

SINGLE BUYER SABAH

OPERATIONS MANUAL

DOCUMENT CONTROL

Document No	Effective Date	Remarks
SBS/ECoS/OM/01	1 May 2026	Version 1.0. Established pursuant to Single Buyer Sabah Guidelines Compliance

SINGLE BUYER SABAH OPERATIONS MANUAL

In line with the Guidelines for Single Buyer Sabah, which came into operation on 3rd January 2024, Single Buyer Sabah issues this Single Buyer Sabah Operations Manual (“Operations Manual”).

Background

1. Malaysia particularly in Sabah adopts a Single Buyer Sabah Market model in managing its electricity supply industry. By virtue of the Section 31 of the Electricity Supply Enactment 2024, an entity called Single Buyer Sabah is entrusted to manage the procurement of electricity and related services which includes planning, scheduling, procuring and settlement in Sabah.
2. The Guidelines for Single Buyer Sabah requires Single Buyer Sabah to develop appropriate policies, systems and procedures.
3. This Operations Manual is developed to reflect the ring-fenced nature of Single Buyer Sabah’s operations.

Purpose

This Operations Manual is established to set out the processes, responsibilities and procedures in performing each function in Single Buyer Sabah. All capitalized terms used in this Operations Manual shall, unless otherwise defined herein, have the same meaning as defined in the Guidelines for Single Buyer Sabah.

Application of the Operations Manual

This Operations Manual applies to all Single Buyer Sabah employees and serves as a reference for the execution of their respective processes, roles and responsibilities.

Citation and Commencement

This Operations Manual shall come into operation on 1 May 2026

Amendment and Variation

Single Buyer Sabah may at any time modify, vary, review or revoke this Operations Manual as deemed necessary.

Dated: 29 April 2026



Cornelius Shapi
Head Single Buyer Sabah

1.0 Introduction

1.1 Background

1.1.1 The Commission has pursuant to the Electricity Supply Enactment 2024 issued the Guidelines for Single Buyer Sabah (“Guidelines”) to govern the operation of the Single Buyer Sabah market as well as the roles and functions of the Single Buyer Sabah. The roles of the Single Buyer Sabah are as follows: -

- (a) to procure electricity to meet demand (and related services to meet the Operating Reserve requirements) at the least cost;
- (b) to facilitate security of electricity supply;
- (c) to monitor the adequacy of the supply of fuel to Generators;
- (d) to promote transparency in the performance of its functions;
- (e) to facilitate competition in the generation sector; and
- (f) to promote confidence in the electricity industry.

1.1.2 This Operations Manual shall be read in conjunction with the Guidelines and shall apply without derogating from the general principles and requirements as detailed in the Guidelines.

1.1.3 Unless otherwise defined herein, all capitalized words appearing herein have the same meanings described in the Guidelines, Power Purchase Agreement, Service Level Agreement and Regulatory Implementation Guidelines.

1.2 Objective of this Operations Manual

1.2.1 The objectives of this Operations Manual are: -

- (a) to detail the functions of the Single Buyer Sabah and the applicable standard operating policies and procedures (subject to Paragraph 3.3.1 below);
- (b) to provide Participants in the Single Buyer Sabah market an insights into the operations of the Single Buyer Sabah;
- (c) to promote transparency and market confidence in the operations of the Single Buyer Sabah; and
- (d) to serve as reference for the day-to-day operations for Single Buyer Sabah staff.

2.0 SINGLE BUYER SABAH GOVERNANCE

2.1 Purpose

The governance arrangements for the Single Buyer Sabah including independent oversight of the Single Buyer Sabah, requirements for the Single Buyer Sabah to comply with the Guidelines for Single Buyer Sabah, the establishment of Single Buyer Sabah Working Groups to add transparency to the Single Buyer Sabah functions and the Single Buyer Sabah's role in monitoring compliance with the Generator Contracts.

2.2 Appointment of the Head of the Single Buyer Sabah

- 2.2.1 The appointment of the Head of the Single Buyer Sabah shall be undertaken in accordance with the requirements of the requirement of the Electricity Supply Enactment 2024, the License conditions and any guidelines or directions issued by the Minister or The Commission.
- 2.2.2 In the event that the position of the Head of the Single Buyer Sabah is left vacant due to the departure of the incumbent at short notice, or the processes for the appointment of the Head of the Single Buyer Sabah have not been able to be completed for any reason, the Chief Executive Officer of Sabah Electricity shall appoint a person to act in the position of the Head of the Single Buyer Sabah with the endorsement from The Commission until the appointment process is completed.
- 2.2.3 Sabah Electricity shall establish appropriate reporting arrangements for the Head of the Single Buyer Sabah which ensure that:
 - (a) the Single Buyer Sabah is empowered to perform its functions under the Guidelines for Single Buyer Sabah in a manner that does not unduly discriminate against any other Participant as specified in Rule 6.2; and
 - (b) any potential conflicts of interest are appropriately addressed.
- 2.2.4 The terms of employment for the Head of the Single Buyer Sabah and the staff of the Single Buyer Sabah shall be consistent with Sabah Electricity's employment policy and appropriate Sabah benchmark.
- 2.2.5 The Head of the Single Buyer Sabah shall report directly to the Chief Executive Officer of Sabah Electricity.

2.3 Single Buyer Sabah Oversight Committee

- 2.3.1 The Commission shall establish and maintain a Single Buyer Sabah Oversight Committee to oversee the compliance of the Single Buyer Sabah with the Guidelines for Single Buyer Sabah.

