

Guidelines

For Solar Photovoltaic Installation
For Self-Consumption in Peninsular
Malaysia



**GUIDELINES FOR SOLAR PHOTOVOLTAIC
INSTALLATION FOR SELF-CONSUMPTION IN
PENINSULAR MALAYSIA**

JANUARY 2025

Registration Record

Registration No.	Revision Date	Remarks

ELECTRICITY SUPPLY ACT 1990 [Act 447]

**GUIDELINES FOR SOLAR PHOTOVOLTAIC INSTALLATION
FOR SELF-CONSUMPTION IN PENINSULAR MALAYSIA**

GP/ST/ No.51/2024

IN exercise of the powers conferred by section 50C of the Electricity Supply Act 1990 [Act 447], the Commission issues the following guidelines:

Citation and Commencement

1. (1) These guidelines may be cited as the Guidelines for Solar Photovoltaic Installation for Self-Consumption in Peninsular Malaysia.
- (2) These Guidelines shall come into operation on 1 January 2025.

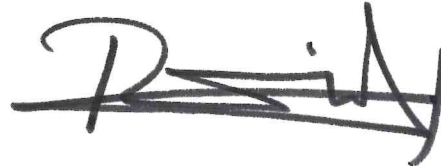
Purpose

2. The purpose of these Guidelines are as follows:
 - (a) to provide for the types of solar PV installation for self-consumption;
 - (b) to prescribe the conditions for the installation of Solar PV System for self-consumption; and
 - (c) to set out the requirements and obligations on the Electricity Utility Company and any person who installs, owns, uses, works or operates the solar PV installation.

Revocation

3. The Guidelines on the Connection of Solar Photovoltaic Installation for Self-Consumption with the registration number of GP/ST/ No.13/2017 (Pin.2023) are revoked.

Dated: 1 JANUARY 2025

A handwritten signature in black ink, appearing to read 'D. Razib', with a horizontal line drawn through it.

DATO' IR. TS. ABDUL RAZIB BIN DAWOOD
Chief Executive Officer
Energy Commission

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1. Application

1.1 These Guidelines shall apply to—

- (a) any person who owns, uses, works or operates or permit to be used, worked or operated any solar PV installation for self-consumption;
- (b) the Electricity Utility Company whose Electricity Supply System is connected or to be connected to a consumer with a solar PV installation for self-consumption; and
- (c) any person who carries out the design, installation, testing, commissioning and maintenance works of the solar PV installation.

1.2 These Guidelines are not applicable to any person whose premises is installed with or have applied to install with solar PV installation under the feed-in tariff system, net energy metering, or any other solar PV programmes. No separate solar PV installation shall be installed at such premises for self-consumption.

2. Definitions and Interpretation

In these Guidelines, unless the context otherwise requires, the definitions of the terms are as follows:

Terms	Definition
Act	means the Electricity Supply Act 1990 [<i>Act 447</i>];
Commission	has the meaning assigned to it under the Act;
Competent Person	has the meaning assigned to it under the Act;
consumer	means a person who is supplied with electricity or whose premises are for the time being connected for the purpose of supply of electricity by an Electricity Utility Company;

Terms	Definition
Distribution Code	means the Distribution Code for Peninsular Malaysia, Sabah and Federal Territory of Labuan with the registration number of Kod/ST/No.1/2016(Pin. 2017);
Domestic Consumer	means any consumer occupying a private dwelling, which is not used as hotel, boarding house or used for the purpose of carrying out any form of business, trade or professional activities or services;
Electricity Utility Company	means the licensee who supplies the electricity in the area of supply as prescribed in the licence;
Electrical Contractor	has the meaning assigned to it under the Regulations;
electrical work	has the meaning assigned to it under the Act;
Electricity Supply System	means the electricity transmission system (132kV/275kV/500kV) and distribution system (240V/400V/11kV/33kV) used, worked or operated by an Electricity Utility Company;
Grid-Connected System	means the electrical installation in a premise that is connected to the Electricity Supply System for the purpose of receiving a supply from the Electricity Utility Company;
Grid System	means the Electricity Supply System of the Electricity Utility Company;
indirect connection	means the connection of a consumer's Solar PV System at a point of the consumer's electricity installation before the point of interconnection with the Electricity Supply System;
installation	has the meaning assigned to it under the Act;
kW	means kilowatt in alternating current (or a.c.) rating;

