

# Comparison of “ON Grid” & “OFF Grid” Cost & Efficiency in Solar Energy

1. Method	“ON Grid”	“OFF Grid”		
2. Usage	BIPV	Advanced modular BIPV		Stand-Alone PV
3. Energy Source	The 'SUN' supplies PV 500V DC, NO Backup system. 'Power Company' still supplies Mains Electricity 240V AC. <i>(SUN 17% : Power Company 83%)</i>	The 'SUN' supplies PV 24V DC, with 5 Days Backup system. <i>(SUN 100% : Power Company 0%)</i>	The 'SUN' supplies PV 12V DC, with 5 Days Backup system. <i>(SUN 100% : Power Company 0%)</i>	
4. Energy Conversion	DC 500V input >> AC 240V Inverter output>> Mains Electricity 240v >> AC to DC Converter 12v >> DC 12V Equipment	DC 24V input>> AC 240V Inverter output>> AC to DC Converter 12v >> DC 12V Equipment	NO Conversion  DC 12V input>> DC 12V Equipment	NO Conversion  DC 12V input >> DC 12V Equipment
5. Efficiency	20% NO Energy Efficiency. <i>(NO Consideration of Equipment Consumption and Energy Conversion)</i>	20% NO Energy Efficiency. <i>(Consideration of Equipment Consumption, BUT Losing in Energy Conversion)</i>	100% Energy Efficiency. <i>(Consideration of Equipment Consumption and Energy Conversion)</i>	100% Energy Efficiency. <i>(Consideration of Equipment Consumption and Energy Conversion)</i>
6. Consumption Example	50 kWh per Day AC. <i>(ONLY 9kWh from Solar. 41kWh from Mains Electricity)</i> max 5 kWp	50 kWh per Day AC.	5 kWh per Day DC equal 50 kWh per Day AC	0.9 A, 12V DC, 12 Hours per Day.
7. Capital Outlay	3 kWp – RM90,000.00. + 83% monthly bill for ever <i>(Capital outlay is High, Requires Expensive IEC certification for voltages ABOVE 75V)</i>	26 kWp-RM 900,000.00 <i>(Capital outlay is High)</i>	As each part can be purchased as you need it start from RM 1,500.00 or Total RM85,000.00. <i>(Low capital outlay)</i>	As each part can be purchased as you need it start from RM 1,500.00. <i>(Low capital outlay)</i>
8. Backup System	NO Back up power if the Mains fails. No power at night	24 hours power plus 5 Days extra Backup system.	24 hours power plus 5 Days extra Backup system.	24 hours power plus 5 Days extra Backup system.
9. Times of Power function	DAYTIME only. <i>(DC solar power 9kwh, is converted to AC mains power and sent to the Mains grid system. 50Kwh taken back from mains system at full price)</i>	AC power ready for 24 hours.	DC Solar power is ready for 24 Hours. <i>(Fed DIRECTLY to all the household appliances.)</i>	DC Solar power is ready for 24 Hours. <i>(Fed DIRECTLY to all the household appliances.)</i>
10. When Over load	It CAN NOT be upgraded. System has to be changed.	It CAN be upgraded.	It CAN be upgraded.	It CAN be upgraded.
11. Inverter Failure	Complete Failure from any Small problem. <i>(One INVERTER controls the whole system.)</i>	More than one modular INVERTER controls the different sections of system. <i>(NO complete failure if one unit goes out.)</i>	NO INVERTER. <i>(100% Reliable, each part can work INDEPENDENTLY, NO complete failure.)</i>	NO INVERTER. <i>(Very Reliable, 100%)</i>