- 2.3.2 The Single Buyer Sabah Oversight Committee shall be chaired by The Commission and shall be comprised of at least one (1) representative from Sabah Electricity and any suitable member as determined by The Commission.
- 2.3.3 In selecting members of the Single Buyer Sabah Oversight Committee, The Commission shall give due consideration to the requisite skills and qualifications of the member, and any conflict of interest that might arise in performing the functions of the Single Buyer Sabah Oversight Committee.
- 2.3.4 The functions of the Single Buyer Sabah Oversight Committee shall include, but not be limited to:
- (a) overseeing the compliance of the Single Buyer Sabah with the Guidelines for Single Buyer Sabah;
 - (b) providing advice and issuing guidance to the Single Buyer Sabah and Participants on achieving compliance with the Guidelines for Single Buyer Sabah;
 - (c) reviewing suggestions for amendments to the Guidelines for Single Buyer Sabah as required by the Rule Change Committee or The Commission;
 - (d) recommending changes to procedures and the Guidelines for Single Buyer Sabah where it considers that the recommended change would better facilitate the objectives set out in Rule 4.2; and
 - (e) assisting The Commission in selecting and appointing an external auditor to assess compliance under Rule 7.4.2
- 2.3.5 The Single Buyer Sabah shall brief the Single Buyer Sabah Oversight Committee from time to time, and as requested by the Single Buyer Sabah Oversight Committee, in relation to the operational actions taken and the implementation of the provision in the Guidelines for Single Buyer Sabah.

2.4 Sabah Gas Supply Committee

- 2.4.1 The Sabah Gas Supply Committee shall be responsible for ensuring the adequacy of gas supply for electricity generation in Sabah based on the relevant Three Month Ahead Dispatch Schedule and the Power Sector Gas Allocation.
- 2.4.2 The Sabah Gas Supply Committee will assess any risk to the availability and reliability of the gas supply and put in place measures to mitigate the impact of any disruption, including the Urgent Gas Procedures for any urgent unplanned disruptions.
- 2.4.3 The Sabah Gas Supply Committee meets at least once every six (6) months and comprises of representatives from the State of Government of Sabah, the *Unit Perancang Ekonomi Negeri* Sabah, The Commission, the Nominated Gas Supplier, the GSO and the Single Buyer Sabah.

2.5 Rule Change Committee

- 2.5.1 The Rule Change Committee shall be responsible for assessing and recommending on the proposed changes to the Guidelines which may better facilitate the objectives of the Guidelines.
- 2.5.2 The Rule Change Committee meets as and when required by The Commission and the member shall be appointed by The Commission and shall consist of an independent Chair, a representatives from the Single Buyer Sabah, two (2) members representing the Generators, one of whom shall be representative of the Sabah Electricity Generation and the other shall be representative of the Independent Power Producer (IPP), the Grid Owner, the GSO, and other independent expert or experts as deemed appropriate by The Commission.

2.6 Single Buyer Sabah Working Groups

- 2.6.1 The objectives of the Single Buyer Sabah Working Groups are to:
 - (a) review the Single Buyer Sabah processes and outcomes and provide recommendations to the Single Buyer Sabah, other Participants and The Commission on changes to procedures that it considers would improve the efficiency of the discharge of responsibilities set out in Guidelines for Single Buyer Sabah; and
 - (b) recommend changes to procedures and Guidelines for Single Buyer Sabah where it considers that the recommended change would better facilitate the objectives set out in Rule 4.2:
 - (i) Rule Change proposals made by the Single Buyer Sabah Working Groups shall be subject to the Rule Change procedures set out in Chapter 18 of the Guidelines; and
 - (ii) Recommendations on changes to procedures that do not require a Rule Change shall be submitted to The Commission for approval. If The Commission approves a recommendation, The Commission and Single Buyer Sabah shall work collaboratively with any relevant Participants to implement the recommendation.
- 2.6.2 The Single Buyer Sabah shall establish the Single Buyer Sabah Working Groups as specified in Rule 7.6.2 no later than six (6) months after the Commencement Date.
- 2.6.3 The Single Buyer Sabah Working Groups shall be as follows:
 - (a) Dispatch Scheduling Working Group (DSWG)

Dispatch Scheduling Working Group comprising members from The Commission, the Single Buyer Sabah and the GSO. In meeting its objectives under Rule 7.6.1, the Dispatch Scheduling Working Group

shall meet at least quarterly and shall review issues including, but not limited to:

- (i) Efficiency and effectiveness of the dispatch scheduling procedures performed by the Single Buyer Sabah and other Participants in facilitating the achievement of the Single Buyer Sabah objectives set out in Rule 4.2;
- (ii) appropriateness of timelines in the dispatch scheduling procedures;
- (iii) appropriateness of the form and content of Participants' submissions of inputs to the Single Buyer Sabah for the purpose of producing the Dispatch Schedules;
- (iv) appropriateness of the form and content of information disseminated by the Single Buyer Sabah to other Participants; and
- (v) any other related issues by the Generators and other Participants.

The Dispatch Scheduling Working Group may invite such Generators and Participants to participate in such meetings.

