

December 2020



# Nauru Utilities Corporation

Five Year Strategic-and-Operational  
Plan 2021 to 2025

## Makur Dogin Naoero

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## *Abbreviations*

AA	Australian Aid
ADB	Asian Development Bank
CAPEX	Capital Expenditure
DIBP	Department of Immigration & Boarder Protection, Australian Government
UAE	United Arab Emirates
EU	European Union
FEA	Fiji Electricity Authority
HV	High Voltage
kl	kilolitres
kW	kilowatt
kWh	kilowatt hour
KPI	Key Performance Indicators
LV	Low Voltage
NWSHP	National Water Sanitation & Hygiene Policy
NWSMP	National Water & Sanitation Master Plan.
NERM	Nauru Energy Road Map
NIEP	National Integrated Environment Plan
NSDS	National Sustainability Development Plan
NUC	Nauru Utilities Corporation
OH&S	Occupational Health and Safety
OPEX	Operational Expenditure
PPA	Pacific Power Association
PPE	Persona Protective Equipment
PWWA	Pacific Water & Wastewater Association
ML	Mega Litres
MW	Megawatt
MWh	Megawatt Hour
RON	Republic of Nauru Government
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SPC	South Pacific Commission
SWP	Safe Work Procedures

# Executive Summary

## Introduction

The purpose of Nauru Utilities Corporation's (NUC) 5-year Strategic and Operational Plan for 2021 - 2025 is to implement and deliver on NUC's 2031 Future Operating Model.

The Strategic and Operational Plan 2021-2025 articulates NUC's Vision, Mission, Strategic Objectives, Targets and Key Performance Indicators (KPIs). It similarly, presents the main strategic and operational activities of NUC for the five-year period. Being a rolling plan, it is subject to annual reviews and updating to make it more responsive to changes in the operating environment.

Our 2031 Future Operating Model is aligned with key national development frameworks particularly the Government's National Sustainability Development Strategy 2005 – 2025 which aims:

 In the case of energy:

Provide a reliable, affordable, secure and sustainable energy supply to meet socio-economic development needs.

 In the case of Water & Sanitation:

Provide a reliable, safe, affordable, secure and sustainable water supply to meet socio-economic development needs; and

Effective management of waste and pollution that minimizes negative impacts on public health and environment.

Furthermore, it enables NUC to effectively and efficiently perform its core functions in line with the *Nauru Utilities Corporation Act 2011*; *Nauru Utilities Corporation Amendment Act 2016*; *Public Enterprise Act 2019*; *Nauru Energy Road Map 2018-2020*; and *Nauru National Energy Policy 2009*.

## Vision

NUC's 5-year Strategic and Operational Plan 2021-2025 is guided by the following vision:

### "Makur Dogin Naoero"

Makur Dogin Naoero meaning "Work for Nauru" appeals to the heart of employees, to give meaning to their work and to inspire exceptional performance.

In order to be a high performing organisation, one that delivers exceptional service to the people of Nauru our vision encapsulates that our people are working for their fellow Nauruans, for their families, especially their children, grandchildren and for future generations.

## Mission

In line with the vision, the mission of the NUC is:

For **N**auru we will **A**chieve, with a **U**nited effort and doing things **R**ight first time, **U**topia: providing safe, reliable, affordable, secure and sustainable electricity and water supply.

## Core Values

In pursuit of its mission, NUC will continue to be guided by the following six (6) core values - defining its desired corporate culture:

	Core Value	Description
1	Impartiality	NUC staff shall treat all customers, stakeholders and each other with fairness. NUC provides safe, reliable, affordable and sustainable electricity and water supply to its customers.
2	Morality	NUC staff shall ensure they uphold standards of right and good conduct.
3	Professionalism	NUC staff shall perform their duties with the highest degree of competence and skills.
4	Accountability	NUC staff shall perform their duties in a manner that shows readiness to take full accountability and responsibility for their actions.
5	Consistency	NUC staff shall ensure uniformity, predictability and coherence in accordance with our Code of Conduct and Core Values.
6	Transparency	NUC staff shall operate in a fair and open manner and without prejudice in delivering safe, reliable, affordable and sustainable electricity and water services.




## Motto

In line with its core values – NUC shall use the following motto to rally employees, consumers, suppliers, and stakeholders, in general, behind its vision and mission:

**“Safe reliable, affordable and sustainable services with positive IMPACT”**

## Strategic Objectives and Implementation Plan

During the five-year period, 2021 - 2025, the NUC through its Strategic and Operational Plan will pursue the following five (5) Strategic Objectives:

-  Customer Focus: NUC shall implement strategies to shift from an “operational” focus to a customer centric organisation. NUC is committed to improving our service delivery to benefit our customers and stakeholders. Underpinning our approach are our fundamental commitments which lay the foundation for our strategic priorities and initiatives. They are:
  - Delivering Safe, Reliable, Affordable and Sustainable Electricity and Water Services
  - Communicating and Engaging with Customers and Stakeholders
  - Delivering Customer Outcomes
  - A High Performing Organization
-  Human Resources: NUC shall continue to develop and up-skill leaders and staff to ensure enhanced operational safety, improved operational performance and customer service outcomes. Through an efficient, robust and well-resourced organisation, our Finance, Human Resource, Procurement and Technical Operations Teams are committed in working together to deliver safe, reliable, affordable and sustainable electricity and water services to our customers.
-  Environment: NUC shall ensure sustainable use and management of the environment and natural resources for the benefit of present and future generations. NUC’s commitment to implementation of large-scale solar and the investigation and implementation of other renewable energy sources coupled with an efficient supply and use of energy will reduce our carbon footprint and subsequent impact on our environment.

- ✚ Safety: An integral part of delivering electricity and water services to our customers is ensuring that it is carried out in a safe and sustainable way. The health, safety and well-being of our staff and customers are paramount. NUC shall provide all systems, equipment and Personal Protective Equipment (PPE) necessary for employees to carry out their work safely. NUC staff continuously identify hazards, report incidents and learn from mistakes, making changes to operations to ensure safety of personnel and the public. It will become a way of life.
- ✚ Operational Performance: Ensuring a safe reliable, affordable and sustainable provision of electricity and water services in Nauru is central objective of Government. An efficient electricity and water utility play a primary role in ensuring this objective is met. Knowing how well NUC is operating, and where it stands in comparison to other similar utilities helps NUC's staff, stakeholders and Government adjust existing practices and set future targets. Information on the operation of NUC systems, inputs and outputs helps to establish good management practices, effective oversight, and enhanced financial sustainability. NUC utilises a range of performance measures and indicator to assess its operational performance. These include, among other things: core indicators such as operating cost per connection; performance scores based on production or cost estimates; benchmarking; and customer survey benchmarking by identifying customer perceptions.

The Strategic and Operational Plan (the Plan) has translated each strategic objective into key strategies, output targets, KPIs as well as operational activities. Accordingly, two detailed implementation activity schedules have been presented in the Plan including:

- ✚ Summary of Proposed Initiatives and Projects (**Appendix 1**)
- ✚ Operational Performance Parameters (**Appendix 2**)
- ✚ Current Electricity and Water Charges (**Appendix 3**)
- ✚ Financial Projections to 2025 (**Appendix 4**)

## *Results Framework*

The Results Framework is presented to facilitate the monitoring and evaluation of the Strategic and Operational Plan.

It presents the main expected results, monitoring plan, reviews, and evaluation and reporting arrangements. This will allow timely identification of implementation challenges and hence facilitate remedial measures in goodtime during implementation.

It will also facilitate the evaluation of the Plan to ascertain the extent to which the set objectives are being realized, as well as address other issues involved in the assessment of the Strategic and Operational Plan.



## *Situational Analysis – COVID-19 Pandemic*

In developing this strategic plan, regard has been given to the current pandemic and its impact on our organisation.

The Asian Development Bank has forecast that developing Asia will contract by 0.7% this year, its first contraction in six decades, however growth will rebound to 6.8% in 2021.

According to ADB, the downturn is broad-based—three-fourths of the region's economies are expected to contract this year with the exception of the People's Republic of China (PRC).

ADB has indicated that depressed demand and low oil prices have offset supply disruptions, keeping regional inflation at 2.9% in 2020, and trimming it to 2.3% in 2021.

The threat of a prolonged COVID-19 pandemic is the main risk to our outlook. A return to more stringent containment measures could slow or even derail recovery and possibly trigger financial turmoil.

There remains uncertainty around the cost impact of the pandemic and it is not clear whether those costs could be mitigated by NUC. In addition, NUC is concerned about the adverse effect that the pandemic may have on future prices faced by customers.

COVID-19 has delayed implementation of some planned RE and other systems in Nauru. It has severely damaged some Pacific Island Countries' economies, particularly those highly dependent on tourism, and caused considerable financial stress to some power utilities (as customers cannot easily pay their bills) and to Pacific national airlines.

The longer-term impacts could include a lower 'normal' level of tourism generally, government and aid resources diverted from energy to other sectors, and potentially global recurrences of other pandemics, with serious effects on our economy and the ability to finance investments, including the energy sector.

The COVID-19 pandemic potentially affects all of our operations in NUC and all of our customers. It has become clear that the impacts of COVID-19 are substantial, and further consideration will need to be made during the 2021-2025 period.

A balanced treatment of all the impacts of the pandemic will require NUC to undertake adequate consultation with affected stakeholders.

**Outlook** (Source ADB Website)

	2019	2020			2021		
		April	June	Sept	April	June	Sept
<b>Pacific</b>	3.5	-0.3	-4.3	-6.1	2.7	1.6	1.3
<b>Nauru</b>	1.0	0.4	-1.7	-1.7	1.1	0.8	0.5

GDP Growth Rate (% per year).

Inflation rate for 2020 is set at 2.9% while 2021 is forecast to be 2.3%

# 1. Introduction

## *Background*

The Nauru Utilities Corporation (NUC) was established under the *Nauru Utilities Act 2011* (the Act) and commenced operations on 1 August 2011. NUC succeeded the Nauru Utilities Authority.

The Act sets out the functions of the Corporation with respect to electricity and water services.

In relation to electricity our functions are:

- (a) to generate, acquire, exchange, transport, distribute, market and otherwise supply electricity;
- (b) to undertake, maintain and operate any works, system, facilities, apparatus or equipment required for any function mentioned in paragraph (a); and
- (c) to do anything that the Corporation determines to be conducive or incidental to the performance of a function mentioned in paragraph (a) or (b).

In relation to water our functions are:

- (a) to acquire, store, treat, distribute, market and otherwise supply water for any purpose;
- (b) to undertake, maintain and operate any works, system, facilities, apparatus or equipment required for any purpose mentioned in paragraph (a); and
- (c) to do anything that the Corporation determines to be conducive or incidental to the performance of a function mentioned in paragraph (a) or (b).

In 2019 the *Public Enterprise Act 2019* identified NUC as a state-owned enterprise for the purposes of the Act.

The introduction of the *Public Enterprises Act 2019* requires NUC to provide its strategic plan, business plans and annual and bi-annual reports including financial statements to Government.

A Statement of Corporate Intent detailing the purpose and main operational activities of NUC is also required for approval by Government.

NUC's primary objective as a State-owned enterprise under the Public Enterprise Act 2019 is to be a successful business, that it is at least as profitable and efficient as a comparable business in the private sector and must conduct its business and operations with a view to being a successful business.

NUC is required under the Act to publish and give effect to its Statement of Corporate Intent, publish its business and strategic plans.

NUC's 5-year Strategic and Operational Plan 2021 – 2025 is aligned with key national development frameworks, particularly the *Public Enterprise Act 2019* and National Sustainability Development Plan, which aims at:

*“A future where individual, community, business and government partnerships contribute to a sustainable quality of life for all Nauruans”*

For NUC this means providing reliable, affordable, secure and sustainable energy and water supply to Nauru.

The Strategic and Operational Plan 2021 – 2025 aims to enable NUC to effectively and efficiently perform its functions under the Act.

Overall, the Plan embraces comprehensive planning and organizational development towards supporting the Government's efforts to enhance the quality of life for all Nauruan's through the provision of safe, reliable, affordable, secure and sustainable electricity and water supply.

### *Purpose of the Strategic and Operational Plan*

The Plan takes into account NUC's ten (10) year strategic 2031 Future Operating Model. Thus, the Strategic and Operational Plan articulates NUC's Vision, Mission, Strategic Objectives, Targets and Key Performance Indicators (KPIs) for 2021 – 2025. It likewise presents the main strategic and operational activities of the NUC for the five-year period.

The Plan considers the current state, and maps out our journey over the next five years to achieving our objectives. The Plan is a 'living' document and will be continuously reviewed and adjusted to ensure progress towards implementing our vision, is preserved.

### *The Planning Process*

Within the framework provided by the Strategic and Operational Plan for 2021-2025, a consultative and participatory approach was followed in developing the core elements of the Plan including setting out NUC's vision, mission, strategic objectives, strategies and targets.

A total of five (5) strategic planning workshops was conducted, with 150 participants to introduce employees to strategic thinking tools and obtain feedback on a shared vision, mission and core values and suggestions for the improvement of NUC operations. A key objective of the workshops was to obtain buy-in from the employees for the implementation of this strategy.

Workshops were also conducted with key stakeholders including government and non-government agencies and customer representatives. Two workshops were held with approximately 50 participants attending the sessions. Valuable insight and feedback were received from stakeholders which was integrated into NUC's Strategic and Operational Plan 2021 – 2025 including our Future Operating Model 2031.

Follow up workshops and in-house consultation sessions were held to ascertain progress of various aspects of the Plan and changes required to update and make the strategic plan more relevant.

Overall, the pertinent national development frameworks as mentioned above directly informed the preparation of the Strategic and Operational Plan 2021-2025. A detailed appraisal of the previous existing Strategic Plan 2015-2020 was undertaken to assess the level of performance, challenges and key issues to be considered when developing the new Plan.

Furthermore, an internal and external environmental scanning was systematically undertaken to assess the level of quality of the services rendered, and the perception in the contextual trends so as to establish strategic issues which needed attention when developing the strategic objectives and targets for this plan. The internal and external environment was assessed using SWOC analysis to identify the main Strengths, Weaknesses, Opportunities and Challenges and in turn the key issues for consideration.

The development of the Strategic and Operational Plan 2021-2025 was undertaken by NUC's corporate team, comprised of members from each division, under the guidance of the Management.

Special thanks go to Mr. Abraham Aremwa, Chairman of the NUC, Board of Directors – Mr. Tim Aingimea, Mr. John Tagamoun, Mr. Leo Scotty, and Mrs Ivy Cook, who provided so much help and advisory throughout the review process, as well as the development of various models and frameworks applied in this plan. Involvement of all staff was done at all levels.

## *Organization of the Strategic and Operational Plan*

The remaining part of this document is divided into the following sections:

**Section 2** - begins with a brief history of the NUC. Then it gives details of the current findings from the Situation Analysis including results from analysis of NUC's stakeholders, strengths and weaknesses identified during the organizational scan, opportunities and challenges considered during the trend analysis and critical issues.

**Section 3** – explains the strategies and activities proposed to enhance our Corporate Governance, Corporate Culture and Ethics, Human Resource and Performance Management, Financial and Procurement Management, including Information Communication and Technology (ICT).

**Section 4** - outlines the strategies and activities proposed to enhance our Electricity Generation and Distribution Network, Renewable Energy Generation Capacity and Strategy.

**Section 5** – Describes the strategies and activities proposed to enhance our water production and delivery.

**Section 6** – presents the strategies and activities proposed to enhance Customer Service, Communication and Engagement Strategy.

**Section 7** – details our approach to tariffs, fees and charges for water and electricity services.

**Section 8** – provides a list of our strategic goals and activities for the period 2021 - 2025

Finally, four appendices are provided in the document.

**Appendix 1** is a detailed implementation action plan for the strategic activities.

**Appendix 2** are the operational, financial and organisational performance parameters used to monitor the overall performance of NUC.

**Appendix 3** sets out NUC's current electricity and water charge for 2021 - 2025

**Appendix 4** is financial projections to 2025 to support the implementation of NUC's capital and operational activities.

## 2. Background

### *Introduction*

This section provides an analysis of the internal and external operating environment of NUC.

The analysis covers historical background; mandates of the NUC; role and functions; governance; relevant national policy and strategic context; the framework provided by NUC's Future Operating Model 2031; strategic performance review to 2020; recent initiatives; stakeholders' expectations; key strengths, weaknesses, opportunities and challenges and the main strategic issues to be addressed by the Strategic and Operational Plan for 2021 - 2025.

### *Legal Framework*

NUC was established in July 2011 as a Corporation by the *Nauru Utilities Corporation Act 2011* with responsibility for production and delivery of energy and water services in Nauru.

NUC's functions and responsibilities are also governed by other relevant policies, legislation and regulations including, the *Nauru Utilities Corporation (Amendment) Act 2016*, *Public Enterprise Act 2019*, Nauru Energy Road Map 2018-2020, Nationally Determined Contribution Implementation Roadmap, National Sustainability Development Strategy, Nauru National Integrated Environment Policy, Nauru Master Plan Final Report and Nauru Utilities Corporation Regulations.<sup>1</sup>

### *Roles and Functions of Nauru Utilities Corporation*

The main roles and functions of NUC as spelt out in the Act are:

In relation to electricity

- (a) to generate, acquire, exchange, transport, distribute, market and otherwise supply electricity;
- (b) to undertake, maintain and operate any works, system, facilities, apparatus or equipment required for any function mentioned in paragraph (a); and
- (c) to do anything that the Corporation determines to be conducive or incidental to the performance of a function mentioned in paragraph (a) or (b).

In relation to water

- (a) to acquire, store, treat, distribute, market and otherwise supply water for any purpose;
- (b) to undertake, maintain and operate any works, system, facilities, apparatus or equipment required for any purpose mentioned in paragraph (a); and
- (c) to do anything that the Corporation determines to be conducive or incidental to the performance of a function mentioned in paragraph (a) or (b).

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<sup>1</sup> The Nauru Utilities Corporation Regulations are in draft and yet to be enacted under the Act.

