GUYANA POWER & LIGHT INC.

DEVELOPMENT AND EXPANSION PROGRAMME

2016 - 2020

April 2016

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1. EXECUTIVE SUMMARY

As the demand for the supply of electricity continues with the development of new housing schemes and the expansion of business into new areas concomitant with natural growth across all served areas, GPL intends to maintain its aggression in meeting this demand with a least cost, reliable and quality supply of electricity.

GPL recognizes that the challenge to meet the current and projected demand a constant and critical assessment of its generating, transmission and distribution infrastructure. This critical review has highlighted the passage of time for Wartsila manufactured generating capacity within the Demerara Interconnected System (DIS) of 38.5MW at Kingston and Garden of Eden. These generators were commissioned in 1994 and have since completed twenty–one (21) years of service. The 4MW generating capacity at Anna Regina, which is the total installed base load capacity, has also completed twenty-one (21) years of service. GPL intends to establish a new 10MW 60Hz generating facility at Anna Regina in 2017. In Berbice, the Mirrlees generator at Canefield (4.6MW) will be retired and replaced with 5.5MW of new HFO fired 60Hz generation in 2018.

The intended commissioning of the Amaila Falls Hydro facility in 2019 was a major factor in the company's assessment of its generating capacity. GPL had committed to purchase electricity (165MW) from this facility to deliver to its customers. The suspension of the project (albeit the recently revived interest) necessitated a critical review of the company's generating capacity with the emphasis on an economic approach to establishing and maintaining reliable generating capacity to satisfy current and projected demand.

GPL intends to add 17.4MWs of generating capacity to its Vreed En Hoop facility in 2018. This additional generation will result in a total of 43.5MW of generating capacity at Vreed En Hoop. GPL also intends to exercise prudent management and maintenance of its aged generators at Garden of Eden (16.5MWs) and Kingston 1 (22MWs) to maximize availability and reliability over the life of this development and expansion programme.

The deployment of renewable energy has gained significant momentum across electric utilities and an increasing number of utilities are including renewable energy in their generation mix. GPL has declared its openness to renewable energy and has been engaging a number of potential Independent Power Producers (IPPs). Currently a 25MW (installed capacity) wind energy project at Hope East Coast Demerara and a 1.5MW Photovoltaic System (Solar) at Bartica (Region 7) are being considered. The wind farm if commissioned is expected to deliver approximately 9.6MWs of reliable power into the grid.

Skeldon Energy Inc (SEI) has significantly improved the reliability of its 10MW HFO fired generation thus stabilizing and enabling GPL to satisfy the peak demand in Berbice. SEI intends to commence maintenance on its two (2) turbines in order to reliably deliver the required amount of electricity renewable energy using bagasse during the cane grinding season.

The 26MW generating facility at Vreed En Hoop was commissioned during 2015 with electricity being generated using fuel (Light Fuel Oil) that was transported by road tankers as against the intended marine transportation. The necessary work to facilitate the delivery of fuel (HFO) via marine transportation was completed and the generating station has since been declared to be fully functional.

The Infrastructure Development Project that was completed in September 2015 provided the interconnection of Berbice and Demerara via 96 Km of 69Kv transmission line and the construction of seven substations. This project provided only for a single transmission line and therefore offering no redundancy should that link become non functional within a section or sections. In this programme GPL intends to construct a second transmission link between Kingston and Sophia, Sophia and Good Hope, Good Hope and Columbia.

1.1 LOSS REDUCTION

The company's overall loss (technical and non technical reported on a 12 month rolling average) was 29.2% against a target for 2015 of 29.6% reflecting a reduction of .4%. The reduction was a result of the continuation of the core activities within the Strategic Loss Reduction Plan. Such activities were:

- The identification and replacement of defective meters with particular focus on the ITRON meters to ensure the integrity of billing process. Accounts with ITRON meters contribute approximately sixty percent (60%) of monthly revenues.
- Leveraging the Customer Information System (CIS) to identify accounts with below average consumption patterns (based on customer category) that may warrant inspections
- Leveraging the Prepaid System (JUICE) to identify accounts with consistent low patterns of monthly aggregated purchases or intermittent monthly purchases of prepaid electricity for inspection.
- The ITRON Meter replacement programme with the added focus on large consuming residential (Tariff A) and Commercial (Tariff B) customers recorded an increase of ITRON installations increased from 3,196 as at December 2014 to 3910 as at December 2015. The installation of approximately 1800 ITRON smart meters using AMI (Advanced Metering Infrastructure) Technology further increased the total number of installations to those categories of customers to 5,710.
- The removal of illegal connections in both regularized and unregularized areas where the culture in those regularized appears to be a refusal to apply for a legitimate service: 3,562 illegal connections were removed resulting from 70 sanitation exercises. These lead to arrests of 157 persons.

The US\$766,383 investment in the Advanced Metering Infrastructure (AMI) from the IDB funded Sustainable Operation of the Electricity Sector and Quality of Service, which facilitated the installation of 1820 smart meters continued to deliver the expected benefits listed below:

- Recording consumption on circuits where prepaid meters were installed and bypassed. This was established as a result of the installation of the AMI meter in series with the prepaid meter
- The constant tracking of the energy state of the meter, such that any loss of power not attributed to GPL, could be detected and the appropriate action executed by the company in those instances.
- A number of AMI installation reported increased consumption, which suggested that the replaced meters may have either been defective from age or tampering. The unbilled consumption was applied to those identified accounts in accordance with the company's Standard Terms and Conditions (amended 2010). Conversely, those accounts with meters that were established as over-recording via monitoring the consumption recorded on the replacement meters, were adjusted with computed credit adjustments.
- The analysis of losses within this pilot zone has revealed a reduction from 42% to 25%. This reduction in conjunction with the value added benefits provide a solid basis to deploy this technology beyond the pilot zone.

The joint Inter Development American Bank and European Union Investment of US64.5M towards the Power Utility Upgrade Program (PUUP) will facilitate the procurement of 54,000 AMI compatible meters within Component III of the program. These AMI meters will replace those meters within the selected served areas. Component III places a significant focus on Loss Reduction with specific emphases on both technical and non technical loss reduction. This programme has a significant budget allocation of US41.5M of the total US4.5M. This investment towards the PUUP spans a period of five (5) years: 2014 - 2019.

The planned GPL / PUUP consolidated technical Loss Reduction measures within the targeted served areas are:

- ✓ Replacement of 915Km of low voltage conductors
- ✓ Replacement of 105,500 meters to AMI meters
- ✓ Relocation and right sizing of transformers
- \checkmark The upgrade of the customer interface: This will include:
 - The service line
 - o Meters
 - Meter enclosures
 - Related accessories
- \checkmark The implementation of social management campaigns.

This significant investment targeted towards technical and non-technical Loss Reduction is expected to contribute to the reduction in losses from the reported 29.2% as at December 2015 to 23.3% during 2020.

GPL is confident that this investment will contribute towards a downward and sustainable trend in losses. However the company remains cognizant of the culture with respect to electricity theft in Guyana and that no solution is forever fraud proof. As such the company will continuously and consistently monitor its loss profile and examine and implement innovations that would support sustainable efforts. This is the approach taken by countries such as the Dominican Republic, Jamaica and Columbia that are challenged with electricity theft.

Continuous major investments coupled with a sustained and coordinated approach to reduce overall losses will position GPL to realize:

- ✓ A reduction in generation demand resulting in lower generation operational costs and capital expenditure in additional generation facilities.
- ✓ Reduced tariffs across all tariff categories as negative impact of losses on tariffs is eradicated for every sustained one percent (1%) reduction.
- ✓ A reduction in the number of customer complaints received at GPL' s Commercial Offices and the Public Utilities Commission (PUC) as a result of retroactive charges representing unbilled consumption from electricity diversion.
- ✓ An improvement in GPL's financial health, thereby better positioning the company to meet its financial obligation and to fund the capital programmes required to deliver the expected and targeted level of service. It's important to note that a one percent (1%) reduction in losses in 2016 would equate to an annual saving of approximately G\$100M and an equivalent percentage increase in sales would increase annual revenue by G\$240M.

1.2 EFFICIENCY AND CUSTOMER SERVICE IMPROVEMENTS

The completion of the US\$40M Infrastructure Development Program and the US\$37M 26MW generating station at Vreed-En-Hoop notably improved the quality of the electricity supply within Demerara and Berbice. GPL is very cognizant of the use of Information and Communications Technology (ICT) to support improvements in customer services and efficiency. GPL intends to invest in additional ICT facilities to realize these improvements over the next five years. The investments will facilitate:

- ✓ The extension of the All-dielectric self-supporting (ADSS) optical fibre cable to the East Berbice and West Berbice Commercial offices, which will result in an improvement of the performance of the corporate Wide Area Network (WAN)
- ✓ The implementation of an Industry Standard computerized Inventory Management System

- ✓ The procurement and implementation of a computerized Business Intelligence System that will support the company's development of a computerized Management Information System (MIS)
- ✓ The procurement and implementation of a computerized Document Management System.
- ✓ The procurement and implementation of a modern computerized Human Resource and Payroll Management system.
- ✓ The further deployment of an interactive Web Portal to customers for account management
- ✓ The procurement and implementation of a computerized Maintenance Management System
- ✓ The upgrade the Customer Information System from a client-server platform to a web based platform
- ✓ The leveraging of the modern Internet Protocol (IP) Private Branch Exchange (PBX) to offer video conferencing services between Berbice and Demerara.
- ✓ The establishment of an electronic platform for alerting delinquent customers via Short Messaging Service (SMS)
- ✓ The establishment of an electronic platform for customers to record contact numbers and meter readings

GPL will continue to execute its strategic plan on the seven 'pillars' highlighted in previous Development and Expansion programmes. These 'pillars' continue to inform critical corporate Key Performance Indicators (KPIs). The company commenced the development of an objective Performance Management System (PMS) during the last quarter of 2015, which is intended to add significant value in the monitoring of performances against KPIs, the review of existing KPIs and the establishment of new KPIs. This objective PMS will also influence the re-design of the appraisal system and the relationship between staff appraisals and salary incentives.

The seven 'pillars' are listed below:

- Optimizing revenue.
- Minimizing cost of operations.
- Improving Customer Service (CS).
- Achieving a sustainable financial position.
- Enhancing Corporate Governance Framework and Practices.
- Enhancing Skills and Competencies of Employees and Contract workers.
- Achieving national objectives.

Details of specific activities supporting each 'pillar' are highlighted below, which are intended to cover and deliver on this Development and Expansion plan and consistently meet the company's Customer Service Standards (CSS) and Operational Standards and Performance Targets (OS&PT).

1.3 CAPITAL INVESTMENTS

It should be noted that under the conditions specified by the International Monetary Fund (IMF) through the Poverty Reduction and Growth Facility (PRGF), the Government of Guyana is required to meet a minimum threshold of concessionality attached to any new loan. Specifically, the grant element of any new loan must be in excess of 35%. This has severely limited GPL's ability to secure loans since May 2003 when it became a public entity. This Development & Expansion Programme is partially financed via a loan to GPL from Government with resources coming from the Inter American Development Bank and the European Union. on highly concessional terms.

1.4 INVESTMENTS

1.4.1 Generation

The program projects an investment of US\$51M over the next five years with financing coming from internal funds. The steep decline in fuel prices, the projections of lower fuel prices and prudent financial management should position GPL to fund the planned programmes.

The investments are as follows:

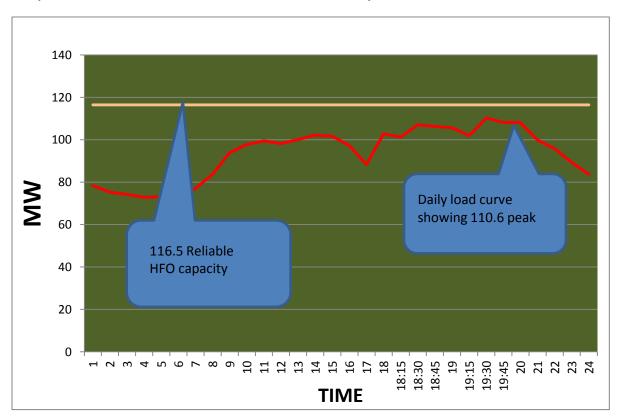
Investment of US\$51.1M to:

- Construct a new 10MW, 60Hz HFO fired power plant at Anna Regina.
- Increase generating capacity at the Vreed En Hoop facility from 26MWs to 43MWs (with the addition of 2 X 8.7MW HFO fired generators)
- Relocate the power plant at Bartica to a more suitable location.
- Replace 4.6MW of aged generation with 5.5MW of new HFO fired generating capacity at Canefield East Berbice

The company projects 96% of its generation from renewable and HFO sources in 2016. This is an increase of 1% over 2015.

The planned commissioning of the Amaila Falls Hydropower facility in 2019 would have realized 165MWs into GPL's grid. This renewable source of base load energy significantly impacted the company's plans for generation. The suspension of this project necessitated the company's review of its base load generation capacity within the Demerara Berbice Interconnected System (DBIS).

GPL has recognized the continuing emergence of renewable energy and its increasing presence in the generation mix internationally and regionally. However, it should be noted that GPL does not consider renewable energy from wind and solar sources as base load power. GPL would therefore need to maintain base load generating capacity to satisfy its peak demand, which is between the hours of 6pm and 9pm presently. The company has projected this peak demand pattern over the life of this programme. The Government of Guyana invited bids for the provision of 1.5MW of electricity from solar for Bartica. A potential Independent Power Provider (IPP): Guyana Windfarm Inc (GWI) has proposed 25MWs of installed capacity from wind at Hope ECD. It should be that noted that 38.5% (9.6MWs) has been proposed as available capacity.





1.4.2 Transmission and Distribution

The US\$40M Infrastructure Development Programme (IDP) realized significant improvements in the quality of the electricity supplied to the customer. These improvements continue to be identified as:

- \checkmark Improved voltage levels due to the shorter lengths of distribution lines
- ✓ Improved system stability
- ✓ Reduced disruption of service supply and easier detection of faults within the system during emergencies

It was previously noted that the IDP would contribute significantly to improvements in the quality of electric services to customers. Whilst there has been evidence of notable

improvements, the requirement remains for infrastructural work in those areas that were outside the scope of the project. GPL intends to complete the infrastructural work in those areas over the life of this programme.

The main components of the planned infrastructure programme are:

- ✓ Construction of Distribution Substations
- ✓ Extension to existing Distribution Substations
- ✓ Construction of Medium to High voltage transmission lines

1.4.3 Substations

The company plans to investment US\$27.9M to construct four (4) new 69/13.8kv substations and expand five (5) existing substations. New 17MVA substations will be constructed at:

- ✓ Parika on the East Bank of Essequibo
- ✓ Canal No 2 on the West Bank of Demerara
- ✓ Kuru Kururu on the Linden Highway on the East Bank of Demerara
- ✓ Williamsburg on the East Bank of Berbice

The construction and commissioning of these substations would allow for new distribution feeders to be deployed in those geographic areas to serve projected loads efficiently.

GPL plans to expand the following substations to accommodate additional single circuit 69kv transmission lines:

- ✓ Kingston (Additional Bay)
- ✓ Sophia (Two additional bays)
- ✓ Good Hope (Two additional bays)
- ✓ Columbia (Additional Bay)
- ✓ No.53 Village (Two additional bays)
- ✓ Vreed En Hoop (Additional Bay)
- ✓ Edinburgh (Additional Bay)
- ✓ Garden of Eden (Rebuild former L2 Bay)

The expansion of various substations are required to deploy new 69Kv transmission links, either to power the new substations or to reduce transmission losses (Sophia to Kingston and Sophia to Good Hope to Columbia).

- ✓ Additional feeders to be deployed on the West Bank of Demerara to meet the growing demand resulting from the development of large housing schemes, thereby reducing technical losses.
- ✓ New feeders to be available to serve loads along the Linden Highway, up to Kuru Kuru and potential new industrial developments in the Timehri area. This initiative is largely targeting market development.
- ✓ Dedicated feeders to be available to serve the growing commercial and industrial load in Parika and up to Roden Rust. The deployment of these feeders will serve to reduce technical losses and support market development

1.4.4 Transmission lines

Investment of US\$18.05M to construct approximately 83Km of single circuit 69Kv lines between:

- ✓ Kingston and Sophia (6kms)
- ✓ Sophia and Good Hope (10kms)
- ✓ Good Hope and Columbia (26Kms)
- ✓ Vreed En Hoop and Canal No 2. WBD (11kms)
- ✓ Edingburgh and Parika. EBE (18kms)
- ✓ Garden of Eden and Kuru Kuru. EBD (12kms)

The construction of these transmission lines will serve to:

- ✓ Maintain the required voltage into the load centers
- ✓ Reduce transmission losses
- ✓ Provide redundancy for transmission between substations

1.4.5 Transmission Structures

GPL intends to strengthen its transmission network and reduce the frequency of pole replacements and maintenance by examining and assessing the use of alternative non wooden structures.

The company expects to commence and conclude a comprehensive assessment of this critical resource during 2016. Should the assessment prove to be economically feasible, a work programme will be developed to replace critical transmission structures during and beyond the life of this development and expansion programme.

1.4.6 Distribution

The company projects a total expenditure of US\$12.5 for the upgrade of the Low Voltage distribution network. This includes:

• Upgrading 38 Km of MV and 183 Km LV network.

• Undertaking a menu of activities (see below), to reduce technical losses and improve the reliability of the supply of electricity.

Note: The quantities for network upgrade include the scope under the Power Utility Upgrade Program.

1.4.7 Loss Reduction

A total of US\$47.3M (US\$34.8 – Non Technical Loss Reduction and US\$12.5 – Technical Loss Reduction) will be expended over the next five years. The Non Technical programme will focus largely on the replacement of current meters in selected served areas with AMI compatible meters. This is in keeping with GPL's metering strategy, which is largely to embrace the Advanced Metering Infrastructure (AMI) technology. This technology requires the use of:

- ✓ 'Smart Meters'
- ✓ Remote Bi-Directional communication infrastructure (GPL to meter and meter to GPL)

The investment in non technical losses is targeting:

- The upgrade of 68,000 meters to AMI. 54,000 upgrades would be completed as part of the coordinated approach to overall loss reduction under Component III of the PUUP.
- The replacement of 21,000 defective meters with AMI meters.
- The replacement of 7,500 tampered meters with AMI meters.
- The upgrade of 9,000 meters for Maximum Demand and large Tariff A and B Consumers to AMI.
- The use of co-axial service lines in particular high-risk areas.
- A Public Education and Social Management Programme.

US\$12.5M, which is included in the US\$47.3M mentioned above, will be spent on technical loss reduction activities targeting both MV and LV networks. This includes:

- Replacement of 74Km of service lines.
- Extension of 54Km of MV network to serve new transformers.
- Upgrade of 38Km of MV network, including load balancing.
- Upgrade of 183Km of LV network, including load balancing.
- Replacing 196 inefficient transformers.
- Right sizing 181 underutilized transformers.
- Installing 333 additional transformers.
- Upgrading 275 transformers, including load balancing.
- Installing 63,913 INSULINK on Customer service connections.
- Upgrading and crimping 6,520 transformer LV drops.
- Upgrading and crimping 3,449 MV jumpers and connections.
- Upgrading and crimping 7,156 LV jumpers and connections.

The investments in technical loss reduction will help to:

- i) Reduce technical losses thereby reducing the total net generation requirement.
- ii) Improve voltage regulation and overall power quality.
- iii) Reduce frequency of faults.
- iv) Improve the design of the existing network to reduce access to establish illegal connections.

1.4.8 New Services

US\$9.4M will be spent to connect approximately 34,200 (30,900 residential and 3,300 business) new consumers. This growth in new services recognizes the continued expansion of the housing sector and an electrification programme for regularized and occupied unserved areas.

1.4.9 Electrification

US\$1.9M is projected to be spent on electrification in unserved rural areas during the life of this programme. This is to serve the pockets of un-served consumers who are appearing with some regularity next to almost every new housing development. The 2016 electrification programme will impact 2,356 potential customers within twenty-four (24) communities in Regions 2, 3, 4, 5 and 6

1.4.10 Information Technology

The company projects US\$892K to be invested in:

- The phased implementation of GIS to serve T&D, Commercial Services, Loss Reduction etc.
- The implementation of a modern industry standard Inventory Management System
- Procurement and Implementation of a Business Intelligence system as a Management Information System tool.
- Procure and implement a Worldwide Web enabled service for customer electricity account on line interaction.
- The implementation of Budgetary Control within the current Oracle E-Business suite.
- Extension of the All Dielectric Self-Supporting (ADSS) fiber cable from the backbone to GPL Commercial and T and D offices in East and West Berbice.
- Procurement and implementation a modern Human Resource Management and Payroll system
- Procurement and Implementation of a modern Document Management System
- Upgrading of the Customer Information System
- Procurement and implementation of a Computerized Maintenance Management System

These investments will:

• Allow the numerous advantages of GIS to be leveraged for T&D planning, overall asset management, Customer Services and Disaster Preparedness.

