Samoa Country Study

TA6810: DEVELOPMENT OF PACIFIC ENERGY REGULATORS ALLIANCE

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Acronym

Acronym	Meaning
ADB	Asian Development Bank
BSC	Balanced Scorecard
BESS	Battery Energy Storage System
CF	Capacity Factor
DoE	Department of Energy
EOI	Expression of Interest
EPC	Electric Power Corporation
EU	European Union
EIRR	economic internal rate of return
FIRR	financial internal rate of return
FTE	Full Time Equivalent
GCF	Green Climate Fund
GEF	Global Energy Fund
GoS	Government of Samoa
GWh	gigawatt hour
IPP	Independent Power Producer
kW	Kilowatt
kwh	kilowatt hour
KPI	Key Performance Indicator (Measure)
LTI	Lost Time Injury (Incidents)
LTID	Lost Time Injury Days
MNRE	Ministry of Natural Resources & Environment
MOF	Ministry of Finance
MW	Megawatt
MWh	megawatt hour
NECC	National Energy Coordination Committee
O&M	operations and maintenance
OOTR	Office of the Regulator - Samoa
OPERA	Office of the Pacific Energy Regulators Alliance
PDS	Pathway for the Development of Samoa 2020/21 to 2025/26
PIC	Pacific Island Countries
PPA_1	Power Purchase Agreement
PPA_2	Pacific Power Association
PSEP	Power System Expansion Plan
RE	Renewable Energy
ROCE	Return on Capital Employed
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SDG	Sustainable Development Goals
SSRES	Small Scale Renewable Energy Source
SOE	State owned enterprise
STEC	Samoa Trust Estate Corporation
TA	Technical Assistance
TOR	Terms of Reference

UNDP	United Nations Development Programme
USD	United States Dollar
WAPe	Weighted average price of electricity
VRE	Variable Renewable Energy
WST	Samoan Tala which equals 100 sene

1. Executive Summary

(a) The Samoa Country Study was commissioned under the ADB funded TA 6810 - REG: Development of the Pacific Energy Regulators Alliance to assist the OOTR with improving the regulation of the Samoan Electricity Sector.

(b) The long-term positive trend in Samoa's energy use per person even as the population has grown during the same period reflects Samoa growing affluence level. This growth in energy usage per person is illustrated in Figure 2.

(c) With the expected conversion of land transportation from fossil fuels to electric vehicles in as second-hand electric vehicles become available from the international market, the growth in the electricity demand upon the grid is expected to increase significantly over the next 10 years.

(d) The OOTR was established for telecommunication and expanded to the electricity sector under the Electricity Act 2010.

(e) The Electric Power Corporation (EPC) was established under the Electricity Power Corporation Act 1980 and is the sole operator of the electricity grid in Samoa.

(f) Under the Energy Management Act 2020, the National Energy Coordination Committee (NECC) was established to coordinate the energy strategy for Samoa. The NECC comprises of representatives of the Government of Samoa (GoS) ministries and State-Owned Enterprises (SOEs) and is chaired by the Minister of Finance and co-chaired by the Minister of Natural Resources and Environment and Minister responsible for EPC. The OOTR is not a member of the NECC as per the Energy Management Act. It is recommended that the OOTR becomes a member of the NECC with the objective of ensuring a process that is transparent and fair to all parties delivering the most competitive price for production capacity and a quality, reliable and secure service.

(g) In the "Pathway for the Development of Samoa (PDS)" FY 2021/22 to FY 2025/26 the GOS has set the target for renewable energy: "Therefore, Samoa will continue to transition to solar, wind and hydropower ahead of its goal of achieving 70% renewable energy use by the end of 2031."[1] The energy usage includes all energy usage sectors such as the electricity sector, land and sea transportation and others.

(h) In November of 2021 the GOS arbitrary reduced the electricity tariff by 20%. Prior to the reduction in the electricity tariff on November 2021, the weighted average price of electricity for Samoa was the lowest of the medium size PIC power utilities as defined by the Pacific Power Association in their annual Benchmarking Report for PIC Power utilities. This comparison based on data provided by the power utilities is shown in Figures 3 and 4 for the financial year 2021.

(i) This action by Cabinet directive appears to contravene the Part II Section 8 (3) of the Telecommunications Act 2005 that establishes the independence of the OOTR.

(j) The arbitrary act by the GOS in reducing the tariff by 20% was probably due to the pressure of rising fuel prices. Figure five illustrates that as fuel prices were increasing and subsequently the electricity tariff based on the tariff model, this action was taken. This resulted in reduced EPC's revenue even as fuel expenses was increasing, jeopardising EPC's financial sustainability. While the OOTR and EPC could learn lessons to avoid repeat in the future, the best strategy is to decouple the electricity tariff from the price of fossil fuel by increasing the renewable energy contribution to the grid, expedite tariff reforms, regulate

[1] PDS page 25

based on international best practise and insulate the regulation function from such political actions.

(k) Production capacity planning is a critical function for determining the electricity demand and capacity needs for the grid to enable a structured and controlled process for achieving the SDG goals. EPC has not produced a Power System Expansion Plan (PSEP) since 2018 and it is imperative that it is produced. Key questions that must be answered in the PSEP are; How does EPC plan to achieve the renewable energy targets set for Samoa? How will the security of power supply be maintained with the addition of more VRE? How is the tariff impacted?

(l) An inventory of renewable resources needs to be compiled, identifying current status of development, potential capacity, and requirements for further development. This task needs to be undertaken by EPC and/or the MNRE.

(m) The process of procuring production capacity for the grid has been largely dictated by unsolicited offers and it would be fair to say it has not produced the competitive prices as evidenced by the Solar for Samoa(SfS) IPP. (SfS) was recently bought out by EPC to avoid continuing to pay the high price for energy.

(n) It is best that through the NECC a structured process is agreed and implemented to procure capacity. This must commence with the production of the PSEP by EPC to identify capacity needs, opportunities, and development options (in-house or IPP). A tender process involving two stages with calling for EOIs and shortlisting for submission of a full bid, should be followed to ensure appropriate technologies are procured at a competitive price from IPPs. A flow chart of the proposed process is described in Annex 4.

(o) Meanwhile, full exploitation of the renewable energy capacity currently connected to the grid is recommended. In particular, the Afolau biomass gasifier, 750 kW plant owned by STEC needs to be made operational. The stated reasons for its unavailability is due to the lack of manpower to harvest the feedstock and the lack of woodchippers to prepare the feedstock. The latter has been addressed with the purchase of woodchippers which are on delivery while the former needs to be addressed with urgency.

(p) Small Scale Renewable Energy Systems (SSRES) are currently dealt with as IPPs. The SSRES policy that is currently in the development stage needs to address the SSRES such as rooftop solar PV differently from IPPs and community-based projects as they are primarily developed for the consumers' own use.

(q) It is critical to manage the connection of SSRES to the grid to avoid oversupply that could result in high spillage energy from the hydro schemes and IPP solar PV plants. EPC should identify the capacity requirements that can be made available for SSRES as part of the PSEP.

(r) In consultations with the Samoa Chamber of Commerce, members desire a policy that will allows them to invest in SSRES with a decent return on investment. Under the current requirements by EPC, the prosumer must connect its SSRES directly to the grid and sell all energy produced to EPC and repurchase its energy needs via a separate grid connection. This makes the investment uneconomic. This requirement is contrary to the required connection as per EPC's Grid Code. (Refer to Figure 6).

(s) The feed-in tariff to be considered in the SSRES policy needs to address the cost requirements placed on EPC to accommodate SSRES. This may require a two-part tariff for prosumers. A detailed study which is not within the scope of this study is recommended.

(t) Regulating the performance of EPC needs to be done in a structure manner and needs to be tied to financial rewards to be effective. The Balanced Scorecard (BSC) framework is recommended. A well-structured BSC will ensure that short-term financial performance is not achieved by curtailing investment in maintenance and capacity that will impact the quality and reliability of supply in the medium to long-term. It will also ensure that

performance is assessed from various perspectives such as GoS, financial, customer, process, and earning & growth perspective.

(u) It is critical that effective consultations with EPC be undertaken in the formulation of the BSC.

(v) Since OOTR is required to approve the budget for EPC, the OOTR should also approve the amount of the performance pay-out. It is important that EPC distributes the performance pay in a transparent way proportionally rewarding good performers and denying poor performers. An equal percentage share of the performance payout to all employees is not recommended as it will destroy any incentive towards excellent performance. An example of how the Author of this report achieved this as the CEO of Nauru Utilities Corporation is provided.

(w) As part of the performance management systems key achievements such as the production of the PSEP, the audited annual report and key timelines could be mandated. This will ensure responsiveness as the determination of the performance pay would be predicated on these reports.

2. Summary of Recommendations:

The summary of recommendations arising from this study are:

Improvement of Regulation Framework:

1. That the EPC Act 1980 be revised and updated to align with the current legislation Electricity Act 2010 and other laws governing the regulation of the electricity sector. In this regard the OOTR needs to represent to the GoS the need to proceed with urgency and participate in the ensuing review.
2. Reduce the fees in the Electricity Act 2010 for lodging an appeal to the Tribunal against a decision of the OOTR to a level that is not as great a barrier as it currently is, and yet is sufficient to deter frivolous appeals. The current fees of SAT $ 100,000.00 for a company and SAT $ 50,000.00 for an individual is considered excessive.

Best Practise Regulation

3. Undertake a survey among stakeholders including the general public to ascertain the OOTR's alignment with the nine principles of best practise regulation as described in Annex 1.
4. That the OOTR review their communications and consultations strategy. The survey carried out under recommendation 3 would help shape the OOTR's communication and consultation strategy.
5. While the OOTR does provide a Determination that details the rationale for multiyear tariff review, the price order for even routine changes in tariff should provide a brief on the rationale for the price change.
6. The target return on investment for EPC provided by the tariff determined by the tariff model needs to be determined. A similar sized utility in the PIC sets the return at 8.5% on the total funds employed.
7. That the OOTR require EPC to propose for approval a system that distributes the performance pay-out to employees that is determined by their contribution to the overall performance of EPC. The distribution of the payout must differentiate between the good performers and the poor performers. EPC may also require assistance in the design and setting up of this system.
8. The OOTR needs to include in their Annual Report the competitiveness of Samoa's electricity tariff benchmarked against other PICs.
9. While a detailed Training Needs Analysis was not required to be carried out under the scope of this consultancy, based on interactions and observations, the OOTR would benefit from capacity building programs in the following areas:
    a. Preliminary assessment of various RE resources and key factors to consider.
    b. Economics of power systems operation.
    c. Performance management of power utilities.
    d. Effective communications and consultations.

Electricity Sector Planning

10. That the OOTR be a member of the NECC to ensure a transparent and fair process is adopted for procuring RE capacity and the best outcome for Samoa. The proposed process is described in Annex 4.

11. EPC needs to provide a PSEP to ensure a well-managed process for involving the private sector in power production. The production of a five-year plan to be reviewed annually should be included as a task item in the BSC for evaluating EPC's performance.
12. That a review of Samoa's inventory of potential RE resources be carried out by EPC and the MNRE to set the basis for developing the resources in a structured and orderly fashion. The PSEP should include a section reviewing the RE potential resources for Samoa.
13. SSRES is a potential RE resource that can make a significant contribution to the transitioning to RE. The SSRES policy needs to treat such sources differently from large scale IPPs as is currently the case. That a SSRES be classified as any installation that is less than between 100 kW and 200 KW.
14. That a review of the feed-in tariff for SSRES be undertaken to take into consideration all cost factors to the prosumer and to EPC with the objective of determining a tariff that provides net benefits to all parties.
15. The OOTR needs to complete the review of the SSRES policy.

Performance Management of Utility

16. That the performance of EPC be determined using the BSC framework. An example of how this could be implemented is provided in this report. The OOTR will require assistance in implementing a performance regulating system and training of staff.
17. The performance of EPC should be coupled with monetary reward. A payout of up to between 10% and 20% of base salary is recommended.
18. That OOTR approves the total payout for performance after each complete financial year to be paid out a week be Christmas following the end of each financial year. EPC's financial year ends on the 30th of June.

Risk Management

19. The arbitrary act by the GoS of reducing the tariff by 20% at a time of rising diesel fuel costs is a risk that needs to be addressed by the OOTR and EPC. This may be helped by improving communications with the political entities and regularly updating them especially on the competitiveness of the electricity tariff in Samoa compared to similar sized PICs
20. The biomass plant owned and operated by STEC needs to be made operational to provide savings in diesel fuel expenditure by EPC. The issue with harvesting feedstock caused by the lack of manpower needs to be addressed. While this is primarily a problem for STEC, the impact is on the electricity sector and on Samoa's foreign exchange situation and should be of concern to EPC and the OOTR. As a requirement under the generating license issued by the OOTR, licensees should be required to report such constraints on generating capacity and OOTR must take a proactive approach in coordinating the response to remove such constraints. Consideration that the PPA_1 issued to the IPP contain penalty clauses for such incidents to ensure EPC is sufficiently compensated for the expenses resulting from additional diesel generation due to the non-availability of IPP RE capacity.
21. The buy out of the IPP, Solar for Samoa, because of the high price of the energy it generates sends a negative signal to the private sector for participating as IPPs. The highly priced PPA_1 is most likely the result of several key factors including a poorly structured procurement process, poor execution of the process and inexperience on the part of EPC and OOTR. This is best avoided by having a transparent process for the procurement of RE capacity. A study

should be commissioned to extract learning points from this experience that could help modify the procurement process.

3. Background

The Samoa Country Study was commissioned under TA 6810, REG: Development of the Pacific Energy Regulators Alliance funded by the ADB. The objective of the study is to make recommendations to improve the regulation of the electricity sector in Samoa.

Samoa comprises 16 islands with a total land area of 2,840 km^2 covering an ocean area of 3,123 km^2 in the South Pacific Ocean. Only four of the 16 islands are inhabited.

The population of Samoa as per the November 2021 census was 205,557.[2] Over 99% reside on the main island of Upolu (78%) and Savaii (almost 22%). With a small number on Manono (811) and Apolima (81) islands. The long-term trend in population growth is shown in Figure 1.

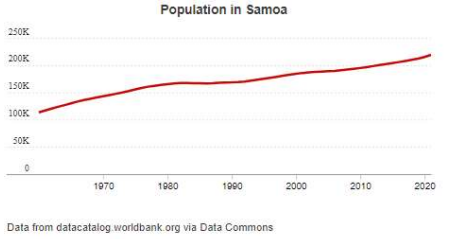


Figure 1: Population Trend for Samoa

The GDP at current market prices in March of 2023 was $2,414.5 million. This was an increase of 10.7% to the year ending March 2022. The GDP per capita was $ 11,602.

The energy use per person in Samoa in 2019 was 7,402 kwh. This includes the energy usage in electricity, transport, heating and cooking. This is compared to Fiji (9,343 kWh), Tonga (6,664 kWh), Vanuatu (3,140 kWh and the Solomon Islands (2,023 kWh) in Figure 2.[3]

The long-term trend in the per capita use of energy for Samoa reflects its growing affluence level.

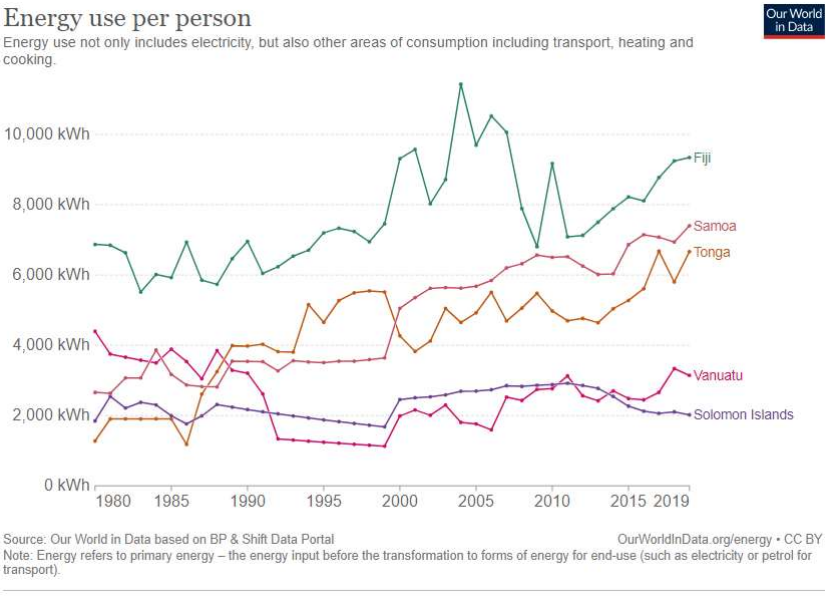


Figure 2: Energy Usage per Person for Samoa and PICs

This organic growth in the per capita usage of energy has occurred even as the population has grown steadily over the same period. This trend has some way to go as Samoa's affluence level increases. This growth coupled with the requirements of new demand and the expected conversion of land transportation in the long term from fossil fuel-based vehicles to electric vehicles, is expected to significantly increase the demand on the electricity grid over the period leading up to 2031.

