

Rural Electricity Supply (BELB)

Purpose



The BELB Programme is implemented with the purpose of providing electricity to houses in traditional villages which are outside the areas which are under the operation of local authorities (PBT) throughout the country including long-houses in the remote areas of Sabah and Sarawak, villages of indigenous people in Peninsular Malaysia, villages on islands and settlements in small estates which are less than 400 hectares (less than 1,000 acres).

The BELB Programme is implemented through 2 methods: first, through the method of connecting grid lines from sources of the State Electricity Authority (PBEN), namely Tenaga Nasional Berhad (TNB) for Peninsular Malaysia, Sabah Electricity Sdn. Bhd (SESB) for the State of Sabah and Sarawak Electricity Supply Corporation (SESCO) for the State of Sarawak. Remote areas which are too far off (and therefore it would not make economic sense to connect them to the grid lines) would receive their supply of electricity through alternative methods such as via solar energy, generator sets, solar hybrid and the like.

In the year 1998, the Government had set up the Electricity Supplies Industry Trust Account (AAIBE) under the Ministry of Energy, Water and Communication (KTAK). The funds of this account are contributed by all Independent Power Producers (IPP) operating in Peninsular Malaysia. 60% of the account's funds have been used for the BELB Programme (under KKLW, TNB etc.)

With the AAIBE, all BELB projects pertaining to grid lines and solar hybrid in Peninsular Malaysia have been funded by it. The provisions for BELB development in Peninsular Malaysia has been used to fund the implementation of other alternative projects, operational and maintenance costs of alternative projects (other than solar hybrid), the installation cost of LJK projects, operational and maintenance costs of LJK as well as consultancy costs. Any available surplus of the provision would be transferred to Sabah and Sarawak with the aim of balancing the coverage gap between the Peninsular and the two states.

Grid Lines Connection Scope



- Construction of infrastructure to the maximum limit of a 33kV voltage delivery line
- Construction of power stations and rural diesel power stations
- Connection of low voltage lines to villages and houses
- Increase of the supply system and quality from 12 hours to 24 hours
- Electrical wiring inside houses is not within the scope

Selection Criteria



- Priority will be given to villages that have a big number of houses, has new houses and public facilities such as schools and clinics;
- The average cost for each house must not be over RM25,000.00. Should it be over the said average cost, consideration will be made separately based on the number of residents.
- For new settlements, houses should be built and resided in at least 30% of the number of lots. However, this condition may be relaxed according to certain factors.

- Housing estates which are developed by the private sector or Government Agencies are not included in these criteria.

Alternative Systems

A. Solar Photovoltaic

Scope

The scope of this PV programme entails the supply of electricity to residential houses, multi-purpose halls, classrooms, police substations (pondok polis), clinics, vaccines, houses of worship and road lamps. The components for each are as follows;

Residential Houses

- 3 x 11 watt lamps each
- 1 x 80 watt output socket
- 2 panels that can generate 23.5 AH a day (12V,4.7A)
- 2 x 125 AH battery panels each
- 1 x control box
- 1 inverter

Multi-purpose Halls

- 6 x 11 watt lamps each
- 1 x 80 watt output socket
- 6 panels that can generate 70.5 AH a day (12V,4.7A)
- 12 x 430 AH battery panels each
- 1 x control box
- 1 x inverter
- 2 x ceiling fans
- Internal wiring

Classrooms

- 6 x 11 watt lamps each
- 1 x 80 watt output socket
- 4 panels that can generate 47.0 AH a day (12V,4.7A)
- 12 x 430 AH battery panels each
- 1 x control box
- 1 x inverter
- 1 x ceiling fan
- Internal wiring

Police Substations/Clinics

- 5 x 11 watt lamps each
- 2 x 80 watt output socket
- 6 panels that can generate 94.0 AH a day (12V,4.7A)
- 12 x 430 AH battery panels each
- 1 x control box
- 1 x inverter
- 1 x ceiling fan
- Internal wiring

Houses of Worship/Surau

- 6 x 11 watt lamps each
- 2 x 80 watt output socket
- 8 panels that can generate 94.0 AH a day (12V,4.7A)
- 12 x 570 AH battery panels each
- 1 x control box
- 1 x inverter
- 2 x ceiling fans
- Internal wiring

Vaccines

- 4 panels that can generate 94.0 AH a day (12V,4.7A)
- 6 x 430 AH batteries each

- 1 x vaccine set
- 1 x control box

Road Lamps

- 1 x 11 watt (DC load) lamp and lamp-post
- 1 x 125 AH battery
- 1 panel that can generate 23.5 AH a day (12V,4.7A)

Selection Criteria

- Situated in an isolated/remote area that does not have normal access roads;
- Has never received supply of electricity
- Does not have any water source that may be suitable for hydro systems
- May not possibly receive supply of electricity through grid lines in the near future (at least 5 years)
- Villages with schools are given priority; and
- Has obtained agreement of local residents.