- Integrate with Oracle E-Business Suite to facilitate to provide a seamless interface to existing modules such as the General Ledger, Procurement Management and Accounts payable, thus further reducing excessive paper costs, whilst strengthening the internal controls to realize improvements in efficiency.
- Facilitate data analysis and reporting up to the Executive Management level. Allow for the merging of data from various corporate databases, thus facilitating fast and comprehensive management decisions. Reports can easily be presented in a graphical or tabular fashion.
- Present customers with a 'window' into their electricity account (via the internet) and allow for the input of critical data such as contact information and meter readings.
- Budgetary Control from the cost center level to the divisional level can be monitored and 'touch of a button' projections can be computed premised on expenditure against budget to identify problematic cost centers.
- Significantly improved network performance within the Berbice regions, which will facilitate improved access times to the corporate systems, whilst providing sufficient bandwidth to accommodate video conferencing and remote surveillance.
- Provide a modern system that embraces and supports current industry standard H R practices and strongly influences payroll management and processing..
- Significantly reduce stationery costs, whilst providing an electronic facility for securing, cataloguing, document version controlling, controlled document access and archiving.
- Eliminate the dependency on Application Virtualization software (Citrix) and relieve users of the dependency on desktop processing as against the more attractive and reliable server processing and the 'serving' of web pages to the user, thus reducing maintenance costs.
- Electronically manage Transmission and Distribution and Facilities Management work programmes: i.e work execution premised on planned programmes, whilst mapping expenditures against budgetary allocations.

1.4.11 Supervisory Control and Data Acquisition System: SCADA

The scope of US\$40M Infrastructure Development Project facilitated partial implementation and functionality of the SCADA system. SCADA functionality was restricted to the monitoring and operation of the 69KV and 13.8KV transmission network.

Whilst the scope of the SCADA implementation may have been limited, the company has acknowledged the benefits of the introduction of remote monitoring and operation of its transmission network.

Financing from Component II of the Public Utility Upgrade Programme (PUUP) will be used to examine the current SCADA system in order to determine its potential to support the wider and future needs of GPL and whether it should or can be upgraded to comprehensively satisfy GPL's requirements. GPL's requirements are:

- Reduction of the frequency of power outages to customers.
- Automated coordination and management of generation and load to improve system stability and power quality.
- Timely and more accurate assessment and evaluation of abnormal system incidents.

1.4.12 Buildings

US\$5.7M will be spent on buildings in Demerara, Berbice and Essequibo to include:

- Vreed-En-Hoop: The construction of a building for Commercial Office. This will address the constant flooding of the Commercial office particularly during high tides.
- Williamsburg: The construction of a building to relocate the Chesney Commercial office.
- Sophia Training School: The construction of a modern facility within the Sophia compound for the Training school.
- New Corporate Office: The construction of a modern building within the Sophia compound to accommodate staff from Middle,, Main and Duke Streets.
- New I C T Centre: The construction of a building within the Sophia compound to accommodate I T and I T related staff i.e. GIS and AMI and provide a secure and controlled environment for sensitive and critical hardware.
- Anna Regina: The rehabilitation of the Commercial and T and D office.
- Leguan: The relocation of the Commercial Office away from the Generation station.
- Garden of Eden: The removal of asbestos from the Stores and Workshop Building (roof)
- Canefield: The removal of asbestos from the Stores and Workshop Building (roof)
- Sophia Multi Purpose Building: Recommence construction and complete in 2017.
- Versailles: Construct a building for T and D West. The current rented building requires extensive remedial work.
- Canefield: Construct a building for the Generation Staff.

These facilities will:

i) Provide accommodation to reduce the dependence on rented facilities.

- ii) Improve customer service facilities and working conditions for staff.
- iii) Improve the image of the company.
- iv) Strengthen the company's asset base

1.4.13 Capacity Building

US\$4.2M will be invested in:

- 1. Additional and more specialized tools and articulated vehicles.
- 2. Training for professional staff in both technical and non-technical areas.
- 3. Office equipment, including computers to improve efficiency.
- 4. Vehicles to build capacity and reduce the large rental fleet of over 150 vehicles.

These investments will:

- Improve T&D maintenance capacity and emergency response capability.
- Significantly reduce SAIFI and SAIDI contribution from T&D related issues and allow improved management of network isolation for maintenance and automatic, more localized fault isolation.
- Improve skills in all critical areas.
- Ensure ICT facilities, office equipment and support systems are adequate and available.
- Provide the Company with its own transport capability for all critical activities and increase the range of specialized vehicles.

1.5 Customer Service

Customer Service remains a primary focus for GPL and as such will remain an important feature of this Development and Expansion Programme. The commissioning of three (3) Customer Service Centers on the East Bank of Essequibo (Parika), East Coast of Demerara (Mon Repos) and East Bank of Demerara (Grove) during 2014 demonstrated the company's commitment to extending its commercial presence at strategic points across its served areas. During August 2015, the new building to accommodate the Bartica Commercial Office and the Bartica T and D office at Esplande was commissioned.

During the third quarter of 2015, the company further leveraged its Customer Information System (CIS) by introducing the CIS controlled credit rating system. This system electronically ranks customers premised on their payment patterns and history and assists in the filtering and extraction of defaulting accounts with credit rating scores above the threshold.

GPL will continue over the life of this programme and beyond to deploy strategies and initiatives that will support the company's efforts to continuously improve its quality of service and consistently meet the Customer Service Standards (CSS), which were introduced in 2011. GPL will also continue to consistently meet the Operational Service and Performance Targets (OS&PT). The performances recorded against the CSS have improved since its introduction. The company will continue to craft and deploy customer service strategies that should result in notable and sustainable performances.

During 2015, the company's meter readers reported that their access to read meters, continues to be compromised as a result of:

- 1. Placement of the meter.
- 2. Locked date
- 3. Untethered dog

The company responded to these concerns by:

1. Formally alerting the customer of the placement of the meter.

2. Placing a message on the bill alerting the customer of the planned dates for meter reading.

While the company injects significant effort into improving performances to meet the targets, customers continue to register some frustration in critical areas of Customer service such as:

- Meter reading
- Billing
- Bill payments
- Disconnection and reconnection
- Queries of all types

It is the intention of GPL to continue to craft and deploy a menu of strategies aimed at addressing and alleviating those frustrations. To this end the company will:

- Further leverage the corporate web site www.gplinc.com to present monthly electronic bills, which customers can access and download at their leisure.
- Provide an electronic platform that will allow customers to record their contact number, preferably a cell number. This would assist in GPL in its intended effort to broadcast payment reminders via Short Message Service (SMS).
- Provide an electronic platform for recording customer retrieved meter readings. This will be subject to GPL's mandatory request to retrieve a minimum of one read per quarter.
- Ensure new Commercial Offices recently opened on the West Coast, East Bank and East Coast of Demerara in 2014 are known to customers and provide the highest level of service.
- Install over 102,000 smart meters. These meters will comprehensively deal with meter reading issues, disconnection and reconnection, billing and some types of queries.
- Expand its public education initiatives to promote electronic payments to make financial transactions with GPL hassle free.
- Encourage more consumers to agree to electronic billing. Only 1,600 consumers are utilizing the available E-billing facility.
- Consolidate the Call Centers where commercial and technical queries are directed. Such a consolidation will present a 'one stop shop' to the public who will be attended to by a multi-skilled CSR.
- Intensify its Public Relations efforts using more target audience penetrative methods.

1.6 MARKET DEVELOPMENT

Although GPL is a monopoly, the Law does not place any restrictions on self – generation, businesses that depend heavily on an uninterrupted supply of electricity that is economically priced, generally tend to self-generate. GPL has taken a conscious decision to avoid frequent tariff increases and, in fact, has foregone tariff increases of G\$26.5B as at December 2015.

GPL expects that the significant investment in the upgrade of the transmission network and the recent decline in fuel prices would gain the attention of self generators and influence a partial return to the grid. In addition the ten percent (10%) fuel rebate introduced in March 2015 and the further ten percent (10%) net rate reduction effective April 1, 2016, could catalyze further interest to return to the grid.

The Government of Guyana's position to critically review the Amaila Falls Hydropower project and its endorsement of the use of renewable energy has attracted a number of potential investors who are desirous of providing energy from renewable sources.

This shift in the generation mix has necessitated the establishment of a Grid Code, which will define the parameters for connecting to the grid. Preliminary efforts have commenced in this regard. GPL expects to this Grid Code to be established during 2016.

1.7 SUMMARY

The Programme projects capital and operational expenditure of US\$194.8M over the next five years. Major sources of financing will be provided by GPL with 33% from IADB/EU funding. The IADB / EU funding is constituted as US\$37.6M in debt financing (IADB) and US\$26.9 as a grant (EU). The Programme projects more significant investment in the earlier years of this programme and to leverage the improvements are to improve service, reduce cost and losses at the earliest possible opportunity.

US47.3M will be spent on loss reduction with total sustained reduction in losses of 5.7% projected over the next five years. This level of projected loss reduction is based on a recent assessment of losses by each feeder and a revision of the loss profile for technical and non-technical losses. The assessment shows that 73% of GPL's losses occur in Region 4 and some parts of Region 3 where just less than 82,000 consumers are being served. The investment will target the 'high loss' areas.

Non-technical losses are projected to reduce from 15.86% at the end of 2015 to 12.3% at the end of 2020 while technical losses are projected to reduce from 13.3% at the end of 2015 to 11% at the end of 2020. The non-technical loss reduction plan is premised heavily on the IDP/EU funded Low Voltage Network Rehabilitation programme and it will be supported by a menu of GPL developed initiatives designed to achieve continuous reduction in losses.

This Loss Reduction plan involves the use of smart meters in selected areas and securing the service connection to the network. This initiative would be supported by an aggressive US\$1.4M IDB/EU funded Social Management Programme.

The company remains cognizant of public perception and as such will intensify its Public Relation efforts and craft and introduce a number of customer service targeted strategies intended to positively impact its customers and the general public.

It is the company's intention over the life of this programme to extend its network into regularized unserved areas using a selection methodology of current occupancy and potential occupancy.

2 METHODOLOGY TO PLAN

The Guyana Power and Light Inc.'s (GPL) current five-year Development and Expansion Programme (2016 – 2020 D&E Programme) and Annual Programme (2016) have been prepared

in accordance with the requirements of the company's Licence (Amended October 4th, 2010), the Public Utilities Commission Act 1999, the Electricity Sector (Technical Standards) Regulations 2008 and the Electricity Sector Reform Act (ESRA) 1999 and Amendment 2010.

Section 38 (2) of the ESRA and its 2010 amendment sets out the details that ought to be captured in the GPL's sustainability programme. Specifically, the Act states:

"The sustainability programmes developed and maintained by a public supplier shall contain detailed descriptions of and data on -

- (a) the plans and projections through which the public supplier will achieve and sustain the customer service, engineering and technical standards necessary for the public supplier's efficient, coordinated and economical supply of electricity under the terms of its Licence;
- (b) the benefits to be accrued to consumers of the service rendered, and the engineering and technical standards to be achieved and maintained, by the public utility as a result of the implementation of the programmes, and the rationale therefore ;
- (c) a development and expansion programme setting forth the plans and projections through which the public supplier will develop and expand its facilities and services to be provided to consumers;
- (d) the operating costs and capital expenditures of the programmes ;
- (e) the sources and amounts of revenues necessary to finance the programmes, including the proposed or actual costs, terms and sources of any debts or equity financing commitments necessary to carry out the programmes and any bids actually, or anticipated to be, received by the public supplier ;
- (f) the debt to equity ratio tolerances to be maintained by the public supplier in implementing the programmes ;
- (g) the timing, amounts and terms of any issuance of securities contemplated by the public utility for the financing of the programmes and the persons to whom they will, or are anticipated to, be offered or issued; No securities are to be issued during this **Programme**.
- (h) the impact the programmes are expected to have upon the natural and social environment ;

- the extent to which the programmes facilitate the use of alternative forms of electricity generation using renewable resources and commercial feasibility thereof.;
- (j) any other aspects of the programmes which the Minister may direct; and
- (k) planned acquisition of new generating capacity;
- (l) loss reduction strategies;
- (m)plans to regain industrial customers;
- (n) plans for providing electricity for development and redevelopment projects in urban areas;
- (o) cost-benefit analysis for each investment project; and
- (p) consistent with any applicable regulations, the following items
 - a. a maintenance programme for the inspection, repair, replacement and upgrade of the supplier's works; (
 - b. a programme for the promotion of technical efficiency and economy in its supply of electricity and in the consumption of electricity by consumers and
 - c. a report on the public supplier's compliance with any technical standards required under the regulations. (Note: the two Regulations under ESRA, The Technical Standards and Wiring Regulations have not been enacted into Law as yet)

2.1 **REVIEW OF 2015 ACHIEVEMENTS**

Work Programme

	2015						
📻 Generation	5MW HFO Unit for Anna Regina.						
Substation	2MW HFO Unit for Bartica						
1 and a second s							
8							
Substation	Williamsburg sub-station						
4	Extension & upgrade of No.53 Substation						
<u>8</u>							
Distribution	Distribution upgrade						
DSM	DSM - Demand Side Management						
L'ON	Dom Lom - Dahani and Mahayatikili.						
Non Tec Loss Reduction	Non Tec Loss Reduction AMI upgrade (9,815 Minor meters)						
	Replace 3,000 defective meters with AMI type						
	MD & Large Tariif A and B AMI upgrade (1,000 Meters)						
	AMI upgrade - Tampered meters (2,000 Minor meters)						
	Public Education & Social Management Programme						
Now Sonicos	New Services 6,000 new services						
THE IF CALING A							
Duilding	Det ding New Manad En Linen Communication and T&D Office						
Dununy	Suilding New Vreed-En-Hoop Commercial and T&D Office New Generation Office – Canefield						
	New Williamsburg Commercial Office						
	Security Facilities						
Capacity Building	Office Equipment, motor vehicles and computer hardware						
	T and D tools and equipment						
	Management Strengthening Programme						
ICT	Implement GIS with GPL assets at Bartica and continue collection of field data						
	Procure and implement an Internet Protocol (IP) PBX with tele and video coferences capabilities						
	Leverage Fiber optic backbone to Sophia and East Berbice						
	Procure and implement a Business Intellignece tool to support a Managemet Information System						

2.1.1 Generation

- 1. The 26MW HFO fired plant at Vreed-en-Hoop was commissioned in February 2015. The commissioning of the plant proceeded despite the unready state of the wharf and fuel pipelines. The wharf and pipelines were subsequently elevated to a state of readiness to certify the facility as fully functional. East Demerara and West Demerara are benefiting from this generation facility.
- 2. Wartsilla was approved as the supplier for the new power plants at Anna Regina and Bartica. However the initial proposals that were submitted to GPL indicated costs of up the US\$3M / MW, which is over twice the budgeted cost. The absence of a functioning Board of Directors from June 2015 this year impacted the momentum of these projects.

A new Board of Directors has since been appointed and has indicated its desire for adequate and reliable generation. It is the intention of the company to commence the Anna Regina project this year and to target 2017 as the commissioning year. The Shareholder's invitation for bids to provide 1.5MW of renewable energy (solar) at Bartica has necessitated a review of new fossil fired generation at that location.

2.1.2 Substations

No progress was made on the new Williamsburg substation or the expansion of the No. 53 substation. Both these projects have now been rescheduled to commence in 2016 and to be commissioned in 2018 as part of the substation expansion programme.

2.1.3 Distribution

GPL's distribution network work programme realized:

- 60 additional kilometers of primary conductors.
- 1,231 additional kilometers of secondary conductors.
- 166 kilometers of upgraded primary conductors
- 512 kilometers of upgraded secondary conductors
- 24,186 kilometers of service line replacements
- Replacement of 1,805 transformers on the Medium Voltage (13.8) network
- 289 additional transformers on the Low Voltage network.

		Dem	erara	Essequibo		Berbice		TOTAL	
Target Indicators 2015		Plan	Achieve	Plan	Achiev e	Plan	Achiev e	Plan	Achieve
Line Extension (Km)	Primary	155	56	1	2	15	2	171	60
	Secondary	161	99	1	3	-	1,129	162	1,231
Line Ungrade (Km)	Primary	7	12	-	1	-	153	7	166
Line Upgrade (Km)	Secondary	5	6	4	1	40	505	49	512
Service Line Replacement (Km)		6,619	13,530	4,805	2,038	7,263	8,618	18,687	24,186
Replacing Transformers (MV Upgrade)	Secondary	397	903	460	175	217	727	1,074	1,805
Installation of Additional Transformers	Secondary	92	227	45	37	38	25	175	289
Jumper	Primary	204	1,197	605	583	297	643	1,106	2,423
Servicing/Replacement	Secondary	214	1,583	676	410	676	891	1,566	2,884
Service Connection @ Consumer		2,763	11,590	5,379	5,131	3,941	3,998	12,083	20,719

2.1.4 Demand Side Management (DSM)

GPL continued with a menu of Demand Side Management (DSM) initiatives with the objective of heightening awareness amongst consumers of the benefits of embracing demand side management.

The initiatives were crafted to achieve the main objective of informing, educating and making customers aware of the following:

The Definition of Energy Conservation/Energy Efficiency/Demand Side Management,

- 2. The Importance of Energy Conservation/Energy Efficiency/Demand Side Management,
- 3. Benefits of Energy Conservation/Energy Efficiency/Demand Side Management, and
- 4. To inform them of practical saving tips and best practices: this would ultimately result in a reduced electricity bill and monies saved.

GPL will continue to sensitize consumers on the benefits that can result from embracing Demand Side Management via a variety of public awareness sensitization programmes. The company is cognizant of the role of the Guyana Energy Agency (GEA) in the DSM initiative and stands ready to collaborate with the GEA for maximum penetration.

2.1.5 Non-Technical Loss Reduction

The meter upgrade programme to AMI compatible meters and the Tampered and defective Meter replacement to AMI compatible meters did not commence as intended in 2015.

GPL's intention was to execute a consolidated and coordinated meter replacement and upgrade strategy with Component III of the joint IADB / EU funded Public Upgrade Utility Programme (PUUP) .

However, delays in the critical procurement activities within the PUUP largely as a result of the absence of a Programme Coordinator influenced the rescheduling of the execution of Loss Reduction activities within Component III.

GPL expects to aggressively execute the meter upgrade and replacement programmes between 2016 and 2019 in collaboration with the PUUP.

2.1.5.1 Secure Metering (Expanded Use of Pre-Paid)

GPL replaced 1,694 post-paid meters with pre-paid meters during 2015.

2.1.5.2 Replacement of Defective Meters

In 2015, a total of 5,419 defective meters were replaced.

2.1.5.3 Social Management Programme

GPL engaged twenty (20) communities between January and March 2015 as part of its Social Management Programme under the US\$5M Project, Sustainable Operation of the Electricity Sector and Improved Quality of Service, financed by the IADB. This programme has been resuscitated under the Public Utility Upgrade Programme (jointly funded by the IADB / EU) and is intended to impact the selected communities identified for the Low Voltage Rehabilitation programme between 2016 and 2019.

2.1.5.4 Expanded Use of ITRON Meters

756 additional ITRON meters using Automated Meter Reading (AMR) technology were deployed to the larger energy consuming customers as at December 2015.

2.1.5.5 Co-Axial Cable

No co-axial cable was purchased in 2015, but it is expected that the cable will be purchased in 2016 for Component III, Lot A of the Loss Reduction component under the IADB / EU funded Power Utility Upgrade Programme (PUUP).

2.1.5.6 Electrification

Kuru Kuru on the Linden Highway, Angoy's Avenue in East Berbice and Parika Backdam on the East Bank of Essequibo were identified for electrification in 2014 with financing being realized in Q3 of 2014. Electrification works were completed in Angoys Avenue and Parika Backdam. Electrification is approximately ninety percent (90%) completed in Kuru Kuru and is expected to be fully completed during Q2 of 2016.