Terms	Definition
kW_p	means kilowatt peak in direct current (or d.c) rating. Rated kW _p in relation to a PV Installation means the maximum direct current power such solar PV modules can produce under standard test conditions of 1,000 watts per square meter of solar irradiation and 25 degrees Celsius ambient temperature;
mains	means a supply line through which electricity is or can be supplied, whether the line is in use or not;
MW	means megawatt or 1,000 kW in a.c. rating;
MW_p	means megawatt peak or 1,000 kW _p peak in d.c. rating;
Off-Grid System	means the electrical installation in a premise that is not connected and completely isolated from the Electricity Supply System of an Electricity Utility Company;
Non-Domestic Consumer	means any consumer other than a Domestic Consumer;
point of interconnection	means the point where a consumer's installation is connected to the Electricity Supply System of the Electricity Utility Company;
premises	means any building together with its land, outbuildings and any structures within the boundary of the land where the owner or occupier resides or conducts the business activity in accordance with the land use as permitted by the local authority;
Regulations	means the Electricity Regulations 1994 [<i>P.U.(A) 38/1994</i>];
Solar PV System	means a Solar Photovoltaic System which refers to the sunlight converted directly to electricity through a system which includes solar PV cells, PV modules, inverters, the

Terms	Definition
	associated protection and control devices, cables and other related devices;
solar PV installation for self-consumption	means a solar photovoltaic installation for self-consumption which refers to a solar PV installation in a premises where the energy produced is solely for the own consumption of the owner or occupier of the premises. No energy produced from the solar PV installation is allowed to be supplied to and for the use of any other person and such installation may include a battery energy storage system;
supply line	has the meaning assigned to it under the Act;
system	has the meaning assigned to it under the Act.

3. Solar PV Installation

3.1 The requirements for solar PV installation are as follows:

- (a) the solar PV installation shall be installed in the premises where the owner or occupier resides or conducts its activity across all sectors which include but not limited to commercial, industrial and agriculture;
- (b) the energy produced from the solar PV installation shall be strictly for the self-consumption of the owner or occupier within the premises;
- (c) the energy produced from the solar PV installation shall not be supplied to any other person or premises outside the premises of the owner or occupier; and
- (d) the installation of solar PV panels shall be within the same premises.

3.2 Off-Grid System

- (a) For an Off-Grid System, the solar PV installation may be designed, installed and operated—
 - (i) to meet the energy requirements and shall be within the safe and permissible limits of the electrical system and equipment; and
 - (ii) in accordance with the Act and the Regulations, any Malaysian Standards, or in the absence of which, the relevant international standards and prudent industry practices.
- (b) It is recommended that the solar PV installation is installed with battery energy storage system of appropriate capacity to mitigate the intermittency in electricity production by the Solar PV System, for standby supply and for better load management.

3.3 Grid-Connected System

For Grid-Connected System, the electricity produced by the solar PV installation shall be strictly for use within the premises where the solar PV installation is installed. No power evacuation to the Electricity Supply System is allowed at any time of the day. The solar PV installation shall be designed and installed with appropriate device, if necessary to comply with such requirements.

- (a) For Non-Domestic Consumer, there shall be no capacity limit on the solar PV installation, provided that the consumer shall comply with all technical and regulatory requirements.
- (b) For Domestic Consumer, the capacity of the solar PV installation shall not exceed—
 - (i) 5kW for single-phase 230V supply; or
 - (ii) 12.5kW for three-phase 400V supply.

- 3.4 The consumer with a solar PV installation with the capacity greater than the capacity specified in paragraph 3.3, which was installed or in the process of installing the solar PV installation before the effective date of these Guidelines, is allowed to continue with the installation, subject to the following conditions:
- (a) the consumer has been granted with generating licence from the Commission; or
 - (b) the consumer has been given any documental approval proof from the relevant local authorities.
- 3.5 For Non-Domestic Consumers, solar PV installation of more than 72kW_p shall be installed with battery energy storage system with full capacity of at least one hour rating to reduce the impact of intermittent energy production of the Solar PV System on the Grid System. A solar PV installation of ~~X~~ kW_p shall be installed with a battery energy storage system of at least ~~1xX~~ kWh which is charged by the Solar PV System. The battery energy storage system can be a.c. or d.c coupled.
- 3.6 For Non-Domestic Consumers with solar PV installation of more than 72kW_p without battery energy storage system, that was installed or in the process of being installing the solar PV installation before the effective date of these Guidelines, is allowed to continue without battery energy storage system, subject to the following conditions:
- (a) the consumer has been granted with generating licence from the Commission; or
 - (b) the consumer has been given any documental approval proof from the relevant local authorities.

