

GUYANA POWER & LIGHT INC.

DEVELOPMENT AND EXPANSION PROGRAMME 2013 - 2017

March 2013

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Executive Summary

With the expected completion of the US\$42M Infrastructure Development Project, a new US\$32M 26MW HFO fired power plant at Vreed-en-Hoop and the US\$9.4M frequency standardization project in Georgetown by Q4 of 2013, GPL's major focus over the last four years of this Development and Expansion Programme would be loss reduction.

Loss Reduction

While over US\$10M has been expended on non-technical loss reduction since 2006 resulting in these losses reducing by over 9%, the pace of progress over the last two years has slowed considerably, suggesting new approaches need to be employed. The IADB is financing over four years (2012-2015), a US\$5M loss reduction project with most of the resources (US\$3.6M) directed at technical losses. It is expected that this project will result in a methodology being established to approach overall loss reduction in a comprehensive, disciplined manner. It would see the introduction of network and metering infrastructure designs that addresses overall losses in a coordinated manner. GPL would, for the first time, be using "fraud proof" networks and Automatic Metering Infrastructure in this coordinated approach.

GPL expects in this Development Plan to utilize the coordinated approach to loss reduction which starts with a network design that reflects the level of risk associated with electricity theft for the area. With the secure network in place, built to current construction standards to address technical losses, an appropriate metering infrastructure would be employed to address non-technical losses. The metering infrastructure will employ technology primarily for its security and reduce dramatically the need for constant raids.

With technology and smart designs driving the coordinated loss reduction effort, GPL is confident that sustained loss reduction will be achieved as it would be able to effectively counter the culture of electricity theft.

Major investments, sustained focus and a coordinated and disciplined approach to reduce overall losses would allow the Company to achieve sustained loss reduction resulting in:

1. Improved service reliability and quality as networks upgraded to current standards (adequately sized transformers and conductors, better load balancing, vegetation mitigation measures particularly use of insulated conductors and improved connections) will experience fewer faults and have improved voltage regulation.
2. Reduced generation needs resulting in reduced operating cost and capital expenditure on new equipment.
3. GPL being better positioned to cushion the impact of volatile fossil fuel prices without a resort to increased tariffs. Stable tariffs would be a catalyst for growth, in preparation for hydro.
4. GPL being able to offer tariffs which are not heavily burdened by overall losses when hydropower is commercially available, sustaining growth.
5. Improved customer service as electricity theft is the source of numerous customer complaints to the PUC. The inability to steal electricity easily should reduce the prevalence of this problem and reduce the number of complaints arising out of associated retrospective billing.
6. GPL's overall financial position improving, to allow it to meet its financial obligation under the hydro PPA and make capital investments on a timely basis. In 2013, reduction in losses

resulting in 1% reduced generation would save the Company \$271M while reduction in losses resulting in a 1% increase in sales would realize \$317M.

Efficiency and Customer Service Improvements

During the life of this Development & Expansion Programme, as we witness the completion of major infrastructure projects to improve power generation and delivery across all service areas, as never before, and undertake unprecedented investments in loss reduction using international expertise, we will also focus on using specialized applications and ICT investments to:

1. Improve non-technical operations particularly in Procurement, Inventory, Fixed Assets, Human Resources and Payroll management.
2. Establish a high speed intranet to service operations in Demerara and Berbice using the fiber optic cable installed under the IDP as the backbone.
3. Reduce incrementally the reliance on paper by using an Electronic Document Management System.
4. Implement GIS for all company assets, particularly T&D and metering infrastructure.
5. Manage T&D and generation maintenance planning and execution in a comprehensive way.
6. Improve customer service by establishing on-line access to a range of services.

Strategic Plan

The Company's Strategic Plan, which is premised on the seven areas of focus listed below, continue to inform the key performance indicators and this Development Programme.

- 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 are included which are intended to ensure that annual targets, covering appropriate areas of the Company's operations over the next five years realize the strategic objectives, Customer Service Standards (CSS) and Operating Standards and Performance Targets (OS&PT) consistently.

Demand Side Management

While most of the development focus is on addressing the infrastructural requirements to improve service quality, reducing losses and operating cost, the continued pursuit of Demand Side Management (DSM), including Energy Efficiency [EE], cannot be overstated as it can postpone or reduce the level of investment needed in both generation and T&D and also allow Consumers to

reduce their power consumption without affecting their quality of life by equipping them with the knowledge to use power more effectively and efficiently.

Making energy efficient appliances affordable and accessible to the average customer is a challenge and this Programme details an approach that can make this possible. The Demand Side Management (DSM) plan is an annual one in this Programme and limited in scope. It should be recognized that the Guyana Energy Agency has been tasked with leading the national DSM (and EE initiatives) and would benefit from grant resources available to the country for appropriate activities. GPL would largely confine its activities therefore to public education.

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. Funding from debt in this Development & Expansion Programme is via loans to GPL from Government with resources coming from the China Exim Bank, PetroCaribe and the IADB on highly concessional terms.

Completion by Q4, 2013 of the transmission, substation and control sub-projects will result in the provision of feeders to complete the Georgetown frequency standardization, the interconnection of Demerara and Berbice and the installation of substations to off-load feeders operating above 80% of their thermal capacity in Demerara and Berbice (Serving the East Bank, East Coast and Corentyne Coast). In December 2013, the integration of the West Demerara in the East Demerara transmission system and the commissioning of the substations at Vreed - en-Hoop and Edinburg have allowed four new feeders to be deployed on the West Coast. This has dramatically improved the quality and reliability of service.

The strategic transmission plan seeks the interconnection of all the load centers in Demerara and Berbice and the installation of substations (where this is economically feasible). The generation plan seeks to achieve GPL's strategic objective of ensuring that production in Demerara and Berbice from renewable and efficient HFO sources are optimized.

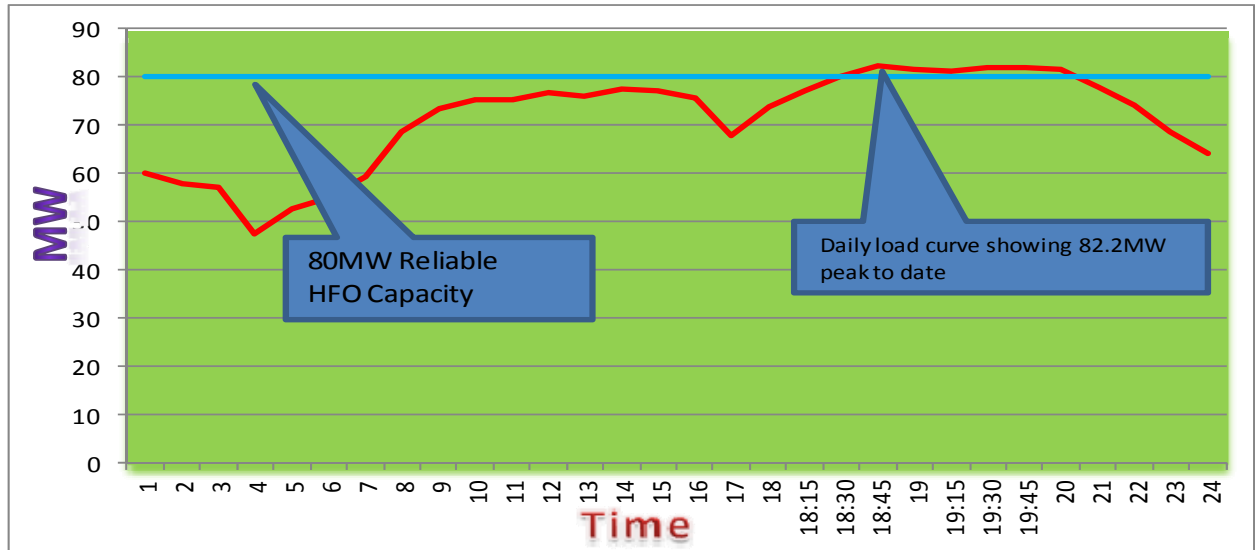
The Programme projects investment of US\$90.14M over the five years (it should be noted that US\$46M would have been disbursed on the transmission, substation and generation sub-projects by December 2012 making the overall investment US\$136.14M) with financing mainly from undistributed dividends, retained earnings and debt. US\$57.8M is being financed from undistributed dividends and retained earnings while US\$25.2M is being financed by debt on concessional terms. The investments are as follows:

- 1) US\$17M in generation to:
 - Construct a new 26MW HFO fired Wartsila plant at Vreed-en-Hoop (US\$26.5M already paid up in 2012 under EPC Contract).
 - Convert the 22MW Wartsila Kingston 1 plant to 60Hz.
 - Expand the capacity at Anna Regina by adding a 3MW HFO unit.
 - Install a 2MW HFO unit at Bartica in a new plant at a suitable location particularly to address the issues of operating cost, noise nuisance and flooding.

- Install two new 600kVA gensets in Leguan and one similar set in Wakenaam to position GPL to commence a 24-hour service in late 2014.

It is projected that generation from renewable or HFO sources will increase to 85% in 2013 from 83% in 2012. Production from HFO fired capacity cost approximately 62% less than from diesel fired Units. The increase in HFO fired capacity and ultimately an almost complete reliance on renewable sources of power is the company's strategic generation plan for this Programme, in an environment of volatile fossil fuel prices.

Peak Daily Load Curve in Demerara compared with reliable capacity



2) US\$3.3M in transmission lines (recognizing that almost US\$13M has already been disbursed for almost 96Km of 69Kv lines) to integrate all the load centers in Demerara and Berbice and reinforce one existing transmission interconnection between Kingston and Sophia. This would allow:

- Bulk power to be wheeled efficiently.
- An optimum merit order system for generation to be employed.
- Reserve capacity to be consolidated (reduced by 10MW).
- Closure of small, dispersed diesel fired generating capacity.
- Reinforcing of the interconnection between Sophia and the Kingston substation to reduce losses when hydropower becomes available.
- Installation of substations strategically, to provide distribution outlets to off-load feeders and provide MV network capacity for growth.

3) US\$14.91M in substations (US\$16M would have been disbursed already to the end of 2012 making the total investment US\$30.91M) to provide 30 outlets at eight (8) new locations through 69/13.8KV substations. This would:

- Result in the length and load on circuits on the West Coast, East Bank, East Coast, West Berbice and the central Corentyne being reduced by up to 67%.
- Provide automatic means of regulating primary distribution voltage.

- Improve the quality of supply by reducing the frequency of outages resulting from feeder trips, planned maintenance outages and improve dispatch management by allowing access to more than one supply source.
- 4) US\$9.8M will be expended on non-technical loss reduction over the next five years with these losses expected to reduce by 6% from the 2012 level of 17%. This includes;
- Installation of 25,000 pre-paid meters to replace post-paid meters, using the split meter technology.
 - Replacement of 29,000 defective and obsolete (A Base) post-paid meters.
 - Installation of 4,000 AMI meters for large customers, bulk metering applications and in specific areas under the IADB US\$5M Loss Reduction Project.
 - Continued use of ITRON meters with an additional 1,000 installations to complete metering upgrade for the 3,000 largest consumers.
 - Use of co-axial service lines in particular high-risk areas.
- 5) US\$29.3M will be spent on technical loss reduction activities targeting distribution upgrades. This would include replacement of old inefficient transformers, MV and LV conductor upgrade, upgrade of connections, load balancing and fraud proofing of networks in particular areas. Technical losses are forecasted to reduce by 2.2% but this should be viewed against continued demand growth and an increase in transmission losses. It should be noted that US\$950,000 will be spent on compensation and that this amount is not included in the US\$29.3M. The compensation, in the form of automatic capacitor banks, would be installed at various sub-stations to cater for an N-1 condition (embraced as the minimum planning criteria) when hydropower is available. The particular sub-stations targeted for compensation were identified in a study conducted by SIEMENS PTI. This investment will help to:
- i) Improve voltage regulation and overall power quality.
 - ii) Reduce frequency and volume of faults.
 - iii) Improve network design to reduce access to establish illegal connections.
- 6) US\$3.62M will be spent to connect 21,280 new consumers. This growth in new services recognizes the continued healthy growth in housing development and the popularity of pre-paid meters. The forecast caters for a new rural electrification programme to serve 4,000 consumers between 2013 and 2014.
- (i) US\$2.026M is projected to be spent on the electrification programme in two phases between 2013 and 2014, as mentioned above. Many recently served housing schemes are expanding with parts of streets being added and requests being made for electricity. Invariably these house owners can't afford the full cost of electricity infrastructure and request Government's assistance.
- (ii) US\$4.29M will be spent on capacity building. This will:
- i) Allow GPL to use the fiber optic network being constructed under the IDP as the backbone for a high speed company intranet. Provision is made to interconnect offices in Berbice and Demerara with fiber to the backbone system.

- ii) Leverage the high speed intranet to implement modern and reputable enterprise-wide software applications to assist in the following:
 - a. Document Management.
 - b. Planned maintenance management.

These applications would help to reduce paper transactions by up to 40% by the end of this Programme and improve maintenance planning dramatically.

- iii) Install additional modules for the Oracle Financial computerized system, specifically:
 - a. Procurement (Over G\$26B in purchases are made annually)
 - b. Inventory (\$3.5B in was held in inventory at the end of 2012),
 - c. Fixed Assets (Fixed Assets had a net book value of G\$20B in 2011)
 - d. HR & payroll management (Over G\$2.7B is expended annually on employment)
- iv) Provide tools and equipment to T&D to improve their capability and productivity, particularly to eventually undertake live-line maintenance up to 13.8Kv.
- v) Allow for a more comprehensive response to emergencies.

(iii) US\$2.854M will be spent on buildings in Demerara, Berbice and Essequibo to:

- vi) Provide accommodation to reduce the dependence on rented facilities.
- vii) To improve working conditions for staff and improve customer service facilities.
- viii) Improve the image of the company.

(iv) US\$1.2M will be spent on a Geographic Information System to:

1. Implement appropriate software and undertake compilation of a comprehensive database in GIS format of the T&D infrastructure, consumers and metering infrastructure, GPL properties otherwise. This would assist in management of T&D assets, system planning and customer service functions and disaster response.

7. Customer Service

While the activities mentioned above are critical for GPL's financial viability this Programme also focuses critically on:

Customer Service - The new Customer Service Standards (CSS) which took effect from January 2011 have been revised with the experience gained over the last two years and the expected infrastructure and other developments over the next two years. The revised standards have been improved in some instances by increments but experience has shown that dramatic improvements would not be possible as an appropriate Company culture would have to be developed.

In addition to the CSS, which form Schedule 2 to GPL's Licence, the Operating Standards and Performance Targets (OS&PT) for the life of this Programme, which is included in this D&E, are also expected to evolve over time.

The mechanisms implemented by GPL to meet the CSS and the OS&PT continue to be periodically reviewed and modified, so as to ensure that internal processes are adequate to consistently meet these Standards and Targets and to track performance routinely. While GPL's network has been expanded by over 40% over the past six years and continues to expand, the number of Commercial Offices has not changed since 1997 (when the Leguan office was opened); making ready access to GPL services a problem.

