

BIPV SYSTEM TESTING AND COMMISSIONING REPORT (SAMPLE)

(A) PHYSICAL INSPECTION SHEET

Project name: Mr Ahmad Ali
 Location: No 1 Jalan Kelana, Ipoh Perak
 PV Capacity: 3.78kWp
 Category: Suria 1000
 Date installed: Aug 2007
 Date commissioned: 12 Sept 2007
 PV Service Provider: Syarikat ABC Sdn Bhd



	SOLAR ARRAY	INVERTER	DC J-BOX	AC CONTROL BOX	MOUNTING STRUCTURE	(OTHERS, please state)
Construction						
<i>Accepted</i>	/	/	/	/	/	
<i>Not accepted because</i>						
Wiring						
<i>Accepted</i>	/	/	/	/	n/a	
<i>Not accepted because</i>						
Grounding						
<i>Accepted</i>	/	n/a	/	/	/	
<i>Not accepted because</i>						
Signage/labeling						
<i>Accepted</i>	/	n/a	/	/	n/a	
<i>Not accepted because</i>						
Documentation						
<i>Accepted</i>	Manuals are provided.					
<i>Not accepted because</i>						

(B) FUNCTIONAL INSPECTION/TEST SHEET

PV ARRAY – DC

Disconnect the array string fuses and/or circuit breakers

Open circuit voltages:

Solar array 1: String 1: 308.5 V
String 2: 307 V

Theoretical values:

Solar array 1: String 1: 340.2 V
String 2: 340.2 V

Insert the array string fuses and/ or turn on the circuit breakers and string disconnect isolators one at a time within array junction box:

Solar Array 1: Voc at input side of array DC main switch: 257 V

Irradiance @ 240 W/m²
Imp = 1.8 A

/ Correct polarity between PV DC main switch and inverter.

INVERTER – AC

Refer to system manual for the inverter and follow start up procedure

Turn on the PV DC main switch followed by PV AC main switch.

/ System connects to grid when main switch turned on and inverter start up procedure was followed:
Vdc at inverter input: 257.6 V

/ Voltage within operating limits of inverter.
Vac at inverter output: 242 V

/ System disconnects from grid when PV AC main switch was turned off.

Initial reading of PV kWh meter : 173 kWh @ 10.30am, 12 Sept 2007

(C) SYSTEM ACCEPTANCE TEST SHEET

Ideal testing conditions are midday on cloudless days. However, this test procedure accounts for less than ideal conditions.

Step 1 Check to make sure that the PV array is in full sun with no shading whatsoever. If it is impossible to find a time during the day when the whole array is in full sun, **only that portion that is in full sun will be able to be accepted. Disconnect all inverter circuit breakers which are not relevant and connect the relevant ones for this test.**

Step 2 If the system is not operating, turn the system on and allow it to run for 15 minutes before taking any performance measurements.

Step 3 Obtain solar irradiance measurement and record irradiance value: _____ W/m².
To obtain percentage of peak sun (i.e. **peak sun factor**), divide irradiance by 1000 W/m² and record the value _____ (example: $692 \text{ W/m}^2 \div 1000 \text{ W/m}^2 = 0.692$ or 69.2%).

Step 4 Measure the module temperature (at the surface) and record the temperature: _____ degrees C.

To obtain the **temperature factor**, calculate using the following formula:
 $(100 - [(T_{\text{mod}} - 25) \times \text{temperature coefficient of the PV module used}]) / 100$,

*Note: **If data is not available, use 0.50 for mono/poly-crystalline modules and 0.25 for amorphous silicon module.*

Step 5 Calculate estimated AC Watt output from the PV system:

- Sum the total of the module ratings and record: 11.88 Watts STC,
- multiply by **peak sun factor** (Step 3),
- multiply by **temperature factor** (Step 4),
- multiply by **inverter efficiency** (if data is not available, take 0.92),
- multiply by **cable losses** (take 0.95),

and record the value: _____ Watts AC-expected.

Step 6 Record AC Watt output from the inverter or system meter: _____ Watts AC-measured.

This recorded Watts AC value in step 5 must be within 90% or higher of WattsAC-estimated recorded in Step 4. If it is less than 90%, the PV system is either shaded, dirty, miswired, fuses are blown, or the modules or inverter are not operating properly.

Repeat procedure for each PV array from Step 1 to Step 5 and fill in values in the table below.

PV array	1st run	2nd run
Nominal power (Wp)	3780	3780
Solar irradiance (W/m ²)	315	319
Peak sun factor	0.315	0.319
Module temperature (C)	35 C	35 C
Temperature factor	0.95	0.95
Inverter efficiency	0.92	0.92
Cable losses	0.95	0.95
Estimated power (W)	988.6	1001
Voltage L1-L2	240	240
Voltage L2-L3	-	-
Voltage L1-L3	-	-
Current L1	3.7	3.8
Current L2	-	-
Current L3	-	-
Measured power (W) (Inverter reading)	888 890	912 950
Factor (Measured/estimated)	0.89	0.91
System acceptance test passed	Yes	Yes
Other information (tilt angle)	20 degrees	20 degrees
Remarks (if any)	-	-

(D) DECLARATION

I hereby certify that the work done on the installation of this BIPV system meets the requirements of MS1837:2005.

PV Service Provider: Syarikat ABC Sdn Bhd
Name: Chong CK

Signature:
Date: 12 Sep 07

Report prepared by: PVSP	Approved by: PTM/MBIPV	Witnessed by: System owner/ TNB rep./PVMC rep
Name: Chong Ck Signature: Company: Syarikat ABC Sdn Bhd Date: 12 Sept 07	Name: Azah Ahmad Signature: Company: PTM Date: 12 Sept 2007	Name: Abdullah A Signature: Company: TNBD Date: 12 Sept 2007

Annex/ Pictures of the BIPV system



PV modules



Inverter



Safety labels are in place



Control box (SPDs, MCCBs and switches)



Manual is made available



Direct feed – TNB and PV meters are located side by side



No drilling to the roof. Cables are properly sealed inside conduit and done neatly.



Retrofitted – PV modules are mounted on the existing roof tiles.