2.1.5.7 New Services

By the end of December 2015, GPL established 6,007 new services, resulting in a net increase of the customer base of 4,575 accounts over 2014. Total number of customer as at December 2015 was recorded at 182,704.

2.1.5.8 Buildings

The new building to house Bartica T&D and Commercial Services and the T&D building in Wakenaam were completed.

2.1.5.9 Capacity Building

Investment in T&D power tools and equipment continued in 2015 with over US\$1.9M expended on:

- 1) HV measuring equipment (V, I, PF, HD).
- 2) Various capacity portable lifting equipment.
- 3) Range of hand tools, including power tools.
- 4) Tree trimming equipment including power tools.

2.2 SUMMARY

Overall losses increased by .46% in 2015, but remained lower than 2013 by 1.74%. Gross generation increased by **5%** in 2015 over 2014. Fuel expenditure was budgeted at **GY\$20.4 billion** (IS), at a weighted average cost (CIF) of **US\$96.23 per bbl** and loss after tax of **GY\$887.6 million** for 2015. Actual expenditure was **GY\$12.6 billion** (IS), at a weighted average cost (CIF) of **US\$54.12 per bbl**. Profit before tax was recorded as **G\$4 billion**.

The Interim Return Certificate for 2016 allowed GPL a reduction in the tariff across all categories of **5%** over those existing at December 31st, 2015. GPL's 2015 Unaudited Accounts reflected overall revenue of **GY\$30.81 billion** and fuel expenditure of **GY\$12.6 billion** and a Weighted Average fuel cost of **US\$54.12 per bbl** (CIF). Profit before tax for 2015 was recorded as **GY\$4 billion**.

3. **STRATEGIC PLAN 2016 – 2020**

Key Performance Indicators (KPI) have been developed to monitor effort and to ensure that the strategic business objectives of the company are achieved. These KPIs have been further developed and expanded into annual targets to form the five-year strategic plan, as detailed below. The current D&E Programme is a function of the 2016 - 20 Strategic Plan.

GPL is a regulated, state-owned electricity utility that enjoys a monopoly in the transmission, distribution and sale of electricity on the Coast where 90% of the population resides in Guyana. As at the end of December 2015, GPL served 182,704 customers with a staffing level of 806 permanent, 495 temporary and contracted employees and generated revenue of US\$145M of which 42% was applied to fuel.

Present Electricity Supply	Medium Term Electricity Supply
Mainly thermal:	Proposed Renewable energy projects

D&E PROGRAMME 2016 – 2020

Installed Capacity: 167 MW: 126MW	1. Solar (2017)—1.5 MW
Heavy Fuel Oil (includes 10 MW of IPP);	2. Bagasse (extended use of
40.7MW diesel fired.	co-generation)—10 MW
• Total Availability: 149.7 MW: 25.1MW	
is diesel fired.	Key Challenges:
139.7 MW owned; 10MW IPP.	High customer tariffs due to:
• Total DBIS Peak Demand: 110.6MW	1. Total dependence on fossil fuel, high
• Total Peak Demand to date: 114.8 MW	and volatile fuel prices.
 Self Generation: Estimated at 42MW 	2. High losses – technical & commercial
 Fuel Mix: 89% HFO; 11% diesel in 2013 	losses of about 29.2 %.

GPL has a balance sheet US\$255M in net assets. In 2015, 94.1% of GPL's generation came from HFO (production from HFO being 62% cheaper than diesel) fired equipment. As a state-owned entity, GPL's key objective is to deliver reliable electricity at the lowest sustainable price and without requiring Government's support for its operations. This requires optimized efficiency in the production, transmission and distribution of power while prudently managing revenue collection, reducing technical and commercial losses and minimizing other costs, particularly employment as this continues to be the largest non-fuel expenditure. Debt is being financed by low interest Government loans, with the resources coming from the IADB. Financing via Grants are made available from the European Union. Previous funding came from PetroCaribe and China Exim Bank. Current funding for the Public Utility Upgrade Programme (PUUP) is coming from the IADB (Debt Financing) and the European Union (Grant).

SWOT Analysis

Strengths	Weaknesses			
 a. GPL has low level interest bearing debt that accounts for 50% of net assets; b. Generation overwhelmingly coming from HFO fired capacity; c. Staff is competitively remunerated compared to Private Sector. d. Funding secured for major capital projects. 	 High level of technical and commercial losses currently at 29.2%; Limited pool and sustained of skills pose a problem to improving efficiencies; Financing limited only to concessional sources and internal resources. A single circuit 69KV transmission line links the Demerara and Berbice Interconnected Systems. No redundancy in 69kv transmission. 			

Opportunities	Threats
 a. GoG is desirous of presenting Bartica in Region 7 as a green city. A 1.5MW solar system is expected to be commissioned during 2017. GPL expects saving resulting from reduced use of its fossil fired generators b. Expanded and strengthened grid will reduce losses, operating costs and improve reliability; c. Capital program partially funded from concessional resources and GPL's resources; d. ISO 9001 can improve the quality of CS. e. Connection of 34,200 new customers by 2020 with secure metering will reduce electricity theft; f. Competitive staff compensation and incentives coupled with new infrastructure and modern equipment will result in improvements in productivity and attitude. 	 Risk of rise in fuel prices can adversely impact costs and tariffs before 2020; Threat of strike action as GPL right sizes its workforce following investments; Implementation delays for capital projects could raise operating costs and deter self – generators.; Loss of key employees via migration could impact operations.

Vision: Guyana Power & Light Inc. aims to be Guyana's premier service provider, meeting and exceeding where possible the expectations of its stakeholders.

Mission: To provide an expanding customer base with electricity services which are technically, financially and environmentally sustainable, achieving best practice and acceptable international norms, delivered by our people performing in accordance with Company values to the highest ideals of work excellence and integrity.

3.1 STRATEGIC OBJECTIVES

- Optimize revenue
- Minimize cost of operations
- Improve Customer Service (CS)
- Achieve a sustainable financial position

- Enhance Corporate Governance Framework and Practices
- Enhancing Skills and Competencies of Employees and Contract workers
- Achieve national objectives

Strategies and targets for each are listed below.

3.2 STRATEGIES AND ASSOCIATED TARGETS

a. (Optimize Revenue:	2016	2017	2018	2019	2020
1.	Maximize collection of billing (% of Billing collected)	99.5	99.5	99.5	99.5	99.5
	(i) Maximize collection of billing (% of Government billing collected)	100	100	100	100	100
	(ii) Maximize collection of billing (% of Non – Government billing collected)	99	99	99	99	99
2.	Maximize level of power billed (Gwh)	550	583	618	655	696
	(ii) Regularize customers with bypass or tampering (GWh)	5.4	5.4	4.3	4.3	3.6
	(iii) Replace defective meters and bill accordingly (GWh)	1.3	1.8	1.8	3.2	3.2
3.	Optimize growth:					
	(i) Expand customer base (# of new customers added in yr.)	6,200	6,500	7,000	7,000	7,500
	(ii) Increase uptake in recently served areas (No. of new connections)	2,650	2,517	2,265	2,039	1,835
	(iii) Net growth (GWh) (Combination of natural growth and loss reduction)	15	16	17	18	20
	(iv) New Consumers (GWh)	16	17	18	19	20
9.	Expand overall revenue by optimizing price, volume and tariff mix (US\$ M)	136	149	156	164	173
	(i) Annual increase in volume (US\$M, over previous year)	-8.7	13.4	7.5	7.9	8.3
	Mix of customers					

	(ii) Residential	-3.6	5.6	3.1	3.3	3.4
	(iii) Commercial	-1.7	2.7	1.5	1.6	1.6
	(iv) Industrial	-3.4	5.1	2.9	3.0	3.3
10.	Maximize collection of arrears from past customers – Number of Accounts.	2400	2300	2100	1800	1600
	(i) Pursue Inactive Customers – Number of demand letters.	1150	1050	900	800	650
	(ii) Maximize legal action and enforcement – Number of cases filed in Commercial Court.	480	490	490	490	490
11.	Ensure strong disincentives to Electricity Theft					
	(i) Prosecute consumers found tampering/Bypass (%)	70	80	80	85	85
	(ii) Prosecute individuals with illegal connections (%)	100	100	100	100	100
7.	Maximize number of secure meters installed.	17,500	23,500	23,500	25,500	15,500

b.	Minimize costs of operations	2016	2017	2018	2019	2020
1.	Labour cost (US Cents / kWh)	2.32	2.31	2.30	2.28	2.23
2.	Control Employment Costs (annual US\$ K)	18,320	18,864	19,425	20,002	20,596
	1. Basic Pay	11,541	11,884	12,237	12,600	12,975
	2. Overtime	1,832	1,886	1,942	2,000	2,059
	3. Allowances	3,114	3,207	3,302	3,400	3,501
	4. Employers Contribution	1,098	1,131	1,164	1,199	1,234
	5. Others	735	757	779	803	826
3.	Reduce total technical and commercial losses (%)	29.0	27.3	25.5	23.8	23.3
	Reduce technical losses (total % at end of period)	13.3	12.6	11.8	11.0	11.0
	Reduce commercial losses (total % at end of period)	15.7	14.7	13.7	12.8	12.3
4.	Control Generation Costs (US \$M)	74	78	81	84	88
	(i) Maximum use of cheaper sources of	02.2.6	02.2.6	02.2.6	02.2.6	02.2.5
	generation (HFO/ LFO /Co-gen)	92:2:6	92:2:6	92:2:6	92:2:6	93:2:5
	 (ii) Maximum availability of engine relative to weighted capacity 	77%	80%	80%	80%	80%

	(iii) Ensure contract for O&M is managed to optimize value for money	As per contract	As per contract	As per contract	As per contract	As per contract
	(iv) Availability	92%	92%	92%	92%	92%
	(v) Lube oil Consumption (g/kWh)(v) Fuel Efficiency (BTU/kWh)	0.15 8312	0.15 8312	0.15 8312	0.15 8312	0.15 8312
	(vii) Optimize dispatched Power	Merit order system	Merit order system	Merit order system	Merit order system	Merit order system
5.	Ensure fuel is procured at the lowest cost at all times	Ensure the contractu al terms with Staatsolie are met	Ensure the contractua l terms with Staatsolie are met	Ensure the contractua l terms with Staatsolie are met	Ensure the contractua l terms with Staatsolie are met	Ensure the contract ual terms with Staatsoli e are met
6.	Ensure overhauls are done on schedule, reduce emergency procurement of spares, reduce downtime, maximize availability, minimize maintenance costs.	Meet Generatio n SAIFI & SAIDI	Meet Generatio n SAIFI & SAIDI	Meet Generatio n SAIFI & SAIDI	Meet Generatio n SAIFI & SAIDI	Meet Generati on SAIFI & SAIDI
7.	Optimize other controllable Costs (US\$K) 1) Transmission & Distribution	6,958 1,011	7,131 1,036	7,309 1,062	7,490 1,088	7,676 1,115
	2) Administrative	5,947	6,095	6,247	6,402	6,561

C.	Improve Customer Service (CS)	2016	2017	2018	2019	2020
1.	Meet Customer Service Standards & OS&PT.					
2.	Implement ISO 9001: 2000 Quality System	Maintain Certification as ISO 9001:20015	Maintain certification	Maintain Certification	Maintain Certificatio n	Maintain Certification
3.	Customer Satisfaction: Improve Image of GPL as first class utility via improving Customer Service, increase efficiency, and optimize tariffs.	65%	70%	75%	75%	80%
4.	% of calls answered at Emergency Call Center	95%	95%	95%	95%	95%
5.	% of calls answered at Commercial Call Center	95%	95%	95%	95%	95%

d.	Achieve Sustainable Financial Position	2016	2017	2018	2019	2020
1.	Ensure that 99.5% of billed sales is collected.					
2.	Complete audited accounts and hold Annual Shareholders Meeting within 6 months of year's end.					s end.
3.	Manage GPL finances to justify concessional	Ensure compliance with conditionalities.				
	financing.					

e. Enhance Corporate Governance Framework and Practices

- 1) Reports are submitted to Board and its Sub-Committees on a timely basis.
- 2) Policies are implemented faithfully.
- 3) Financial Statements are audited within stipulated time frames and Management Letters are responded to promptly.
- 4) Procurement process is fair and transparent and in keeping with Procurement Policy.
- 5) Internal Audit recommendations are implemented.
- 6) The Board is assisted in its annual self evaluation and that of its sub-committees.
- 7) Assistance is provided, as necessary, in policy formulation.

f. Enhancing Skills and Competencies

- 1) Determine or identify the skills and competencies required for each job.
- 2) Periodically asses the level at which each employee is performing.
- 3) Provide advice and/or feedback to employees on performance, career development and future prospects.
- 5) Facilitate requisite training/attachments/development interventions recognizing current deficiencies and future needs.
- 5) Utilize teamwork and 'special assignment' strategies to advance group skills.

6) Seek out and provide opportunities for coach/mentor interactions with relevant Experts.

- 7) Provide necessary training to Contracted personnel and the staff of Contractors.
- 8) Incentivize attainment of new skills.

g. Achieve National Objectives

- 1) Promote conservation of electricity through public education.
- 2) Maximize use of **renewable** sources of generation to minimize generation costs and reduce carbon footprint.
- 3) Maximize efficiencies while implementing an effective Social Management Programme.
- 4) Ensure regulatory compliance with electricity laws and GPL's license.
- 5) Expand national grid to catalyze direct investments in the Country.
- 6) Provide advice for national Energy Policy formulation.
- 7) Provide technical support to hinterland utilities.

3.3 Functional Strategies (with reference to Objective Strategies)

3.3.1 2016

Ma	anagement/Overall Coordination
1)	Ensure budget reflects appropriate priorities and is implemented prudently.
2)	Undertake quarterly review of achievements of all Divisions, CSS and OS&PT and take corrective
	action as necessary.
3)	Manage all capital projects to ensure delivery on time and within budget.
4)	Provide the environment necessary for key skills to be developed and retained.
5)	Achieve ISO 9001 – 2015 Quality system certification. Previous standard was ISO 9001 -2008
6)	Ensure communications are adequate and efficient and internal communications support
	achievement of CSS, OS&PT and keep stakeholders informed of pertinent developments while
	external communications inform relevant stakeholders of supply issues, major developments and
	tips on DSM.
Co	mmercial
1)	Customer Service Standards (CSS) and relevant Operating Standards & Performance Targets (OS&PT)
	are met consistently.
2)	Implement systems to provide an exceptional quality of Customer Service at all offices.
3)	Constantly review procedures to ensure customer service is optimized.
4)	Keep consumers informed of key developments using the PR Unit.
5)	Provide active support to Legal and Loss Reduction to pursue outstanding balances.
6)	Maximize Revenue Collection with minimum disconnections
Fin	ance
1)	Manage cash flows in accordance with budget and to optimize working capital.
2)	Provide necessary support to secure funding for capital projects, where necessary.
3)	Ensure timely completion of statutory financial reports.
4)	Facilitate completion of annual audits to ensure Company meets its statutory obligations on time.
5)	Complete procurement Plan and ensure efficient procurement process in compliance with
	Procurement Manual.
6)	Provide routine financial reports to all Divisions on a timely basis.
7)	Ensure inventory levels are optimized and overall stores management is efficient.
8)	Ensure procurement process meets the purchasing demands of the Users departments.
IT	
1)	Implement GIS application and populate database using a phased approach

mission critical systems (e.g. CSS & OS&PT).

- 3) Manage Hardware and software infrastructure to ensure 99.9% system availability.
- 4) Provide close support in implementation of Inventory Management Module (OFCS)
- 5) Optimize security and integrity of corporate systems.
- 6) Pursue all options to expand electronic bill payments.
- 7) Commence expansion of fiber optic link to West Coast and East Bank Berbice by Q4
- 8) Provide support for SCADA operations, maintenance and expansion.
- 9) Complete implementation of Inventory Management System
- 10) Procure and commence Implementation of a Business Intelligence System to support the Management Information System (MIS)

Loss Reduction

- 1) Implement all elements of the Strategic Loss Reduction Plan (SLRP) not detailed below.
- 2) Replace 12,000 meters with AMI meters.
- 3) Replace 3,000 defective and obsolete meters with AMI meters
- 4) Upgrade 1000 Large Tariff A, B and MD to AMI meters
- 5) Meter 6,200 New Services.
- 6) Upgrade 4,000 installations to current interface.
- 7) Continuously review the benefit of various initiatives to focus field activity.
- 8) Manage disconnection / reconnection activity prudently.
- 9) Investigate all reports of theft of company property.
- 10) Coordinate Social Management Programme with PUUP in areas targeted for loss reduction investment.

HR/Admin

- 1. Continuously review employee attendance and staffing levels to determine appropriate actions to limit overtime cost.
- 2. Develop and implement a Strategic Training and Development Plan.
- 3. Continue to implement and update initiatives to boost employee's morale.
- 4. Complete construction of Vreed-En-Hoop commercial & T&D office. Q4
- 5. Commence construction of new Training school. Q4
- 6. Complete Construction of Office Building at Canefield Power Station (In progress)
- 7. Recommence Construction of T & D Main Building at Sophia
- 8. Commence Rehabilitation of Commercial and T & D Building at Anna Regina
- 9. Commence Construction of I C T Centre at Sophia
- 10. Complete Remodeling of Customer Service Area at Main Street Phase 2
- 11. Complete Removal of Asbestos from Stores and Workshop Building at Canefield & Garden of Eden
- 12. Complete construction / relocation of Leguan Commercial and T and D Building. Q3
- 13. Commence Construction of T & D Building at Versailles
- 14. Complete security facilities as determined by latest security review.

15.	Commence and	l complete designs for	Williamsburg office and	I new Corporate Complex at S	Sophia Q2
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16. Facilitate ongoing review of Safety Rules and Codes of Practice Handbook.

17. Coordinate annual environmental audit of Company facilities.

18. Ensure Company is compliant with relevant Labour, Safety, Environmental and Health Laws.

19. Complete ongoing right-sizing review in consultation with respective Divisions and implement approved plans.

20. Establish an objective Performance Management System

Projects -

Manage the following sub-projects effectively to ensure completion by Milestones indicated.

1)	Award contracts for both Preparatory and EPC Works new 10MW HFO fired 60 cycle generation at
	Anna Regina -Q4
2)	EPC Contract awarded for construction of double circuit

- 69KV transmission line from Kingston to Sophia Q4
- 3) EPC Contract awarded for construction of Transmission line from Vreed-En-Hoop to Canal No.2 Q4
- 4) EPC Contract transmission line from GoE to Linden Highway / Soesdyke junction
- 5) Canal No. 2 WBD EPC Contract awarded -Q4
- 6) Parika Substation EBE EPC Contract awarded -Q4
- 7) Complete sealing of walls on Leguan Power plant to reduce noise emissions Q3.
- 8) Williamsburg substation EPC Contract awarded –Q4
- 9) No. 53 substation EPC Contract awarded Q4
- 10) Vreed En Hoop Substation extension awarded Q4
- 11) Sophia Substation extension EPC contract awarded Q4. * no activities between 2016 and 20
- 12) 69kv transmission line from Edinburgh Substation to Parika -EPC Contract awarded for construction - Q4. * no activities between * no activities between 2016 and 2018
- 13) Edinburg Substation Extension EPC Contract awarded Q4
- 14) Award contracts for both Preparatory and EPC Works new Bartica Power Plant Q4.
- 15) Complete Access Road & Bridge at Edinburg Substation Q2.
- 16) Annual Maintenance Contract for dredging of the three GPL wharfs in progress -Q2.
- 17) Complete remedial works at No.1 Tower to prevent further erosion Q4.
- 18) Complete remedial works within Wartsila Power Plant compound Q3
- 19) Kuru Kuru Substation EPC Contract awarded Q4
- 20) GOE Substation Extension EPC Contract awarded Q4
- 21) Kingston Substation Extension EPC Contract awarded Q4

Operations

- 1) Complete Technical Loss Reduction investment works Q4
- 2) Ensure Operating Standards & Performance Targets are met consistently.
- 3) Complete Transmission, distribution and generation maintenance programmes Q4
- 4) Facilitate compilation of GIS field data Ongoing
- 5) Install 500 non wallaba structures Q4
- 6) Manage Government financed Un-served Areas Electrification New Housing Projects
- 7) Complete electrification for identified unserved areas (regularized areas)

3.3.2 2017

Ma	inagement/Overall Coordination		
1)	Ensure budget reflects appropriate priorities and is implemented prudently.		
2)	Undertake quarterly review of achievements of all Divisions, CSS and OS&PT and take corrective		
	action as necessary.		
3)	Manage all capital projects to ensure delivery on time and within budget.		
4)	Provide the environment necessary for key skills to be developed and retained.		
5)	Maintain ISO 9001 – 2018 Quality system re-certification.		
6)) Ensure communications are adequate and efficient and internal communications support		
	achievement of CSS, OS&PT and keep stakeholders informed of pertinent developments while		
external communications inform relevant stakeholders of supply issues, major developments and			
	tips on DSM.		
Commercial			
1)	Ensure Customer Service Standards (CSS) and relevant Operating Standards & Performance Targets		
1)	(OS&PT) are met consistently.		
2)	Assist in the promotion of electronic transactions.		
2)			
3)	Constantly review procedures to ensure customer service is optimized and relevant Standards and		
1)	Targets are surpassed. Provide active support to Legal and Loss Reduction to pursue outstanding balances.		
4)			
5)	Maintain a menu of initiatives targeting improvements in Customer service		
6)	Maximize revenue collection whilst minimizing service disconnections		
Fin	ance		
1)	Manage cash flows in accordance with budget and to optimize working capital.		
2)	Provide necessary support to secure funding for capital projects, where necessary.		
3)	Ensure timely completion of statutory financial reports.		

