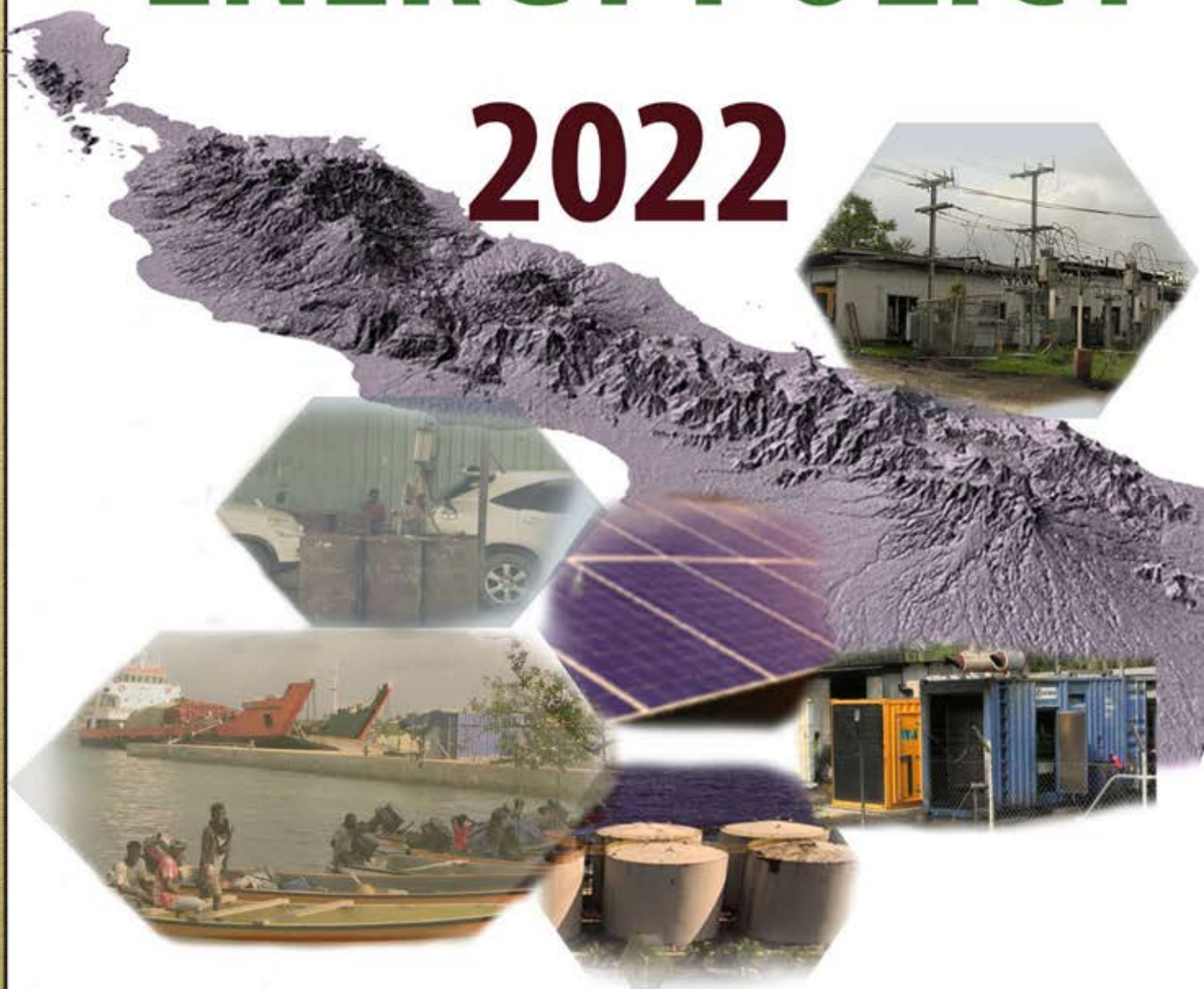




BOUGAINVILLE ENERGY POLICY

2022



DEPARTMENT OF
MINERAL AND ENERGY RESOURCES



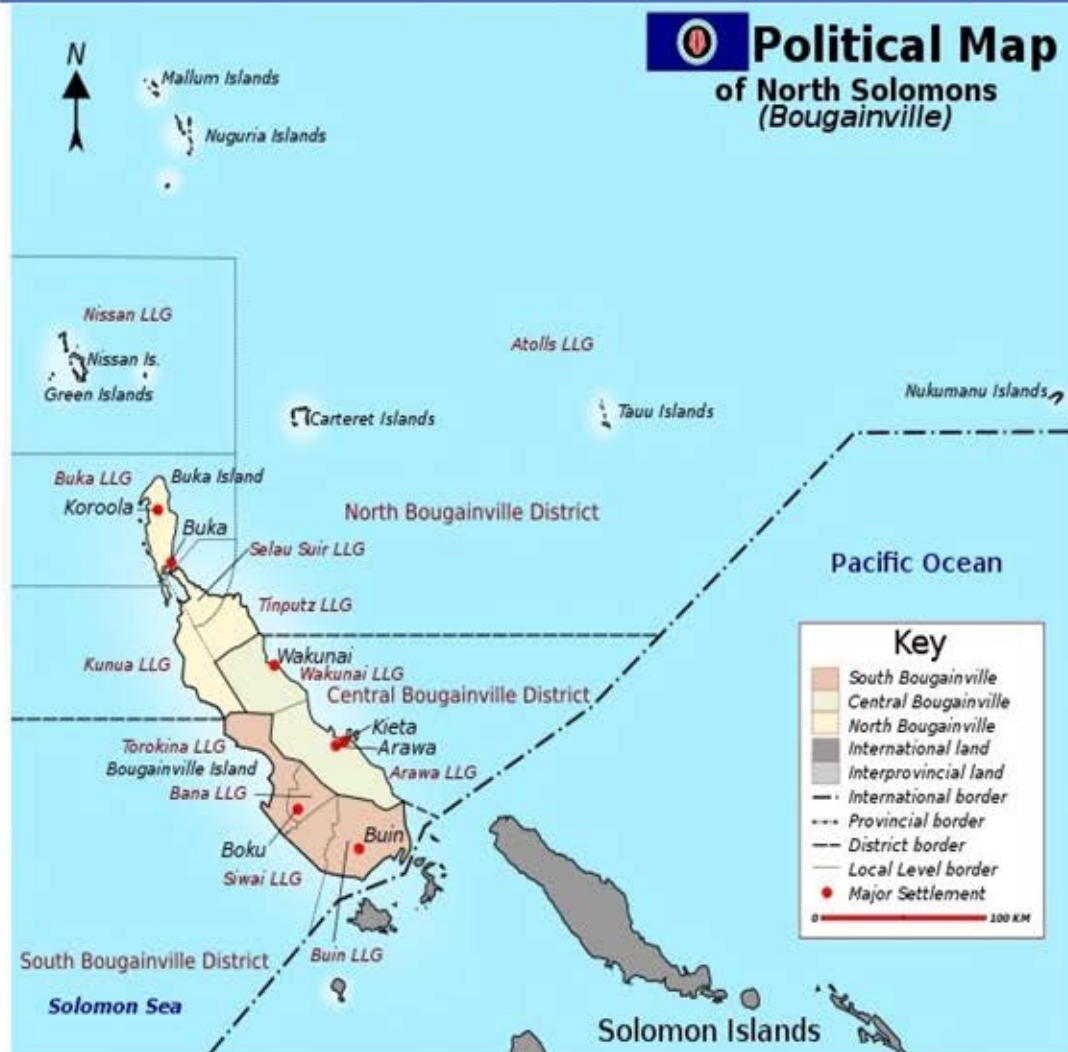
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MAP OF AROB



FOREWORD BY THE MINISTER



I hereby proudly introduce the Bougainville Energy Policy (BEP-2022), formally endorsed by the Bougainville Executive Council (BEC) through BEC Decision No.73 of 2022.

Under the leadership of our Hon. President Ishmael Toroama, developing an energy policy and energy legislative framework for Bougainville has been a key priority given the critical importance of energy to socio-economic development. It is indeed, a sad reality that above 90% of the population do not have access to, and cannot, at this

juncture, afford modern electricity. Clearly, there is an urgent need for accessible, affordable, reliable and sustainable modern energy for the people of Bougainville.

This energy policy sets broad objectives for the achievement of energy goals in Bougainville, and strives to ensure that clean and sustainable energy for the enhancement of economic growth and betterment of livelihoods is achieved. It provides a broader integrated framework that encompasses the whole spectrum of the sources of energy, not just oil and gas, but renewable sources of energy as well, and not only upstream but midstream and downstream processing.

The energy policy offers key solutions on how we can achieve these energy goals, with certain guiding principles of how the energy policy will be implemented. I am hopeful that by 2050, 70% of the urban household will have access to electricity, businesses will be successful with reliable and affordable energy, and 30% of rural outer island atoll households will have access to renewable sources of energy by 2030.