## Governance and Organisational Structure

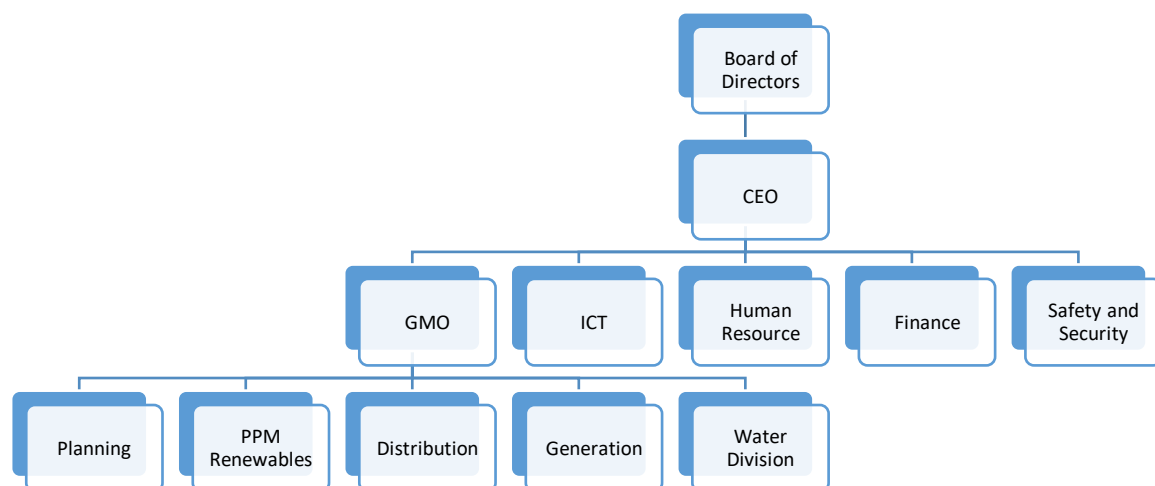
NUC is governed by the Board of Directors consisting of a Chairman and four members and two *ex officio* members, including the Chief Executive Officer. The Board provides oversight over the business of the NUC, while the Chief Executive Officer manages the day-to-day operations and activities of the Corporation.

The Board of Directors comprise five members including two *ex officio* members appointed by Cabinet. Of the members appointed, two must be appointed to represent the interests of residential customers; one is appointed to represent the interests of customers that are private sector businesses, one appointed to represent the interests of state-owned enterprises, and one appointed to represent other interests as determined by Cabinet.

Under the current NUC organizational structure, there is one General Manager Operations, four Corporate Services Managers, and five Engineering Managers who assist the Chief Executive Officer.

NUC operates primarily from its head office at the Power Station site and a customer service office located at the Civic Centre Complex in Nauru.

Figure 1: NUC's Organization Chart.



### 3. Corporate Strategy

#### *Corporate Governance*

The *Public Enterprise Act 2019* establishes the Board of Directors appointed by the Minister for Utilities and approved by Cabinet.

The Board responsibility as set out in the Act is stated as:

*‘Subject to the Public Enterprise Act 2016, the business operations and affairs of the Corporation must be managed by, or under the direction or supervision of, the board’.*

The Act sets out obligations on Directors to act honestly and in good faith, ensuring that NUC’s primary objective is achieved and ensuring proper governance and compliance with the Act.

The Act further requires that Directors take all reasonable steps to ensure that NUC achieves its primary objective under the *Public Enterprise Act 2019*.

Similarly, the *Nauru Utilities Corporation Act 2011* which establishes the NUC as a corporation sets out the primary functions of the NUC in the provision of electricity and water services however.

There are no regulations, rules or codes for the generation and distribution of electricity and/or the production and distribution of water enacted under the Act. There are no power system rules or safety and reliability standards enacted under the Act or Regulations.

There are a number of policies and procedures that require attention within the NUC to enhance good corporate governance. These include but are not limited to, Conflict of Interest & Gifts including Declaration of Interest policies, Probity Guidelines, Contractual and Financial Delegations Policies and Procedures, and Organisational Risk Management Policy.

These policies, standards and guidelines are required to improve NUC’s corporate governance with respect to transparency, participation, responsiveness, accountability, equity, effectiveness and efficiency.

Transparent accounting practices have been implemented to International Financial Reporting Standards (IFRS) within NUC.

Enabling NUC’s corporate governance framework will require adequate training and development of all staff within the organisation.

#### *Corporate Culture and Business Ethics*

Our culture is a vital and unique part of our organization. It’s what makes people decide to join our team and is the biggest reason employees choose to stay or leave. It’s the key to gaining (and maintaining) a truly high performing organization—one that makes work a place people want to be.

NUC’s desired corporate culture is one characterised by autonomy, where employees are empowered to innovate and work autonomously, without micro-managing or hand-holding where staff have ownership in their work.

Secondly, NUC’s corporate culture is one that values outputs (the quality of work produced) rather than inputs (the number of hours logged). Achievements are regularly celebrated in the presence of peers, who are encouraged to recognize one another for reaching important milestones.

Thirdly, NUC's employees who are part of our strong culture are united by a common path to purpose—*not* profits. Where individual staff goals are aligned with the objectives of the organization.

The development of this culture is a key objective of this strategic plan and the foundation stone for building such a culture is the formulation of a shared vision for the organization, a clear mission and appropriate core values to govern our behaviour.

Our core values govern organizational behaviour and the way we do things. It also provides a guideline for the behaviours that are not acceptable.

The feedback from employees on the types of behaviours they desire and the behaviour they want to discourage in NUC are:

Desired Behaviours	Undesirable Behaviours
Leadership by example	Corrupt conduct
Just and fair	Fraudulent conduct
Professionalism	Bullying
Equal rights and treatment	Harassment
Motivated	Selfishness
Communication	Dishonesty
Teamwork	Favouritism
Unity	Discrimination
Punctuality	Unethical
Awards/Rewarding	Illegal
Respectful	Nepotism
Consistency	Disrespectful
Accountable	Laziness
Responsible	Poor leadership
Transparency	Unprofessional
Integrity	
Ethical	
Safe Practices	
Integrity	
Moral	

## Human Resources

Our people are an integral part of NUC's achievements. They are key to our successes and enabling the delivery of electricity and water services to customers in a safe, reliable, affordable and secure way.









The management of administrative tasks like payroll and management of employee files aims to improve employee efficiency, motivating employees through rewards and incentives and is the responsibility of our Human Resource Management Team.

The development of our staff is fundamental to NUC's objective of being a high performing organisation as a whole. Our staff development and capacity building activities are focussed on improving employee performance. Our training and development plans focus on motivating employees by making them feel valued, and is the responsibility given to all managers.



Our HR Strategy focuses on, ensuring people have the right knowledge, skills and support for the work they are required to do; providing the right remuneration and incentives to motivate employee to willingly and eagerly work towards implementing the business strategy of NUC; and ensuring our disciplinary processes are fair and just.

To meet these objectives, the following shall be undertaken:

-  A review of the structure of the organization to align with the objectives and processes proposed in this strategic plan.
-  Establish clear position and/or job descriptions that are valued within NUC taking into consideration the new position requirements, accountabilities and responsibilities and taking into account external factors such as economic, financial and employment environment in Nauru.
-  Link the performance of all employees to the performance of the NUC in terms of achievement, effectiveness and efficiency using the Balanced Scorecard and the leadership of the NUC with the business culture of this strategic plan using the 360-degree appraisal system.
-  Implement Performance Review, Training and Development Plans for all staff aligned with NUC's strategic objectives and operational plans and is the responsibility of all managers.
-  Implement training and development in key areas such as Occupational Health & Safety, Customer Service, Project Management, Leadership, Computer Literacy, Technical and Personal Development.
-  Increase exposure of staff on technical related matters. Invest in professional development of staff specifically on modern technology and technical expertise.
-  Continue to attract and retain the best employees who are customer focused and develop an integrated HR Management system.
-  Integrate and develop policies and procedures on cross cutting issues, such as gender equality, social inclusion and environmental awareness in line with relevant policies and standards.

## *Finance and Procurement*

Established under *Nauru Utilities Corporation Act 2011*, NUC's principal activity is the provision of non-contestable electricity and water services in Nauru.

NUC, as a public authority, is obligated to carry out its financial and procurement management in accordance with the *Public Finance (Control and Management) Act 2012*.

### Financial Reporting

Our financial management strategy ensures that all the financial aspects of the NUC operations are managed in a transparent manner that captures all transactions and records them under the appropriate budget classification, complies with legal requirements, and produces reports appropriate for managing the utility and reporting to the relevant authorities and regulators.

To enhance our reporting capabilities further system enhancement is required specifically the need for an automated budget reporting tool. 'JET' is a reporting tool that will provide timely reporting of budget forecasts and actuals from the profit and loss statements and will assist managers in managing their budgets more effectively.

A further review of the budgeting process is required to make sections heads accountable for their budget.

Currently our processes and systems are being reviewed to explore the option of automatic transfer of data between systems.

#### Pre-Payment Options

Although pre-paid vouchers for electricity are already available from various outlets around Nauru, water pre-paid vouchers are not available at shopping outlets. available at shopping outlets throughout Nauru. There is an opportunity to consider payments through mobile apps. Digicel shall also be approached to consider payments though the mobile phone.

Payments will also be made using EFTPOS where customers will be able to use their credit card to make payments. This initiative is currently being rolled out by the Bendigo Bank throughout Nauru.

#### Tariff Review - Electricity and Water Services

There is a need to commission a tariff study to enable the long-term sustainability of the NUC and to rebalance electricity tariffs and fees to remove cross subsidies between each division.

The water tariffs will need to be reviewed within the next five years to ensure sustainability of water operations and services into the future.

A review of labour timesheets to enable the capture of information of hours worked, both normal and overtime, for recurrent and capital jobs is also required, and the capture of all capital expenditure including, consultancy, materials, labour, other costs associated with the project that needs to be capitalized.

#### Policies and Procedures

The following policies shall be reviewed or established to manage the financial and procurement function of the NUC:

- ✚ Development of a Financial and Contract Delegation Policy to assign appropriate levels of authority for approval of purchase orders, tenders and contracts.
- ✚ Review and establishment of a Financial Policy and Financial Management Manual
- ✚ Develop an Energy Theft Policy and Procedures

There is an opportunity for NUC to engage an internal auditor. The function of the internal auditor is to carry out on-going auditing, provide advice to the CEO on business processes and investigates incidents that may occur during the course of business. The head of the internal audit function generally provides a report to the Board of Directors on finance (while administratively the Internal Auditor reports to the CEO).

The use of external auditor(s) will continue and provides assurance to the owners of the corporation from an external perspective. These audits are conducted annually to meet NUC's obligations under the Act.

#### Purchasing and Procurement

There is a need to establishment of a Tenders committee comprising the Corporate Financial Controller, Manager Procurement the appropriate division and department head. The committee

shall oversee all tenders to ensure the process is transparent and fair and produces the best outcome for the NUC.

For significant tenders involving significant contract and financial requirements the CEO may Chair the committee with the support of the Tenders Committee.

There is a need to review the procurement and payment processes to ensure the timely supply of machines, spares parts and other items. Delays in supply chain with regards to materials and equipment has a negative impact on NUC's operations and efficiency.

A review and revaluation of all NUC assets is proposed to be conducted in the next period to ensure NUC assets are appropriately captured and capitalised within the asset register.

### Financial Projections

The financial projections use existing or estimated financial data to forecast our business's future income and expenses.

The assumptions and different scenarios considered enable us to see how changes to one aspect of our finances (such as reduced or increased demand and /or lower or higher operating expenses) might affect NUC's sustainability and ability to deliver electricity and water services.

The financial projections over the next 5-year period are set out in Appendix 4 of this plan.

The following assumptions were considered in developing the financial projections:

For base demand scenario,

- ✚ Domestic demand will reduce over the 5-year period to 2025 from 4% in 2021 to less than 1% towards the end of 2025.
- ✚ Commercial customer demand remains flat over the 5-year period to 2025.
- ✚ Industrial customer demand remains flat over the 5-year period to 2025.
- ✚ Government demand is 2% per year over the 5-year period to 2025

For lower demand scenario,

- ✚ Domestic demand is lower than 1% over the 5-year period to 2025.
- ✚ Commercial customer demand remains flat.
- ✚ Industrial customers demand remains flat.
- ✚ Government demand is lower than 1% over the 5-year period to 2025

For upper demand scenario,

- ✚ Domestic demand will reduce over the 5-year period to 2025 from 5% in 2021 to less than 1% towards the end of 2025.
- ✚ Commercial customer demand will be 1% per year over the 5-year period to 2025.
- ✚ Industrial customer demand will be 1% per year over the 5-year period to 2025.
- ✚ Government demand will be less than 1% per year over the 5-year period to 2025.

Further assumptions considered are that:

- ✚ Revenue and costs with 50% of the energy generated is from solar PV installations.
- ✚ The forecasts assume that tariffs, fees and charges for electricity and water remain at the current rate throughout the period.
- ✚ Diesel fuel cost is taken to be \$1.20 per litre.

- ✚ Corporate Services including CEO, Finance and HR costs are shared equally between Electricity and Water.
- ✚ The water section usage of electricity is priced at the commercial tariff and recorded as a cost to water and income for electricity. Similarly, the same is done for the electricity usage of water.
- ✚ System losses both technical and non-technical are maintained at acceptable levels.

## *Procurement and Contracts*

The Nauru Utilities Corporation is a public authority and is required to perform its procurement processes in accordance with the *Public Finance (Control and Management) Act 2012*.

NUC's procurement operations are conducted in accordance with Regulations and Procurement Manual enacted under the Act.

NUC's purchasing and procurement process commences with the identification of a need and ends with the ward of a contract. The specific functions include elements of inventory control, and logistics management.

The goal of NUC's purchasing and procurement processes is to award timely and cost-effective contracts to qualified contractors, suppliers and service providers for the provision of goods, work and services to support our operations, in accordance with principles and procedures established in the purchasing and procurement rules.

NUC's principles for purchasing and procurement ensure that management is accountable for their actions and that procurement is managed in accordance with the objectives, principles and procedures defined in our Purchasing and Procurement Manual.

Purchasing and procurement management, requirement identification and budget allocation, procurement planning and strategy development, procurement method selection, document preparation and advertisement, bid and proposal submission, evaluation and selection, and contract award to closeout, are all addressed in the procurement manual. NUC management are not at liberty to use a procurement method not stipulated in the procurement rules or not identified for a specific type of procurement requirement. Any deviation from procurement rules requires justification and clearance from a designated approving authority, sometimes the Board, or relevant Minister before the action is carried out.

Transparency, integrity, economy, openness, fairness, competition and accountability are some of the fundamental principles of NUC's purchasing and procurement.

Transparency in NUC's procurement process enables information to be made available to all stakeholders: contractors, suppliers, service providers, and the public at large, unless there are valid and legal reasons for keeping certain information confidential for example proprietary information belonging to companies or individuals.

NUC's purchasing and procurement process integrity, including that of our procurement management staff, is vital in ensuring confidence in our dealings with stakeholders.

The need to manage NUC budgets and finances with care and due diligence so that prices paid for goods, services and works are acceptable and represent efficient and good value for money for NUC is paramount.

### Property, Buildings and Fleet Services

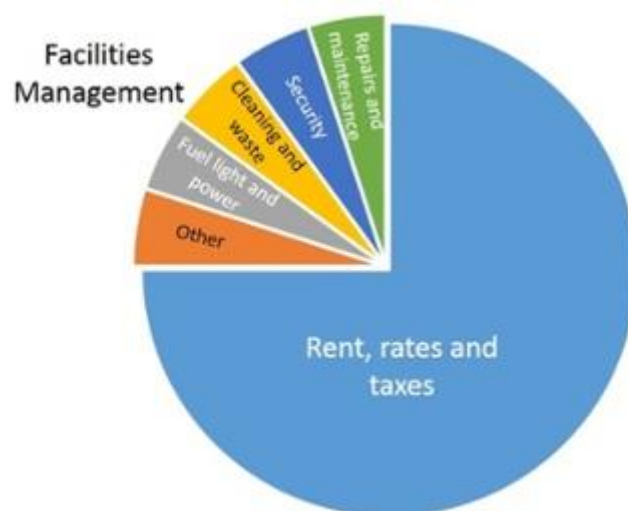
With NUC's current workload and that projected for the future, increasing performance and delivering services to meet customer expectations and increased costs in providing property, building and fleet services will need to be accounted for.

Shortage of skilled labour and increasing material costs continue to rise and make it difficult to anticipate and budget future projects regardless of type or size. There are internal facilities and fleet management services that have not been able to keep abreast with increasing demand for our services.

Property management, fleet management and facilities required to house stores and materials, provide transportation and adequately deliver services needs to be planned, budgeted and addressed on a continuing basis over the next 5-year period.

Fleet management needs to be enhanced and maintained to support the electricity distribution services and water delivery demands and ensuring public safety requirements and met.

Adequate budget needs to be set aside for Facilities Management which includes cleaning and waste, security, repairs and maintenance and rents/leases, rates and taxes.



Our fleet services program needs to ensure that vehicle maintenance and replacement, fuel, repairs, vehicle acquisition, equipment disposal and maintenance services are provided in an efficient and cost-effective manner so as to minimise downtime due to breakdowns or other unscheduled maintenance.

NUC needs to provide building maintenance services on leased properties, manage security services, manage security system installation and repairs. Provide a wide array of internal services such as cleaning, repairs, and purchases for office equipment and management of surplus plant and equipment.

Warehousing of materials, equipment and plant is critical in ensuring public safety and efficient operations within the electricity and water services divisions.

## *Information Management and ICT*

The management of corporate information, both paper and electronic form is an important function that NUC is required to undertake for it to meet both legal and operational requirements.

NUC's current reporting process is tedious owing to multiple susceptible points for error and the use of Excel trackers as opposed to system statistics. Implementation of Navision has left many tracking data offline. Process improvements need to be made to improve efficiency, revenue and activity accounting and time-to-report.

A preliminary assessment of reporting requirements, data sources and readiness to integrate was undertaken in 2019 to develop an Information Enterprise Architecture (IEA) that improves the business and supplies information to relevant stakeholders when needed.

The objective of this strategy is to ensure:

- ✚ That NUC establish an efficient and effective Information Management System that:
  - provides a platform for exchange of data and information on financial, human resource management customer billing and system analysis and reporting.
  - ensures essential paper-based records are maintained for legal or operational requirement.
  - ensures financial information is maintained for at least 7 years and contracts for as long as is necessary.
  - electronic based information is secure and can be accessed by relevant employees in NUC to enable the efficient performance of their tasks.

The information platform will ensure:

- ✚ information needs and functions required meet the needs of the organisation and supports work performed by NUC employees.
- ✚ effective and efficient performance of reporting, monitoring and evaluation of key business parameters.
- ✚ provides for security of data and services.

The following figure outlines the status and interface between various systems and processes within NUC.