(b) Long-Term Demand and Supply Working Group (LDSWG)

Long-Term Demand and Supply Working Group comprising members from The Commission, the Minister, and any other relevant Government agencies or authorities, the Nominated Gas Supplier, the Single Buyer Sabah, the GSO and the Grid Owner. In meeting its objectives under Rule 7.6.1, the Long-Term Demand and Supply Working Group shall meet at least once every six (6) months and shall review issues including, but not limited to, the development and content of:

- (i) The Ten Year Ahead Load Forecast Report produced by the Single Buyer Sabah as set out in Rule 15.2.2; and
- (ii) The Ten Year Ahead Generation Capacity Report produced by the Single Buyer Sabah as set out in Rule 15.2.4.

(c) Single Buyer Sabah Website Working Group (SBWWG)

Single Buyer Sabah Website Working Group comprising (at a minimum) members from The Commission, the Single Buyer Sabah, the appointed information communication and technology service provider and the GSO. In meeting its objectives under Rule 7.6.1, the Single Buyer Sabah Website Working Group shall meet at least twice a year and shall review issues including, but not limited to:

- (i) the information published on the Single Buyer Sabah Website, with particular consideration of whether additional information should be published;
- (ii) the format and accessibility of the information published on the Single Buyer Sabah Website; and
- (iii) appropriateness of timelines in these Guidelines for Participants and The Commission to publish information on the Single Buyer Sabah Website.

The Single Buyer Sabah Website Working Group may invite other persons including the relevant Generators to participate in such meetings.

2.6.4 The Single Buyer Sabah may establish additional Single Buyer Sabah Working Groups as a platform to discuss emerging issues. The Single Buyer Sabah may determine the scope of each Single Buyer Sabah Working Groups and their Terms of Reference from time to time.

2.6.5 The Commission may direct the Single Buyer Sabah to establish additional Single Buyer Sabah Working Groups to discuss specific matters not covered by the existing Single Buyer Sabah Working Groups.

2.6.6 For each Single Buyer Sabah Working Group, the establishment will be as follows:

- (a) the Single Buyer Sabah shall propose a Terms of Reference;
- (b) the Single Buyer Sabah shall seek nominations from the relevant stakeholders specified in Rule and as deemed appropriate from key stakeholders including, but not necessarily limited to:
 - (i) The Commission;
 - (ii) relevant Government agencies and statutory bodies;
 - (iii) Generators;
 - (iv) the GSO;
 - (v) the Grid Owner;
 - (vi) Sabah Electricity Distribution;
 - (vii) the Nominated Gas Supplier;
 - (viii) Industry bodies; and

- (ix) Customer Groups; other relevant persons as may be determined by the Single Buyer Sabah
- (c) upon receipt of nominations, the Single Buyer Sabah shall propose the membership of the Working Group, including a chair to The Commission;
- (d) The Commission shall review the proposed Terms of Reference and the membership of the Working Group and finalise and approve them in consultation with the Single Buyer Sabah;
- (e) within three (3) months of its establishment, each Working Group shall propose a draft Charter for approval by The Commission, which shall include, but not necessarily be limited to, a process for developing and finalising recommendations of the Working Group; and
- (f) in the event that the Working Group requires a secretariat to meet its Terms of Reference and comply with its Charter, the Single Buyer Sabah shall provide a secretariat, with any costs incurred by the Single Buyer Sabah in doing so recovered via the Single Buyer Sabah Tariff.

2.7 Compliance with the Guidelines

- 2.7.1 The Single Buyer Sabah shall ensure that it has appropriate policies, systems and procedures in place to ensure that it is capable of complying with the Guidelines for Single Buyer Sabah.
- 2.7.2 In the event that the Single Buyer Sabah becomes aware that there is a non-compliance by the Single Buyer Sabah with the Guidelines for Single Buyer Sabah, it shall immediately inform the Single Buyer Sabah Oversight Committee and The Commission and put in place procedures to address the non-compliance.
- 2.7.3 The Commission shall appoint a suitably qualified auditor to assess the compliance of the Single Buyer Sabah with the requirements of the Guidelines for Single Buyer Sabah:
 - (a) twelve (12) Months from the Commencement Date of the Guidelines for Single Buyer Sabah; and
 - (b) at least once every three (3) years thereafter, or as specified by The Commission.
- 2.7.4 The Single Buyer Sabah shall ensure that the information provided to the auditor is accurate and complete.
- 2.7.5 The cost of the audit shall be borne by the Single Buyer Sabah and treated as recoverable operating expenditure for the purposes of calculating the Single Buyer Sabah Operation Tariff.

2.8 Generator contracts

- 2.8.1 The Single Buyer Sabah shall monitor the compliance of parties with the Generator Contracts.
- 2.8.2 In the event that the Single Buyer Sabah becomes aware of any non-compliance with the Generator Contracts that it considers will have a material effect on its ability to achieve its objectives under Rule 4.2, then it shall notify The Commission.

3.0 GENERAL OBLIGATIONS OF THE SINGLE BUYER SABAH

3.1 General Obligations of the Single Buyer Sabah

- 3.1.1 The Guidelines requires the Single Buyer Sabah to purchase electricity and perform its functions as the Single Buyer Sabah in a fair and non-discriminatory manner while promoting competition in the electricity supply industry and enhance public confidence in the electricity industry. In doing so, the Single Buyer Sabah shall:
- (a) purchase electricity on a least cost basis in accordance with the terms and conditions of the Generator Contracts in procuring electricity, the Single Buyer Sabah must take into consideration the generation and Electricity Transmission Network constraints and configuration and all relevant system security and safety parameters as specified in the Sabah Grid Code (“SGC”);
 - (b) facilitate the security of electricity supply by maintaining oversight of demand and supply issues in the performance of dispatch scheduling and planning the long-term supply and demand;
 - (c) monitor the adequacy of supply of gas and hydro levels to meet the dispatch schedules and respond to any unplanned curtailments or disruptions;
 - (d) perform its functions in a transparent and consistent manner and, subject to any confidentiality obligations and requirements, publish information with regard to the performance of its functions in a clear, concise, understandable and readily accessible manner;
 - (e) deal with Participants in the Single Buyer Sabah market in a fair and balanced manner and not make decisions or act in a manner that is biased and/or unreasonably discriminates against any Participants;
 - (f) instill confidence in the electricity industry by avoiding conflicts of interests which may have an effect of reducing competition in the Single