The energy policy is a guide of where we are going, and how we achieve the goals. If we are to succeed, it is because of our commitment to achieve best practices and working together, and not hesitating to acknowledge shortcomings and success along the way. I know I can count on ongoing support from all stakeholders as Bougainville embarks to chart a new course for energy development; including the development of administrative, policy and legislative frameworks in line with the visions of the Autonomous Bougainville Government (ABG) and the people of Bougainville.

A handwritten signature in blue ink, appearing to read 'Rodney Osio'. The signature is written in a cursive style and is positioned above a dotted line.

HON. RODNEY OSIOCO, MHR

ACKNOWLEDGEMENT



Globally, energy is a critical input for economic growth and also social development. As with all other countries, energy is fundamental for Bougainville's economic growth. Having energy policy and legislative frameworks in place is critical from the onset if sustainable energy-derived socio-economic development is to be realized.

Without guiding energy policy and legislative frameworks in place, any energy development attempts will be subject to failure for lack of directions and coordination.

Given the very broad and cross-cutting nature of the energy sector, having a comprehensive overarching energy policy is imperative for Bougainville; this is achieved in the Bougainville Energy Policy (BEP-2022). The BEP-2022 aims to ensure efficient administrative coordination efforts across relevant agencies with energy related responsibilities. Bringing the different spectrum of the sources of energy, different streams of markets, and different departments (and stakeholders) coordinating together under one policy, is a milestone towards achieving socio-economic growth.

The BEP-2022 sets out the key policy areas for the development of the energy sector in Bougainville. These policy areas form the basis for which substantive Bougainville Energy-related Acts and Regulations will be enacted and implemented across various ABG departments in line with the vision to achieve energy security and sustainability by 2050.

Bougainville energy sector goals herein include long term (2050), medium term (2030) and short-term independence ready goals (2025). Priority independence preparedness goals include putting in place all administrative, policy and legislative frameworks for the energy sector by 2025, and pursuing strategies aimed at reducing the unit cost of energy, this includes for ABG to be the sole importer and wholesaler of quality and cheaper bulk fuel into AROB by 2025.

The development of this Bougainville Energy Policy could not have been accomplished without the contributions of many ABG departments and individuals.

Foremost, acknowledgment is given to the God of Bougainville, Creator of all creation and Redeemer and Saviour of mankind for his constant presence in Bougainville's journey towards independence.

Secondly, the Toroama-Nisira government is commended for signing of the Sharpe Agreement in 2021 on the dispensation of Constitutional Requirements relating to the process of transfer of powers and functions pursuant to Section 295 of the National Constitution. This has enabled work on the BEP-2022 to progress without constitutional hindrances.

I would like to recognize the perseverance of the Minister responsible for mineral and energy, Honorable Rodney Osico, MHR, for his continuous support and encouragement towards the development of this Bougainville Energy Policy.

I acknowledge the leadership by ABG Chief Secretary Mr. Shadrach Himata in initiating this energy policy development under the Momis-Masono Government. Further acknowledgement is accorded to ABG Deputy Chief Secretary (Operations) Mr. Michael Otoroa, and the various ABG Departments and respective Heads of Departments and their Officers who have contributed towards the development of this comprehensive policy document during the various rounds of consultations; Department of Technical Services, Department of Trade Commerce and Industry, Department of Education, Department of Bougainville Independence Mission Implementation, Department of Community Government, Department of Community Development, Department of Lands & Physical Planning and Environment Conservation, Department of Personnel Management and Administrative Services (DPMAS).

I acknowledge and thank the members of the Bougainville Energy Development Steering Committee (BEDSC), for their input during the Desktop Review and Analyses, through to the consultation on the Draft Bougainville Energy Policy.

Lastly, but not the least, thank you to Marsol Consultants for the technical assistance towards the development of this document for Bougainville.

You are all commended for your contributions.

For Bougainville Independence.

.....
PETER KOLOTEIN
SECRETARY DOMER

VISION

Accessible, Reliable, Affordable, Clean and Sustainable energy for the enhancement of economic growth and betterment of livelihoods in the Autonomous Region of Bougainville.

GOAL

- To achieve improved financial, policy and legislative frameworks for the energy sector by 2025.
- ABG to be sole importer and wholesaler of quality and cheaper bulk fuel into AROB by 2025
- To supply 70% of the urban household with electricity by 2050.
- To provide 30% reliable and affordable energy to business to achieve successful commercial outcomes by 2030
- To provide 30% of rural outer island atoll households with renewable sources of energy by 2030.
- To make households, business-houses and government buildings 50% more energy efficient by 2030
- To achieve a 30% efficiency improvement in transport sector fuel use by 2030.
- To provide 20 % of power generation through indigenous renewable resources by 2030.



1.0 ENERGY POLICY BACKGROUND

1.1 ENERGY IN AROB

While energy is a broad term encompassing a range of different fuels and end uses, the energy sector in AROB comprises of the two main type of energy sources, which are (i) fossil fuels which includes petroleum and natural gas, and (ii) renewable energy which includes hydro, geothermal, solar and biofuel. According to the 2014 Bougainville Energy Development Strategy 2015 – 2030 (BEDS, 2014), more than 90% of the population did not have access to the main grid electricity supply.

The Bougainville Socio-Economic Baseline Survey Report 2021(BSEB, 2021) recorded very minimal progress on energy-related developments from the 2014 BEDS document. For example, BSEB 2021 reported of a Bougainville population of 318, 596 with very limited access to unreliable electricity services. BSEB (2021) identified the main energy sources to be firewood (87%), kerosene (8%), gas (4%) and electricity (1%). This shows that a large population of AROB are using, instead of electricity, other energy sources such as petrol or diesel generators in the villages, solar stand-alone lights, kerosene, propane and biomass.

Fuel is supplied from PNG, in gallons of drums to Bougainville with the tariff rate to customer stands at PGK0.57kWh in 2016, with added costs which affects peoples' affordability to electricity.

The energy contributions to the economic development in AROB is minimal with increasing demand for potential growth in the future for commercial activities especially for the three main urban centers of Buka-Kokopau, Arawa, and Buin. For Buka Township, the commercial activities are viable with demand for electricity usages for operating shops, bakeries, services stations, workshops, banks, hotels and airlines, and agro-industries. In 2016, the electricity demand had increased to 13% total, with peak demand at 2.20MW, consuming a total of 10,352MWh per annum. In Arawa Township, the economy is based on timber, copra and cocoa production, with few commercial activities that supports the agro-industries including government services around the township. The electricity peak demand was 0.832MW, a total power consumed at 1,458MWh, an average growth rate of 20% in 2016. Buin Town has the similar commercial activities as Buka town but Buka town has potential increasing demand due to population size. It has a total peak demand of 0.482 MW with a total power consumption at 844MWh in 2016.

The outer islands in 2016, has no record to account for the supply demand for electricity. However, the traditional use of biomass for cooking, cocoa and copra drying remains the largest use of renewable energy throughout Bougainville providing around 15% of the gross national energy production.

There is potential for development of Hydrocarbon energy sources as well as other sources of energy.

1.2. WHY NEED ENERGY POLICY?

The need for development of Autonomous Bougainville Energy Policy (ABEP) framework is in two subjective responses, first, is the response to the need for autonomous Bougainville to exercise powers within the functions that are decentralized, and second is the response to the increasing demand for, or the lack of energy development in AROB.

First, the need for an autonomous Bougainville started with the Bougainville Peace Agreement (BPA), which was signed by the Bougainville Leaders and the PNG National Government on 30 August 2001. One of the key elements of the BPA is the granting of autonomous status to the government in Bougainville elected under its own Constitution with the right to assume 'increasing control over a wide range of powers, functions, personnel, and resources on the basis of guarantees contained in the National Constitution'

The Organic Law on Peace Building in Bougainville was enacted in 2002, which amended the PNG Constitution to apply to Bougainville, followed by the enactment of the Bougainville Constitution in 2004. Section 290, Subsection 2 (n) of the National Constitution of PNG, as amended, provides for the transfer of energy functions and powers (including electricity, power generation and distribution) to ABG Administration from the National PNG Government. Thus, giving rise to the development of energy policy and law for Bougainville.

The Bougainville Economic Development Policy (BEDP) was produced in 2010, followed by the Bougainville Strategic Development Plan ("BSDP 2018-2022) in 2014, which sets the foundations, vision, strategies, and implementation of development goals as well as aspirations within the powers and functions relinquished to ABG. Later, the Bougainville Energy Development Strategy (BEDS) 2015-2030, was set out in 2015, which defines the mission to "[m]ake electricity services reliable and affordable to the people of Bougainville", and to "[e]nhance the economic and social development of Bougainville",

The BSDP (2018-2022) sets the scene for the development of the Bougainville Energy Policy, with the aim to achieve accessible, affordable, reliable, sustainable and modern energy for the people of AROB.