4)	Facilitate completion of annual audits to ensure Company meets its statutory obligations on time.		
5)	Complete procurement Plan and ensure efficient procurement process in compliance with		
	Procurement Manual.		
6)	Provide routine financial reports to all Divisions on a timely basis.		
7)	Ensure inventory levels are optimized and overall stores management is efficient.		
8)	Ensure procurement process meets the purchasing demands of the Users departments.		
IT			
1)	Optimize and maintain Local and Wide Area Network performance.		
2)	Manage Hardware and software infrastructure to ensure 99.9% system availability.		
3)	Optimize security and integrity of corporate systems		
4)	Provide support on implementation of Phase 11 of GIS database development.		
5)	Support implementation of Automatic Metering Infrastructure (AMI).		
6)	Support operations, maintenance & expansion of SCADA.		
7)	Complete expansion of fiber optic link to West Coast and East Bank Berbice locations by Q4.		
8)	Complete implementation of Business Intelligence System (BI).		
9)	Procure and commence Implementation of Maintenance / Work Management System (CMMS)		
10)	Procure and commence implementation of Human Resource Management and Payroll		
Los	s Reduction		
1)	Implement all elements of the Strategic Loss Reduction Plan (SLRP) not detailed below.		
2)	Replace 4,000 defective meters with AMI		
3)	Replace 16,000 minor meter with AMI meters.		
4)	Replace 1,500 tampered meters with AMI meters		
5)	Upgrade 2,000 Large Tariff A, B and Maximum Demand customers to AMI meter installations.		
6)	Meter 6,500 new services		
7)	Implement other elements of the Strategic Loss Reduction Plan (SLRP).		
8)	Provide End User assistance in the implementation of the Business Intelligence System (BI).		
8)	Continuously review the benefit of various initiatives to focus field activity.		
9)	Manage disconnection / reconnection activity prudently.		
10)	Investigate all reports of theft of company property.		
11)	Coordinate Social Management Programme with PUUP in areas targeted for loss reduction		
	investment.		
HR,	/Admin		
1)	Continuously review employee attendance and staffing levels to determine appropriate actions to		
	limit overtime cost.		
2)	Execute Strategic Training and Development Plan with emphasis on capacity to support the D and E.		
3)	Develop and implement initiatives to boost employee's morale.		
4)	Complete construction of Commercial Office at Williamsburg and relocate Chesney operations. Q4		

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- 5) Complete Construction of ICT Centre at Sophia
- 6) Complete Construction of Multi Purpose Building at Sophia
- 7) Complete Construction of New Training School at Sophia
- 8) Commence construction of Corporate offices at Sophia.
- 9) Complete Rehabilitation of Commercial and T & D Building at Anna Regina
- 10) Complete Construction of T & D Building at Versailles
- 11) Complete Construction of Facilities Management Maintenance Workshop Building at Sophia
- 12) Facilitate ongoing review of Safety Rules and Codes of Practice Handbook.
- 13) Coordinate annual environmental audit of Company facilities.
- 14) Ensure Company is compliant with relevant Labour, Safety, Environmental and Health Laws.
- 15) Continue right-sizing review in consultation with respective Divisions and implement approved plans.
- 16) Strengthen the objective Performance Management System
- 17) Provide End User assistance in the implementation of Human Capital Management & Payroll system.
- 18) Provide End User assistance in the implementation of the Business Intelligence System (BI).

Projects - Manage the following sub-projects effectively to ensure completion by Milestones indicated.

- 1) Complete 10MW HFO unit at Anna Regina Q4
- 2) Williamsburg Substation Construction 80% complete -Q4.
- 3) Extend No. 53 Substation Construction 80% complete Q4
- 4) Transmission line from Vreed-En-Hoop to Canal No.2 Construction: -80% complete Q4
- 5) Vreed En Hoop Substation extension Construction 80% complete -Q4
- 6) Transmission line from Edinburg to Parika- Construction -80% complete Q4
- 7) Canal No. 2: 17MVA substation Construction 80% complete- Q4
- 8) Parika 17MVA substation Construction: 80% complete- Q4
- 9) Edinburg substation extension Construction: 80% complete Q4
- 10) Rebuild former L2 bay at GoE substation 80% complete Q4
- 11) Double Circuit 69Kv T Line from Kingston to Sophia Construction 80% complete . Q4
- 12) Manage SCADA expansion Project Ongoing.
- 13) Complete new Generation Plant at Bartica Q4
- 14) EPC Contract transmission line from GoE to Kuru Kururu 80% Complete Q4

- 15) Kuru Kuru Substation 80% Complete Q4
- 16) GOE Substation Extension 80% Complete Q4
- 17) Kingston Substation Extension 80% Complete Q4
- 18) Sophia Substation extension 80% Complete Q4

Operations

- 1) Complete Technical Loss Reduction investment works Q4
- 2) Ensure Operating Standards & Performance Targets are met consistently.
- 3) Complete Transmission, Distribution and Generation maintenance programme Q4
- 4) Facilitate compilation of GIS field data Ongoing
- 5) Manage Government financed Un-served Areas Electrification New Housing Projects
- 6) Complete electrification for selected unserved areas (regularized areas)
- 7) Assign load and deploy new feeders from Williamsburg substation Q4
- 8) Achieve competence to undertake live-line maintenance up to 13.8Kv.
- 9) Install equipment to facilitate SCADA expansion into distribution and generation

10)

3.3.3 2018

Ma	inagement/Overall Coordination
1.	Ensure budget reflects appropriate priorities and is implemented prudently.
2.	Undertake quarterly review of achievements of all Divisions, CSS and OS&PT and take corrective
	action as necessary.
3.	Manage all capital projects to ensure delivery on time and within budget.
4.	Provide the environment necessary for key skills to be developed and retained.
5.	Maintain ISO 9001 – 2018 Quality system certification.
6.	Ensure communications are adequate and efficient and internal communications support
	achievement of CSS, OS&PT and keep stakeholders informed of pertinent developments while
	external communications inform relevant stakeholders of supply issues, major developments and
	tips on DSM.
Со	mmercial
1)	Ensure Customer Service Standards (CSS) and relevant Operating Standards & Performance Targets
	(OS&PT) are met consistently.
2)	Assist in the promotion of electronic transactions.
3)	Constantly review procedures to ensure customer service is optimized and relevant Standards and
	Targets are surpassed.

4)	Provide active support to Legal and Loss Reduction to pursue outstanding balances.			
5)	Maintain a menu of initiatives targeting improvements in Customer service			
6)	6) Maximize revenue collection whilst minimizing service disconnections			
Fin	ance			
1)	Manage cash flows in accordance with budget and to optimize working capital.			
2)	Provide necessary support to secure funding for capital projects, where necessary.			
2) 3)	Ensure timely completion of statutory financial reports.			
3) 4)	Facilitate completion of annual audits to ensure Company meets its statutory obligations on time.			
5)	Complete procurement Plan and ensure efficient procurement process in compliance with Procurement policy.			
6)	Provide routine financial reports to all Divisions on a timely basis.			
7)	Ensure inventory levels are optimized and overall inventory management is efficient.			
8)	Ensure procurement process meets the purchasing demands of the Users departments.			
	ss Reduction			
-00				
1)	Replace 16,000 minor meters with AMI meters.			
2)	Replace 4,000 defective meters with AMI meters			
3)	Replace 2,000 Large Tariff A, B and Maximum Demand meters with AMI meters			
4)	Replace 1,500 tampered meters with AMI meters			
5)	5) Meter 7,000 New Services.			
6)	Implement other elements of the Strategic Loss Reduction Plan (SLRP).			
7)	Provide End User assistance in the implementation of the Business Intelligence System (BI).			
8)	Continuously review the benefit of various initiatives to focus field activity.			
9)	Manage disconnection / reconnection activity prudently.			
10)	Investigate all reports of theft of company property.			
11)	Coordinate Social Management Programme with PUUP in areas targeted for loss reduction			
	investment.			
ΙΤ				
1)	Optimize and maintain Local and Wide Area Network performance.			
2)	Manage Hardware and software infrastructure to ensure 99.9% system availability.			
3)				
4)	Provide support on GIS implementation, Phase 111.			
, 5)	Provide appropriate support for Automatic Metering Infrastructure (AMI).			
6)	Provide appropriate support for SCADA operations, maintenance and expansion.			
7)				
8)	Procure and commence Implemention of an Electronic Document Management System.			

9) Complete implementation of Computerized Maintenance Management System (CMMS) Q4.

10) Complete implementation of Human Resource Management and Payroll System

 HR/Admin Continuously review employee attendance and staffing levels to determine appropriate actions to limit overtime cost. Execute Strategic Training and Development Plan with emphasis on capacity to support the D and E. Develop and implement initiatives to boost employee's morale. Complete new Corporate Building in Sophia. – Q4 Complete Construction of Facilities Management Maintenance Workshop Building at Sophia Execute Maintenance programmes in keeping with annual maintenance plans. Complete ongoing right-sizing review in consultation with respective Divisions and implement approved plans. Monitor objective Performance Management System with an emphasis on improvements. Facilitate ongoing review of Safety Rules and Codes of Practice Handbook. Secondinate annual environmental audit of Company facilities. Sourdinate annual environmental audit of Company facilities. Sensure Company remains compliant with relevant Labour, Safety, Environmental and Health Laws. Projects - Manage the following sub-projects effectively to ensure completion by Milestones indicated. Vreed En Hoop Substation Extension – completed and commissioned Q1 Canal No. 2 17MVA substation – completed and commissioned Q1 Canal No. 2 17MVA power transformers, two at GoE and one at Sophia substations. Double Circuit 69Kv T Line from Kingston to Sophia – completed and commissioned. Q1 Bouble Circuit 69Kv T Line from Sophia to Good Hope: Design and Procure material Complete extension of Edinburg substation – completed and commissioned. Q1 Golden Grove substation extension – Design, Procure equipment and commence preparatory civil works. Q4 Complete transmission line from Vreed-En-Hoop to Canal No.2 – Q1 Complete transmission line from GoE to Kuru Kuru – Q1 Provide End User assistance in the implementation of the computerized Main	
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 3) Develop and implement initiatives to boost employee's morale. 4) Complete new Corporate Building in Sophia. – Q4 5) Complete Construction of Facilities Management Maintenance Workshop Building at Sophia 6) Execute Maintenance programmes in keeping with annual maintenance plans. 7) Complete ongoing right-sizing review in consultation with respective Divisions and implement approved plans. 8) Monitor objective Performance Management System with an emphasis on improvements. 21. Facilitate ongoing review of Safety Rules and Codes of Practice Handbook. 22. Coordinate annual environmental audit of Company facilities. 23. Ensure Company remains compliant with relevant Labour, Safety, Environmental and Health Laws. Projects - Manage the following sub-projects effectively to ensure completion by Milestones indicated. 1) Vreed En Hoop Substation Extension – completed and commissioned Q1 2) Canal No. 2 17MVA substation – completed and commissioned. Q1 4) Replace three 16.7MVA power transformers, two at GoE and one at Sophia substations. 5) Double Circuit 69Kv T Line from Kingston to Sophia – completed and commissioned. Q1 6) Double Circuit 69Kv T Line from Sophia to Good Hope: Design and Procure material 7) Complete transmission line from Vreed-En-Hoop to Canal No. 2 – Q1 10) Complete transmission line from Vreed-En-Hoop to Canal No. 2 – Q1 11) Complete transmission line from GoE to Kuru Kuru – Q1 12) Provide End User assistance in the implementation of the computerized Maintenance Management System. 13) Good Hope Substation extension – Design, Procure equipment and commence preparatory civil 	
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 12) Provide End User assistance in the implementation of the computerized Maintenance Management System. 13) Good Hope Substation extension – Design, Procure equipment and commence preparatory civil 	10) Complete transmission line from Edinburg to Parika – Q1
System. 13) Good Hope Substation extension – Design, Procure equipment and commence preparatory civil	11) Complete transmission line from GoE to Kuru Kuru – Q1
WORKS	13) Good Hope Substation extension – Design, Procure equipment and commence preparatory civil works

D&E PROGRAMME 2016 – 2020

- 14) Columbia Substation extension Design, Procure equipment and commence preparatory civil works
- 15) Kuru Kuru Substation Completed and Commissioned Q1
- 16) GOE Substation Extension Completed and Commissioned Q1
- 17) Extend No. 53 Substation Completed and Commissioned Q1
- 18) Kingston Substation Extension Completed and Commissioned Q1
- 19) Sophia Substation Extension Completed and Commissioned Q1
- 20) Williamsburg Substation Completed and Commissioned Q1
- 21) Vreed En Hoop Substation Extension completed and commissioned. Q1
- 22) Canal No. 2 17MVA substation completed and commisioned

Operations

- 1) Complete Annual Transmission, Distribution and Generation Maintenance Programme Q4
- 2) Implement Technical Loss Reduction Plan Q4
- 3) Ensure universal usage of Computerized Maintenance Management System Software Q4
- 4) Reduce planned maintenance outages by 30%.
- 5) Assign load and deploy new feeders from Canal No.2, Parika and Kuru Kuru Sub Stations.
- 6) Support activities to replace three 16.7MVA transformers at Sophia and GoE.
- 8) Manage Government financed Un-served Areas Electrification New Housing Projects
- 9) Complete electrification for selected unserved areas (regularized areas)

10)

3.3.4 2019

Management/Overall Coordination			
1)	Ensure budget reflects appropriate priorities and is implemented prudently.		
2)	Undertake quarterly review of achievements of all Divisions, CSS and OS&PT and take corrective		
	action as necessary.		
3)	Manage all capital projects to ensure delivery on time and within budget.		
4)	Provide the environment necessary for key skills to be developed and retained.		
5)	Maintain ISO 9001 – 2018 Quality system certification.		
6)	Ensure communications are adequate and efficient and internal communications support		
	achievement of CSS, OS&PT and keep stakeholders informed of pertinent developments while		
	external communications inform relevant stakeholders of supply issues, major developments and		

	tips on DSM.
Со	mmercial
1)	Ensure Customer Service Standards (CSS) and relevant Operating Standards & Performance Targets
,	(OS&PT) are met consistently.
2)	Assist in the promotion of electronic transactions.
3)	Constantly review procedures to ensure customer service is optimized and relevant Standards and
	Targets are surpassed.
4)	Provide active support to Legal and Loss Reduction to pursue outstanding balances.
5)	Maintain a menu of initiatives targeting improvements in Customer service
6)	Maximize revenue collection whilst minimizing service disconnections
Fin	ance
1)	Manage cash flows in accordance with budget and to optimize working capital.
2)	Provide necessary support to secure funding for capital projects, where necessary.
2) 3)	Ensure timely completion of statutory financial reports.
-	
4)	Facilitate completion of annual audits to ensure Company meets its statutory obligations on time.
5)	Complete procurement Plan and ensure efficient procurement process in compliance with Procurement Manual.
6)	
6) 7)	Provide routine financial reports to all Divisions on a timely basis.
7)	Ensure inventory levels are optimized and overall stores management is efficient.
8) I T	Ensure procurement process meets the purchasing demands of the Users departments.
1)	Optimize and maintain Local and Wide Area Network performance.
2)	Manage Hardware and software infrastructure to ensure 99.9% system availability.
3)	Optimize security and integrity of corporate systems
4)	Provide support on GIS maintenance.
5)	Provide support for SCADA operations and maintenance.
6)	Provide appropriate support for Automatic Metering Infrastructure (AMI).
7)	Complete implementation of Fixed Asset Computerized System with linkages into CMMS.
8)	Procure and commence upgrade of version of CIS to web based version
Los	ss Reduction
1)	Replace 17,000 minor meters with AMI meters.
2)	Replace 5,000 defective meters with AMI meters
3)	Upgrade 2,000 Large Tariff A, B and Maximum Demand accounts to AMI metered accounts
4)	Replace 1,500 tampered meters with AMI meters
5)	Meter 7,500 New Services
6)	Implement other elements of the Strategic Loss Reduction Plan (SLRP).
7)	Provide End User assistance in the implementation of the Business Intelligence System (BI).

8)	Continuously review the benefit of various initiatives to focus field activity.			
9)	Manage disconnection / reconnection activity prudently.			
10)	Investigate all reports of theft of company property.			
11)	Coordinate Social Management Programme with PUUP in areas targeted for loss reduction			
	investment.			
12)	Implement other elements of the Strategic Loss Reduction Plan (SLRP).			
HR	/Admin			
1)	Continuously review employee attendance and staffing levels to determine appropriate actions to			
	limit overtime cost.			
2)	Execute Strategic Training and Development Plan with emphasis on capacity to support the D and E			
3)	Develop and implement initiatives to boost employee's morale.			
4)	Ongoing right-sizing review in consultation with respective Divisions and implement approved plans.			
5)	Monitor objective Performance Management System with an emphasis on improvements.			
6)	Facilitate ongoing review of Safety Rules and Codes of Practice Handbook			
7)	Coordinate annual environmental audit of Company facilities			
8)	Execute Maintenance programmes in keeping with annual maintenance plans.			
9)	Ensure Company is compliant with relevant Labour, Safety, Environmental and Health Laws			
10.	Coordinate annual environmental audit of Company facilities.			
Pro	ojects			
1)	New double circuit transmission line Sophia to Good Hope – 35% complete – Q4			
2)	New transmission line Good Hope to Columbia – 10% complete – Q4			
3)	Expand Good Hope substation – 50% complete – Q4			
4)	Expand Columbia substation – 15% complete – Q4			
5)	Install 5MVAr automatic capacitor bank (13.8Kv) at Canefield – Complete Q3			
6)	Install three (3) 10MVAr automatic capacitor banks (69Kv) at Kingston substation – Complete Q4			
7)	Annual Maintenance Contract for dredging of V/Hoop wharf in progress Q4.			
8)	Golden Grove substation extension – Design, Procure equipment and commence preparatory civil works. 80% Complete - Q4			
Ор	erations			
1)	Implement annual Transmission, Distribution and Generation maintenance programme. – Q4			
2)	Implement technical loss reduction plan. – Q4			
5)	Manage Government financed Un-served Areas Electrification – New Housing Projects			
6)	Complete electrification for selected unserved areas (regularized areas)			

- 7) Execute Technical Loss Reduction Plan Q4
- 8) Ensure universal usage of Computerized Maintenance Management System Software Q4
- 9) Reduce planned maintenance outages by 30%.
- 10) Reduce planned maintenance outages by 30%.

3.3.5 2020

Ma	Management/Overall Coordination				
1)	Ensure budget reflects appropriate priorities and is implemented prudently.				
2)	Undertake quarterly review of achievements of all Divisions, CSS and OS&PT and take corrective				
	action as necessary.				
3)	Manage all capital projects to ensure delivery on time and within budget.				
4)	Provide the environment necessary for key skills to be developed and retained.				
5)	Maintain ISO 9001 – 2015 Quality system certification.				
6)	Ensure communications are adequate and efficient and internal communications support				
	achievement of CSS, OS&PT and keep stakeholders informed of pertinent developments while				
	external communications inform relevant stakeholders of supply issues, major developments and				
	tips on DSM.				
Со	mmercial				
1)	Ensure Customer Service Standards (CSS) and relevant Operating Standards & Performance Targets				

(OS&PT) are met consistently.