The Company therefore proposes over the next five years to:

- Open new Commercial Offices to serve consumers on the West Coast, East Bank and East Coast of Demerara.
- Vastly increase the number of payment centers available and expand the modes of electronic payments to make financial transactions with GPL hassle free.
- Fostering a relationship between Consumer Representatives and the Private Sector to ensure energy efficient appliances are more available, affordable and accessible.
- Expanding the initiatives to foster behavioral change to impact DSM through debating competitions.
- Improving communication with customers, introducing Social Management Plans as an integral part of any major service improvement and loss mitigation project and expanding customer care training for Staff and Contractor's personnel.
- Achieving full ISO 9001 – 2008 certification in 2013.

8. Market Development – There is no doubt that market development is critical when one considers that GPL has committed to 140MW from the Amaila Falls Hydro project. The demand forecast of almost 1,027 GWh for 2017 assumes that 134 GWh will come from current off-grid demand (50% of forecasted off-grid demand that would access GPL service). The forecasted growth of almost 21.7% for 2017 from 2016 seems optimistic but GPL expects that the projected reductions in tariff in 2017 (and rebalancing) coupled with supply reliability will serve as growth catalysts. It should be noted that GPL will have to agree fixed annual payments for the guaranteed 140MW from Amaila, which implies that the lowest tariff will be derived if all the energy is used.

The Programme, as mentioned before, projects expenditure of US\$90.14M over the next five years. Major sources of financing will include 64% from undistributed dividends and retained earnings and 28% from debt. The Programme is heavily front-loaded, for obvious reasons, with almost 76% of the expenditure occurring within the first three years.

US\$60.6 M will be spent on loss reduction with a total reduction in losses of 8.2% projected over the next five years. This level of projected loss reduction is based on the returns over the last three years of implementing various loss reduction initiatives and the projected returns from new initiatives. Non-technical losses are projected to reduce from 17% at the end of 2012 to 11% at the end of 2017 while technical losses are projected to reduce from 14.7% at the end of 2012 to 12.5% at the end of 2017. The non-technical loss reduction plan includes all activities which have yielded results to date and new initiatives based on field intelligence and available mature technology.

Overall supply quality including voltage and frequency regulation, SAIFI and SAIDI would see significant improvements by Q4, 2013 when the transmission and substation facilities are completed and maintenance activities are optimized. The West Coast of Demerara did benefit in December 2012 when the priority facilities were completed. The improvements can be seen in the SAIFI and SAIDI projections.

1. METHODOLOGY TO PLAN

The Guyana Power and Light Inc. (GPL) current five-year Development and Expansion Programme (2013 – 2017 D&E Programme) and Annual Programme (2013) 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 (see pages 28-29, 33, 35-37,39-40, 45-46);
- (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 (see pages 28-29);
- (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 (see pages 30 - 38) ;
- (d) the operating costs and capital expenditures of the programmes (see pages 48 - 51);
- (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 (see page 51);
- (f) the debt to equity ratio tolerances to be maintained by the public supplier in implementing the programmes (see page 51);
- (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 (see page 54);
- (i) the extent to which the programmes facilitate the use of alternative forms of electricity generation using renewable resources and commercial feasibility thereof. (see page 34);
- (j) any other aspects of the programmes which the Minister may direct; and
- (k) planned acquisition of new generating capacity; (See Pages 33-34)
- (l) loss reduction strategies; (See Pages 41-42)
- (m) plans to regain industrial customers; (See Page 43)
- (n) plans for providing electricity for development and redevelopment projects in urban areas; (See Page 44)
- (o) cost-benefit analysis for each investment project; (See Pages 56-57) 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; (See Pages 35-37 & 40)
 - b. a programme for the promotion of technical efficiency and economy in its supply of electricity and in the consumption of electricity by consumers; (See Pages 42, 52-53) 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)

1.1 Review of 2012 Achievement

	2012	2012
2012 Achievements	Generation	Versailles 6MW HFO Plant Frequency conversion - 22MW Wartsila Kingston 1 Plant 2 x 600kW Genset - Leguan 600Kw Genset - Wakenaam
	Transmission Lines	Transmission Line between Versailles and Edinburg Substations Transmission Line between Versailles and Kingston Substations, inclusive of submarine cable Transmission Line between New Georgetown and New Sophia Transmission Line between New Sophia and Onverwagt
	Substations	Vreed-en-Hoop Substation Edinburgh Substation Diamond Substation, including tie - lines 1 And 2 (69kV) New Georgetown Substation New Sophia Substation Extended Sophia Substation Good Hope Mahaicony (Columbia) Substation Onverwagt Kingston Substation Garden-of-Eden (metering, SCADA interconnection, etc.) SCADA Extension & upgrade of No.53 Substation New Williamsburg Substation
	Distribution	Georgetown Frequency Conversion LV network upgrade (Fraud proofing included) Distribution automation
	DSM - Demand Side Management	energy efficiency Initiative
	Non Tec Loss Reduction	Replace 6,000 meters with pre-paid meters Coaxial cable use (Service Drops)
	New Services	6,900 new services
	Buildings	Complete new T&D building - Sophia
	Capacity Building	Acquire T&D Equipment & Tools

Generation:

1. The used 6MW HFO fired plant planned for Versailles was replaced by a new 26MW HFO fired plant at Vreed-en-Hoop. By the March 2013 ten test piles for the foundations had been driven. GPL has to do static and dynamic load testing of two 72' test piles to validate the foundation design and confirm whether shorter piles (65') can be used for non-critical foundations.
2. The main shipment of equipment for the frequency conversion of the Kingston 1 Plant arrived in late December 2012 with actual works starting on February 15th 2013 and expected to be completed by July 2013.
3. Financial difficulties again prevented the additional gensets from being procured for Leguan and Wakenaam. GPL will tender for these units in 2014.

Transmission lines & Substations:

Progress on the various transmission line sub-projects is as follows:

1. Transmission line between Vreed-en-Hoop and Edingburg – Completed in December, 2012.
2. Transmission line between Kingston and Vreed-en-Hoop – Completed in December 2012.
3. Transmission lines between new Georgetown and new Sophia and new Sophia and Onverwagt – Conductor stringing on the Sophia to New Georgetown substation tie line is 74% complete while pole planting has just started on the Sophia to Good Hope section of the Sophia to Onverwagt transmission line.

Progress on the substation sub-projects are as follows:

1. The Extension of the Kingston substation and the new Vreed-en-Hoop and Edingburg substations have been completed and placed in service in December 2012.
2. Foundation works are 8% complete at New Georgetown and Golden Grove.
3. Assembly work is well advanced at New Sophia (59% complete) and Good Hope (33% complete).
4. The Contractor is expected to deploy shortly to Columbia to commence foundation works.
5. Works on both the Williamsburg and No. 53 substations were deferred to 2014 due to cash constraints in 2012 and 2013 (High fuel prices).

Distribution:

1. The Phase 11 frequency conversion of the Georgetown 50Hz network has commenced with Bel Air Park completed and preparatory work in Kingston progressing.
2. Work to upgrade the network in Cummings Park is about 70% complete.
3. Cash flow problems have prevented the ordering of the remote operated re-closers in 2012.

Demand Side Management (DSM):

1. GPL continued its public education campaign through interaction with consumers at GuyExpo, Essequibo and Berbice Nights, various jobs fairs and career days.

Non-Technical Loss Reduction:

2. GPL replace 5,060 post-paid electro-mechanical and electronic meters with pre-paid meters by the end of the year. Pre-paid meters are replacing post-paid meters in instances where the consumer has volunteered or where there has been meter tampering or Change of Tenancy (COT). GPL has not used the amendment in ESRA, Regulation 14, Paragraph 4 a (1) to enforce the pre-paid meter on post-paid customers as Legal advice suggests that despite the provision in Law, any arbitrary change in the supply Contract could attract a Constitutional challenge.
3. The pilot project in Cummings Park is expected to be completed by Q2, 2013. Coaxial cables would be bought from IADB funds in 2013.

New Services:

1. By the end of 2012 GPL established 8,296 new services.

Buildings:

2. Work on the new T&D building at Sophia was progressed further with the ground floor being approximately 30% complete.

Capacity building:

The following T&D tools and equipment have arrived and are in service:

1. The four bucket trucks that were purchased in 2011 actually arrived in 2012 and have been deployed.
2. Hydraulic, telescopic tree trimmers which can be operated from the buckets of the trucks mentioned above.
3. Resistographs for pole testing. This would allow a more accurate assessment of poles.
4. Infrared cameras to allow early detection of transformers, switches and connections in distress.

Overall losses actually rose by 0.6% for 2012 over the previous year. Generation increased by 5.63% in 2012 over 2011. According to the 2012 management accounts, fuel expenditure was G\$24.2B (P&L), at a weighted average cost (CIF) of US\$108.32 per bbl and loss after tax of G\$2.8B. G\$6B in fuel subvention is being provided by Government to avoid GPL implementing the 28.91% tariff increase allowed by its Final Return Certificate.

STRATEGIC PLAN 2013 – 17

The strategic business objectives of the company have been disaggregated into Key Performance Indicators (KPI) with annual targets to form the five-year strategic plan, as detailed below. The current D&E Programme is premised on this 2013 – 17 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 2012, GPL had 166,878 customers, 803 permanent, 153 temporary and 151 contracted employees and revenue of US\$144M of which 83% was applied to fuel.

Present Electricity Supply	Medium Term Electricity Supply
<p>Mainly thermal:</p> <ul style="list-style-type: none"> • Installed Capacity: 156.9 MW : 105.3MW Heavy Fuel Oil (includes 10 MW of IPP); 51.6MW diesel • Total Availability : 125.7 MW: 97.9 MW (HFO) owned (27.8 MW is either over 30 years old or high speed Units); • Total Peak Demand: 104.8 MW • Self Generation: Estimated at 42MW • Fuel Mix: 83% HFO; 17% diesel in 2012 	<p>Proposed Renewable energy projects</p> <ol style="list-style-type: none"> 1. Hydro (starting 2017)—165 MW 2. Bagasse (extended use of co-generation)—10 MW <p>Key Challenges:</p> <p>High customer tariffs due to:</p> <ol style="list-style-type: none"> 1. Total dependence on fossil fuel, high and volatile fuel prices. 2. High losses – technical & commercial losses of 31.7 %.

GPL has a balance sheet US\$188M in net assets. In 2012, 83% of GPL’s generation came from HFO fired equipment (production from HFO being 62% cheaper than diesel). With a 165 MW hydropower project achieving commercial operation in January 2017, GPL will need fossil fuel for only 7.8% of its electricity supply. As a state-owned entity, GPL’s key objective is to deliver reliable electricity at the lowest sustainable price and without requiring Government 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 is the largest non-fuel expenditure. Debt is being financed by low interest Government loans, with the resources coming from the China Exim Bank, IADB and PetroCaribe resources.

SWOT Analysis

Strengths	Weaknesses
<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. High level of technical and commercial losses currently at 31.7%; 2. Limited pool and sustained of skills pose a problem to improving efficiencies; 3. Financing limited only to concessional sources and internal resources.

Opportunities	Threats
<ul style="list-style-type: none"> a. Hydro financial close should occur by Q2-2013 with construction starting shortly after. Completion of hydro by Q4 2016 will lower electricity cost and attract self-generators to the grid; b. Expanded and strengthened grid will reduce losses, operating costs and improve reliability; c. Capital program largely fully funded from concessional resources; d. ISO 9001 can improve the quality of CS. e. Connection of 21,280 new customers by 2017 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. 	<ul style="list-style-type: none"> • Risk of rise in fuel prices can adversely impact costs and tariffs before 2017; • 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. • Changes in global weather patterns could result in severe water shortages for the hydro.

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.

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

See strategies and targets for each below.

Strategic Objectives (in black), Strategies and associated Targets

a. Optimize Revenue:		2013	2014	2015	2016	2017
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)	497.7	543.5	576.4	627.97	771.3
	(ii) Regularize customers with bypass or tampering (GWh)	2.0	1.80	1.0	0.8	0.8
	(iii) Replace defective meters and bill accordingly (GWh)	2.0	2.2	2.2	2.2	2.3
3.	Optimize growth:					
	(i) Expand customer base (# of new customers added in yr.)	4,800	4,200	4,200	4,040	4,040
	(ii) Increase uptake in recently served areas (No. of new connections)	2,100	3,000	1,800	1,600	1,000
	(iii) Net growth (MWH) (Combination of natural growth and loss reduction)	36,675	30,084	30,068	57,952	182,100
	(iv) New Consumers (MWh)	2,592	2,468	2,268	2,182	2,182
4.	Expand overall revenue by optimizing price, volume and tariff mix (US\$ M)	153.4	166.99	175.4	186.76	191.86
	(i) Annual increase/(decrease) in volume (US\$M, over previous year)	11	39	11	14	(35)
	Mix of customers					
	(ii) Residential	6	15	4	7	-14
	(iii) Commercial	3	8	2	3	-7
	(iv) Industrial	2	16	5	4	-14
5.	i) Maximize collection of arrears from past customers – Number of Accounts.	2400	2300	2100	1800	1600
	ii) Pursue Inactive Customers – Number of demand letters.	1200	1150	1050	900	800
	(iii) Maximize legal action and enforcement – Number of cases filed in Commercial Court.	360	480	580	560	580
6.	Ensure strong disincentives to Electricity Theft					
	(i) Prosecute consumers found tampering/Bypass (%)	80	85	85	85	85
	(ii) Prosecute individuals with illegal connections (%)	100	100	100	100	100
7.	(I) Maximize number of prepaid meters installed in place of Post-paid ones.	5,000	6,000	6,000	6,000	6,000

b. Minimize costs of operations		2013	2014	2015	2016	2017
1.	Employment Numbers (number at end of year)	1,261	1,261	1,261	1,261	1,257
2.	Control Employment Costs (annual US\$ K)	12,700	12,142	12,353	12,482	12,236
	i) Basic Pay	8,001	7,649	7,782	7,863	7,708
	ii) Overtime	1,270	1,214	1,235	1,248	1,224
	iii) Allowances	2,159	2,064	2,100	2,122	2,080
	iv) Employers Contribution	762	728	741	749	734
	v) Others	508	486	494	499	489
3.	Reduce total technical and commercial losses (%)	29.7	27.3	25.6	24.22	23.5

	i) Reduce technical losses (total % remaining at end of period)	13.8	13.2	12.7	12.35	13.5
	ii) Reduce commercial losses (total % remaining at end of period)	15.9	14.1	12.9	11.87	11
4.	Control Generation Costs (US \$K)	126,910	142,995	162,250	163,910	149,233
	(i) Maximum use of cheaper sources of generation (HFO/ LFO /Co-gen/Hydro mix)	90:5:5:0	93:2:5:0	94:2:4:0	94:2:4:0	6:2:3:89
	ii) Maximum availability of engine relative to weighted capacity	75%	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)	0.6	0.6	0.6	0.6	0.6
	vi) Fuel Efficiency (BTU/kWh)	8500	8500	8500	8500	8500
	(vii) Optimize dispatched Power	Merit order system	Merit order system	Merit order system	Merit order system	Merit order system
5.	i) Ensure fuel is procured at the lowest cost at all times	Ensure the contractual terms with Staatsolie are met	Ensure the contractual terms with Staatsolie are met	Ensure the contractual terms with Staatsolie are met	Ensure the contractual terms with Staatsolie are met	Ensure the contractual terms with Staatsolie are met
6.	(i) Ensure overhauls are done on schedule, reduce emergency procurement of spares, reduce downtime, maximize availability, minimize maintenance costs.	Meet Generation SAIFI & SAIDI	Meet Generation SAIFI & SAIDI	Meet Generation SAIFI & SAIDI	Meet Generation SAIFI & SAIDI	Meet Generation SAIFI & SAIDI
7.	Optimize other controllable Costs (US\$K)	10,270	9,887	9,452	9,522	9,594
	i) Transmission & Distribution	2,540	2,155	2,177	2,243	2,311
	ii) Administrative	7,730	7,732	7,275	7,279	7,283

c. Improve Customer Service (CS)	2013	2014	2015	2016	2017
i) Meet Customer Service Standards & OS&PT.					
ii) Implement ISO 9001: 2000 Quality System	Full certification	Maintain certification	Maintain Certification	Maintain Certification	Maintain Certification
iii) Customer Satisfaction: Improve Image of GPL as first class utility via improving Customer Service, increase efficiency, and optimize tariffs.	65%	70%	75%	75%	80%
iv) % of calls answered at Call Center	95%	95%	95%	95%	95%
v) Increase collection outlets	5	5	5	5	5

d. Achieve Sustainable Financial Position	2013	2014	2015	2016	2017
i) Ensure that 99.5% of billed sales is collected.					
ii) Ensure that GPL is creditworthy to attract private investment in a US\$840M, 165 MW hydroelectric project without Government guarantees.					
iii) Complete audited accounts and hold Annual Shareholders Meeting within 6 months of year's end.					
iv) Manage GPL finances to justify concessional financing.	Ensure compliance with conditionalities.				