[2] SAMOA POPULATION AND HOUSING CENSUS, 2021
[3] https://ourworldindata.org/energy

4. Electricity Industry Structure

EPC is the sole provider of electricity throughout Samoa. It operates three grids, the grid on the main island of Upolu which includes a submarine cable connection to Manono island, the grid on the largest island of Savai'i, and a solar PV, BESS mini grid for the island of Apolima. The EPC operates as a GoS SOE under the EPC Act 1980.

The OOTR is charged with regulating the electricity sector under the Electricity Act 2010. This Act extends the role of the regulator that was established under the Telecommunications Act 2005 for the Telecommunications sector to the Electricity sector.

Under the Energy Management Act 2020, the National Energy Coordination Committee (NECC) was established to coordinate the energy strategy for Samoa. The NECC is comprised of the following members:

a. Minister of Finance, as Chairperson;
b. Minister of Natural Resources and Environment, as Co-Chairperson;
c. Minister of Works, Transport, and Infrastructure;
d. Chief Executive Officer of the Ministry of Finance;
e. Chief Executive Officer of the Ministry of Natural Resources and Environment;
f. Chief Executive Officer of the Ministry of Works, Transport, and Infrastructure;
g. Chief Executive Officer of the Ministry of Women, Community and Social Development;
h. Attorney General;
i. Chief Executive Officer of the Ministry of Commerce, Industry and Labour;
j. Chief Executive Officer of the Ministry of Agriculture and Fisheries;
k. Chief Executive Officer of the Ministry of Customs and Revenue;
l. Chief Executive Officer of the Scientific Research Organisation of Samoa;
m. Chief Executive Officer of the Land Transport Authority;
n. Commissioner of Police;
o. Director General of the Ministry of Health;
p. General Manager of the Electric Power Corporation; and
q. General Manager of Samoa Trust Estate Corporation.

OOTR is not a member of the NECC as it was envisaged at the time of enactment that the OOTR needed to maintain its independence.

5. Scope of the Country Study

The scope of this Country study is to:

1. Review the energy industry sector in Samoa with emphasis on OOTR role as the regulator.
2. This study excludes the review of the tariff model for setting tariffs as this scope is included in a regional study to be undertaken by the OPERA TA consultants. However, observations on the competitiveness and implications of the current tariff are considered in this report.
3. Identify and make recommendations to improve the regulation of the electricity supply industry.

4. Provide comments on the SSRES policy.

6. Samoa's Sustainable Development Goal 7

In the "Pathway for the Development of Samoa (PDS)" FY 2021/22 to FY 2025/26 the target is set for renewable energy: "Therefore, Samoa will continue to transition to solar, wind and hydropower ahead of its goal of achieving 70% renewable energy use by the end of 2031."[4] The previous Nationally Determined Contribution (NDC) was 100% of electricity generation from renewable energy by 2025. While the previous target was restricted to the electricity grid, the current target is for all energy usage sectors including the electricity grid, land and sea transportation and other uses such as for cooking.

7. The Regulator (OOTR)

Competition is generally accepted as the best mechanism for achieving the best economic outcome in an economic system in most cases delivering lower prices, better quality products and new products. Regulation is about striking the right balance between competition and regulation to achieve greater economic efficiencies and benefits.

The electricity grid is a natural monopoly with limited opportunities for competition in a market arrangement. Duplicating of electric lines and poles is not economically viable, especially so in a Pacific Island Country (PIC) comprising small islands with a limited electricity market. On the generation side there may be scope for the participation of the private sector as IPPs with some degree of competition when bidding for projects to bring about lower prices. Nevertheless, a high degree of regulation is generally required to ensure efficient allocation and development of resources, lower prices, and improved quality of supply.

The drive for regulation of electricity in PICs arose from actual and perceived inefficiencies and abuse by power utilities of monopolistic positions resulting in high electricity tariffs and poor reliability of supply. With the establishment of a regulator, the expectations are that electricity prices will be reduced, and power reliability increased. If the regulator is perceived to be unable to achieve these expectations, the regulator is in danger of being overridden by political interests in an attempt to secure these goals. This unfortunately has happened in Samoa when in November of 2021 the GoS imposed a reduction of the electricity tariff by 20%. This arbitrary act was imposed at the time when the price for diesel fuel was increasing post COVID 19[5] further aggravating the financial status of EPC. While in the short-term it may appear beneficial to consumers it will in the medium to long-term result in reduced reliability and quality of supply as the operation of the grid becomes unsustainable.

In regulating the electricity grid, the Regulator is looking for a balance between the following competing interests:

1. That the tariff for electricity and fees for other electricity services are affordable and fair to consumers.

[4] Pathway for the development of Samoa FY 2021/22 to FY 2025/26, page 25
[5] See Figure 5 EPC Diesel Fuel Price 2014 to 2023

2. That the grid operator or utility must achieves a return on investment that is reasonable and able to sustain the operation of the grid at a reliable and secure service level and quality required as benchmarked against similar power utilities.
3. That best practise efficiencies are achieved in the attainment of the above goals.

A well-designed and executed regulation should promote the efficient allocation of resources in an economy. Inappropriate regulation could detract from the efficiency of the electricity sector and distort the allocation of resources.

Best Practise Regulation:

Regulatory policies and measures must be clear, responsibilities well-defined and transparently executed. The paper, Best Practice Utility Regulation,[6] defined nine principles that its authors considered to be characteristic of best practice utility regulation.

The principles described and explained in the referenced paper are summarized in Annex 1. It is stressed that the principles may appear to be in conflict at times and must be balanced against each other to maximise public benefit.

These principles are Transparency, Accountability, Independence, Consistency, Predictability, Flexibility, Effectiveness and Efficiency, Communication and Consultation. Further explanation of these nine principles are provided in Annex 1.

Observations:

Indications that the OOTR may need to consider reviewing its operations to improve alignment with these nine principles are:

1. The GoS has taken the drastic measure of reducing the electricity tariff, ignoring both the independence of the OOTR and economic viability of EPC.[7] It appears that the GoS was responding to the impact of increasing fuel prices as a result the recovery after the COVID 19 pandemic and the Russia – Ukrainian war. This is clearly indicated in Figure 5 which illustrates EPC's historical price of fuel for power generation. While it is understandable that the GoS would like to limit the impact of rising fuel prices on the electricity tariff and subsequently on consumers, this should not be at the expense of the utility.

   Both entities cannot remain indifferent to this act as it threatens the underlying purpose for the existence of the OOTR and the financial viability of EPC. Ultimately, it will lead to a situation where the quality and reliability of service will deteriorate with a negative impact on the Samoan economy and on consumers.

   There are signs that GoS understands the critical nature of the situation and is considering ways to address it.

   Nevertheless, there are lessons to be learnt by the OOTR and EPC to avert the situation ever happening again during rising fuel prices.

   (a) Review their communication strategy aligning it with the nine principles of best practise regulation. The strategy should include an outreach program to all stakeholders including

[6] Best Practice Utility Regulation, Utility Regulators Forum discussion paper, Office of Water Regulation, Western Australia, July 1999

[7] The impact of this cannot be quantified because EPC's Annual Reports for the financial year 2022 and 2023 are still with the GOS for approval before it can be released to the public.

the Government Ministers & SOEs, members of the NECC, members of the opposition, key public institutions such as the Chamber of Commerce, and public outreach through the media (both print, radio, social media and TV), and in person consultation and awareness meetings.

(b) Ultimately the best plan for avoiding this situation in the future is to decouple the electricity tariff from diesel fuel cost by displacing diesel fuel generation with renewable energy production. The quicker this strategy is executed the better it will be for Samoa.

2. OOTR had previously adopted the view that to maintain independence it should remain at arm's length in the development of the electricity grid. It is now thought that the OOTR should become more involved to ensure its views are taken into consideration during the process rather than at the end of the process. While this new strategic approach is understandable, the OOTR must be clear that its role is to ensure the process delivers an outcome that is fair to all stakeholders and especially the consumers and EPC. OOTR should be careful not to be drawn into executing the process itself. The following is proposed for consideration in adopting the new strategic approach:
    a. OOTR should become a member of the NECC from which it is currently not included under the Energy Management Act 2020.
    b. As a member of the NECC, the OOTR should insist that a process be agreed to by all stakeholders for procuring capacity. The process should transparent and fair to all parties delivering the most competitive prices and a quality, reliable and secure service.
    c. OOTR should not be drawn into actual execution of the process as this may compromise its independence and perception of neutrality. Rather at key points in the process it should have the opportunity to comment on the execution of the process, provide considerations for further progress and confirm that the process is delivering the desire outcomes of fairness, reliability of service and competitive prices. For example, in a process where EOIs are called and candidates shortlisted to prepare a full bid, the OOTR should be given the opportunity to review the short-listed candidates and their proposals before they are notified to submit a full bid. The OOTR at this stage should be focused more on confirming the correct process and evaluation was followed to ensure the best outcomes. In Annex 4 the recommended process is described.
    d. More on the recommended process shall be stated later in this report when dealing with the procurement of production capacity.

3. Best practise regulation provides for an appeal to a Tribunal against the OOTR decisions. The Electricity Act 2010 provide for a Tribunal; however, it requires a fee of USD 35,530.00 (Samoan Tala SAT $ 100,000) for a company and USD 17,765.00 (SAT $ 50,000) for an individual to be paid upon lodgement of an appeal.

   While the fee must be sufficient to deter frivolous appeals and cover if not all, most of the cost of engaging a tribunal, it must not present a formidable barrier to the process of lodging an appeal. In consultations with EPC this fee required under the Act was highlighted as excessive. It is recommended that this fee be reduced.

4. The OOTR price order is an opportunity for OOTR to project an image of fairness, independence, and confidence. The current order is clear and concise in stating the decision and its application. OOTR does provide a detailed Determination for the multiyear tariff

review that is available to the public. It would improve confidence in the OOTR if this practise was extended to every price order howbeit, substituting the detailed Determination with a brief explanation of the rational for the change in the electricity tariff.

Key Requirements Under the Electricity Acts 2010

The key requirements of the Regulator under the Electricity Act 2010 as summarized by a previous TA is presented in Table 1.

Table 1: Key Requirements under the Electricity Act 2010[8]

Part	Key requirements	Status as at July 2023
2 – Regulator	Single person regulator Permits regulator under Electricity Act and Telecommunications Act to be same person Budget to be recouped through tariffs/license fees Staff appointed under Public Service Act 2004	Executed
3 – Licensing	Specification of electricity network services and generation licenses Provisions for granting, revoking licenses.	Executed
4- Tariffs	Three-year tariff setting period with fuel price adjustment. Need to consider the likelihood for the tariff to recoup costs of providing services and a return on investment similar to comparable investments. Need to consider the ability of low-income households to pay for electricity services. Requirement to issue determination within 6 months of a tariff application Ability for Regulator to introduce explicit subsidies for particular customer classes (low income customers) Seek cabinet approval before introducing subsidies and consult with Samoa Bureau of Statistics.	Executed (However, since November 2021) there has not been a change in electricity tariffs due to New Government 20% reduction Policy as per Cabinet Directive) A target for a return in investment that EPC is required to earn to be sustainable needs to be determined as the basis for setting the tariff.
5 – Standards of Electricity Services	Requirement to develop service standards.	Executed

[8] Final Report for the Office of the Regulator, Samoa, prepared by Jeremy Hornby, Project Number: TA-9292 REG (49407-005), May 2018, Samoa: Strengthening Project Preparation Capacity in Asia and the Pacific - Supporting Preparation of Infrastructure Projects with Private Sector Participation in Asia Pacific (Subproject 4) – International Utility/IPP Specialist:

	Consult with Government regarding provision of services to rural areas.	
6 – Consumer Protection	Regulator acts as Government's representative for resolving disputes between consumers and electricity network service licensees (EPC) Review and/or set standards for customer deposits, metering, billing, collection of tariffs and fees	Executed
7 – Power System Expansion Planning and Review	Requirement for EPC to develop a Power System Expansion Plan 5-year focus and must be updated 1 year before 3-year tariff review. Need for regulator's approval for EPC to enter a PPA with IPPs – to evaluate whether project represents least cost option and consistent with Expansion Plan.	Pending EPC submission (OOTR has issued Order E80/2021 for EPC to develop PSEP)
8 – Public Consultation	Requirement to seek consultation on all issues having widespread public impact. Statement of consumer rights and responsibilities to be developed by EPC.	Executed
9 – Dispute Resolution	Ability to mediate or hear the dispute and issue an order.	Executed
10 – Appeals	Any appeal to be filed with the Electricity Tribunal Tribunal to consist of presiding member and two others. Ability to issue separate decision or refer decision back to the Regulator.	Executed
11 – Miscellaneous	Corresponding amendments to the EPC Act 1980.	Awaiting on EPC review of its Act

8. Tariff Observations and Competitiveness

OOTR uses a tariff model developed in-house. While the scope for this study excludes a detailed analysis of the tariff model[9] some observations on the competitiveness of the electricity tariff is presented in this report.

[9] This is included in the scope for a regional study by the OPERA consultants.

The tariff as per the Tariff Model comprises three parts:

1. A Usage Charge. Covers all fixed expenses.
2. A Debt Charge. Covers all debt charges.
3. An Energy Charge. The energy charge is adjust monthly taking into consideration the diesel fuel expenses for the generation of electricity and the IPP prices. The formulae for determining the energy charge is:

$$Energe\ Charges = \frac{\Sigma fuel\ expenses + \Sigma\ IPP\ expenses}{\Sigma energy\ sales\ (kwh)}$$

Since, the Government reduced the tariff in November of 2021, the tariff as determine by the tariff model has not been applied.

Weighted Average Price Comparison

When comparing tariffs of the Pacific islands utilities the different tariff structures must be taken into consideration. Some of these differences are:

1. Some utilities offer a lifeline tariff at a subsidised rate. For Tonga, Fiji, Nauru, and Vanuatu the Government pays the utility a subsidy to enable a reduced rate for these consumers.
2. All utilities have the fuel price adjustment component that is adjusted either monthly or quarterly, or on application in response to fuel price changes. For Samoa the fuel price component was reviewed monthly, however there has not been a fuel price adjustment and change in energy charge ever since the GoS has reduced the tariff by 20% in November of 2021.

To compare the tariff effectiveness, the Weighted Average Price (WAPe) of electricity as determined by the formulae below is used:

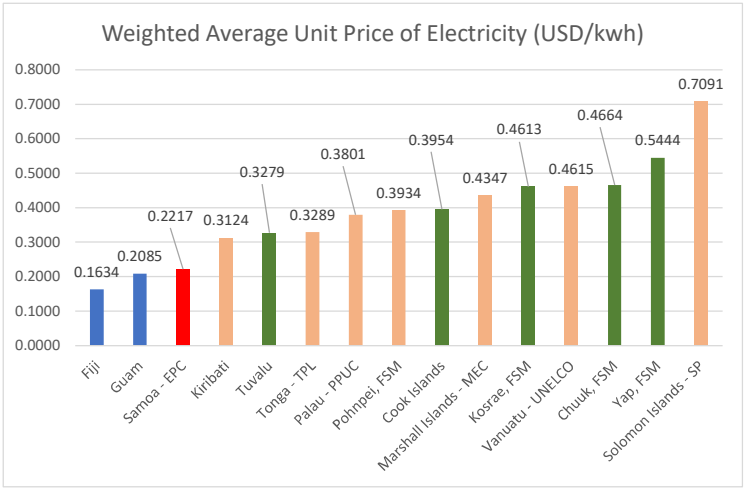
$$\text{WAPe} = \frac{Total\ Revenue\ earned\ from\ the\ sales\ of\ electricity\ for\ the\ period\ (USD)}{Total\ Energy\ Sold\ for\ the\ period\ (kwh)}$$

Taking the period of a financial year, the aggregated impact of the tariff upon consumers is determined for comparison.

Figure 3 ranks the PICs on the basis of the WAPe using the local currency to USD exchange rate provided in Annex 1. This comparison is for the financial year 2021.

EPC is highlighted in red. The larger utilities as per PPA_2 category are marked in blue, the medium size utilities are marked in light orange, while the smaller utilities are in green.[10]

Figure 3: Comparison of the Price for Electricity for Pacific Islands FY2021



[10] Data provided for the PPA_1 Benchmarking Report 2021

EPC in red is ranked the third lowest out of the 15 countries/states/territories selected for this comparison. However, being a medium sized utility EPC is ranked as having the lowest WAP when compared to similar sized utilities in the Pacific. Figure 5 illustrates the price differential between the medium size utilities from the lowest to the highest.