- 2) Actively promote electronic transactions via intensive PR programmes
- 3) Constantly review procedures to ensure customer service is optimized.
- 4) Provide active support to Legal and Loss Reduction to pursue outstanding balances.
- 5) Maintain a menu of initiatives targeting improvements in Customer service
- 6) Provide End User assistance for the CIS upgrade project

Finance

- 1) Manage cash flows in accordance with budget and to optimize working capital.
- 2) Provide necessary support to secure funding for capital projects, where necessary.
- 3) Ensure timely completion of statutory financial reports.
- 4) Facilitate completion of annual audits to ensure Company meets its statutory obligations on time.
- 5) Complete procurement Plan and ensure efficient procurement process in compliance with Procurement Manual.
- 6) Provide routine financial reports to all Divisions on a timely basis.
- 7) Ensure inventory levels are optimized and overall stores management is efficient.

8)	Ensure procurement process	meets the purchasing demands	of the Users departments.
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ΙT

- 1) Optimize and maintain Local and Wide Area Network performance.
- 2) Manage Hardware and software infrastructure to ensure 99.9% system availability.
- 3) Optimize security and integrity of corporate systems
- 4) Provide support on GIS maintenance.
- 5) Provide appropriate support for Automatic Metering Infrastructure (AMI).
- 6) Provide support for SCADA operations and maintenance.
- 7) Continue execution of upgrade of Customer Information System (CIS)

Loss Reduction

- 1) Replace 7,000 minor meters with AMI meters
- 2) Replace 5,000 defective and tampered meters with AMI meters
- 3) Upgrade 2,000 Large Tariff A, B and Maximum Demand accounts to AMI metered services
- 4) Replace 1,500 tampered meters with AMI meters
- 5) Meter 7,500 New Services
- 6) Implement other elements of the Strategic Loss Reduction Plan (SLRP).
- 7) Provide End User assistance in the implementation of the Business Intelligence System (BI).
- 8) Continuously review the benefit of various initiatives to focus field activity.
- 9) Manage disconnection / reconnection activity prudently.
- 10) Investigate all reports of theft of company property.
- 11) Coordinate Social Management Programme with PUUP in areas targeted for loss reduction investment.
- 12) Implement other elements of the Strategic Loss Reduction Plan (SLRP).

HR/Admin

- 1) Continuously review employee attendance and staffing levels to determine appropriate actions to limit overtime cost.
- 2) Execute Strategic Training and Development Plan with emphasis on capacity to support the D and E
- 3) Develop and implement initiatives to boost employee's morale.
- 4) Complete right-sizing review in consultation with respective Divisions and implement approved plans.
- 5) Coordinate annual environmental audit of Company facilities
- 6) Execute Facility Maintenance programmes in keeping with annual Facility Maintenance plans.
- 7) Ensure Company is compliant with relevant Labour, Safety, Environmental and Health Laws

Projects

1) Kingston substation extension – Complete Q1

Sophia substation extension – Complete Q1 2) Good Hope substation extension - Construction 80% complete Q4 3) 4) Columbia substation extension – Construction 80% complete. Q4 New transmission line Sophia to Good Hope – Complete Q4 5) New transmission line Good Hope to Columbia - Complete Q4 6) Operations 1) Implement annual Transmission, Distribution and Generation maintenance programme. 2) Implement technical loss reduction plan. 3) Manage Government financed Un-served Areas Electrification – New Housing Projects 4) Complete electrification for selected unserved areas (regularized areas) 5) Execute Technical Loss Reduction Plan 6) Ensure universal usage of Computerized Maintenance Management System Software 7) Reduce planned maintenance outages by 30%. 12) Implement annual Transmission, Distribution and Generation maintenance programme. 13)

3.4 Monitoring, Review and Management of Plan

GPL will review and revise its strategic plan semi-annually, based on reports presented by management to the Board of Directors and decisions of the Board. Management's detailed operating plans will be consistent with the strategic plan.

4. OPERATING STANDARDS AND PERFORMANCE TARGETS

Category	Analysis and Projection	s								
Customer	Targets for System Aver	Targets for System Average Interruption Frequency Index (SAIFI) and								
Interruptions	System Average Interrup	System Average Interruption Duration Index (SAIDI) proposed for 2014 - 2018 are:								
SAIFI = <u>Total Number of Customer Interruptions</u> Total Customers Served										
	SAIDI = <u>Total Custo</u>	mer Hours of I	nterruptions							
	Total Cu	stomers Served	1							
		2016	2017	2018	2019	2020				
	SAIFI	75	75	70	68	65				
	SAIDI	90	85	80	80	75				

Voltage	The nominal voltage and	frequency leve	els are indicated	l in paragraph	a 3.6 of the	Standard
Regulation	Terms & Conditions.					
	GPL will seek to maintain and \pm 10% following a sy delivered to each custome time taken to resolve then	stem disturban er the Standard	ice. Since it is	difficult to m	onitor the v	oltage
		2016	2017	2018	2019	2020
	100% of customer	30 days	30 days	30 days.	30 days	30 days
	voltage complaints due					
	to network					
	reconfiguration,					
	vegetation, upgrade of					
	lines, additional					

transfo	rmer, etc.			

Category	Definition of	Definition of Target								
Meter Readings	Large Consu	mers – Maxii	mum Demand	Consumers (Ta	ariffs C & D)					
	 Produce Ninety-Seven percent (97%) of Maximum Demand Bills based on actual meter readings Domestic and Small Business Consumers (Tariffs A & B) Produce Ninety percent (90%) of non Maximum Demand Bills based on actual meter 									
	readings.	ty percent (90								
		2016	2017	2018	2019	2020				
	MD Cons.	97%	97%	97%	97%	97%				
	Non MD	Non MD 90% 90% 90% 90% 90%								

Category	Definition of	Target								
Issuing of bills		Issue Non Maximum Demand Bills within ten (10) days of meter reading Issue Maximum Demand Bills within seven (7) days of meter reading								
	Days	2016	2017	2018	2019	2020				
	Non MD	10	10	10	10	10				
	MD	7	7	7	7	7				
Category	Definition of	Target								
Accounts Receivable	The status of GPL accounts receivable is stated in its audited annual financial statements. The quoted figures are net of provision for doubtful debts. Unlike the figures in the financial statements the receivables as per the billing system include GEC's receivables.									
	Net	2016	2017	2018	2019	2020				
	Days	40	30	30	30	30				

Category	Definition of	Definition of Target								
Accounts Payable	While most of GPL's Creditors offer 30 days credit some of the largest ones actually offer up to sixty days. The determination of this target is from the invoice date.									
		2016	2017	2018	2019	2020				
	Days	26	26	26	26	26				

Losses	The level of losses at Dec. 2015 is projected at 30.6 of dispatched power with technical losses estimated at 14.28% and non-technical at 16.32%. The total projected losses as a percent of dispatched power are included below, along with the forecasted split: The Company expects to achieve these targets at end of the respective years.											
		2016 2017 2018 2019 2020										
	Technical (%)	13.10	12.90	12.60	12.60	23.30						
	Non-Technical (%)	15.50	14.70	14.00	13.10	12.30						
	Overall (%)	28.6	27.6	26.6	25.7	11.0						
Average Availability	The Availability Target is based on the ratio of declared capacity and available hours to installed capacity and hours in the period. Availability = Available capacity x Total Available Hours Installed capacity x Hours in the period											
	2016 2017 2018 2019 2020											
	Availability	80%	80%	80%	80%	80%						

5 DEVELOPMENT AND EXPANSION PROGRAMME 2016 - 2020

5.1 Demand Forecast

GPL's projected demand for 2016 through to 2020 is premised on a median forecast, which used an annual growth rate of 4.7 to 4.9. %. GPL has modified the Mercados forecast between 2016 and 2020 to reflect a more accurate loss position, connection of new consumers every year and the other indicators explained below:

5.1.1 New Customers

Net customer growth over this planning period has been projected at 34,200. This includes additions from recently served areas and from new housing developments.

With improved service quality and stable tariffs the customer base and demand is projected to increase at a rate of approximately 3.5% annually.

5.1.2 Loss Reduction

Progress in largely loss reduction and to a lesser extent demand side management should result in reduced demand and increased sales. In the forecast, 40% of the recovery resulting from meter replacements and electricity theft and all the reductions resulting from billing errors are flowing to increased sales while the other 60% recovery from meter replacements and electricity theft and all the technical loss reduction will result in reduced demand.

5.1.3 Tariff rebalancing

An IADB funded Tariff study concluded that Tariff A is being subsidized by almost 33% and that Tariffs B, C, D and all Government tariffs are providing this cross-subsidy. With progress on loss reduction been projected for each year of the programme, GPL intends to use the additional cash flow to continue to invest in loss reduction and to ensure that any reasonable escalation in fuel prices above the forecasted annual increases can be met without recourse to tariff increases.

5.1.4 Reduction in un-served energy

A reduction in energy not served is associated with generation shortfall and network unavailability.

This will be achieved by having:

- Adequate reserve generation capacity to cater for planned maintenance and emergency repairs;
- More reliable distribution system and improved response to network faults.
- Shorter feeders with multiple alternative feeds and enhanced maintenance planning and execution facilitated by the additional seven (7) substations.

5.1.5 Reduction in parasitic power consumption

The use of new generating plants for base-load operation would reduce the dependency on older plants using up to 5% (The new 26MW Vreed En Hoop Plant is using 1.5%) of its generation for auxiliaries.

The results of this forecast for the entire system are included in the table below.

 Table 5.1.A Projected Demand and Energy.

	2016	2017	2018	2019	2020
Net Generation (MWH)	778,655	814,525	838,892	863,906	911,529
Sophia Auxillaries (MWH)	619	619	619	619	619
Converter Losses (MWH)	2630.24	0	0	0	0
Station auxilliaries (MWH)	14,551	14,867	15,311	15,767	16,400
%	1.8%	1.9%	1.9%	1.9%	1.9%
Gross Generation	796,389	832,927	857,746	880,596	915905
% Growth (%)	5.15	4.6	3.0	2.7	4.0

Table 5.1.B: Regional Forecast

ESSEQUIBO	2015	2016	2017	2018	2019	2020
Net Energy (MWH)	38,555	40,817	42,718	44,016	45,349	47,189
Load factor -%	0.67	0.67	0.67	0.67	0.67	0.67
Peak (MW)	6.74	7.02	7.35	7.58	7.80	8.12
Gross Energy (MWH)	39,544	41,229	43,149	44,461	45,807	48,353
Aux use %	0.03	0.01	0.01	0.01	0.01	0.01
DEMERARA	2015	2016	2017	2018	2019	2020
Net Energy (MWH)	578,273	611,839	640,009	659,140	678,779	706,000
Peak (MW)	84	88	91	93	94	97
LF %	0.80	0.81	0.82	0.83	0.84	0.85
Sop. Aux Use & Converter Losses	3,249	3,249	619	619	619	619
Gross energy (MWH)	590,632	627,574	656,690	673,210	693,250	721,026
Aux Use %	0.02	0.02	0.02	0.02	0.02	0.02
BERBICE	2015	2016	2017	2018	2019	2020
Net Energy (MWH)	119,088	125,998	131,798	135,736	139,778	145,382
Peak (MW)	23	21	22	23	24	25
LF %	0.60	0.68	0.68	0.68	0.68	0.68
Gross Energy (MWH)	120,587	127,585	133,458	137,445	141,538	147,213
Aux use %	0.01	0.01	0.01	0.01	0.01	0.01
Total – Gross Generation (MWH)	750,763	796,389	830,297	855,116	880,596	915,905

Table 5.1.C: 15-Year Forecast

Year	2016	2017	2018	2019	2020	2021	2022	2023
Growth	6.26%	4.59%	2.98%	2.66%	4.01%	3.00%	3.00%	3.00%
Gross Energy (MWH)	796,389	832,927	857,746	880,596	915,905	943,382	971,684	1,000,834
Year	2024	2025	2026	2027	2028	2029	2030	2031
Growth	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Gross Energy (MWH)	1,030,859	1,061,785	1,093,638	1,126,448	1,160,241	1,195,048	1,230,900	1,267,827

The forecasted load factors are based on historical trends. Growth in demand has been adjusted, given the unavailability of the planned 165 Megawatts of Hydropower in 2019.

The DBIS peak demand is projected to grow to 130MW (rounded up) by 2020 while the Essequibo non-co-incident peak is forecasted to be 8.1MW.

5.2 Planned Retirements and Generation Expansion, DBIS

The formation of the DBIS (Demerara Berbice Interconnect System) in 2014 allowed not only an optimum merit order dispatch to be derived from available generating capacity in the systems, but also for reserve capacity to be shared thereby reducing both operating cost and capital expenditure. The integrated system coupled with the installation of new substations has improved system management, stability and overall reliability and service quality, particularly voltage regulation.

The criterion for reserve capacity used is the size of the two largest units, resulting in a reserve of 16.5MW in the DBIS. Given the unavailability of 165 Megawatts of Hydropower in 2019, GPL projects expansion in fossil fired base load generation with additional generation coming from renewable sources.

Table 5.2.A: Capacity Forecast without additions, DBIS

Existing Capacity, MW	2015	2016	2017	2018	2019	2020
DEMERARA						
Garden of Eden Power Station	8.5	8.5	8.5	0.0	0.0	0.0
Demerara Power (Kingston 1)	22.0	22.0	22.0	22.0	22.0	22.0
Demerara Power, (Kingston 11)	36.3	36.3	36.3	36.3	36.3	36.3
Demerara Power 1 (GoE)	22.0	22.0	22.0	22.0	22.0	22.0
Vreed En Hoop Power Station	26.1	26.1	26.1	26.1	26.1	26.1
Mobile Units	0.0	0.0	0.0	0.0	0.0	0.0
Total Demerara	114.9	114.9	114.9	106.4	106.4	106.4

Existing Capacity, MW	2015	2016	2017	2018	2019	2020
DEMERARA						
BERBICE	2015	2016	2017	2018	2019	2020
Canefield						
No.3 Mirrlees Blackstone	0.0	0.0	0.0	0.0	0.0	0.0
No. 4 Mirrlees Blackstone	4.6	4.6	4.6			
Mobile Units	3.0	3.0	3.0	-		
Onverwagt						
No. 5 & 6 General Motors	4.4	4.4	4.4	0.0	0.0	0.0
IPP (SEI)	8.0	8.0	8.0	8.0	8.0	8.0
Total Berbice	20.0	20.0	20.0	8.0	8.0	8.0
Total DBIS	134.9	134.9	134.9	114.4	114.4	114.4
Diesel Fired Capacity (DFC)	15.9	15.9	15.9	-	-	-
Reserve Capacity	16.5	16.5	16.5	16.5	16.5	16.5
Net Capacity (Tot. DBIS – Reserve)	104.4	104.4	104.4	97.9	97.9	97.9
Peak Demand	110.0	110.0	120.0	120.0	120.0	130.0
Excess(Shortfall)	-5.6	-5.6	-15.6	-22.10	-22.10	-32.10

5.2.1 Retirements

In 2018, all diesel driven units within the DBIS will be retired – Caterpillar sets at Canefield and Onverwagt, Nigattas at Garden of Eden and General Motors at Onverwagt. In addition the No 4 HFO fired Mirrlees unit at Canefield will be retired. This equates to generating capacity of 20.5 MW.

The forecast indicates that there is a need for 15.6 MW of additional base load generating capacity by 2017, consequent on the retirements given above. As the demand grows, additional base load capacity will be required despite the addition of renewable sources – namely the proposed Wind Farm facility at Hope Beach, to compensate for the intermittent nature of such sources. The proposed additions are included in Table 5.2.B below.

 Table 5.2.B: Proposed Generation Addition, DBIS

	2016	2017	2018	2019	2020
Hydro IPP	-	-	-	-	-
Wind Farm	-	10			
Garden of Eden			17.4		
Canefield		5.5			
Total New Additions		15.5	17.4		
Total Accumulated Available					
new Capacity		15.5	32.9	32.9	32.9

The planned additional capacity within the DBIS will be realized by installation and commissioning of the two 8.7 units at Garden of Eden, where there is sufficient transformer capacity and closer proximity to the larger load centers and a 5.5MW HFO driven unit at Canefield.

The formation of Skeldon Energy Inc (SEI), the O&M contract with Wartsila and investment in refurbishment of both DG's (10 MW) and Cogeneration facilities (30 MW) will lead to more reliable supply from Skeldon. In addition, SEI is examining the possibility of installing a second 16.7 MVA transformer at the Skeldon substation. This will address the current limitation where only 13 MW can be transferred to the GPL grid.

While the latter development will address capacity needs when co-generation facilities are operational, only 8 MW would be available during off-crop season, hence the need for additional capacity at Canefield.

The table below illustrates the company's generating capacity with the additional generation.

Fristing Consider MW	2015	2016	2017	2018	2010	2020
Existing Capacity, MW DEMERARA	2015	2010	2017	2018	2019	2020
Garden of Eden Power Station	8.5	8.5	8.5	17.4	17.4	17.4
	22.0	8.3	22.0	22.0	22.0	22.0
Demerara Power (Kingston 1)						
Demerara Power, (Kingston 11)	36.3	36.3	36.3	36.3	36.3	36.3
Demerara Power 1 (GoE)	22.0	22.0	22.0	22.0	22.0	22.0
Vreed En Hoop Power Station	26.1	26.1	26.1	26.1	26.1	26.1
Wind Farm			10.0	10.0	10.0	10.0
Total Demerara	114.9	114.9	124.9	133.8	133.8	133.8
BERBICE	2015	2016	2017	2018	2019	2020
Canefield						
ADDITION			5.5	5.5	5.5	5.5
No. 4 Mirrlees Blackstone	4.6	4.6	4.6			
Mobile Units	3.0	3.0	3.0	-		
Onverwagt						
No. 5 & 6 General Motors	4.4	4.4	4.4			
IPP	8.0	8.0	8.0	8.0	8.0	8.0
Total Berbice	20.0	20.0	25.5	13.5	13.5	13.5
Total DBIS	134.9	134.9	150.4	147.3	147.3	147.3
Reserve Capacity		16.5	20.0 ¹	20.0	20.0	20.0
Net Capacity		118.4	130.4	127.3	127.3	127.3
Peak Demand		110.0	120.0	120.0	130.0	130.0
Excess(Shortfall)		8.4	10.4	7.3	-2.7	-2.7

¹ Reserve capacity increased with addition of Wind Farm offering 10 MW of firm capacity.

5.3 ESSEQUIBO GENERATION EXPANSION

Anna Regina: In 2017, the company proposes to complete a 10MW (2 x 5MW), 60Hz HFO fired Unit at Anna Regina.

Wakenaam: GPL has projected that the addition of the 500Kw gen-set in 2014 will meet the 24/7 demand in Wakenaam into 2020.

Leguan: GPL has projected that the addition of the two (2) 500Kw diesel fired generators in 2014 will meet the 24/7 demand in Leguan into 2020.

Bartica: GPL expects to receive 1.5MWs of renewable energy (solar) from an IPP by the end of the first quarter of 2017. In 2016, GPL will commence the relocation of the power plant at a new location. The relocation of this facility will positively address the current noise and pollution complaints from residents. The plant will be built with five gen-set foundations to permit easy installation of two (2) additional gen-sets. There are currently three (3) diesel fired generators at Bartica.

5.4 USE OF RENEWABLE RESOURCES OF ENERGY

5.4.1 Co-generation

GPL has been receiving small amounts of power from the Skeldon cogeneration facility since 2008. The co-generation facility has experienced severe operational challenges since its commissioning, but GuySuCo has been investing additional sums to correct design deficiencies and upgrade equipment. There is no doubt that all the difficulties would not be totally overcome.

In 2015, GUYSUCO divested its cogeneration to the Skeldon Energy Inc.(SEI): an incorporated entity jointly owned by GPL and the National Industrial and Commercial Investments Ltd. (NICIL). SEI contracted Warsilla to repair the three (3) diesel generators, which suffered significant wear and tear damage. SEI intends to improve its reliability of energy supplied via cogeneration during the harvesting season and has established an Operations and Maintenance (O and M) contract with Wartsilla for the diesel generators.

GPL expects the increased reliability of purchased power from SEI to meet the demand in Berbice, given its recent investment in the major overhaul of the diesel generators, its intention to complete remedial work to the two (2) turbines. In addition SEI's sole mandate and core business is economic electricity generation for sale to GPL and GUYSUCO.

