

Hybrid Storage Systems

2016

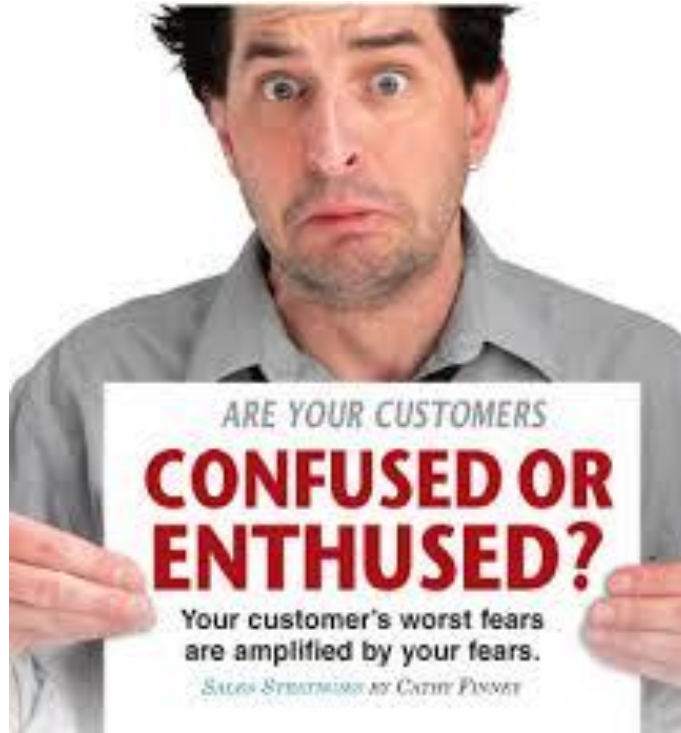
Craig Hunter

Business Development Manager Selectronic Australia



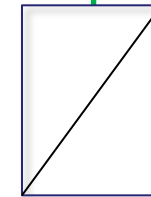
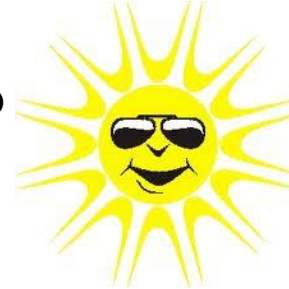
POWER

www.selectronic.com.au
PERFORMANCE PASSION



Grid Connect as we know it

Sun up



Grid Tie inverter



Peak price

Export excess PV to grid for $\approx 6 - 8c$



Grid Connect as we know it

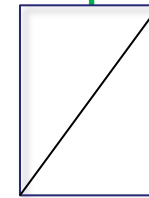
After Sun Down



After Sun down



Buy back your excess solar \approx
12 - 52c/kWh



Grid Tie
inverter



Peak price

Grid Tie Systems

- Cost effective.
- Efficient and Simple.
- Self consume Solar is only option
- Only works when grid is available

So why are domestic customers asking about storage?

- You want choices
- You want energy independence
- You want cheaper electricity
- You want energy security