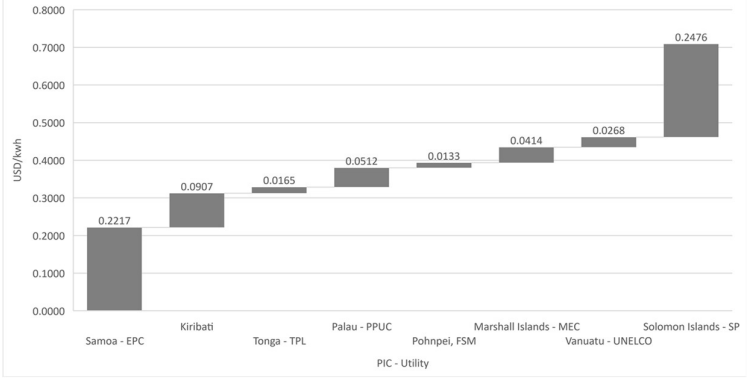


Figure 4: WAPe Comparison of Tariffs for Medium sized PIC Power Utilities.

The FY2021 for EPC ends on the 30th of June 2021, five months before the GoS action to reduce the electricity tariff by 20%.

Table 2 compares the medium sized PIC utilities. Samoa has a significantly higher demand than the PICs in its category and so economy of scales work in its favour to lower electricity prices. Kiribati while having the lowest demand in the group has the second lowest WAP_e because the government subsidies PUB's fuel expenses.

Table 2:PIC Medium sized Power Utilities - FY 2021 Data

PIC	Utilities	Peak Demand (for Largest Grid)	Total Annual Energy (GWh)
		MW	GWH
Samoa	EPC	28.20	170.56
Kiribati	PUB	5.60	31.42
Tonga	TPL	10.18	74.86
Palau	PPUC	11.92	82.31
FSM	PUC	5.96	43.07
RMI	MEC	9.80	63.86
Vanuatu	UNELCO	11.47	58.87
Solomon Islands	SIEA	16.08	98.42

The price of electricity in Samoa **before the reduction of the tariff by 20%** was reasonable compared to similar sized Pacific Island utilities.

Like all PICs, Samoa struggles with high fuel price contributed in large part by the long thin fuel supply chain due to its remoteness and smaller volumes of fuel import. It is most challenging during periods

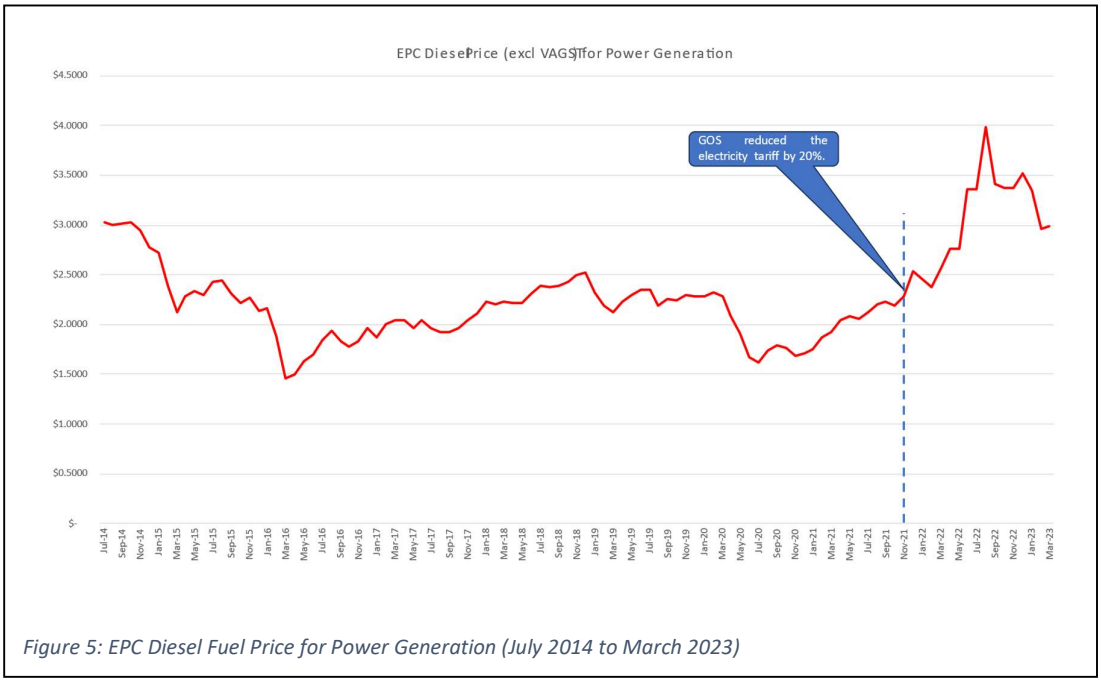


Figure 5: EPC Diesel Fuel Price for Power Generation (July 2014 to March 2023)

of rapid increases in fuel prices due to rising oil prices on the international market as had recently occurred post COVID 19. Such situations often trigger Government intervention to limit the electricity tariff to the detriment of the utility. The intervention of the GoS to reduce the tariff appeared to be motivated by the impact of rising fuel prices upon the electricity tariff post- Covid 19. Samoa is not unique in this regard. It would be better that during such periods the GoS provide subsidy to EPC to avoid the tariff increase rather than limit the tariff and expect EPC to bear the burden. EPC could be required to assist by controlling expenses. The medium to long term solution to this situation is to transition away from fossil fuels to renewable energy production sources as quickly as is possible.

9. Production Capacity Planning

While the planning of production capacity is not the direct role of the regulator, it is imperative that the OOTR understand and approve the process and evaluate the impact on the electricity tariff. Since energy production expenses is the largest expense in the operation of the electricity grid over the long term an effective and transparent process for the procurement of production capacity is required. The planning and procurement process recommended is provided for the benefit of the OOTR. Production capacity planning involves the following process:

1. Compile renewable resource inventory.
2. Demand forecasting and capacity needs assessment.
3. Capacity and system planning.
4. Project Viability.
5. Engineering, Procurement and Construction.
6. Commissioning and Operation.

Renewable Resource Inventory:

A renewable energy resource inventory needs to be compiled for Samoa. The inventory should include all potential resources such as hydro, wind, solar, geothermal, wave, and any other resources that may be available for development. The process of managing these resources should begin with identifying options for development based on a desktop study with limited field data, an assessment of the maturity of the technology in engineering and economic terms, and the appropriateness of its development to the Samoa's energy needs. At this stage any risks or environmental concerns should be noted for further investigations if it is not overwhelmingly significant to discard the option all together. At this stage the requirements to further investigation the viability of the options should be identified also. This may include gaps in the data set that may need to be addressed.

It is unclear who is responsible for this stage of development. The MNRE and most certainly EPC would be the most likely candidates to execute this function, or they could be made jointly responsible. Whatever the arrangement, it is important that this is done. It is clear from the last PSEP provided by EPC in 2018 that the identification of production capacity options was undertaken. The OOTR's role in this regard is to require a review of RE resources be included in the PSEP.

Demand Forecasting and Capacity Needs Assessment:

The development of production capacity to the operational stage can take between 2 to 15 years dependent on the technology (hydro, wind, solar PV), capacity, and other factors such as land acquisition. It is therefore imperative that the capacity development begins well before it is required. To achieve the renewable energy targets for Samoa not only must diesel engine energy production be replaced by renewable energy production, but capacity must also provide for the growth in demand.

Demand forecasting and capacity needs assessment is vital to the execution of Samoa energy strategy. The forecast must take into consideration the following factors:

1. Organic growth due to the increasing population and affluent level in Samoa. (Figure 2)
2. New growth in demand as a result of a growing economy.
3. The transition away from fossil fuels in the land and sea transport sectors which is likely to be towards the use of electric vehicles and engines.

Failure to execute this function well could result is an oversupply or undersupply of Variable Renewable Energy (VRE) capacity. An oversupply of VRE capacity could result in significant spillage energy from the hydropower and solar PV schemes and unnecessary costs through penalties imposed by IPPs with a take or pay PPA.

EPC clearly must be responsible for this function as it is the exclusive operator the electricity grids in Samoa. It is imperative that EPC produce a PSEP as soon as possible.

EPC has not provided a PSEP since 2018 and while the OOTR has issued a demand order for EPC to provide it, the urgency to respond is lacking. Making the production of the PSEP by EPC a requirement under their BSC that impacts their performance reward would incentivise urgency in this matter. More details on the BSC is provided later in this report.

Capacity and System Planning:

The ranking of the options for increasing production capacity should be based on engineering viability, , risks, and economic viability. At this stage the costings are reasonable estimates that may require refinement in the next development stage.

Capacity planning involves two key aspects:

1. The development of renewable capacity to displace diesel fuel energy production in the mix.
2. The dispatchable capacity required to maintain system security and reliability of supply.

Associated with the capacity expansion plans are the grid augmentation projects required to enable connectivity and transmission/ distribution of the power generated.

The long-term PSEP of between 10 and 20 years into the future will consider the sequencing of capacity expansion to achieve the most economically viable program.

Project Viability:

The viability of each project will generally include two stages: the pre-feasibility and the feasibility stage. For large projects the expenses involved in each stage can be significant. For smaller projects the two stages may be combined into one stage. The pre-feasibility stage will prove the viability of the project sufficient to progress to the more expensive feasibility stage. Significant risk that could pose as project inhibitors are to be investigated to determine if they are insurmountable barriers to developing the project.

Once the prefeasibility study has shown that the project is most likely to be viable, the feasibility study can be engaged. The outcome of the feasibility study will be detailed recommendations for the development of the project.

Engineering, Procurement and Construction (EPC_2):

At some stage in the planning process the decision as to whether to develop the capacity in-house using utility, government and/or development partner funds or to allow the private sector to participate as an IPP will have to be made. The general policy of development partners is to encourage the private sector to invest in production capacity.

This stage involves the detailed design, procurement, and construction of the project through to the commissioning stage when the project becomes operational.

Commissioning and Operations:

Once the project is commissioned, it becomes available for operational dispatch.

The implications between an IPP arrangement and a utility owned capacity can significantly impact the dispatch order of merit.

If the capacity is utility owned then the dispatch decision may be based on the marginal cost of operation whereas if it is IPP owned, the price of electricity provided by the IPP must cover the full costs of the project and the owner's return on investment. For comparative purposes a return of 8.5% is used for a similar sized power utility in the PICs.

For diesel fired capacity the marginal cost of operation is very high whereas for VRE utility owned capacity has high sunk costs and low marginal cost, and would be favoured to be operated first. However, if the PPA_1 for the IPP requires take or pay for the energy produced, the utility may have to take the energy from the IPP. For this reason, a consideration for the future would be to separate out the production capacity from the grid (lines and poles) operation.

An operational risk posed by VRE is that the variability of energy production. This variability can happen on a daily, monthly, seasonal, and annual basis and the risk must be considered and provided for in the planning and operational process.

EPC has an established National Control Centre with a SCADA system and personnel that have experience and are capable of managing the grid operations incorporating VRE sources. The current grid is supplied by a mixture of hydro (both with storage and run of river), solar, wind and diesel engines.

Afolau Biomass Gasifier Plant:

The Afolau biomass project was developed by the MNRE and funded by GEF via the UNDP. The plant has a capacity of 750 kW, and the feedstock is local timber and includes invasive species such as the African tulip, the rubber tree and other species.

STEC owns and operates the plant and has 6,000 acres of feedstock with 3,000 acres reserved for replanting.

At the time the plant was visited, the plant was not operating, and the following reasons were given for this are:

1. The lack of manpower to maintain the rate of feedstock. The plant required 29 persons to maintain the rate of harvesting to continually operate the plant. Recently, the workforce was reduced to six persons with the resignation of most of the harvesting team to take up seasonal work overseas.
2. Wood chipping to prepare the feedstock was done by hand after the breakdown of the woodchipper. With the assistance of the UNDP, three wood chipping machines were purchased for which STEC is awaiting delivery.

STEC is reviewing the operation of the plant and considering the option of outsourcing.

It is unfortunate that the plant is not operating for the stated reasons, and it is hoped that the issues can be adequately addressed sooner to restart operations. The savings in diesel fuel is estimated to be more than 1.4 million litres per annum.

In such events, the OOTR needs to take a more proactive role in impressing upon all parties involved, in this instance STEC and EPC, to resolve these issues highlighting the negative impact on the electricity tariff and subsequently the economy of Samoa. The licensing requirements for IPPs should include the reporting of such constraints on production capacity that intervention may be expedited.

IPPs:

The involvement of the private sector through IPPs in the provision of renewable energy production capacity has a checked history in Samoa. Current there are two major IPPs providing renewable energy for the grid.

Table 3: IPPs Established for Upolu Grid

IPP	Capacity (MW)	Type	Price (SAT/kwh)	Comment
Solar for Samoa	4.00	Ground Mounted Solar PV	0.98	Recent taken over by EPC
Green Power Samoa	4.00	Ground Mounted Solar PV	0.63	
Sun Pacific Energy (Harelac)	3.50	Ground Mounted Solar PV	0.55	
STEC	0.75	Biomass Gasifier	0.50	Not operating
SPREP	0.10	Roof Top Solar	0.40	Small Roof top solar considered an IPP

Solar for Samoa was recently bought out by EPC to avoid paying the high price for its energy. This unfortunate situation is the consequence of a production capacity procurement process that was either ineffective and/or poorly executed. It is obvious that the long-term implications of the contract was not sufficiently appreciated when it was awarded. Being the first contract awarded, inexperience may have contributed to this situation.

A study on the history of this IPP, the process by which it was awarded the contract and the execution of the contract is recommended to extract lessons that can be learned to ensure the mistakes are not repeated. This could be taken in consideration in the design of the capacity procurement process.

In the procurement for the provision of capacity by IPPs, a proactive, structured process is preferred to deliver the best outcomes for Samoa than to accept unsolicited bids. The recommended process is described in Annex 4.

10. Small Scale Renewable Energy Sources Policy.

Small Scale Renewable Energy Sources (SSRES) in the current situation would mainly consist of roof top solar PV installed by consumers to primarily provide for their own energy use with the excess energy produced supplied to the grid.

While it is unlikely that all customers will install such systems for various reasons including structural integrity of the house, orientation and affordability, a significant number will have a large aggregate impact on the grid. For example, if 1,000 customers install a 2 KW solar PV grid connected roof top mounted system, the aggregate impact would be equivalent to a 2 MW solar PV installation. The incorporation of such energy sources in Samoa renewable energy strategy is to be encouraged as it allows investment by the consumer and is a more efficient utilisation of space. The term used to identify such a consumer is prosumer.

The connection of SSRES must be controlled to ensure the operation of the grid is not compromised, especially during period of low load such as on a Sunday. EPC must, as part of its planning, identify the capacity of SSRES that can be incorporated onto the grid without significant curtailing other renewable sources such as solar farms and hydroelectric generation.

The PSEP must also identify distribution network argumentation projects to ensure overloading does not occur on the distribution network as a result of significant SSRES.

The OOTR is currently considering a draft policy that was prepared by the OOTR in consultation with stakeholders and public consultation is about to commence. The following comments on the draft policy are presented for consideration.

1. The definition of SSRES should include any renewable energy source with a capacity of up to between 100 kW and 200 kw installed primarily for the consumers' own use.
2. As recognised by the draft policy there needs to be differentiation between SSRES, community-based schemes and IPPs that are focused on providing energy to the grid. The current treatment of SSRES as IPPs is not recommended.
3. The Grid Code clause 8.1 limits the capacity of the rooftop solar PV installed by the prosumer. It states, "This means that consumer self-supplier generation plant must be specified so that in one year, the total energy expected to be generated by the consumer self-supplier's generation plant (Qpv) is not greater than the total energy expected to be consumed within the consumer installation (Qload) within a year." The practical implication of this is that a prosumer may install a roof top solar PV with a capacity that is over five times its average demand. For example, an annual energy demand of 8760 kwh (average demand of 11kw) the capacity limit of a rooftop solar a prosumer can install is around 5 kW.
4. The grid code provides a typical Rooftop Solar PV schematic diagram presented in this report as Figure 6. In the only grid connected rooftop solar PV in Samoa installed by SPREP the actual connection of the solar PV plant is directly to the grid with a separate meter, rather than at the consumer switchboard. Thus, in effect SPREP is supplying the total energy produced to the grid at around $0.40 per kwh and purchasing it energy needs at around $0.50 whereas if connected as per the typical schematic in the Grid Code, the SPREP plant would, when producing, replace the grid supplied demand first before back feeding into the grid. In effect

SPREP would save $0.50/kWh for supplying its own demand before providing energy to the grid at the feed in tariff rate of $0.40 per kWh.

5.