Second, the increasing need and demand due to lack of accessibility to energy especially the main grid electricity in AROB had been experienced prior to the Bougainville conflict. Of the estimated >318, 596 population for AROB, more than 90% of the population have no accessibility to modern energy other than to traditional sources of energy. These findings were well highlighted in the 2021 BSEB report, which gives rise to the need for a

Bougainville Energy Policy and legislative framework to achieve the desired outcomes. Even with the very small margin of those with access to modern energy (electricity) especially for commercial activities in the three main urban centers of Buka-Kokopau, Arawa and Buin, electricity usage remains a serious obstacle with energy shortages and supply disruptions, and the high cost of energy in AROB.

Developing a Bougainville Energy Policy, Plan and Legislative Framework will enable to achieve accessibility, availability, and affordability, and ensure clean and Sustainable energy for the enhancement of economic growth and betterment of livelihoods for Bougainville.

Having an overarching guiding energy policy is significant for the coordination of efforts between the relevant energy sector players in the region for better facilitation of the economic and social development for the AROB; noting that energy is a core component of economic and social development. Without a written energy policy, any attempts to develop and manage the usage of energy will subject to failure for lack of directions and coordination.

Relevant ABG departments with energy-related responsibilities will, from the over-arching Energy Policy, develop their relevant energy legislations. For example; the Energy Policy will provide the basis for the development of the Bougainville Oil & Gas Act and Regulations under DOMER, and the development of electricity legislation under the Department of Technical Services.

1.3. OVERVIEW OF THE AROB ENERGY SECTOR

1.3.1. CURRENT RELATED LEGISLATIONS AND POLICIES

There is no specific energy related legislation for energy development in AROB. Other than, the Bougainville Energy Development Strategy (BEDS) 2015-2030, most energy related policies and legislations are predominately of Papua New Guinea, which are not specifically promulgated for Bougainville to address the energy development in AROB.

With the transition of autonomous Bougainville, the policies and laws have been changed to transfer the powers. The amendments to the National PNG Constitution and the creation of the Autonomous Region of Bougainville Constitution, had paved the way for Bougainville development aspirations including energy. Section 290, Subsection 2 (n) of the National Constitution of PNG, as amended, provides for the transfer of energy functions and powers (including electricity, power generation and distribution) to ABG Administration from the National PNG Government. Section 23(1) of the Constitution of the Autonomous Region of Bougainville requires that “[t]he laws and policies of Bougainville shall be directed towards the recognition of customary rights of the People of Bougainville in relation to the land and the sea and natural, mineral and oil resources of

Bougainville and any law relating to the development of such resources shall take that into account.”

In the absence of specific energy laws, AROB is bound by the existing PNG energy legislations. Some of which are, the Electricity Supply (Government Power Stations) Act of 1970, and Electricity Industry Act 2002. The 1970 Electricity Act was enacted prior to PNG becoming Independence purposely for the establishment, control and maintenance of Government power stations, while the 2002 Electricity Industry was enacted to establish an Electricity Commission and to regulate the generation, supply and sale of electricity. Although both Acts have the provisions for construction, entry on land and registration of titles, the latter was not repeal to avoid inconsistencies with powers relating to supply of electricity.

Other related PNG laws are, the Mining and Mineral Resources Acts which are enacted with major focus on Petroleum (Oil and Gas). Other laws, the PNG Mining Act of 1992, Mineral Resources Development Company Pty Limited (Privatization) Act of 1996, the Oil and Gas Act of 1998 (PNG), the Petroleum PNG Holdings Limited Authorization Act of 2007, the Kumul Minerals Holdings Limited Authorization Act of 2015, and Kumul Petroleum Holdings Limited Authorization Act of 2015.

The only specific law on mining for Bougainville is the Bougainville Mining Act of 2015, which provides a regulatory mechanism and frameworks for mining in Bougainville. The difference between the Bougainville Mining Act and the PNG Mining Acts however, is that the Bougainville Act gives exclusive rights to ownership of mineral resources, to be vested in the customary landowners, while the PNG Mining laws are by state-controlled ownership.

The PNG Government’s recent enactment of the National Energy Authority Act of 2021 gives the state control, whereby the PNG State aims to regulate the generation, transmission, distribution and retailing of the renewable and non-renewable energy by an independent Authority, which roles including:

- (a) overseeing the administration and enforcement of energy laws and policies; and
- (b) receiving and collecting levies, fees, tariffs and other charges; and
- (c) responsible for energy research and development – to implement energy policy and law; and
- (d) to approve the corporate policies of subsidiary companies and affiliate states; and
- (e) to administer the National Electrification Trust Fund.

The recent law applies to (i) downstream activities relating to oil, gas, coal and geothermal; (ii) regulate generation, transmission, distribution and retailing of the renewable and non-

renewable energy, (iii) benefit-sharing arrangements between investors, national government, provincial governments and landowners relating to development of energy resources.

It is the intention of the development of this policy to drive the enactment of specific energy laws for Bougainville after which, the PNG energy law will cease to apply in AROB.

Besides these legislations, a few policies and strategic documents are developed exclusively for AROB which relates to energy. These includes (i) the Bougainville Economic Development Policy 2010, (ii) Bougainville Strategic Development Plan 2018 – 2022, (iii) the Bougainville Energy Development Strategy (BEDS) 2015-2030, (iv) the Department of Minerals & Energy Resources (DOMER) Strategic Plan 2017-2022.

The Bougainville Economic Development Policy in 2010 steers the promotion of development of a prosperous, broad based, inclusive, sustainable economy of AROB, with aims to conserve and develop natural resources based on agreed economic development framework. It ensures that the needs arising out of the unique status of the AROB are well considered, whereby all investment decisions relating to natural resources must be in joint venture (JV) investment Ltd Company with Bougainvilleans.

The Bougainville Strategic Development Plan 2018 – 2022, developed to focus on the four key developmental areas: social development, economic development, infrastructure development and the government framework. It is within these areas which the powers and functions are relinquished to the ABG.

The Bougainville Energy Development Strategy (BEDS) 2015-2030, sets out a clear definition for the ABG energy mission charter to “[m]ake electricity services reliable and affordable to the people of Bougainville”. It aims to:

- Set a plan for the ABG to ensure accessibility of electricity to AROBs needed areas and sectors is accelerated, including plans to gain renewable energy and energy efficiency in the electricity sector;
- Enhance the economic and social development of Bougainville with the lead by electricity development and expansion of electricity supply;
- Plan and provide for adequate and reliable infrastructure with effective operational and financial resources to ensure both investment and sustainability of electricity services in the region.

The BEDS is an important energy document which emphasizes that reliable and sustainable energy must be in place to ensure ABG achieves: (i) future power requirements and sustaining of existing and new customers; (ii) support the government’s Medium Term

Development Strategy 2030 Development Plan; (iii) expand the availability of power across the region; and (iv) to be successful in other commercial outcomes.

The Department of Minerals & Energy Resources (DOMER) Strategic Plan 2017-2022, focuses on energy to cover the upstream energy sector specifically on oil and gas (exploration, extraction, and marketing). It provides strategic guidance to DOMER and ABG to deliver effectively, the primary mining and oil and gas exploration, extraction and marketing.

Recognizing the need for coordination of energy related development goals, a Bougainville Energy Development Steering Committee (BEDSC) was established to drive the energy policy development through coordinative efforts of the relevant departments who are part of the BEDSC, and especially the core departments of Mining and Energy Resources, the Department of Technical Services, and Department of Commerce, Trade & Industry (State owned Enterprises Directorate), to draw down specific powers and functions as relevant to their roles and responsibilities within the energy sector. By definition, the BEDSC Charter, formed under the Section 56 (c) of the Bougainville Public Service Act 2014 as a subcommittee to the whole government Central Agencies Coordinating Committee (CACC). The BEDSC is also to facilitate joint partnership of ABG-PNG Power Limited (PPL) to implement the memorandum of understanding (MOU) between ABG and PPL on the energy development partnership. It ensures under the joint partnership with PPL facilitates the establishment of an energy company within 5 years.

1.3.2. PLANNING, MANAGEMENT AND COORDINATION

The planning, management and coordination of the energy sector in AROB is clustered. This energy policy aims to integrate a governance structure whereby energy planning, management and operation is centralized and coordinated between the different departments with energy related administrative responsibilities and establish an energy office and an energy advisory council that will advise the relevant Minister and the Bougainville Executive Council (BEC) on energy matters.

The current composition of BEDSC especially the relevant departments such as the Department of Mining and Energy Resources (DOMER), the Department of Technical Services, and Department of Commerce, Trade & Industry (State owned Enterprises Directorate), and other 7 members, aims to provide support that will enable effective coordination and consideration of all aspects of the primary and secondary energy sources for economic development.