5.4.2 Wind Energy

GPL expects to enter into a Power Purchase Agreement (PPA) with Guyana Wind Farm Inc. for the supply of 10 megawatts in 2017, from an installed capacity of 25 megawatts. Guyana Wind

Farm Inc. (GWI) is expected to generate wind energy from a Wind Farm at Hope on the East Coast of Demerara.

5.4.3 Generation Mix

The potential introduction of a generation mix (wind, solar, Hydro, fossil fuel) into GPL's grid will require the development and publication of a Grid Code, which will set out the parameters governing connection of generating sources: both base load and intermittent, to the GPL grid. The code will also define the allowable level of penetration for intermittent generating sources such as wind and solar.

GPL will still be required to maintain adequate generating resources to satisfy peak demands despite the introduction of non hydro renewable energy sources.

5.5 PLANS TO MEET GENERATION NEEDS OVER 15-YEAR FORECAST

GPL's strategic long term generation plan is premised on an economic generation mix to meet the daily peak demand. This mix will include fossil fired generation and energy from renewable sources.

There continues to be interest in the development of a 25MW wind farm, grid scale PV farms and co-generation from biomass. Guyana Wind Farm Inc. (GWI) has indicated a desire to establish a Power Purchase Agreement (PPA) with GPL for the supply of 10 megawatts (from a proposed installed capacity of 25MWs). Bartica has been identified by the Government of Guyana as a 'Green Town'. The GoG is encouraging the supply of electricity from renewable sources and has invited proposals for a 1.5MW solar farm at Bartica. This farm is expected to be commissioned in 2017.

GPL will examine all proposals from potential Independent Power Providers (IPPs) with special emphasis on estimated selling prices against GPL's generation costs, given the impact of generation costs on Tariffs and to GPL's operations.

Given the suspension of the 165MW Amaila Falls Hydropower project and its impact on GPL's intended base load generating capacity, GPL will subscribe to base load fossil fired generation over the next five years to satisfy demand.

The 'Arco Norte' Interconnection Project (development of an electrical interconnection among Suriname, Guyana, French Guiana and Brazil) will facilitate transmission of electricity from Brazil into Guyana. However, this project is currently at the feasibility stage.

GPL remains optimistic that the Amalia Falls Hydropower Plant, additional Hydropower plants and the Arco Norte electrical interconnection will be commissioned between 2021 and 2035. GPL also expects Hydropower to drive its base load generation over the coming fifteen years. Should Amaila Hydropower or any Hydropower plant of similar capacity be brought into commercial operation, then GPL expects to maintain a minimum of 50MW of fossil fuel capacity to fill capacity gaps.

5.6 GENERATION MAINTENANCE PLAN – 2016

5.6.1 GPL Owned – Wartsila Operated & Maintained

	GARDEN OF EDEN													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC		
# 1DG														
Date	7-Jan-16		9-Mar- 16		10- May-16		11-Jul- 16		11- Sep-16		12- Nov-16			
Expected R/H	166,775		167,77 5		168,775		169,77 5		170,77 5		171,77 5			
Maint. Type	3,000		4,000		5,000		6,000		7,000		8,000			
Duration (Hrs)	8		12		8		10		8		12			
# 2DG														
Date		19- Feb-16		21-Apr- 16		22-Jun- 16		23- Aug-16		18-Oct- 15		19- Dec-15		
Expected R/H		169,91 5		170,91 5		171,91 5		172,91 5		167,915		16891 5		
Maint. Type		5,000		6,000		7,000		8,000		3,000		4000		
Duration (Hrs)		8		10		8		12		8		12		
# 3DG														
Date		3-Feb- 16		5-Apr- 16		6-Jun- 16		7-Aug- 16		8-Oct- 16		9-Dec- 16		
Expected R/H		27,000		28,000		29,000		30,000		31,000		32000		
Maint. Type		3,000		4,000		5,000		6,000		7,000		8000		
Duration (Hrs)		8		12		8		10		8		12		
# 4DG														
Date		24- Feb-16		26-Apr- 16		27-Jun- 16		28- Aug-16		29-Oct- 16		30- Dec-16		
Expected R/H		149,88 0		150,88 0		151,88 0		152,88 0		153,880		15488 0		
Maint. Type		8,000		9,000		10,000		11,000		12,000		1000		
Duration (Hrs)		12		8		10		8		386		8		

KINGSTON 1

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	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC
# 100	5744		ivu uv	74 10		5011	302	100	521	001	1101	DEC
# 1DG	24-Jan-		10-Mar-	25-Apr-		14-Jun-	30-Jul-		14-	30-Oct-		15-Dec-
Date	16		10-1011-	16		14-5011-	16		Sep-16	16		15-Dec-
Expected	140,89			142,89		144,89	146,89		147,89			
R/H Maint.	1		141,891	1		1	1		1	148,891		149,891
Туре	10,000		11,000	24,000		1,000	2.000		3,000	4.000		5,000
Duration			,	,		,	,		-,			- /
(Hrs)	10		8	336		8	10		8	12		8
# 2DG												
	14-Jan-		2-Mar-	19-Apr-		16-Jun-	22-Jul-		16-	22-Oct-		7-Dec-
Date	16		16	16		16	16		Sep-16	16		16
Expected	129,41			131,41		132,41	133,41		134,41			
R/H	2		130,412	2		2	2		134,41 2	135,412		136,412
Maint.						_						
Туре	10,000		11,000	12,000		1,000	2,000		3,000	4,000		5,000
Duration												
(Hrs)	10		8	336		8	10		8	12		8
# 3DG	1		1			1	r	1			1	
Data		2-Feb-	25-Mar-		16-May-		7-Jul- 16	28-Aug-		9-Oct-		10-Dec-
Date		16	16		16		10	16		16		16
Expected		117,58					117,58					
R/H		4	117,584		117,584		4	117,584		117,584		117,584
Maint.		10.000	44.000		12.000		4 000			0.000		
Type Duration		10,000	11,000		12,000		1,000	2,000		3,000		4,000
(Hrs)		10	8		336		8	10		8		12
# 4DG												
# 400	7-Jan-		30-Mar-	30-Apr-		15-Jun-	31-Jul-		15-	31-Oct-		16-Dec-
Date	16		16	16		16	16		Sep-16	16		16
Expected	127,29		120.204	129,29		130,29	131,29		132,29	122 201		124 201
R/H Maint.	1		128,291	1		1	1		1	133,291		134,291
Type	11,000		12,000	1,000		2,000	3,000		4,000	5,000		6,000
Duration												
(Hrs)	8		336	8		10	8		12	8		10

	KINGSTON2													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC		
# 1DG														
	1-Jan-			2-Apr-	18-May-	14-Jun-	21-Jul-			23-Oct-				
Date	16			16	16	15	15			15				
Expected														
R/H	49,707			51,707	52,707	46,648	47,721			48,707				
Maint.														
Туре	1,000			1,000	4,000	2,000	1,000			12,000				
Duration														
(Hrs)	6			6	10	8	6			480				
# 2DG														
Date	17-Oct-		3-Mar-	18-Apr-		13-Jun-	22-Jul-		5-Sep-	17-Oct-		2-Dec-		

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KINGSTON2													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC	
	15		16	16		15	15		15	15		15	
Expected R/H			51,921	52,921		45,745	46,654		47,712	48,921		49,921	
Maint. Type	12,000		1,000	4,000		1,000	2,000		1,000	12,000		1,000	
Duration (Hrs)	336		6	10		6	8		6	336		6	
# 3DG													
Date	5-Jan- 16		7-Mar- 16	22-Apr- 16		7-Jun- 16	23-Jul- 16		7-Sep- 16		14-Nov- 15		
Expected R/H	48,634		49,634	50,634		51,634	52,634		53,634		48,523		
Maint. Type	12,000		1,000	2,000		1,000	4,000		1,000		1,000		
Duration (Hrs)	336		6	8		6	10		6		6		
# 4DG													
Date	27-Jan- 16		13-Mar- 16	28-Apr- 16		13-Jun- 16	29-Jul- 16					26-Dec- 15	
Expected R/H	36,822		37,822	38,822		39,822	40,822					35,822	
Maint. Type	12,000		1,000	2,000		1,000	4,000					1,000	
Duration (Hrs)	336		6	8		6	10					6	
# 5DG													
Date		7-Feb- 16	24-Mar- 16		9-May- 16	24-Jun- 16		9-Aug- 16				27-Dec- 15	
Expected R/H		36,791	37,791		38,791	39,791		40,791				35,791	
Maint. Type		12,000	1,000		2,000	1,000		4,000				1,000	
Duration (Hrs)		336	6		8	6		10				6	

					VRE	ED-EN-HOC	P					
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC
# 1DG												
		6-Feb-	22-Mar-		6-May-	20-Jun-		4-Aug-	18-Sep-		2-Nov-	
Date		16	16		16	16		16	16		16	
Expected												
R/H		9,951	10,951		11,951	12,951		13,951	14,951		15,951	
Maint.												
Туре		2,000	1,000		12,000	1,000		2,000	1,000		4,000	
Duration												
(Hrs)		10	8		336	8		10	8		12	
# 2DG												
		2-Feb-	18-Mar-		2-May-	16-Jun-	31-Jul-		14-Sep-	29-Oct-		13-Dec-
Date		16	16		16	16	16		16	16		16
Expected												
R/H		9,997	10,997		11,997	12,997	13,997		14,997	15,997		16,997
Maint.												
Туре		2,000	1,000		12,000	1,000	2,000		1,000	4,000		1,000

	VREED-EN-HOOP													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC		
Duration (Hrs)		10	8		336	8	10		8	12		8		
# 3DG														
	16-Jan-		1-Mar-	15-Apr-	30-May-		14-Jul-	28-Aug-		12-Oct-	26-Nov-			
Date	16		16	16	16		16	16		16	16			
Expected														
R/H	8,940		9,940	10,940	11,940		12,940	13,940		14,940	15,940			
Maint.														
Туре	1,000		2,000	1,000	12,000		1,000	2,000		1,000	4,000			
Duration														
(Hrs)	8		10	8	336		8	10		8	12			



Major over haul

5.6.2 GPL – Owned & Operated – Schedule of Major Services

5.6.2.1 Demerara

Units	Jan	Feb	March	April	May	June	July	August	Sept	October	Nov.	Dec.
#2 Crossley		service & repairs				service & repairs					service & repairs	
#7 Caterpillar												
#5 Nigata	service & repairs			service & repairs			service & repairs			service & repairs		
#6 Nigata	Top Overhaul			service & repairs			service & repairs			service & repairs		

Engines at GoE: HFO and Diesel Fired Sets

Major over haul

5.6.2.2 Berbice

Date	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov.	Dec.
Duto												
NO. 10 CAT			5000 hrs @ 20,963			5,500 hrs @ 21,463		6,000 hrs @ 21,963		6,500 hrs @ 21,963		7,000 hrs @ 22,463
NO. 11 CAT	6,500 hrs @ 21,413		7000 hrs @ 21,963		TOP END @ 22,413		500 hrs @ 22,913		1000 hrs @ 23,413		1500 hrs @ 23,963	

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Date	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov.	Dec.
Date												
NO 40			5000			5,500		6,000		6,500		7,000
NO. 10 CAT			hrs @			hrs @		hrs @		hrs @		hrs @
			20,963			21,463		21,963		21,963		22,463
NO. 13 CAT		1,500 hrs @ 9,000		2,000 hrs @ 9,500		2,500 hrs @ 10,000		3,000 hrs @ 10,500		3,500 hrs @ 11,000		4,000 hrs @ 11,500
		3,500 hrs @ 126,864		4,000 hrs @ 127,364		4,500 hrs @ 127,864		5,000 hrs @ 128,364		5,500 hrs @ 128,864		
NO. 3												
MIRRLEES												
											6,000 hrs @ 129,364 (TOP	

Major over haul

Engines at Canefield: HFO and Diesel Fired Sets

UNIT	ACTIVITY	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEPT.	ост.	NOV.	DEC.
# 1	Proposed Date	13	26	-	8	27	-	5	19	30	-	8	23
	Type of Service	2000		2500		3000		3500		4000	-	4500	
	Proposed Hours	20953		21453		21953	-	22453		22953	-	23453	
# 2	Proposed Date	5	22	-	6	-	1	17	15	18	-	4	20
	Type of Service	12500		13000		13500		14000		14500	-	15000	
	Proposed Hours	22140		22640		23140		23640		24140	-	24640	
# 5	Proposed Date	13	1 to 28	22	18	16	14	8	1 & 29	23	10	2 & 29	22
	Type of Service	А	F	А	A*	А	В	А	C & A	A*	А	B & A	A*
	Proposed Hours	106777	107027	107377	107727	108077	108427	108777	109029 109377	109727	110077	110427 110777	111127
#6	Proposed Date	4	1	2	12	30	-	4	16	-	3	7	11

D&E PROGRAMME 2016 - 2020

UNIT	ACTIVITY	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEPT.	ост.	NOV.	DEC.
	Type of Service		11000		11500		12000		12500	-	13000		13500
	Proposed Hours		22953		23453		23953		24453	-	24953		25453
#7	Proposed Date	14	12	10	4 to 30	20	17	7	2 & 30	20	11	7	1 & 28
	Type of Service	А	В	А	F	А	A*	А	B & A	С	А	A*	A & B
	Proposed Hours	24884	25234	25584	25834	26184	26534	26884	27234 27584	27834	28184	28534	28884 29234

5.6.2.3 Essequibo

UNIT	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	ОСТ	NOV	DEC
NO. 1 DG SET	500 HRS (13515 0 HRS)	1000 HRS (13565 0 HRS)	2000 HRS (13665 0 HRS)	500 HRS (13715 0 HRS)	500 HRS (13815 0 HRS)	2000 HRS (13865 0 HRS)	1000 HRS (13965 OHRS)	500 HRS (14015 0 HRS)	500 HRS (14115 0 HRS)	1000 HRS (14165 0 HRS)	2000 HRS (14265 0 HRS)	500 HRS (14315 0 HRS)
		500 HRS (13615 0 HRS)		1000 HRS (13765 0 HRS)		500 HRS (13915 0 HRS)		2000 HRS (14065 0 HRS)		500 HRS (14215 0 hrs)		1000 HRS (14365 0 HRS)
NO. 2 DG SET	500 HRS (13581 9 HRS)	500 Hrs (13681 9 HRS)	2000 HRS (13731 9 HRS)	1000 HRS (13831 9 HRS)	500 HRS (13881 9 HRS)	500 HRS (13981 9 HRS)	1000 HRS (14031 9 HRS)	500 HRS (14131 9 HRS)	1000 HRS (14181 9 HRS)	2000 HRS (142819 HRS)	500 HRS (14331 9 HRS)	500 HRS (14431 9 HRS)
	1000 HRS (13631 9 HRS)		500 HRS (13781 9 HRS)		2000 HRS (13931 9 HRS)		500 HRS (14081 9 HRS)		500 HRS (14231 9 HRS)		1000 HRS (14381 9 HRS)	
NO. 3 CAT	500 Hrs 29742				1000 Hrs 30242			500 Hrs 30742				1000 Hrs 31242
NO. 5 DG SET	500 HRS 4782	1000 HRS 5282	2000 HRS 6282	500 HRS 6782	500 HRS 7782	2000 HRS 8282	1000 HRS 9282	500 HRS 9782	500 HRS 10782	1000 HRS 11282	2000 HRS 12282	500 HRS 12782
Fairfield		500 HRS 5782		1000 HRS 7282	Major	500 HRS 8782		2000 HRS 10282		500 HRS 11782		1000 HRS 13282



Major over haul

Anna Regina Wartsilas and Cats

U NI												
т	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	ОСТ	NOV	DEC
CAT SET	500 HRS	250 HRS	1000 HRS	250 HRS	500 HRS	250 HRS	2000 HRS	250 HRS	500 HRS	250 HRS	Major	250 HRS
#1 CAT	(81318 HRS)	(81568 HRS)	(81818 HRS)	(82068 HRS)	(82318 HRS)	(8568 HRS)	(82818 HRS)	(83068 HRS)	(83318 HRS)	(83568 HRS)	(83818 HRS)	(84068 HRS)
CAT SET	250 HRS	Major	250 HRS	1000 HRS	250 HRS	500 HRS	250 HRS	2000 HRS	250 HRS	500 HRS	250 HRS	1000 HRS
#2 C	(50402 HRS)	(50652 HRS)	(50902 HRS)	(51152 HRS)	(51402 HRS)	(51652 HRS)	(51902 HRS)	(52152 HRS)	(52402 HRS)	(52652 HRS)	(52902 HRS)	(53152 HRS)
CAT SET	500 HRS	250 HRS	1000HR S	250 HRS	500 HRS	250 HRS	2000 HRS	250 HRS	500 HRS	250 HRS	1000 HRS	250 HRS
#3 C/	(106737 HRS)	(106987 HRS)	(107237 HRS)	(107487 HRS)	(107737 HRS)	(107987 HRS)	(108237 HRS)	(108487 HRS)	(107737 HRS)	(108987 HRS)	(109237 HRS)	(109487 HRS)

Major over haul

Wakenaam: Cats

UNI												
Т	JAN	FBR	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
	250 HRS	250 HRS	500 HRS	2000 HRS	500 HRS	1000 HRS	250 HRS	250 HRS	250 HRS	Major	500 HRS	1000 HRS
	4905	5405	6155	6655	7155	7655	8405	8905	9405	10155	10655	11155
IT SET	500 HRS	1000 HRS	250 HRS	250 HRS	250 HRS	250 HRS	2000 HRS	500 HRS	1000 HRS	250 HRS	250 HRS	250 HRS
#1 CAT :	5155	5655	6405	6905	7405	7905	8655	9155	9655	10405	10905	11405
-		250 HRS				500 HRS			250 HRS			500 HRS
		5905				8155			9905			11655
	250 HRS	250 HRS	250 HRS	2000 HRS	500 HRS	1000 HRS	250 HRS	250 HRS	250 HRS	250 HRS	500 HRS	1000 HRS
	4901	5401	5901	6651	7151	7651	8401	8901	9401	9901	1061	11151
CAT SET	500 HRS	1000 HRS	500 HRS	250 HRS	250 HRS	250 HRS	2000 HRS	500 HRS	1000 HRS	Major	250 HRS	250 HRS
#2 C/	5151	5651	6151	6901	7401	7901	8651	9151	9651	10151	10901	11401
			250 HRS			500 HRS				250 HRS		500 HRS
			6401			8151				10401		11651

Major over haul

Leguan: Cats

UNI												
Т	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	ОСТ	NOV	DEC
	1000 HRS	500 HRS		2000 HRS	500 HRS	1000 HRS		500 HRS	2000 HRS	500 HRS		1000 HRS
AT SET	55586	56086		56586	57086	57586		58086	58586	59086		59586
#6 CAT				ТОР								
	500 HRS	2000 HRS	1000 HRS	500 HRS	500 HRS	1000 HRS	2000 HRS	500 HRS	500 HRS	2000 HRS	500 HRS	500 HRS
T SET	65619 .2	66119.2	67119.2	67619 .2	68619 .2	69119. 2	70119. 2	70619. 2	71619.2	72119. 2	72619.2	73619.2
#9 CAT		500 HRS		2000 HRS	ТОР	500 HRS		1000 HRS			1000 HRS	
		66619.2		68119 .2		69619. 2		71119. 2			73119.2	
	2000 HRS		500 HRS	1000 HRS	500 HRS		2000 HRS	500 HRS		1000 HRS	500 HRS	2000 HRS
AT SET	12085		12585	13085	13585		14085	14585		15085	15585	16085
#10 CAT (MAJOR									

Major over haul

Bartica: Cats

5.7 T&D Expansion and Modernization Plan

Expenditure over the life of this Programme on T&D expansion and modernization is expected to be US\$45.9M and will realize the following:

- Construction of 69kV transmission links between:
 - ➢ Vreed-En-Hoop substation and Canal No. 2.
 - Edingburg substation and Parika.
 - ➢ Garden-of-Eden substation and Kuru Kuru.
 - Sophia and Kingston (second 69Kv link).
 - Sophia to Good Hope to Columbia (second 69Kv link).