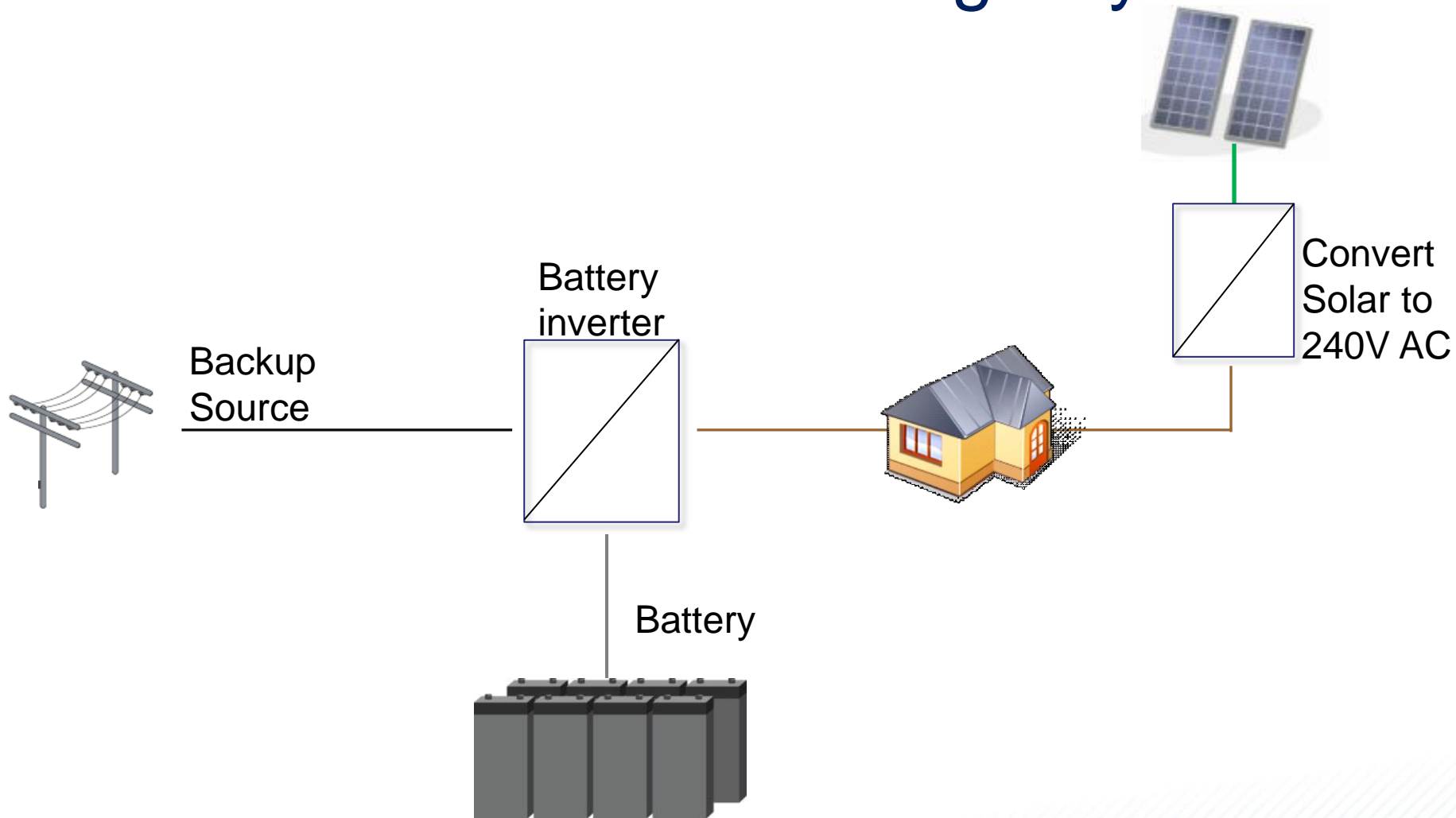
Why are Commercial customers asking about storage?