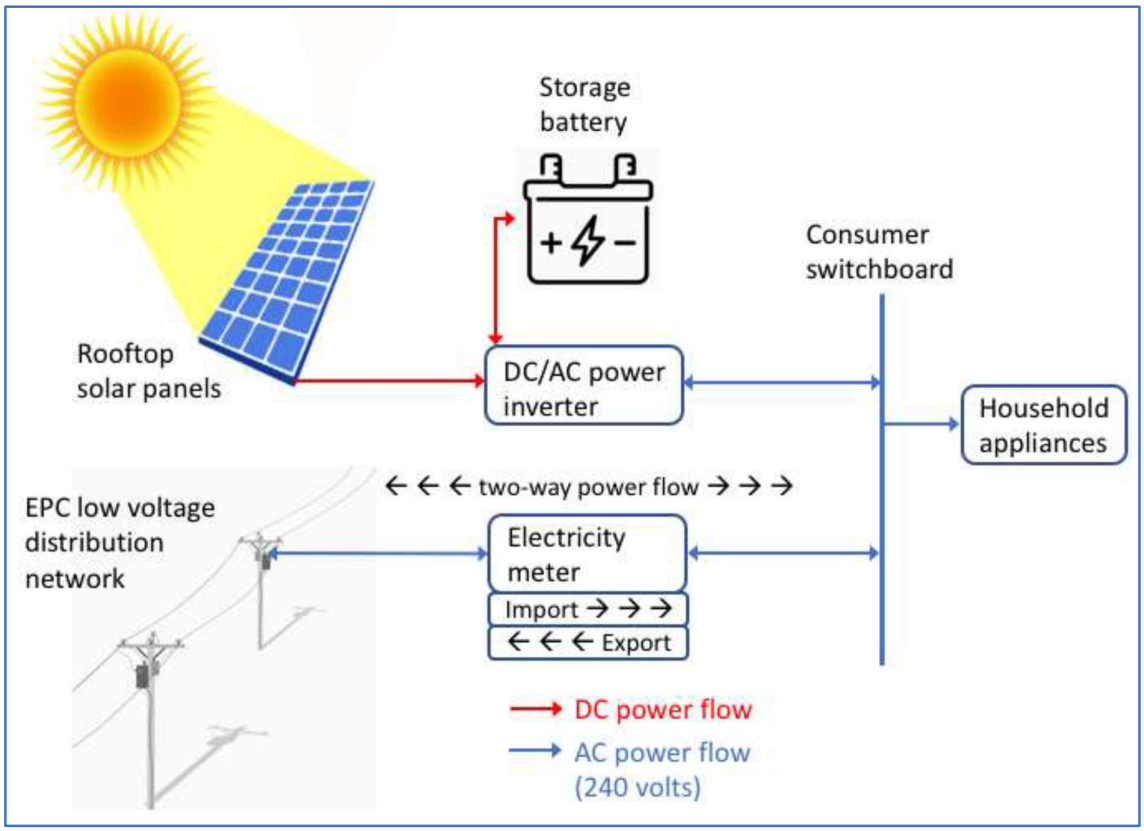


Figure 6: Typical Roof Top Solar PV Schematic Diagram from EPC Grid Code - Figure 10

Feed In Tariff:

The feed in tariff is the tariff that applies to the excess energy that a prosumer provides to the grid.

In Figure 5 the excess energy supplied to the grid is measured as Export energy on the meter.

The grid must support SSRES (rooftop solar) in several ways even when it is not taking energy from the grid and therefore must be compensated for providing such support. This support includes:[11]

1. Operability and stability: SSRES that do not have batteries and inverters that are capable of standalone operation relies on the grid for stable operation. The grid sets and maintains the frequency and voltage that the SSRES inverter follows. The Grid Code allows for the prosumer solar PV to supply its own demand provided it is capable of disconnecting from the grid when the network to which it is connected is isolated.
2. Security of Supply: Without sufficient battery capacity, grid connected $SSRES_2$ relies on the grid to provide security of supply during period when the $SSRES_2$ is underproducing (low sun intensity period due to clouds for solar PV installations) and not producing (during the night hours for solar PV installations). This obligates EPC to invest in and maintain sufficient generating capacity to provide for a prosumer's demand.

[11] Inverters capable of assisting in some of these functions may be installed although it is not typical.

3. Reactive Support: SSRES generally do not normally contribute to voltage support and the need for reactive support during fault conditions. With the large aggregate impact of SSRES the obligation to provide for such support has a monetary impact on EPC's operations.

The other impact of SSRES are:

1. Savings on the electricity bill of the prosumer when the SSRES is producing. This in turn represents a loss of revenue to the utility.
2. The supply of excess energy to the grid provides savings in EPC variable production expenses. In the current situation the variable costs mainly consist of diesel fuel expenses to produce energy.

The feed-in tariff is currently set by the OOTR at 70% of the energy charge. The energy charge is currently dominated by the price of diesel fuel. This will change in the future as more and more renewable energy is purchased from IPPs or produced by EPC renewable plants.

While this tariff ensures the sharing of the benefits of savings between the prosumer and EPC for the excess energy supplied by the prosumer, EPC is not compensated for the services provided above to ensure a stable system even while the prosumers is providing for its own demand. A two-part tariff for prosumers should be considered comprising a demand charge in $/kw and an energy charge in $/kWh. This would be appropriate charge for the investment in capacity EPC must make to maintain security of supply and to ensure system stability and quality of supply.

It is recommended that in establishing the SSRES policy, a study be commissioned to determine the appropriate tariff structure and level to ensure a win-win for both the prosumers and EPC. This review is outside of the scope of this study.

11. Regulating Performance

A key function of the OOTR is the regulation of the performance of EPC. The establishment of an effective system of monitoring the performance of EPC, the working relationship and responsiveness of EPC could be greatly improved.

It is expected that the OOTR will require training on the regulation of the performance of power utilities and assistance in the implementation of the performance management system.

In regulating for performance, the following outcomes are to be achieved:

1. EPC must achieve a sufficient return on investment to be operationally and financially sustainable without compromising the long-term outlook for short-term financial gains whilst maintaining acceptable quality and reliability of supply.
2. The electricity tariff must be affordable for consumers. While it is natural for consumers to seek the cheapest electricity tariff, the regulator and the GOS must avoid administrative and discretional decisions to reduce the tariff at the expense of EPC.
3. EPC must be required to operate effectively and efficiently without burdening the population with a electricity tariff that includes expenses that cover inefficiencies in EPC operations.

To effectively regulate the performance of EPC, the OOTR should:

1. Determine performance targets and corporate sustainability model for EPC;
2. Introduce rewards/ deterrents based on EPC performance.

Defining Performance:

Performance is defined by the desired outcomes of the business strategy and the means of achieving them. Key Performance Indications (KPIs) that are appropriate for measuring the success of the business outcomes and the means by which they are achieved needs to be monitored.

To comprehensively assess the performance of EPC, it is recommended that OOTR adopt the Balanced Scorecard Framework (BSC) for defining EPC's performance. The BSC translates business strategy into well-defined goals and appropriate KPIs that align individual efforts with the business strategy. For purposes of regulation, it will provide assurance that the long-term health of EPC is not sacrificed for short term prospects.

"The BSC provides a framework for the execution of business strategy. It ensures progress with balance between the short- and long-term prospects of the organization, between financial and non-financial measures, between lagging and leading indicators, and between external and internal performance perspectives."[12]

A well designed BSC framework will satisfy the following:

1. Provide a balanced assessment of EPC's performance from key perspectives.
2. Align the performance of EPC with its strategic objectives.
3. Ensure the long-term objectives are not sacrificed for short term goals. E.g., Excellent financial achievements are not the result of neglecting the maintenance of the assets.
4. Galvanise EPC employees to focus on achieving the strategic objectives.
5. Is transparent and logical.
6. Is used to determine performance pay/ bonus.
7. Distributes the performance pay among EPC employees in a fair and just manner.

The design of a comprehensive BSC is illustrated in the following Table 5.

Table 4: BSC Design Process

(1) Perspective →	(2) Objective →	(3) Measures/ KPIs →	(4) Targets
GoS			
Finance			
Customer			
Process			
Learning & Growth			

The design process of the BSC answers the following questions:

1. What critical areas of measurement/ perspectives need to be measured to provide a complete picture of the state of strategy?
2. What strategic objectives will the firm pursue in each critical performance area and how will these link?
3. Which measures and targets are needed to track the progress of these objectives?

[12] The Balanced Scorecard by R S Kaplan & D P Norton; preface

4. Who will be responsible for collecting data, reporting, and answering queries concerning these measures.

Perspectives:

Generally, a corporate BSC for a private company adopts four perspectives for monitoring performance: Financial, Customer, Process and Learning & Growth. The former two are external perspectives while the latter two are internal perspectives. For regulation purposes it is advisable that the GoS perspective be considered separately in addition to the four perspectives to differentiate its role as both the sole shareholder of EPC and as a key customer.

Objectives:

The objective for each critical performance area needs to be agreed upon by all stakeholders. Objectives are best stated that meet the "SMART" acronym:

S Specific Focus on one issue that is well expressed
M Measurable - One or few measures can track progress
A Achievable - Given enough effort and resources it is achievable.
R Relevant - strong relationship to vision and mission of the entity
T Time - incorporates a time horizon

When formulating the objectives, the questions in Table 14 should be answered.

Table 5: Questions when Formulating the BSC Objectives

Perspective	**Type**	**Performance Issues Addressed**
Country	Results	What does the GoS require of EPC to contribute to GoS's commitments and obligations?
Financial	Result	How do we look to our shareholders? Are we producing the right financial results?
Customer	Result	How do customers judge our product and services? Are we exceeding the expectations of the marketplace? What specifically must we excel at if customers are to buy from us and commend our service? (Even though EPC is a monopoly operating under an Act, it must think and act as if competing for customer loyalty.)
Process	Driver	What changes do we need to make to our processes to become more competitive, financially sustainable and improve customer satisfaction? Specifically, what do we need in terms of new products, services, channel management and process improvement?
Learning & Growth	Driver	What objectives do we need to have to pursue to develop our people, information technology and leadership for the future? What is our organizational culture and change agenda?

An example of the objectives for each perspective is provided below:

Table 6: Examples of Objectives

Perspective	Objective
Country	Achieved the SDG_1 7 Goals
Finance	Achieve ROI target as per tariff model
Customer	Provide an affordable and reliable power supply
Process	Maintain best practise in safety and operational efficiency.
Learning & Growth	Improve competency of organisation, maintain a work culture conducive to best business performance.

Measures/ KPIs

Measures or KPIs are used to monitor and determine improvements in performance. These are determined by the objectives. Measures are required for the following purposes:

1. Comply with Statutory Requirements, e.g., Annual Report.
2. Check financial and non-financial health of the organization on a regular basis.
3. Challenge the assumptions that underpin strategy.
4. To inform decisions and motivate staff. The latter is best achieved when monetary incentives are tied to the achievement of targets.

Properties of good measures are:

1. **Relevance**: logical and clear relationship to a strategic or operational objective that people agree is important enough to monitor.
2. **Quantifiable**: Numbers better than text-based indicators.
3. **Verifiable**: Auditable.
4. **Accountability**: One or more persons held responsible for level of performance.
5. **Linked to Recognition System**: Good performance should be celebrated and rewarded, and poor performance addressed openly.

The types of measures are:

1. Exact Measures: complete measures, e.g., financial measures, customer satisfaction index, operational measures based on metered data. These measures may require much effort, time, and expenses to gather and report data.
2. Proxy Measures: Next best surrogate measures. These may not be complete in that they do not capture the full performance; however, they are so linked to the objective that they provide a good indication of performance and easier to determine. Best use two or three proxy measures if needed. E.g., the author of this report once used the measure of ratio of favourable articles to unfavourable articles in the print news media to track customer satisfaction supported by a detailed customer survey annually. The former measure while it does not capture the full impact was much easier to obtain and provided an sufficiently accuracy prediction of customer satisfaction. In todays environment, this proxy measure could be captured from the social media sources.
3. Activity Measures: measure how busy people are and not what they achieve. For example, the 'number of training workshops conducted' is an activity measure. This however does not capture the effectiveness of the training conducted. Activity measures are not as good as exact and proxy measures but, in some cases, may have to be used, the assumption being that the completion of the activity will bring about the desired result, e.g., the completion of a training

program will result in a more informed and knowledgeable worker. This assumption is generally, although not always, true.

4. Project Measures: measures progress of projects in terms of time, budget & specification.

Examples of measure that could be adopted based on the objectives in Table 15 are described in Table 16. This BSC is provided as a sample. To formulate the BSC detailed discussion with EPC must be conducted and the final form agreed too.

Table 7: Example of Considerations of Measures/ KPIs for a Power Utility

Perspective	Measures
GoS	• SDG 7 Goals applicable are energy access and renewable energy contribution to total energy usage. With energy access at almost 100%, the focus could be on renewable energy contribution.
Finance	• The Tariff Model provides for the utility to achieve a sustainable ROI for EPC. This could be the key measure in this perspective. • Another financial measure that could be considered is debtor days (the effectiveness in collecting post-paid revenue), • Key financial inputs into the tariff model are the fixed cost and IPP costs. KPIs for monitoring thee two factors may be required. • Other financial measures such as profit, ROE, etc. may be adopted depending on the need although the ROI would be sufficient to ascertain performance.
Customer	• Customers generally expect a secure, reliable, affordable, and quality power supply. • Measures such as SAIFI and SAIDI for determining the impact of power outages on customer can be used to monitor power supply reliability and for benchmarking against other power utilities. • WAPe against GDP per capita and as benchmarked against other PICs could be used to assess affordability. • Number of customer complaints resolved within a specified period against the total number of complaints received could be used.
Process	• Efficiency measure such as Specific Fuel Consumption (SFC) and Specific Lubricating Oil Consumption (SLOC) would be used to monitor operations. • The reporting requirements for EPC could be included as a measure. • The production of the annual report by a stated date after the end of the financial year may be adopted as a measure.
Learning & Growth	• Execution of the annual training plan could be used to ascertain human capital improvements. This assumes a training plan is produced for budgeting purposes against which the implementation can be determined. • Full Time Equivalent (FTE) and related measures may be used to monitor the right sizing of EPC. • Project measures for installing ICT and operational control systems or upgrades could be used for improving information capital and operational capacity. • Safety indicators such as Lost Time Injury Days (LTID) and Lost Time Injuries (LTI) may be used.

Table 8: Example of a BSC for EPC

Perspective	Objective	Indicators	Target for 2024	Long Term Target
GOS	Achieve SDG_1 Goals	GRE (Grid RE)	RE contribution > x%	70% of total energy usage is RE by 2031. 100% of grid energy is RE by 2031.
Finance	Achieve financial sustainability	ROCE	ROCE = x% ± 1%	Sustainable EPC.
	Efficiently manage budget.	Fixed Expenses	FE ≤ Approved Budget	
	Reduce variable cost	WAP_{IPP}	WAP_{IPP} < DF unit production costs	
		Debtor Days	DD < 35 days	Efficiency in collection of post-paid revenue
Customer	Achieve best practise reliability of supply.	SAIFI SAIDI	SAIFI < 50 SAIDI < 500 minutes	SAIFI < 10 by 2030 SAIDI < 200 minutes by 2030
	Achieve affordable tariff	WAP_e	WAP_e ± 10% of lowest medium PIC utility	Maintain competitive tariff
Process	Efficient diesel fuel consumption	SFC_D	SFC_D > 3.95 kwh per litre	
	Maximise solar production	Performance ratio – solar PV		Performance during commissioning
	Optimum maintenance & energy production	CF - EPC	14% < $CF_{solar\ PV}$ < 20%	Maintain CF within range
			20% < CF_{wind} < 30%	Maintain CF within range
	Minimise power station parasitic load	PS Parasitic load	PS% < 3%	
	Reduce diesel consumption	Diesel Energy Production	%DEP < 35%, Best < 40%	DEP < 60% by 2026 DEP approx. 0 by 2030
	Efficient delivery of energy	System Losses	SL < 10%, Best < 5%	SL < 5% by 2025
	Monitor non-revenue earning demand	Non-Revenue demand	%NRE < 3%, Best < 1%	NRD < 1% by 2025
Learning & Growth	Productive use of manpower	FTE FTE per kwh	TBD TBD	TBD TBD
	Improve capacity of HR	Training Plan implemented for 2024	100% complete by end of FY 2024	

	Safe working environment	LTID LTI	TBD TBD	TBD TBD

This BSC is provided as a sample of what could be used. Depending on the strategic objectives other measures could be included and some of the above could be excluded.

Formulation of the BSC:

It is critical that the BSC is formulated with consultations between OOTR, EPC and the GoS. The Author of this report has learnt by experience that a series of workshops with all employees and other stakeholders is best to provide them an opportunity to contribute to and take ownership of the business strategy and help them understand and appreciate the purpose of the BSC, and the indicators by which performance will be measured.

Monetary Reward

The BSC is most effective when linked to monetary rewards.

The key factors in this process are:

1. The amount of the performance pay.
2. The distribution of the performance pay to employees of EPC.
3. The timing of the payout.
4. The assessment of the performance payout.

The Amount of Performance Pay.