Although Administrative support to the BEDSC is provided by the office of the Chief Secretary and the Department of Technical Services and Department of the President, that

however, lacked a central focus on the coordination efforts on energy, than having an office which could have such concentration.

1.3.3.SUPPLY AND DEMAND

Generally, there is lack of accessibility and supply of modern electricity grid in AROB even when demand for electricity is high especially for the main urban districts. AROB is highly dependent on biomass rural energy use and petroleum imports for electricity generation in the urban areas, land transport, sea transport and air transport. With the outer islands dependent on biomass for energy. The growth of petroleum imports is mainly due to increased economic growth on Buka, Arawa/Kieta and Buin, to a much smaller extent, on rural and outer Islands

There is increased demand for use of solar photovoltaic (PV) but unrecorded as other renewable energy technology used thus far, producing less than an unknown total energy used in AROB.

Petroleum is supplied by Puma and Islands Petroleum from Rabaul to various private small scale drum operators, who are operating all across the AROB. These small-scale operators are responsible for the local distribution and sales of Petroleum in AROB. Even for the supply of fuel to PPL-owned power generators on Buka and Arawa are provided by a third party. The fuels are supplied mostly in 44-gallon drums out of PNG mainland and Rabaul.

In 2016, the total petroleum imports were 17.2 million litres with 3.1million litres petrol, Zoom 1.6 million litres 12.5million litres diesel and 0.60 million litres kerosene. The current duty (levy) on fuel imports is PGK0.60 per litre on petrol, PGK0,30 per litre on Zoom, PGK0.21 per litre on diesel and unknown on LPG. Duty is exempted for kerosene but not exempted on fuel for PPL nor ABG's Buin's power generation usage. Supply into AROB and to the outer islands is by 200-litre drums and often faces shortages of supply due to inconsistent of shipping schedules. Petroleum use in the outer islands is mainly kerosene which is used for lighting or cooking, while petrol is used for outboard powered boats, and for few private and community stand-alone gen-sets. Diesel is mainly used for land transport and for power generation in some institutions. Traditional sailing canoes are used extensively for subsistence fishing results in low use of petrol on outer islands.

AROB has no experience in receiving grant aids from donors to boost energy in petroleum supply for usage in government power generation needs, something that is widely experienced in other small Islands states within the Pacific Island Countries (PIC).

Like most of the mainland of PNG and Island provinces in PNG, the traditional uses of biomass have provided the most overall energy used by the AROB. Coconut husks, shells and wood fuel are used for cooking and cash crop drying such as coca. The biomass utilization and consumption therefore remain high, reflecting a major concern for social

livelihood of people in AROB, while the other sources of renewable energy remain low and undeveloped.

The power system on Arawa and Buka has been installed by PPL with current total installation capacity at Arawa 0.75 MW and Buka 2.0 MW. Tariff is updated regularly to keep up with changes in fuel prices. The current tariff rate to customer's stands at PGK0.57/kWh. Arawa electricity peak demand in 2016 was 0.832MW, a total power consumed at 1,458MWh (2016) with an average growth rate of 20%. Arawa demand is currently at 1MW with supply at about 700KW. Buka Island electricity demand in 2021 has an average growth of 13% total, with peak demand at 2.20MW, consuming a total of 10,352MWh per annum. Buin on the other hand has a total peak demand of 0.482 MW with a private supply of about 400KW with a total power consumption at 844MWh in 2016.

For the outer islands over the same period in 2016-2021, there is no record to account for the supply demand for power.

The supply and demand of electricity have not come to reach a palatable stage for the AROB consumer at any time yet.

1.4. ISSUES FOR POLICY CONSIDERATIONS

The following broad issues have been identified through a series of consultations, and a thorough desktop review of the existing Bougainville Energy Documents. The review placed emphasis on the key energy areas relating to the energy sector. The issues identified, are to some extent reflected and similar to areas which are depicted in the BSDP 2018-2022, BEDP, BEDS and the PNG GOVT /INTEROIL Project Agreement 1997 from an energy sector perspective. It should also be noted that the sequence in which these broad issues or areas are presented are not ranked in terms of their priority.

1.4.1. NO SPECIFIC ENERGY POLICY AND LEGISLATION FOR AROB

The absence of specific energy policy and legislation is a setback to the development of energy sector in AROB. Due to no specific energy policy and laws, there is no clear visioning, planning and implementation in line with the development of socioeconomic priorities during the transition period to Independence. This energy policy document aims to provide a specific energy policy and laws for the development of energy in AROB other than relying on the policies and laws of the National Government of Papua New Guinea, and to provide administration guidance for the coordinated efforts within the relevant energy sectors, and more importantly, for better facilitation of the economic and social development for the AROB.

1.4.2. HUMAN AND INSTITUTIONAL RESOURCES DEVELOPMENT

The availability of skilled local human resources, development opportunities, and institutional capacity in the energy sector is also a major obstacle to the effective and efficient delivery of energy services in AROB. Under the Post Bougainville Peace Accord Agreement, a transitional development was signed in 2005, which agreed that energy powers, human and institutional resources development be implemented over the years. To some extent however, as is identified, energy sector implementation during the transition period has been slow and incomplete due to several factors some of which are discussed below.

- (1) There is lack of coordinated effort from PNG through the Departments of Petroleum Energy, PNG Power Ltd and National Planning Office to work with BDSC for the successful implementation of AROB Energy sectors during this transition period. It is only through the PNG Power Limited (PPL) has been involved with the recent signing MOU in May 2021. MOU with PNG Power Limited for the setting up of an Energy Company which relates to electricity only, not primary energy, and secondary-downstream petroleum, and the rest of the renewable energy.
- (2) The lack of human resources has been identified since pre-and post-Bougainville conflict, and few efforts have been undertaken to build the capacity and institutional developments to prepare Bougainvilleans and the relevant departments to implement, especially for the energy sector in AROB.
- (3) Department of Minerals and Energy Resources (DOMER) is the department responsible with the core functions to look after the energy resources, mineral resources and Geo-hazard management. The focus however, have been centered on capacity building for the sustainable management of mineral resources, and less on energy resources.
- (4) Under the DOMER Strategic Plan 2017-2022, it does not cover the entire energy sector and energy sources as listed below:
 - (a) Petroleum, which includes:
 - (i) Oil & Gas -Upstream-Covered;
 - (ii) Oil & Gas-Processing & Refining-Not covered;
 - (iii) Oil & Gas-Downstream-Terminal Storages, Distribution; and Retailing.
 - (b) Renewable Energy, which includes:

- (i) Hydro Power;
- (ii) Solar;
- (iii) Biomass;
- (iv) Others.

(c) Electricity, which includes Energy Efficiency.

(5) The 5-Value Statements-Guiding Principles listed in the Strategic Plan has no division for energy, and no guiding principle on leadership and management.

(6) Limited financial resourcing avenues to implement energy development plans. Clearly, financial resourcing has been one of the major factors for the development and implementation:

(a) First, there is a need to provide grant or technical assistance funds to identify renewable energy programs that requires implementation.

(b) Second, there is need to provide education and training for the people in the energy sector importantly to enhance the awareness within the energy sector of the possibilities created by the new and more cost-efficient renewable technologies.

(c) Third, to ensure long-term success of a renewable energy investment program, there must be adequate attention to the preparation and financing of the program at the outset followed by continuous training, maintenance and support services. Too many promising renewable energy projects have failed because of these services were neglected or never adequately provided for.

1.4.3. ENERGY SECURITY

The issues with energy supply availability, accessibility, affordability, and sustainability predominantly become serious energy security issues in AROB. Multiple infrastructures, social and economic development plans and growth requires energy for the manufacturing, extraction of minerals, transportation, communication, agriculture and more. Without 'energy' there is nothing to drive the economic development for AROB.

The heavy reliance on biomass and fossil fuel coupled with increasing demand, limited storage capacity and high fuel prices are impeding factors to the availability and affordability of much needed energy services for sustainable development and welfare of people. The need for strategic planning, development of appropriate policies and legislations, efficient end-use, and the development of locally available energy infrastructure and resources to ensure a sustainable supply of energy is of utmost importance.

1.4.4. ECONOMIC GROWTH AND IMPROVEMENT OF LIVELIHOODS

Energy though is considered an underlining requirement for economic growth which leads to improvement of livelihoods, has never been seriously mainstreamed into key national priority sectors such as education and health. This is reflected in the current inadequate staffing, infrastructure, budget allocation and activities in the energy sector. There is however a noted progress in the expansion of the New Energy Company but with limited documented details on how it affects economic growth and improves living standards, particularly in the rural and outer island communities.

1.4.5. ACCESS

Equitable access and distribution of energy developments is a fundamental requirement for the achievement of core development goals, such as economic development and improvement of livelihoods, health, education, and gender equality for Bougainville. Access to energy could open up new opportunities for enhancing income generating activities and improve productivity by decreasing production costs and improving quality, therefore increasing household income.