- You want cheaper electricity
- You want energy security

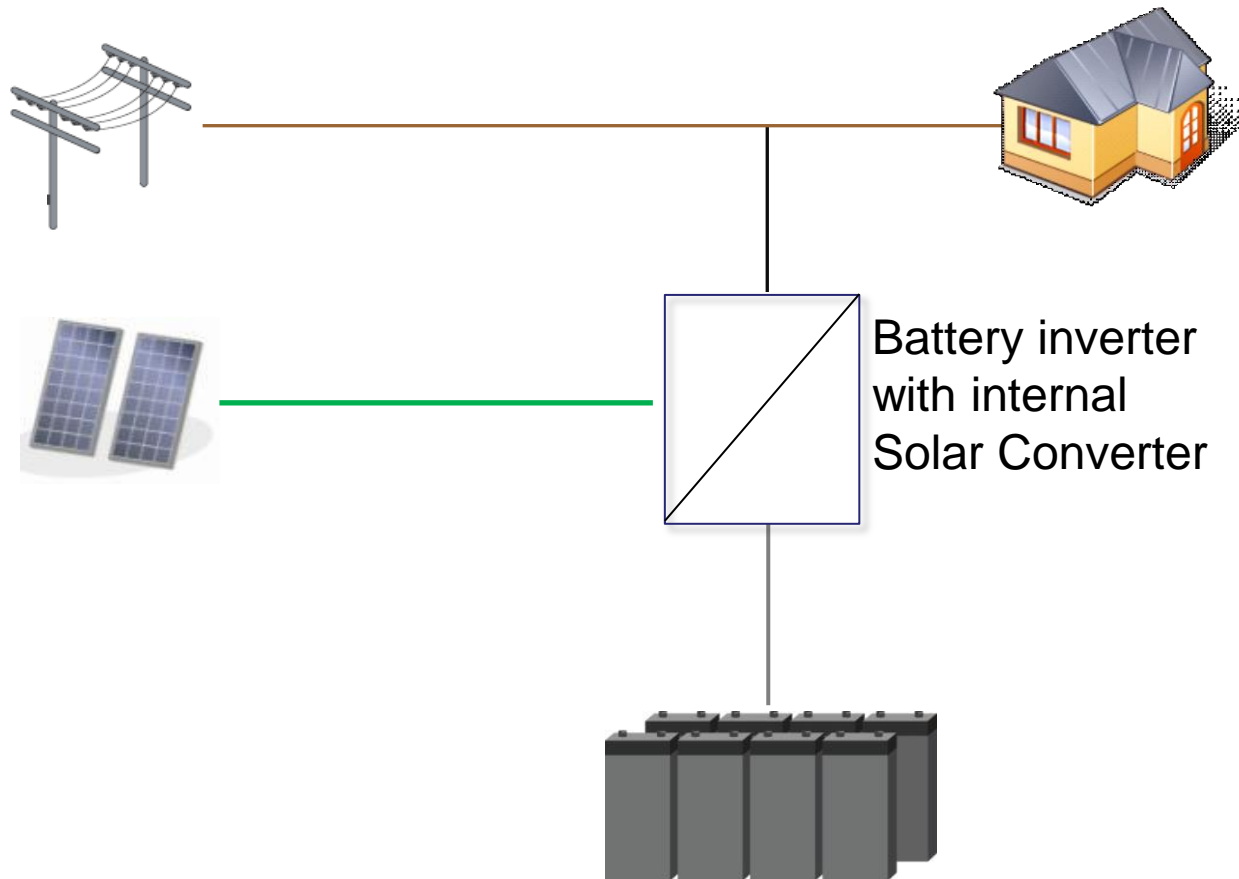
The Market

- Looking/Anticipating change.
- Premium Feed In tariffs coming to an end.
- Utilities concerned, technically and commercially.
- Unrealistic expectations.