Buyer Sabah market or providing a competitive advantage to any Participant (including another division or unit of Sabah Electricity);

- (g) at all times ensure it performs its functions in a manner that is consistent with the SGC Guidelines and other applicable laws, codes, rules, regulations and guidelines; and
- (h) provide advice and recommendation when required, on relevant Sabah electricity supply industry issues to key stakeholders, such as the Minister and The Commission.

3.2 Functional departments

3.2.1 The Single Buyer Sabah is organized in the following functional units which are responsible for the following scope of work:

- (a) Integrated System Planning Department
 - (i) Load Forecast Unit

The Load Forecast unit shall be responsible for maintaining oversight over demand and supply of electricity in Sabah and Federal Territory of Labuan through forecasting load demand over the short term forecast for daily operations, medium term forecast for the fuel scheduling supplies and long term forecast for capacity expansion, development and retirement plan. Further, this unit also oversees economic analysis and development, including Gross Domestic Product (GDP) studies conducted via third-party appointment when needed.
 - (ii) Capacity Planning Unit

The Capacity Planning unit shall be responsible to formulate and develop power development plan (PDP), prepare pre-feasibility studies of specific generation projects, provide information and report to external parties, study specific requirements as and when required.
 - (iii) Energy Resource Planning Unit

The Energy Resource Planning unit shall be responsible for the preparation of short-term dispatch schedules (from day ahead to three months ahead) based on the Least Cost Dispatch Scheduling Methodology, undertake short to medium term fuel mix planning and strategy, perform short to medium term energy simulation studies and generation cost analysis, and preparation of short to medium term Demand and Supply Outlook.

(b) Power Contract Management Unit

The Power Contract Management unit shall be responsible for negotiating and managing Generators Contracts including contracting for new energy and monitoring contract performance.

(c) Finance and Enterprise Management Unit

The Finance and Enterprise Management unit shall be responsible for settlement and clearance of invoices, performing the reporting obligations of the Single Buyer Sabah under the Guidelines and Incentive Based Regulations (currently outsourced by Sabah Electricity Finance Division and Strategy and Sustainability Division), monitoring compliance of the Single Buyer Sabah with the Guidelines and any applicable laws, rules, regulations, codes and guidelines, lead and facilitate risk matters for Single Buyer Sabah, oversee the operations of Single Buyer Sabah ICT services (currently outsourced by Sabah Electricity Information and Digital Division), manage office administration and human resources.

(d) Legal Management Unit

The Legal Management unit's main function shall be responsible on legal matters, specifically the Power Contract Management unit in preparing, negotiating the Generator Contracts, managing dispute resolution process under the Generator Contracts and providing legal opinions as and when required.

3.3 **Business Functions and Processes of Single Buyer Sabah**

3.3.1 This Operation Manual provides the core business functions and daily processes in Single Buyer Sabah. The descriptions provided herein are not exhaustive. Single Buyer Sabah may propose other support functions and processes which are necessary to enhance further Single Buyer Sabah's daily operations.

4.0 LOAD FORECAST

4.1 Load Forecast

- 4.1.1 The Load Forecast shall be responsible for carrying out short term load forecasting which covers the daily, weekly and monthly operational forecasts, long term forecasting and regional load forecasting studies.
- 4.1.2 The studies are used to meet internal and external requirements as they are critical inputs to the capacity planning, scheduling and system operation processes.
- 4.1.3 The scope of load forecasting horizons includes the following:
 - (a) Day Ahead Load Forecast (including current day revision);
 - (b) Week Ahead Load Forecast;
 - (c) Three Month Ahead Load Forecast;
 - (d) One Year Ahead Load Forecast;
 - (e) Five Year Load Demand Forecast; and
 - (f) Ten Year Demand and Supply Forecast (in accordance to Rule 15.2 of the Guidelines).

4.2 Long Term Load Forecast Data Collection and Model Update

- 4.2.1 The Load Forecast unit shall collect data to update the forecasting models using relevant software (e.g Itron MetrixND & MetrixLT). The data to be collected includes of the following:
 - (a) Annual and monthly aggregate and sectoral electricity sales from Sabah Electricity Retail Division;
 - (b) Annual and monthly electricity generation data from Sabah Electricity Generation Division;
 - (c) Annual system losses data as provided by Sabah Electricity Retail Division;
 - (d) Number of customers and average electricity selling price as provided by Sabah Electricity Retail Division;
 - (e) Renewable energy data from The Commission and Sabah Electricity Retail Division;
 - (f) Distribution new load demand (Large Power Consumers) data from Sabah Electricity Distribution Division and Retail Division;