e. Enhance Corporate Governance Framework and Practices

- i) Reports are submitted to Board and Sub-Committees on a timely basis.
- ii) Ensure Financial Statements are audited within stipulated time frames and Management Letters are responded to promptly.
- iii) Ensure tenders for goods and services are in keeping with the Procurement Manual.
- iv) Ensure Internal Audit recommendations are implemented.
- v) Assist the Board in its annual self evaluation and that of its sub-committees.
- vi) Provide assistance, as necessary, in policy formulation.

f. Enhancing Skills and Competencies

- i) Determine or identify the skills and competencies required for each job.
- ii) Periodically assess the level at which each employee is performing.
- iii) Provide advice and/or feedback to the employee on performance, career development and their future aspirations.
- iv) Facilitate requisite training/attachments/development interventions.
- v) Utilize teamwork and 'special assignment' strategies
- vii) Seek out and provide opportunities for coach/mentor interactions.
- viii) Provide necessary training to Contracted personnel and the staff of Contractors.

g. Achieve National Objectives

- i) Promote conservation of electricity through public education.
- ii) Maximize use of **renewable** sources of generation to minimize generation costs.
- iii) Optimize tariffs and maximize efficiencies (low overall losses, optimized information management, high collections rate).
- iv) Ensure regulatory compliance with electricity laws and GPL's license.
- v) Expand national grid to catalyze direct investments in the Country.

Functional Strategies over 5 year period (with reference to Objective Strategies)

2013

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. Achieve full certification of ISO 9001 – 2008 Quality system in 2013.
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 (OS&PT) are met consistently.
2. Optimize use of tools available in CIS to improve Customer Service.
3. Constantly review procedures to ensure customer service is optimized.
4. Provide active support to Legal and Loss Reduction to pursue outstanding balances.
Finance
1. Manage cash flows in accordance with budget and to optimize working capital.
2. Secure funding for capital projects, where necessary and ensure timely completion of statutory financial reports.
3. Complete procurement Plan and ensure efficient procurement process in compliance with Procurement Manual.
4. Provide routine financial reports to all Divisions on a timely basis.
IT
1. Ensure ongoing training to fully utilize CIS capabilities.
2. Optimize and maintain Local and Wide Area Network performance to ensure ready access to mission critical systems (e.g. CSS & OS&PT).
3. Manage Hardware and software infrastructure to ensure 99.9% system availability.
4. Facilitate training of personnel who are required to use CIS or any other application in the Company's efforts to meet CSS and OS&PT.
5. Optimize security and integrity of corporate systems.
6. Pursue all options to expand electronic bill payments.
7. Assist in implementation of GIS software package.
Loss Reduction
1. Implement all elements of the Strategic Loss Reduction Plan (SLRP) not detailed below.
2. Replace 5,000 meters with pre-paid meters.
3. Replace 5,000 defective and obsolete meters.
4. Install additional 1,000 ITRON meters.
5. Meter 4,800 New Services.
6. Continuously review the benefit of various initiatives to focus field activity.
7. Manage disconnection / reconnection activity prudently.
8. Investigate all reports of theft of company property.
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. Develop and implement initiatives to boost employee's morale.
4. Complete new Building in Sophia.
5. Complete new commercial building in Bartica.

6. Complete new T&D building in Wakenaam.
7. Complete ongoing right-sizing review in consultation with respective Divisions and implement approved plans.
Projects - Manage the following sub-projects effectively to ensure completion by Milestones indicated.
(i) New 26MW Plant at Vreed-en-Hoop – Completion Q4
(ii) Frequency conversion of Wartsila Kingston 1 Plant – Completed by Q3
(iii) 69Kv line from Sophia to Onverwagt – Complete (80 km) Q3
(iv) Complete 69Kv line from Sophia to New Georgetown Substation – Q2
(v) Diamond substation, including two tie lines – Complete Q2
(vi) New Georgetown Substation – Complete – Q2
(vii) New Sophia Substation – Complete Q2
(viii) Extend Sophia substation – Complete Q2
(ix) Good Hope Substation – Complete Q2
(x) Columbia (Mahaica) Substation – Complete Q2
(xi) Onverwagt sub-station expansion – Complete – Q1
Operations
<ul style="list-style-type: none"> Georgetown frequency conversion (Network) – Q2 Ensure Operating Standards & Performance Targets are met consistently. Complete maintenance programme – Q4 Implement GIS plan (compilation of field data) Manage capital projects associated with Gov't financed electrification programme and technical loss reduction. Bartica voltage upgrade (4.16Kv to 13.8Kv) – Q4 Complete load reassignment and deployment of new feeders from substations at Edinburg, Vreed-en-Hoop, New Georgetown, Golden Grove, Good Hope and Columbia. – Q4 Support live-line maintenance training including live exercises.

2014

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 generation, substation and loss reduction capital projects to ensure delivery on time and within budget, as appropriate.
4. 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.
5. Provide the environment necessary for key skills to be developed and retained.
6. Maintain ISO 9001-2008 certification.
Commercial
1. Ensure Customer Service Standards (CSS) and relevant Operating Standards & Performance Targets (OS&PT) are met consistently.
2. Optimize use of tools available in CIS to improve Customer Service.
3. Constantly review procedures to ensure customer service is optimized.
4. Provide active support to Legal and Loss Reduction to pursue outstanding balances.
Finance
1. Manage cash flows in accordance with budget and to optimize working capital.
2. Secure funding for capital projects, where necessary and ensure timely completion of statutory financial reports.
3. Complete procurement Plan and ensure efficient procurement process in compliance with Procurement Manual.
4. Implement Procurement and Inventory modules on Oracle Financial Computerized System.
5. Provide routine financial reports to all Divisions on a timely basis.
IT
<ul style="list-style-type: none"> • Optimize and maintain Local and Wide Area Network performance. • Manage Hardware and software infrastructure to ensure 99.9% system availability. • Optimize security and integrity of corporate systems • Provide support on GIS application, Procurement and Inventory modules on Oracle Financial Computerized System implementation. • Support implementation of Automatic Metering Infrastructure (AMI). • Implement plan to provide high speed intranet to offices in Demerara and Berbice – 40% complete by Q4.
Loss Reduction
1) Replace 5,000 meters with pre-paid meters.
2) Replace 6,000 defective and obsolete meters.
3) Install 2,000 AMI meters.
4) Meter 4,200 New Services.
5) Implement other elements of the Strategic Loss Reduction Plan (SLRP).
6) Continuously review the benefit of various initiatives to focus field activity.
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. Develop and implement initiatives to boost employee's morale.
4. Complete new building in New Amsterdam – Q4
5. New Middle Street – 30% complete.
6. Complete ongoing right-sizing review in consultation with respective Divisions and implement approved plans.
Projects
1. Install 3MW HFO unit at Anna Regina – Q4
2. Install 2 MW HFO Unit at Bartica in new power plant – Q4
3. Install 2 x 600Kva gen-sets in Leguan – Q4
4. Install 600Kva gen-set in Wakenaam – Q4
5. Williamsburg Substation with tie lines - 45% complete Q4
6. Extend No. 53 Substation – 35% complete Q4
Operations
<ul style="list-style-type: none"> • Implement annual maintenance plan. • Manage electrification programme financed by Gov't and other T&D capital programmes including for loss reduction. • Leguan voltage upgrade (4.16 to 13.8Kv) – Complete Q4 • Install 2,700 alternative structures (steel and concrete) – Q4. • Implement GIS plan (Compilation of field data and use of the application) • Implement technical loss reduction plan. • Assign load and deploy new feeders from Williamsburg substation – Q4 • Achieve competence to undertake live-line maintenance up to 13.8Kv.

2015

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, substation and loss reduction capital projects to ensure delivery on time and within budget, as appropriate.
4. 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.
5. Provide the environment necessary for key skills to be developed and retained.
6. Maintain ISO 9001-2008 certification.

Commercial
1. Ensure Customer Service Standards (CSS) and relevant Operating Standards & Performance Targets (OS&PT) are met consistently.
2. Optimize use of tools available in CIS to improve Customer Service.
3. Constantly review procedures to ensure customer service is optimized.
4. Provide active support to Legal and Loss Reduction to pursue outstanding balances.
Finance
1. Manage cash flows in accordance with budget and to optimize working capital.
2. Ensure compilation of statutory financial reports on a timely basis.
3. Complete procurement Plan and ensure efficient procurement process in compliance with Procurement Manual.
4. Complete implementation of Procurement and Inventory modules and implement Human Resources and Payroll modules on Oracle Financial Computerized System.
5. Provide routine financial reports to all Divisions on a timely basis.
Loss Reduction
1. Replace 5,000 meters with pre-paid meters.
2. Replace 6,000 defective and obsolete meters.
3. Meter 4,200 New Services.
4. Install 2,000 AMI meters.
5. Implement other elements of the Strategic Loss Reduction Plan (SLRP).
6. Continuously review the benefit of various initiatives to focus field activity.
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 GIS implementation.
5. Provide appropriate support for Automatic Metering Infrastructure (AMI).
6. Implement plan for high speed intranet for offices in Demerara and Berbice.
7. Implement Electronic Document Management System.
8. Assist in implementation of Planned Maintenance and HR and Payroll Software.
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. Develop and implement initiatives to boost employee's morale.
4. Complete new Building in Middle Street. – Q4
5. Complete ongoing right-sizing review in consultation with respective Divisions and implement approved plans.

Projects
1. New Williamsburg sub-station with tie lines – complete Q2
2. Extend No. 53 Substation – Complete Q3
3. Linden substation and interconnection – 10% Complete – Q4
Operations
• Employ 4,000 alternative structures – Q4
• Complete Annual Maintenance Programme – Q4
• Implement Technical Loss Reduction Plan – Q4
• Implement Planned Maintenance Software – Q4
• Reduce planned maintenance outages by 30%.

2016

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 substations and loss reduction capital projects to ensure delivery on time and within budget, as appropriate.
4. Ensure internal communications are adequate and efficient to support achievement of CSS, OS&PT and keep stakeholders informed of pertinent developments.
5. Provide the environment necessary for key skills to be developed and retained.
6. Maintain ISO 9001-2008 certification.
Commercial
1. Ensure Customer Service Standards (CSS) and relevant Operating Standards & Performance Targets (OS&PT) are met consistently.
2. Optimize use of tools available in CIS to improve Customer Service.
3. Constantly review procedures to ensure customer service is optimized.
4. Provide active support to Legal and Loss Reduction to pursue outstanding balances.
Finance
1. Manage cash flows in accordance with budget and to optimize working capital.
2. Ensure compilation of statutory financial reports on a timely basis.
3. Complete procurement Plan and ensure efficient procurement process in compliance with Procurement Manual.
4. Complete implementation of Human Resources and Payroll modules and implement Fixed Assets module on Oracle Financial Computerized System.
5. Provide routine financial reports to all Divisions on a timely basis.
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 GIS maintenance.
5. Provide appropriate support for Automatic Metering Infrastructure (AMI).
6. Assist in implementation of Fixed Assets module on Oracle Financial Computerized System and Planned Maintenance software.
Loss Reduction
1. Replace 5,000 meters with pre-paid meters. – Q4
2. Replace 6,000 defective and obsolete meters. – Q4
3. Meter 4,040 New Services – Q4
4. 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. Develop and implement a strategic training and development plan.
iii) Develop and implement initiatives to boost employee's morale.
iv) Complete ongoing right-sizing review in consultation with respective Divisions and implement approved plans.
Projects
1. New transmission line (Kingston to Sophia) – Complete Q4
2. Expand Kingston substation – Complete Q3
3. Expand Sophia substation – Q3
4. Linden substation and interconnection – Complete Q4
Operations
1. Employ 4,100 alternative structures.
2. Implement annual maintenance programme.
3. Implement technical loss reduction plan.
4. Implement planned maintenance software.
5. Interconnect five (5) feeders in Linden to new substation.

2017

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 loss reduction capital projects to ensure delivery on time and within budget, as appropriate.
4. Ensure internal communications are adequate and efficient to support achievement of

CSS, OS&PT and keep stakeholders informed of pertinent developments.
5. Provide the environment necessary for key skills to be developed and retained.
6. Maintain ISO 9001-2008 certification.
Commercial
1. Ensure Customer Service Standards (CSS) and relevant Operating Standards & Performance Targets (OS&PT) are met consistently.
2. Optimize use of tools available in CIS to improve Customer Service.
3. Constantly review procedures to ensure customer service is optimized.
4. Provide active support to Legal and Loss Reduction to pursue outstanding balances.
Finance
1. Manage cash flows in accordance with budget and to optimize working capital.
2. Ensure compilation of statutory financial reports on a timely basis.
3. Complete procurement Plan and ensure efficient procurement process in compliance with Procurement Manual.
4. Complete implementation of Fixed Assets module on Oracle Financial Computerized System.
5. Provide routine financial reports to all Divisions on a timely basis.
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 GIS maintenance.
5. Provide appropriate support for Automatic Metering Infrastructure (AMI).
6. Assist in implementation of Fixed Assets module on Oracle Financial Computerized System and Planned Maintenance software.
Loss Reduction
1. Replace 5,000 meters with pre-paid meters
2. Replace 6,000 defective and obsolete meters.
3. Meter 4,040 New Services
4. 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. Develop and implement a strategic training and development plan.
3. Develop and implement initiatives to boost employee's morale.
Operations
1. Employ 5,000 alternative structures.
2. Implement annual maintenance plan.

3. Implement technical loss reduction plan.

4. Fully implement planned maintenance software.

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.