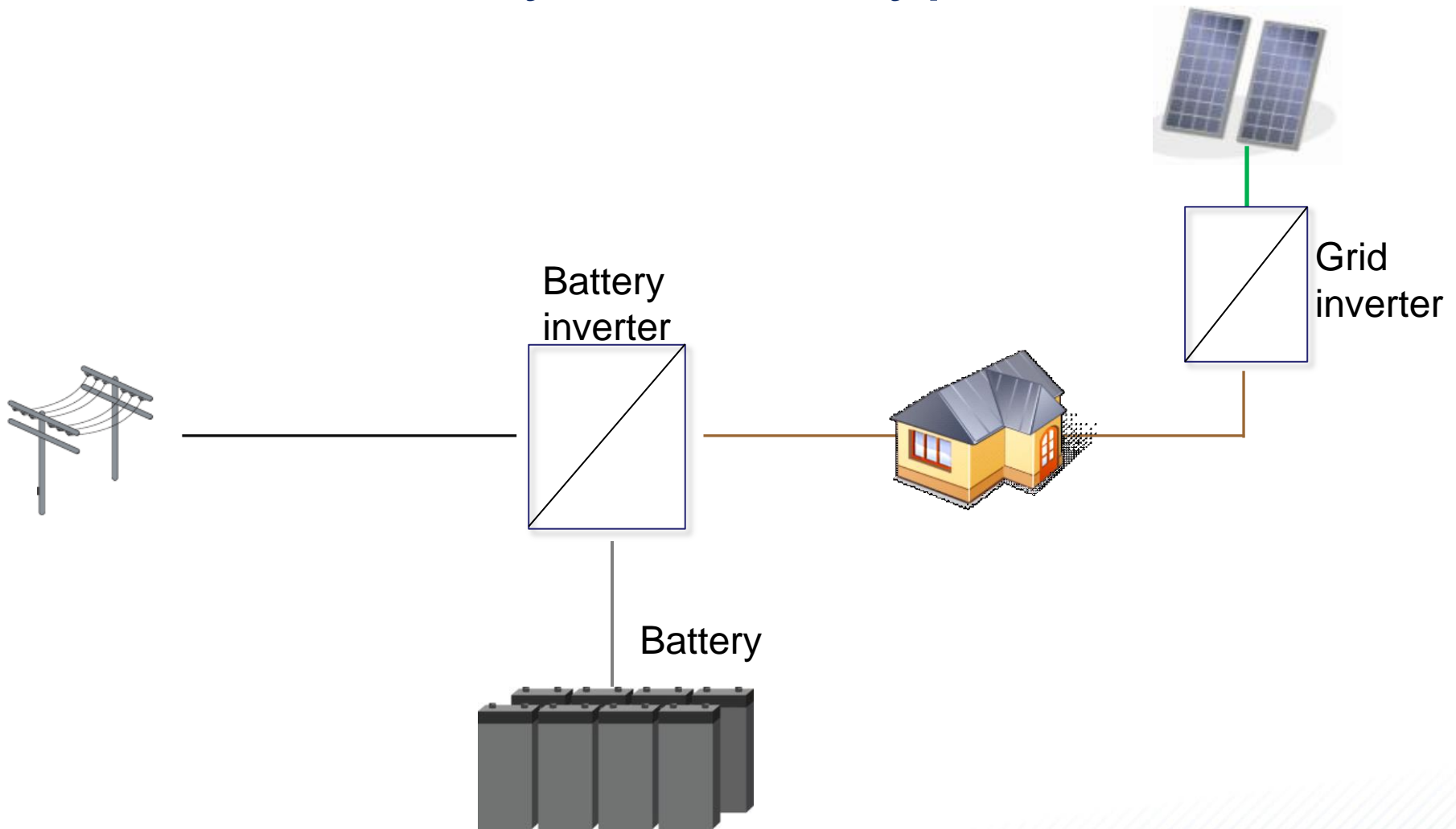
What is needed for a Storage System



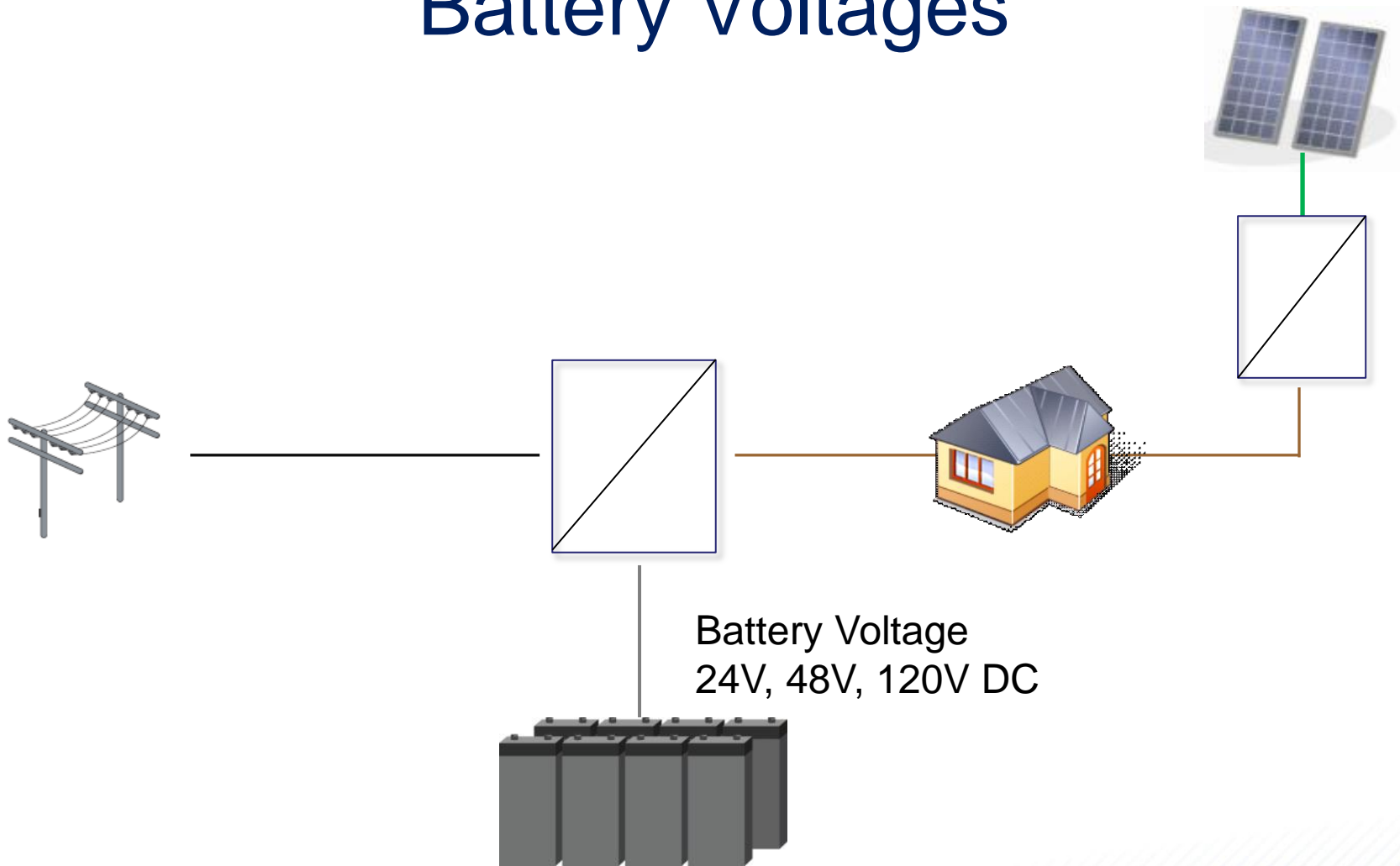
Battery Inverter types



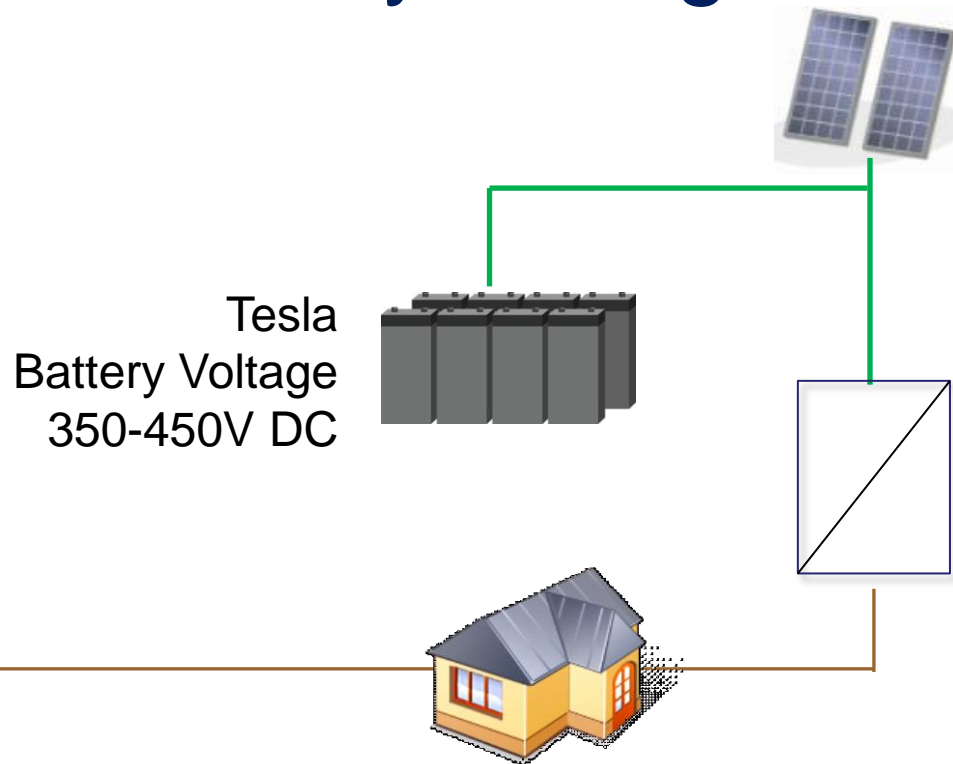
Battery Inverter types



Battery Voltages



Battery Voltage



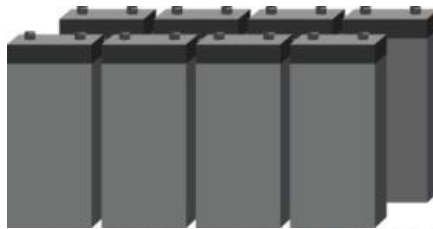
Inverter brands

Battery inverter & Solar converter in one.

- Redback
- Solax

Separate components

- Selectronic
- SMA
- Schneider
- Outback



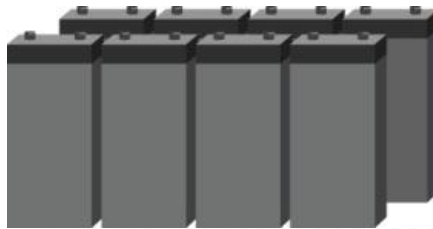
Battery types and brands

Lithium

- LG
- Sonnenschein
- Samsung
- Tesla

Saltwater

- Aquion



Battery types and brands

Zinc Bromide

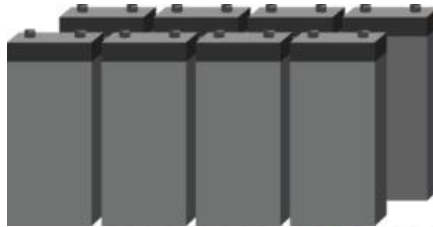
- Redflow

Advanced Lead Acid

- Hitachi
- Ultra Battery

Sodium Nickel Chloride

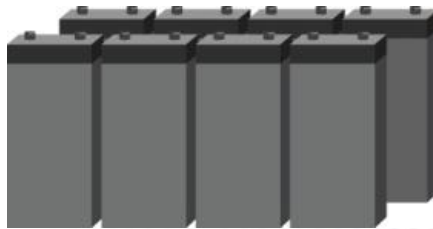
- FIAMM



Battery types and brands

Lead Acid

- Sonnenschein
- Hoppecke
- BAE
- Exide
- Raylite



Storage approaches

All in one system. Includes batteries, solar converter, battery inverter.