- (g) Step load (new demand) data sourced from Ministry of Industrial Development and Entrepreneurship (MIDE), Industrial Parks, and Sabah Electricity Retail Division;
- (h) Actual Commercial floorspace data sourced from the National Property Information Centre (“NAPIC”) (where necessary);
- (i) Energy efficiency performance data from The Commission;
- (j) Annual and monthly peak demand data from the GSO;
- (k) Historical temperature data from the Malaysian Meteorological Department;
- (l) Weather outlook updates from the Malaysian Meteorological Department;
- (m) Electric vehicles data from Ministry of Transport / Road Transport Department;
- (n) Annual GDP from Department of Statistics Malaysia (DOSM);
- (q) Population and number of households as reported by the DOSM;
- (r) Household number forecasts from DOSM and Single Buyer Sabah’s analysis;
- (s) Population forecasts from DOSM and Single Buyer Sabah’s analysis;
- (t) Temperature forecast based on Single Buyer Sabah’s analysis;
- (u) Commercial floorspace data from Single Buyer Sabah’s analysis; and
- (v) GDP forecasts based on studies conducted by appointed consultants, and supplemented by Single Buyer Sabah’s analysis if necessary.

4.3 Long Term Load Forecast Simulation Studies and Results Analysis

- 4.3.1 The load forecast uses multiple methodologies to project sale of electricity. These load forecast methodologies may include the following:
 - (a) Sectoral econometric sales regression models driven by key factors for each sector; and
 - (b) Post-estimation model to account for new emerging trends such as energy efficiency, self-consumption (SELCO) solar and electric vehicle.
- 4.3.2 Peak demand and generation methodologies will include:
 - (a) a regression model capturing economic, demand and weather trends to forecasts hourly underlying peak demand and generation; and
 - (b) a post-estimation model to adjust the forecast for future distribution-side technology impacts on the system demand profile.
- 4.3.3 The Load Forecast unit shall then integrate the forecast results from the various forecasting models and perform a qualitative and quantitative analysis to verify

the forecast results from the various models. A forecast error analysis is also conducted to evaluate the accuracy of past electricity demand forecast.

- 4.3.4 Findings from the Load Forecast unit shall be presented to the LDSWG which comprises various representatives from The Commission, the Minister, other relevant Government agencies or authorities, the Nominated Gas Supplier, the Single Buyer Sabah, the GSO and the Grid Owner (Sabah Electricity). The LDSWG shall discuss the forecast results quantitatively and qualitatively to come up with a unified electricity demand forecast.
- 4.3.5 The finalized demand forecasts from the LDSWG shall be presented and approved or endorsed by the Sabah Grid Demand Forecast Committee (SGDFC), chaired by The Commission. The SGDFC comprises of various representatives which includes the relevant government agencies and ministries such as the Minister, industry experts, relevant consumer associations, Single Buyer Sabah and GSO. The composition of SGDFC and its functions are provided in the TOR under the Commission. The approved or endorsed demand forecasts by the SGDFC will be used in the Capacity Planning process, as provided in Paragraph 5 herein.

4.4 Preparation of Short-Term Load Forecasts

- 4.4.1 The Short-Term Load Forecast unit shall prepare the:
 - (a) Day Ahead Load Forecast which is to be presented in the Daily Operational Review Meeting on weekdays (Daily Docket); and
 - (b) Week Ahead Load Forecast which is to be presented in the Weekly Coordination Meeting held every Thursday (Weekly Docket).
- 4.4.2 Relevant data collected such as weather parameters and latest load data shall be used to renew the coefficients in the forecast models software. An analysis is then conducted on the results of the various forecast models to produce a preliminary forecast. The preliminary forecast shall be discussed, verified and approved internally by Single Buyer Sabah before being presented in the Daily Docket and Weekly Docket Meeting by the Short-Term Load Forecast unit to the GSO.

5.0 CAPACITY PLANNING

5.1 Capacity Planning

- 5.1.1 The Capacity Planning unit shall be responsible for carrying out medium to long term capacity planning to ensure adequate generation capacity to meet forecast future demand with appropriate planning reserve margin target set by The Commission. This planning role supports The Commission in relation to contracting for new capacity.
- 5.1.2 The capacity planning activities include demand-supply analysis, and determination of maximum capacity for each of the identified sites, and other technical and economic studies related to generation capacity issues.
- 5.1.3 The generation development plan shall be presented and discussed in the LDSWG which shall consist of representatives from the Capacity Planning unit together with representatives of The Commission and the Minister and other representative as per Paragraph 2.6.3 (b) (ii) via the Sabah Energy Council (MTS).

5.2 Power Development Plan

- 5.2.1 The Capacity Planning unit shall prepare the power development plan annually.
- 5.2.2 The Capacity Planning unit shall initiate the process by establishing a work plan with the other unit of the Single Buyer Sabah, The Commission, the Minister and such other persons with data relevant for the power development plan for delivery of the requisite input data.
- 5.2.3 The Capacity Planning unit shall compile, review and verify the requisite input data which includes the following:
 - (a) Electricity demand forecast from the Load Forecast unit;
 - (b) Generation plants data from Sabah Electricity, IPPs or the Power Contract Management unit;
 - (c) New options plant data from THERMOFLOW (a power plant design and cost estimation software);
 - (d) Fuel price projections from Fuel Management Unit Sabah Electricity, PETRONAS or Sabah Energy Corporation Sdn. Bhd. (SEC) and other publicly available resources;
 - (e) Renewable energy data from The Commission.
- 5.2.4 The data shall then be updated and processed using the simulation software and used to prepare the power development plan including new capacity expansion, generation mix, fuel requirement projection and emission projection.
- 5.2.5 Capacity Planning unit shall discuss the key assumptions used for simulation of the base case and other scenarios as well as simulation result with The Commission aligning to the Guidelines.