The performance pay need to be sufficient to provide meaningful incentive for workers to perform and yet not excessive that it may provide strong incentive for unproductive behaviour and cheating.

Based upon over 20 years of experience, the author recommends the maximum performance pay be between 10% and 20% of the salary budget for the financial year. The mid-point of 15% would be a good choice.

The Distribution of Performance Pay to Employees:

It is critical that when the performance pay is paid out to employees the differentiation between

The Timing of the Payout:

The 'timing value of money' is a term coined by the author to describe the observation that the timing of the payout is dependent on when it is paid. In a Christian society such as with Tonga, Christmas and the New Year is when money given is appreciated more by the workers than at any other time.

In Fiji, the author experiment with the timing of the payout splitting the total payout in three parts where around 50% of the BSC assessed payout was paid a week before Christmas, the rest paid on the last week of January (The start of the school year is when many parents appreciate the extra money), and a third payment based on a 360-degree appraisal which attracted a maximum pf 5% of the salary was paid out later in the year. Note: the financial year was the calenda year which is why the total payout was not paid before Christmas.

While EPC may wish to split the performance payout into two payments, it is recommended that the total performance payout be done a week before Christmas each year.

The Assessment of the Performance Payout:

The effectiveness of the performance payout requires the following:

1. The amount determined by the assessment of the BSC by OOTR.
2. The distribution of the payout among the EPC employees which is largely determined by EPC and approved by OOTR.

The assessment of the BSC by the OOTR:

The objective of this assessment is to determine the total amount of payout from the budget as follows:

1. Determine the performance rating for each measure by determining an acceptable base target and an optimistic target. For many measures where in the long-term improvement is required towards the long term target the previous financial year's achievement may be chosen as the base target. The base target would be allocated a score of 0%. The optimistic target would be the best performance expected for that financial year which to achieve would attract a score of 100%. A performance assessment between the two targets would be attract a score prorated between the two targets.

   Figure 10 illustrates actual results for SAIDI for the Nauru Utilities Corporation between 2015 and 2020 financial year. For each year the base target was the previous year's result and the optimistic target was 50% of the previous year from 2015 to 2018. The long-term target was to achieve a SAIDI of 200 minutes. It was obvious that the long-term target would require over 5 years to achieve.

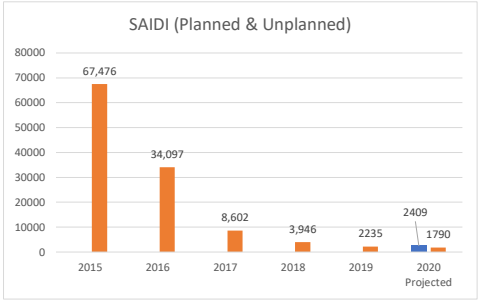


Figure 7: Nauru Utility Power Outage Indicator SAIDI

   From 2015 to 2018 the optimistic target was achieved and so for each of these years the score allocated for this indicator was 100%. This assessment methodology could be adopted where the long-term targets require year on year improvements.

   Where the objective is to maintain a performance level, the performance zone may be defined. For example; the ROCE target may be set at 8.5% ± 1% in Table 17. In this instance the score of '0%' would be given for a ROCE of 7.5% and 100% for a ROCE of 9.5%. The same could be done for project measures where the 0% score could be given for the minimum expected progress for that year and 100% score for the most optimistic progress expected to be achieved.
   The base and optimistic targets are set during the formulation of the BSC.

2. Average the indicators used for each perspective. A weighing for each indicator could be used to represent the importance of the indicator to that perspective, however, it is best to keep it simple and only use key measure/ KPIs for each perspective and average then to determine each perspective score.
3. A weighting could be introduced for perspectives to reflect the importance and difficulty of achieving the perspective score. For example, Table 18 may illustrate the weighing of perspectives as follows:

Table 9: Weighing Factor for Perspectives

Perspective	Weighing Factor
GOT	25%
Financial	25%
Customer	20%
Process	15%
Learning & Growth	15%

Note: The weighting Factor is to be determine by consultations with EPC.

4. The average score for each perspective is then multiplied by the weighting factor to determine the contributing score for each perspective.
5. The perspective score is added to determine the overall performance score.
6. The overall performance score is then multiplied by the budget allocated for the performance pay to determine the actual payout.
   For an overall score of 60% and a budget of 20% of the salary budget then the total payout is 60% x 20% = 12%.

The Distribution of the Payout among EPC Employees:

The objective of this exercise is to achieve the following:

1. Differentiate good performers from poor performers. The most performance destructive methodology for distributing the performance pay is to pay every employee 12% of their salaries. This will not incentivise the non-performer to improve and discourage the performer from maintaining his performance level.
2. Align individual effort while encouraging teamwork. Individualising performance assessment run the risk of encouraging the worker to focus solely on what he believe will gain him the greater bonus to the neglect of cooperating with others and being flexible to the unforeseen situations that may require his attention.
3. Be seen to be fair. Based on the principle that a senior officer's core duty is to lead his team to perform and achieve the goals of the unit, his performance is only as good as the performance of his team. Performance systems fail when the manager is given good bonus while those who report to him receive a poor bonus.

The methodology recommended to for adoption by EPC is as follows:

1. The first stage could eliminate employees with a disciplinary record for that year and for other factors such as safety, supervisor's assessment, etc.
2. Assessment and score each measure/ KPI.
3. Develop a responsibility map for each indicator by section. It is not advisable to take this down to the individual level. For example, the power outage indicators SAIFI and SAIDI is primarily the responsibility of the engineering division including the planning sections, the grid operational section, the production or generation sections, the construction, and repair and maintenance sections.
4. Determine the assessment score for each section based on the indicator responsibility and accountability map.[13]
5. Translate the individual score and section score into each individual worker's score.
6. Determine the payout for each worker.

An actual assessment done by the author for the Nauru Utilities Corporation is attached in Annex 3 to illustrate the methodology that can be adopted.

The timetable for executing the BSC is proposed as follows:

[13] Refer to Annex 2, Appendix 1, page 51

1. During the budgeting period leading to the commencement of the new financial year on the 1st of July od each year, the BSC be formulated and agreed upon as part of the budget submission. The budget for the performance payout for the previous financial year be approved in the budget submission of the new financial year as a percentage of the previous year's salary budget.
2. On a monthly basis EPC include an update on the measures in their monthly report to OOTR and every quarter the two meet to discuss the progress and corrective actions that may need to be taken.
3. At the end of the financial year after the audit of the financial and operational reports the BSC for the financial year is submitted to OOTR.
4. Based on the final BSC results, the performance of EPC is assessed, and the actual performance payout determined.
5. The performance pay be paid out one week before Christmas following the end of the financial year.

12. Annex 1: Nine Principles of Best Practise Regulation.

Key Principle	Explanation
Transparency	Transparency requires regulators to be open with stakeholders about their objectives, processes, data, and decisions. Regulators should establish visible decision-making processes that are fair to all parties and provide rationales for decisions. Such openness can assist in gaining stakeholders' confidence and acceptance of the regulator's decisions. There are circumstances in which it is impossible to provide information by reason of its confidentiality. The rules about treatment of information, including rules about what information will be regarded as confidential, or to which access will be restricted for any reason, should be identified early in the decision-making process, and explained to stakeholders. Transparency requires: • Integrity of decision makers. • Integrity of the decision-making process. • Integrity and logic of the reasoning behind regulatory decisions. • Facts and arguments taken into consideration in making regulatory decisions. • Clarity and verifiability of rules governing decision making processes. • Clarity and verifiability of transactions that occur within the regulated sector. Clear and verifiable procedures and rules are an essential feature of transparency. If an activity is to be effectively regulated, the rules and procedures that govern it should be clearly stated, consistently applied and on public record.
Accountability	Accountability involves regulators taking responsibility for their regulatory actions. This requires regulators to establish clearly defined decision-making processes and provide reasons for decisions. Supporting the decision-making processes should be effective appeal mechanisms and adherence to principles of natural justice and procedural fairness.
Independence	Regulatory decisions should be free from undue influences that could compromise regulatory outcomes. The principle of independence is a necessary element in providing stakeholders with confidence in the regulatory system and is linked to achieving the principles of consistency and predictability. Independence also has implications for accountability and facilitates transparency in processes. A confident, independent regulator will not seek to hide the processes used to reach decisions. Independence, when openly exercised, builds trust and confidence in the regulator.

	Independence requires that regulators have the expertise necessary to make judgments without undue influence from, or reliance on, market participants.
Consistency	Consistent treatment of participants across service sectors, over time and across jurisdictions, is a key principle for providing confidence in the regulatory regime. This principle is linked to the provision of consistent and fair rules that do not adversely affect the business performance of a specific participant.
Predictability	The principle of predictability of regulation is an essential requirement for utilities to be able to confidently plan for the future and be assured that their investments will not be generally threatened by unexpected changes in the regulatory environment. The principle is particularly important in the utility sector, which is characterised by major infrastructure works with long investment time horizons.
Flexibility	Flexibility involves the use of a mix of regulatory tools and the ability to evolve and amend the regulatory approach over time as the external environment changes. This assumes that the organisation has knowledge of, keeps up to date with, and is open to alternative regulatory approaches. At times courage may be required to implement new initiatives rather than to recycle approaches which can become a part of the culture within the public sector. Flexibility includes taking into account the condition of the local market when considering the design of regulation. These local conditions include the extent of infrastructure, the number of existing participants in the market and the existence of long-term contractual obligations. Key mechanisms for providing flexibility in regulation include being open to alternative regulatory tools and recognising conditions change over time.
Effectiveness and efficiency	Best practice regulation should include an assessment of the cost effectiveness of the proposed regulation, and an assessment of alternative regulatory proposals. Suitable measurements should be established to monitor the benefits established through regulatory controls and provide an assessment of the costs incurred by the regulatory body and utility. Efficiency takes a number of forms as shown below. • Information requirements. Regulatory bodies must have access to information that relates to the operations of the service provider. In order to achieve efficiency, • it is important that the information required should be limited to that required for them to carry out their functions. There needs to be a

balance between the disclosure of information required for regulation and the need for maintenance of confidentiality of commercial information. The regulator should therefore determine the minimum levels of information needed from stakeholders to support effective reporting and the minimum number of authorities for whom reports are necessary to effectively meet obligations to the Government and the community for disclosure and compliance purposes.

- Time taken to make decisions. Decision- making processes should be well defined and structured to eliminate unnecessary delays.
- Staff with appropriate levels of technical knowledge. There needs to be a stock of technical knowledge within the regulatory body to ensure that informed decisions can be made. The alternative is the dominance, through superior knowledge, by the organisations which are subject to regulation. In these circumstances, the regulator will tend to ask for higher volumes of information than might otherwise be requested with a higher knowledge and experience base. This is neither efficient nor desirable for all parties. Regulatory authorities should therefore invest in attracting, training, and keeping good staff.
- Processes should also minimise waste and duplication and operate quickly and easily for all parties.

Communication

Effective communication assists all stakeholders to understand regulatory initiatives and needs. Effective communication is both educative and informative and can help to build commitment to regulatory initiatives through better understanding of the regulatory objectives and rationales.

The regulator should always provide an explanation to enable stakeholders to understand the background and rationale for a decision.

Consultation

Effective and early consultation between regulators, customers and utilities is an essential component for ensuring appropriate regulatory systems are established. Consultation assists regulators to understand the implications of their regulations on industry participants and enables stakeholders to discuss the impact of regulation and suggest alternatives and improvements. The canvassing of all the possible alternatives is not the only outcome of consultation — consultation provides the basis to ensure that the quality of regulation is maximised.

13. Annex 2: Conversion Rates used for Comparing Electricity Rates

Conversion Rate to USD used to compare Electricity Prices of PIC Utilities

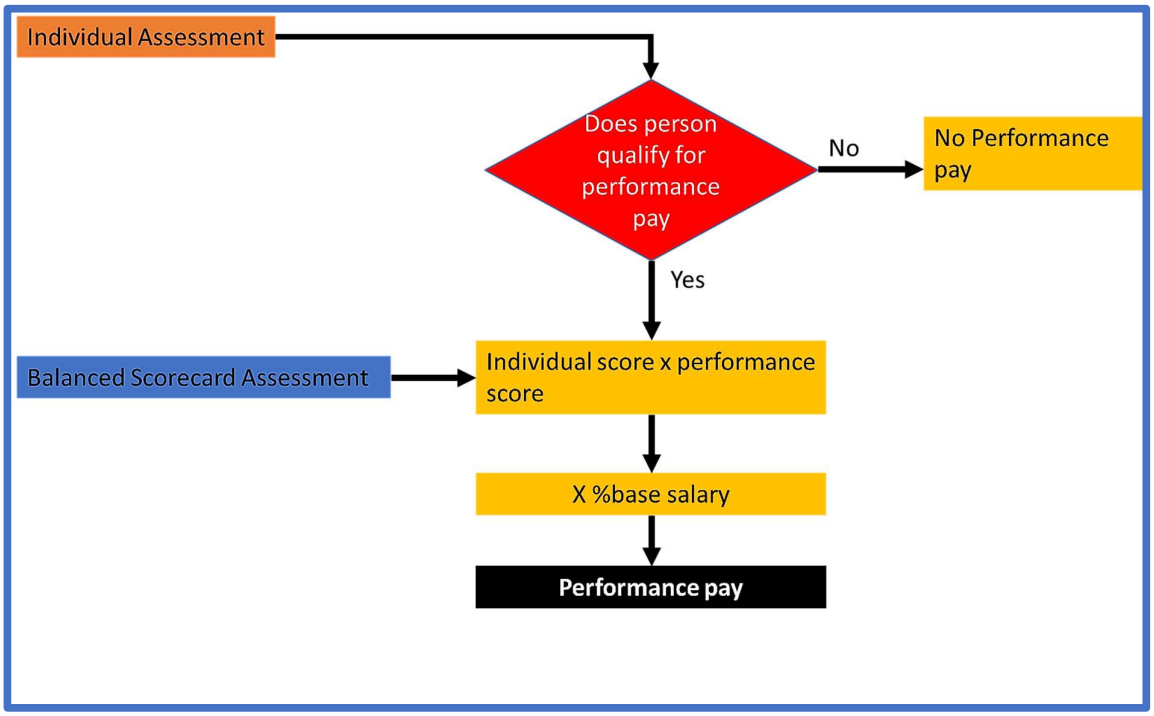
Pacific Utility	Country/ Territory	Local Currency	2021 Conversion Rate
ASPA	American Samoa	USD	1.00000
CPUC	Fed. States of Micronesia (FSM)	USD	1.00000
CUC	Commonwealth of Northern Marianas	USD	1.00000
EDT	French Polynesia	XPF	0.00840
EEC	New Caledonia	XPF	0.00840
EEWF	Wallis & Futuna	XPF	0.00840
ENERCAL	New Caledonia	XPF	0.00840
EPC	Samoa	WST	0.35530
EFL	Fiji	FJD	0.43350
GPA	Guam	USD	1.00000
KAJUR	Marshall Islands (RMI)	USD	1.00000
KUA	Fed. States of Micronesia (FSM)	USD	1.00000
MEC	Marshall Islands (RMI)	USD	1.00000
NPC	Niue	NZD	0.59000
NUC	Nauru	AUD	0.63250
PPL	Papua New Guinea (PNG)	PGK	0.28410
PPUC	Palau	USD	1.00000
PUB	Kiribati	AUD	0.63250
PUC	Fed. States of Micronesia (FSM)	USD	1.00000
SCE	Santa Catalina Island	USD	1.00000
SP	Solomon Islands	SBD	0.12000
TAU	Cook Islands	NZD	0.59000
TEC	Tuvalu	AUD	0.63250
TPL	Tonga	TOP	0.41231
UNELCO	Vanuatu	VUV	0.00818
YSPSC	Fed. States of Micronesia (FSM)	USD	1.00000

14. Annex 3: Performance Assessment Example for Distribution of Performance Pay.

Performance Assessment for Nauru Utilities Corporation, June 2017.

Introduction

The performance assessment process is as illustrated in the following diagram.



The assessment is for the 12 months of the financial year 2017.

Locals can be awarded performance pay of up to 20% of their base salary while expatriates can receive a maximum of 10% of base salary.

The individual assessment looks at a person's disciplinary record, safety record and supervisor rating of the person's performance.

This Balanced Scorecard assess corporate performance and this assessment is combined with a individual assessment to arrive at a final score from which the performance pay is determined for each employee who qualifies.

Each area is assessed and awarded a score which is then used to determine an overall score.

Balanced Score Card Assessment

The Balanced score cord has 34 performance indicators. Each are assessed and awarded a score based on the performance indicated.

The plan of assessment comprises two components:

1. Assess the quality and integrity of data and the acquisition process required to determine the KPI's. Those responsible for data acquisition are awarded performance points based on this assessment.
2. Assess the performance as indicated by the KPI's after the November monthly period to determine progress in line with the strategic plan. Sections responsible for performance shall be awarded performance points.