3. OPERATING STANDARDS AND PERFORMANCE TARGETS

Category	Analysis and Projections					
Customer Interruptions	Targets for System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) proposed for 2012 - 2016 are:					
	SAIFI = $\frac{\text{Total Number of Customer Interruptions}}{\text{Total Customers Served}}$					
	SAIDI = $\frac{\text{Total Customer Hours of Interruptions}}{\text{Total Customers Served}}$					
		2013	2014	2015	2016	2017
	SAIFI	140	80	65	65	65
	SAIDI	160	100	90	85	80

Voltage Regulation	The nominal voltage and frequency levels are indicated in paragraph 3.6 of the Standard Terms & Conditions.					
	GPL will seek to maintain, in stable conditions voltages, of $\pm 5\%$ of the nominal voltage and $\pm 10\%$ following a system disturbance. Since it is difficult to monitor the voltage delivered to each customer the Standard is based on number of voltage complaints and the time taken to resolve them.					
		2013	2014	2015	2016	2017
	100% of customer voltage complaints due to network reconfiguration, vegetation, upgrade of lines, additional transformer, etc.	55 days	40 days	30 days	30 days.	30 days

Category	Definition of Target					
Meter Readings	Large Consumers – Maximum Demand Consumers					
	Produce Ninety-Seven percent (97%) of Maximum Demand Bills based on actual meter readings					
	Domestic and Small Business Consumers					
	Produce Ninety percent (90%) of non Maximum Demand Bills based on actual meter readings.					
	2013	2014	2015	2016	2017	
	MD Cons.	97%	97%	97%	97%	97%
	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					
		2013	2014	2015	2016	2017
Days	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.					
		2013	2014	2015	2016	2017
	Net Days	45	40	30	30	30
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.					
		2013	2014	2015	2016	2017
	Days	30	26	26	26	26

Losses	The level of losses at Dec. 2012 was 31.7% of dispatched power with technical losses estimated at 14.7% and non-technical at 17%. 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.					
		2013	2014	2015	2016	2017
	Technical (%)	13.8	13.2	12.7	12.35	12.5
	Non-Technical (%)	15.9	14.1	12.9	11.87	11.04
	Overall (%)	29.7	27.3	25.6	24.22	23.5
Average Availability	The Availability Target is based on the ratio of declared capacity and available hours to installed capacity and hours in the period.					
	$\text{Availability} = \frac{\text{Available capacity} \times \text{Total Available Hours}}{\text{Installed capacity} \times \text{Hours in the period}}$					
		2013	2014	2015	2016	2017
	Availability (%)	75	80	80	80	80

4. DEVELOPMENT AND EXPANSION PROGRAMME 2013 - 2017

4.1 Demand Forecast

The demand forecast is premised on the median forecast done for the Amaila Falls hydro project. This forecast used an annual growth of 4.7 to 4.9%, except in 2017 when Linden consumers and 25% of the forecasted demand from self-generators were included. GPL has modified the Mercados forecast between 2013 and 2016 to reflect a more accurate loss position, connection of new consumers every year and the other indicators explained below:

- **Natural growth**

GPL used Mercados' median forecast which forecasted natural growth of between 4.7 and 4.9% per year. The forecast for 2017 includes all the demand in Linden and 25% of the forecasted demand from all the major self generators in Demerara and eighty former (Pre-2003) large GPL customers.

- **New Customers**

Net customer growth over this planning period has been projected at 21,280. This includes additions from recently served areas, from new housing developments and another Un-served Areas Electrification Programme to benefit 4,000 consumers, to be implemented in two phases in 2013 and 2014. Average monthly use of 90kWh has been estimated for each new customer.

The expectation in respect of the electrification programme is based on the number of pending requests for network expansion coming from recently served areas where a new street or part of a new street has appeared. With improved service quality and stable tariffs the customer base and demand will grow steadily.

- **Loss Reduction**

Progress in loss reduction and 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. 8% of all technical loss reduction (0.048%) is projected to come from demand side management initiatives.

- **Tariff rebalancing**

It has been established that Tariff A is being subsidized by almost 33% and that Tariffs B, C, D and all Government tariffs are providing this cross-subsidy. While progress on loss reduction has been projected each year of the programme, GPL intends to use the additional cash flow to continue to invest in loss reduction and to ensure any reasonable escalation in fuel prices above the forecasted annual increases of 8% can be met without recourse to tariff increases.

It is intended however that when hydropower is available commercially by January 2017 that a complete rebalancing will be done to reflect the actual economic tariff for each category. GPL will

also, in 2017 introduce a new tariff category; called a high voltage industrial category, which will target users with a demand of 2.5 MVA and above.

- **Reduction in un-served energy**

A reduction in energy not served 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;
- New base-load plants to meet base-load needs more reliably;
- Shorter feeders with multiple alternative feeds and enhanced maintenance planning and execution;

- **Reduction in parasitic power consumption**

The frequency standardization project in Georgetown will result in the removal of the frequency converters from their usual duty. The annual losses in the converters exceed 5GWh. The use of new generating plants for base-load operation would reduce the dependency on older plants using up to 5% (The new 36.3MW Kingston 11 Plant is using 1.5%) of their generation for auxiliaries.

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

Table 4.1.1: Projected Demand and Energy.

	2011	2012	2013	2014	2015	2016	2017
Net Generation (MWH)	629,214	666,838	707,440	747,061	774,371	828,670	1,007,859
Sophia Aux. (MWH)	614	611	15	15	15	15	0
Converter losses (MWH)	5,462	3,594	1,920	-	-	-	-
Station Auxiliary (MWH)	18,874	18,243	22,584	15,001	14,762	15,177	18,685
%	2.9	2.6	3.08	1.97	1.87	1.80	1.82
Gross generation	653,376	690,146	732,762	762,417	789,442	844,155	1,026,922
% Growth	3.48	5.63	6.17	4.05	3.54	6.93	21.65

Table 4.1.2: Regional Forecast

ESSEQUIBO	2012	2013	2014	2015	2016	2017
Net Energy (MWH)	34,728	36,863	38,945	40,387	42,388	44,702
Load factor	0.62	0.67	0.67	0.67	0.67	0.67
Peak (MW)	6.66	6.57	6.94	7.06	7.30	7.69
Gross Energy (MWH)	36,145	38,580	40,759	41,422	42,816	45,153
Aux use	0.039204	0.0445	0.0445	0.025	0.01	0.01
DEMERARA	2012	2013	2014	2015	2016	2017
Net Energy (MWH)	526,566	558,602	589,865	611,406	657,681	827,583
Peak (MW)	80	83	84	86	90	113
LF	0.78	0.8	0.82	0.83	0.85	0.85
Sop. Aux Use & Converter Losses (MWH)	4,777	1,935	15	15	15	15
Gross energy (MWH)	547,127	580,797	601,918	623,899	671,118	844,488
Aux Use	0.037581	0.035	0.02	0.02	0.02	0.02
BERBICE	2012	2013	2014	2015	2016	2017
Net Energy (MWH)	105,545	111,975	118,251	122,577	128,602	135,574
Peak (MW)	20	19	20	21	22	23
LF	0.62	0.68	0.68	0.68	0.68	0.68
Gross Energy (MWH)	106,874	113,385	119,740	124,121	130,221	137,281
Aux use	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124
Total (MWH)	690,146	732,762	762,417	789,442	844,155	1,026,922

Table 4.1.3: GPL 15-Year Forecast

Year	2012	2013	2014	2015	2016	2017	2018	2019
Growth	0.056	0.062	0.040	0.035	0.069	0.217	0.047	0.047
Net Energy (MWH)	690,146	732,762	762,417	789,442	844,155	1,026,922	1,074,894	1,125,605
Year	2020	2021	2022	2023	2024	2025	2026	2027
Growth	0.047	0.048	0.048	0.048	0.049	0.049	0.049	0.049
Net Energy (MWH)	1,179,018	1,235,365	1,294,777	1,357,215	1,423,192	1,492,671	1,565,979	1,642,888

The forecasted load factors are based on historical trends and the expectation of an accelerated growth in industrial demand, particularly when hydropower is available.

The DBIS peak demand is projected to grow to 136MW by 2017. It should be noted that the Off-Grid demand informing the demand forecast for 2017 is adding 18MW to the peak.

4.2 Planned Retirements and Generation Expansion, DBIS

The Generation Expansion Programme (GEP) is premised on the integration of the Demerara Interconnected System (DIS) and Berbice Interconnected System (BIS) in 2013 with the completion of the Sophia – Onverwagt transmission link.

The integration of the DIS and BIS in 2013 would allow 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 would improve system management, stability and overall reliability and service quality, particularly voltage regulation.

The Georgetown 60Hz standardization plan, which is expected to be completed by the third quarter of 2013 (generation asset, but load should be converted by May) is premised on the 22MW Wartsila built Kingston 1 plant being converted to 60Hz, starting in the first quarter of 2013. The plant will be converted in two phases with each phase lasting approximately three months. During this period 11MW capacity would be unavailable which would create a deficit in generation capacity in Demerara, using the usual reserve criteria. The current plan is to use rented Caterpillar modules to cover the shortfall.

Conversion of the 15MW, 50Hz load in Georgetown is expected to be completed by Q2 of 2013 when the first 11MW generating capacity is re-commissioned at 60Hz.

The criterion for reserve capacity used is the size of the two largest units, resulting in a reserve of 15.6MW (15MW is being used the plan below) in the DBIS. By January 2017, with the availability of 140MW of hydropower capacity, GPL would have to maintain adequate capacity to cater for planned maintenance / penstock inspection for a period of 2-3 weeks when no power will be delivered from the hydro. From 2017 a reserve capacity of 50MW is considered more appropriate as this would be adequate to power all the essential services and provide some basic level of supply (in addition to what can be dispatched from GuySuCo) to customers in the unlikely event that the double circuit transmission interconnection fails. Realistically, GPL will maintain all its generating capacity, where feasible.

Table 4.2.1: Capacity Forecast W/O Additions, DBIS

Existing Capacity, MW	2013	2014	2015	2016	2017
DEMERARA					
Garden of Eden Power Station	6.50	4.00	4.00	4.00	4.00
Demerara Power (Kingston 1)	22.00	22.00	22.00	22.00	22.00
Demerara Power, (Kingston 11)	36.30	36.30	36.30	36.30	36.30
Demerara Power 1 (GoE)	22.00	22.00	22.00	22.00	22.00
Versailles Power Station	2.20	2.20	2.20	2.20	0
Mobile Units	13.00	10.0	10.0	6.0	6.0
Total Demerara	102.00	96.50	96.50	92.50	90.30
BERBICE	2013	2014	2015	2016	2017
Canefield					
No.3 Mirrlees Blackstone	5.0	5.0	5.0	5.0	5.0
No. 4 Mirrlees Blackstone	5.0	5.0	5.0	5.0	5.0
Onverwagt					
No. 5 & 7 General Motors	4.4	4.4	2.2	2.2	0
IPP	8.0	8.0	8.0	8.0	8.0
Total Berbice	22.40	22.40	20.20	20.20	18.00
Total DBIS	124.40	118.90	116.70	112.70	108.30
Reserve Capacity	15.00	15.00	15.00	15.00	50.00
Net Capacity	109.4	103.9	101.7	97.70	58.30
Peak Demand	102.00	104.00	107.00	112.00	136.00
Excess (Shortfall)	7.4	(0.1)	(5.3)	(14.3)	(77.7)
Diesel Fired Capacity (DFC)	26.10	20.60	18.40	14.4	10.0

The forecast indicates that there is a need for 78.7MW of additional generating capacity by 2017, of which 16.1MW is for replacement capacity (Note that with hydro the reserve capacity has been increased to 50MW in 2017 and that peak has been projected to grow by 18MW due to self generators and Linden being served by GPL). The proposed additions are included in Table 4.2.2 below.

Table 4.2.2: Proposed Generation Addition, DBIS

Capacity Additions, MW	2013	2014	2015	2016	2017
Hydro IPP	-	-	-	-	140.0
Vreed-en-Hoop	26.0	-	-	-	-
Total New Additions	26.0	0.0	0	0	0
Total Accumulated Available new Capacity	26.0	26.0	26.0	26.0	166.0
Excess (Shortfall) – DBIS	33.4	25.9	20.7	11.7	88.3
Diesel Fired Capacity to be used for peak	0.0	0.0	0.0	3.7	0

With the integration of the Demerara and Berbice systems in 2013, no additional generating capacity is planned for the Berbice system. It is expected that Skeldon, the 10MW Mirrlees capacity at Canefield and transfers from Demerara will adequately meet all generation needs until hydropower is available in 2017.

4.3 Essequibo Generation Expansion

The expansion plan for Essequibo includes the installation in 2014 of two 600kVa gensets at Leguan and one similar unit at Wakenaam. In 2014 also it is proposed to install a 3MW HFO fired Unit at Anna Regina and a 2MW HFO fired unit at Bartica.

4.4 Use of Renewable Sources of Energy

4.4.1 Co-generation

Renewable energy has been making a contribution, albeit small, with the commissioning of the Skeldon 30MW co-generation facility since 2008. While operational and other difficulties since its commissioning have severely limited the dispatch of power from the co-generation facility, GuySuCo has undertaken the necessary capital investments to reduce HFO consumption, improve bagasse handling and boiler operations. It is expected that the improvements will be completed in Q2 2013 resulting in more stable and cost effective operation.

4.4.2 Hydro Power

The 165MW Amaila Falls Hydroelectric Project is expected to be completed by December 2016 with at least 140MW becoming available at the delivery points (Linden and Sophia). This project should provide 88% of all GPL's energy requirements by 2017.

The contractor identified for the construction of the Amaila Falls hydropower project is projecting a forty-two (42) month construction period. Work on the access road, which is financed by the Guyana Government, is expected to be completed in 2013.

With the EPC Contract already executed, Financial close is expected to occur by the second quarter of 2013 and construction is expected to start within the same quarter. With financial close, the tariff will be determined but this is not expected to exceed US\$0.115/kWh. Initiatives to reduce the tariff by buying down the equity during the early years would be limited by a minimum threshold for its equity set by Site.

The average annual available energy at the distribution point is 1017 GWh. GPL will implement initiatives to develop the market to realize the best tariff as an annual cash flow has to be guaranteed to the IPP.

While it is critical that GPL employ initiatives to expand the market, such expansion has to be managed to ensure available generation and network capacity remain adequate and the Company is not forced into expensive short term fixes.

4.5 PLANS TO MEET GENERATION NEEDS OVER 15-YEAR FORECAST

GPL's strategic long term generation plan is premised on the continued use of renewable sources of power to meet base-load generation needs. The planned development of large hydropower facilities (up to 2,700MW) by the Brazilians at upper and middle Mazaruni would assist GPL to meet its incremental power needs when the capacity at Amaila becomes inadequate by 2019. There is no expansion plan contemplated for the Amaila project nor has it been technically designed for expansion or phasing purposes

It would be recognized that the changes in global weather patterns would impact water availability for any hydro development, both positively and negatively. GPL would therefore continue to maintain a minimum of 50MW of fossil fuel capacity to fill capacity gaps.

While Guyana has both wind and PV potential and ongoing interest is being shown by various parties from time to time, it is not expected that any such development will significantly impact the generation mix in the future.

Guyana also has potential for co-generation from biomass and various parties continue to look at wood waste, paddy husk, and waste from ethanol production to produce up to 26MW.

Hydropower will therefore remain the main source of power generation over the next fifteen years.