- 5.2.6 The proposed power development plan shall then be submitted for the necessary verifications and approvals by the Chief Engineer of the Capacity Planning unit, Head of Integrated System Planning and Head of Single Buyer Sabah before submission to The Commission.

6.0 SCHEDULING

6.1 Scheduling

- 6.1.1 The Short-Term Scheduling sub-unit and Medium-Term Scheduling sub-unit within the Energy Resource Planning unit are responsible for the short to medium term scheduling and planning for dispatch of Generators. Its related functions include fuel requirement nomination for gas, coordination with GSO for generator outages and analysis for Incentive Based Regulation documentation and submission.

- 6.1.2 The scope of dispatch scheduling includes the following:

- (a) Day Ahead Dispatch Schedule;
- (b) Week Ahead Dispatch Schedule;
- (c) 3-Month Ahead Dispatch Schedule; and
- (d) One Year Demand and Supply Outlook.

Note: The dispatch schedules refer to the planned dispatch of all generating units to meet the load profiles for the corresponding time horizon.

- 6.1.3 The Energy Resource Planning unit shall use the Least Cost Dispatch Scheduling Methodology to prepare the dispatch schedules to minimize the cost of electricity procurement in accordance with the Guidelines.

6.2 Preparation of Forecast Dispatch Schedules

- 6.2.1 The Short-Term Scheduling sub-unit shall prepare the Day Ahead Dispatch Schedules / Week Ahead Dispatch Schedules / Three Month Ahead Dispatch Schedules in accordance with the Guidelines. The Medium-Term Scheduling sub-unit shall prepare the One Year Demand and Supply Outlook in accordance with the Guidelines.

- 6.2.2 The Scheduling sub-unit shall collect the relevant input data, including; -

- (a) Daily Availability Declarations from the Generator(s);
- (b) Day Ahead/ Week Ahead/ Three Month Ahead Load forecast from Load Forecast unit;
- (c) Day Ahead/ Week Ahead/ Three Month Ahead Transmission Outage Plan from Grid Operation Planning Department, GSO;

- (d) Day Ahead/ Week Ahead/ Three Month Ahead Generation Outage Plan from Grid Operation Planning Department, GSO;
- (f) Gas curtailment schedule and gas allocation from Nominated Gas Supplier;
- (g) System Constraint (if any) from the GSO; and
- (h) Generator testing pattern (if any) from the Generator(s).

6.2.3 Using the PLEXOS Model with the updated input data, the Energy Resource Planning unit shall conduct the production simulation to prepare and submit the relevant dispatch schedules for approval by the Chief Engineer of the Energy Resource Planning unit.

6.2.4 The dispatch schedules once finalized shall be submitted to the GSO, and individually to Generators (generator daily dispatch profile)

6.2.5 The One Year Demand and Supply Outlook shall be reviewed at the relevant working group and submitted to The Commission for approval.

7.0 PLEXOS MODEL

7.1 PLEXOS Model

7.1.1 PLEXOS Integrated Energy Model Software is a simulation software that uses mathematical optimization to provide simulation integrating energy production, transportation and demand over simulated timeframes. PLEXOS is predominantly used by the Capacity Planning unit and Energy Resource Planning unit for simulation of forecasts and scheduling dispatch based on verified input data.

7.2 Simulation Model Review and Updates

7.2.1 The Energy Resource Planning unit and Capacity Planning unit are responsible for updating and reviewing the data for the PLEXOS database. The data which are necessary for the simulation model includes:

- (a) Demand forecast;
- (b) Forced outages;
- (c) Fuel availability;
- (d) Fuel conversion factors;
- (e) Fuel prices;
- (f) Gas curtailment;

- (g) Generator availabilities;
- (h) Heat rates;
- (i) Hydro energy production;
- (j) Interconnection availabilities;
- (k) Major public holidays;
- (l) Minimum down times for generators;
- (m) Minimum up times for generators;
- (n) Planned outages;
- (o) Plants ups and retirements;
- (p) Solar profiles;
- (q) Start up costs;
- (r) System constraints;
- (s) Test energy and testing patterns;
- (t) Tested annual available capacities;
- (u) Transmission line constraints; and
- (v) Variable operating rates.

- 7.2.2 Data is collected from other units of the Single Buyer Sabah, GSO, Generators and other relevant Participants via emails, official letters, minute of meetings, websites and information in SLAs and PPAs. All information shall be reviewed, verified and approved before updating the simulation model.
- 7.2.3 Data revisions shall be approved by the Chief Engineer of Capacity Planning unit and Energy Resource Planning unit before the database controllers updates the models. Only database controllers who are authorised can do amendments on the PLEXOS Database. Database controllers must record all the changes and details of the changes made in a log.
- 7.2.4 PLEXOS Dispatch Scheduling Model changes or revisions shall be presented and reviewed by the Dispatch Scheduling Working Group (DSWG). Model changes and the details of the changes shall be recorded in a log.