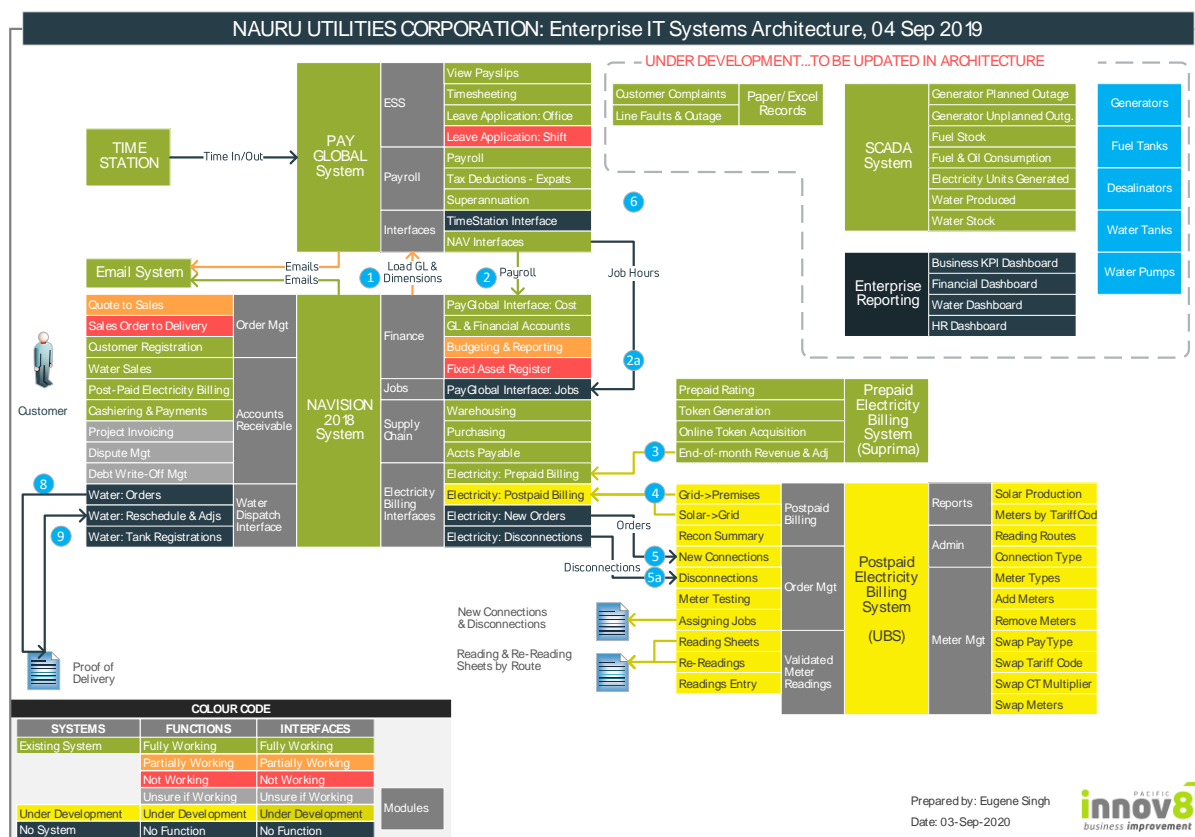





Figure 2: Information Management Enterprise Platform

The Management Reporting system shall be set up to acquire data from all the other systems and provide reports for managing the operations of NUC. The software for managing this function has been determined and a detailed project plan for implementation has been formulated.

The project scope requirements are:

- To establish a secondary back-up safe server room that is secured and protected from major risks. The secondary server will provide on line redundancy for the financial system. Should one server fail the other will automatically continue to carry out the function.
- Review the suitability of the Navision software to provide for all NUC's financial software needs.
- Acquire a second PC for the Suprima pre-paid software to provide on-line back up to the current PC.
- Undertake a review of the network to determine connection needs, switch requirements and routing of cable. This exercise will scope and cost the project for upgrading the network.
- Back-ups for both the Navision and Suprima systems data are held on site however off-site storage is required.
- The acquisition of up-to-date AUTOCAD drawing software, computers and printers to record and maintain proper drawing records.

-  The acquisition of software to support condition-based monitoring and maintenance of ICT assets.
-  The introduction of on-line banking for power top-up and water orders. This would provide customers with easy access to our services and payment options.
-  With the expansion and upgrades required to NUC's SCADA network, there is an opportunity for our staff to be trained in its operation and maintenance including providing some administrative functionality for the SCADA system.



## 4. Electricity Generation and Distribution

### *Electricity Demand Forecast*

This section sets out the energy demand analysis and forecasting for NUC. Our demand forecasts are made on the basis of statistical evaluations and projections of past consumption trends. Where the information and data are not available trend-line extrapolation is used.

Consideration is also given to demand changes due to specific policies, such as renewable energy penetration or establishment of new commercial/industrial plants which can be substantial relative to existing demand.

The electricity demand forecast is critical to the development of generation and distribution capacity plans and the estimated revenue and costs forecast for the provision of electricity.

A lower and upper demand forecast is used to determine the sensitivity of the generation capacity argumentation program to the demand. The sales categories are Domestic, Commercial, Government and Industrial.

The connection to the grid by large customer, such as RonPhos, Regional Processing Centres (RPC) and a number of commercial enterprises, have contributed to the increase in demand of around 49 MWh per annum over the previous 5-year period.

Using a variety of inputs including third-party forecasts and the most up-to-date data available, our outlook provides:

- ✚ Expected growth in electricity demand, and timing
- ✚ Anticipated demand for generation capacity
- ✚ Potential types and locations of new generation

Keeping with the mandate of providing safe, reliable, affordable and sustainable electricity services while facilitating an efficient and effective market for electricity the NUC is developing is developing the 2025 long term outlook.

Given the challenges faced as a result of the COVID-19 pandemic and the low oil price, stakeholder feedback provided to the NUC will be an important input into how we forecast Nauru's near to long-term electricity generation and distribution system.

The growth rate for domestic demand is set at 3% per annum. While this may appear to be conservative, in the current economic environment many Nauruans continue to acquire a range of electrical appliances for the home such as air conditioning, televisions, household items and other white goods that are expected to contribute to the growth in demand. New domestic customer connections over the previous period indicated an average increase in demand of 1.2 MWh per year.

The following table describes the types and number of electricity customers served by NUC.

Total Number of Customer - Electricity					
Type	Domestic	Commercial	Industrial	Government	Total
Post Paid	34	43	5	50	132
Prepaid	3032	370	21	6	3429
Fixed Rate	0	0	4	1	5
<b>Total</b>	<b>3066</b>	<b>413</b>	<b>30</b>	<b>57</b>	<b>3566</b>

Table 1: Total number of Customers by Type and Meter Classification

The trends for Commercial, Industrial and Government demand that is currently on the system remains flat with minimal growth. However, consideration is given to potential growth with proposed developments in the Ports and Fisheries sector including secondary mining activities.

The following table illustrates the previous 5-year period of energy sales (in kWh) and shows a trend-line projection based on available historic data.

	Previous 5-year Period						Period 2021 - 2025				
Energy Sales	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Domestic prepaid lifeline				4,591,928	5,125,886	5,695,711	5,980,496.55	6,279,521.38	6,593,497.45	6,923,172.32	7,269,330.93
Domestic prepaid regular				6,661,502	7,229,749	8,166,725	8,575,061.25	9,003,814.31	9,454,005.03	9,926,705.28	10,423,040.54
<b>Total Domestic Prepaid</b>	<b>10,463,444</b>	<b>11,018,151</b>	<b>11,572,400</b>	<b>11,253,430</b>	<b>12,355,635</b>	<b>13,862,436</b>	<b>14,555,557.80</b>	<b>15,283,335.69</b>	<b>16,047,502.47</b>	<b>16,849,877.60</b>	<b>17,692,371.48</b>
Domestic - Postpaid	800,225	979,277	1,158,321	2,367,688	2,645,990	2,470,735	2,594,271.98	2,723,985.58	2,860,184.86	3,003,194.10	3,153,353.81
Commercial - Prepaid	2,438,559	3,083,551	4,179,284	4,501,145	4,148,735	4,030,352	4,231,869.60	4,443,463.08	4,665,636.23	4,898,918.05	5,143,863.95
Commercial - Postpaid	2,054,317	2,144,102	4,813,726	4,549,054	4,787,602	4,048,691	4,251,125.95	4,463,682.25	4,686,866.36	4,921,209.68	5,167,270.16
Government	1,924,393	2,000,473	2,525,363	3,717,647	4,152,479	4,497,641	4,722,523.05	4,958,649.20	5,206,581.66	5,466,910.75	5,740,256.28
Industrial- Prepaid	199,626	238,435	200,827	136,244	117,042	214,341	225,058.05	236,310.95	248,126.50	260,532.83	273,559.47
Industrial- Postpaid	910,067	561,903	472,873	826,313	1,814,249	1,221,825	1,282,916.25	1,347,062.06	1,414,415.17	1,485,135.92	1,559,392.72
<b>Total Domestic</b>	<b>11,263,669</b>	<b>11,997,428</b>	<b>12,730,721</b>	<b>13,621,118</b>	<b>15,001,625</b>	<b>16,333,171</b>	<b>17,149,829.78</b>	<b>18,007,321.27</b>	<b>18,907,687.33</b>	<b>19,853,071.70</b>	<b>20,845,725.29</b>
<b>Total Commercial</b>	<b>4,492,876</b>	<b>5,227,653</b>	<b>8,993,010</b>	<b>9,050,199</b>	<b>8,936,337</b>	<b>8,079,043</b>	<b>8,482,995.55</b>	<b>8,907,145.33</b>	<b>9,352,502.59</b>	<b>9,820,127.72</b>	<b>10,311,134.11</b>
<b>Total Government</b>	<b>1,924,393</b>	<b>2,000,473</b>	<b>2,525,363</b>	<b>3,717,647</b>	<b>4,152,479</b>	<b>4,497,641</b>	<b>4,722,523.05</b>	<b>4,958,649.20</b>	<b>5,206,581.66</b>	<b>5,466,910.75</b>	<b>5,740,256.28</b>
<b>Total Industrial</b>	<b>1,109,693</b>	<b>800,338</b>	<b>673,700</b>	<b>962,557</b>	<b>1,931,291</b>	<b>1,436,166</b>	<b>1,507,974.30</b>	<b>1,583,373.02</b>	<b>1,662,541.67</b>	<b>1,745,668.75</b>	<b>1,832,952.19</b>
<b>Total Energy Sales</b>	<b>18,790,631</b>	<b>20,025,892</b>	<b>24,922,794</b>	<b>27,351,521</b>	<b>30,021,732</b>	<b>30,346,022</b>	<b>31,863,322.68</b>	<b>33,456,489</b>	<b>35,129,313</b>	<b>36,885,779</b>	<b>38,730,068</b>

Table 2: Energy Sales Trend-line Projections to 2025

The following likely base demand projection assumes that:

- Domestic demand will reduce over the 5-year period to 2025 from 4% in 2021 to less than 1% towards the end of 2025.
- Commercial customer demand remains flat over the 5-year period to 2025.
- Industrial customer demand remains flat over the 5-year period to 2025.
- Government demand is 2% per year over the 5-year period to 2025.

Energy Forecast: Most Likely																												
Year	Sales												Non Revenue	Losses			Total Demand on	Total			MD	Load Factor	Loss	Year				
	Domestic		RPC 2	RPC 3	Commercial		RPC1	Government		Industrial		Total Sales		Energy				kW	kW	%					kW	MW	%	%
	kWh	G%			kWh	kWh		kWh	G%	kWh	kWh																	
2015	11,263,669				4,492,876			1,924,393			1,109,693		18,790,631		12,323,924		31,114,555	312,390	1.00%	31,426,945	4.8	74%	39%	2015				
2016	11,997,428	6.5%			5,227,653	16%		2,000,473	4%	800,338	-28%		20,025,892	544,907	11,018,058	66%	31,588,857	283,300	0.90%	31,872,157	4.85	76%	35%	2016				
2017	12,730,721	6.1%			8,993,010	72%		2,525,363	26%	673,700	-16%		24,922,794	793,446	8,909,590	55%	34,625,830	188,700	0.54%	34,814,530	5.03	79%	26%	2017				
2018	13,621,118	7.0%			9,050,199	1%		3,717,647	47%	962,557	43%		27,351,521	738,305	7,723,250	36%	35,813,076	366,520	1.01%	36,175,596	5.30	78%	21%	2018				
2019	15,001,625	10.1%	-	-	8,936,337	-1%		4,152,479	12%	1,931,291	101%		30,021,732	1,779,977	4,327,292	26%	36,129,001	362,000	1.01%	36,495,001	5.30	79%	12%	2019				
2020	16,333,171	8.9%	-	-	8,079,043	-10%		4,497,641	8%	1,436,166	-26%		30,346,021	1,832,990	6,775,290	14%	38,954,301	366,000	0.94%	39,320,301	5.55	81%	17%	2020				
2021	16,986,498	4.00%	-	-	8,079,043	0%	2,392,991	4,587,594	2.0%	1,450,528	1%		33,496,653	1,832,990	5,024,498	15%	40,354,141	353,040	1.00%	40,707,181	5.96	78%	12%	2021				
2022	17,326,228	2.00%	-	-	8,079,043	0%	3,988,319	4,679,346	2.0%	1,450,528	0%		35,523,463	1,832,990	3,552,346	10%	40,908,799	353,040	1.00%	41,261,839	6.04	78%	9%	2022				
2023	17,499,490	1.00%	-	-	8,079,043	0%	3,988,319	4,772,933	2.0%	1,450,528	0%		35,790,312	1,832,990	2,863,225	8%	40,486,527	353,040	1.00%	40,839,567	5.98	78%	7%	2023				
2024	17,516,990	0.10%	-	-	8,079,043	0%	3,988,319	4,868,391	2.0%	1,450,528	0%		35,903,270	1,832,990	2,513,229	7%	40,249,489	353,040	1.00%	40,602,529	5.94	78%	6%	2024				
2025	17,534,507	0.10%	-	-	8,079,043	0%	3,988,319	4,965,759	2.0%	1,450,528	0%		36,018,155	1,832,990	2,521,271	7%	40,372,416	353,040	1.00%	40,725,456	5.96	78%	0%	2025				

Table 3: Base Energy Demand Forecast.

The following lower demand projection assumes that:

- Domestic demand is lower than 1% over the 5-year period to 2025.
- Commercial customer demand remains flat.
- Industrial customers demand remains flat.
- Government demand is lower than 1% over the 5-year period to 2025.

Energy Forecast: Low																			
Year	Sales											Non Revenue		Losses		Total		Total	
	Domestic				Commercial			Government		Industrial		Total Sales	Energy			Demand on	Auxillaries	Generation	MD
	kWh	RPC2	RPC3	G%	kWh	G%	RPC1	kWh	G%	kWh	G%	kWh	kWh	kWh	% Sales	kWh	kWh	%	% Gen
2015	11,263,669				4,492,876			1,924,393		1,109,693		18,790,631		12,323,924		31,114,555	312,390	1.00%	31,426,945
2016	11,997,428	6.5%			5,227,653	16%		2,000,473	4%	800,338	-28%	20,025,892	544,907	11,018,058	66%	31,588,857	283,300	0.90%	31,872,157
2017	12,730,721	6.1%			8,993,010	72%		2,525,363	26%	673,700	-16%	24,922,794	793,446	8,909,590	55%	34,625,830	188,700	0.54%	34,814,530
2018	13,621,118	7.0%			9,050,199	1%		3,717,647	47%	962,557	43%	27,351,521	738,305	7,723,250	36%	35,813,076	362,520	1.01%	36,175,596
2019	15,001,625	10.1%	-	-	8,936,337	-1%		4,152,479	12%	1,931,291	101%	30,021,732	1,779,977	4,327,292	26%	36,129,001	366,000	1.01%	36,495,001
2020	16,333,171	8.9%	-	-	8,079,043	-10%		4,497,641	8%	1,436,166	-26%	30,346,021	1,832,990	6,775,290	14%	38,954,301	366,000	0.94%	39,320,301
2021	16,349,504	0.10%	-	-	8,079,043	0.0%	2,267,044	4,520,129	0.5%	1,436,166	0%	32,651,887	1,832,990	4,897,783	15%	39,382,660	353,040	1.00%	39,735,700
2022	16,365,854	0.10%	-	-	8,079,043	0.0%	3,778,407	4,542,730	0.5%	1,436,166	0%	34,202,200	1,832,990	2,736,176	8%	38,771,366	353,040	1.00%	39,124,406
2023	16,382,220	0.10%	-	-	8,079,043	0.0%	3,778,407	4,565,444	0.5%	1,436,166	0%	34,241,279	1,832,990	1,712,064	5%	37,786,333	353,040	1.00%	38,139,373
2024	16,398,602	0.10%	-	-	8,079,043	0.0%	3,778,407	4,588,271	0.5%	1,436,166	0%	34,280,489	1,832,990	1,714,024	5%	37,827,503	353,040	1.00%	38,180,543
2025	16,415,000	0.10%	-	-	8,079,043	0.0%	3,778,407	4,611,212	0.5%	1,436,166	0%	34,319,829	1,832,990	1,715,991	5%	37,868,810	353,040	1.00%	38,221,850

Table 4: Low Energy Demand Forecast.

The following Upper demand projection assumes that:

- Domestic demand will reduce over the 5-year period to 2025 from 5% in 2021 to less than 1% towards the end of 2025.
- Commercial customer demand will be 1% per year over the 5-year period to 2025.
- Industrial customer demand will be 1% per year over the 5-year period to 2025.
- Government demand will be less than 1% per year over the 5-year period to 2025.