2.0 GUIDING PRINCIPLES OF THE POLICY

The Bougainville Energy Policy is developed with six (6) guiding principles namely sustainability, good governance, environment compatibility, stakeholder participation, gender equity, and cultural and traditional compatibility which are presented below. It is noted, that these principles are not presented in any order of priority.

2.1. SUSTAINABILITY

The broader outlook of energy effectively contributing to sustainable development provides one of the key principles in developing the Bougainville Energy Policy (BEP). It is envisaged that the BEP will provide the guidance and essential tools to provide sustainable energy services. Accessibility and affordability are vital aspects to access to energy services and ABG in its transition post conflict is mindful of this with respect to the different communities'

demands for energy. It is with the intention that the BEP will provide the framework that will enable the energy needs of the various communities to be provided for.

2.2. GOOD GOVERNANCE

Good governance embraces best practices for the effective, efficient and economic delivery of energy services. It also includes the welfare of landowners and vulnerable groups like the rural and outer islands through the application of appropriate energy technologies.

2.3. STAKEHOLDER PARTICIPATION

To identify and formulate energy priority issues a wide range of stakeholders such as government ministries and statutory bodies, public enterprises, private sector representatives including civil society, targeted landowner groups and churches are consulted individually and in a workshop setting. The consultative process is encouraged and is a prerequisite for any formulation of any policy and legislative framework.

2.4. CULTURAL AND TRADITIONAL COMPATIBILITY

Energy services are to enhance and provide value-adding to the traditional land use and owners for all energy developments. With land use, we have to learn from the past and to ensure that the future energy related projects allow for open dialogue and agreements between landowners and stakeholders for smooth facilitation of energy projects.

2.5. MACHINERY AND ENVIRONMENT COMPATIBILITY

The growing environment concerns globally and, in the Pacific, and increasing trends of energy related consumption around AROB requires control. It is therefore intended that all energy initiatives will need to seriously consider machinery specifications, and environmental issues, and in particular the impact of energy import and use on land, water and air. Any proposed energy use will require careful machinery specifications, and any development will include an environmental impact assessment. It is with anticipation that the negative impacts on the fragile environment already experienced in the outer atolls can be lessened through the consideration of the principles of environmental compatibility and implementation of climate change mitigation programmes in the energy sector planning and development.

2.6. GENDER EQUITY

Not only that the women of AROB are landowners, the development partners and ABG is aware of the needs of different gender groups participation and development pertaining to energy in the communities. The distinct needs of women, children and disadvantaged social

groups are to be explored and considered in the planning process. Attention shall be given to ensure that energy programmes that are developed and implemented provide a balance between social and economic development needs of these concerned population.

3.0 KEY ENERGY POLICY AREAS

The following key policy areas shall compliment other development efforts, and accepted socio-cultural practices in AROB, and shall be in compliance and consistent with the formulation of Acts and Regulations relevant to the energy sector in AROB. As and when required and applicable, and subject to changes over time, some of these recommendations will be subject to review and amendments for the improvement of the energy sector in the future.

3.1. POLICYPLANNING, ADMINISTRATION AND MANAGEMENT

3.1.1. BACKGROUND

This energy policy considered two approaches for the establishment of a governance and energy administration for AROB, one from a state-owned development approach such as from the PNG Energy Authority Act of 2021, which looks at establishing a National Energy Authority with certain powers vested in the National Energy Board, and the other is the community-based development approach such as the Bougainville Mining Act of 2015, which establishes an Advisory Council to oversee implementation of energy policies and laws and the Advisory Council to provide advice to the relevant Ministers and BEC who are established as the decision making authorities in the implementation of the mining laws.

3.1.2. ENERGY POLICY GOVERNANCE

This policy proposes an integrated governance structure for the energy sector in AROB be established, which considers the integration of the relevant departments to be part of the advisory body on the matters relating to energy in AROB. The Energy Advisory Council be established to advise the relevant Ministers responsible for energy. Similar to BEDSC structure, the Deputy Chief Secretary (Operations) is to be Chair of the Advisory Council. Functions of the Advisory Council to be identified in legislation.

As suggested, the Bougainville Energy Office shall become the central administration, planning and management of energy policy in AROB, and shall coordinates with the relevant Departments that implements the various energy components such as the Department of Technical Services, DOMER, Department of Lands, Physical Planning, Environment, Conservation and Climate Change, Department of Finance & Treasury, Department of Commerce, Trade & Industry and etc.

3.1.3.ENERGY POLICY ADMINISTRATION AND OPERATIONS.

Energy policy administration, operation and management is vested with the newly establish Bougainville Energy Office (BEO). BEO is responsible for the central administration and coordination of all development action plans, proposals and coordinate the funding of energy Policy, and shall coordinate the link for all energy implementing Agencies/Ministries, and international donors. The administration functions and powers of the BEO should be identified and other officers who are responsible for the carrying out the operational functions. Within the Energy Office, it shall consist of administrations, and coordinate in relation to Petroleum, Transport energy use, Electricity, Renewable Energy, Energy Efficiency.

BEO shall coordinate with the Department of Technical Services to implement and operate infrastructure, generation and distribution of power, and ensures the implementation of an appropriate policy, strategic and systematic planning mechanism, and well-coordinated energy programmes through its planning unit within the Department. Assist with the setting up of an Energy Company which relates to electricity (power), primary energy, secondary-downstream petroleum, and the rest of the renewable energy developments. The Company may also consider having combine utilities where it is responsible for energy and utility sectors power, water, sewer, and downstream petroleum and responsible for transport energy use.

BEO shall coordinate with Department of Finance & Treasury for the implementation of Tax & Revenue.

BEO shall coordinate with Department of Commerce, Trade & Industry and work with other relevant ABG SOE's on energy commercial and investment opportunities.

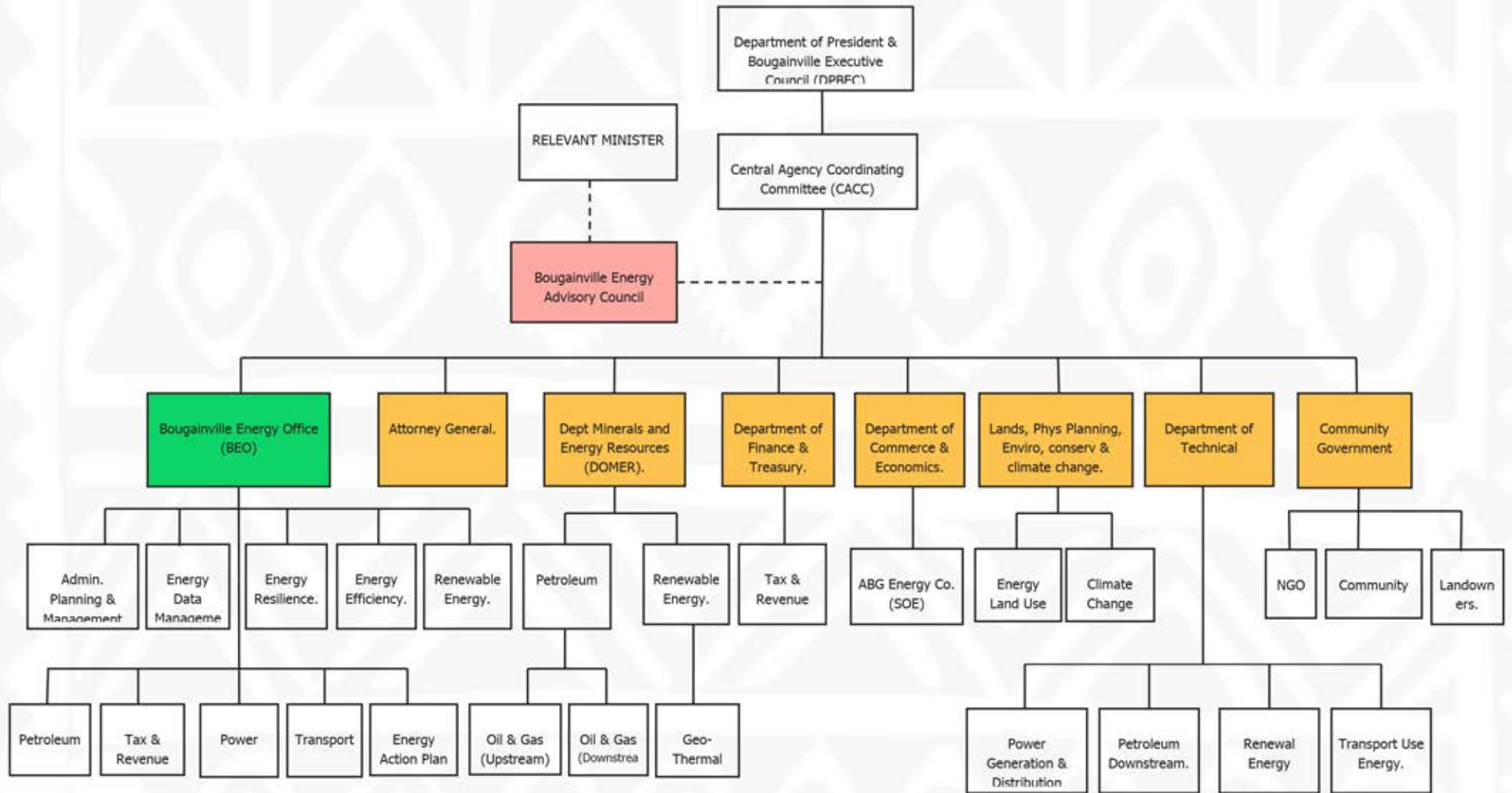
BEO shall coordinate with Department of Minerals and Energy Resources (DOMER)that is responsible for implementing Petroleum Upstream (Oil & Gas), Midstream and Renewable Energy –Geothermal sector

BEO shall coordinate with Department of Lands, Physical Planning, Environment, Conservation and Climate Change is responsible for implementing Energy land use, Energy Impacts on Environment and Climate change.