The performance score is allocated as follows:

0% Indicator matches the previous year's performance.

100% The optimistic target for the indicator is achieved.

Where the indicator lies in between the score is proportional. The score may be adjusted for other considerations.

1. Assessment of Data Acquisition & Reporting:

All sections have significantly improved their reporting and therefore maximum points are awarded for most of those responsible for reporting.

The exception is mentioned here:

- Finance Budget control reporting. The quality of the reports needs to be improved. Each month section heads need to be provided the reports for comments and correction so that the accuracy is improved. Examination of the section reports show a lot of questionable items. A score of 70% is allocated here.

Customer Service Performance:

The key indicators for customer service are the power outage indicators for electricity and the water delivery ratio for water. The former tracks the power outage impact on customer and the latter the delivery response to water orders.

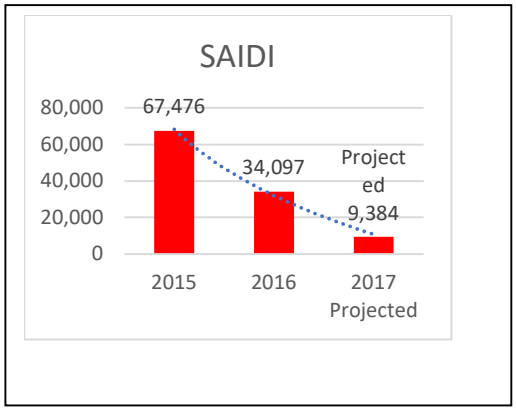
Power Outages:

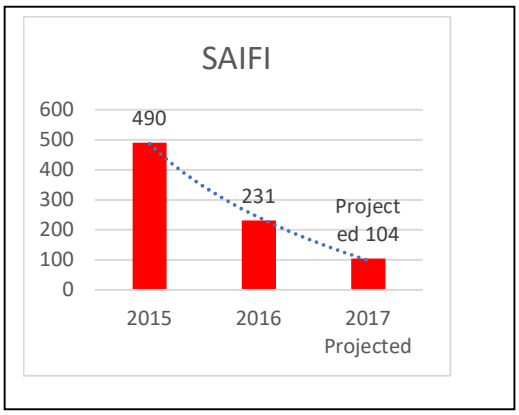
The power outages on the low voltage network are tracked by the "Complaints and Fault Response Indicators". CFRD and CFRI look at the duration and frequency impact of outages on customers respectively.

CFRD: Result to the end of May projected for the financial year 2017 suggests that the average duration of power outages on the low voltage network will reduce by almost 63% compared to the financial year 2016.

CFRI: Results to the end of November projected to the end of the financial year 2017 indicate that the frequency of power outages on the low voltage network will reduce by 60% compared to the financial year 2016.

Power Outages	2016	2017 Projected	% Reduction
CFRD	1,448	539	63%
CFRI	10	4.21	60%





The power outages on the high voltage network is measured with internationally recognized indicators SAIDI (System Average Interruption Duration Index) & SAIFI (System Average Interruption Frequency Index).

SAIDI and SAIFI are projected to be reduced by 72% and 55% respectively based on results to May, 2017. This result is phenomenal and reflects the major effort made towards improving power reliability. The maximum score is awarded for these indicators as they exceed the optimistic target of 50% reduction in outages.

CFRD	100%
CFRI	100%
SAIDI	100%
SAIFI	100%

2. Water Delivery:

The water delivery indicator shows that an average of 85% of orders were delivered within 2 days compared to 76% for the previous year. This improvement it must be considered in the light of a drought period in the first half of the financial year. Because most customers feed water off their roof into their tanks, the higher rainfall reduces the orders for water which subsequently reduces the pressure on the water tanker fleet. Nevertheless, the target of 85% was achieved.

W2DR = 100%

Financial Performance:

The financial performance of the NUC is measure using the following indicators.

Ope: is the operating profit for the electricity division. This profit excludes the fuel cost for the generation of electricity as it seeks to measure the performance of the division rather than the generating efficiency which is measured separately as an operational indicator. Including fuel cost here would swamp out all other effects.

This indicator is determined using direct revenue from electricity sales and direct costs for electricity production and distribution. Corporate costs are not included.

This indicator shows profit YTD May 2017 of 51%. The target set at 51%.

Opw: is the operating profit for the water division. As with Ope only direct revenue and costs are used to determine this indicator.

The Ope to the end of May, 2017 is 31%. This far exceeds the target of greater than 5%.

Opc: is the operating profit for the corporation, inclusive of water, electricity, and corporate costs. Fuel is excluded as the government funds it, and is tracked separately.

The Opc at the end of May 2017 is 24%. This exceeds the target of 2.5%.

Rinc: This indicator measures the revenue increase compared to the same period for the previous year. To the end of May 2017, the Rinc is 37%. This exceeds the target of 20% and is even more impressive when it is considered that the electricity tariffs remain the same in both periods.

For these indicators because the optimistic targets were met or exceeded, the scores awarded are as follows:

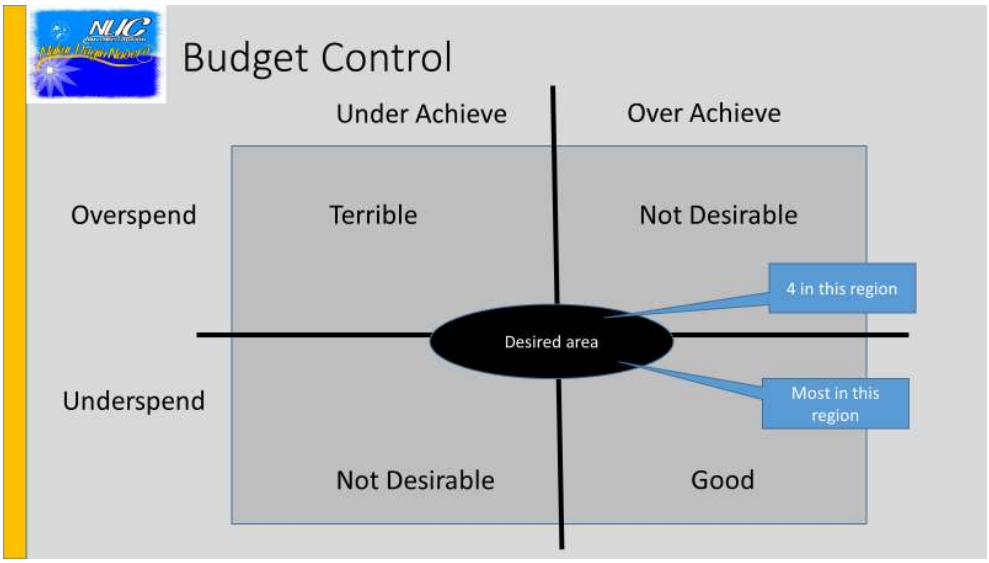
Ope	100%
Opw	100%
Opc	100%
Rinc	100%

BC: The BC (Budget Control) indicator is assessed for each section.

A Points to note are:

1. The operational expenses for the period YTD May 2017 total $ 7,868,020.00. The budget for the same period is $ 9,132,791.00. A savings of $1,264,771.00
2. NUC has also funded from its revenues fuel for power generation to the total amount of $1,686,961.00
3. Sections budget were reviewed and scored in accordance with actual expenditure against Budget.

When assessing performance points for budget control for each section the following illustrates:



Sections that underspend or overspend and underachieve will not receive performance points.

Top points are awarded for sections that slightly underspend and overachieved. Those that overspend and over-achieved will not score as well.

A summary of the scores are:

Section	Score
CEO Office	90%
Drawing Office/ Planning	90%
Power Station Electrical	80%
Finance	70%
Human Resources	90%
ICT	90%
Power Station Maintenance	60%
Metering & Regulation	90%
Power Distribution	90%
Procurement	90%
Renewable Energy	90%
Security	75%
Operations/ Control	90%
Water Production	80%
Water Dispatch	75%

Dd: Debtor days measures the effectiveness of managing the payment from credit customers. Dd currently is at 240 days as compared to 196 days at the end of the 2016 financial year. The target for this year is to reduce Dd to 100 days. Much effort has been put into collection of outstanding debt. The main debtors are Eigigu Holdings and Government Departments. Government is committed to clear all outstanding debts and Eigigu is yet to commit to a repayment plan. Considering the effort put into this and the prospect of a major improvement within a month, some leeway is exercised in scoring this indicator.

Dd = = 60%

NRE: Non-Revenue Energy is the energy produced which does not earn revenue for the NUC. The major component of this is energy loss which shall be assessed separately. The other components are electricity for NUC houses, offices, streetlights, and other public lighting. Power station Auxiliaries, while non-revenue earning is also excluded from this group and tracked separately.

The NRE excluding losses is 2.34% of the total energy available for sale. This measure is improving as more data is captured.

Score 90%

Operational Performance:

The following indicators measure the operational performance:

1 Electricity:

GA: Generator Availability measures the performance of the maintenance and operational staff. The current YTD May GA is 84% compared to 75% for the previous period. The target is 85% for the

financial year 2017. The improvement is 9% points above the last year performance when the target was 10 percentage points.

GA = 9/10 = 90%

GMC: Generator Maintenance Compliance measures the adherence to the planned maintenance schedule for the generators. The target is to exceed 90% where planned maintenance is done as and when due. The 10% non-compliance is where the maintenance is done but with some delay usually for operational reasons. The GMC for the period is 93%. This is above the target.

GMC 100%

SFC: Specific Fuel Consumption looks at the efficiency of utilizing fuel to generate power. While the benchmark is 4 kWh per litre fuel this will not be realizable until the old generators are rehabilitated and the new generators are installed.

The SFC for the period is 3.48 compared to 3.43 for the previous period. This improvement represents a savings of over $100,000 per annual in fuel expenditure.

SFC 90%

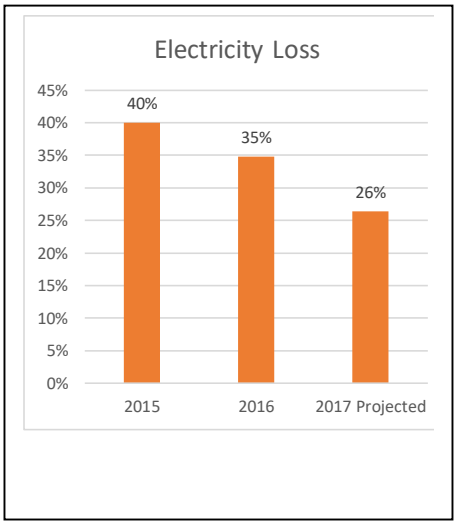
SLOC: Specific Lubricating Oil Consumption measures the efficiency of utilizing lubricating oil for power generation. SLOC for the current period is 510 kWh per litre oil. This compares with 404 kWh per litre for the previous period. The benchmark is to be greater than 500 kWh per litre. As with SFC this improvement is a result of much effort and a premium is added for this effort.

SLOC 100%

Le: Electricity energy loss is the percentage of energy loss in the process of delivery. Likely causes are thefts, metering and accounting errors and technical loss.

This is steadily reducing from 36% for the previous period to 26% YTD May 2017. The target loss reduction is 25%..

Le = 10/11 = 91%



NMeC & eMF:

Non-Metered electricity Connections and electricity Meter Faults are indicators that need to be re-evaluated as they do not sufficiently measure the performance of the Regulation and Metering sections. For this evaluation, the overall assessment of the section shall be considered.

Type of work	Number attended	YTD numbers
Alteration works	4	35
Customer faults	30	497
Damaged meter	1	6
Faulty CIU	1	23
Change of M/Mode	2	7

Faulty Meter	8	66
Bypass cases	1	25
Blank meter	8	16

The following points are pertinent:

- The ratification of faulty meters and correction of meter readings has resulted in additional revenue of approximately $ 1.3 million.
- Under the installation review project 102 installations have been inspected in the Meneng District and 92 installations have been rectified. The high rate of defects (90%) has slowed down the progress.
- The non-metered electricity connections vary as new non-metered connections are discovered. As of the end of May 2017, 92% of the known unmetered connections have had a meter installed.

Performance scores are

NMeC	95%
Emf	95%

PSAux: Power Station Auxiliary electricity usage is 0.6% of the total energy generated. This is well below the target of 2%.

PSAux	100%

RE: The Renewable energy component of total generated energy is measured to track the strategic objective of generating 50% of energy from renewable sources by 2020. RE is at 3.49% compared to the previous period where it was 0.7%. Also, capacity factor for the grid connected solar installations is 18%.

RE	95%

2 Water:

Lw: Water loss is at 6% compared to 18% for the last period and well below the target of 10%.

Lw	100%

WTA: Water Tanker Availability is at 66% compared to 73% last year. This unfortunately does not fully reflect the performance. Last year Nauru experienced a lot of rain. This places less demand on the tanker fleet and the impact is reflected in the WTA. A draught was experience during the period under assessment and the impact on WTA is obvious. WTA for the first six months of the FY 2017 was 57% when the drought was severe and 77% in the second half of the year. Some leeway is given because of this in scoring this indicator.

One factor that is encouraging is that better maintenance records are kept and carried out.

WTA	70%

ROA: Reverse Osmosis Plant Availability as with the power generators measure the performance of maintenance on the RO Plants.

ROA is at 94% compared to 76% for the previous period. NUC has become more involved with the maintenance of the RO's in assisting the contractors for the detention camp.

ROA	100%

Learning & Growth:

FA: Fleet Availability looks at how well the vehicle fleet, excluding the water tankers, is looked after.

FA has risen from 61% to 83% with the target of 85%

FA =	((83 – 61)/(85 – 61)) = 92%

OPT & DT: The Order Processing Time and Delivery Time are average time in days for ordering and delivering of supplies.

The OPT and DT have reduced from 29.51 and 19.5 to 9.89 and 7.21 respectively. The reduction of both indicators by almost 4 times is a major improvement.

OPT	100%
DT	100%

LWHP & LPHP: The Labour Work Hours and Labour Paid Hours Productivity measure the hours worked and hours paid per customer connection. Work hours is the actual hours worked while paid hours is the hours paid for work. During normal working hours work hours is equal to paid hours. During overtime 1 work hour may be equivalent to 1.5 or 2 paid hours depending on the overtime rate paid.

LWHP and LPHP was 119 and 160 hours for the financial year 2016. To the end of May 2017 LWHP and LPHP is 109 and 159 respectively. Projected to the end of the 2017 financial year, LWHP and LPHP are 118 and 171 hours respectively. This shows no improvement to date. To show improvement for the year 2017, overtime will need to be controlled. The scores reflect that while deterioration of these indicators is minimal, the efforts of labour has resulted in improvements in operations.

LWHP	30%
LPHP	30%

Att: Attendance is monitored for sections and therefore the score is allocated for each section.

The Average score for the period for each section is shown on the following table:

FY 2017	Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Overall
	Power Operations	88%	87%	92%	84%	85%	89%	94%	87%	85%	89%	83%		87%
	Water Dispatch	76%	90%	86%	84%	82%	86%	69%	77%	78%	80%	79%		81%
	Water Production	81%	93%	65%	52%	68%	53%	45%	37%	58%	61%	56%		61%
	Lines gang	80%	79%	81%	71%	89%	70%	62%	58%	77%	77%	72%		74%
	Vegetation Management	83%	64%	78%	72%	90%	81%	74%	82%	72%	79%	78%		78%
	Power Station Maintanence	85%	86%	72%	79%	85%	82%	84%	78%	76%	80%	77%		80%
	Power Station Electrical	85%	85%	82%	71%	90%	71%	92%	76%	83%	83%	103%		84%
	Special Projects	90%	84%	84%	67%	84%	65%	80%	88%	88%	84%	84%		81%
	Building & Plumbing	36%	49%	76%	73%	88%	73%	71%	73%	69%	70%	66%		68%
	ICT	71%	55%	61%	46%	65%	60%	63%	78%	76%	69%	74%		65%
	HR	48%	64%	70%	42%	60%	69%	59%	57%	68%	69%	64%		61%
	Finance	69%	71%	70%	77%	77%	62%	62%	49%	60%	52%	54%		64%
	Ceo sec & S/ Security	83%	93%	86%	83%	70%	79%	62%	85%	82%	74%	71%		79%
	Procurement	48%	39%	49%	51%	57%	41%	36%	83%	82%	75%	78%		58%
	Metering	69%	78%	86%	77%	92%	89%	77%	81%	83%	76%	73%		80%
	Renewable Energy	60%	70%	91%	98%	84%	73%	86%	53%	67%	68%	62%		74%
	Draftman	35%	40%	77%	81%	77%	75%	49%	58%	71%	95%	78%		67%

TD: Training days is determined as a percentage of man days. The YTD TD is 1.02%. We expect this to be between just above 1% for the year. The target is 2%.

	TD	50%

ITf and TR: IT Faults and Tickets resolved are indicators for the performance of the ICT section. ITf for the previous period was 99. This data, however, is suspect as we did not have comprehensive reporting. The YTD ITf for the current period is 98 and the ICT monthly reports have vastly improved. For that reason, scoring of performance is more subjective.