Energy Forecast: High																			
Year	Sales											Non Revenue		Losses		Total		Total	
	Domestic				Commercial			Government		Industrial		Total Sales	Energy			Demand on	Auxillaries	Generation	MD
	kWh	G%	RPC2	RPC3	kWh	G%	RPC1	kWh	G%	kWh	G%	kWh	kWh	kWh	% Sales	kWh	kWh	%	% Gen
2015	11,263,669				4,492,876			1,924,393		1,109,693		18,790,631		12,323,924		31,114,555	312,390	1.00%	31,426,945
2016	11,997,428	6.5%			5,227,653	16%		2,000,473	4%	800,338	-28%	20,025,892	544,907	11,018,058	66%	31,588,857	283,300	0.90%	31,872,157
2017	12,730,721	6.1%			8,993,010	72%		2,525,363	26%	673,700	-16%	24,922,794	793,446	8,909,590	55%	34,625,830	188,700	0.54%	34,814,530
2018	13,621,118	7.0%			9,050,199	1%		3,717,647	47%	962,557	43%	27,351,521	738,305	7,723,250	36%	35,813,076	362,520	1.01%	36,175,596
2019	15,001,625	10.1%	-	-	8,936,337	-1%		4,152,479	12%	1,931,291	101%	30,021,732	1,779,977	4,327,292	26%	36,129,001	366,000	1.01%	36,495,001
2020	16,333,171	8.9%	-	-	8,079,043	-10%		4,497,641	8%	1,436,166	-26%	30,346,021	1,832,990	6,775,290	14%	38,954,301	366,000	0.94%	39,320,301
2021	17,149,830	5.00%	-	-	8,159,833	1.0%	2,518,938	4,520,129	0.5%	1,450,528	1%	33,799,258	1,832,990	5,069,889	15%	40,702,137	353,040	1.00%	41,055,177
2022	17,664,324	3.00%	-	-	8,241,432	1.0%	4,198,230	4,542,730	0.5%	1,465,033	1%	36,111,749	1,832,990	3,611,175	10%	41,555,914	353,040	1.00%	41,908,954
2023	17,840,968	1.00%	-	-	8,323,846	1.0%	4,198,230	4,565,444	0.5%	1,479,683	1%	36,408,171	1,832,990	3,640,817	10%	41,881,978	353,040	1.00%	42,235,018
2024	17,858,809	0.10%	-	-	8,407,085	1.0%	4,198,230	4,588,271	0.5%	1,494,480	1%	36,546,874	1,832,990	3,654,687	10%	42,034,552	353,040	1.00%	42,387,592
2025	17,876,667	0.10%	-	-	8,491,155	1.0%	4,198,230	4,611,212	0.5%	1,509,425	1%	36,686,690	1,832,990	3,668,669	10%	42,188,349	353,040	1.00%	42,541,389

Table 5: High Energy Demand Forecast

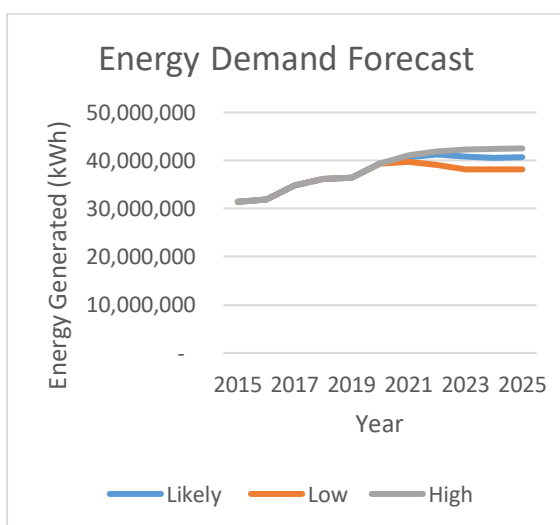


Figure 3: Energy Demand Forecasts (kWh)

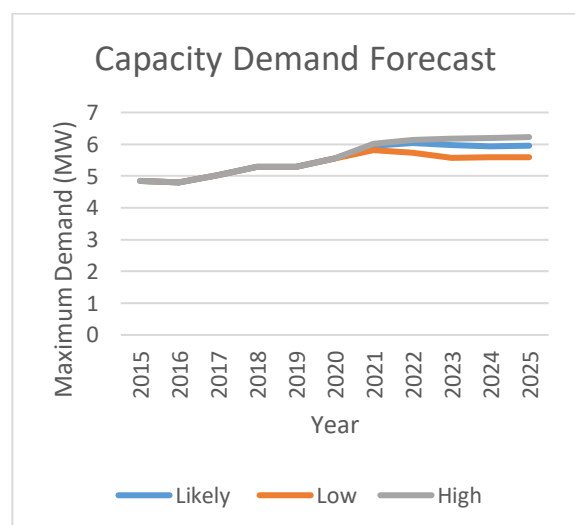


Figure 4: Capacity Demand Forecast (MW)

## Diesel Generation Capacity

The current installation of diesel generation capacity adequately meets the maximum demand with an N-2 security. This has been achieved with the installation of medium speed generators and the high-speed diesel generator now meeting the N-2 security requirement, i.e. there is sufficient capacity available to supply the maximum demand of the system with the loss of the two largest generators.

The current diesel generating capacity status and availability is summarized in the following table.

Generation Data		Station																
		INSIDE POWER STATION (MEDIUM/LOW SPEED ENGINES)						OUTSIDE HIGH SPEED ENGINES				STANDBY ENGINES AT ESSENTIAL SERVICES						
Set Number	G1	G2	G3	G4	G5	G6	LACKSTAR	G2A	G2B	G3	G5	GON	MENENG	AIRPORT	S/CAMP	RON HOSPITAL	PRISON 1	PRISON 2
Engine Model	Ruston	MAN	MAN	Ruston	Cummins	Ruston	Cummins	Cummins	Cummins	Cummins	Cummins	Cummins	Cummins	Cummins	Cummins	Caterpillar	Caterpillar	Caterpillar
Installed capacity Kw	2.40	2.85	2.85	3.00	1.00	2.40	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50	0.32	0.50	0.50	0.10
Rated Capacity Kw	2000	2500	2500	2800	850	2000	800	800	800	800	850	450	450	450	300	450	450	100

Table 6: Current Diesel Generator Capacity

The current available capacity for high-speed diesel generators is 4 MW. The current available capacity of medium speed diesel generators is 15 MW.

With the introduction of an additional 6 MW Solar Farm, it is proposed that the high-speed containerised generators be relocated to the solar farm site as a back up to the main power station and ensure better voltage stability during periods of low renewable energy generation due to cloud cover.

The new 6 MW Solar Farm will provide surplus energy capacity, further reducing fuel costs incurred by NUC to run diesel generators. There is an opportunity with the additional capacity to accommodate the proposed fish plant and RonPhos rehabilitation.

The installation of solar PV systems is solely for the displacement of diesel generated energy and not diesel generating capacity. This criterion is based on the observation that the maximum demand usually occurs in the evening and that the use of battery storage capacity will be solely for stability purposes (short time storage) and not for capacity displacement purposes (long time storage). This design criteria are necessitated by the high price of battery storage.

Furthermore, this would establish a backup power generation site to mitigate the risk of having all our generators in one location. With all generators at the power station, an earthquake, fire, flood due to excessive rain, tsunami or other disaster could result in prolonged loss of power generation for the whole of Nauru. By relocating the containerize generators to the solar farm site this risk is mitigated.

In addition, the establishment of a backup generation site at the solar farm would not require the construction of a complex power station building as the generators can be located at the developed solar site. This project is estimated to cost \$1.5 million and includes geotechnical study, preparation of foundations, fencing of the compound, and balance of plant to connect the generators to the network.

The operating strategy based on the above criteria is to maintain sufficient diesel generating capacity to meet the maximum demand yet minimize the operation of the diesel generations through the use of renewable sources. Thus, security of supply is maintained yet fuel usage is minimized providing savings in diesel fuel costs.

The following table illustrates NUC's usage of diesel fuel and oil stocks over the previous 5-year period to 2020.

	Year	2015	2016	2017	2018	2019	2020
Fuel Received	L					8,968,740	9,200,874
Fuel in Stock (Month End)	L						
Fuel Used	L	8,912,059	9,154,148	9,611,760	9,207,805	9,174,031	9,262,280
DeleGold 15W40 Oil Received	L					26,000	8,200
15W40 Oil in Stock (Month End)	L						
15W40 Oil Used	L	67,301	77,724	64,236	41,131	20,668	16,616
MG412 Oil Received	L						10,520
MG412 Oil in Stock (Month End)	L						
MG412 Oil Used	L	67,301	77,724	64,236	41,131	20,786	16,330
Total Oil Used	L					41,454	32,946
Water Usage	L			2,238,182	1,898,132	<b>1,644,510</b>	<b>3,188,275</b>
Diesel Energy Produced	kWh	31,122,200	31,399,967	33,516,670	34,998,930	<b>35,503,000</b>	<b>36,147,000</b>
Power Station Auxillary	kWh	312,390	283,300	188,700	362,520	366,000	426,100
Net Diesel Energy Production	kWh	30,809,810	31,116,667	33,327,970	34,636,410	35,137,000	35,754,700
Maximum Demand	MW				5.30	5.3	5.55

Table 7: Diesel Fuel and Oil Usage 5-year Period 2015-2021.

The introduction of additional renewable generation, specifically the opportunity to achieve 100% generation from renewable source will significantly reduce Nauru's reliance on fossil fuels for the generation of electricity and subsequently production of water.

The following shows projected trend in diesel prices based on Singapore price forecast over the next 10 years to 2030.

NUC's diesel price is based on the Singapore diesel price (in USD/bbl)

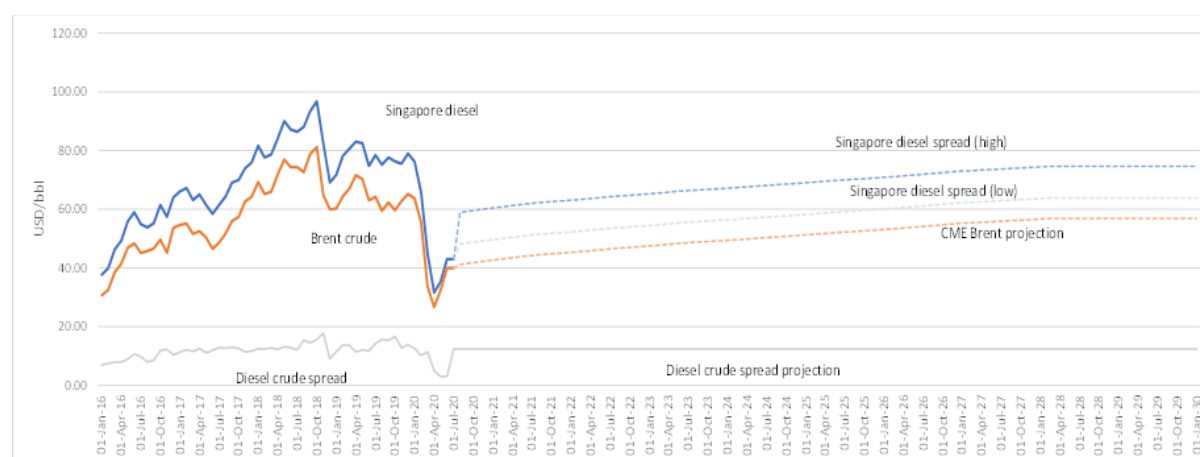


Figure 5: Diesel Price Projections to 2030.

Beyond 2030 to 2040 the International Monetary Fund (IMF) projections for crude oil price is that it will be increasing over time. Thus, the NUC price for diesel fuel is more likely to be increasing beyond 2030. As NUC reduces its dependency on diesel fuel (as part of our climate change response), the fuel price is expected to increase to cover the fixed cost of importing the fuel.

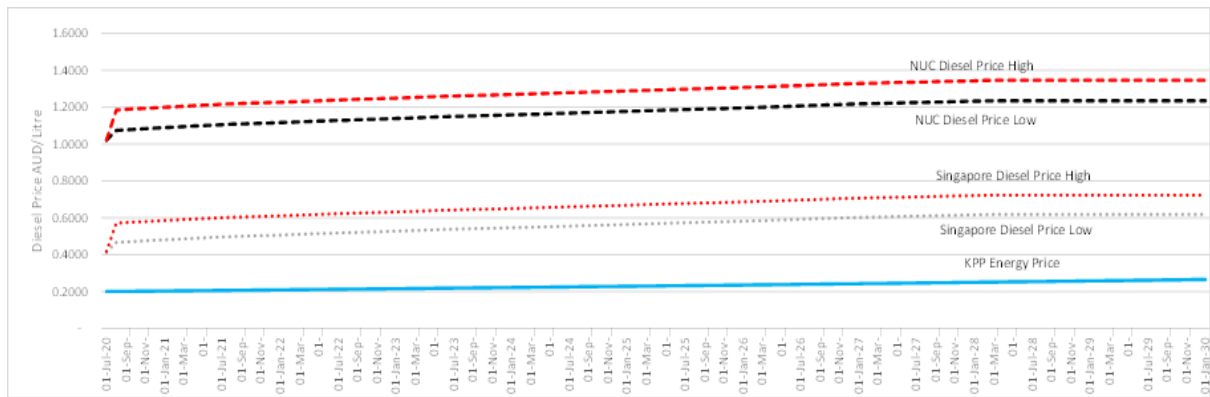


Figure 6: NUC Diesel Price Projections

## Power Generation Projects

### Installation of SCADA – Supervisory Control & Data Acquisition

SCADA currently installed within the diesel power station and solar generation plant has enabled NUC to control and monitor in real time the operations remotely from the field.

This has provided safe and secure control and monitoring capabilities of our diesel generators, transformers and switch gear within the power generation sites.

Our SCADA system allows us to monitor and gather process data (in real time), interacting with field devices and control station displays, recording system events, and enabling the control of our network either locally or from our control centre.

The information gathered is analysed in order to identify opportunities for improved efficiency and to expedite the communication of issues within the system to reduce the amount of time required to repair key pieces of equipment.

The installation of SCADA in monitoring and controlling our network has been a phased development and implementation. The current SCADA system provides monitoring and control capabilities for our generation plant (both solar and diesel plants), the 3.3kV bus network and water production facilities.

There is a need to expand SCADA capabilities to accommodate the additional 6 MW Solar Farm, the 33kV interconnector and switchgear (to be commissioned as part of the new Solar Farm and include the monitoring and control of system reliability and security when the proposed new Kinetic Power Plant is established in 2023.

In addition, there is an opportunity to provide SCADA capability for the existing 11kV distribution network. This would enhance the safe, reliable and secure operation of the grid.

The need to extend SCADA capabilities to the grid will require additional communication link, the replacement of switchgear to enable remote control of the equipment.

It is envisaged that this development in SCADA capability will also be undertaken in a phased approach to enable staff to be fully trained in the new technology.

## Renewable Energy Generation Strategy

The energy road map for the Government of Nauru set a target of 50% of energy generated from renewable sources by 2020.

The only renewable source of energy to date that appears to be viable is PV solar panel generation. Other sources that have been or continue to be considered:

1. Wind turbine: The wind data available to date does not appear to favour large scale investment in wind turbines, nevertheless, ongoing monitoring of wind shall continue.
2. Ocean thermal generation: This technology is in the experimental stage and would be both risky and comparatively expensive.
3. Wave energy generation: there does not appear to be any viable site where the waves are adequate and consistent.

To achieve the target of 50% of energy from renewable sources by 2022 has been challenging. The following table illustrates the increase in renewable energy generation over the 5-year period to 2020. The total installed capacity of 2.32MW comprises both roof top installations and 2 ground mounted solar farms of 500kW and 1.125MW sites respectively.

Facility	Installed Capacity	Mounting	Connection Point	Commissioning Date	2015	2016	2017	2018	2019	2020
<b>Energy Produced (kWh)</b>	kW				365	366	365	365	365	366
Buada	500	Ground	Grid. RMS	Apr-16			869,126	862,304	738,469	773,500
Site 1 MZMFAT/EU Solar	1125	Ground	Grid Field	Oct-19						1,267,620
Noddy/ C Tank Building	138	Roof	P/Station	Oct-13	193,933	188,890	212,853	201,443	126,067	162,910
NUC Office	20	Roof	P/Station					34,692	28,572	30,434
Government Solar	52	Roof	RME			33,588	49,944	65,482	61,499	56,965
NGH (Hospital) (22kW)	22	Roof	RMN	Apr-18			18,414	21,882	13,199	26,011
RON Hospital	25	Roof	RMN					8,967	45,970	85,847
Odin Aiwo Hotel (5KW)	5	Roof	RME						4,714	8,393
Nauru College (30 kW)	30	Roof	RMN				57,710	60,232	51,076	53,908
Capelle Warehouse (97kW)	97	Roof	RMN						102,983	134,247
Capelle Apartments (30 kW)	30	Roof	RMS				13,627	41,527	32,794	37,780
Capelle Main Store (230 kW)	230	Roof	RMN						44,796	315,317
Meneng Disable Peoples Centre (1.5 kW)	1.5	Roof	RMS					1,632	1,348	1,431
Meneng Disables school (1.5 kW)	1.5	Roof	RMS					1,296	2,491	1,951
Angelique Ika (6.3 kW)	6.3	Roof	RMN					7,043	8,127	7,733
Joseph Deireraagea (9.1kW)	9.1	Roof	RMN						8,597	12,075
Meda Deireraagea (3.9 kW)	3.9	Roof	RMN						2,794	4,474
Tim Ika (6.3 kW)	6.3	Roof	RMN						7,270	9,839
Raymond Ika (6.3 kW)	6.3	Roof	RMN						6,788	9,564
Dodo Tanang	1.1	Roof								636
Dewa Danang	2.2	Roof								1,165
Ludwig Scotty	1.1	Roof								576
Jad Denuga	2.2	Roof								1,142
Leo Scotty	1.1	Roof								512
Morley Thoma	1.1	Roof								512
Taiwan Farm Buada	5.2	Roof	RMS							356
<b>Total Capacity</b>	<b>2322.9</b>				<b>138</b>	<b>190</b>	<b>817</b>	<b>826.3</b>	<b>1,184</b>	<b>2,323</b>
<b>Total Energy</b>					<b>193,933</b>	<b>222,478</b>	<b>1,221,674</b>	<b>1,306,500</b>	<b>1,287,554</b>	<b>3,004,898</b>
<b>Capacity Factor</b>					<b>16%</b>	<b>13%</b>	<b>17%</b>	<b>18%</b>	<b>12%</b>	<b>15%</b>

Table 8: Renewable Energy Generation 2015 - 2020

Table 8 shows an increase in renewable energy generation exported into the grid over the 5-year period to 2020 with an average capacity factor of 15%.

Several issues need to be considered in order to achieve the renewable energy target solely with the use of solar.

Firstly, with respect to land use. Ground mounted solar installations take up significant land which renders the area unavailable for other uses.

Secondly, system or voltage stability of the network will be a concern as solar power depends on the sun for energy generation which on average provides sufficient radiation to generate energy for less than 50% of a day. Also, during the day generation will vary due to angle of sunrays, cloud cover, shading from nearby buildings or vegetation and other reason. Tests on the Government building solar panels indicate the power output can be suddenly reduced by up to 70% due to cloud cover. This can cause serious stability issues in our power system.

With the increase of solar renewable energy generation being exported to the grid, NUC will need to further consider the use of additional technology for voltage and network stability in the form of battery energy storage system. This may require a storage capacity of several hours to maintain the system and provide sufficient time to bring on-line diesel generation or other base load generation when there are prolonged reductions in solar energy.

The following graphs show how the energy generated from a typical roof top solar installation varies throughout the day. Note the impact of rain in figure 8. This is indicative only and for each system this performance can vary, however, NUC will need to perform system studies to determine solar penetration and grid stability requirements.