4.6 GENERATION MAINTENANCE PLAN – 2013

4.6.1 GPL Owned – Wartsila Operated & Maintained

WOGI 1 - GOE				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DG1	Daily RH	22.3	Date												
ENG No. 1	Monthly RH	655	Run hrs	150,591	151,231	151,913	152,582	153,265	153,687	154,379	155,062	155,722	156,413	157,075	157,755
GOE	Last OH	129067	Type Maint.		9k	10k		11k	12k OH		1k	2k		3k	4k
6163	Dec-12	149900	Duration (hrs)		8	10		8	266		8	10		8	12
DG2	Daily RH	22.33	Date												
ENG No. 2	Monthly RH	655	Run hrs	150,985	151,625	152,308	152,978	153,663	154,085	154,778	155,462	156,123	156,815	157,478	158,159
GOE	Last OH	129698	Type Maint.		9k	10k		11k	12k OH		1k	2k		3k	4k
6164	Dec-12	150293	Duration (hrs)		8	10		8	266		8	10		8	12
DG3	Daily RH	22.3	Date												
ENG No. 3	Monthly RH	655	Run hrs	7,684	8,331	9,013	9,674	10,365	11,025	11,709	12,400	12,822	13,513	14,175	14,857
GOE	Last OH	0	Type Maint.	7k		8k	9k		10k	11k		12k OH		1k	2k
AAE22025	Dec-12	7000	Duration (hrs)	8		10	8		10	8		266		8	10
DG4	Daily RH	22.3	Date												
ENG No. 4	Monthly RH	655	Run hrs	130,590	131,229	131,921	132,580	133,264	133,933	134,613	135,297	135,966	136,648	137,310	138,001
GOE	Last OH	118181	Type Maint.	12k OH	1k		2k	3k		4k	5k		6k	7k	
7396	Dec-12	130146	Duration (hrs)	266	8		10	8		12	8		10	8	

WOGI 2 - KINGSTON I				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DG 5	Daily RH	17.5	Date												
ENG No. 1	Monthly RH	529	Run hrs	120,338	120,840	121,382	121,899	122,441	122,960	123,503	124,038	124,557	125,100	125,616	126,153
Kingston	Last OH	106150	Type Maint.	2k	3k		4k		5k		6k	7k		8k	9k
7651	Dec-12	119803	Duration (hrs)	10	8		12		8		10	8		12	8
DG 6	Daily RH	17.5	Date												
ENG No. 2	Monthly RH	530	Run hrs	112,800	113,300	113,842	114,361	114,904	115,420	115,957	116,499	117,017	117,560	118,079	118,621
Kingston	Last OH	106806	Type Maint.		6k		7k		8k	9k		10k		11k	
7653	Dec-12	112257	Duration (hrs)		10		8		12	8		10		8	
DG 7	Daily RH	17.5	Date												
ENG No. 3	Monthly RH	514	Run hrs	101,263	101,765	102,307	102,824	103,366	103,885	104,421	104,963	105,482	106,025	106,356	106,898
Kingston	Last OH	94883	Type Maint.	6k	7k		8k		9k	10k		11k		12k OH	
7652	Dec-12	100728	Duration (hrs)	10	8		12		8	10		8		266	
DG 8	Daily RH	17.5	Date												
ENG No. 4	Monthly RH	514	Run hrs	112,198	112,705	113,242	113,760	114,302	114,821	115,364	115,712	116,237	116,774	117,299	117,834
Kingston	Last OH	103725	Type Maint.	8k		9k	10k		11k		60k OH		1k		2k
7650	Dec-12	111664	Duration (hrs)	12.00		8.00	10.00		8.00		266		8.00		10.00

WOGI 3 - KINGSTON II			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
DG9	Daily RH	22.3	Date	11-Jan	22-Feb		5-Apr	17-May	28-Jun		9-Sep	20-Oct		1-Nov	13-Dec
ENG No. 1	Monthly R	674	Run hrs	26,970	27,605	28,297	28,958	29,640	30,302	30,993	31,673	32,335	33,026	33,686	34,370
Kingston II	Last OH	12000	Type Maint.	1k	4k	4k	1k	2k	1k		8k	1k		2k	1k
AAE13218	Dec-12	26286	Duration (f	8	12		8	10	8		12	8		10	8
DG10	Daily RH	22.3	Date		2-Feb	16-Mar	27-Apr		8-Jun	20-Jul	31-Aug		12-Oct	23-Nov	
ENG No. 2	Monthly R	674	Run hrs	26,356	26,994	27,674	28,335	29,027	29,686	30,370	31,050	31,719	32,403	33,063	33,754
Kingston II	Last OH	12073	Type Maint.		1k	4k	1k		2k	1k	8k		1k	2k	
AAE13218	Dec-12	25665	Duration (hrs)		10	12	8		10	8	12		8	10	
DG11	Daily RH	22.3	Date	1-Jan	12-Feb	26-Mar		7-May	18-Jun	30-Jul		10-Sep	22-Oct		3-Dec
ENG No. 3	Monthly R	654	Run hrs	25,927	26,566	27,248	27,917	28,601	29,259	29,943	30,634	31,294	31,978	32,647	33,327
Kingston II	Last OH	13539	Type Maint.	24k OH	1k	2k		1k	4k	1k		2k	1k		8k
AAE13218	Dec-12	25483	Duration (f	266	8	10		8	12	8		10	8		12
DG12	Daily RH	22.3	Date		10-Feb	24-Mar		5-May	16-Jun	28-Jul		8-Sep	20-Oct		1-Dec
ENG No. 4	Monthly R	634	Run hrs	11,200	11,600	12,291	12,953	13,635	14,296	14,976	15,668	16,329	17,011	17,680	18,364
Kingston II	Last OH		Type Maint.		12k OH		1k	2k	1k	4k		1k	2k		1k
AAE21095	Dec-12	10756	Duration (hrs)	266			8	10	8	12		8	10		8
DG13	Daily RH	22.3	Date	8-Jan	19-Feb		5-Apr	14-May	25-Jun		6-Aug	17-Sep	29-Oct		10-Dec
ENG No. 5	Monthly R	654	Run hrs	11,218	11,857	12,549	13,208	13,892	14,550	15,241	15,925	16,585	17,269	17,938	18,618
Kingston II	Last OH		Type Maint.			12k OH	1k	2	4k		1k	2k	1k		8k
AAE21095	Dec-12	10774	Duration (f	266	8		10	8	12		8	10	8		12

4.6.2 GPL – Owned & Operated

4.6.2.1 Demerara

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
GoE Mobile 1												
# 10 Cat			500 hrs			1,000 hrs						
# 11 Cat		1,000 hrs			1,500 hrs							
# 12 Cat	Major Overhaul		500 hrs			1,000 hrs						
# 13 Cat			1,000 hrs			1,500 hrs						
Versailles												
#1 Cat	Top Overhaul	500 hrs	1,000 hrs	1,500 hrs	500 hrs	1,000 hrs	1,500 hrs					
#2 Cat	1,500 hr	500 hr	1,000 hr		1,500 hr	500 hr	Major Overhaul					
#3 Cat	500 hr	1,000 hr	1,500 hr	500 hr	Top Overhaul	500 hr	1,000 hr					
Leonora												
#1 Cat	1,500 hr	500 hr		Top Overhaul	500 hr	1000 hr	1,500 hr					
#2 Cat	1,500		500 hr		1,000 hr	1,500						
#3 Cat	500 hr	Top Overhaul	500 hr	1,000 hr	1,500 hr		500 hr					
GoE Mobile 11												
# 6 Cat	500 hr	Top Overhaul	500 hr	1,500 hr	500 hr	1,000 hr						
# 8 Cat	1,500 hr	500 hr	Top Overhaul	500 hr	1,000 hr	1,500 hr						
#9 Cat	Top Overhaul	500 hr	1,000 hr	1,500 hr	500 hr	1,000 hr						
Garden of Eden												
#2 Crossley												
#5 Nigata												
#6 Nigata			Major Overhaul									
Versailles												
#6 GM												

4.6.2.2 Berbice

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Canefield												
#3 Mirlrees	3,500 hrs	4,000 hrs	4,500 hrs		5000 hrs	5,500 hrs		6,000 hrs	6,500 hrs	7,000 hrs	7,500 hrs	
#4 Mirlrees	5,000 hrs	5,500 hrs	6,000 hrs		6,500 hrs	7,000 hrs	7,500 hrs	8,000 hrs		8,500 hrs	9,000 hrs	

4.6.2.3 Essequibo

Anna Regina Wartsila Units

Anna Regina Power Station			JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
DG1	Daily RH	24	Date	5th	18th	29th		10th	22nd		2nd	14th	25th	
ENG No. 1 AR 6725	Monthly RH	744	Run hrs	110,123	110,623	111,623	112,623	113,391	113,623	114,623	115,583	115,623	116,623	117,623
	Last OH	105623	Type Maint.		5K	6K	7K		8K	9K		10K	11K	12K OH
	Nov-12	117623	Duration (hrs)		6	8	6		8	6		8	6	288
DG2	Daily RH	24	Date	17th	28th		11th	23rd		4th	15th	26th		7th
ENG No. 2 AR 6724	Monthly RH	744	Run hrs	110,373	111,373	112,158	112,373	113,373	114,285	114,373	115,373	116,373	117,183	117,373
	Last OH	106373	Type Maint.	4K	5K		6K	7K		8K	9K	10K		11K
	Dec-12	118373	Duration (hrs)	8	6		8	6		8	6	8		6

ESSEQUIBO - Cat Sets												
Anna Regina	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
#3 Cat Set				500 hr			1,000 hr			1,500 hr		
Leguan												
#1 Cat Set	500 hr	500 hr		500 hr	500 hr		500 hr			500 hr		
#2 Cat Set												
#3 Cat Set										500 hr		
#4 Cat Set											500 hr	
Wakenaam												
#1 Cat Set	500 hr		500 hr		500 hr	500 hr		500 hr		Major Overhaul		500 hr
#2 Cat Set		Major Overhaul		500hr		500hr			500hr			500 hr
#3 Cat Set										500 hr		
Bartica												
#4 Cat Set	500hr		500hr		500hr		Top Overhaul		500hr		500hr	
#5 Cat Set		500hr		500hr		500hr		500hr	Top Overhaul			500 hr
#6 Cat Set	500		500hr		500hr		500hr		500hr		500hr	

4.7 T&D Expansion and Modernization Plan

Expenditure over the life of this Programme on T&D expansion and modernization is expected to be US\$52.65 million and will realize the following:

- Completion of a 69kV transmission link between Kingston and a new sub-station at Vreed-en-Hoop and terminating at the new substation at Edingburg on the West Coast.
- Completion of new 69kV substations at Golden Grove (E.B.D.), Sophia and South Georgetown (New Georgetown Substation) and expansion of the existing sub-stations at Sophia and Kingston.
- Completion of the 69 kV transmission line from Sophia to Onverwagt, with substations at Good Hope and Columbia (Mahaica) and upgrade of the Onverwagt substation.
- Construction of a second 69Kv transmission line between Sophia and Kingston.
- Construction of a new 69Kv substation at Williamsburg and expansion of the No.53 Substation by two bays.
- Construction and interconnection of a 25MVA substation at Linden.
- Completion of the frequency conversion and upgrade of the 50Hz system in Georgetown. This includes:
 - The replacement of 17MVA, 11KV, 50Hz transformers with 13.8KV, 60Hz transformers.
 - Extension of 18Km of primary circuits.
- Re-design of the distribution network in areas with sub-feeds to allow individual connections.

- Installation of new 60Hz feeders and the re-assignment of loads in Georgetown, East Coast (both lower and upper East Coast), East Bank, West Coast and on the Corentyne.
- Installation of automatic compensation equipment to maintain a Power Factor of 0.98
- Use of concrete and other alternative structures (tubular and lattice steel, etc) to reduce the long term maintenance burden presented by wooden poles.
- Acquisition of specialized vehicles and equipment for T&D.
- Phased replacement of 317 old, inefficient transformers.
- Phased upgrade of undersized LV (1,566 Km) and MV (123Km) conductors.
- Phased upgrade of LV (11,770) and MV (4,076) connections.
- Construction of fraud proof networks in areas with high electricity theft.
- Use of specialized service lines (coaxial cables) to prevent theft.
- Upgrade of service lines (268Km).
- Extension of primary lines to accommodate new transformers (268Km)

The construction of the transmission links to Berbice and West Demerara will enable the GPL to rely on more efficient HFO fired or co-generation capacity, prior to hydro, to meet its power needs and also to consolidate its reserve. The extension of the transmission line to Edinburg and the construction of a 69 kV substation at this location will not only provide a better quality, more reliable and secure supply to the West Coast Demerara but also reduce technical losses.

The Williamsburg Substation will be designed to split the Canefield to Skeldon transmission line. This will improve the supply reliability to the substation and the manageability of the transmission system. It would also allow GPL the opportunity to use phase shifting transformers in the future, if necessary.

The plan to install substations is aimed at improving supply quality and available distribution network capacity but will also reduce technical losses. Shorter feeders and lighter loads would also allow for improved overall management, including maintenance and reduction in un-served energy due to line plant unavailability. The timing of construction of the various substations is targeted at optimizing network capacity to meet current demand and expected growth over a ten-year period in an efficient and timely manner.

The link between Sophia and Onverwagt will be done in three sections, one from Sophia to Good Hope, the other from Good Hope to Columbia and the third from Columbia to Onverwagt. The three-section arrangement would allow for better management and the use of phase shifting transformers in the future.

With a 50MVA substation planned for Bamia in Linden under the hydropower interconnection facilities scope, GPL has to provide the infrastructure to interconnect with the existing LECI 13.8Kv distribution system. It is proposed to have two 69Kv tie lines between the Bamia substation and a GPL 69/13.8Kv substation to serve five (5) feeders.

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

Table 4.7: T&D Expansion Programme, Capital Cost – US\$ ‘000

T&D Capital Investment Summary		2013	2014	2015	2016	2017	Total
	-US\$'000						
Transmission Lines	\$	2,754	\$ -	\$ -	\$ 539	\$ -	\$ 3,293
Substations	\$	7,259	\$ 2,135	\$ 1,640	\$ 3,875	\$ -	\$ 14,909
Compensation	\$	-	\$ -	\$ -	\$ 950	\$ -	\$ 950
Distribution	\$	6,145	\$ 6,839	\$ 5,100	\$ 5,100	\$ 6,125	\$ 29,309
Capacity building	\$	390	\$ 1,445	\$ -	\$ 1,350	\$ -	\$ 3,185
Electrification	\$	1,000	\$ 1,027				
GIS	\$	500	\$ 500				\$ 1,000
Total	\$	18,047	\$ 11,946	\$ 6,740	\$ 11,814	\$ 6,125	\$ 52,646

While major transmission and sub-station projects will be outsourced to overseas contractors, a key strategy of this Programme is the outsourcing of major distribution capital jobs to local Contractors. The ongoing engagement of Contractors in system improvement works and network extension has allowed the Contractors to not only improve and expand the skills available to them but also their compliment of tools and equipment.

GPL would continue to provide technical training to Contractor’s personnel to further improve their competence. This can only accrue benefits to GPL over time. The objectives of promoting private participation in the T&D activities of the Company are the following:

- Improved efficiency in executing major T&D upgrades and network extension;
- Reduced outages to consumers;
- Improved reliability of the T&D system as more work can be done during outages;
- Reduction of Energy not Served due to T&D faults and maintenance activities;
- Reduction of costs;
- Reduction of Capital Investments in specialized T&D tools and equipment.