TR data for the previous period is not available and so the capture of this data is solely for the current period. TR for the period is 79%.

	ITf	70%
	TR	79%

LTID & LTIF: The safety indicators are yet to be captured. However, much progress has been made on the safety front. Training has been provided and the safety representatives are in place and the committee is operating.

Workers are provided with PPE's and more and more are using the PPEs.

No fatalities nor serious accidents have occurred during the period to date.

It is expected that by the next assessment the system for capturing the safety indicators will be in place.

Scoring of these indicators is subjective. This considers the progress made and several near miss incidents that could have resulted in serious or even fatal accidents.

Score:	LTID	80%
	LTIF	80%

Performance Evaluation Results:

The Balanced Scorecard is shown in Appendix 1.

The results of the performance evaluation is summarized in the tables is Appendix 2. The results are below:

	Performance Score		
	Score	Max Score	PS
Operations & Call Centre	1468%	1700%	86%
Water Dispatch	767%	1000%	77%
Water Production	661%	900%	73%
Water Laborotary	320%	700%	
Lines gang	884%	1100%	80%
Vegetation Management	888%	1100%	81%
Power Station Maintanence	1561%	1820%	86%
Power Station Electrical	884%	1100%	80%
Special Projects	481%	700%	69%
Building & Plumbing	466%	700%	67%
ICT	563%	800%	70%
HR	616%	800%	77%
Finance	1372%	1600%	86%
Vehicle Fleet Maintainance	747%	1000%	75%
Security & Safety	546%	700%	78%
Procurement	668%	900%	74%
Metering	1028%	1300%	79%
Renewable Energy	565%	800%	71%
Planning	968%	1200%	81%

Note: The Water Laboratory section was yet to be established.

The employee performance scores are shown in Appendix 3.

Note:

- The total Performance pay payout is $ 161,966.18
- The approved budget has an allocation of $544,125.00 of which only $ 22,400.00 is expended. There is sufficient funds in the approved budget to cover for this performance payout.

Appendix 1: Balanced scorecard

Balanced Scorecard		FY 2015	FY 2016	2017 Financial Year													
Perspective	Measure	2015	2016	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	March	April	May	June	YTD	Target
Customer	CFRD		1,448	46.80	61.75	66.20	102.64	86.57	94.37	13.84	25.32	32.92	1.84	6.64		539	724
Service	CFRI		10	0.13	0.43	0.54	0.72	0.73	0.77	0.25	0.21	0.37	0.02	0.05		4.21	5
	SAIDI	67,476	34,097	331.28	1,571.55	705.57	855.25	805	1,087	1,035	500	830	326	556		8,602	< 10,000
	SAIFI	490	231	5.10	17.33	6.73	8.07	7.85	11.12	13.34	5.77	8.83	4.17	7.20		96	< 110
	W2DR		76%	89%	67%	73%	86%	82%	89.00%	90%	91%	84%	92%	88%		85%	>85%
Finance																	
	Ope	56.30%	60%	67%	71%	71%	33%	70%	67%	55%	51%	41%	21%	31%		51%	> 51%
	Opw	12.60%	32%	54%	21%	23%	-15%	44%	42%	49%	53%	21%	12%	7%		31%	>(5%)
	Opc	14%	37%	51%	33%	41%	20%	22%	22%	47%	25%	21%	5%	8%		24%	> 2.8%
	Rinc	61%	20%	31%	30%	58%	19%	37%	58%	41%	41%	21%	37%	25%		37%	> 20%
	BC	Individual sections assessed															
	Dd		196	291	330	250	333	169	249	169	207	256	200	257		240	130
	NRE	40%	37%	32%	32%	31%	27%	26%	19%	31%	27%	24%	29%	27%	#DIV/0!	29%	<30%
Operations																	
Electricity	GA		75%	84%	80%	76%	74%	87%	86%	84%	84%	87%	87%	92.00%		84%	85%
	GMC		92%	90%	96%	91%	93%	91%	95%	93%	90%	94%	94%	96%		93%	90%
	SFC	3.49	3.43	3.54	3.50	3.54	3.41	3.42	3.42	3.45	3.86	3.45	3.50	3.25		3.48	> 3.6
	SLOC	462	404	417	470	417	402	641	522	471	544	543	767	696		510	< 500
	Le	40%	36%	31%	30%	28%	25%	23%	17%	29%	25%	22%	26%	24%		26%	< 25%
	NMeC		26	26		21	9	5						25			
	eMF		166	11	26	5	12	10	61	61	49		29	55		319	
	PSAux		0.9%	0.80%	0.79%	0.46%	0.29%	0.51%	0.56%	0.53%	0.55%	0.57%	0.43%	0.50%		0.6%	< 2%
	RE	0.73%	0.7%	3.24%	3.50%	3.47%	3.08%	3.71%	3.26%	2.86%	3.59%	3.85%	3.23%	3.44%	#DIV/0!	3.49%	
Water	Lw	11%	15%	-4%	3%	-6%	4%	1%	4%	-8%	-1%	6%	21%	26%		6%	< 10%
	FA		61%	71%	67%	73%	88%	87%	87%	86%	93%	85%	90%	85%		83%	> 85%
	WTA	0	73%	55%	51%	51%	53%	57%	76%	87%	77%	70%	74%	78%		66%	> 80%
	ROA	0	76%	99%	98%	99%	89%	84%	97%	96%	87%	94%	98%	93%		94%	> 85%
Org. Capacity																	
Supply Chain	OPT (d)		29.51	8.73	10.37	3	15	7.93	18.63	7.3	12.4	9.5	8.1	7.8		9.89	
	DT (d)		19.5	3.56	4.97	5.7	11.3	6.1	17	5.8	9.1	6.3	6	3.5		7.21	
HR	LWHP		119	13	9	8	12	9	8	12	9	10	10	9		109.19	< 100
	LPHP		167	19	13	12	17	12	14	18	13	13	15	13		159.13	< 130
	Att	49%	76%	74%	77%	77%	73%	81%	74%	69%	79%	75%	74%	73%		75%	> 95%
	TD	0%	2%	2%	1%	0.2%	1%	4%	1%	0.00%	0.05%	1.4%	0.48%	2%	#DIV/0!	1.02%	2%
ICT	Itf		99	36	1	8	11	11	10	4	10	4	2	1		98	
	TR			87%	79%	80%	89%	80%	64%	44%	79%	95%	79%	93%		79%	
Safety	LTID																
	LTIF																

Appendix 2: Evaluation Results:

Table 1 A: Responsibility for Measure

Performance Measures	CFRD	CFRI	SAIDI	SAIFI	WQC	W2DR	Ope	Opw	Opc	Rinc	BC	Dd	NRE	GA	GMC	SFC	SLOC	Le	Lw	NMeC	eMF	FA	WTA	ROA	PSAux	OPT	DT	LWHP	LPHP	Att	TD	Itf	LTID	LTIF
Operations & Call Centre	60%	60%	60%	60%										60%	60%	18%	20%	20%							20%										
Water Dispatch						30%													20%				70%												
Water Production																			20%					50%										
Lines gang																																		
Vegetation Management																																		
Power Station Maintanence														60%	60%	60%	60%	60%																
Power Station Electrical																																		
Special Projects																																		
Building & Plumbing																																		
ICT																															50%			
HR																												50%	50%		50%			
Finance						30%	30%	30%	30%	30%	40%	30%	30%					20%	20%																
Vehicle Fleet Maintainance																						50%												
Security & Safety																														60%			50%	50%
Procurement																										50%	50%							
Metering																		20%		50%	50%													
Renewable Energy																		20%																

Table 1B: Accountable for Measure

Performance Measures	CFRD	CFRI	SAIDI	SAIFI	WQC	W2DR	Ope	Opw	Opc	Rinc	BC	Dd	NRE	GA	GMC	SFC	SLOC	Le	Lw	NMeC	Mf	FA	WTA	ROA	PSAux	OPT	DT	LWHP	LPHP	Att	TD	Itf	LTID	LTI
Operations & Call Centre	40%	40%	40%	40%			100%				90%			36%	40%	72%	72%	73%							80%			30%	30%	87%			80%	80%
Water Dispatch						70%		100%			75%								80%				21%					30%	30%	81%			80%	80%
Water Production								100%			80%								80%					50%				30%	30%	61%			80%	80%
Water Laborotary								100%																				30%	30%				80%	80%
Lines gang	100%	100%	100%	100%			100%				90%																	30%	30%	74%			80%	80%
Vegetation Management	100%	100%	100%	100%			100%				90%																	30%	30%	78%			80%	80%
Power Station Maintanence	100%	100%	100%	100%			100%				60%			36%	40%	72%	80%	73%							100%			30%	30%	80%			80%	80%
Power Station Electrical	100%	100%	100%	100%			100%				80%																	30%	30%	84%			80%	80%
Special Projects							100%				80%																	30%	30%	81%			80%	80%
Building & Plumbing								100%			80%																	30%	30%	66%			80%	80%
ICT									100%		90%																	30%	30%	65%		38%	80%	80%
HR									100%		90%																	15%	15%	61%	25%		80%	80%
Finance						70%	70%	70%	70%	70%	90%	47%	63%					73%	80%	95%								30%	30%	64%			80%	80%
Vehicle Fleet Maintainance						100%			100%		80%											46%	70%					30%	30%	81%			80%	80%
Security & Safety									100%		75%																	30%	30%	71%			40%	40%
Procurement									100%		90%															50%	50%	30%	30%	58%			80%	80%
Metering							100%			100%	90%	60%	90%					73%		48%	48%							30%	30%	80%			80%	80%
Renewable Energy							100%				90%							73%										30%	30%	62%			80%	80%
Planning	100%	100%	100%	100%			100%				90%							91%										30%	30%	67%			80%	80%

Appendix 3: Performance Pay List

NAME/ POSITION	Grade	Commence	P.A.	Comments	Qualify	Safety	Superv. Score	Discplinary Action	IndividualScore	Base Salary	BSC Score	Recommend Payout
FLEET MAINTENANCE (4)												
W1	6.1	3.01.07	$ 13,056.00		1.00	1	76	1	76.00	20%	67%	$ 1,329.62
W2	9.1	1.07.05	$ 10,724.00		1.00	1	89	1	89.00	20%	67%	$ 1,278.94
W3	13.1	12.04.13	$ 8,466.00		1.00	1	89	1	89.00	20%	67%	$ 1,009.66
W4	15.1	21.06.16	$ 6,391.00		1.00	1	89	1	89.00	20%	67%	$ 762.19
Navid Asadi	13.1	1.05.17	$ 8,466.00		-	1	55	1	-	20%	67%	
BUILDING MAINTENANCE (4)						1			-			
W4	12.2	29.01.14	$ 9,251.00		1.00	1	82	1	82.00	20%	67%	$ 1,016.50
W6	16.2	29.05.15	$ 6,236.00		1.00	1	76	0.95	72.20	20%	67%	$ 603.32
W7	12.1	2.11.16	$ 8,982.00		1.00	1	85	1	85.00	20%	67%	$ 1,023.05
W9	12.1	7.11.16	$ 8,982.00		1.00	1	81	1	81.00	20%	67%	$ 974.91
W10	15.1	1.05.17	$ 6,391.00		-	1	89	1	-	20%	67%	
PLANNING; (4)												
W11	N/A				-	1			-	20%	81%	
W12	13.1	3.01.17	$ 8,466.00	probation	-	1		1	-	20%	81%	
W13		11.01.16	$ 14,412.00	Long term Study leave	-	1			-	20%	81%	
						1			-			
RENEWABLE ENERGY; (4)						1			-			
W14	8.2	13.01.14	$ 11,776.00	Long term Study leave	-	1			-	20%	71%	
W15	14.1	27.04.15	$ 6,715.00		1.00	1	55	1	55.00	20%	71%	$ 524.44
W16	13.1	19.12.16	$ 8,466.00		1.00	1	62	1	62.00	20%	71%	$ 745.35
W17	8.1	01.07.05	$ 11,378.00		1.00	1	77	1	77.00	20%	71%	$ 1,244.07
SECURITY & SAFETY; (3)						1			-			
w18	5.1	11.02.14	$ 17,314.00		1.00	1	80	1	80.00	20%	78%	$ 2,160.79
w19	9.2	19.01.15	$ 11,046.00		1.00	1	86	1	86.00	20%	78%	$ 1,481.93
w20	13.1	19.12.17	$ 8,466.00		1.00	1	73	1	73.00	20%	78%	$ 964.11
METERING; (8)						1			-			
W20	13.2	01.07.05	$ 8,720.00		1.00	1	72	1	72.00	20%	79%	$ 991.99
W21	11.1	01.07.05	$ 9,529.00		1.00	1	75	1	75.00	20%	79%	$ 1,129.19
W22	9.1	01.07.05	$ 10,724.00		1.00	1	53	1	53.00	20%	79%	$ 898.03
W23	15.1	20.02.17	$ 6,391.00	still casual	-	1		1	-	20%	79%	
W24	6.1	01.07.05	$ 13,056.00		1.00	1	79	1	79.00	20%	79%	$ 1,629.65
W25	13.2	01.07.05	$ 8,720.00		1.00	1	73	1	73.00	20%	79%	$ 1,005.76
W26	13.2	01.07.05	$ 8,720.00		1.00	1	81	1	81.00	20%	79%	$ 1,115.99
W27	14.1		$ 6,715.00		1.00	1			-	20%	-	

NAME/ POSITION	Grade	Commence	P.A.	Comments	Qualify	Safety	Superv. Score	Discplinary Action	IndividualScore	Base Salary	BSC Score	Payout
POWER GENERATION ELECTRICAL; (7)						1			-			
W28	N/A				-	1			-	20%	80%	
W29	10.2	10.02.09	$ 10,412.00		1.00	1	50	1	50.00	20%	80%	$ 832.96
W30	15.2	9.12.14	$ 6,551.00		1.00	1	54	1	54.00	20%	80%	$ 566.01
W31	15.1	21.06.16	$ 6,391.00		1.00	1	63	1	63.00	20%	80%	$ 644.21
W32	12.2	29.02.16	$ 9,251.00		1.00	1	46	1	46.00	20%	80%	$ 680.87
POWER GENERATION MAINTENANCE; (19)						1			-			
						1			-			
W33	9.1	01.07.05	$ 10,724.00		1.00	1	70	1	70.00	20%	86%	$ 1,291.17
W34	15.1	15.04.13	$ 6,391.00		1.00	1	80	1	80.00	20%	86%	$ 879.40
W35	N/A				-	1		1	-	20%	86%	
W36	13.2	01.07.05	$ 8,720.00		1.00	1	80	1	80.00	20%	86%	$ 1,199.87
W37	9.2	18.02.13	$ 11,046.00		1.00	1	74	1	74.00	20%	86%	$ 1,405.93
W38	9.1	01.07.05	$ 10,724.00		1.00	1	81	1	81.00	20%	86%	$ 1,494.07
W39	9.1	01.07.05	$ 10,724.00		1.00	1	61	1	61.00	20%	86%	$ 1,125.16
W40	10.3	30.07.12	$ 10,724.00		1.00	1	75	1	75.00	20%	86%	$ 1,383.40
W41	14.1		$ 6,715.00		-	1		1	-	20%	86%	
W42	9.1	1/07/2005	$ 10,724.00		1.00	1	66	1	66.00	20%	86%	$ 1,217.39
W43	N/A				-	1		1	-	20%	86%	
W44	15.1	20.3.17	$ 6,391.00	still casual	-	1	79	1	-	20%	86%	
W45	5.1	10.06.08	$ 17,314.00		1.00	1	79	1	79.00	20%	86%	$ 2,352.63
W46	14.1	6.01.14	$ 6,715.00		1.00	1	85	1	85.00	20%	86%	$ 981.73
W47	10.1	27.07.16	$ 10,412.00		1.00	1	85	1	85.00	20%	86%	$ 1,522.23
W48	6.5	01.07.05	$ 14,695.00		1.00	1	96	1	96.00	20%	86%	$ 2,426.44
W49	14.2	15.04.13	$ 8,466.00		1.00	1	60	0.9	54.00	20%	86%	$ 786.32
W50	N/A				-	1		1	-	20%	86%	
PSTN SHIFT OPERATOR; (13)		Commenced				1			-			
W51	8.2	01.07.05	$ 11,776.00		1.00	1	72	1	72.00	20%	86%	$ 1,458.34
W52	15.2	5/01/2017	$ 6,551.00	still casual	-	1	92	1	-	20%	86%	
W53	12.2	01.07.05	$ 9,251.00		1.00	1	96	1	96.00	20%	86%	$ 1,527.53
W54	10.2	28.07.14	$ 10,412.00		1.00	1	98	1	98.00	20%	86%	$ 1,755.05
W55		8.07.14	$ 6,398.08		1.00	1	80	0.8	64.00	20%	86%	$ 704.30
W56	10.2	01.07.05	$ 10,412.00		1.00	1	98	1	98.00	20%	86%	$ 1,755.05
W57	10.2	01.07.05	$ 10,412.00		1.00	1	92	0.95	87.40	20%	86%	$ 1,565.22
W58	15.2	01.07.05	$ 6,552.00		1.00	1	96	0.9	86.40	20%	86%	$ 973.68
W59	12.2	01.07.05	$ 9,251.00		1.00	1	78	1	78.00	20%	86%	$ 1,241.11
W60	10.2	01.07.05	$ 10,412.00		1.00	1	98	1	98.00	20%	86%	$ 1,755.05
W61	15.2	5.01.17	$ 6,551.00	still casual	-	1	94	1	-	20%	86%	
W62	15.2	01.07.05	$ 6,552.00		1.00	1	92	0.8	73.60	20%	86%	$ 829.43
W63	15.2	21.03.16	$ 6,551.00		1.00	1	96	1	96.00	20%	86%	$ 1,081.70