8.0 POWER PURCHASE AGREEMENT (“PPA”)/CONTRACT MANAGEMENT

8.1 Preparation of the new PPAs

- 8.1.1 Technical Unit shall be responsible to assist The Commission in providing inputs for Request for Proposal (“RFP”) documents which include preparation of draft PPAs for bidding exercises of new generation projects.
- 8.1.2 Technical Unit coordinates the discussion of the new PPAs with the relevant stakeholders such as The Commission, GSO and Sabah Electricity to ensure the PPAs prepared are in line with the Prudent Utility Practices and the SGC.
- 8.1.3 Upon completion of the bidding exercises conducted by The Commission, Technical Unit shall be responsible to undertake discussions with the selected bidders to finalise the draft PPAs. Upon finalisation of the draft PPAs, Technical Unit arranges for the signing and execution of the PPAs by Sabah Electricity.

8.2 Operationalisation of the PPAs

- 8.2.1 Upon signing and executing of the PPAs, Technical Unit manages the PPAs until the occurrence of the Commercial Operation Date (COD). Technical Unit shall be responsible to monitor the progress of the projects and to ensure the projects are in full compliance with the requirements and obligations in the PPAs which involve various meetings regarding such projects with The Commission, Sabah Electricity, GSO and the project developers.
- 8.2.2 From the occurrence of the COD until the end of the term of PPAs/ SLA contracts, Technical Unit and Commercial Unit perform various operationalisation tasks in accordance with the PPAs/SLAs. The activities include:
 - (a) Coordination of Tested Annual Available Capacity (TAAC) test, Revalidation Test, etc.
 - (b) Providing various input for monthly generators’ invoice settlement, namely Annual Scheduled Available Capacity (ASAC) approval, consequences of Failed Dispatch Instruction (FDI) and other related operational matters.
 - (c) Coordinate with Metering Unit, Sabah Electricity to perform activities related to metering namely meter verification (yearly), meter replacement (due to faulty), remote meter reading and any other meter issues (missing data, inconsistency etc.)
 - (d) Other arise issues (tailored to specific agreements) namely:
 - (i) Perform Cost Saving / Tariff Adjustment for direct negotiation PPAs;
 - (ii) Perform analysis on FDI and non-compliance with the operating standards or characteristics set out in Appendix B of the PPAs/SLAs;

- (iii) Perform risk analysis on impact for Change in Law implication;
- (iv) Perform technical capability analysis for PPA / SLA extension;
- (v) Managing different interpretation of provisions in the agreements between affected parties;
- (vi) Promote out of court settlement arrangement for all IPP/ Sabah Electricity power plants; and
- (vii) Monitor and manage the expiry, extension and renegotiation of power supply agreements.

8.3 Providing Input, Data and Opinions to the Stakeholders

- 8.3.1 Technical Unit and Commercial Unit provide input and data to both internal and external group however subject to confidentiality obligation under the relevant agreement, for various purposes namely update on the projects progress, projects technical and commercial data for simulation purposes.
- 8.3.2 Technical Unit contributes constructive opinions in accordance with the PPAs,SLAs and any power supply agreement for the benefit of electricity industry, to The Commission on the rising issues such as on the Force Majeure Event treatment, views on the delayed projects and others.
- 8.3.3 Commercial Unit shall be responsible in managing, extracting and compiling all commercial data required for internal use (unit in Single Buyer Sabah) and for external parties (The Commission, the Minister, Sabah Electricity , etc. where relevant). The required data is been use for a lot of purposes ranging including but not limited for:
 - (a) simulation and study purpose;
 - (b) decision making on the outcome or direction on certain issues;
 - (c) least cost dispatching and merit order; and
 - (d) audit purpose.

9.0 SINGLE BUYER SABAH FILE SHARE

9.1 Single Buyer Sabah File Share

- 9.1.1 Single Buyer Sabah file sharing server (“SB File Share”) is a platform to store documents and files for Single Buyer Sabah. The Single Buyer Sabah File Share is maintained and supported by the Information and Digital Division of Sabah Electricity and has the following features:
 - (a) Resilient service;

- (b) Data are backed up regularly;
- (c) Controlled access to read and write the data to provide security of the folders and files; and
- (d) Departmental and localised security.

10.0 SINGLE BUYER SABAH WEBSITE

10.1 In accordance with Rule 19.2 of the Guidelines, Single Buyer Sabah shall develop a Single Buyer Sabah Website to promote transparency in performing its functions, and to ensure the website presents data and information clearly.

10.2 Single Buyer Sabah Website Change Request Process:

10.2.1 In order to ensure that the data and information contained on Single Buyer Sabah Website are clear, Single Buyer Sabah Website administrator has developed a process to manage any changes on Single Buyer Sabah Website's content ("Change Request Process").

10.2.2 This Change Request Process requires any person who wishes to change, remove or alter any contents of Single Buyer Sabah Website, to fill-up the form in accordance with the Change Request Process and get approval from Head of Single Buyer Sabah.

10.2.3 Single Buyer Sabah Website administrator will implement the requested changes accordingly.

11.0 SINGLE BUYER SABAH SETTLEMENT CENTRE (SBSC)

11.1 SBSC System

11.1.1 SBSC is a billing system to process the monthly payment for the power generators in Sabah and Federal Territory of Labuan. SBSC is used by Single Buyer Sabah, GSO and Generators.

11.2 SBSC Access

11.2.1 The SBSC system administrator shall be responsible in managing the user access. Request for the access is via submission of the respective request form (whichever applicable). SBSC system administrator currently done by Chronos under the purview of Power Contract Management.

11.2.2 New SBSC access request:

- (a) To get access to the SBSC system, the requestor is required to fill in the SBSC Form and get the necessary approval from the requestor's Head of Single Buyer Sabah;
- (b) The form needs to be submitted to Single Buyer Sabah (Enterprise Management sub-unit) to be processed by SBSC system administrator;
- (c) SBSC system administrator will require authorization from Single Buyer Sabah management to configure the requested access; and
- (d) SBSC system administrator will provide the requestor with the SBSC token and user ID for them to access the SBSC system.