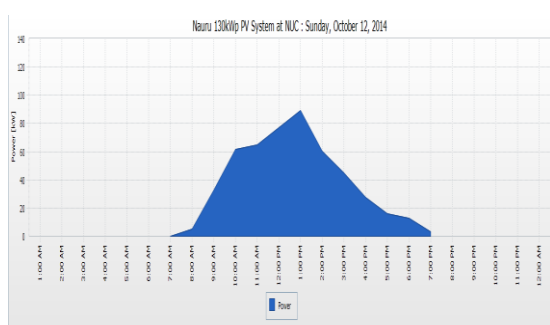


Figure 7: Typical Solar Energy Profile

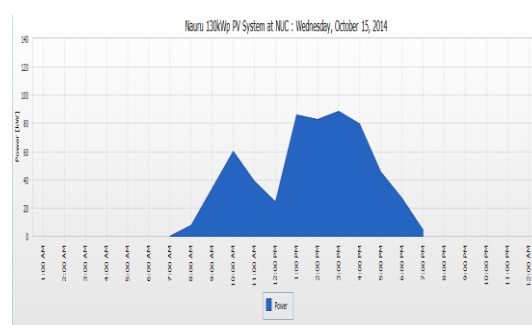


Figure 8: Solar Energy Profile during Rain

NUC's role in implementing the Energy Road Map for Nauru is to support the installation of renewable energy projects with technical and operational expertise. The policy recommended the adoption of solar:

- ✚ utilizing rooftops for solar installations wherever possible.
- ✚ for installations above the stability limit, battery storage systems with capacity for maintaining up to 2 hours of energy supply will need to be installed to maintain system stability.
- ✚ the maintaining of the buy-back tariff of \$0.20 to encourage the private sector and individuals to invest in rooftop solar power installations.
- ✚ the solar power installations shall not be used for diesel capacity displacement.
- ✚ Sufficient diesel generation capacity shall be maintained to meet the maximum demand of the power system.

#### New 6 MW Solar Farm

The project includes the construction of a 6MW grid-connected solar power plant and a 2.5MWh, 5MW battery energy storage system to supply continuous power when solar energy is interrupted by cloud cover and to maintain network stability.



The system will be fully automated and integrated with the existing diesel generation system to optimise solar energy use, enable optimal battery energy storage system charging and discharging, and allow optimal shut-off of the diesel engines, which will reduce Nauru's reliance on diesel for power generation and decrease production costs.

The design and development work have commenced on the installation of a 6MW solar power project funded by ADB and Government of Nauru. The project is scheduled for completion by the end of 2022.

The new 6 MW Solar Farm will provide surplus energy capacity, further reducing fuel costs incurred by NUC to run diesel generators.

However, the generation investment strategy shall be to ensure sufficient diesel capacity to meet the N-2 security requirement and install solar and other renewable generation to reduce diesel fuel usage. The avoidance of investing in diesel generation capacity will require the investment in battery storage system to provide for up to 5 days of supply with minimum recharge for system stability.

The project is expected to strengthen the institutional capacity of the Nauru Utilities Corporation by training staff in the operation and management of the solar plant and the battery energy storage system. It will also support gender-mainstreaming efforts and provide project implementation assistance.

The 6MW Solar Power Project will help boost the capacity of electricity generation from renewable sources from 3.0% to 47%.

#### Kinetic Power Plant

On 10 September 2020, Cabinet approved the signing of a Power Purchase Agreement between the NUC and Green Pacific Energy (GPE) of Fiji to facilitate the development of a 3MW kinetic power plant in Nauru.

The installation and operation of the new generation will enable Nauru to generate the majority if not all of its power from renewable sources. This will significantly decrease NUC's reliance on diesel fuel generation and subsequently reduce fuel costs.

The new kinetic power plant will be producing base load capacity with potential availability of 97%. NUC will need to ensure that the grid is able to accept up to 3 MW of power and establish grid operating procedures to enable the power plant to connect safely to our network.

It is envisaged that a minimum of 23,000 MWH per year of operations. This equates to 87% of the maximum production of the power plant.

The introduction of 100% renewable energy generation with both solar and kinetic power production is estimated to save approximately \$2M per year based on fuel price projections described above in figure 5 and figure 6.

### *Distribution Network*

#### *The Distribution Network Strategy*

The low voltage distribution network is in a state of deterioration and poses a risk to the safety of workers, the general public and equipment. As a result, there are frequent individual customer power outages which could be avoided if the network was upgraded. While much work has been done to improve the state of the high voltage network beginning with the more serious issues, there

remains much rehabilitation work to upgrade the remaining low voltage network to acceptable standards.

The objective of this strategy is to:

- ✚ upgrade the LV network to acceptable standards of engineering. Australian & New Zealand standards have been adopted for network design and equipment specifications.
- ✚ improve reliability of supply and minimise the frequency and duration of power outages by:
  - improving standards of construction and maintenance to minimise the risk of faults; and,
  - reducing outage times by improving response to system events when faults do occur.
- ✚ improve the health and safety of our workers, the general public and equipment on the network.

#### Operational Safety Distribution Network

The safety of our employees and the general public is paramount in the design and construction of the network and must take into consideration the operational procedures for carrying out work on the network.

Currently, NUC has no safety manual governing work on the electricity network. Safety rules, permits and switching programs have been introduced however, further training and development is required to ensure compliance.

System drawings and network status tracking has been introduced in the Control Centre; however, staff require on-going training and development to ensure compliance with safety rules and safe work procedures.

Reporting of safety incidents, near misses and hazards requires further enhancement. Risk management processes need to be introduced and staff training and development in hazard identification, risk management and monitoring is required to ensure compliance with OH&S policies and procedures. Safety indicators shall be adopted to monitor and improve safety compliance at work.

Operational communication network needs to be provided to support field staff in performing their work safely and efficiently. Many incidents occur as a result of poor communication and the lack of information provided to field staff when required.

Personal Protective Equipment (PPE) on equipment is provided to employees to enable them to perform their work safely. PPE forms an important part of protecting employees from hazards and unsafe environment.

It is a mandatory requirement of NUC that staff wear appropriate PPE when carrying out their work. Management is accountable for ensuring that staff are provided with suitable PPE for the tasks they perform and all staff are responsible for ensuring they maintain and use it for the purpose it is intended.

Regular training is provided for network control operators and field staff on the preparation and use of Permits to Work, Switching Programs, Fault Reports, Pin Board Monitoring and other operational safety systems.

Several initiatives to improve network operations remain to be developed and implemented, these include:

- ✚ Develop and implement a Work Safety Manual.
- ✚ Develop and implement Grid Operation Security Policy.
- ✚ Develop and implement Grid Operating Procedures
- ✚ Develop and implement Safe Work Procedures
- ✚ Training and development of Network Operators and field staff to understand the Policy and Manual.
- ✚ Establish and maintain drawing records of the HV and LV networks.

Some minor works remain to be completed; these include:

	<b>Ring Main North Feeder</b>	Budget Est.	Fund
1.	Upgrade Domestic feeder to 11 kV and install a transformer at D3	\$1.5M	EU/AA
	<b>Ring Main South Feeder</b>	-	-
	-	-	-
	<b>Ring Main East</b>	-	-
1	Aiwo Hotel – Relocate transformer and RMU to roadside and reticulate LV to AIWO North	\$50k	NUC
		-	-

Other projects planned for the high voltage network are:

- ✚ Installation of an additional 2.5MVA transformer and associated switchgear and busbar at the power station site for the Ports supply as well as providing additional security of supply in the event of an existing transformer being out of service for prolonged periods.
- ✚ Circuit breakers at the 3.3 kV substations are old and appear not to have been serviced for a long time. An assessment shall be done of all the 3.3 kV substations and switchgears to determine whether to replace or service and maintain.
- ✚ Construction manual shall be developed to standardise all construction works on the network. Meanwhile the construction standards for the FEA network have been adopted.

### Low Voltage Network

The low voltage network (415/240V) supplies the vast majority of household customers throughout Nauru, each with their own distinct level of consumption, and with most of the low voltage cables and conductors that are at least 40 years old.

As residential demand for electricity increases over time, the low voltage electrical network will be put under considerable strain. Without considerable investment in the existing networks – or application of smart network management – outages are likely to become more common.

Improving the capacity of the local electricity network, its ability to cope with load issues and being able to quickly identify and reduce outages will be crucial to the success of our electrical future.

With the predicted uptake of additional solar installations or potentially the use of electric vehicles, a key challenge will be creating a robust network with distributed grid connected solar to generate the right amount of power to maintain reliable supply to our customers.

The refurbishment and augmentation of the low voltage network has progressed as funding has been made available. However, rusted steel pole structures still remain and poor design of underground installations and overhead network require further attention.

The current condition of the low voltage conductors, many with broken strands, incorrectly sized conductors and high resistant joints and connections reduce the capacity of the lines and increase technical losses on the network. It is estimated that 22% of energy generated does not earn revenue for NUC due to high losses on the network.

The refurbishment of the LV network would reduce such losses caused by these technical losses i.e. old conductors, poor connections and joints and inferior public lighting system.

Non-technical losses on the low voltage network also contribute to lost revenue for NUC, which include, electricity theft and meter by-pass, billing and accounting errors, or under-estimation of electricity bills.

A detailed program has been developed to determine the full scope of work to upgrade the network to the required standard. The cost of the work is estimated to be \$4M spread over the next two years.

There is further opportunity to introduce LV network monitoring to enhance network performance. Improved monitoring of the network would provide for detailed analysis of transformer utilisation, station voltage, voltage unbalance and power factor for parts of the low voltage network, enabling NUC to better respond to voltage fluctuations and customer loading issues. NUC will need to further investigate the requirement to implement such technologies within the low voltage network.

#### Customer Connections and Installations

The wiring of customer premises needs to be regulated to ensure safety of people and property. The quality of wiring carried out on premises in Nauru is not governed by regulations and can be carried out by anyone. It is most fortunate that not many more dwellings and homes are destroyed by fire caused by electrical short circuits.


Although many new dwellings are now being constructed to AS/NZ 3000 electrical wiring standards, the majority of existing houses are below standard.

There are no enacted Regulations that govern the wiring of houses, licensing of electrical contractors, electrical inspections of premises and approvals for connection to the grid.

In addition, the metering of energy sales is an area where further improvement needs to be made.

There is a need to implement additional revenue assurance monitoring on energy usage to reduce the likelihood of electricity theft, faulty metering and other discrepancies in the sale and use of electricity. NUC currently tracks and monitors meter installations and customer usage patterns on a fortnightly basis to reduce the incidents of electricity theft or non-technical losses.

Proposed initiatives include:

-  Development of Regulations that govern the wiring of houses, licensing of electricians, inspections of premises and approvals before connection. The regulations shall also cover the technical quality of service and other technical requirements for the safety and efficient operations of electricity supply.

- ✚ Install metering at specified nodes in the network to monitor energy flow and usage. The data will be used to assess energy production and distribution to customer's connections and assessments made on non-technical losses due to theft.
- ✚ Review and implement Energy Theft Policy and Procedures to discourage non-technical losses.

### Energy Efficiency and Demand Side Management Strategy

NUC's energy efficiency and demand side management strategies will require further policy development, programming and technical support for the development and implementation of energy efficiency programs.

Specialist skills in the area of residential energy use, for both appliances and building shells and enhanced experience in the area of commercial and industrial equipment efficiency will be required to assist customers with identifying and addressing energy efficiency opportunities.

Our aim is to develop, implement and maintain various energy information programs, particularly those related to energy labelling and building audits. There is a need to further develop and assess energy efficiency standards and performance requirements for appliances, equipment and buildings.

To assist customers in accessing affordable energy supply, NUC will support programs that encourage use of energy efficient appliances and electronics, use energy efficient cooling, refrigeration and washing appliances, the installation of energy efficient lighting and use of renewable energy.

NUC administers an energy efficiency rebate scheme funded by the IUCN which supports customers who wish to purchase energy efficient washing machines, refrigerators and freezers by providing a 30% rebate on the purchase price of the item if it meets the energy efficient set for that particular appliance. Uptake of the scheme has progressed slowly with total payout of approx. \$10,000 to date.

Improvements in energy efficiency and energy conservation will also be considered during tariff reviews and our price setting approach.

As discussed previously, reducing technical and non-technical losses associated with the generation, distribution and supply of electricity is an important factor to reducing costs and reducing our impact on the environment.

Continuing our review of NUC's metering and connection processes, upgrading our HV and LV network of poles and wires including monitoring of energy flows and non-technical losses will ensure efficient supply and usage of energy.

## 5. Water Production and Delivery

The *Nauru Utilities Corporation Act 2011* sets out the functions of NUC with respect to water services, specifically to acquire, store, treat and distribute water and to undertake and maintain and operate the works, systems and facilities for the production and delivery of water throughout Nauru.

As stated in the Nauru Economic Infrastructure Strategy and Investment Plan (NEISIP), Nauru's development strategy for water is to provide a reliable, safe, affordable, secure and sustainable water supply to meet socio-economic development needs.

Furthermore, the Nauru Water and Sanitation Master Plan 2015 to 2035 is used as a key planning document for the water sector and is therefore the basis for this strategic plan.

This strategic plan outlines the priorities in development that need to be addressed in order to achieve a reliable water supply and sewerage system to meet current and future needs.

### Existing Water Production and Supply

Households in Nauru receive their drinking water through rain water harvesting, desalinated tanker delivery, bottled water or groundwater (boiled) before drinking. In the majority of cases NUC delivers water to the customers via delivery tankers or water trucks.

NUC's primary form of water production is by use of reverse osmosis (RO) which is further supplemented by rainwater harvesting.

Reverse osmosis is a water purification process that uses a partially permeable membrane to remove salts, particles, unwanted fragments and larger elements from sea water. Reverse osmosis can remove many types of dissolved and suspended chemical species as well as biological ones (principally bacteria) from water, and is used in the production of potable water.

Rain water harvesting is dependent of rain fall and catchment areas. Nauru currently does not have catchment facilities such as dams and all rainwater captured by residential and/or commercial rooftops is stored in private rain tanks.

The majority of water customers capture rainwater and therefore their demand for potable water is dependent on annual rainfall. NUC utilises its facilities throughout Nauru to capture rain water for its use.

NUC's current maximum desalination treatment capacity is approximately 2350 kl/day or 2.35 megalitres per day. The current capacities of operational RO's is provided in Table 15 of the following section.

## Water Demand Forecast

Water production and delivery data for the 5-year period between 2016 – 2020 is provided below in tables 9 and 10 respectively.

Water Production		Year				
		2020	2019	2018	2017	2016
Osmoflow 900	Litres	50390600	115719300	127909520	246859640	100705000
Avenale 800	Litres	138071700	78574870	103636000	196112100	29696500
Avenale 480	Litres	37746200	12782300	69498000	133818900	77151900
Hitachi 110	Litres	2358000	3630000	4825940	9651880	12691200
Meneng 100 (old)	Litres		8251756			
<b>TOTAL PRODUCTION</b>	<b>Litres</b>	<b>235942500</b>	<b>218958226</b>	<b>305869460</b>	<b>586442520</b>	<b>220244600</b>

Table 9: Total water production 2016 - 2020

Water Delivery		Year				
		2020	2019	2018	2017	2016
RPCs	Litres	73030300	101802500	142199009		148158083
NUC	Litres	110789000	79363500	108409000	115921000	41484500
Hired Tanker	Litres	8421060	4789435			
NUC Tanker	Litres	102367940	74574065			
<b>TOTAL DELIVERY</b>		<b>183819300</b>	<b>181166000</b>	<b>250608009</b>		<b>189642583</b>

Table 10: Total water deliveries 2016 - 2020

The total demand for water in 2021 was 183ML with an average daily demand for water for all customers around 403kL. RPC demand was 73ML in 2021, which was 30% less than the previous year of 101ML. NUC's demand increased from 79ML in 2019 to 110ML in 2021 which equates to a 40% increase over the period.

At the time of developing this plan the total number of water customers was 1594 comprising 1569 domestic and 25 commercial customers.

DOMESTIC CUSTOMERS WATER TANKS															
District	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Totals
	Aiwo	Denig	Nibok	Uaboe	Baitsi	Ewa	Anetan	Anabar	Ijuw	Anibare	Meneng	Yaren	Boe	Buada	
# of Tanks	176	294	61	47	70	62	73	73	41	55	255	96	132	159	1594

In determining customer demand for potable water, the following assumptions have been taken into account:

- the forecast considers previous years trends in production and delivery
- population growth is considered to remain flat. For the purpose of demand forecasts, it is assumed to be around 2%.
- water usage per household (comprising family of 4 persons) is assumed to be 44 litres per day. This equates to 18kL per year.
- rainfall per year is assumed to be low to allow for long periods of drought that has been forecast by the Bureau of Meteorology for Nauru.
- the planning criteria adopted assumes capacity for production, storage and delivery to be sufficient for extended drought periods.
- Demand for water by commercial customers is assumed to increase by 1% annually.

- ✚ Demand for water by Government is fixed at 20,000kL per year.
- ✚ Demand for water by industrial customers is estimated to be 3,000kL per year.
- ✚ The Regional Processing Centre demand is assumed to be 50,000kL per year.

Table 11 below sets out the average demand for water over the next five years based on population growth of 2 percent and average daily usage of 11 litres of water per person per day.

Year	Population #	Residential KL	Demand /person	
			L/person-yr	L/person-d
2015	11,181	26,029	2,328	6
2016	11,459	28,781	2,512	7
2017	11,737	75,383	6,423	18
2018	12,014	61,447	5,115	14
2019	12,292	40,089	3,261	9
2020	12,570	58,692	4,669	13
<b>Average demand</b>			<b>4,051</b>	<b>11</b>
2021	12,854	66,861		
2022	13,145	72,344		
2023	13,442	77,952		
2024	13,746	83,686		
2025	14,057	89,550		

Table 11: Water demand and residential population growth.