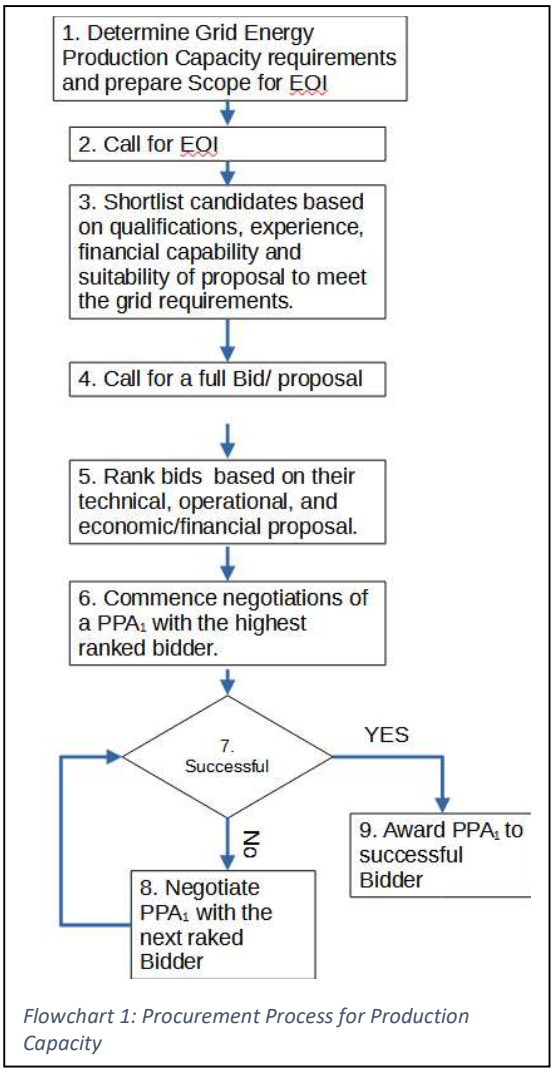
NAME/ POSITION	Grade	Commence	P.A.	Comments	Qualify	Safety	Superv. Score	Discplinary Action	IndividualScore	Base Salary	BSC Score	Payout
WATER PRODUCTION; (9)						1			-			
W64	14.1	28.11.16	$ 6,715.00		1.00	1	72	1	72.00	20%	73%	$ 705.88
W65	13.1	11.03.14	$ 8,466.00		1.00	1	85	1	85.00	20%	73%	$ 1,050.63
W66	7.2	07.04.08	$ 12,615.00		1.00	1	74	0.75	55.50	20%	73%	$ 1,022.19
W67	13.1	11.03.14	$ 8,466.00		1.00	1	84	1	84.00	20%	73%	$ 1,038.27
W68	14.2	01.07.05	$ 6,883.00		1.00	1	60	1	60.00	20%	73%	$ 602.95
W69	14.1	01.07.05	$ 6,715.00		1.00	1	57	1	57.00	20%	73%	$ 558.82
W70	9.2	03.03.14	$ 11,046.00		1.00	1	74	1	74.00	20%	73%	$ 1,193.41
W71	14.1	01.07.05	$ 6,715.00		1.00	1	64	0.95	60.80	20%	73%	$ 596.08
W72. Trainee	N/A				-	1			-	20%	73%	
WATER DISTRIBUTION; (25)						1			-			
W73	12.2	31.10.13	$ 9,251.00		1.00	1	61	1	61.00	20%	77%	$ 869.04
W74	15.1	18.12.13	$ 6,391.00		1.00	1	71	1	71.00	20%	77%	$ 698.79
W75	15.1	01.07.05	$ 6,391.00		1.00	1	63	0.85	53.55	20%	77%	$ 527.05
W76	15.1	18.12.13	$ 6,391.00		1.00	1	70	1	70.00	20%	77%	$ 688.95
W77	6.1	01.07.05	$ 13,056.00		1.00	1	78	1	78.00	20%	77%	$ 1,568.29
W78	15.1	13.3.17	$ 6,391.00	still casual	-	1	70	1	-	20%	77%	
W79	12.1	21.11.16	$ 8,982.00		1.00	1	65	1	65.00	20%	77%	$ 899.10
W80	12.1	01.07.05	$ 8,982.00		1.00	1	69	1	69.00	20%	77%	$ 954.43
W81	15.1	1.07.05	$ 6,391.00		1.00	1	86	1	86.00	20%	77%	$ 846.42
W82	15.1	01.07.05	$ 6,391.00		1.00	1	62	1	62.00	20%	77%	$ 610.21
W83	15.1	01.07.05	$ 6,391.00		1.00	1	66	1	66.00	20%	77%	$ 649.58
W84	12.1	21.11.16	$ 8,982.00		1.00	1	83	1	83.00	20%	77%	$ 1,148.08
W85	15.1	12.04.13	$ 6,391.00		1.00	1	57	0.85	48.45	20%	77%	$ 476.85
W86	12.2	31.07.15	$ 9,251.00		1.00	1	67	1	67.00	20%	77%	$ 954.52
W87	12.2	30.10.13	$ 9,251.00		1.00	1	69	1	69.00	20%	77%	$ 983.01
W88	12.2	1.10.13	$ 9,251.00		1.00	1	74	1	74.00	20%	77%	$ 1,054.24
W89	10.1	01.07.05	$ 10,412.00	23/01 - 9/06/17 took leave	0.50	1	72	1	36.00	20%	77%	$ 577.24
W90	11.1	02.02.11	$ 9,529.00		1.00	1	68	1	68.00	20%	77%	$ 997.88
W91	16.2	01.07.05	$ 6,236.00		1.00	1	74	0.8	59.20	20%	77%	$ 568.52
W92	12.2	12.05.15	$ 9,251.00		1.00	1	75	1	75.00	20%	77%	$ 1,068.49
W93	16.1	11.04.16	$ 6,084.00	still temporary	-	1	67	1	-	20%	77%	
W94	11.1	01.07.05	$ 9,529.00		1.00	1	78	1	78.00	20%	77%	$ 1,144.62
W95	15.1	31.07.15	$ 6,391.00		1.00	1	69	1	69.00	20%	77%	$ 679.11
W96	12.2	22.09.11	$ 9,251.00	Terminated	-	1	58	1	-	20%	77%	

NAME/ POSITION	Grade	Commence	P.A.	Comments	Qualify	Safety	Superv. Score	Discplinary Action	IndividualScore	Base Salary	BSC Score	Payout
SUPPLY CHAIN; (7)						1			-			
W97	5.2	06.08.12	$ 18,007.00		1.00	1	87	1	87.00	20%	74%	$ 2,318.58
W98	15.1	15.02.17	$ 6,391.00		-	1		1	-	20%	74%	
W99	15.1	27.01.17	$ 6,391.00		-	1		1	-	20%	74%	
W100	13.2	05.12.13	$ 10,412.00		1.00	1	93	1	93.00	20%	74%	$ 1,433.11
W101	15.1	27.01.17	$ 6,391.00		-	1		1	-	20%	74%	
W102	15.1	27.01.17	$ 6,391.00		-	1		1	-	20%	74%	
W103	13.1	4.04.17	$ 8,466.00		-	1		1	-	20%	74%	
FINANCE: (19)						1			-			
W104	8.1	01.07.05	$ 11,378.00		1.00	1	92	1	92.00	20%	86%	$ 1,800.45
W105	14.1	3.10.16	$ 6,715.00	casual	-	1	93	1	-	20%	86%	
W106	8.1	13.01.14	$ 11,378.00	Long term Study leave	-	1	86	1	-	20%	86%	
W107	14.1	23.11.16	$ 6,715.00	casual	-	1	88	1	-	20%	86%	
W108	11.1	21.10.15	$ 9,529.00		1.00	1	69	1	69.00	20%	86%	$ 1,130.90
W109	13.2	30.06.14	$ 8,720.00		1.00	1	92	1	92.00	20%	86%	$ 1,379.85
W110	11.2	07.08.13	$ 9,814.00		1.00	1	83.5	1	83.50	20%	86%	$ 1,409.49
W111	12.1	15.04.13	$ 8,982.06		1.00	1	84	0.95	79.80	20%	86%	$ 1,232.84
W112	7.2	01.07.05	$ 12,615.00		1.00	1	81	1	81.00	20%	86%	$ 1,757.52
W113	13.2	01.07.05	$ 8,720.00		1.00	1	93	1	93.00	20%	86%	$ 1,394.85
W114	8.1	01.07.05	$ 11,378.00		1.00	1	45	1	45.00	20%	86%	$ 880.66
W115	5.1	06.08.12	$ 17,314.00	Long term Study leave	-	1		1	-	20%	86%	
W116	N/A			student trainee	-	1		1	-	20%	86%	
W117	8.2	14.11.12	$ 11,776.00		1.00	1	81	1	81.00	20%	86%	$ 1,640.63
W118	13.2	30.06.14	$ 8,720.00		1.00	1	93	1	93.00	20%	86%	$ 1,394.85
W119	13.1	9/12/2014	$ 8,466.00		1.00	1	45	0.95	42.75	20%	86%	$ 622.50

NAME/ POSITION	Grade	Commence	New Annual		Qualify	Safety	Superv. Score	Discplinary Action	IndividualScore	Base Salary	BSC Score	Payout
LINEMEN; (17)						1			-			
W120	6.1	01.07.05	$ 13,056.00		1.00	1	86	1	86.00	20%	80%	$ 1,796.51
W121	15.1	25.01.16	$ 6,391.00		1.00	1	96	1	96.00	20%	80%	$ 981.66
W122	15.1	16.03.17	$ 6,391.00	still casual	-	1		1	-	20%	80%	
W123	15.1	29.12.15	$ 6,391.00		1.00	1	88	1	88.00	20%	80%	$ 899.85
W124	14.2	04.02.14	$ 6,883.00		1.00	1	90	1	90.00	20%	80%	$ 991.15
W125	9.1	20.3.17	$ 10,724.00	still casual	-	1		1	-	20%	80%	
W126	12.1	04.08.14	$ 8,982.00		1.00	1	98	1	98.00	20%	80%	$ 1,408.38
W127	14.2	13.04.15	$ 6,883.00		1.00	1	57	0.8	45.60	20%	80%	$ 502.18
W128	12.2	12.11.13	$ 9,251.00		1.00	1	75	1	75.00	20%	80%	$ 1,110.12
W129	14.3	15.9.14	$ 7,055.00		1.00	1	93	1	93.00	20%	80%	$ 1,049.78
W130	11.2	01.07.05	$ 9,814.00		1.00	1	93	1	93.00	20%	80%	$ 1,460.32
W131	9.2	12.11.13	$ 11,046.00		1.00	1	88	1	88.00	20%	80%	$ 1,555.28
W132	14.2	20.03.13	$ 6,883.00		1.00	1	90	1	90.00	20%	80%	$ 991.15
W133	8.2	01.07.05	$ 11,776.00	Long term Study leave	-	1		1	-	20%	80%	
W134	12.2	25.01.16	$ 9,251.00		1.00	1	85	1	85.00	20%	80%	$ 1,258.14
W135	15.1	04.02.14	$ 6,391.00		1.00	1	91	1	91.00	20%	80%	$ 930.53
LINE CLEARING; (9)						1			-			
W136	15.1	13.02.16	$ 6,391.00	casual	-	1		1	-	20%	81%	
W137	8.1	01.07.05	$ 11,378.00		1.00	1	77	1	77.00	20%	81%	$ 1,419.29
W138	15.1	16.3.17	$ 6,391.00	casual	-	1		1	-	20%	81%	
W139	15.1	16.3.17	$ 6,391.00	casual	-	1		1	-	20%	81%	
W140	15.1	16.3.17	$ 6,391.00	casual	-	1		1	-	20%	81%	
W141	15.1	21.3.16	$ 6,391.00		1.00	1	63	1	63.00	20%	81%	$ 652.27
W142	15.1	21.12.15	$ 6,391.00		1.00	1	68	1	68.00	20%	81%	$ 704.03
W143	15.1	21.3.16	$ 6,391.00		1.00	1	93	1	93.00	20%	81%	$ 962.87
W144	11.1	01.07.05	$ 9,529.00	LWOP	-	1		1	-	20%	81%	
HUMAN RESOURCE/ ADMINISTRATION; (10)						1			-			
W145	12.2	17.04.15	$ 9,251.00		1.00	1	79	1	79.00	20%	77%	$ 1,125.48
W146	12.2	01.07.05	$ 9,251.00		1.00	1	40	0.9	36.00	20%	77%	$ 512.88
W147	11.2	06.01.14	$ 9,814.00	23/01 took Leave till Oct LWOP	0.50	1	64	1	32.00	20%	77%	$ 483.63
W148	13.1	29.08.16	$ 8,466.00		1.00	1	64	1	64.00	20%	77%	$ 834.41
W149	14.1	7/10/2016	$ 6,715.00		1.00	1	75	1	75.00	20%	77%	$ 775.58
W150	4.4	17.09.09	$ 21,065.00		1.00	1	77	1	77.00	20%	77%	$ 2,497.89
W151	8.2	7.10.12	$ 11,776.00		1.00	1	78	1	78.00	20%	77%	$ 1,414.53
W152	N/A				-	1		1	-	20%	77%	
W153	16.1	3/04/2017	$ 6,084.00	casual	-	1		1	-	20%	77%	
W154	16.1	3/04/2017	$ 6,084.00	casual	-	1		1	-	20%	77%	
ICT; (4)						1			-			
W155	5.2	22.08.12	$ 18,007.00		1.00	1	83	1	83.00	20%	70%	$ 2,092.41
W156	13.2	12.11.14	$ 8,720.00		1.00	1	81	1	81.00	20%	70%	$ 988.85
W157	14.1	2/03/2016	$ 6,715.02		1.00	1	70	1	70.00	20%	70%	$ 658.07

15. Annex 4: Process for Procuring Production Capacity from IPPs.

The process for procuring capacity to meet the electricity grid requirements with the private sector participation is outlined in the flowchart Figure A. The process is primarily the responsibility of EPC. The responsibility of the OOTR and other Government departments is to ensure a fair and transparent process is executed and that the best technical and financial option is selected to meet the needs of the grid.



Flowchart 1: Procurement Process for Production Capacity

EPC may wish to engage consultants to assist them with the process.

The description of each step is as follows:

1. Identify the need for production capacity and energy required of IPPs, including grid connectivity and operational requirements. The Scope or Terms of Reference is then prepared detailing these requirements and the technical and financial capabilities required of candidates. Candidates must also provide a brief on how they intend to meet the requirements.

2. Expression of Interest is then called for from parties interested in participating as IPPs.

3. Based on a candidates experience, financial capabilities, and proposal on how the candidate intends to meet the capacity needs, a shortlist of candidates is prepared. At this stage the OOTR may review the shortlist to verify fairness in the selection of candidates.

4. The shortlisted candidates are invited to submit a full bid detailing their proposal.

5. The full bid must provide sufficient information to enable the technical, operational, and financial assessment of the feasibility of the proposal. The bids are ranked, and the highest ranked bidder invited to negotiate a PPA1. Upon the successful outcome of negotiations, the PPA1 shall be awarded to the highest ranked bidder. Should negotiations be unsuccessful, the next ranked bidder shall be invited to negotiate a PPA1. This process shall be repeated until a successful outcome is achieved.

he PPA1 will include Condition Precedence that must be satisfied after the signing before the PPA1 becomes binding. This would include the approval of the PPA1 by the OOTR and the issue of a generation license to the IPP by the OOTR.

The approval by the OOTR is the final step in the award of the PPA_1

16. References

1. Pathway for the Development of Samoa FY 2021/22 to FY 2025/26
2. Best Practice Utility Regulation, Utility Regulators Forum discussion paper, Office of Water Regulation, Western Australia, July 1999
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5. The Strategy Focused Organization by Robert S Kaplan & David P Norton, published 2001.
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