Storage approaches

Discrete components.
Maximum flexibility. Upgrade
existing Solar

Battery Inverter



Solar Converter/
Grid Tie inverter



Batteries

Hybrid applications

Energy shifting 100% grid

+

Capacity increase/decrease Peak Lopping

+

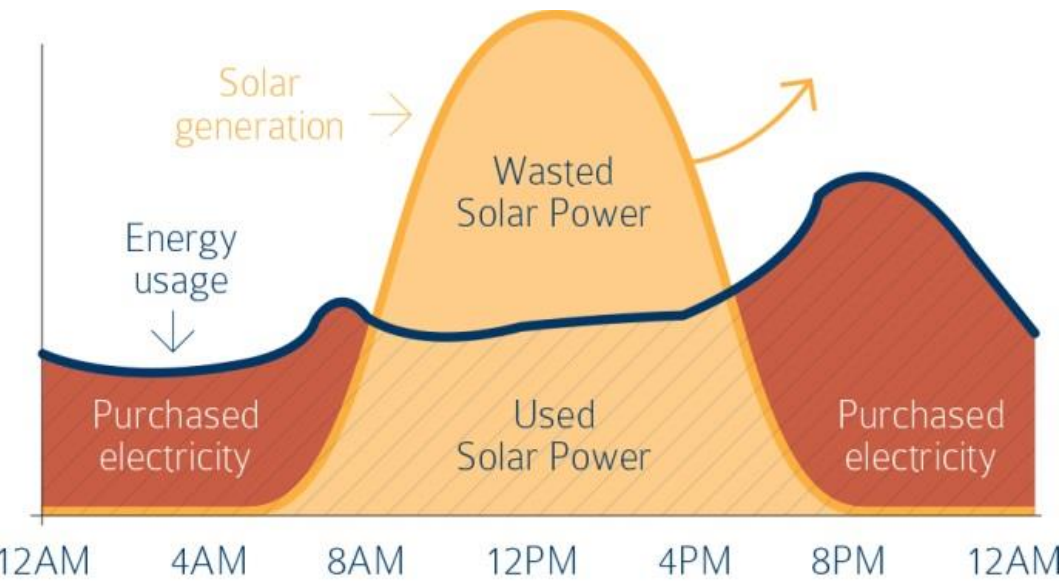
Grid Back up /UPS mode

+

Avoid High Tariff periods

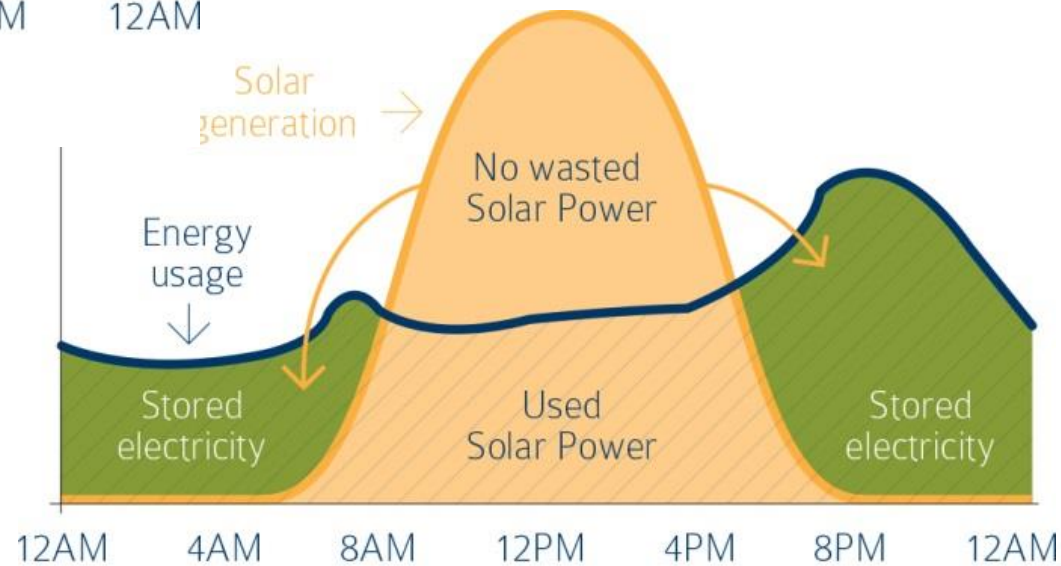
+

Take me Off the grid completely



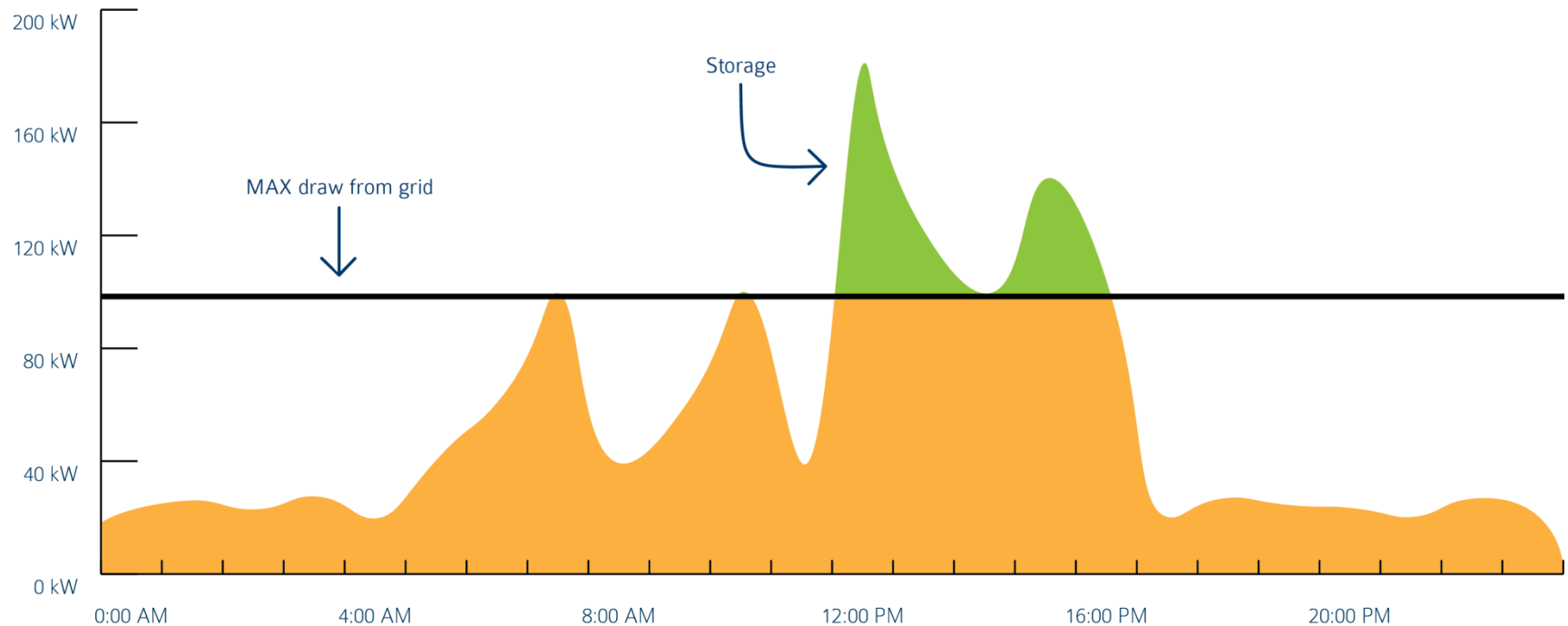
Without Batteries

Energy shifting