12. Safety	<b>DANGER of electrocution 500v from very High Voltage PV system or 240v Mains.</b>	<b>DANGER of electrocution from High Voltage system. 240v Mains</b>	<b>SAFE 12v Low Voltage can Not electrocute children playing near wires or PV storage unit.</b>	<b>SAFE 12v Low Voltage can Not electrocute children playing near wires or PV storage unit.</b>
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13. Payback Period	<p style="text-align: center;"><b>SOLAR POWERS ONLY 17% OF THE HOUSE POWER.</b></p> <p style="text-align: center;"><b>In FACT, you NEVER STOP paying the bill every month, (83% still to pay) So, it is NEVER PAID UP.</b></p> <p style="text-align: center;">Example: Monthly bill is RM500. Pay RM90,000 Capital for BIPV :-</p> <p>A) <i>PAY RM90,000 For a 3kWp BIPV system, Monthly bill is RM500 and monthly PV rebate approximately RM85. You must continue to PAY RM415 a month. The bill is never paid off – NO repayment available. RM415 will increase when cost of Electricity increases. ( Solar Panel life span 25 years) and YOU NEVER STOP paying the monthly bill.</i></p> <p>B) <i>ATERNATIVE: Pay the RM90,000 OFF your bill, in advance, to the power company, to STOP the monthly bill of RM500 for 15 years. Payback period is 15 years on this alternative.</i></p> <p style="text-align: center;"><i>*Do you ask for pay back period when you buy a car?</i></p>	<p style="text-align: center;"><b>NO BILL FROM THE POWER COMPANY SOLAR POWERS 100% OF THE HOUSE POWER</b></p> <p style="text-align: center;">Example: Monthly bill saved is RM500 Pay RM900,000 Capital for BIPV, AC whole house powered :-</p> <p>A) <i>PAY RM900,000 For a 30 kWp BIPV system, Monthly bill is Zero. No rebate. ( Solar Panel life span 25 years) Saving of RM500 bill per month has a repayment of RM150,000 in 25 years. NEVER PAID UP</i></p>	<p style="text-align: center;"><b>NO BILL FROM THE POWER COMPANY SOLAR POWERS 100% OF THE HOUSE POWER</b></p> <p style="text-align: center;">Example: Monthly bill saved is RM500. Pay RM85,000 Capital for BIPV, DC whole house is powered :-</p> <p>A) <i>PAY RM85,000 For a 3 kWp BIPV system, Monthly bill is Zero. No rebate. ( Solar Panel life span 25 years) Saving of RM500 bill per month has a repayment of RM85,000 in 15 years.</i></p>	<p style="text-align: center;"><b>NO BILL FROM THE POWER COMPANY SOLAR POWERS 100% OF THE HOUSE POWER</b></p> <p style="text-align: center;">Example: NO Monthly bill. Pay RM1,500 Capital for small system :-</p> <p>A) <i>PAY RM1,500 For a lighting system, Monthly bill is Zero. No rebate. ( Solar Panel life span 25 years) No monthly bill to save</i></p> <p style="text-align: center;"><i>*What is the payback period of normal Electricity supply?</i></p>
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Description :-

1. **On Grid** : Connected to the 240v Mains supply of the National Grid
2. **Off Grid** : NOT connected to the 240v Mains supply of the National Grid
3. **Energy Efficiency** : Description
4. **BIPV** : Building Integrated Photovoltaic. The Solar panels are built into the structure of the house.
5. **Stand-Alone** : Solar Panels are not part of the structure and no mains supply is available.
6. **PV** : Photovoltaic. Solar panels that make Electricity directly from Sunlight
7. **DC** : Direct current. Like a battery.
8. **AC** : Alternating current. Like the Mains 240v supply where the + & - change.
9. **Inverter** : A unit that converts battery voltage into AC Mains voltage.
10. **Converter** : A unit that converts AC mains voltage back to DC battery voltage.
11. **Consumption** : The amount of energy used.
12. **Certification** : An International body has examined and certified that a Solar Panel is safe to use.
13. **Backup** : Power storage that will keep a system working when there is no Sunshine.

**14. Over Load** : *When more power is used than was available.*

**15. Safety** : *Description*

**16. Payback** : *Description*