Alternative Systems

B. Solar Hybrid

Selection Criteria

- The user must agree to pay for internal wiring costs, the metre deposit, and the monthly electricity bills according to the normal tariff.
- The distance of the location from the nearest 11kV grid line must be over 10km.
- There is no plan to introduce a grid system within the period of the next 3 years. If the distance of the location from the nearest 11kV grid line is less than 10km or if there is a plan to introduce the grid system within the period of the next 3 years; but the solar hybrid cost is estimated to be lower than the grid system cost, then the solar hybrid system may be considered on a case by case manner.
- The condition of the house must be suitable and safe for internal wiring, the Saluran Atas Voltan Rendah (SAVR) system and the metre installation.
- Requires a wide area of land to place the solar hybrid system; as wide as 1 acre or more. The permission to access specified areas must preliminarily be obtained by the applicant.
- There should be a route on land or on water to transport all equipment to the location. Should there be no suitable routes, alternative transportation costs will be calculated separately.
- Priority would be given to group settlement areas with a minimum of 20 houses.
- The estimate of the project cost as well as the solar hybrid and SAVR installation costs are as follows:

Type	Number of Houses	Cost Estimate
Type 1	20 – 29	RM1,000,000
Type 2	30 – 39	RM1,100,000
Type 3	40 – 49	RM1,200,000
Type 4	50 – 59	RM1,300,000
Type 5	60 – 100	RM1,500,000

Note: The cost estimates above are subject to the following:

- The electricity-generating ceiling rate for a solar hybrid system is 50kW
- The currency exchange rate is based on 1USD = RM3.80
- All items/equipment/related equipment are Government tax exempted
- The transportation cost is calculated based on land or water routes. If via alternative routes such as by air, additional costs will be calculated separately
- The actual cost can only be prepared after a site visit has been done by TNB-ES

Alternative Systems

C. Gen-Set

Selection Criteria

- The concerned village may be easily accessible on land or on water to transport diesel;
- The distance of the village from the grid line is not less than 10 kilometres.
- The village is not going to receive any supply of electricity via grid lines at least within the next five (5) years;
- The generation of electricity must conform to the Electricity Supply Act and the Electricity Supply Department for Peninsular Malaysia and Sabah, and the Sarawak Electricity Ordinance for Sarawak. Should a specific exemption be required to fulfil the licensing and safety conditions, it shall be dealt with by the Indigenous Affairs Department (JHEOA), the Sabah Federal Development Department (JPPS) and/or the Sarawak State Development Department (JPNS);

- The energy/capacity requirement is between 500 watt per hour and 1000 watt per hour for a house (supply of between 6 hours and 12 hours a day) to enable the use of items such as radio, television, lamps, fans and other light equipment, whereby its watt power is still within the authorized limit. The use of items such as irons, refrigerators, washing machines, electrical rice cookers and heavy electrical equipment over 1000 watt in power is strictly forbidden; and
- Should the electricity line be connected with a grid system, the average cost would be over RM15,000.00 for each house.

Village Road Lamp Programme (LJK)

The Village Road Lamp (LJK) Programme was first introduced by the Government during the early period of the 8th Malaysia Plan (RMKe8). The LJK Programme is aimed at brightening up coverage areas so that economic, social and recreational activities may be carried out more comfortably and safely during the night time. It is fixed on to existing electrical posts such as those in front of public buildings (community halls, worship homes etc) and at road junctions with a limit of not more than 10 units per village. This programme is a one-off programme that is fully funded by the Government, whereby the funding includes the continued operation and maintenance costs.

Programme Scope

The installation, operation and maintenance costs for 1 unit of LJK are as follows:

	Original Cost (RM)	Original O&M (RM)	Upgrade (RM)	New Cost (RM)	New O&M (RM)
Peninsular M'sia	460	4.36	342	379.13	9.47
Sabah	598	7.56		598	7.56
Sarawak	598	11.844		1 M – 730.00 3 M – 770.00	11.844

* The LJK used in Sabah and Sarawak is of 70 watt whereas those used in Peninsular Malaysia is of 150 watt.

Village Selection Criteria

- All villages that receive their supply of electricity from grid lines are eligible for consideration under this road lamp installation programme.
- This programme covers settlements or villages under the FELDA schemes of which land ownership have been transferred to the settlers. For villages still under the FELDA scheme, the implementation and maintenance costs are to be borne by FELDA.
- This programme does not include villages that have yet to receive their supply of electricity through a grid connection. This is because the LJK are installed on existing electricity posts.
- Traditional villages that have been installed with road lamps via funding from the local authorities (PBT), housing estates or resettlement areas developed by the private sector or private individuals are not eligible for consideration under this programme.
- The maximum number of lamps that may be installed is 10 units for each village.
- The location for lamp installation should be along the main village road, with concentration in front of public buildings such as in front of suraus/mosques, community halls and schools.
- Villages that have been installed with the maximum number of 10 lamps during Phase 1 are not eligible for consideration.
- The installation of road lamps for villages that receive their electricity supply through solar-generated systems are already included in such systems.