11.2.3 Change in SBSC user access:

- (a) SBSC user need to submit the SBSC User Access Change Request Form to the SBSC system administrator if there are any changes required on the existing access permission and roles of the SBSC user; and
- (b) Once the SBSC system administrator received the SBSC User Access Change Request Form, the SBSC system administrator will configure the changes accordingly.

12.0 RELATED SUBMISSIONS FOR THE PURPOSE OF INCENTIVE BASED REGULATION

12.1 Overview

12.1.1 Under the Incentive Based Regulations ("IBR") framework, Single Buyer Sabah shall be responsible for two tariffs; (1) SB Generation tariff and (2) SB Operations tariff in accordance to the Guidelines on Tariff Determination Under Incentive Based Regulation for Sabah Electricity Sdn. Bhd. ("RIG").

12.2 SB Generation Proposal for IBR

12.2.1 SB Generation cost includes the cost incurred by Single Buyer Sabah for the procurement of electricity generation from all generators in the system based on their respective PPAs, SLAs and other cost associated with purchasing electricity from the generators (grid connected). This also includes generation cost incurred by Sabah Electricity Distribution Network and Sabah Electricity Retail.

12.2.2 For IBR submission, it involves a four-step process, which comprises of:

- (a) setting the input parameters (which consist of sales, generation, fuel prices and commercial rates);

- (b) establishing the generation mix via PLEXOS run;
- (c) calculating the SB Generation cost and deriving the SB Generation base tariff via SB Generation Cost model; and
- (d) preparing SB Generation proposal report.

12.2.3 The proposed forecasts generation cost including the fuel price will be submitted to Sabah Electricity Strategy and Sustainability Division which the proposed generation costs and tariff will include off grid generators costs such as rural, mini hydro, renewable energy under feed-in-tariff before submitting to The Commission.

12.3 SB Generation Proposal for Imbalance Cost Pass Through

12.3.1 The SB Generation cost approved under the IBR for each Regulatory Period is reviewed semi-annually via Imbalance Cost Pass-Through (“ICPT”) mechanism

12.3.2 Both IBR and ICPT submissions are coordinated by Finance and Reporting unit within the Finance & Enterprise Management Department, Sabah Electricity Finance Division and Sabah Electricity Strategy & Sustainability Division.

12.4 SB Operations and Performance Indicators Proposal for IBR

12.4.1 As per the RIG, SB Operation cost includes operating expenses, cost of working capital, return on assets, depreciation, regulatory tax, efficiency carry-over scheme on operating and capital expenditure and incentives adjustment (reward, penalty, or zero reward/penalty with regard to the SBPIs).

12.4.2 For the purpose of IBR submission, Single Buyer Sabah is required to derive a 3-year forecast of the operating expenses and capital expenditure. These forecasts and the actual cost incurred for current Regulatory Period will be submitted to Sabah Electricity Strategy and Sustainability Division. The actual performance of SBPIs will also be submitted to Sabah Electricity Strategy and Sustainability Division for performance evaluation i.e. the incentives adjustment (reward, penalty, or zero reward/penalty).

12.4.3 Based on the data provided by Single Buyer Sabah to Sabah Electricity Strategy and Sustainability Division will derive the total forecast cost for Single Buyer Sabah which will include off-grid generators and renewable energy under feed in tariff via the Revenue Requirement Model (RRM) established together with The Commission and Single Buyer Sabah will then review the generation cost. Currently, the RRM is centrally managed by Sabah Electricity Strategy and Sustainability Division for all regulated entities.

12.4.4 Following from the above, Single Buyer Sabah will prepare the proposal report which covers the SB Operations and SBPIs.

12.4.5 The proposed forecasts cost, tariff and SBPIs will be tabled to Sabah Electricity Regulatory Council for approval before submitting to The Commission.

12.5 Single Buyer Sabah Actual Performance Indicators Submission for IBR

12.5.1 The Enterprise Management sub-unit within the Finance & Enterprise Management unit shall be responsible for the submission of the Single Buyer Sabah's performance indicators in accordance with the RIG. The Enterprise Management unit will receive inputs from the respective performance indicators' owner.

12.5.2 Regulatory targets apply for each of the performance indicators in accordance with the RIG as approved by The Commission.

13.0 SETTLEMENT AND CLEARANCE

13.1 Settlement and Clearance sub-unit shall be responsible in managing and facilitating settlement processes for all power purchase contracts in Sabah and Federal Territory of Labuan and interconnection agreements.

13.2 Settlement and Clearance sub-unit shall:

13.2.1 Ensure timely issuance of invoice for import energy for Generators with the PPA;

13.2.2 Facilitate and monitor timely payment of the generators' invoices (30 days credit term). Settlement is carried out monthly in arrears following receipt of the Participant's actual invoice;

13.2.3 Ensure all settlement are managed in accordance to the agreements, codes and relevant acts and technical performance;

13.2.4 Provides estimation of generators cost of generators in Sabah and Federal Territory of Labuan on monthly basis. This function is to facilitate Finance Division Sabah Electricity with detailed and comprehensive cashflow management.

13.3 It is compulsory to ensure that all invoices are checked, verified and approved prior to submission to Finance Division Sabah Electricity for payment purposes.