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

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

As a result of outsourcing these capital works, the Company will be able to find the resources to continuously upgrading the tools and equipment available to T&D crews to vastly improve productivity.

This will lead to the following benefits:

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

The Company proposes to spend a total of US\$1,690,000 over this programme on T&D equipment and vehicles. Outsourcing will continue to build momentum in 2011 and increase progressively over the following years.

4.7.1 Network Maintenance Plan - 2013

Description of Activity		T & D				
		QTR 1	QTR 2	QTR 3	QTR 4	Total
POLE REPLACEMENT	PRIM.	479	501	385	361	1,726
	SEC.	745	732	504	511	2,492
POLE PLUMBING	PRIM.	679	713	704	636	2,732
	SEC.	713	737	707	676	2,833
POLE TREATMENT	PRIM.	1,832	1,845	1,827	1,859	7,363
	SEC.	1,993	1,979	2,028	2,198	8,198
OLD POLE REMOVAL	PRIM.	475	492	394	363	1,724
	SEC.	734	718	543	507	2,502
POLE STUBBING	PRIM.	589	568	541	533	2,231
	SEC.	308	308	280	287	1,183
ANCHOR BLOCK REPLACEMENT	PRIM.	56	67	56	54	233
	SEC.	101	83	88	85	357
GUY REPLACEMENT	PRIM.	100	81	88	63	332
	SEC.	125	125	107	99	456
REPLACEMENT DEFECTIVE CROSS ARMS	PRIM.	306	355	341	330	1,332
INSULATOR REPLACEMENT	PRIM.	280	299	261	253	1,093
	SEC.	284	295	239	244	1,062
LINE/HARDWARE TRANSFER	PRIM.	480	503	424	364	1,771
	SEC.	740	728	532	523	2,523
LINE EXTENSION (KM)	PRIM.	9.90	12.76	8.10	8.00	38.76
	SEC.	11.39	15.87	13.40	18.00	58.66
LINE UPGRADEMENT (KM)	PRIM.	8.80	3.90	4.80	3.00	20.50
	SEC.	20.18	22.28	20.59	24.58	87.61
LINE RETENSION (KM)	PRIM.	16.90	14.17	8.14	7.76	46.97
	SEC.	18.01	21.15	15.39	17.45	72.00
SERVICE LINE REPLACEMENT (MTS)		3,711	3,607	3,321	2,955	13,594
INSTALLATION/REPLACEMENT (GAB)		14	11	18	20	63
INSTALLATION/REPLACEMENT (SPD)		34	18	16	9	77
INSTALLATION/REPLACEMENT (RCO)		113	114	60	110	397
INSTALLATION/REPLACEMENT (PMCO)		369	327	350	345	1,391
TRANSFORMER MAINTENANCE		290	295	354	364	1,303
INSTALLATION OF ADDITIONAL TRANSFORMERS		53	56	37	41	187
MAINTENANCE OF CAPACITOR BANKS		5	6	16	12	39
JUMPER SERVICING/REPLACEMENT	PRIM.	127	326	266	275	994
	SEC.	409	514	406	462	1,791
SERVICE CONNECTION @ CONSUMER/INSTALLATION OF INSULINK		8,305	6,345	5,563	6,049	26,262
INSTALLATION OF ADDITIONAL EARTHS		103	145	105	163	516
ROUTE CLEARING	PRIM.	41.62	97.05	79.37	81.55	299.59
	SEC.	15.47	20.19	29.7	31.1	96.46
LINE INSPECTION (KM)	PRIM.	194.30	192.84	204.53	238.80	830.47
	SEC.	137.62	159.09	149.76	144.52	590.99
C.E.O.F CARDS		525	533	526	658	2,242

The T&D maintenance programme is scoped to address known defects and defects reasonably expected to be uncovered in 2013. As mentioned before, outsourcing and investments to improved GPL's maintenance capacity and capability will serve to ensure that the targets are achieved.

In Demerara, network management is divided into four areas of control, Central is responsible for the network between Liliendal and Rahaman's turn, South is responsible for the network south of Rahaman's turn and both transmission lines, East is responsible for the network between Liliendal and Bygeval (Mahaica) while West is responsible for the entire West Demerara.

West Berbice has responsibility for the network in west Berbice and upper East Coast, east of Bygeval. East Berbice has responsibility for the entire network in that area while the Essequibo office has responsibility for Essequibo Coast, Leguan, Wakenaam and Bartica.

4.8 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 2012 total losses (dispatched power less billed sales) was 31.7% of dispatched power. The strategies which will be employed in our Loss Reduction programme are expected to reduce losses to at least 22.9% by the end of 2017.

4.8.1 Non-Technical Loss Reduction

It has been confirmed that the single most effective strategy to reduce non-technical losses is ensuring that there is adequate, secure metering. During this Programme GPL will introduce Automatic Metering Infrastructure (AMI) technology to upgrade existing ITRON meters. This new metering technology will allow GPL to communicate with each meter in real time. This would enhance our loss reduction efforts as certain critical information can be obtained without the need to visit the customer. It is planned to install 4,000 AMI meters over two years for all large customers and in network metering applications to detect areas with high losses.

For other consumers, the company will continue to depend primarily on pre-paid meters (split meter), which will deliver the double benefit of reducing losses while at the same time improving customer service. It should be noted that the pre-paid meter is essentially marketing itself and over 20,000 are expected to be in service by the end of 2012. It is expected that 25,000 pre-paid meters will be installed over the next five years, replacing post-paid electromechanical and electronic meters and over 20,000 will be installed for new services.

GPL will continue to use the ITRON meters for all Maximum Demand (MD) and large non-MD installations until AMI meters are introduced in 2014.

Our billing statistics, which indicate that just over 61,000 consumers use up to 75kWh per month including just over 10,000 that record zero consumption, confirm that theft of electricity is not only a problem in un-served and recently served areas but chronic among other consumers. This conclusion is based on the fact that a survey done in 2002 reveal that 70% of residential consumers owns a refrigerator. The coordinated approach to loss reduction utilizing an appropriate network design coupled with secure metering should comprehensively address this problem.

The activities envisaged over the life of this Programme require a capital investment of US\$9.8M and include:

- Installation of 25,000 pre-paid meters to replace post-paid meters.
- Replacement 29,000 defective and obsolete meters.
- Installation of 4,000 AMI meters.

- Continuation of raids in areas mentioned before, where electricity theft is a problem.
- Prosecution all cases of illegal electricity extraction
- Ongoing investigation of cases of zero and persistent low consumption
- Continued use of the Intelligence Unit to process and evaluate billing data to identify anomalies.
- Utilizing intelligence to identify and prosecute individuals involved in the “business” of meter tampering.

4.8.2 Technical Loss Reduction

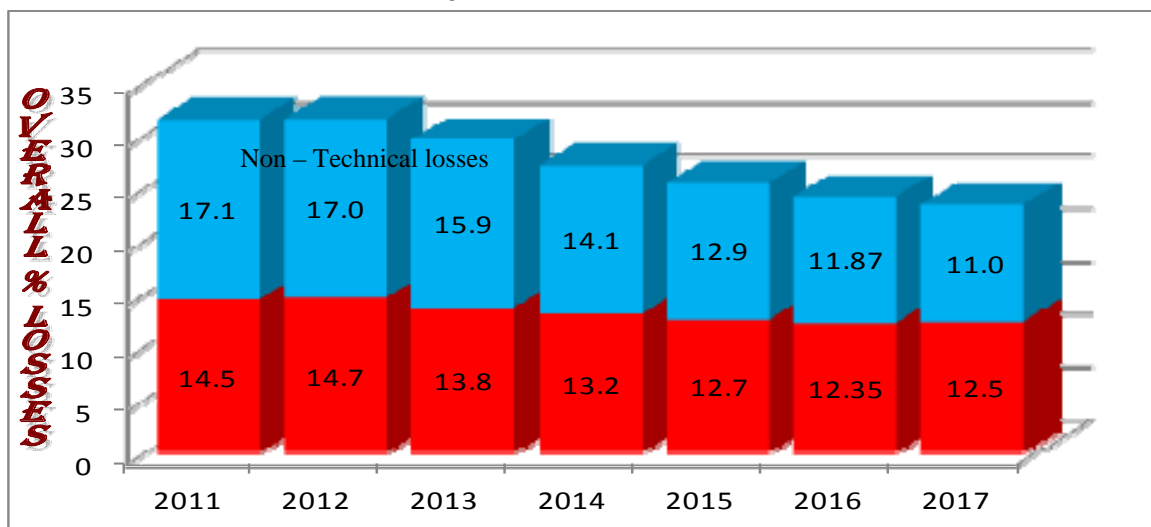
Investment in technical loss reduction will be US\$49.96M over the life of this programme. The investment will address losses at the distribution level, within both the MV and LV network. An estimate of 1.5% reduction in technical losses is projected over the life of the programme.

6.8.2.1 Distribution Upgrade Programme

ACTIVITY	Aspect	Quantity
Service Line Upgrade (Km)		268
Network Extension (Km)	PRIM.	243
Conductor Upgrade (Km)	PRIM.	123
	SEC.	566
Replacement of Inefficient Transformers		403
Recovery of Under Utilized Transformers		142
Installation of additional Transformers		317
Upgrading Customer Service Connection (Using Insulink)		193,261
Upgrading Network MV and LV Connections	PRIM.	4,076
	SEC.	11,770

The distribution upgrade represents the consolidated totals for the life of this Development & Expansion Programme.

Table: 4.8.2 Loss Reduction Projections



5 Operations

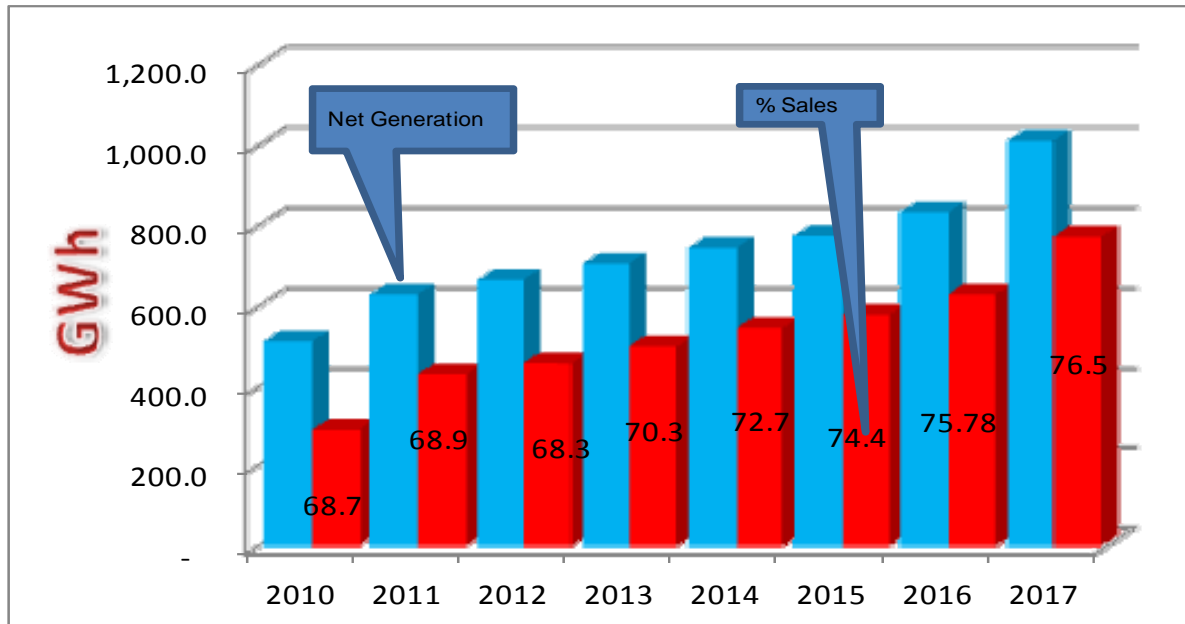
5.1 Sales and Revenue Collection

Sales growth from 2013 to 2017 shows an increase based on the expectation that losses will be brought down from 31.7% in 2012 to 23.5% by the end of 2017 and that 2.69% will translate fully into Sales, 21,280 new consumers will access GPL service and that normal growth will be between 4.7 and 4.9%.

It is projected that the customer base will increase from 166,000 in 2012 to around 187,280 by the end of 2017. The projected increase in the customer base is largely as a result of new connections in recently served areas and the forecasted electrification programmes in 2013 and 2014.

An 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 collection trends over the past few years.

Table 5.1 Net generation & % Sales



5.2 PLANS TO REGAIN INDUSTRIAL CUSTOMERS

There is no doubt that industrial consumers expect:

1. A reliable and efficient service.
2. Competitive tariff.
3. Power of acceptable quality and available capacity to meet their growth.

The investments in generation, transmission, sub-stations, control facilities and loss reduction are all geared towards providing a reliable, least cost service. GPL expects to rebalance its tariffs once

power is commercially available from the hydro to remove the cross subsidy currently being provided by non-residential tariffs.

Before hydro, industrial consumers would be able to access power that is more reliable but the tariff reduction which many will be looking for would not come until 2017. GPL is not projecting to lose industrial consumers but expects that with Government's intervention to provide fuel subsidies thereby stabilizing the tariff, self generators will be attracted back to the grid.

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

Georgetown - The frequency standardization project in Georgetown will result in increased feeder capacity because of the higher distribution voltage. In addition, the new Georgetown substation will allow additional feeders to be available to serve the Georgetown load while the frequency conversion of the 22MW Wartsila built plant at Kingston would improve system reliability. It should also be noted that the new Kingston 11 plant's capacity has been increased to 36.3MW while a new 26MW plant will be constructed at Vreed-en-Hoop and connected to the national grid.

New Amsterdam - New Amsterdam is served from Canefield and the construction of a new substation at Williamsburg will effectively off-load 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 2013 will allow consumers in New Amsterdam to also access power from Demerara.

Rose Hall - The new substation at Williamsburg (which is contiguous to Rose Hall) 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, Canefield power station (11MW of HFO fired Mirrlees capacity) and from the 106MW Wartsila capacity in Demerara.

Anna Regina - GPL's power plant on the Essequibo Coast is located at Anna Regina. In 2014 an additional 3MW Wartsila unit will be added to the plant. This would increase the overall capacity there to 8.4MW with 7MW being Wartsila. This capacity would be adequate to meet the projected 4.9MW peak in 2017.