Figure 9 below provides a graphical representation of the 5-year demand forecast for residential customers based on population growth and average water usage in kilolitres per year

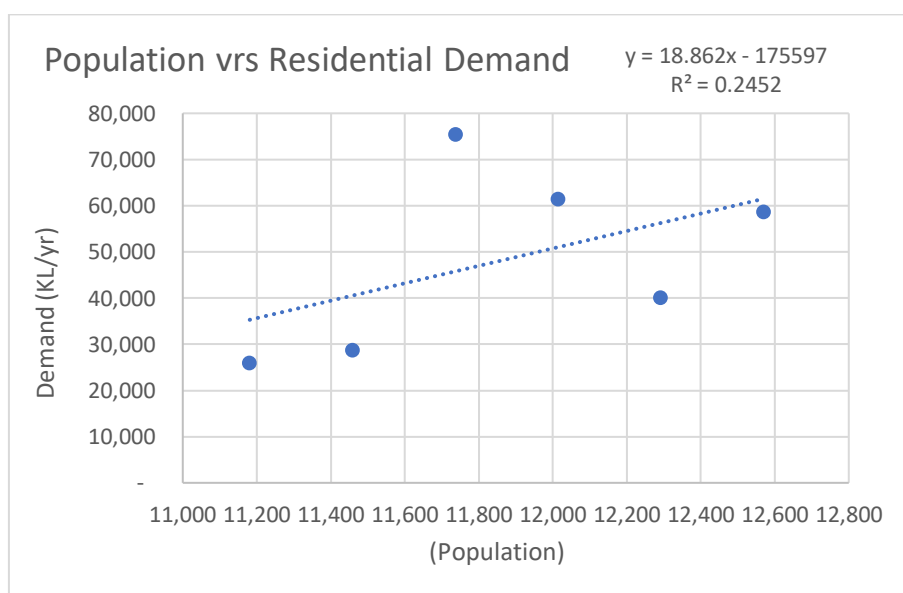


Figure 9: Population versus Residential Water Demand 2021 – 2025.

The following tables sets out the various scenarios for water demand over the 5-year period to 2025. Three scenarios are considered from the most likely, to both a low- and high-level demand forecast.

The scenarios are based on the assumptions described above and categorised by customer type i.e. domestic, commercial, industrial and government.



Likely Forecast 2020 - 2025													
Year	Domestic	Commercial	Industrial	Government	Meneng Fresh Water	Total Sales	Losses	NUC	Fire	NUC Demand	RPC's	Fresh Water Total Demand	Sea water
2015	26,029	13,086		2,995		42,110				42,110	148,158	190,268	
2016	28,781	5,107		12,194		46,082	43,179			89,261	131,884	221,145	
2017	75,383	18,782		16,919		111,085	26,231	3,217		140,533	166,336	306,868	
2018	61,447	24,375	3,348	27,060		116,230	39,621	3,436	2,838	162,124	142,199	304,323	
2019	40,089	20,774	2,033	21,979		84,874	29,155	2,300	826	117,156	101,803	218,958	108,553
2020	58,692	15,274	2,731	19,113	19,360	115,170	62,290	3,945	867	182,272	73,030	255,302	107,704
2021	66,861	15,427	3,000	20,000	19,360	124,647	40,000	3,500	850	168,997	50,000	218,997	108,000
2022	72,344	15,581	3,000	20,000	19,360	130,285	40,000	3,500	850	174,635	50,000	224,635	108,000
2023	77,952	15,737	3,000	20,000	19,360	136,049	40,000	3,500	850	180,399	50,000	230,399	108,000
2024	83,686	15,894	3,000	20,000	19,360	141,940	40,000	3,500	850	186,290	50,000	236,290	108,000
2025	89,550	16,053	3,000	20,000	19,360	147,963	40,000	3,500	850	192,313	50,000	242,313	108,000

Table 12: Likely forecasted demand for water 2021 – 2025 (,000)

Low Forecast 2020 - 2025													
Year	Domestic	Commercial	Industrial	Government	MH Fresh	Total Sales	Losses				RPC's	Total Demand	Sea Water
2015	26,029	13,086		2,995		42,110				42,110	148,158	190,268	
2016	28,781	5,107		12,194		46,082	43,179			89,261	131,884	221,145	
2017	75,383	18,782		16,919		111,085	26,231	3,217		140,533	166,336	306,868	
2018	61,447	24,375	3,348	27,060		116,230	39,621	3,436	2,838	162,124	142,199	304,323	
2019	40,089	20,774	2,033	21,979		84,874	29,155	2,300	826	117,156	101,803	218,958	108,553
2020	58,692	15,274	2,731	19,113	19,360	115,170	62,290	3,945	867	182,272	73,030	255,302	107,704
2021	53,488	15,427	3,000	20,000	19,360	111,275	30,000	3,500	850	145,625	50,000	195,625	97,200
2022	57,875	15,581	3,000	20,000	19,360	115,816	30,000	3,500	850	150,166	50,000	200,166	97,200
2023	62,361	15,737	3,000	20,000	19,360	120,458	30,000	3,500	850	154,808	50,000	204,808	97,200
2024	66,949	15,894	3,000	20,000	19,360	125,203	30,000	3,500	850	159,553	50,000	209,553	97,200
2025	71,640	16,053	3,000	20,000	19,360	130,053	30,000	3,500	850	164,403	50,000	214,403	97,200

Table 13: Low forecast demand for water 2021 – 2025 (,000)

High forecast Demand 2020 - 2025													
Year	Domestic	Commercial	Industrial	Government	MH Fresh	Total Sales					RPC's	Total Demand	Sea Water
2015	26,029	13,086		2,995		42,110				42,110	148,158	190,268	
2016	28,781	5,107		12,194		46,082	43,179			89,261	131,884	221,145	
2017	75,383	18,782		16,919		111,085	26,231	3,217		140,533	166,336	306,868	
2018	61,447	24,375	3,348	27,060		116,230	39,621	3,436	2,838	162,124	142,199	304,323	
2019	40,089	20,774	2,033	21,979		84,874	29,155	2,300	826	117,156	101,803	218,958	108,553
2020	58,692	15,274	2,731	19,113	19,360	115,170	62,290	3,945	867	182,272	73,030	255,302	107,704
2021	73,547	15,427	3,000	20,000	19,360	131,333	50,000	3,500	850	185,683	50,000	235,683	118,800
2022	79,578	15,581	3,000	20,000	19,360	137,520	50,000	3,500	850	191,870	50,000	241,870	118,800
2023	85,747	15,737	3,000	20,000	19,360	143,844	50,000	3,500	850	198,194	50,000	248,194	118,800
2024	92,055	15,894	3,000	20,000	19,360	150,309	50,000	3,500	850	204,659	50,000	254,659	118,800
2025	98,505	16,053	3,000	20,000	19,360	156,918	50,000	3,500	850	211,268	50,000	261,268	118,800

Table 14: High forecast demand for water 2021 – 2025 (,000)

Figure 10 and 11 below show the total demand forecast for likely, low and high scenarios including the RPC1 compared to NUC water demand without RPC1.

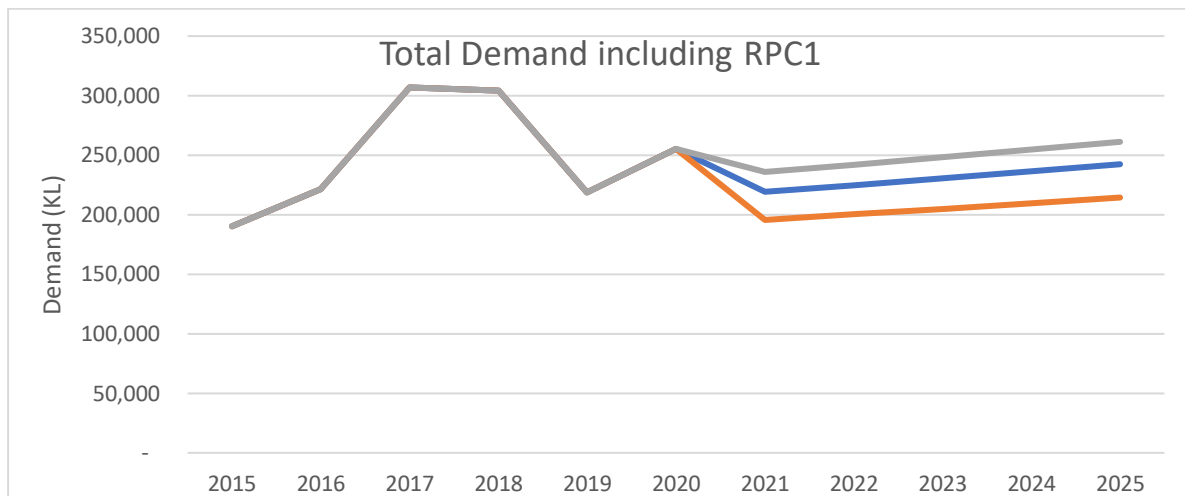


Figure 10: Total Water Demand (Likely Low and High including RPC 1) 2021 – 2025

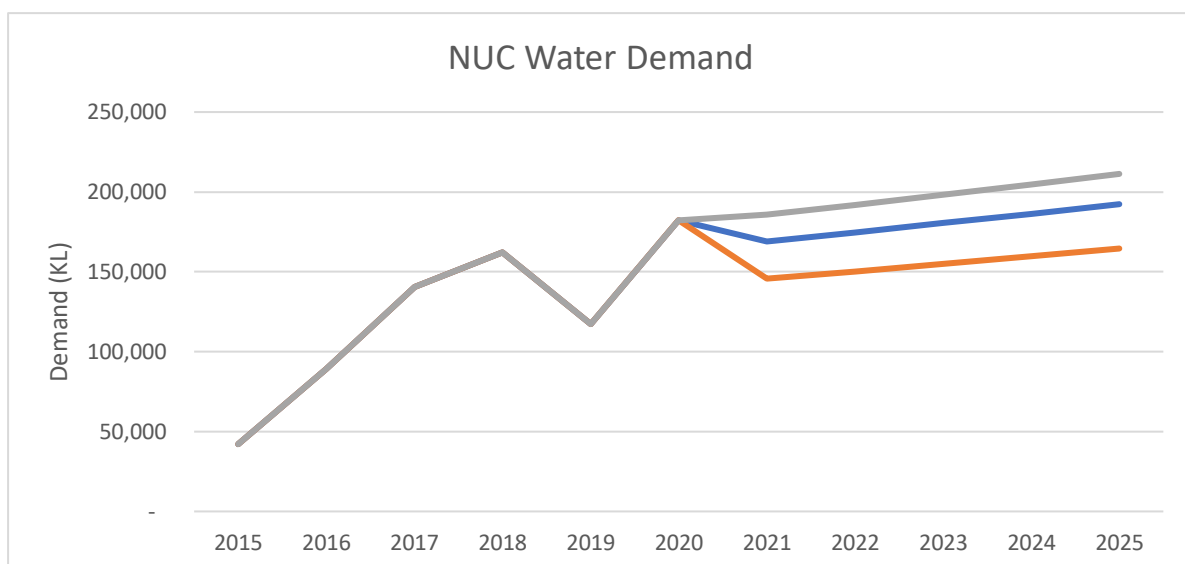


Figure 11: NUC Water Demand (Likely Low and High excluding RPC1) 2021 - 2025

### Reverse Osmosis (RO) Plant Capacities

The current capacity of available RO plant is illustrated in the following table.

Plant No.	Plant Manufacturer	Capacity (kL/day)	Status
1	Osmoflo 900	900	Operational
2	Avenale 800	800	Operational
3	Avenale 480	480	Operational
4	Hitachi	120	Operational
5	Meneng Old	50	Operational
6	Meneng Avenale 480	480	Installation in progress

Table 15: Reverse Osmosis (RO) Plant capacities

The Meneng Avenale 480 plant, is being progressed, however is subject to a number of constraints which currently delay the completion of the project in 2021. NUC is working through the issues to finalise the project.

The current Meneng (Old) 50 kL/day plant although operational at reduced capacity, will be unable to meet the increasing demand for Meneng Hotel, which is currently around 250kL/month.

Due to a lack of space at the NUC power station site at Aiwo, to accommodate additional RO's NUC has considered a further option to relocate additional RO's to the Meneng hotel site which already has sea water intakes and water storage capacity of 1.2 million litres. This option remains under review and consideration.

### Reverse Osmosis (RO) Sea Water Piping and Pump Capacities

The four RO plants are fed via sea water intake pumps. A new pump rated at 200 kL per hour has been installed. The current configuration comprises two by 200 kL per hour pumps in parallel as depicted in the following figure 12. The total intake demand for the RO's is 290 kL per hour.

This installation has been constructed as a temporary arrangement, while the Ports Development Project is constructed. There are plans to re-instate a new sea in-take system as part of the Ports Project. This was to be completed by 2020 however due to delays in the Ports development it's planned completion is due end of 2021.

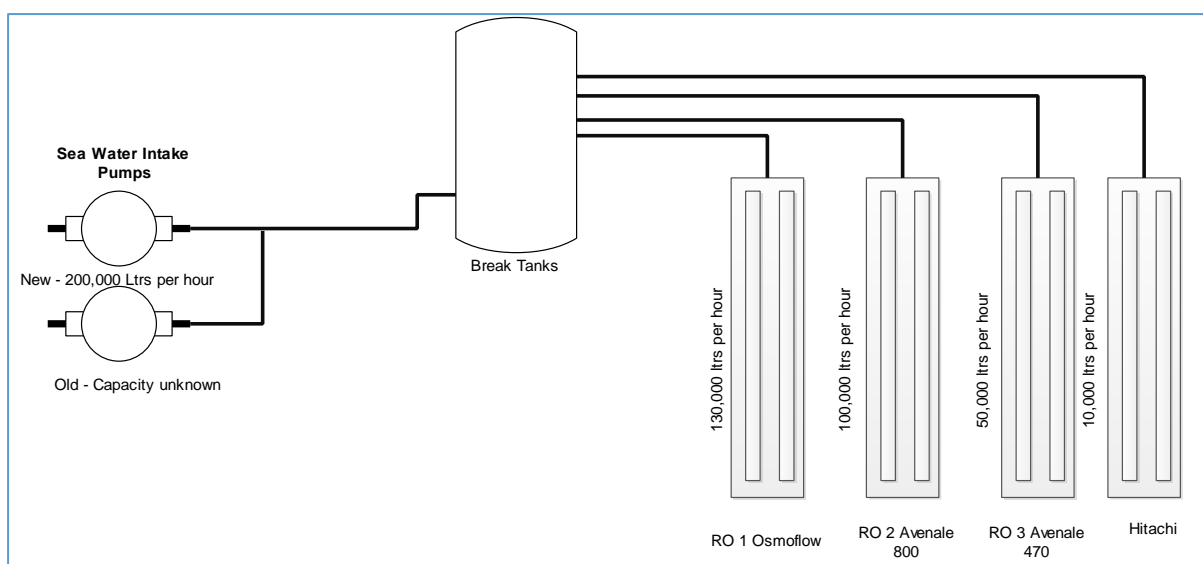


Figure 12: Sea Water Intake for the RO Plants

### Water Tanks Storage Capacity

The current tank capacities available to NUC are set out in Table 15 below.

Tank (ID)	Capacity (kL)	Operational Status
C1	275	Operational
C2	275	Operational
C3	275	Operational
C4	275	Operational
C5	275	Operational
C6	275	Operational
B13	4,000	Operational
B10	3,000	Installation to be progressed
C7	275	Need to assess condition and viable options for refurbishment
C8	275	Need to assess condition and viable options for refurbishment
C9	275	Need to assess condition and viable options for refurbishment
C10	275	Need to assess condition and viable options for refurbishment
C11	275	Need to assess condition and viable options for refurbishment
C12	275	Need to assess condition and viable options for refurbishment

Tank B13 is constructed of steel and requires regular maintenance and condition monitoring. B10 has been removed and replacement is currently planned with a 3,000kL capacity tank. This is programmed for completion by 2022

Tanks C7 to C12 are concrete tanks which require condition assessment to determine viable options for reuse. Increased storage availability provides higher levels of water security as it provides a buffer should a catastrophic failure occur with the RO Plants or prolonged power outages.

Donor funding may be required to refurbish tanks C7 to C12 to improve security of supply.

There is additional storage capacity for the Refugee Processing Centres spread over numerous tanks which total approximately 2.5 megalitres.

### Delivery Truck Capacity

Water delivery is currently done with water trucks or tankers. Water trucking can be a rapid means of transporting water to areas and customers in need of water however, tank truck delivery operations, are expensive and relatively time-consuming to administer.

The number of tankers needed to supply the required quantity of water will depend on a variety of factors. These include, but not limited to, the regular supply of fuel, storage facilities to ensure reliability of supply, experienced drivers and operators, maintenance and availability of vehicle parts, availability of skilled maintenance staff and road conditions for access.

NUC's current trucking capacity is detailed in the following table.

Vehicle	Capacity (Litres)	Status
Truck 1	4,000	Operating
Truck 2	5,000	Operating
Truck 3	8,000	Operating
Truck 4	8,000	Operating
Truck 5	10,000	Operating
Truck 6	10,000	Operating
<b>Hire Vehicles</b>		
Truck 1	8,000	Operating
Truck 2	7,500	Operating
Truck 3	7,500	Operating
Truck 4	4,500	Operating
Truck 5	5,000	Standby availability for peak demand periods
Truck 6	8,000	Standby availability for peak demand periods

Table 17: NUC Vehicle including Hire Vehicles Truck Capacity 2020

Trucking capacity utilization is based on normal hours of work, rate of filling, traveling and discharging time. The current percentage time available for operations for NUC water tankers is around 89% i.e. the reliability of water delivered is measured by the number of orders delivered within 2 days of payment.

To enhance trucking capacity utilisation would require additional investment in NUC trucking fleet to provide N-1 security. The current fleet which includes hired vehicles is 12 with carrying capacity of 95,000 litres (utilising the standby hire trucks), would need to be increased to approximately 17 trucks to achieve orders delivered to within one day of payment and improved efficiency to above 95%. The cost of service would substantially increase and would need to be borne by the customers. NUC would need to assess the customer's willingness to pay for this increased service in water delivery.

The average capacity of water being delivered as at the time of this report was 695,000 litres per day. The maximum capacity of water trucks and/or tankers on the island which includes fire department trucks is 192,500 litres.

Delivery forecasts are set out in the below table for low, high and likely scenarios. The number of trips is segregated into domestic, commercial and commercial plus owner uplifts as well as owner-uplifts only, including government.

Figure 13 below provides a graphical representation of the demand for total number of trips over the 5-year period to 2025 for all three scenarios.