3.1.4. ENERGY GOVERNANCE STRUCTURE

>SEE FLOW-CHART BELOW:

3.1.4. ENERGY GOVERNANCE STRUCTURE



3.1.5. POLICY CONSIDERATIONS:

- I. Review and formulate an appropriate governance and organizational structure for the BEP.
- II. Improved Decision-making process by the Responsible Minister and encourage more effective coordination of energy sector activities by establishing a Bougainville Energy Office (BEO) that would administrate and coordinate between the relevant departments.
- III. Establish a regulatory framework by establishing an Energy Advisory Council for the energy sector.
- IV. Ensure that appropriate energy legislations are in place.
- V. Establish Energy Policy Transition Power between PNG Power Ltd and ABG.
- VI. Ensure equitable allocation of financial, assets and skilled labor as resources for efficient and effective energy services delivery.
- VII. Ensure the Coordination of energy requirements for any major infrastructure development.
- VIII. Ensure ownership of resources align with great emphasis of community development between ABG and land owners and the investor.
- IX. Ensure Human resources development aligns with every energy sector development.

3.1.6. ENERGY LAND USE ADMINISTRATION AND OPERATIONAL CONTRACTS/AGREEMENTS.

- A. Development of energy resources in AROB to include landowners who own the resources.
- B. Community-based development approach considers that landowners locally registered, enters JV with an investor whereby the locally registered company enters into investment arrangement with benefit sharing between land/resource owners to be calculated based on actual volume of power consumed (kWh) and volume of fuel /lubricants (litres) and gas (kg) consumed within a timeframe.
- C. A community-based administration structure should be established within and policy and legislative framework to facilitate energy land use and community dispute resolutions.
- D. Develop a legal framework to facilitate energy land use.

3.1.7. CROSS CUTTING ISSUES

Established new Bougainville Energy Office to carry out the Administration, Management and Coordination, remove the energy component from DOMER, and have DOMER responsible only for Petroleum and Geo-thermal energy. Consider renaming of Department of Mineral & Energy Resources (DOMER) to Department of Mining & Petroleum (DMP).

3.2. PETROLEUM (FOSSIL FUELS) ENERGY RESOURCES

3.2.1. BACKGROUND

The AROB Petroleum upstream sector has not been explored and reviewed for the past 30 years or more. The national government of PNG has the Petroleum Act and the 2017 National Energy Policy, as well as the 2021 National Energy Authority Act which aligns AROB petroleum sector to come under the control of the PNG Government. The delivery strategies and policies for all sectors of petroleum and its related development including services of petroleum supply and demand have no specific deliverables from the PNG government. As discussed well above, it's the informal private sector that provide services on petroleum to the people of AROB. As such, supply, accessibility, affordability, sustainability of petroleum products is unreliable and unregulated. It is evident that private sector is unable to meet the demand of the vast AROB population especially when the service costs are extremely high.

It is essential for sector developmental policies to be delivered to answer the key development strategic areas expressed in the Bougainville Strategic Development Plan 2018-2022 and further highlighted in the July 2021 Energy Documents Review Report.

3.2.2. UPSTREAM PETROLEUM EXPLORATION, EXTRACTION AND EXPORT

The existing upstream petroleum data for AROB is old, extracted almost 50 years ago when the last actual exploration was conducted on Bougainville basin, off-shore West-Coast Bougainville Island.

Greater awareness, knowledge, and detailed data are required for the upstream petroleum crude deposit in the entire region. Earlier studies review conducted back in 1985 showed potential deposits in the Bougainville sedimentary basin and that if further exploration is conducted which could highlight a lot more detail record of deposits to necessitate further plans for specific and detailed exploration to be conducted. By way of clarity in the sector the areas highlighted needs to be addressed through the following policies.

3.2.2.1. POLICY CONSIDERATIONS:

- I. Ensure to put in place an AROB appropriate authority for the Upstream Petroleum act.
- II. Ensure ownership of resources align with great emphasis of balanced state with ABG and land owners and the investor.
- III. Encourage investment planning in exploration, extraction and marketing of products
- IV. Encourage competitive bidding for the investors to explore and extract the natural resources.
- V. Ensure that related drilling and extraction handling, transportation, meet both National and international safety, engineering, and environmental standards
- VI. Encourage environment conservation measures with land and sea localities whilst meeting the objectives of the developing petroleum upstream sector.
- VII. Ensure cross cutting issues and benefits is shared and addressed specific and broad levels with relevant stake holders while harnessing the development goals to explore, extract and Market petroleum crude oil and gas

3.2.4. MIDSTREAM PETROLEUM CRUDE OIL AND LNG REFINING AND PROCESSING

Currently, there is no increasing demand for crude oil and LNG refining as it ties in with the ABG energy infrastructure development. The outcome of further exploration and extraction will very much influence this petroleum sector. Also, the current neighbors, PNG is running its refinery at almost 56% under capacity. Further south to Australia, they have closed 3 oil refineries in the last 15 years. The basic economics of scale for refining is not viable at this point of time.

The policy direction in this sector is to shelve any plans at this stage.

3.2.5. DOWNSTREAM REFINED PETROLEUM IMPORT, STORAGE AND DISTRIBUTION

A safe, reliable and affordable imported refined petroleum supply is the primary concerns which require attention. Additional petroleum components such as sufficient storage, proper handling, regular supply, affordable pricing, and etc., are areas to be addressed through the energy policies.

The development of energy infrastructure for access by AROB requires petroleum downstream sector processes to be implemented immediately for power generation, transport and for general population demands and consumption.

In comparison, other PIC Governments like Samoa (Apia), Nauru, Kiribati and the Marshall Islands, have prioritised the energy sector ownership and control in terms of supply and

demand costs to allow for other developments to take place much conveniently with use of effective supply security.

3.2.5.1. POLICY CONSIDERATIONS:

- I. Encourage ABG ownership of petroleum Import and wholesale facility.
- II. Ensure a secure, reliable, and cost-effective supply to whole Region.
- III. Ensure that storage facilities, handling, and transportation of products
- IV. Conform to national and international safety and environmental standards.
- V. Ensure that related wastes are disposed of in an environmentally sound manner.
- VI. Promote training and awareness programmes on the risks associated with the use of petroleum products.
- VII. Ensure to put in place an AROB appropriate authority for the downstream Petroleum Act.
- VIII. Encourage competitive bidding for the supply of petroleum products.
- IX. Improve the capacity of storage facilities to maintain supply security.
- X. Encourage the establishment of marine bunkering for licensed fishing fleets and sea transports.
- XI. Encourage local and private petroleum retail franchising and ownership

3.2.6. CROSS CUTTING ISSUES AND BENEFITS

The petroleum sector alignment with other policy development sectors' goals is essentially vital to ensure the petroleum policies delivery is considered complete. The areas discussed below are key considerations and mitigating factors whenever Petroleum is introduced as an energy and economic source:

I. LAND OWNERSHIP

Any planned development in petroleum sector has bearing on land tenure and ownership. The initial policy delivery is to ensure land use policy is achieved at all times.

II. INFRASTRUCTURE DEVELOPMENT

Petroleum as an energy source provides service and access to the success of infrastructure development and its flow on benefits to the people of AROB is significant.

II. ECONOMIC AND SOCIAL DEVELOPMENT

The effective development of petroleum as a source service and access effectively delivers economic development, vice versa; an ineffective energy service delivery brings stagnation to the nation and peoples' social and economic livelihood.