5.4 SUMMARY OF WORK PLAN

2013				
Technical Loss Reduction	Generation	Complete 26MW Vreed-en-Hoop Complete Frequency conversion - 22MW Wartsila Kingston 1 Plant		
	Transmission Lines	Complete Transmission Line between Versailles and Edinburg Substations Complete Transmission Line between Versailles and Kingston Substations, inclusive of submarine cable Complete Transmission Line between New Georgetown and New Sophia Complete Transmission Line between New Sophia and Ormerwagt		
		Substations	Complete Versailles Substation Complete Edinburgh Substation Complete Diamond Substation, including tie - lines 1 and 2 (69kV) Complete New Georgetown Substation Complete New Sophia Substation Complete Extension of Sophia Substation Complete Good Hope Complete Mahaicony (Columbia) Substation Complete Ormerwagt substation extension Kingston Substation Complete Garden-of-Eden (metering, SCADA interconnection, etc.) Complete SCADA system and new Sophia Control Center	
			Distribution	Complete Georgetown Frequency Conversion (15MW load) Complete Phase 1 of Distribution upgrade Complete Bartica 13.8Kv distribution upgrade Introduction of alternative structures
				DSM - Demand Side Management , energy efficiency Initiative
	Tec Loss Reduction			Replace 5,000 meters with pre-paid meters Coaxial cable use (Service Drops) IADB Public Education & Social Management Replace 5,000 defective meters Use of ITRON meters for large customers (expansion)
				Electrification
			New Services	4,800 new services
			Buildings	Complete new T&D building - Sophia Complete new Commercial / T&D building in Bartica Complete new T&D building - Wakenaam
	Capacity Building			Acquire T&D Equipment & Tools
	GIS			Implement GIS Application and commence collection of field data
	Total			

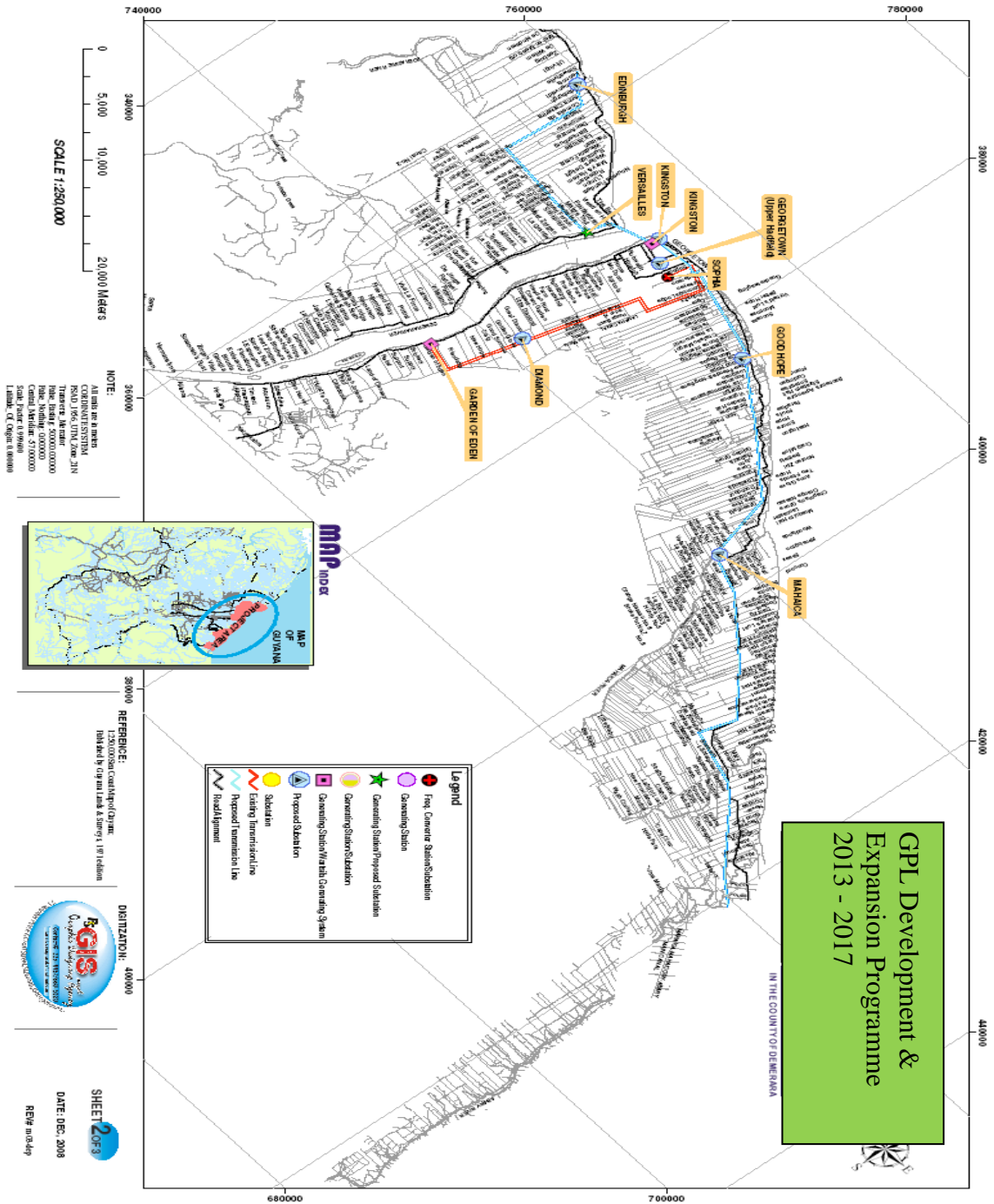
2014			
Technical Loss Reduction	Generation	Complete installation of 3MW HFO Unit for Anna Regina Complete new power plant with 2MW HFO Unit for Bartica Install 2 x 600kVa gensets in Leguan Install 600kVa genset in Wakenaam	
	Substations	Williamsburg sub-station 45% complete Extension & upgrade of No.53 Substation 25% complete	
		Distribution	Distribution upgrade Alternative structures Complete Leguan 13.8Kv distribution upgrade
	DSM		Demand Side Management
	Non Tec Loss Reduction		Replace 5,000 meters with pre-paid meters Replace 6,000 defective meters Utilize Coaxial cable (Service Drops) in areas targeted for loss reduction intervention. IADB Public Education & Social Management Install 2,000 AMI Meters
		Electrification	Un-served Areas Electrification
		New Services	4,200 new services
		Buildings	Complete New T&D Building New Amsterdam Commence construction of New Building Middle Street
	Capacity Building		Acquire T&D Equipment & Tools Implement Procurement & Inventory modules (Oracle Financial Computerized System) Commence work to interconnect offices in Demerara and Berbice using fiber optic cable (ICT Infrastructure) Commence implementation of an Electronic Document Management System

2015		
Technical Loss Reduction	Substation	Commence construction of Linden Substation & interconnection Complete Williamsburg substation Complete No. 53 substation extension
	Distribution	Distribution upgrade (Implement technical loss reduction plan) Employ alternative structures
	DSM	DSM - Demand Side Management
	Non Tec Loss Reduction	Replace 5,000 meters with prepaid meters Replace 6,000 defective meters Coaxial cable use (Service Drops) IADB Public Education & Social Management Install 2,000 AMI meters
	New Services	Meter 4,200 new services
	Building	Complete new building in Middle Street
	Capacity Building	Complete implementation of Procurement & Inventory modules (Oracle Financial Computerized System) Implement HR & Payroll Module (Oracle Financial Computerized System) Complete construction of ICT Infrastructure to facilitate high speed intranet Complete implementation of Electronic Document Management System Implement Planned Maintenance Software

2016		
Technical Loss Reduction	Transmission	Complete construction of new transmission line - Kingston - Sophia
	Substations	Commence construction of Linden Substation & interconnection Complete expansion of Kingston sub-station Complete expansion of Sophia sub-station
	Distribution	Distribution upgrade (Implement technical loss reduction plan) Employ alternative structures
	Compensation	Complete installation of 5 MVAR capacitor bank - Canefield (13.8Kv) Complete installation of 3 x 10MVAR capacitor bank - Kingston (69Kv)
	Non Tec Loss Reduction	Replace 6,000 defective and obsolete meters Replace 5,000 meters with pre-paid meters
	New Services	Meter 4,040 new services
	Capacity building	Purchase T&D Equipment Complete implementation of HR & Payroll Module (Oracle Financial Computerized System) Implement Fixed Assets Module (Oracle Financial Computerized System) Complete installation of Planned Maintenance Software

2017		
Technical Loss Reduction	Non Tec Loss Reduction	Replace 5,000 meters with pre-paid meters Replace 6,000 defective and obsolete meters
	New Services	Meter 4,040 new services
	Distribution	Distribution upgrade (Implement technical loss reduction plan) Employ alternative structures
	Capacity building	Complete implementation of Fixed Assets Module (Oracle Financial Computerized System)

5.5 Geographic Representation of Transmission Facilities - Demerara



6 OPERATING COSTS AND CAPITAL EXPENDITURES

6.1 Accounts Summaries

Table 6.1.: Profit & Loss Account

	2013	2014	2015	2016	2017
	G\$'000	G\$'000	G\$'000	G\$'000	G\$'000
<u>OPERATING REVENUE</u>					
Sales	31,678,121	34,733,968	36,835,697	39,592,996	41,057,627
Miscellaneous Income	145,686	148,600	151,572	154,603	157,695
TOTAL OPERATING REVENUE	31,823,807	34,882,568	36,987,269	39,747,599	41,215,322
<u>OPERATING COSTS</u>					
Fuel	24,734,738	24,437,869	26,903,617	30,595,316	4,008,634
Operations & Maintenance contract	1,831,118	1,817,391	1,867,824	1,969,461	-
Repairs & Maintenance	864,704	778,233	809,363	841,737	875,407
Purchased Power	415,692	437,699	441,907	446,930	22,064,324
Rental of Equipment	26,231	-	-	-	-
Employment costs	3,034,647	3,255,971	3,418,770	3,589,708	3,769,194
T&D Repairs and Maintenance	890,984	801,886	833,961	867,320	902,012
Administration	1,391,482	1,447,141	1,505,027	1,565,228	1,627,837
Rates	32,833	35,460	38,297	41,361	44,669
Bad debts	475,172	521,010	552,535	593,895	615,864
PUC Assessment & Licence	51,000	51,000	51,000	51,000	51,000
TOTAL OPERATING COSTS	33,748,600	33,583,660	36,422,301	40,561,955	33,958,942
Earning Before Interest, Tax, Depreciation and Amortization	(1,924,793)	1,298,908	564,968	(814,356)	7,256,380
<u>Depreciation and Amortization</u>					
Amortization - consumer financed projects	(437,058)	(445,799)	(454,715)	(463,809)	(473,086)
Depreciation	2,413,610	2,607,620	2,839,442	3,097,550	3,236,338
Interest	278,437	301,768	1,061,335	1,205,578	1,142,058
Net Depreciation and Amortization	2,254,989	2,463,589	3,446,062	3,839,318	3,905,310
Net profit before taxation	(4,179,782)	(1,164,681)	(2,881,094)	(4,653,675)	3,351,070
Taxation	87,000	95,000	100,000	105,000	105,000
Net profit/(loss) after taxation	(4,266,782)	(1,259,681)	(2,981,094)	(4,758,675)	3,246,070
Accumulated deficit b/f	(12,987,457)	(17,254,239)	(18,513,920)	(21,495,014)	(26,253,688)
ACCUMULATED DEFICIT C/F	(17,254,239)	(18,513,920)	(21,495,014)	(26,253,688)	(23,007,619)

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

Table 6.2: Cash Flow Statement

	2013	2014	2015	2016	2017	Total
	G\$'000	G\$'000	G\$'000	G\$'000	G\$'000	G\$'000
OPERATING RECEIPTS						
Sales collections	30,176,794	34,386,629	36,467,340	39,197,066	40,647,051	180,874,879
Other Receipts	587,742	136,840	139,577	142,369	145,216	1,151,744
Customer Security Deposits	52,500	49,875	47,381	45,012	445,012	639,781
VAT Refunds	523,005	519,555	543,561	566,726	220,809	2,373,656
TOTAL OPERATING RECEIPTS	31,340,040	35,092,900	37,197,859	39,951,173	41,458,088	185,040,060
OPERATING EXPENDITURE						
Fuel	22,779,546	24,437,869	26,903,617	30,595,316	4,008,634	108,724,982
O&M Contract	2,118,157	1,817,391	1,867,824	1,969,461	-	7,772,834
Generation Maintenance	815,878	778,233	809,363	841,737	875,407	4,120,618
Purchased Power	396,760	437,699	441,907	446,930	22,064,324	23,787,620
Rental of Generators	106,231	-	-	-	-	106,231
R&M - T&D	890,984	801,886	833,961	867,320	902,012	4,296,163
Employment Costs	3,019,671	3,255,971	3,418,770	3,589,708	3,769,194	17,053,315
Administration Expenses	1,329,383	1,498,141	1,556,027	1,616,228	1,678,837	7,678,616
Rates & Taxes	47,000	35,460	38,297	41,361	44,669	206,787
PUC Assessment & Licence	51,000	51,000	51,000	51,000	51,000	255,000
Interest	67,002	301,768	1,061,335	1,205,578	1,142,058	3,777,740
Corporation & Property Taxes	87,000	95,000	100,000	105,000	105,000	492,000
VAT	409,731	529,539	544,835	568,716	189,181	2,242,003
TOTAL OPERATING EXPENDITURES	32,118,344	34,039,958	37,626,936	41,898,354	34,830,317	180,513,908
OPERATING CASH DEFICIT	(778,303)	1,052,942	(429,076)	(1,947,181)	6,627,771	4,526,152
CAPITAL RECEIPTS						
Proceeds from share issue	1,000,000	-	436,800	2,002,000	-	3,438,800
Loans	5,203,500	3,800,000	2,500,000	2,800,000	-	14,303,500
Others (IADB and customer capital cont)	688,040	735,657	102,621	55,000	60,500	1,641,817
TOTAL CAPITAL RECEIPTS	6,891,540	4,535,657	3,039,421	4,857,000	60,500	19,384,118
CAPITAL EXPENDITURE						
Others - Non Technical	278,945	715,312	441,210	286,200	21,400	1,743,067
Generation, T&D & Metering	6,103,218	4,481,211	2,093,611	2,638,552	1,756,341	17,072,933
TOTAL CAPITAL EXPENDITURES	6,382,163	5,196,523	2,534,821	2,924,752	1,777,741	18,816,000
FINANCING EXPENDITURE - LOAN RE-PAYMENTS (PRINCIPA	240,686	117,230	85,259	93,215	101,904	638,295
NET CASH BALANCE FOR PERIOD	(509,612)	274,845	(9,736)	(108,148)	4,808,626	4,455,975
Balance b/f	693,933	184,321	459,166	449,430	341,282	693,933
BALANCE C/F	184,321	459,166	449,430	341,282	5,149,908	5,149,908

Note: The biggest threat to cash flows is unforeseen steep rises in the price of fuel. Based on information from the US Energy Information Administration, crude price (WTI) is expected to average US\$96 per barrel in 2013. Based on average historical spreads, HFO and LFO are forecasted at US\$108.25 and US\$132.79 per barrel (CIF), respectively, for 2013. Thereafter, these prices are forecasted to rise by 5% p.a. thereafter.

7. PROJECTED CAPITAL EXPENDITURE

It should be noted that the projected capital expenditure does not include interest but the financial statements above does.