- Completion of new 69/13.8 Kv substations at the following locations:
 - Parika (17MVA).
 - Canal No. 2 (17MVA)
 - ➢ Kuru Kuru (17MVA)
 - Williamsburg (17MVA)
- Expansion of the following substations:
 - Edingburg (Additional bay).
 - Vreed-En-Hoop (Additional bay).
 - ➤ Garden-of-Eden (Rebuild former L2 bay).
 - Kingston (Additional bay).
 - Sophia (Additional two bays).
 - ➢ Good Hope (Additional two bays).
 - Columbia (Additional bay).
 - ➢ No. 53 (Additional two bays).
 - Golden Grove (additional two bays)
- Installation of automatic capacitor banks the following locations:
 - ▶ 5 MVAr at Canefield (13.8Kv).
 - ➢ 30 (3 X 10) NMVAr at Kingston (69Kv).
- Completion of the following, as part of a technical loss reduction investment plan:
 - Replacement of 74Km of service lines.
 - Extend 54Km of primary lines.
 - Upgrade 38Km of primary lines.
 - 196 inefficient transformers.
 - Remove 181 underutilized transformers.
 - Install 333 additional transformers.
 - Upgrading transformers in 45 communities.
 - Servicing connections for and or upgrading 6,520 transformer LV drops.
 - Servicing connections for and or upgrading 3,449 MV jumpers.
 - Servicing connections for and or upgrading 7,156 LV jumpers.
- Expansion of the distribution network to accommodate potentially 8,855 new customers in Regions 2, 3, 4, 5, 6 and 7. i.e. occupied unserved areas and new Housing developments
- Implementation of GIS, including a sustained effort of field data collection to populate the database.
- New power tools and articulated vehicles to build capacity, particularly in Demerara and Berbice.

The construction of new substations at Parika, Canal No.2, Kuru Kuru and Williamsburg would allow for new distribution feeders to be deployed in those geographic areas to serve projected loads efficiently.

The expansion of various substations are required to deploy new 69Kv transmission links, either to power the new substations or to reduce transmission losses (Sophia to Kingston and Sophia to Good Hope to Columbia).

Upgrade of various substations is necessary to meet projected demand on the respective substations.

GPL has to update its design standard to reduce the network maintenance burden. The current high maintenance design based on wooden poles and cross-arms and bare conductors will be reviewed and an economic assessment of alternative and more resilient structures such as concrete or steel poles, steel arms and insulated conductors undertaken. The company intends to conduct and conclude this assessment during 2016.

72% of overall losses (22.8% of 31.7%) are occurring in Region 4 and a few parts of Region 3. GPL will focus its efforts on these geographical areas to upgrade the distribution network and the metering infrastructure to address losses. The Technical Loss Reduction Plan below details the activities for all served areas.

The cost of the proposed expansion of the T&D System is included in the following table:

	2016	2017	2018	2019	2020	Total
Transmission Lines	935,034	6,326,510	1,874,314	2,006,296	6,903,527	\$ 18,045,681
Substations	2,333,072	15,828,765	5,901,634	3,183,820	662,582	\$ 27,909,873
Capacity Building	3,268,106					\$ 3,268,106
Compensation	0	0	0	2,069,700	0	\$ 2,069,700
Distribution	9,247,135	6,129,741	3,677,845	2,206,707	1,324,024	\$ 22,585,452
Electrification	452,785	1,503,725				\$ 1,956,510
Total						\$ 75,835,322

 Table 5.7.A
 T&D Expansion Programme, Capital Cost – US\$ '000

Given the magnitude of the transmission line and substation projects, GPL intends to award turnkey contracts for the execution of works. GPL also intends to continue its practice of awarding labour contracts for customer capital jobs.

The company will continue to provide technical training to 'Fee for Service' personnel (contractors) to improve their competence and validate their existing certification. This is imperative and good practice in order to ensure work is done to the standards specified in the

Company's Construction Manual. The objectives of promoting private participation in the T&D activities of the Company are the following:

- > Capital works can progress without compromising maintenance activities;
- Reduction of Capital Investments in specialized T&D tools and equipment.
- Significant resources can be concentrated during scheduled outages, this will:
 - Improve the reliability of the T&D system as the defects are corrected faster.
 - Reduce Energy not Served due to T&D faults and maintenance activities.
 - Improve SAIFI and SAIDI.
 - Reduce maintenance cost.

Some of the main capital works that will be outsourced during the programme are:

- Rehabilitation of feeder backbone structures;
- Major network rehabilitation and system upgrades;
- Secondary network upgrade;
- Transmission Network expansion;
- Specific interventions targeting areas with high levels of emergency calls;
- Customer capital jobs;
- ✤ Vegetation management.

GPL recognizes and endorses the importance of adequate equipment to effectively manage its T and D work programmes. The company intends to maintain a programme of prudent addition and replacement of tools and equipment for availability to T and D crews in order to vastly improve productivity.

This will lead to the following benefits:

- **4** Better training of remaining work force;
- **4** Better equipped crews;
- Quicker responses to emergency calls;
- **4** Improved efficiency.

5.7.1 Network Maintenance Plan – 2016

Planned Targets 2016						
Activity	Туре					
Activity		Q1	Q2	Q 3	Q4	Total
POLE REPLACEMENT	PRI	923	996	697	1,261	3,878
POLE REPLACEMENT	SEC	856	915	731	1,296	3,798
POLE PLUMBING	PRI	275	360	296	274	1,205
POLE PLUMBING	SEC	328	304	331	300	1,262
POLE TREATMENT	PRI	5,960	5,839	2,677	1,641	16,117
	SEC	11,337	12,772	6,738	1,947	32,794

Planned Targets 2016						
Activity	Туре	Q1	Q2	Q 3	Q4	Total
	PRI	398	439	301	246	1,384
OLD POLE REMOVAL	SEC	565	457	452	420	1,893
	PRI	181	148	136	135	601
POLE STUBBING	SEC	117	102	115	102	437
	PRI	98	90	70	72	330
ANCHOR BLOCK REPLACEMENT	SEC	122	115	88	111	437
GUY REPLACEMENT	PRI	126	128	70	82	407
GUI KEFLACEMEN I	SEC	126	109	102	112	448
CHANGING DEFECTIVE CROSS ARM	PRI	469	539	385	371	1,764
INSULATORS REPLACEMENT	PRI	658	733	605	629	2,625
	SEC	519	403	393	396	1,710
LINE HARDWARE TRANSFER	PRI	545	744	295	259	1,843
	SEC	605	494	437	444	1,980
LINE EXTENSION (KM)	PRI	6	12	10	11	39
	SEC	7	17	18	17	59
LINE UPGRADEMENT (KM)	PRI	7	12	9	9	36
	SEC	7	9	14	13	44
LINE RETENSION (KM)	PRI SEC	69 76	47 30	20 26	25	160
CEDVICE LINE DEDLACEMENT (SEC SEC				26	158
SERVICE LINE REPLACEMENT (m) INSTALLATION / REPLACEMENT	SEC	7,398	7,185	5,758	5,809	26,150
(GAB)	PRI	10	13	8	8	39
INSTALLATION / REPLACEMENT (SPD)	PRI	18	20	20	1	59
INSTALLATION / REPLACEMENT RCO)	PRI	158	172	159	165	655
INSTALLATION / REPLACEMENT (PMCO)	SEC	271	233	231	249	984
TRANSFORMER MAINTENANCE	SEC	452	379	442	416	1,688
INSTALLATION ADDITIONAL TRANSFORMERS	PRI	48	42	30	27	147
CAPICTOR BANK MAINTENANCE	PRI	5	9	3	4	21
JUMPER REPLACEMENT/SERVICING	PRI	331	453	364	303	1,451
-	SEC	439	393	362	461	1,654
SERVICE CONNECTION @ CONSUMER	SEC	3,818	2,848	2,593	2,990	12,249
INSTALLATION ADDITIONAL EARTHS	SEC	229	188	197	238	853
ROUTE CLEARING (KM)	PRI	42	50	80	68	240
	SEC	56	65	56	64	242
LINE INSPECTION (KM)	PRI	191	193	172	174	731
	SEC	196	236	174	203	809
C.E.O.F Inspection	PRI	176	159	150	201	686

The T&D maintenance programme has been developed to address known defects (from field inspections) reasonably expected to be uncovered in 2016 . The outsourcing of components of

this programme in addition to investments in GPL's maintenance capacity and capability will better position the company to achieve its targets.

5.8 LOSS REDUCTION

The reduction of losses, technical and non-technical, continues to be one of the key challenges facing the GPL. By the end of 2015 total losses (dispatched power less billed sales) was 29.2%. The strategies which will be employed in our Loss Reduction programme are expected to reduce total losses to at least 23.3% by the end of 2020.

5.8.1 Non-Technical Loss Reduction

Secure metering continues to be recognized as the key strategy to reduce non-technical losses and this Programme would employ Automatic Metering Infrastructure (AMI) technology to achieve this. The results of pilot indicated a significant reduction in losses (from 42% to 25%) and provided the basis to implement this technology on a wider scale.

In a recent loss profiling of all feeders, it was found that 72% of overall losses (22.2% of the 30.9%) are accounted for in Region 4 and part of the West Bank (La Retrait to Free and Easy) and the West Coast (Edingburg to Roden Rust). There are just less than 82,000 consumers in this service area out of the Company's 182,704 customers. This geographic area would therefore be focused on intently between 2016 and 2017 with all meters expected to be AMI.

Over the life of this Programme over 105,500 AMI meters are expected to be installed. These installations with be equipped with circuit breakers and a Customer Display Unit. The circuit breakers will allow remote disconnection and reconnection.

AMI meters will not only be used for customer installations but will also be used for grid metering to allow a comparison between energy delivered to a geographic area and the energy registered by Consumers' meters. This technology will greatly enhance GPL's capability to easily detect theft and therefore reduce losses.

The activities envisaged over the life of this Programme require a capital investment of US\$36.9M and include:

- ▶ Installation of 105,500 AMI meters.
- > Upgrade of 4,000 interfaces to current standard.
- Regular inspection of areas with new, reinforced networks to reduce illegal connections.
- Prosecution of all cases of illegal electricity extraction.
- Execution of a Social Management Programme to educate consumers on the impact of electricity theft.

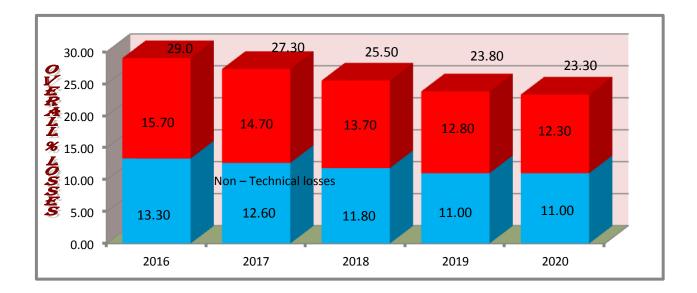
5.8.2 Technical Loss Reduction

Investment in technical loss reduction will be US\$12.47 over the life of this programme. The investment will address losses at the distribution level, within both the MV and LV network. An estimate of 2.3% reduction in technical losses is projected over the life of the programme. This could be considered a conservative estimate but must be viewed in light of growing demand and the company's intention to sustain this reduction. The US\$46M investment in transmission lines and substations will also have loss reduction value and these have been included in the loss reduction estimate. It should be noted that new transmission lines, substations and an upgraded distribution network would improve supply quality, which would have the effect of increasing demand. An increase in demand increases technical losses exponentially.

x				Total			
		2016	2017	2018	2019	2020	
Activities		Quantity	Quantity	Quantity	Quantity	Quantity	
SERVICE LINE REPLACEMENT (KM)		22	21	7	6	18	74
LINE EXTENSION (KM)	PRIM.	10	10	10	9	15	54
LINE UPGRADEMENT (KM)	PRIM.	6	6	11	8	7	38
	SEC.	50	77	11	10	35	183
REPLACING INEFFICIENT TRANSFORMERS		23	23	72	61	18	196
REPLACING UNDER UTILISED		18	18	70	60	15	181
INSTALLING ADDITIONAL TRANSFORMERS)		57	55	98	85	39	333
REPLACING TRANSFORMERS (MV VOLTAGE		100	175	0	0	0	275
SERVICE CONNECTION @		11,080	15,593	13,960	8,280	14,000	62,913
TRANSFORMER DROPS		486	394	1,920	1,520	2,200	6,520
JUMPER	PRIM.	648	459	936	856	550	3,449
SERVICING/CRIMPING/REPLACEMENT	SEC.	1,348	1,007	2,160	1,440	1,200	7,156

5.8.2.1 Distribution Upgrade Programme (Technical Loss Reduction Investment)

Table: 5.8.A Loss Reduction Projections



6 OPERATIONS

6.1 Sales and Revenue Collection

Sales growth from 2016 to 2020 shows an increase based on the expectation that losses will be brought down from 29.2% in 2015 to 23.3 (5.9% reduction) by the end of 2020 and that 1.4% (40% of non technical loss reduction) will translate fully into Sales. 34,200 new consumers will access GPL service and that normal growth will be between 3 and 4%.

It is projected that the customer base will increase from 182,704 in 2015 to potentially 211,804 by the end of 2020. The projected increase in the customer base is largely as a result of new connections in recently served areas.

The active campaign to reduce Receivables will continue and a cash collection rate of 99.5% (cash collections as a percentage of sales) has been assumed for the life of the Programme. The target is based on 100% of Government and 99% of non-Government sales being collected.

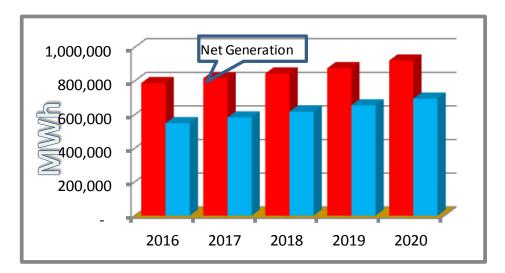


Table 6.1.A Net generation & Sales (MWh)

6.2 PLANS TO REGAIN INDUSTRIAL CUSTOMERS

Industrial consumers expect:

- 1. A reliable and efficient service.
- 2. Competitive tariff.
- 3. Power of acceptable quality and
- 4. Available capacity to meet their growing needs.

The investments in generation, transmission, sub-stations, control facilities and loss reduction are all geared towards providing a reliable, least cost service. GPL had expected to rebalance its tariffs once power became commercially available from the hydro to remove the cross subsidy currently being provided by non-residential tariffs. However, the suspension of this project by the Government will influence the tariff rebalancing initiative given the framework within tariff rebalancing was being considered.

Before hydro, industrial consumers would be able to access power that is more reliable. However, the tariff reduction which many will be looking for would not materialize before the commissioning of adequate economic renewable base load generation to satisfy demand within Demerara and Berbice. GPL is not projecting to lose industrial consumers. This retention projection is premised on lower fuel prices over the life of the programme and the Government's support in stabilizing tariffs should fuel prices escalate at an astronomical rate.

6.3 PLANS FOR PROVIDING ELECTRICITY FOR DEVELOPMENT AND REDEVELOPMENT PROJECTS IN URBAN AREAS

- Georgetown The new Georgetown substation which came into commercial operation in 2013 has facilitated an additional eight (8) feeders for load in Georgetown. In addition the new 26MW power plant that was commissioned February 2015 is delivering bulk power to East Demerara via the 1.8 km, 69kv sub marine cable that links the Kingston and Vreed En Hoop generation stations.
- New Amsterdam New Amsterdam is served from Canefield and the planned commissioning of a new substation at Williamsburg in 2018 will effectively off-load circuits emanating from Canefield so that more of the power delivered to Canefield can be directed to New Amsterdam. The interconnection of the Demerara and Berbice systems in 2014 has allowed consumers in New Amsterdam to also access power from Demerara.
- **Rose Hall** The planned commissioning of the new substation at Williamsburg (which is contiguous to Rose Hall) in 2018 will provide a vastly improved quality of service for consumers in Rose Hall. The new feeders will allow GPL to meet growth in the town for at least ten years.
- **Corriverton** Corriverton is being served by a feeder emanating from GuySuCo's new Skeldon factory. This allows access to generation and network capacity that would be

more than adequate to meet the medium term needs of the Town. An alternative supply is also available from the No.53 Sub-station.

Through the life of this programme, the generation needs of Berbice in general and its towns in particular would be met from GuySuCo's Skeldon facility. The company intends to retire 4.6MW of HFO fired Mirrless capacity at Canefield power station and install 5.5MW of new HFO fired generation in 2017. Berbice will also be positioned to receive power dispatched from Demerara via the interconnection of Demerara and Berbice (DBIS).

Anna Regina - GPL's power plant on the Essequibo Coast is located at Anna Regina. In 2017 a new 10MW, 60 Hz plant will be commissioned. This planned 10MW of installed capacity will be capable of meeting the demand on the entire Essequibo Coast beyond the life of this programme.

6.4 SUMMARY OF WORK PLAN

2016	2016
Generation	4MW HFO Unit for Anna Regina (Commence installation)
	Relocation of the Bartica generation facility
	5.5MW HFO Unit for Canefield (Commencement installation)
Substations	Williamsburg sub-station (17MVA)
	Extension & upgrade of No.53 Substation
	Parika sub-station (17MVA)
	Canal No. 2 sub-station (17MVA)
	Williamsburg sub-station (17MVA)
	Extension & upgrade of Edingburgh Substation
Distribution	Distribution upgrade
Non Tec Loss Reduction	Replace 6,000 meters with pre-paid meters (meters in stock)
	Upgrade 4,000 installations to current interface, including new meters (AMI).
	Public Education & Social Management Programme
	Replace 1,500 defective meters
	Upgrade 1000 AMR meters to AMI Meters
Electrification	Provision of electricity to 2,356 potential consumers
New Services	6,200 new services
Buildings	New Vreed-En-Hoop Commercial and T&D Office
	New Williamsburg Commercial Office
	New Generation Office - Canefield
	Security Facilities
	New ICT Centre - Sophia (commence construction)
Capacity Building	Office Equipment, motor vehicles, computer hardware & software
Information Technology	GIS Application and collection of field data
	Inventoty Management Module (Oracle Financial Computerized System)
	ICT Infrastructure (East and West Berbice Commercial Buildings.)

	2017
2017	2017
Generation	4MW HFO Unit for Anna Regina (Commission)
	Relocation of the Bartica generation facility (Relocate)
	5.5MW HFO Unit for Canefield (Commission)
	2 x 8.7MW HFO Units for Vreed En Hoop (Commence installation)
Substations	Williamsburg sub-station (17MVA) – On going
	Extension & upgrade of No.53 Substation On going
	Parika sub-station (17MVA) On Going
	Canal No. 2 sub-station (17MVA) On Going
	Williamsburg sub-station (17MVA) On Going
	Extension & upgrade of Edingburgh Substation On Going
Distribution	Distribution upgrade
Non Tec Loss Reduction	Replace 4,000 defective meters
	Public Education & Social Management Programme
	Replace 1,500 tampered meters
	Upgrade 1000 AMR meters to AMI Meters
	Replace 16,000 minor meters with AMI meters
Electrification	Provision of electricity to 2,356 potential consumers
New Services	6,200 new services
Buildings	New Corporate Office – Sophia (commence construction)
	New Training School – Sophia (commission)
	New T and D Office – Versailles (commission)
	Security Facilities
	New ICT Centre - Sophia (commission)
Capacity Building	Office Equipment, motor vehicles, computer hardware & software
. , , ,	
Information Technology	Document Management System
	Computerized Maintenance Management System
	ICT Infrastructure (East and West Berbice Commercial Buildings.)