4. Point of Interconnection for Grid-Connected System

4.1 For Grid-Connected System, the solar PV installation shall be connected to the consumer's installation before the meter of the Electricity Utility Company, or commonly known as behind the meter connection or indirect connection.

4.2 **Figure 1** shows an example of the connection of the consumer's solar PV Installation to the Electricity Supply System of the Electricity Utility Company.

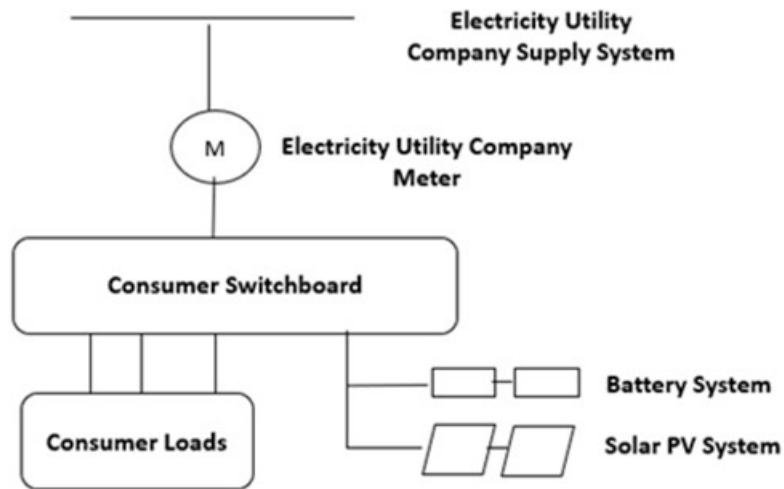


Figure 1: Sketch of interconnection for Grid Connected System

5. Technical Requirements

5.1 The design of the solar PV installation, the equipment and materials used, the installation works, the testing and commissioning and the operation and maintenance of the solar PV installation shall comply with—

- (a) the Act;
- (b) the Regulations;
- (c) the Licensee's Supply Regulations 1990 [P.U.(A) 384/1990];
- (d) the laws of the relevant local authorities; and

- (e) any codes, guidelines, standards, directives and notices issued by the Commission and any other authorities having jurisdiction over the installation works and operation of the solar PV installation.
- 5.2 In the absence of such guidelines, standards, directives and notices, the requirements shall be in accordance with the acceptable prudent industry practices as may be determined by the Commission.
- 5.3 The consumer shall refer to the technical and any other documents published by the Electricity Utility Company on the relevant technical and commercial requirements, specifications, standards, etc. for the design, installation, testing, commissioning and operation of the grid-connected Solar PV System.
- 5.4 The electricity produced by the solar PV installation shall comply with the security and reliability standards, safety requirements and quality of supply of the Electricity Utility Company.
- 5.5 The solar PV installation shall be designed and installed with equipment, if necessary, to prevent the inadvertent evacuation of power from the consumer electrical installation onto the Electricity Supply System.
- 5.6 The design of the solar PV installation, technical calculations, site plans, equipment layout diagrams, system diagrams, electrical schematic diagrams, equipment installation diagrams, structural drawings and any other drawings for the solar PV installation shall be prepared and certified by a qualified and competent person as required under the Act and other relevant laws which shall include but not limited to the following:
 - (a) the Act;
 - (b) the Regulations;
 - (c) the relevant guidelines, codes, directives, etc. issued by the Commission;
 - (d) the Registration of Engineers Act 1967 [*Act 138*];
 - (e) the Architects Act 1967 [*Act 117*];

- (f) the Uniform Building By-Laws 1984 [G.N. 5178/84]; and
- (g) the laws of the relevant local authorities.

5.7 The consumer shall perform connection assessment study for solar installation with capacity above 72kW_p to assess the effect and safety of the connection of the solar PV installation and the consultant who prepares the design of solar PV installation shall be responsible to conduct the connection assessment study.