Likely Scenario						
Number of Trips						
Year	Domestic	Combine Comm & Owner UL	Commercial	Owner Uplift	Government	Total Trips
2020	10,253	1,220	117	1,103	2,313	13,786
2021	11,680	2,879	276	2,603	2,420	16,980
2022	12,638	2,903	278	2,625	2,420	17,962
2023	13,618	2,928	281	2,647	2,420	18,966
2024	14,619	2,952	283	2,669	2,420	19,992
2025	15,644	2,977	286	2,692	2,420	21,041
Low Scenario						
Year	Domestic	Combine Comm & Owner UL	Commercial	Owner Uplift	Government	Total Trips
2020	10,253	1,220	117	1,103	2,313	13,786
2021	9,344	2,879	276	2,603	2,420	14,644
2022	10,110	2,903	278	2,625	2,420	15,434
2023	10,894	2,928	281	2,647	2,420	16,242
2024	11,695	2,952	283	2,669	2,420	17,068
2025	12,515	2,977	286	2,692	2,420	17,912
High Scenario						
Year	Domestic	Combine Comm OUL	Commercial	Owner Uplift	Government	Total Trips
2020	10,253	1,220	117	1,103	2,313	13,786
2021	12,848	2,879	276	2,603	2,420	18,148
2022	13,902	2,903	278	2,625	2,420	19,225
2023	14,979	2,928	281	2,647	2,420	20,327
2024	16,081	2,952	283	2,669	2,420	21,454
2025	17,208	2,977	286	2,692	2,420	22,605

Table 18: Forecast Truck Deliveries (Likely, Low and High) 2021 – 2025

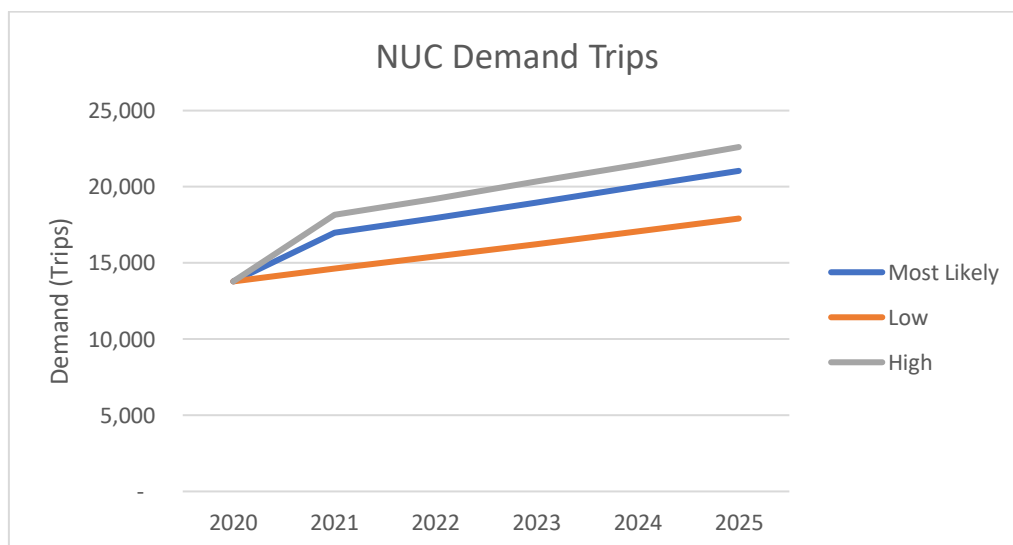


Figure 13: Forecast NUC Delivery Demand (Likely Low and High) 2021 - 2025

### Delivery of Water via a Piping System

Towards the end of this planning period there may be a need to install limited piping systems for the delivery of water to customers. Areas that may be considered for initial installations are:

- ✚ The RON Hospital previously was supplied water via pipeline from the NUC site. The feasibility of repairing current pipelines is not considered feasible and a new network would be required to supply the RON Hospital.
- ✚ Supply of reticulation water to nearing areas such as Aiwo which is in close proximity to the NUC plant/office.
- ✚ Supply of piped water to the eastern Meneng district where storage tanks behind the Meneng Hotel could be used to extend pipes to residents in the adjacent area.

The long-term Water Master Plan for Nauru should capture these initiatives and identify and evaluate water reticulations and waste management options for the country.

## 6. Customer Communication and Engagement Strategy

In the future, our customers will have many new options for how they source, manage and use their electricity and water. Many customers will be very proactive and will invest in new technologies and explore the full range of options available. Others will continue to rely on the electricity network, and will continue to expect reliable supply for the best possible price.

The needs and expectations of our customers will be more diverse, and we will need to be more proactive in understanding the specific circumstances of individual customers and communities, and their particular types of electrical appliances and devices.





Similarly, water customers' needs and expectations will be more diverse and we will need to be more proactive in understanding their specific circumstances. Energy and water efficiency, reliability and security of supply will be expected.

This section describes the NUC's commitment to our customers and stakeholders. It details what our customers can expect when dealing with us and the level of service we aim to provide.

### *Our commitment to our customers*







The NUC is committed to improving our service delivery to benefit our customers and stakeholders.

Underpinning our approach are our fundamental commitments which lay the foundation for our strategic priorities and initiatives. They are:


-  Delivering Safe, Reliable, Affordable and Sustainable Electricity and Water Services
-  Communicating and Engaging with Customers and Stakeholders
-  Delivering Customer Outcomes
-  A High Performing Organization

Our power generation, water production and field services teams will still be delivering many of its core services – restoring power after outages, attending to water supply outages and leaks, conducting routine maintenance of generation plant, water production facilities and of power lines, and managing vegetation.

Our customer service strategy will mean that we will need to:

-  Continually refresh our understanding about our customers and their changing needs.
-  Introduce new capabilities to develop and deliver services that customers value, and creating great experiences for them.
-  Implement new approaches to how we market our services and engage with our customers.
-  Introduce new support systems and better customer data to enable us to deliver new services efficiently and effectively.
-  Create new partnerships and collaborations with manufacturers, suppliers, stakeholders and customers.
-  Develop a new cultural focus not just on delivering a great service as we supply electricity and water to our customers, but on seeing new opportunities and responding in a timely and agile way.

We will strive to establish and foster positive relationships through:

-  showing you courtesy and respect



- ✚ acting in an honest and fair manner
- ✚ being accessible, understanding and helpful
- ✚ listening and providing you with considered and timely responses
- ✚ taking ownership of, and dealing with, any issues that arise
- ✚ managing expectations and honouring our commitments

We will provide you with timely and accurate information

We will make it easy for you to contact us and will use plain English in our communication with you.

We will strive to provide you with reliable and timely information.

We will consult with you regularly and listen to your feedback. Your feedback is critical, as it helps us improve the way we serve you. We will not make important decisions that impact on your service without proper consultation.

We will:

- ✚ strive to understand what is important to you
- ✚ provide a range of options for how and when you can provide feedback
- ✚ consult with you regularly and include your feedback in our decision making to the extent possible
- ✚ keep you informed about changes to our services
- ✚ monitor our performance and service levels every year to ensure we continue to improve.

We will respect and protect your privacy

We will only collect the information we need to conduct our business and will strive to keep your information up to date. Private or personal information will not be released without your consent unless we are reasonably and lawfully required to do so.

We will respond to your issues and concerns.

If you contact us, or request that we resolve an issue we will ensure you receive a timely, reliable and accurate response. We will respond to your complaint or concern within 3 business days.

Performance Indicator	2021-22	2022-23	2023-24	2024-25
Continually increase our online transaction capability for your convenience	80%	85%	90%	95%
Answer telephone calls in an average of 10 seconds	80%	85%	90%	95%
Serve you in person within 10 minutes	80%	85%	90%	95%
Respond to emails within 3 working days	80%	85%	90%	95%
Respond to written correspondence within 7 working days	80%	85%	90%	95%
Reduce waiting time at NUC Offices	80%	85%	90%	95%
Give out accurate information	80%	85%	90%	95%
Reduce response time on complaint and referrals (external/internal)	80%	85%	90%	95%

We are accountable for delivering effective results and services for our customers in a professional manner, acting with integrity and ensuring transparency by taking ownership of issues and proactively seeking resolutions. The NUC's customer service performance metrics is set out below.

- ✚ Cash flow – revenue

- ✚ Complaints Escalation Rates:

- Number of complaints for this period
- Number of complaints last period
- % increase/decrease in number of complaints since last month
- increase/decrease in number of complaints year to date

- ✚ Employee retention / turnover rate (explain whether due to resignation, retirement or termination)

- ✚ Employee productivity

- ✚ Number of active issues, resolved issues and average resolution time.

## 7. Pricing of Electricity and Water Services

Many factors influence the price of electricity and water services provided by NUC.

Electricity prices generally reflect the cost to build, finance, maintain, and operate power plants and the electricity grids i.e. the complex system of poles and wires.

NUC as a state-owned enterprise is required under the Public Enterprise Act 2019 to be a successful business, that it is at least as profitable and efficient as a comparable business in the private sector and must conduct its business and operations with a view to being a successful business.

This requires NUC to fully recover its costs of providing water and electricity services from its customers through tariff fees and charges, in an effective and efficient manner.

Several key factors influence the price of electricity and water services:

Fuel prices, especially for diesel petroleum fuels, may increase during periods of high electricity demand and when there are fuel supply constraints or disruptions because of extreme weather events and accidental damage to transportation and delivery infrastructure. Higher fuel prices, in turn, may result in higher costs to generate electricity.

Power plant costs: Each power plant has financing, construction, maintenance, and operating costs.

Transmission and distribution system: The electricity network i.e. poles and wires systems that connect power plants with consumers have construction, operation, and maintenance costs, which include repairing damage to the systems from accidents or extreme weather events and improving security.

Weather conditions: Extreme temperatures can increase demand for cooling, and the resulting increases in electricity demand can push up fuel and electricity cost. Solar provides for low cost generation when the sun is shining, however when solar is not available due to cloud cover, rain or other factors, the loss of generation from this source can put upward pressure on other energy/fuel sources and price.

The cost of generating electricity is the largest component of the price of electricity. The cost of electricity is usually highest in the summer periods.

The cost of supply varies from changes in fuel and oil prices, operating and maintenance costs including transactional costs; however, most consumers pay set rates as set out in Appendix 2.

Changes in costs generally reflect variations in electricity demand, availability of generation sources, fuel costs, and power plant availability. Costs are usually highest in the summer when total demand is high because more expensive generation sources are added to meet the increased demand.

Electricity prices also vary by type of customers. Electricity prices are usually higher for residential (with the exception of lifeline tariffs) and commercial consumers because it costs more to distribute electricity to them. Industrial customers use more electricity and can receive it at higher voltages, so supplying electricity to these customers is more efficient and less expensive. The price of electricity to industrial customers is generally close to the wholesale price of electricity.

Similarly, the cost of providing water services is dependent upon various factors. Many may consider water as a natural resource which is indispensable to everyone's life, and is of course a free

commodity, however, its collection, treatment and distribution, as well as the treatment of waste water before it is returned to the environment requires significant technical, financial and human resources which are sometimes complex and have a cost which needs to be paid for one way or another.

Production and storage: Costs comprises construction costs, amortisation expenses and provisions for the replacement of all water collection, treatment and distribution facilities, as well as the cost of treatment, operation and maintenance, including that of the Tank Delivery network, administrative and customer management services, and resource preservation costs.

Water Tanker Deliveries: Tanker operation is expensive and relatively time consuming to administer. Costs incurred in the delivery of water is dependent on the capital costs (the number of tankers needed), fuel costs, human resource, spare parts, and operating and maintenance costs.





Other considerations include filling and delivery points, technical and non-technical losses, as well as access roads.

## 8. Nauru Utilities Corporation Strategic Goals and Activities








As already alluded to, the Strategic and Operational Plan implements the strategic priorities in the National Sustainability Development Plan. The Plan includes other appropriate strategic objectives, strategies, targets and activities designed to realise the aspirations in NUC's 2031 Future Operating Model. The following summarizes these strategic goals and priorities.

### Summary of Goals and Strategic Priorities







#### ***Strategic Goal 1: Responsiveness to key cross-cutting agendas enhanced***

-  Implement the NUC Anti-Corruption Strategy.
-  Implement the NUC Gender Mainstreaming Strategy.
-  Promote staff Health, Safety and Welfare.
-  Promote Staff awareness on Environmental Issues.






#### **Strategic Goal 2: Empowered Stakeholders through Knowledge Generation and Exchange**

-  Enhance internal and external stakeholders' knowledge, skills and expertise
-  Enhance mechanisms to provide timely and tailored information to meet the needs of stakeholder groups.
-  Enhance public knowledge, awareness and understanding of NUC's functions.
-  Track, assess and share information on energy and water services.
-  Enhance targeted communication with key stakeholders.
-  Strengthen interactions with key stakeholders.
-  Strengthen international cooperation on energy and water matters.









#### **Strategic Goal 3: Enhanced Customer Experience through Engagement and Communication**

-  Enhanced service delivery to benefit our customers and stakeholders.
-  Establish and foster positive relationships with our customers.
-  Establish a Customer Charter that outlines our communication to our customers and in turn how our customers can help us provide quality service.
-  Establish Customer Service Standards to reflect how customers want the organization to deliver: customer service and respond to enquiries and complaints.
-  Establish a Customer Management System that enhances customers experience when dealing with NUC.
-  Establish a Customer Consultation and Engagement Program.

#### **Strategic Goal 4: Enhanced Enabling Legal and Institutional Environment for Energy and Water Sector**

-  Support the review of the Nauru Utilities Corporation Act 2011 to clarify key functions and responsibilities.
-  Support the review and development of Nauru Utilities Corporation Regulations to include Power System Rules and Regulations, Safety and Reliability Standards, Renewable Energy and Energy Efficiency.
-  Support the review and development of Nauru National Energy Policy
-  Develop procedures and guidelines related to electricity supply and customer connections. To include procedures and guidelines for water supply and delivery.
-  Implement established Regulations, Standards and Codes enacted under the Act.

### **Strategic Goal 5: High Achieving Energy and Water Utility in the Pacific Region**

-  Strengthen the NUC's organizational, management and staffing framework.
-  Strengthen business processes and customer services.
-  Strengthen NUC's energy and water operations.
-  Transform NUC into an e-utility with most services delivered through ICT systems.
-  Strengthen financial sustainability mechanisms of the NUC.
-  Strengthen Quality Management Systems (QMS).
-  Institutionalize modern strategic management and performance management systems.
-  Modern Internal auditing and risk management frameworks.

## Appendix 1: Summary of Proposed Initiatives and Projects

#	Initiative / Project	Budget	Date to Commence	Funding
<b>Corporate Governance</b>				
1	Revise Nauru Utilities Corporation Act 2011 to clarify the functions and responsibilities of NUC as a Corporation.	-	Q3 2021	GoN/NUC
2	Revise Nauru Utilities Corporation (Amendment) Act 2016 to clarify the role and functions of the Board of Directors.	-	Q3 2021	GoN/NUC
3	Review, develop and enact Electricity Regulations under the Act.	-	Q3 2021	GoN/NUC
4	Review, develop and enact Water Regulations under the Act.	-	Q3 2021	GoN/NUC
5	Review NUC Organisational Structure.	-	Q1 2021	NUC
6	Develop and implement Organisational Risk Management Policy.	\$5k	Q2 2021	NUC
7	Develop and implement Quality Management System.	\$5k	Q2 2021	NUC
8	Develop Conflict of Interest and Gifts Policy for NUC.	\$5k	Q2 2021	NUC
9	Identify and develop policies, procedures, codes and guidelines (Fraud Control Policy, Sponsorship Policy, Probity Policy, Social Media Policy, etc).	\$5k	Q2 2021	NUC
10	Develop Service and Installation Rules for electricity.	\$10k	Q3 2021	NUC
11	Country Strategy Development Energy and Water Sectors (Technical Review) (DCIE) Dept of Energy	-	Q2 2021	ADB
<b>Corporate Culture &amp; Business Ethics</b>				
1	Review and implement Values and Code of Conduct for employees and management.	\$5k	Q1 2021	NUC
2	Review and implement Equal Opportunity Policy.	\$5k	Q2 2021	NUC
3	Review and implement Sexual Harassment Policy.	\$5k	Q2 2021	NUC
4	Design and implement Annual Employee Satisfaction Survey.	\$5k	Q2 2021	NUC
<b>Human Resources</b>				
1	Review Human Resource Management Manual Policies and Procedures.	\$5k	Q1 2021	NUC
2	Review, develop and implement employee Performance Review & Development Plans.	\$5k	Q1 2021	NUC
3	Review and implement Selection and Recruitment Policy and Procedures.	\$5k	Q1 2021	NUC
4	Develop Annual Refresher training modules for First Aid & CPR, Fire-Fighting, Driver Awareness, Emergency Response, OH&S, etc. for all staff.	\$5k	Q1 2021	NUC
5	Review Position Descriptions and Salary Bands to reflect accountabilities and responsibilities.	\$5k	Q1 2021	NUC
6	Integrate and develop policies and procedures on gender equality, social inclusion and environmental awareness in line with relevant policies and standards.	\$5k	Q2 2021	NUC
<b>Finance &amp; Procurement</b>				
1	Tariff Review and Reset	\$50k	Q4 2022	NUC

2	Review, develop and implement Financial and Contractual Delegation Policy and Procedures.	\$5k	Q1 2021	NUC
3	Establish Tenders and Contracts Review Committee including processes and procedures.	\$5k	Q2 2021	NUC
4	Review, develop and implement Purchasing and Contracts Management Manual.	\$5k	Q2 2021	NUC
5	Review, revise / update Financial Management Manual.	\$5k	Q2 2021	NUC
6	Review and develop Internal Audit processes and procedures.	\$5k	Q3 2021	NUC
<b>Information Management &amp; ICT</b>				
1	Establish secondary back-up safe server room	\$159k	Q3 2021	NUC
2	Review of Navision software for suitability	\$50	Q3 2021	NUC
3	Second PC for Suprima pre-paid software for (On-line backup)	\$10k	Q4 2021	NUC
4	Review of ICT network and scope upgrade	\$10K	Q4 2021	NUC
5	Establish back-ups storage for Navision and Suprima systems	\$10k	Q4 2021	NUC
6	Acquisition of AutoCAD drawing software including hardware	\$50k	Q1 2021	NUC
7	Acquisition of software to support condition-based monitoring and maintenance of ICT assets	\$20k	Q4 2021	NUC
8	Introduce on-line banking for power top-up and water orders.	\$10k	Q1 2022	NUC
9	ICT Staff Training in SCADA administrative functionality.	\$30k	Q1 2022	NUC
<b>Power Generation</b>				
1	Expand SCADA Capabilities to include Distribution Network (Phased Implementation Approach)	\$500k	Q4 2024	NUC
2	Relocate containerized high-speed generators to 6 MW Solar Farm site	\$1.25M	Q4 2024	Donor
3	Document NUC Grid Operating Procedures for Third Party Access.	\$30k	Q3 2023	NUC
4	Establish Grid Connection for IPP – Kinetic Power Plant	\$50k	Q4 2024	NUC
5	Review Generation & Network Protection co-ordination		Q4 2024	NUC
6	Install HV cable, switchgear and 1 MVA transformer station for Nauru Ports redevelopment.	\$250k	Q4 2022	NUC
<b>Renewable Energy Generation</b>				
1	Grant 0664 Solar Farm Project 6 MW	US\$22M	Q4 2023	ADB
2	Kinetic Power Producer – IPP 3 MW	TBD	Q1 2021	IPP
3	Roof Top Solar Installations Connection and Metering	-	On-going	NUC
4	Solar Farm Project Battery Storage Capacity 5 MW for voltage and load control	\$1.5M	Q4 2024	Donor
5	Solar Farm Rain Water Harvesting Project	\$1.5M	Q4 2024	Donor
<b>Energy Efficiency &amp; Demand Side Management</b>				
1	Support the development of Energy Efficiency Policy	-	Q1 2021	NUC
2	Support the development of Energy Efficient Appliance Standards	-	Q1 2021	NUC



