLING CHARGES | | \$611.01 |
| GROSS TOTAL | | \$611.01 |
| DISCOUNT DATE AND VALUE | Sep 07 | \$30.55 CR |
| NET AMOUNT DUE | | \$580.46 |
| 30 DAY | | \$0.00 |
| 60 DAY | | \$0.00 |
| 90 DAY+ | | \$0.00 |

DATE OF BILL Aug 21 2012

ACCOUNT NUMBER [Redacted]

TELEPHONE NUMBER [Redacted]

RATE CLASS [Redacted]

SERVICE ADDRESS [Redacted]

The Fuel Adjustment Rate is 19.75 cents per kWh for the readings taken on or after Aug 1, 2012 until further notice.

IMPORTANT PAYMENT NOTICE:
Payments made via ATM or Online Banking take 2 (two) working days to reach your BELCO account. Please check your discount date carefully to avoid losing your discount.

PAPERLESS BILLING & ONLINE ACCESS
Please call our Customer Service at 299-2800 or email us at go.green@belco.bm to receive Bill Summary emails and obtain Online Access to view & print your bills in their entirety and see all of your account transactions.



BERMUDA ELECTRIC LIGHT COMPANY
P.O. BOX HM 1026, HAMILTON HM DX

Failure to receive or loss of bill does not constitute a valid claim for discounts.
Payments made after date of bill are not included on this bill.
When making a payment please return this portion of the bill.

| | |
|-----------------------|--------------------|
| DATE OF BILL | Aug 21 2012 |
| ACCOUNT NUMBER | |
| OUTSTANDING BALANCE | \$0.00 |
| THIS MONTH TOTAL | \$611.01 |
| GROSS TOTAL | \$611.01 |
| DISCOUNT DATE | Sep 07 2012 |
| DISCOUNT VALUE | \$30.55 CR |
| NET AMOUNT DUE | \$580.46 |

Appendix C - Sustainable Electricity Rates: Comparison of Net Metering and a Degression Based Feed-in-Tariff Developed for Bermuda