2018	2018
Generation	2 x 8.7MW HFO Units for Vreed En Hoop (Commence installation)
Substations	Williamsburg sub-station (17MVA) – Commission
Cubolationio	Extension & upgrade of No.53 Substation – Commission
	Parika sub-station (17MVA) – Commission
	Canal No. 2 sub-station (17MVA) – Commission
	Williamsburg sub-station (17MVA) – Commission
	Extension & upgrade of Edingburgh Substation – Commission
Distribution	Distribution upgrade
Non Tec Loss Reduction	Replace 4,000 defective meters
	Public Education & Social Management Programme
	Replace 1,500 tampered meters
	Upgrade 1000 AMR meters to AMI Meters
	Replace 16,000 minor meters with AMI meters
Electrification	Provision of electricity to 2,356 potential consumers
New Services	7,000 new services
Buildings	New Corporate Office – Sophia (ongoing)
	New Training School – Sophia (commission)
	New T and D Office – Versailles (commission)
	Security Facilities
	New ICT Centre - Sophia (commission)
Capacity Building	Office Equipment, motor vehicles, computer hardware & software
expanding	
Information Technology	GIS application development - ongoing
	Fixed Assets (Implementation)

2019	2019
Generation	
Substations	Good Hope sub-station (17MVA) Expansion – in Progress
	Columbia sub-station (17MVA) Expansion – In progress
Distribution	Distribution upgrade
Non Tec Loss Reduction	Replace 5,000 defective meters
	Public Education & Social Management Programme
	Replace 2,000 tampered meters
	Upgrade 1000 AMR meters to AMI Meters
	Replace 17,000 minor meters with AMI meters
Electrification	Provision of electricity to 2,356 potential consumers
Electrification	
New Services	7,000 new services
Buildings	New Corporate Office – Sophia (commission)
	New Facilities Management Workshop – Sophia (commission)
Capacity Building	Office Equipment, motor vehicles, computer hardware & software
Information Technology	CIS Upgrade (Preparation)

2020	2020
Generation	
Outratations	Quarter that the station (4700) (A) Expansion (completed)
Substations	Good Hope sub-station (17MVA) Expansion (completed)
	Columbia sub-station (17MVA) Expansion – (completed)
	Kingston Substation Expansion (completed) Sophia Substation Expansion (completed)
Distribution	Distribution upgrade
Distribution	
Non Tec Loss Reduction	Replace 5,000 defective meters
	Public Education & Social Management Programme
	Replace 1,500 tampered meters
	Upgrade 1000 AMR meters to AMI Meters
	Replace 7,000 minor meters with AMI meters
Electrification	Provision of electricity to 2,356 potential consumers
New Services	7,500 new services
Duilding	
Buildings	
Capacity Building	Office Equipment, motor vehicles, computer hardware & software
Information Technology	CIS Upgrade (complete)

7. OPERATING COSTS AND CAPITAL EXPENDITURES

7.1 Accounts Summaries

Table 7.1: Profit & Loss Account

INCOME STATEMENT											
	Yr 2015	Yr 2016	Yr 2017	Yr 2018	Yr 2019	Yr 2020					
	G\$'000	G\$'000	G\$'000	G\$'000	G\$'000	G\$'000					
OPERATING REVENUE											
Sales	32,244,568	33,139,049	35,135,182	37,259,300	39,520,113	41,926,962					
less Fuel Rebate	2,201,653	4,639,467	3,513,518	3,725,930	3,952,011	4,192,696					
Net Sales	30,042,915	28,499,582	31,621,664	33,533,370	35,568,102	37,734,265					
Grant Aid - EU	-	1,021,597	1,520,934	1,240,361	1,970,110						
GoG Subsidy	-										
Miscellaneous Income	817,311	833,657	850,331	867,337	884,684	902,378					
	30,860,226	30,354,837	33,992,929	35,641,068	38,422,896	38,636,643					
OPERATING COSTS											
Generation Expenses											
Fuel	12,634,891	10,856,593	11,695,784	12,285,675	12,923,523	13,803,161					
Operations & Maintenance contract	1,930,164	1,983,708	2,103,196	2,230,346	2,365,679	2,509,753					
Repairs & Maintenance	574,848	597,842	621,755	646,626	672,491	699,390					
Purchased Power	754,254	2,051,078	2,071,589	2,092,305	2,113,228	2,134,360					
Rental of Equipment	148,343	_,,	_,,	_,,	_,,	_,,					
	16,042,500	15,489,220	16,492,325	17,254,952	18,074,920	19,146,665					
	10,042,000	10,400,220	10,402,020	11,204,002	10,014,020	10,140,000					
GROSS INCOME	14,817,726	14,865,616	17,500,604	18,386,116	20,347,976	19,489,978					
Other Expenses											
Employment costs	3,699,276	3,847,247	4,001,137	4,161,182	4,327,629	4,500,735					
IDB Institutional strengthening Loan (OPEX)	3,033,270	630,000	848,400	856.884	1,289,257	4,000,700					
	000 444	,	,	/	, ,	604.000					
T&D Repairs and Maintenance	233,111	531,593	552,857	574,971	597,970	621,889					
Depreciation + Amortization	3,341,637	4,552,098	5,556,348	5,758,535	5,349,297	5,646,896					
Administration	1,664,050	1,774,987	1,845,986	1,919,826	1,996,619	2,076,484					
Rates & Taxes	41,167	42,000	43,680	45,427	47,244	49,134					
Bad debts	412,374	497,086	527,028	558,889	592,802	628,904					
Loss on Exchange	883										
PUC Assessment & Licence	50,000	51,000	51,000	51,000	51,000	51,000					
	9,442,497	11,926,010	13,426,436	13,926,715	14,251,818	13,575,042					
Total Operating Costs	25,484,997	27,415,231	29,918,761	31,181,667	32,326,738	32,721,706					
Operating Profit/(Loss)	5,375,229	2,939,606	4,074,168	4,459,401	6,096,158	5,914,937					
Finance Charges											
Interest	1,239,352	1,239,352	1,239,352	1,239,352	1,239,352	1,239,352					
Net profit before taxation	4,135,877	1,700,254	2,834,816	3,220,049	4,856,806	4,675,585					
Taxation	129,909	320,218	379,611	410,570	425,149	471,569					
Net profit/(loss) after taxation			2,455,205								
Net pronuctoss) after taxation	4,005,968	1,380,036	2,455,205	2,809,480	4,431,657	4,204,016					
Remeasurement of defined benefit											
Related Tax											
Net Comprehensive Loss	4,005,968	1,380,036	2,455,205	2,809,480	4,431,657	4,204,016					
Accumulated deficit b/f	(16,499,486)	(12,493,518)	(11,113,482)	(8,658,277)	(5,848,797)	(1,417,140					
ACCUMULATED DEFICIT C/F	(12,493,518)	(11,113,482)	(8,658,277)	(5,848,797)	(1,417,140)	2,786,876					

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In accordance with GPL's Licence the Shareholder is entitled to a target rate of return on equity of 8% per annum.

Table 7.2:	Cash Flow	Statement
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CASH FLOW											
	Yr 2015	Yr 2016	Yr 2017	Yr 2018	Yr 2019	Yr 2020					
	G\$'000	G\$'000	G\$'000	G\$'000	G\$'000	G\$'000					
Cash flows from operating activities											
Net comprehensive loss before taxation	4,135,877	1,700,254	2,834,816	3,220,049	4,856,806	4,675,585					
Adjustments for:											
Depreciation & Amortization	3,341,637	4,552,098	5,556,348	5,758,535	5,349,297	5,646,896					
Deferred Income											
Defined pension benefit liability											
Interest expense	1,239,352	1,239,352	1,239,352	1,239,352	1,239,352	1,239,352					
Amortisation of customer finance project	(612,983)	(625,243)	(637,748)	(650,503)	(663,513)	(676,783					
Gain on remeasurment of pension liability	-	(,,	()	(/	(/	(
	3,968,005	5,166,207	6,157,952	6,347,384	5,925,136	6,209,465					
Operating profit/(loss) before working capital change	8,103,883	6,866,461	8,992,768	9,567,433	10,781,942	10,885,050					
		0,000,101	0,002,100	0,001,100	10,101,012	10,000,000					
Working capital changes											
Receivables	(629,267)	(170,331)	(175,441)	(180,704)	(186,126)	(191,709					
Inventories	862,553	(178,793)	(187,733)	(197,120)	(206,976)	(217,324					
Payables	277,939	(108,102)	(225,854)	(225,313)	(224,766)	(224,212					
Related parties -Payables	(2,339,784)	-	-	-	-	-					
Related Parties - Receivable	3,989,829	28,975	-	-	-	-					
	2,161,270	(428,251)	(589,029)	(603,137)	(617,867)	(633,246					
Net cash outflow from operating activities	10,265,153	6,438,209	8,403,740	8,964,296	10,164,075	10,251,804					
Cash flow from investing activities											
-											
Purchase of fixed assets and Intangible assets	(1,429,178)	(8,033,637)	(15,113,796)	(9,341,419)	(4,443,315)	(3,816,600					
Investments - Capital	(3,105,000)										
Interest capitalised		-	-	-	-	-					
Increase in deposit	(2,852,393)	-	-	-	-	-					
Net cash outflow from investing activities	(7,386,572)	(8,033,637)	(15,113,796)	(9,341,419)	(4,443,315)	(3,816,600					
Cash flow from financing activities											
Non-current related parties	3,180,726	2,000,000	3,000,000	3,000,000	-	-					
Net movement in loans	-	-	-	-	-	-					
Taxes Paid	(39,995)	(418,797)	(379,611)	(410,570)	(425,149)	(471,569					
Conversion of Debt to Equity	-										
New Equity in the year	-	-	-	-	-	-					
Interest paid	-	(1,239,352)	(1,239,352)	(1,239,352)	(1,239,352)	(1,239,352					
Customer deposits	325,864	109,248	114,711	120,446	126,469	132,792					
Customer financed projects	4,941	89,888	95,899	101,309	106,178	110,560					
Net cash inflow from financing activities	3,471,536	540,988	1,591,647	1,571,834	(1,431,854)	(1,467,568					
Net increase in cash and cash equivalents	6,350,117	(1,054,440)	(5,118,410)	1,194,711	4,288,905	4,967,636					
Cash and cash equivalents - January 1	966,097	7,316,214	6,261,774	1,143,364	2,338,075	6,626,981					
Cash and cash equivalents - December 31	7,316,214	6,261,774	1,143,364	2,338,075	6,626,981	11,594,616					
Represented By:											
	7,316,214	6,261,774	1,143,364	2,338,075	6,626,980	11,594,616					
Cash on hand and at bank	7,310,214	0,201,774	1,140,004	2,000,010	0,020,000						
Cash on hand and at bank Bank overdraft	-	-	-	-	-	-					

8. PROJECTED CAPITAL EXPENDITURE

	Summary of Capital Expenditure (US\$)												
	Total		2016		2017		2018		2019		2020		
Generation	\$ 51,113,3	26 \$	6,955,191	\$	24,808,135	\$	19,350,000	\$	-	\$	-		
Transmission Lines	\$ 18,045,6	81 \$	935,034	\$	6,326,510	\$	1,874,314	\$	2,006,296	\$	6,903,527		
Substations	\$ 27,909,8	3 \$	2,333,072	\$	15,828,765	\$	5,901,634	\$	3,183,820	\$	662,582		
Compensation	\$ 2,069,70	0 \$	-	\$	-	\$	-	\$	2,069,700	\$	-		
Loss Reduction - Non Technical	\$ 34,803,4	12 \$	5,341,812	\$	8,487,500	\$	8,082,971	\$	8,048,478	\$	4,842,681		
Loss Reduction - Technical	\$ 35,055,0	27 \$	12,508,796	\$	10,889,044	\$	5,260,255	\$	3,428,440	\$	2,968,493		
New services	\$ 9,405,00	0 \$		\$	1,787,500	\$	1,925,000	\$	1,925,000	\$	2,062,500		
Buildings	\$ 5,691,67	8 \$		\$	2,037,280	\$	1,618,346	\$	-	\$	-		
Capacity building	\$ 4,192,55		· · · ·	\$	-	\$	-	\$	-	\$	-		
Electrification	\$ 1,956,51		, ,	\$	1,503,725	\$	-	\$	-	\$	-		
IT & GIS	\$ 892,00			\$	302,000	\$	30,000	\$	80,000	\$	200,000		
SCADA	\$	\$,	\$		\$		\$		\$			
Total	\$ 191,134,7			\$	71,970,459		44,042,520	\$	20,741,735		17,639,782		

Table 8.1: Summary of Capital Expenditure, US\$

Table 8.2: Summary of Capital Expenditure, G\$M

Guyana Dollar (\$000)	Total		2016		2017		2018		2019		2020
Generation	\$ 10,774,4	33	\$	1,460,590	\$ 5,209,708	\$	4,104,135	\$	-	\$	-
Transmission Lines	\$ 3,845,92	26	\$	196,357	\$ 1,328,567	\$	397,542	\$	429,791	\$	1,493,669
Substations	\$ 5,891,12	22	\$	489,945	\$ 3,324,041	\$	1,251,737	\$	682,041	\$	143,358
Compensation	\$ 443,3'	73	\$	_	\$ _	\$	-	\$	443,373	\$	-
Loss Reduction - Non Technical	\$ 7,390,48	35	\$	1,121,780	\$ 1,782,375	\$	1,714,398	\$	1,724,153	\$	1,047,778
Loss Reduction - Technical	\$ 7,405,9	53	\$	2,626,847	\$ 2,286,700	\$	1,115,700	\$	734,444	\$	642,273
New services	\$ 2,000,34	12	\$	358,050	\$ 375,375	\$	408,293	\$	412,375	\$	446,249
Buildings	\$ 1,198,65	51	\$	427,571	\$ 427,829	\$	343,251	\$	-	\$	-
Capacity building	\$ 880,4.	36	\$	880,436	\$ -	\$	-	\$	-	\$	-
Electrification	\$ 410,80	57	\$	95,085	\$ 315,782	\$	-	\$	-	\$	-
IT & GIS	\$ 188,99	03	\$	58,800	\$ 63,420	\$	6,363	\$	17,138	\$	43,273

Guyana Dollar (\$000)	Total	2016	2017	2018	2019	2020	
SCADA	\$-	\$-	\$-	\$-	\$-	\$ -	
Total	\$ 40,430,592	\$ 7,715,462	\$ 15,113,796	\$ 9,341,419	\$ 4,443,315	\$ 3,816,600	

9.1 <u>Sources of Funding</u>

Funding over the next five years will come primarily from internal resources and from IADB/EU (US\$64M) via the Public Utility Upgrade Project (PUUP). The table below summarizes the sources and amounts of funding.

Table 9.1: Summary and Sources of Funding US\$

Source of Funding (US\$)	Equity	EU	IADB	Total
Generation	\$51,113,326			\$51,113,326
Transmission Lines	\$18,045,681			\$18,045,681
Substations	\$27,909,873			\$27,909,873
Compensation	\$2,069,700			\$2,069,700
Loss Reduction - Non Technical	\$9,689,769	\$6,204,548	\$18,909,125	\$34,803,442
Loss Reduction - Technical	\$11,469,576	\$13,020,452	\$10,565,000	\$35,055,027
New services	\$9,405,000			\$9,405,000
Buildings	\$5,691,678			\$5,691,678
Capacity building	\$4,192,554			\$4,192,554
Electrification	\$1,956,510			\$1,956,510
IT& GIS	\$892,000			\$892,000
Total	\$ 142,435,666	\$ 19,225,000	\$ 29,474,125	\$ 191,134,791
Percentage of overall expenditure	75%	10%	15%	

All new debt will be via concessional financing.

10. HUMAN RESOURCES

Development and maintenance of the requisite core of skills to manage the evolving electricity infrastructure that is based increasingly on automation and ICT systems would be critical for GPL. The continued heavy loss of skills is a severe challenge for the best of plans as new professionals depart after gaining some practical experience. The Company would maintain the Management Trainee programme on an ongoing basis to mitigate the loss of skills at the professional level. This initiative coupled with the engagement of specialists on short term Contracts to mentor professional staff should deliver the results for GPL.

While GPL's remuneration to professional level staff is competitive and has attracted persons from both the public and private sectors, the loss of skills to the Caribbean and North America continues. While every effort will be made to attract and retain the best and the brightest, GPL recognizes that it cannot compete with the attraction of overseas employment. The Company would continue to invest adequate resources to ensure that training is ongoing, timely, relevant and targeted to meet the direct needs of the company.

At the technician level, GPL would continue to invest in the apprenticeship programme and specialized 6-month and one year intensive programmes to provide the requisite number and level of skills. GPL has also been benefiting from national training being done through the Ministry of Labour, targeting unemployed youths and the efforts of various contractors.

In the non-technical areas GPL will continue to provide opportunities for Accountants by maintaining the trainee Accountant programme. The skill pool in the country involving basic computer and accounting skills is very large and GPL would not need to intervene in any way.

An IADB funded Corporate Development Plan for GPL was developed by Power Planning Associates (a UK consultant firm) in 2013. This plan informed Components I and II of the PUUP, which is largely targeting management strengthening and capacity building. GPL expects to realize improved skill sets amongst its Human Resources that are aligned with the corporate direction. GPL will continue to closely monitor and review critical skillsets in this regard.

11. IMPACT OF PROGRAMME ON NATURAL & SOCIAL ENVIRONMENT

All new generating assets at Vreed-en-Hoop, Anna Regina, Leguan and Wakenaam would be in strict compliance with the Environmental Protection Act while older assets at Garden-of-Eden, Versailles and Onverwagt are to be retired or relegated to occasional use. GPL expects a net reduction in emissions from the use of modern generators and the retirement of old, inefficient generators.

More importantly, the use intended use of renewable resources would have a net positive environmental impact. EPA approval will be pursued for the generation investments, which will be based on current technology for the largest units.

With respect to the social environment, GPL expects that the ready access to a legitimate supply of power for current un-served areas, the significant investments in generation and networks to improve power quality, customer service and the recent 20% net reduction in tariffs would impact positively on the social environment.

GPL is however conscious that the removal of illegal services, prosecuting persons caught stealing electricity and taking prompt steps to collect revenues would have some social consequences. These measures are likely to generate some negative social impact, especially by the perpetrators of illegal activities. To address this, the social management plan, with its three-pronged approach (before, during and after) is expected to yield better results.

12. <u>RISK AND MITIGATION</u>

12.1 Loss Reduction

This D&E Programme is targeting sustainable loss reduction, which remains a challenge to GPL. Whilst the company embraces the investments financed by the joint IADB and EU, it remains cognizant and concerned of the culture of a section of the population who persist in the illegal practice of electricity theft.

External resources, which to date continue to be the main source of funding are largely guaranteed and would finance the bulk of activities and therefore there is little risk, from this perspective, that progress would be frustrated. Where initiatives are financed by internal cash-flows, these are at risk of high fuel prices and to a lesser extent the Company not realizing its loss reduction forecasts despite implementing the various initiatives.

The sharp decline in fuel prices on the world market has positively impacted the company's financial position with respect to its funding of its capital programme to some extent. However, GPL still has to contend with the volatility of fossil fuel prices for most of this Programme. No one can forecast the price of fossil fuel with high accuracy but the reality that internal cash resources would be utilized only minimally reduces the risk to overall success.

Improved customer service and power supplies, more dialogue and diligent public relations initiatives targeting all Consumers are expected to positively impact a culture change where electricity theft is concerned.

12.2 Fuel Prices

The volatility of fuel prices on the world market remains an ever present risk and one that has very limited mitigating opportunities. With limited storage, GPL cannot take advantage of

price drops. However, given the less volatile fuel price projections from reputable organizations, such as the US Energy Information Administration (EIA) into 2017, GPL intends to explore the possibility of consummating a Forward Contract with the fuel supplier.

Co-generation from GuySuCo would assist, albeit minimally, to mitigate the high fuel prices in the short term. The potential use of energy from other renewable sources (wind and solar), although not significant, would positively impact fuel costs.

With the delay / suspension of the Amalia Fall Hydro Power project, GPL would continue to rely on the more efficient HFO fired equipment equipment to meet in execss 90% of the Company's generation.

13. CONTINGENCY

13.1 Financial Contingency

It's a reality that should GPL's cash flow become insufficient and the necessary concessional loans to be contracted through the Government are unavailable during the life of this programme, then GPL would have no option but to adjust its development plans accordingly.

Although no assurances have been given that loan resources to GPL would continue to be available, the company remains optimistic of the Government's interest in the execution of this five year plan.

Provision has been made in the financial projections for some capacity to absorb increased operating costs, particularly from fuel, without derailing the capital programme.

13.1 <u>Hydro Delay</u>

GPL would have to continue to rely on base load HFO capacity to satisfy demand in the absence of hydro.

Presently, there is no effective way to mitigate against not having a 165MW base load renewable source, other than the use of HFO fossil fired generation.

The intermittent supply of electricity from wind and solar will require the stability of fossil fired generation to satisfy the demand, but the use of these sources of renewable energy should realize savings and contribute to a reduction in emissions.

13.2 Generation, Transmission & Distribution

Sixty-seven (67%) of the funding for these components of this programme is to be provided through internal resources. All the investments in new generation, transmission lines and sub-stations would be financed through internal cash flows.

It must be noted that the dependency on internal resources exposes the financing to the risks of higher than budgeted fuel prices and slower than expected loss reduction progress.