IV. POWER GENERATION EFFICIENCY

The access to low cost and available supply of petroleum products as energy source in good quality provides greater efficiency and greater yield in power generation outputs and reduction of power consumer tariff. Ineffective access to petroleum products services provides a negative impact on limited power access and affordability to AROB consumers.

V. CLIMATE CHANGE& WASTE MANAGEMENT

As much as AROB requiring easy access to petroleum as energy and economic source, the impacts which hydrocarbons provides for exploration and harvesting through its downstream access, has great climate change concerns with its effluent discharge into the environment gives concerns to AROB greenhouse gas (GHG)footprint.

Access to this energy and economic source shall require comprehensive risk and use mitigation to minimize the levels of exposure to the environment. The feasibility study and adaptation plans and standards are required to ensure instituted to govern petroleum as energy source and economic commodity.

VI. GENDER EQUALITY

The petroleum business segmentation and establishment require much more focus to ensure equitable gender base participation, especially for women to be considered as equal partners in petroleum downstream business spinoffs like running retail sites, training and employment.

3.3. TRANSPORTATION ENERGY USE-PETROLEUM SECTOR

3.3.1. BACKGROUND

The transport sector is the largest consumers of petroleum products in AROB. All forms of transportation services in AROB use energy, and it has been identified that transportation services in AROB is in dire state. The Atolls especially are facing many challenges with shipping energy use.

It is noted that new vehicle registration numbers have increased tremendously but have access to and use fuel products of unknown quality which leads to higher costs of operation. Access to quality and affordable fuels by road and small sea craft continues to pose great challenge to ordinary Bougainvilleans.

The air transport energy use has much greater challenge and heavily impact on the ordinary persons in AROB. AROB relies heavily on PNG third level airlines and Air Niugini to service AROB. Recalling the past, where BOUGAIR served a domestic air transport facility out of Arawa, was considered to be successful as it well served the AROB people.

The following policies will address the energy issues in the transport sector through the promotion of environmentally clean, energy efficient and cost-effective modes in land, air and sea transport.

3.3.2. POLICY CONSIDERATIONS:

- I. Promote public awareness and educational programs in good transport management practices.
- II. Encourage the use of alternative fuels such as biofuels (coconut oil) and biodiesel.
- III. Promote the use of public land transport like buses and passenger trucks.
- IV. Enforce appropriate measures to minimize the importation of second-hand vehicles.
- V. Encourage the use of non-motorized and traditional transportation systems.
- VI. Promote the use of environmentally friendly and fuel-efficient vehicles.
- VII. Encourage low carbon sea and land transport systems, start with low sulfur powered vessels and trucks
- VIII. Encourage effective fuel supply system at airports.
- IX. Encourage to set up effective transport systems through effective energy use (e.g., Nauru's Our Airlines, Marshalls Shipping Corporation and Fiji's public bus transport system)

3.3.3. CROSS CUTTING ISSUES

The alignment of transport energy use sector with other policy development sectors is essential to ensure the transport energy use policies delivery is achieved. The areas discussed below are key considerations and mitigating factors whenever transport energy use is introduced as a policy matter in energy development:

I. TRANSPORT INFRASTRUCTURE DEVELOPMENT

Land access and use for transport energy use is vital consideration for building airports, roads, and wharves, results in development of economic and social livelihoods for the people.

II. CLIMATE CHANGE & WASTE MANAGEMENT

The acquisition of transport assets such as air planes, ships and inland motor vehicles, forms the major considerations when dealing with Transport Energy Use. The energy used for such transport assets must also be aligned to the transport type, manufacturer and environment recommendations for limiting of and mitigating of green-house-gases (GHG) effluent propagation levels. Waste management and disposal guidelines must be observed at all times to reduce impacts on transport energy use effluent levels.

III. GENDER EQUALITY

The transport energy use business segmentation and establishment require much more focus to ensure equitable gender-based participation, especially for women to be considered as equal partners in transport business spinoffs like running transport companies, training and employment.

3.4. POWER/ELECTRICITY

3.4.1. BACKGROUND

Efficient, reliable, affordable and safe electricity is essential for the economic and social development in AROB. The key issues identified are lack of access to power, high cost of the Papua New Guinea Power Limited (PPL) fuel supply, limited key and trained personnel, inefficient performance of utilities, and inefficient consumption of electricity. Electricity in Bougainville is primarily generated from petroleum products by PPL in Arawa and Buka, while ABG supplies power in Buin. Predominantly, the electrification in rural areas and outer islands remains inaccessible. The record shows that only 2 percent of AROB populations have accessibility to power as per the 2014/2015 survey. There have been issues to install mini power grids and hydro-power plants, most of the plans requiring Land Use and Project Financing constraints. The BEDS -2016 to 2030 plan has lagged behind and will require financing, and land economic use.

There are currently five (5) thermal power plants restored after the crises in Arawa, Buin, Kunua, Nissan and Wakunai, while four (4) are currently have been planned for Bana, Panguna, Siwai/Ameo and Torokina.

There are also plans to set up stand-alone power supply system from Hydro Power sources. There is also potential to consider hybrid systems between renewable (Hydro and Solar) to thermal power generated power sources.

There is a comprehensive plan from 2015 to 2027 to install a total 5.5MW power generation infrastructure for AROB. But the plan has slowly progressed for lack of framework set out to support and achieve plans already in place.

3.4.2. POLICY CONSIDERATIONS:

- I. Promote the introduction of best-practice regulations and standards for the safe and reliable supply, generation, transmission and distribution of power.
- II. Encourage private sector participation in the power sector.
- III. Encourage an appropriate tariff structure.
- IV. Promote supply side and demand side management measures.
- V. Encourage the use of alternative fuels and renewable energy sources for power generation.
- VI. Ensure compliance to legislations and regulations established under the Environment Act and other related legislations.
- VII. Encourage establishment of mini-grids to promote electricity accessibility.
- VIII. Promote introduction of best –practice procurement and supply of fuel for power generation requirements.

3.4.3. CROSS CUTTING ISSUES

Land use relationships and environment sustainability remain critical areas in power development programme list of key compliances.

3.5. OUTER ISLAND AND RURAL ELECTRIFICATION

3.5.1. BACKGROUND

The need for the provision of a reliable, affordable and environmentally friendly energy supply to the rural and outer islands is essential given that 70% of the households are residing in rural and outer islands of AROB, where most have no access to electricity. Clearly, there are no records or data to state if there are stand-alone solar PV home systems, or that some homes are using micro fuel-based fuel generators. Evidently, these rural dwellers rely heavily on biomass as their primary energy fuel for cooking. Even if petroleum products are made available, they have not been reliable, safely available and affordable with respect to their level of income.

The rural electrification plan is one that needs policy focus targeting the vast population to enable energy access.

3.5.2. POLICY CONSIDERATIONS:

- I. Encourage establishment of mini-grids to promote electricity accessibility.
- II. Encourage and improve the provision of sustainable energy access to households, communities and institutions.

- III. Strengthen the operations of the public and private energy service entities in promoting and implementing renewable energy technologies.
- IV. Ensure minimal detrimental impacts of energy development and usage on the outer island environment and communities.
- V. Ensure an appropriate tariff structure considering affordability for the outer island electrification.
- VI. Encourage the application of appropriate technologies and incentives to enable rural dwellers access to energy.

3.5.3. CROSS CUTTING ISSUES AND BENEFIT

Land use relationships and environment sustainability remain critical areas in power development program list of key compliances.

3.6. RENEWABLE ENERGY RESOURCES

3.6.1. BACKGROUND

Increased use of applicable renewable energy technologies is seen as the most appropriate long-term alternative to conventional systems. However, there are a number of barriers to its widespread use, which will be addressed throughout these policies. AROB has vast potential for Hydro power infrastructure for electricity supply which requires a robust development plan where stakeholder and development partners need immediate collaboration to advance the technology and development program in priority areas in AROB. The ABG have recognized through the BEDS 2015-2030 Plan and the BSDP 2018-2022, Strategies and plans for the expected outcomes to the development of the highest priority renewable energy sector- Hydro Power facilities infrastructure. However, the progress to reach project execution level has been slow. Hydro Power has great potential to have wider energy use coverage for the AROB due to its long-term energy supply source, hence, paramount consideration for the harvest of this source of energy should be prioritised, with both people and infrastructure development needed to harvest the energy resources.

The abundance of energy resources in this sector is prevalent, with fourteen (14) potential identified hydro sites accessible for power generation. The Solar and Biofuels could also be easily farmed and harvested provided that prioritised resourcing and capacity is made readily available under demand.

3.6.2. POLICY CONSIDERATIONS:

- I. Ensure that the vast Hydro resources potential area are developed and used in an economic, environmental and culturally sustainable manner.