3	Support Customers with Energy Efficiency Audits	-	Q1 2021	NUC
<b>Buildings, Facilities &amp; Fleet</b>				
1	Security perimeter fence - Power Station Compound	\$100k	Q1 2021	NUC
2	Security perimeter fence – Power Distribution Area	\$100k	Q1 2021	NUC
3	Refurbishment of ablution – Power Station Building	\$100k	Q2 2021	NUC
<b>Distribution Network (HV &amp; LV)</b>				
1	Review, develop and implement Distribution Network Safety and Reliability Standards	\$5k	Q3 2022	NUC
2	Review, develop and implement Asset Management Strategy	\$5k	Q3 2022	NUC
3	Review, develop and implement OH&S Manual	\$5k	Q2 2021	NUC
4	Low Voltage Rehabilitation Project	\$1.5M	Q2 2021	Donor
5	Review and implement Grid Extension Policy	\$5k	Q4 2021	NUC
6	Review, develop and implement Distribution Network budget and costing methodology	\$5k	Q4 2021	NUC
7	Develop and implement Project Management Methodology	\$5k	Q1 2021	NUC
8	High Voltage Network Rehabilitation – Ports Area	\$250k	Q3 2021	Donor
9	33kV Interconnector Upgrade (T/F's Protection, Switchgear and Control System)	\$250k	Q3 2021	Donor
<b>Metering &amp; Revenue Protection</b>				
1	Install meters for customers whose bills are estimated <sup>2</sup>	\$20	Q3 2021	NUC
2	Review and establish revenue protection policy and procedures	\$5	Q4 2021	NUC
<b>Water Production &amp; Delivery</b>				
1	Construct new Water Office & Workshop	\$50k	Q2 2021	NUC
2	Install new RO plant at Meneng Hotel with 480kl/day capacity	\$250k	Q1 2021	NUC
3	300kl treatment tank to be installed at Meneng Hotel with piping direct to Hotel	\$350k	Q1 2021	NUC
4	Assess condition of 3MI Tank at Meneng Hotel – Inspect and maintain to optimal level.	\$300	Q3 2021	NUC
5	Establish Re-mineralisation plant at both Meneng and Aiwo sites	\$250k	Q4 2022	NUC
6	Relining of C-Tank at Power Station site	\$150k	Q1 2021	Canstruct/ABF
7	Complete 20-year water Master Plan.	\$100k	Q4 2023	Donor
8	Install 2 x 300kl (disinfectant) tanks at B13 and Meneng Hotel sites	\$750k	Q4 2022	NUC
9	Design, Construct and Maintain piped water system to RON Hospital Facility.	\$2.5M	Q4 2024	Donor
10	Design, Construct and Maintain Storage Tank Facilities from Water Harvesting Project (Re: 6 MW Solar Farm Site)	\$1.5M	Q3 2023	Donor
11	Assessment and Refurbishment of C7 – C12 Storage Facilities to enhance security of supply	\$1.5M	Q3 2022	Donor

<sup>2</sup> Five installations still require completion that include: RonPhos Cantilever # 2, RonPhos Kiln, RonPhos Shoreline # 2, RonPhos Workshop, Nauru REHAB Field Workshop. NUC has installed HV metering units at 3 sites which need further work to complete.

Customer Management				
1	Review, develop and implement Customer Management System (Enquiries, Complaints, Grievances and Disputes)	\$5k	Q2 2021	NUC
2	Develop and implement NUC Customer Charter	\$5k	Q1 2021	NUC
3	Develop and implement Customer Communication and Engagement Strategy	\$5k	Q2 2021	NUC
4	Develop and implement Stakeholder Management Strategies	\$5k	Q1 2021	NUC
5	Review and implement Energy Theft Policy and Procedures	\$5k	Q1 2021	NUC
6	Develop and establish KPI monitoring and evaluation process and procedures	\$5k	Q2 2021	NUC

Notes:

1. Costs are indicative only.
2. NUC funded works forms part of NUC's operational budget.
3. Capital projects generally funded by donors through donor agencies.

## Appendix 2: Current Electricity and Water Charges 2020

Electricity & Water Fees and Charges			
	Note	Tariff/ Rate	Unit
<b>Electricity</b>			
Residential Lifeline	A	\$ 0.22	kWh
Residential Prepaid	A	\$ 0.47	kWh
Residential Postpaid	A	\$ 0.48	kWh
Commercial		\$ 0.70	kWh
Industrial		\$ 0.70	kWh
Government		\$ 0.70	kWh
Feed In Tariff	B	\$ 0.20	kWh
Reconnection Fee		\$ 15.00	per event
Meter Tampering/ By Pass Fine Residential		\$ 1,000.00	per meter
Meter Tampering/ By Pass Fine Commercial		\$ 10,000.00	per meter
Reconnection after Tampering		\$ 100.00	per meter
Single Phase meter		\$ 120.00	per meter
Three Phasse meter		\$ 445.00	per meter
New Single Phase Pole Connection		\$ 50.00	per connection
New Three Phase Pole Connection		\$ 100.00	per connection
New Connection Single Phase		\$ 50.00	per connection
New Connection Three Phase		\$ 150.00	per connection
<b>Water</b>			
Residential		\$ 0.0084	Litre
Commercial/ Industrial		\$ 0.0118	Litre
Government		\$ 0.01553	Litre
Residential Delivery < 5,000 L		\$ 5.00	per truck
Residential Delivery > 5,000 L		\$ 10.00	per truck
Commercial Delivery		\$ 263.49	per truck
Government Delivery		\$ 165.00	per truck
Truck Owner Delivery		\$ 117.25	per truck
Fresh Water Delivery via Pipe		\$ 0.0118	Litre
Sea Water Delivery via Pipe		\$ 0.0030	Litre
<b>Corporate</b>			
Cash Power After Hours		\$ 15.00	per Top Up
Labour Hire		\$ 15.00	per man hour
Cherry Picker Hire		\$ 90.00	per hour
Crane Truck Hire		\$ 100.00	per hour
Excavator Hire		\$ 90.00	per hour
Fork Lift 3.5T Hire		\$ 60.00	per hour
Fork Lift 2.5T Hire		\$ 45.00	per hour
<b>Note A</b>			
Each Residential pre-paid customer is provided 200kWh per month at the residential life line tariff. Usage in excess of 200kWh during the month is charged at the residential tariff.			
<b>Note B</b>			
Feed-In tariff applies to excess energy supplied to the grid by customers who have installed grid connected roof top solar panels.			

## Appendix 3: Operational Performance Indicators

Sector	Description	Unit/Measure
<b>Electricity</b>		
<b>Renewable Energy Capacity Factors</b>	Total grid connected solar generated	(%)
	Total government solar energy generated	(%)
	Total solar energy generated exported to grid	(%)
	Total private sector solar energy generated	(%)
	Total private sector energy generated exported to grid	(%)
<b>Energy Sales and Production</b>	Total diesel energy produced	(kWh)
	Total renewable energy produced	(kWh)
	Total renewable energy exported to grid	(kWh)
	Total auxiliary power consumed power station supply	(kWh)
	Total sales	(kWh)
	Total revenue from energy sales	(\$)
	Total losses	(kWh)
	Losses	Total losses / (total diesel energy and total renewable energy exported to the grid) (%)
<b>Water Production and Delivery</b>	Total produced, stored and delivered (volume)	(Litres)
	Availability of reverse osmoses units	(%)
	Total electricity used for water production	(kWh)
	Production efficiencies	(litres/kWhe)
	SWIRO Availability	% time available for operations
	Water Tanker Availability	% time available for operations
	Vehicle Fleet Availability	% time available for operations
<b>Water sales and deliveries</b>	Water volume sales	(litres)
	Water tank trip sales	(number of deliveries)
	Water losses in litres	(%) Losses = (water loss) / (water production storage)
<b>Financial Performance</b>		
<b>Electricity</b>	Weighted Average Per Unit Cost	(Total Power Exported) / (Energy Sales + Production)
	Weighted Average Per Unit Revenue	(Sales) / (Energy Sales + Production)
<b>Water</b>	Weighted Average Volume Unit Cost	(Total Water Expenses) / (Water Sales + Deliveries)
	Electricity Cost for Water Production and Delivery	0.7 / (Water Production + Storage)
	Total Unit Cost of Water Production and Delivery	(Weighted average volume unit cost) / (Electricity cost for water production and delivery)
	Weighted Average Water Revenue / Litre	(Total Water Income) / Water Sales + Delivery)
	Monitor Assets, Liabilities, equity and Cashflow of the organisation	(\$)
<b>Network Performance Indicators</b>	System Average Interruption Duration Index (Planned and/or Unplanned)	SAIDI
	System Average Interruption Frequency Index (Planned and/or Unplanned)	SAIFI
<b>Human Resources</b>	Labour Work Hours/Labour Paid Hours	Overtime ratio
	Employee Attendance per section	(%)
<b>ICT</b>	Complaints, outages, internal network faults, system faults	Number resolved, number unresolved,
<b>Procurement</b>	Orders placed, delivered, outstanding and delivery duration	Number of orders, deliveries, outstanding. Delivery duration in days.

## Appendix 4: Financial Projections to 2025

<b>ELECTRICITY SALES FORECAST</b>						
		<b>Forecast ( Years)</b>				
<b>ENERGY SALES</b>	<b>Units</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
Residential @ \$0.22/kWh - prepaid	\$	1,355,318	720,098	720,818	721,538	722,260
Residential @ \$0.47/kWh - prepaid	\$	4,306,629	4,692,090	4,696,782	4,701,479	4,706,181
Domestic - Postpaid @ \$0.48/kWh	\$	1,231,901	1,492,566	1,494,058	1,495,552	1,497,048
Commercial - Prepaid	\$	2,078,119	3,023,650	3,023,650	3,023,650	3,023,650
Commercial - Postpaid	\$	1,997,174	2,905,075	2,905,075	2,905,075	2,905,075
Government - Prepaid	\$	221,888	227,136	228,272	229,414	230,561
Government - Postpaid	\$	1,996,992	2,044,228	2,054,450	2,064,722	2,075,045
Industrial- Prepaid	\$	116,980	136,436	136,436	136,436	136,436
Industrial- Postpaid	\$	479,349	581,647	581,647	581,647	581,647
Total Domestic	\$	6,893,848	6,904,754	6,911,658	6,918,570	6,925,489
Total Commercial	\$	4,075,293	5,928,725	5,928,725	5,928,725	5,928,725
Total Government	\$	2,218,880	2,271,365	2,282,722	2,294,135	2,305,606
Total Industrial	\$	596,329	718,083	718,083	718,083	718,083
<b>Total Electricity Income</b>	<b>\$</b>	<b>13,784,350</b>	<b>15,822,927</b>	<b>15,841,188</b>	<b>15,859,513</b>	<b>15,877,903</b>

**Note:** Community Service Obligations are not included.

<b>WATER SALES FORECAST</b>						
		<b>Forecast ( Years)</b>				
<b>WATER SALES VOLUME</b>	<b>Units</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
Total Domestic	\$	902,715	486,152	523,835	562,369	601,776
Total Commercial	\$	172,279	183,857	185,696	187,553	189,428
Total Government	\$	414,342	194,000	194,000	194,000	194,000
Total Industrial	\$	46,350	35,400	35,400	35,400	35,400
Menen Hotel - Fresh Water	\$	144,102	228,448	228,448	228,448	228,448
Menen Hotel - Sea Water	\$	43,008	291,600	291,600	291,600	291,600
<b>Total Water Volume Sales</b>	\$	1,722,796	1,419,457	1,458,978	1,499,370	1,540,652
<b>WATER SALES DELIVERY</b>						
Domestic Water Deliveries < 5000L	\$	96,958	69,446	74,829	80,334	85,963
Domestic Water Deliveries > 5000L	\$	24,240	17,362	18,707	20,083	21,491
Commercial Water Deliveries	\$	98,839	73,362	73,978	74,599	75,226
Government Water Deliveries	\$	447,480	526,352	526,352	526,352	526,352
Water Own Uplift	\$	264,657	307,760	310,341	312,947	315,580
<b>Total Water Delivery Income</b>	\$	932,174	994,282	1,004,207	1,014,315	1,024,612
Total Water Domestic	\$	1,023,913	572,960	617,371	662,787	709,230
Total Water Commercial	\$	458,228	777,268	779,721	782,200	784,703
Total Water Government	\$	861,822	720,352	720,352	720,352	720,352
Total Water Industrial	\$	311,007	343,160	345,741	348,347	350,980
<b>Total Water Income</b>	\$	2,654,971	2,413,740	2,463,185	2,513,686	2,565,264
			2,413,740	2,463,185	2,513,686	2,565,264

**Notes:**

- Demand for water is dependent upon environmental factors such as drought, and rain periods.
- Water delivery charges for residential customers are cross subsidised by large customers and do not cost recover for the service.
- Revenue from water sales is dependent upon customer demand, however increases in demand for residential water consumption may increase revenue which is offset by increased costs.

<b>Operating Expenditure Forecast</b>					
	<b>Forecast ( Years)</b>				
	<b><u>2021</u></b>	<b><u>2022</u></b>	<b><u>2023</u></b>	<b><u>2024</u></b>	<b><u>2025</u></b>
Employment Expenses	\$ 3,318,958	\$ 3,375,380	\$ 3,432,761	\$ 3,491,118	\$ 3,550,467
Financial Expenses	\$ 298,536	\$ 303,611	\$ 308,773	\$ 314,022	\$ 319,360
Fuel & Oil Expenses	\$ 9,787,230	\$ 9,953,613	\$ 10,122,825	\$ 2,573,728	\$ 2,617,482
ICT Expenses	\$ 272,270	\$ 276,898	\$ 281,605	\$ 286,393	\$ 291,261
Repairs & Maintenance Expenses	\$ 953,536	\$ 969,746	\$ 986,232	\$ 1,033,088	\$ 1,050,650
Board Expense	\$ 33,920	\$ 34,497	\$ 35,083	\$ 35,679	\$ 36,286
General & Administrative Exp	\$ 2,853,143	\$ 2,901,646	\$ 2,950,974	\$ 3,001,141	\$ 3,052,160
<b>TOTAL EXPENSES</b>	<b>\$ 17,517,593</b>	<b>\$ 17,815,392</b>	<b>\$ 18,118,254</b>	<b>\$ 10,735,169</b>	<b>\$ 10,917,667</b>
Depreciation	\$ 2,350,000	\$ 2,350,000	\$ 2,350,000	\$ 2,350,000	\$ 2,350,000

In determining the operating expenditure forecasts for 2021-2025 the following assumptions were made:

- Inflation is set at 1.7% based on Asian Development Bank projections for Nauru.
- Gross Domestic Product is assumed to be 0.5% based on Asian Development Bank projections for Nauru.
- Renewable energy penetration through solar which includes the new 6 MW solar development project will be in full operation in 2024-25 financial year which is forecast to offset diesel fuel usage by up to 25%.

Forecast Profit and Loss Statement Forecast 2021 - 2025					
	Forecast ( Years)				
	2021	2022	2023	2024	2025
Electricity Income	\$ 13,784,350	\$ 15,822,927	\$ 15,841,188	\$ 15,859,513	\$ 15,877,903
GON CSO	\$ 1,388,213	\$ 1,457,624	\$ 1,530,505	\$ 1,607,030	\$ 1,687,382
Water Income	\$ 2,654,971	\$ 2,413,740	\$ 2,463,185	\$ 2,513,686	\$ 2,565,264
<b>TOTAL REVENUE</b>	<b>\$ 17,827,533</b>	<b>\$ 19,694,290</b>	<b>\$ 19,834,878</b>	<b>\$ 19,980,229</b>	<b>\$ 20,130,548</b>
Employment Expenses	\$ 3,318,958	\$ 3,375,380	\$ 3,432,761	\$ 3,491,118	\$ 3,550,467
Financial Expenses	\$ 298,536	\$ 303,611	\$ 308,773	\$ 314,022	\$ 319,360
Fuel & Oil Expenses	\$ 9,787,230	\$ 9,953,613	\$ 10,122,825	\$ 5,147,456	\$ 5,234,963
ICT Expenses	\$ 272,270	\$ 276,898	\$ 281,605	\$ 286,393	\$ 291,261
Repairs & Maintenance Expenses	\$ 953,536	\$ 969,746	\$ 986,232	\$ 1,033,088	\$ 1,050,650
Board Expense	\$ 33,920	\$ 34,497	\$ 35,083	\$ 35,679	\$ 36,286
General & Administrative Exp	\$ 2,853,143	\$ 2,901,646	\$ 2,950,974	\$ 3,001,141	\$ 3,052,160
<b>TOTAL EXPENSES</b>	<b>\$ 17,517,593</b>	<b>\$ 17,815,392</b>	<b>\$ 18,118,254</b>	<b>\$ 13,308,897</b>	<b>\$ 13,535,149</b>
<b>EBITDA</b>	<b>\$ 309,940</b>	<b>\$ 1,878,898</b>	<b>\$ 1,716,625</b>	<b>\$ 6,671,332</b>	<b>\$ 6,595,399</b>
Depreciation	\$ 2,350,000	\$ 2,350,000	\$ 2,350,000	\$ 2,350,000	\$ 2,350,000
<b>EBIT</b>	<b>-\$ 2,040,060</b>	<b>-\$ 471,102</b>	<b>-\$ 633,375</b>	<b>\$ 4,321,332</b>	<b>\$ 4,245,399</b>

The following assumptions are considered for the above forecast:

- The Government of Nauru's Community Service Obligations to increase as per forecasted GDP growth of 0.5%.
- Deficit after Depreciation is noted in the first three years of the forecast; however, it picks up in Year 4 onwards due to the assumption that the increase renewable energy solar penetration will reduce fuel expenditure by 25%.
- The Repair and Maintenance for solar infrastructure is factored at 3% from 2024 onwards.
- Although a deficit after depreciation is noted in the first three years, EBITDA is positive from 2021 to 2025. i.e., NUC is able to continue to cover its operating costs only.