5.8 The connection assessment study for solar installation with the capacity above 72kW_p shall include—

- (a) the load profile of the consumer electrical installation before and after the solar PV installation;
- (b) the general description of the solar PV installation, the consumer's electrical installation and the interconnection to the electrical supply system;
- (c) the analysis of any impact on voltage and power factor to the Electricity Supply System;
- (d) the suitable solar PV installation capacity in compliance with these Guidelines;
- (e) the fault analysis for consumer with maximum demand above 425kW a.c.; and
- (f) any other analysis required for the purpose of safety and security of the consumer's electrical installation and the Electricity Supply System at the point of interconnection with the Electricity Utility Company.

- 5.9 The consumer shall perform self-assessment study for solar installation with capacity of not more than 72kW_p, when required by Electricity Utility Company, to assess the effect and safety of the connection of the solar PV installation and the consultant or Competent Person who prepares the design of solar PV installation shall be responsible to conduct the connection assessment study.
- 5.10 The connection assessment study for solar installation with the capacity of not more than 72kW_p shall include, but not limited to—
- (a) the load profile of the consumer installation before and after the solar PV installation;
 - (b) the suitable solar PV installation capacity in compliance with these Guidelines;
 - (c) the analysis of any impact on voltage and power factor to Electricity Supply System; and
 - (d) any other analysis required for the purposes of safety and security of the consumer's electrical installation and the Electricity Supply System at the point of interconnection with the Electricity Utility Company.
- 5.11 The electrical installation works, supervision of the electrical works and testing and commissioning of the solar PV installation shall be carried by qualified Electrical Contractors and Competent Persons registered with the Commission in accordance with the Act and the Regulations. The civil, building, structural, mechanical, and other works, where required under the relevant laws, shall be carried out, supervised and certified completion by the qualified persons under such laws.
- 5.12 The owner or occupier of the premises, whoever relevant, shall be responsible for the management, control, operation, maintenance and safety of the solar PV installation and electrical installation up to the point of interconnection.

- 5.13 The management, control, operation, maintenance and safety of the Electricity Supply System and equipment, including the metering system, beyond the point of interconnection, shall be responsibilities of the Electricity Utility Company.
- 5.14 Electricity produced by solar PV installation is intermittent. For Grid-Connected System, there are two separate sources of power supply to the premises, from the mains of the Electricity Utility Company and from the solar PV installation. To ensure the safety of persons working on the electrical installation in the premises, a clearly legible label of appropriate size and letters similar to the figure as shown below shall be permanently affixed at conspicuous locations at the equipment and the electrical installation to remind any person working on the electrical installation that the premises is installed with solar PV installation.



Figure 2: Sample of label

6. Testing and Commissioning

- 6.1 Upon completion of the installation works of the solar PV installation, the Electrical Contractor who carried out the installation works shall ensure that the installation to be tested and commissioned by a qualified Competent Person in accordance with the Act and the Regulations.
- 6.2 The Supervision and Completion Certificate and the Test Certificate (Form G and Form H as prescribed in the First Schedule of the Regulations) for the installation shall be duly signed by the Competent Person undertaking the works in

accordance with the Regulations. A copy of the certificates shall be kept by the consumer for record and reference purposes.

7. Licensing and Submission of Information to Energy Commission

7.1 Any person who uses, works or operates or permits to be used, worked or operated a solar PV installation are required to have a licence granted by the Commission under the Act unless such person is exempted under paragraph 7.3.

7.2 An application for such licence shall be submitted to the Commission together with the relevant document and information before the commissioning of the solar PV installation. The procedure and requirements for application for such licence can be downloaded from the Commission's official website.

7.3 The consumer of solar PV installation of which the installation is exempted from the licensing requirements shall submit the following document to the Commission within **thirty (30) days** after commissioning of the solar PV installation as follows:

(a) Form of Information of Solar PV Installation as can be found in the Commission's official website. A sample of the form is in **Attachment 1**; and

(b) a copy of Supervision and Completion Certificate (Form G) and Test Certificate (Form H) of the solar PV installation duly signed by the Competent Persons as prescribed in the First Schedule of the Regulations.

7.4 Upon request by the Commission, the consumer of the solar PV installation shall submit to the Commission any document, account, estimate, return, report or other information as the Commission deems necessary in such manner and at such time as the Commission may requires.