Table 7.1: Summary of Capital Expenditure, US\$

Summary of Capital Expenditure (US\$)						
	2013	2014	2015	2016	2017	Total
Generation	\$ 9,119,833	\$ 7,894,475		\$ -	\$ -	\$ 17,014,308
Transmission Lines	\$ 2,753,726	\$ -	\$ -	\$ 539,000	\$ -	\$ 3,292,726
Substations	\$ 7,258,715	\$ 2,135,000	\$ 1,640,000	\$ 3,875,000	\$ -	\$ 14,908,715
Compensation	\$ -	\$ -	\$ -	\$ 950,000		\$ 950,000
Distribution	\$ 6,145,000	\$ 6,839,450	\$ 5,100,000	\$ 5,100,000	\$ 6,125,000	\$ 29,309,450
DSM	\$ 285,000	\$ 320,000	\$ 255,000	\$ -	\$ -	\$ 860,000
Non-Technical Loss Reduction	\$ 2,290,000	\$ 2,635,575	\$ 2,260,575	\$ 1,275,000	\$ 1,355,000	\$ 9,816,150
New services	\$ 775,000	\$ 693,000	\$ 714,000	\$ 707,000	\$ 727,200	\$ 3,616,200
Buildings	\$ 464,100	\$ 1,494,000	\$ 896,000	0	0	\$ 2,854,100
Capacity building	\$ 390,000	\$ 1,445,000	\$ 1,005,000	\$ 1,350,000	\$ 100,000	\$ 4,290,000
Electrification	\$ 1,000,000	\$ 1,026,786		\$ -	0	\$ 2,026,786
GIS	\$ 500,000	\$ 500,000	\$ 200,000			\$ 1,200,000
Total	\$ 30,981,374	\$ 24,983,286	\$ 12,070,575	\$ 13,796,000	\$ 8,307,200	\$ 90,138,435

Table 7.2: Summary of Capital Expenditure, G\$M

Guyana Dollar (Millions)		2013	2014	2015	2016	2017	Total
Exchange Rate		206	208	210	212	214	
Generation	\$	1,879	1,642	-	-	-	\$ 3,521
Transmission Lines	\$	567	-	-	114	-	\$ 682
Substations	\$	1,495	444	344	822	-	\$ 3,105
Compensation	\$	-	-	-	201	-	\$ 201
Distribution	\$	1,266	1,423	1,071	1,081	1,311	\$ 6,151
DSM	\$	59	67	54	-	-	\$ 179
Non- Technical Loss Reduction	\$	472	548	475	270	290	\$ 2,055
New services	\$	160	144	150	150	156	\$ 759
Buildings	\$	96	311	188	-	-	\$ 595
Capacity building	\$	80	301	211	286	21	\$ 900
Electrification	\$	206	214	-	-	-	\$ 420
GIS	\$	103	104	42			\$ 249
Total	\$	6,382	5,197	2,535	2,925	1,778	\$ 18,816

8. FUNDING

8.1 Sources of Funding

Funding over the next five years will come from both internal and external sources. External sources include the IDB, the Exim Bank of China and Government of Guyana. The table below summarizes the sources and amounts of funding.

Table 8.1: Summary and Sources of Funding US\$

Source of Funding (US\$)	Debt	IDB	GoG	GPL	Total
Generation	12,606,616	-	-	4,407,692	17,014,308
Transmission Lines	3,292,726				3,292,726
Substations	14,908,715				14,908,715
Compensation	950,000				950,000
Distribution	19,875,000	3,309,450		6,125,000	29,309,450
DSM	860,000				860,000
Non-technical Loss Reduction	7,470,000	991,150		1,355,000	9,816,150
New Services	2,889,000			727,200	3,616,200
Buildings	2,854,100				2,854,100
Capacity Building	4,190,000			100,000	4,290,000
Electrification			2,026,786		2,026,786
GIS		800,000		400,000	1,200,000
Total	69,896,157	5,100,600	2,026,786	13,114,892	90,138,435

All new debt will be via concessional financing. The table below shows how different sources of funding affect the debt: equity ratio.

Table 8.2 Debt / Equity Ratio

Year	Debt - %	Equity - %
2013	74	26
2014	80	20
2015	88	12
2016	99	1
2017	97	3

9. TARIFF TRENDS AND TARIFF REBALANCING

Tariff rebalancing is recognized as necessary in order for the GPL to maintain and to attract back former industrial consumers, now self generating. A tariff study done in 2010 confirmed that Tariff A is being subsidized by the other tariff categories to the tune of 33%. No tariff rebalancing will be

done until Q4 of 2016 in preparation for hydropower being available commercially in January 2017. At this time, complete tariff rebalancing will be done by disproportionately reducing all tariffs. Based on a marginal cost approach, the study indicates that Tariff A should be increased by 25% while Tariffs B, C and D should be reduced by 17%, 17% and 29% respectively.

In keeping with the recommendation of the tariff study a new industrial tariff would be introduced in 2016 for consumers using 2.5MVA and above.

The tariff rebalancing forecast presented below and its sustainability is premised on:

- The projected loss reduction targets being achieved;
- Fuel prices not escalating significantly above 8% per annum
- Exchange rates not exceeding significantly the projected rates
- Hydro achieves commercial operation in Q1 2017.
- GPL expanding the market to maximize dispatch from the hydro.

The forecasted tariff rebalancing plan is premised on GPL tariffs at December 31st 2012 and reflects the recommendations from the tariff study, financed by the IADB in 2010. It should be noted that the 2014 tariffs reflect an increase of 20% for all categories and annual tariffs reflect changes in exchange rate to the US\$.

Table 9.1 Tariff rebalancing plan

Average Selling Price - US cents/kWh							
	2012	2013	2014	2015	2016	2016	2017
Tariff							
A	25.57	25.57	25.32	25.08	24.84	24.84	22.15
A	27.40	27.40	26.63	26.88	26.63	26.63	-
B	36.59	36.59	35.56	35.89	35.56	35.56	28.18
C	35.82	35.82	34.80	35.13	34.80	34.80	27.58
D	32.69	32.69	31.77	32.07	31.77	31.77	25.17
E	25.90	25.90	25.17	25.40	25.17	25.17	22.44
F							22.66
GA	24.88	24.88	24.17	24.40	24.17	24.17	
GA	27.23	27.23	26.46	26.71	26.46	26.46	
GB	36.47	36.47	35.43	35.77	35.43	35.43	
GC	34.88	34.88	33.90	34.22	33.90	33.90	
GD	33.73	33.73	32.78	33.09	32.78	32.78	
GE	27.02	27.02	26.26	26.51	26.26	26.26	

The advent of hydropower in 2017 would allow for Government tariffs to be aligned (reduced) with the corresponding non-Government tariff category. It would also provide opportunities for industrial tariffs C and D to be reset at points which would attract large companies back to the grid with a price below their projected self generation cost.

10. DEMAND SIDE MANAGEMENT (DSM)

Demand Side Management (DSM) is the implementation of policies and measures which serve to control, influence and generally reduce electricity demand. DSM has been pursued internationally over the last two decades as an initiative to reduce demand growth while leveraging advantages to both Utilities and Consumers. It is recognized as a major solution in the fight against climate

change and significant investment is being made by developed countries. In Guyana, it would support the Government's Low Carbon Development Strategy while allowing GPL to forego investments in generation and T&D.

DSM relies essentially on two pillars, behavioral change and technological intervention (Energy Efficiency). GPL has set the following objectives for DSM:

1. Education of customers to ensure electricity use is managed prudently, i.e. basic tips are employed routinely in the home, factory or office.
2. Ensure that various categories of customers are aware of the energy efficient appliances they can employ.
3. The average school child is aware of what can be done to reduce electricity wastage.
4. Energy efficient appliances are more common on the local market.
5. The sale of energy efficient appliances increases from year to year.

The following are some of the initiatives that will be employed in the pursuance of DSM objectives.

- Continuing to provide information to consumers via flyers, radio, television and printed media regarding energy management and efficient use of electricity.
- Making the secondary school debating competition focusing on energy efficiency and behavioral change and their impact on electricity use, an annual event.
- Continuing to interact with consumers and the public at large at trade fairs country-wide and discussing ways to use electricity efficiently.
- Working with the GEA on the public education campaign to encourage use of energy star rated appliances.
- Actively pursue grant financing for an Energy Efficiency Action Plan, develop a street lighting standard, implement an energy efficient street lighting pilot project and develop a database to capture information that would facilitate future interventions.
- A public lighting standard will be pursued based on energy efficient lighting.
- The initiative to introduce pre-paid meters is in itself a technological intervention as consumers can now access information that facilitates conservation through more prudent use of power.
- GPL will develop a database, providing grant financing is available, and begin to populate it with the following information:

a) End-use equipment for consumers by tariff category -

- i) Power demand
- ii) Type of design – Energy efficient or traditional
- iii) Year of manufacture
- iv) Typical hours of use
- v) Operating Power Factor (where applicable)

b) Energy efficient equipment available on the market –

- 1) Manufacturer, specifications, construction standard, energy consumption and guarantees.
- 2) Prices and availability including names and addresses of local and Regional distributors.

- c) Energy Efficiency Consultants / Service Providers available in the Region –
 - 1. Names and contact information.
 - 2. Experience and availability n

10.1 BENEFITS OF DSM

Demand Side Management is now universally accepted as an effective tool in countering unbridled demand growth. Since third world countries have the greatest potential for growth, DSM initiatives can derive multiple benefits including:

- a) Deferral of investments in generation and networks.
- b) Reduction in Technical losses.
- c) Improvement in network reliability due to reduce load and associated failures.
- d) Social benefits as Consumers can improve their standard of living and more can afford service if they can use power more efficiently.
- e) Reduction of greenhouse gas emissions.

With the Guyana Energy Agency leading the national effort on Demand Side Management and Energy Efficiency, GPL will play a supporting role in public education.

11. HUMAN RESOURCES

Development and maintenance of the requisite core of skills to manage the evolving electricity infrastructure that is based increasingly on automated and ICT systems would be critical for GPL. The continued heavy loss of skills challenges even the best of plans as new professionals depart after gaining some practical experience. The Company plans to reopen its Management Trainee programme to a new batch of graduates, particularly from the electrical engineering discipline. While GPL's remuneration to professional level staff is competitive and we have been able to attract persons from both the public and private sectors, the loss of skills to the Caribbean and North America continues. The Company will therefore be forced to engage experts on short term contracts to mentor young graduates through its Management Trainee programme. 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.

GPL 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 rely on its apprenticeship programme to provide the requisite number and level of skills. GPL has also been benefiting from national training being done through the Ministry of Labour 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.

12. IMPACT OF PROGRAMME ON NATURAL & SOCIAL ENVIRONMENT

All new generating assets is Vreed-en-Hoop, Anna Regina, Leguan, Wakenaam and Bartica 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. More importantly, the use of renewable resources, particularly in 2017 would have a net positive environmental impact. GPL has obtained the necessary permits for the construction of the various transmission lines and substations under the IDP, from the EPA. Similar 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 power legitimately, the significant investments in generation and networks to improve power quality, customer service and planned reductions 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 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.

13. RISK AND MITIGATION

13.1 Loss Reduction

GPL has set itself realistic targets for loss reduction over the life of this Programme. The resources necessary to drive the various loss reduction initiatives, which are financed by internal cash-flows, are at risk of high fuel prices and the Company not realizing its loss reduction forecasts despite implementing the various initiatives. The risk of not achieving the projected level of loss reduction depends on reversing the culture of electricity theft as the technological interventions are not absolute guarantees. The fact is that the employment of new technology and designs in combination with public education and Social Management Programmes is considered the best practice to achieve sustained loss reduction. The risk that GPL would not realize the level of loss reduction envisaged would be mitigated by constant review of the results of implementing the various initiatives and modifying actions appropriately. There is a real risk that the culture of electricity theft would not change but the combination of modern fraud proof network designs, latest in metering technology and continued use of legal avenues are expected to have some impact. Since loss reduction will be the main focus of the capital programme in the last four years of this D&E, it is not expected that loss reduction efforts will be stymied by lack of financial resources.

13.2 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 and financial resources, GPL cannot take advantage of price drops but is forced to deal with the numerous price fluctuations.

Co-generation from GuySuCo would help, albeit in a minimal way, to militate against the impact of high fuel prices in the short term, but the plan to change the fuel mix urgently to reduce diesel use to a minimum is the optimal interim arrangement until the advent of hydro in 2017, which would obviously mitigate this risk significantly. The use of modern, more efficient HFO fired equipment to meet over 90% of the Company's generation needs is the best interim plan to hydro. The new 26MW power plant at Vreed-en-Hoop would ensure this is realized as it would achieve commercial operation in Q3 2013 when the Demerara and Berbice systems are integrated.

13.3 Market Size

The risk of not expanding its market size would result in GPL having to pay for energy and capacity that it cannot use when hydro comes on line in January 2017. Not being able to market all the energy in 2017 would result in the full benefits of lower cost energy not being realized by customers. GPL expects that with the advent of hydro, rebalanced and reduced tariffs (below the avoided cost of self generators) and stable supply, self generators will be attracted back to the grid. It would be noted that GPL would invest in the network infrastructure necessary to deliver power to almost all load centers in Regions 2, 3, 4, 5, 6, 7 and 10.

14. Financial Contingency

The majority of the debt financing envisaged for this five-year Programme has been fully secured, which means that the major generation, transmission, substation and control facilities will be constructed. Provision has been made in the financial projections for some capacity to absorb increased operating costs, particularly from fuel, without derailing the capital programme.

There is a limit to any contingency arrangement as while it has to pass the acid test of reasonableness it is always constrained by resources.

14.1 Hydro Delay

GPL would have to continue to rely on HFO capacity to meet demand and energy needs if the commercial operation of hydro is further delayed. There is always an option to inject mobile generation units to meet any short-term shortfall, as has been done by GPL in the past. But the emergency generation addition would be based on additional high speed, diesel fired capacity.

14.2 Transmission & Distribution

While most of the transmission and sub-station facilities and new feeders are financed, are being constructed and should be in operation in 2013, major investments in technical loss reduction through the life of the Programme would be financed from internal cash flows. This

means that they could be impacted by abnormally high fuel prices and lack of progress in loss reduction.

Buying adequate stocks of fuel to avoid load shedding would always be given priority over loss reduction investments therefore the scope of these investments would have to be adjusted if debt financing is not an option.

15. COST-BENEFIT ANALYSIS OF INVESTMENT PROJECTS

The transmission and sub-station projects have been grouped logically to calculate the cost-benefit analysis. The logical grouping is necessary as each group forms a compliment that is necessary to perform a desired function. The cost-benefit analysis has been done for a twenty-year period.

Project	Cost (US\$M)	Benefit	
		NPV (US\$M)	IRR
Upgrade existing Sophia, build new G'town sub-station & interconnection	6.891	2.887	7%
Golden Grove Substation	3.102	3.852	12%
Vreed-en-Hoop Substation and Kingston interconnection.	6.528	11.387	14%
New Edinburgh (Leonora) Substation & transmission line from Vreed-en-Hoop.	4.212	3,205	9%
New Good Hope sub-station.	1.295	2.334	17%
New Columbia Sub-station	1.360	5.653	30%
Expand & Upgrade Onverwagt, New Sophia sub-station & Control Centre, Sophia to Onverwagt 69 kV transmission line & SCADA	15.575	39.937	18%
2 x 600kW gensets for Leguan	0.15	0.015	10%
600Kw genset for Wakenaam	0.068	0.019	14%
Anna Regina interconnection, including interconnection of Leguan & Wakenaam and related works.	17.36	2.64	8%
Linden Interconnection.	4.5	8.2	67%
No. 53 substation	1.85	1.956	16%
Williamsburg substation	1.995	.789	6%
2 X 3MW Units for Versailles	3.0	2.889	38%
3MW Unit for Anna Regina	3.9	11.6	31%
2MW HFO Unit for Bartica	3.2	11.9	41%
Kingston Wartsila 22MW frequency conversion (50 – 60Hz)	7.685	12.7	17%
26MW Vreed-en-Hoop Power Plant	32.0	2,268	7