- II. Expedite the infrastructure set up for Hydro power program.
- III. Promote and Strengthen collaboration with development partners for the advancement of renewable energy programs.
- IV. Encourage human capacity development to the private sector for implementing and operating applicable and sustainable renewable energy technologies.
- V. Promote sustainable renewable energy development.
- VI. Promote and encourage the use of other appropriate renewable energy technologies, such as biofuel and solar programs for biodiesel and Solar PV developments.
- VII. Introduce appropriate incentive packages including taxes, duties and tariffs to encourage use of renewable energy technologies.

3.6.3. CROSS CUTTING ISSUES AND BENEFITS

Land use relationships and environment sustainability remain critical areas in power development program list of key compliances. Development partners training and awareness of ABG need for vast energy development agenda and program.

3.7.ENERGY EFFICIENCYAND CONSERVATION

3.7.1. BACKGROUND

The heavily reliance on imported fuel coupled with increasing demand and inefficient appliances and equipment warrants an optimal use of available energy sources. There are no set standards in AROB to follow when importing electrical and renewable products to the local market.

3.7.2. POLICY CONSIDERATIONS:

- I. Introduce and encourage implementation of energy efficiency and conservation programs.
- II. Promote public awareness and education in energy efficiency and conservation measures.
- III. Introduce and enforce the use of energy efficient appliances and equipment.
- IV. Introduce appropriate incentive packages including taxes, duties and tariffs to encourage efficient energy use.
- V. Ensure all imported petroleum products meet machinery and environmental specifications and standards, and ensure compliance to these standards and specifications, failure to subject to regulatory penalties.

3.7.3. CROSS CUTTING ISSUES

The key areas of considerations include climate change, taxation and energy sustainable standards need to be maintained to sustain energy access and affordability.

3.8. TARIFF AND PRICES

3.8.1. BACKGROUND

Energy Tariff and Prices are common facts when it comes to delivery of energy services. Developing and establishing energy infrastructure and the delivery of energy services as expressed in the BEP energy mission means that the energy service has a very high costs for implementation.

The high cost of energy for AROB is identified and will be considered in every energy budget.

The tariff and Prices of both raw and generated power has to be monitored to ensure tariff is justifiable to the delivery of power to the population whilst ensuring relevant cost of supply side of energy generation and distribution is recovered, and that power companies' operations, whether private enterprises or SOE are sustainable and operational at all times.

3.8.2. POLICY CONSIDERATIONS:

- I. Ensure Imported Energy Material and equipment Prices are regulated to control wholesale and Retail prices.
- II. Ensure Refined petroleum prices are regulated to control access of fuel to the population.
- III. Ensure Power Tariffs are based on minimum full Cost Recovery.
- IV. Ensure to encourage new energy technology by reducing import tariff.

3.8.3. CROSS-CUTTING ISSUES:

The review identified that price mechanism provided by PNG's Import Parity Prices (IPP) and the Independent Consumer and Competition Commission (ICCC) does not serve and benefit the whole AROB, that's why AROB fuel prices are 80-110% above Lae and Rabaul Prices. This price condition is totally a negative driver to ABG Energy use and sustainable development.

Some interventions are identified to remedy the identifiable issues in AROB which includes (1) Resource's ownership and energy development, (2) Governance and Regulatory, (3)

Energy Infrastructure Implementations, (4) Socio-Economic Aspect, (5) Environmental Aspects, and (6) Fuel Pricing and Tax Revenues.

The current revenue arrangements are unbeneficial to AROB, the revenue that collected from fuel are rebated to the PNG Treasury Department and causing longer delays in the financing of Bougainville Economic Plans and other action plans. A new mechanism should be set up to alleviate such delay in the implementation of energy programs.

3.9. HUMAN, ENVIRONMENT AND DISASTER RISK MANAGEMENT

3.9.1. BACKGROUND

Energy infrastructure and service development through use of petroleum, electricity, renewable energy and wherefor instance construction of hydro power plants can have adverse effect to the environment. By incorporating environmental and disaster risk considerations into energy sector planning and development, will lessen the impacts on energy services. On the other hand, adverse impacts can be reduced through fuel substitution, increased use of renewable energy, energy efficiency and conservation, better engineering and technology introduction through effective change management, and other applicable approaches.

As much as needing energy accessibility and affordability, energy sustainability through disaster resilience plans is a must be consideration and practice, to be viable in today's energy access and sustainability systems.

Ensuring that Man-made disasters caused by post conflict lawlessness are mitigated.

3.9.2. POLICY CONSIDERATIONS:

- I. Ensure all imported petroleum products meet machinery and environmental specifications and standards
- II. Minimise the adverse impact of energy production, distribution and consumption on the environment.
- III. Promote awareness programs on the impact of energy use on the local ecosystem and biodiversity.
- IV. Enforce Environment Impact Assessments (EIAs) on all energy sector development.
- V. Ensure energy disaster preparedness, Response and Recovery Plans are developed.
- VI. Ensure well documented power generation and distribution resilience plan to disaster response and recovery.
- VII. Ensure people development in areas of power disaster resilience preparedness and planning.

VIII. Ensure to align community development policing and crime prevention measures.

3.10. ENERGY DATA MANAGEMENT

3.10.1. BACKGROUND

The availability, accessibility and quality of data and information for all key energy service areas are critical in order for the ABG to be well informed and be confident to make policy decisions and interventions on timely basis. The need for policy and legislation in ABG for this area allows for effective and efficient data collection, management and dissemination.

3.10.2. POLICY CONSIDERATIONS:

- I. Ensure key stakeholders with the energy sector areas maintain relevant energy data
- II. Ensure resources are planned out for a data base to be set up for the energy data management purposes within regulated Energy Office.
- III. Enforce energy data collection by Law.
- IV. Ensure energy data reporting is in place by Law.

4.0 BOUGAINVILLE ENERGY OFFICE (BEO)

4.1 FUNCTIONS

- Administer the BEP and related legislation(s),
- Regulate and coordinate energy sector developments across various ABG departments,
- Oversee the regulation of the energy sector in Bougainville,
- Coordinate energy sector investment promotion and marketing,
- Energy database management.
- Do all things necessary and desirable for the achievement of its objectives and functions.

4.2 PURPOSE

- Overarching body responsible for overseeing all energy related matters in Bougainville,
- To encourage the long-term development of all renewable resources of energy to complement and eventually replace the traditional non-renewable sources of energy,

- BEO to report to the Deputy Chief Secretary (Operations) and relevant Ministers with energy responsibilities.

4.3 MANDATE

BEO mandate to be established in law. Mandate to be similar to the PNG National Energy Authority in several areas including;

- Administer the BEP and related sub-policies, plans and legislation(s),
- Regulate and coordinate energy sector developments across various ABG departments,
- Oversee the regulation of the energy sector in Bougainville,
- Coordinate energy sector investment promotion and marketing,
- Energy database management including a resource inventory for the Oil and Gas energy reserves and assets,
- Maintain registry of all players in the energy industry,
- Promote and encourage R&D into all forms of energy sources including coal and nuclear energy research,
- Plan and support the rollout of electricity throughout Bougainville,
- Oversee the issuance and enforcement of regulations and licensing,
- Identify areas and declare reserve zones for energy security and related purposes,
- do all things necessary and desirable for the achievement of its objectives and functions

5.0 TABLE OF ACCRONYMS

ABG	Autonomous Bougainville Government
AROB	Autonomous Region of Bougainville
BEDS	Bougainville Energy Development Strategy 2015-2030
BEDSC	Bougainville Energy Development Steering Committee
BEDP	Bougainville Economic Development Policy, 2010
BEO	Bougainville Energy Office
BEP	Bougainville Energy Policy 2022
BOUGAIR	Bougainville Air (Former Bougainville Airline)
BSDP	Bougainville Strategic Development Plan, 2018-2022
CACC	Central Agencies Coordinating Committee
DOMER	Department of Minerals and Energy Resources, 2017
EIA's	Environment Impact Assessment's
EPU	Energy Planning Unit, within Department of Technical
GHG	Green House Gas
JV	Joint Venture
KW	Kilo Watts
kWh	Kilo Watt Hour
MOU	Memorandum of Understanding
MW	Mega Watts
MW/hr	Mega Watts per Hour
PIC	Pacific Island Countries
PPL	PNG Power Limited
PV	Solar Photovoltaic
RE	Renewable Energy
SOE	State Own Enterprise

GLOSSARY OF TERMS

Energy Security	UN definition as energy that is accessible, affordable, available and sustainable
Cross Cutting Issues and Benefits	Relevant deliverables that shall be considered and executed to ensure energy policies are implemented successfully
kilowatt-hour (kWh)	Unit of measure of electricity consumed by a consumer that is charged with by the power utility.
Sustainable /Sustainability	This specifically refers to sustaining energy programmes /initiatives in AROB, i.e., to keep the energy programmes /initiatives in operation, technical and financial, over a longer period of time.
Machinery & Environment Specification	The growing concern in Climate Change allows for all Energy sources used need to comply with Machinery and Environment minimum GHG effluent requirements