8. Submission of information to the Electricity Utility Company

- 8.1 For Grid-Connected System, the consumer shall inform the Electricity Utility Company on the installation of the Solar PV System by submitting a copy of the Form of Information of Solar PV Installation referred to in paragraph 7.3(a) with the available information to the Electricity Utility Company prior to the installation of the Solar PV System.
- 8.2 In addition to the submission of the form referred to in paragraph 8.1, the consumer shall also submit the information and data in accordance with the Distribution Code, where relevant and if so, requested by the Electricity Utility Company, not less than **thirty (30) days before** the commissioning of the solar PV installation.

9. Alteration and Disconnection of Solar PV Installation

- 9.1 The owner of the solar PV Installation shall inform the Commission in writing at least one month in advance prior to any alteration to the solar PV installation, provided that any such alteration shall be in accordance with the provisions of these Guidelines. The alteration shall be informed in Part 7, 8 and 9 of **Attachment 1**.
- 9.2 If the solar PV Installation is to be disconnected and discontinued in use or dismantled from the premises, the owner of the solar PV Installation shall inform the Commission by way of notice in writing at least one month in advance prior to such disconnection or dismantling. A sample of the notice is in **Attachment 2**.

10. Environmental attributes

The right to any credit or financial benefit which are available or may become available for reductions of greenhouse gas emissions from the energy produced by solar PV Installation shall be with the consumer of the installation.

11. Notice by the Commission

The Commission may issue any written clarification, notice or directive if necessary from time to time in relation to these Guidelines.

12. Cost

12.1 For the purposes of these Guidelines, any installation constructed after 31 December 2024, is subject to charges, fees, or any other payments that imposed by the Government to reflect the true cost of supply, ensure fairness to all consumers and maintain the security and reliability of the electricity supply system.

12.2 In relation to the charges imposed by the Government as referred to in paragraph 12.1, the imposition of charges is applicable to non-domestic installations with an installation capacity of more than 72kW_p.

Attachment 1

Form on Information of Solar PV Installation

PART 1: INFORMATION

(a) Please submit this form together with a copy of Supervision and Completion Certificate (Form G) and Test Certificate (Form H) of the solar PV installation to the Energy Commission within one month of commissioning of the solar PV installation

(b) For Grid-Connected System, please send a copy of this form to the Electricity Utility Company prior to the installation of the Solar PV System

(c) The installation shall comply with "Guidelines for Solar Photovoltaic Installation for Self-Consumption".

For office use only:

Reference No: _____

Date Received: _____

Time Received: _____

Receiving Officer: _____

PART 2: CONSUMER INFORMATION

Name of Consumer: _____ IC/ROC Number: _____

Electricity Bill Account Number: _____ *(not applicable for off grid system)*

Electricity Utility Company: _____ *(not applicable for off grid system)*

Email address: _____ Phone Number: _____

Mailing Address: _____

I hereby authorize the Electrical Contractor as described in PART 4 to act on my behalf to manage my Self Consumption (SelCo) registration

Signature: _____

Date: _____

PART 3: CONTACT PERSON (IF RELEVANT)

Name: _____ IC Number: _____

Relationship: _____

Email address: _____ Phone Number: _____

Mailing Address: _____

PART 4: ELECTRICAL/ELECTRICAL SERVICES CONTRACTOR/COMPETENT PERSON DETAILS

i. ELECTRICAL CONTRACTOR

- (a) Name of Electrical Contractor : _____
- (b) Company ROC No : _____
- (c) Registration No. with Energy Commission : _____
- (d) Phone number of company : _____
- (e) E-mail address : _____
- (f) Mailing Address : _____

ii. COMPETENT PERSON(S) IN-CHARGED OF INSTALLATION, TESTING & COMMISSIONING WORKS

- (a) Name of Competent Person(s): : _____
- (b) IC No : _____
- (c) Competent Person(s) Certificate No : _____
- (d) Phone number of company : _____
- (e) E-mail address : _____
- (f) Mailing Address : _____

iii. ELECTRICAL SERVICES CONTRACTOR (IF RELEVANT):

- (a) Name of Electrical Services Contractor : _____
- (b) Company ROC No : _____
- (c) Registration No. with Energy Commission : _____
- (d) Name of Competent Person(s) : _____
- (e) IC No : _____
- (f) Competent Person(s) Certificate No : _____
- (g) Phone Number of company : _____
- (h) E-mail address : _____
- (i) Mailing Address : _____

PART 5: SOLAR PV SERVICE PROVIDER DETAILS (IF ANY)

Company Name: _____ Company ROC No: _____
Phone Number: _____ E-mail address: _____
Mailing Address: _____

PART 6: CONSUMER INFORMATION

Installation Address: _____

Supply Voltage Low Voltage (230V/400V) Medium Voltage (11kV/33kV)
 High Voltage (132kV/275kV/500kV)

Solar PV Installation connection to: _____

Solar PV Installation Type Rooftop (Domestic/Commercial/Factory/Warehouse)
 Ground-mounted
 Floating
 Others: _____ (Please provide details)

PART 7: TECHNICAL INFORMATION

(a) Existing maximum demand of electrical Installation _____ kW

(b) Existing average monthly energy consumption _____ kWh

- for consumer less than six (6) months record (*if applicable):

1 month 4 months
 2 months 5 months
 3 months 6 months

(c) Capacity of solar PV installation _____ in kW_p , _____ in kW_{ac}

(d) Estimated energy production per month _____ kWh

(e) Scheduled date of commissioning of solar system: _____ (dd/mm/yyyy)

(f) Installation of Battery Energy Storage System: Yes No

- Battery capacity: _____ kW/kWh
- Battery Manufacturer: _____
- Battery Standard used: _____

(g) Daytime Peak Demand before installing the solar PV installation _____ kW (if available)

(h) Daytime Lowest Demand before installing the solar PV installation _____ kW (if available)

PART 8: SOLAR PV SYSTEM INFORMATION

(a) PV (i) Manufacturer/Model : _____

Module (ii) Type: Monocrystalline Polycrystalline Thin Film
 PERC Dual Facial Others: _____

	(iii) Module Capacity	:	_____	(kW _p)
	(iv) Module Efficiency	:	_____	(%)
	(v) Total Capacity of Modules	:	_____	(kW _p)
	(vi) Reference Yield	:	_____	(kWh/kW _p)
	(vii) Module Weight	:	_____	(kg)
(b) Inverter	(i) Manufacturer/Model	:	_____	
	(ii) Number of Inverters	:	_____	
	(iii) Inverter Capacity (each)	:	_____	
	(iv) Total Inverter Capacity	:	_____	
	(v) Type:		<input type="checkbox"/> Single Phase	<input type="checkbox"/> Three Phase
	(vi) Inverter Input/Output voltage	:	_____	
	(vii) Inverter Input/Output current	:	_____	
	(viii) Rated Power Factor:		___ Adjustable Range: ___ lagging to ___ leading	
	(ix) Inverter Efficiency		_____	

PART 9: DECLARATION OF ELECTRICAL CONTRACTOR UNDERTAKING THE SOLAR PV INSTALLATION WORK

By signing this form, I declare that:

(a) I am representing the applicant of the premise and the information furnished above is true to my knowledge.

(b) I hereby acknowledge that all information given is true and the relevant Authority shall have the right to take any action if the above information is false.

(c) I confirm that the solar PV installation design comply to the relevant International/Malaysian standards and Guidelines for Solar Photovoltaic Installation for Self-Consumption.

(d) I also verify that the site condition is fit for installations of the Solar PV System.

Signature : _____

Name : _____

IC No : _____

Designation : _____

Name of Electrical Contractor : _____

Date : _____

Our. Ref. No :

Date :

Chief Executive Officer
Suruhanjaya Tenaga (Energy Commission)
No. 12, Jalan Tun Hussein, Presint 2
62100 Putrajaya, Malaysia

Dear Sir,

SELCO REGISTRATION: DISCONNECTION OF SOLAR PV INSTALLATION FOR ELECTRICITY BILL ACCOUNT NO:

With reference to the above, I hereby inform that I, (Name of Consumer) (Electricity Bill Account No:) will disconnect and discontinue in use or dismantle from the solar PV installation on (Date - one month before disconnection) at (Address of Premise)

- 2. Please find the attached EC private licence (*if applicable).

Thank you.

Yours sincerely,

.....

(Signature of Consumer)

Name of Consumer:

IC/ROC No.:

Phone No.:



**No. 12, Jalan Tun Hussein
Precinct 2**

62100 Putrajaya

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Fax : +603 8888 8637

Web : www.st.gov.my