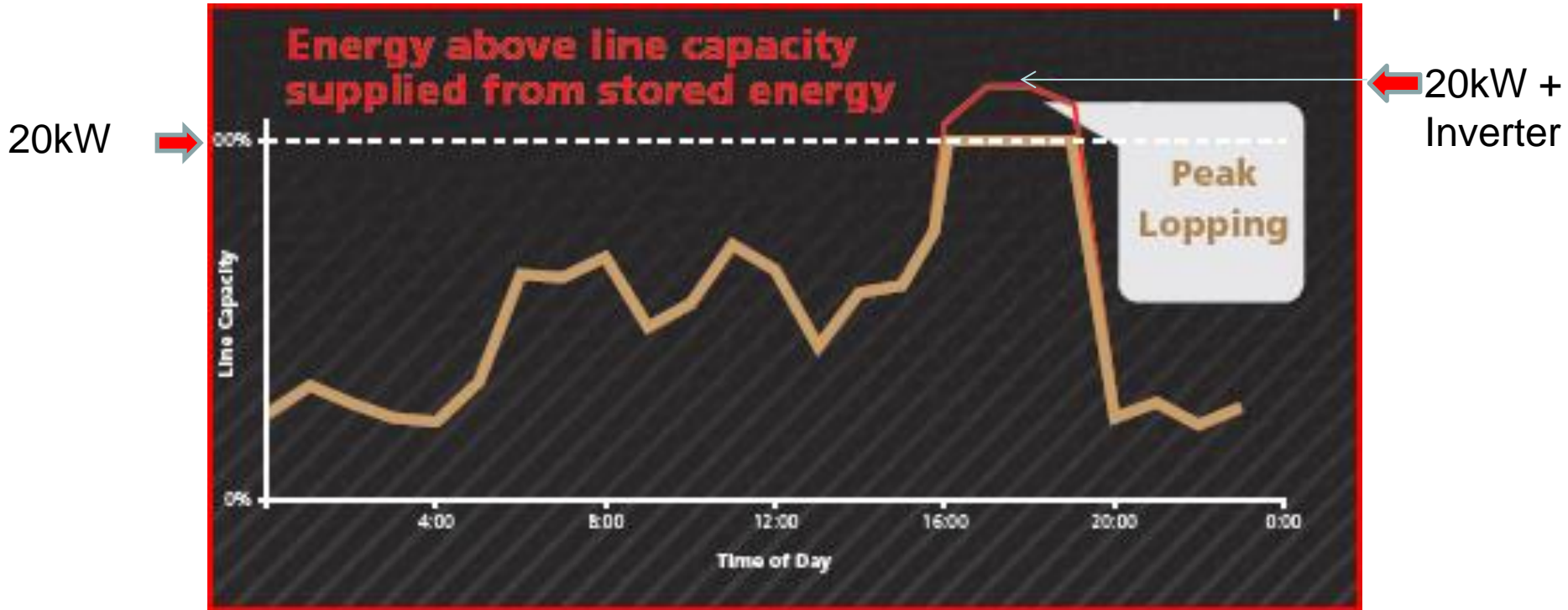


With Batteries

Commercial application- reducing supply capacity charges (peak shaving)

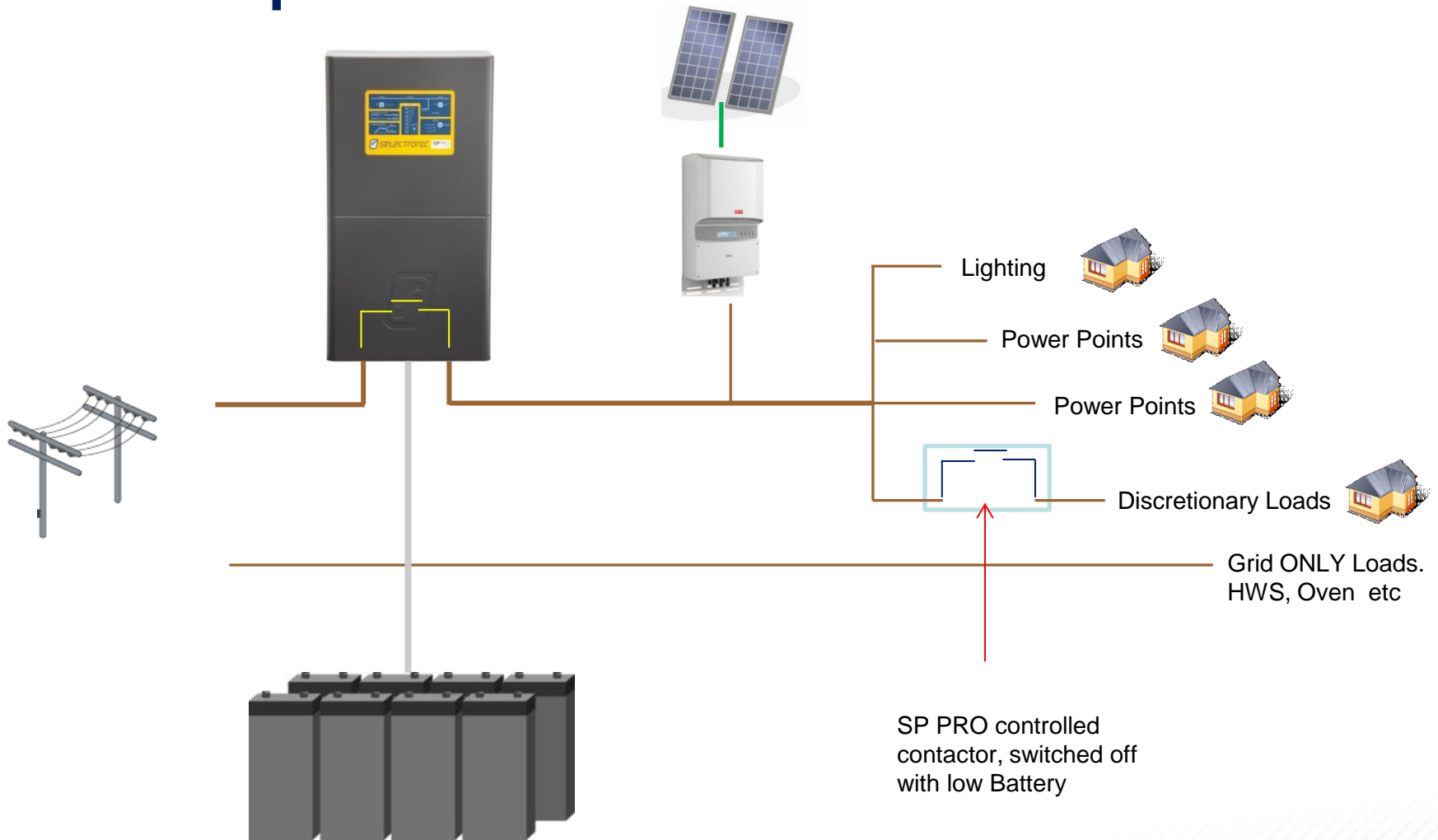


Rural SWER line with limited capacity



PV Optional

Backup some circuits or all circuits



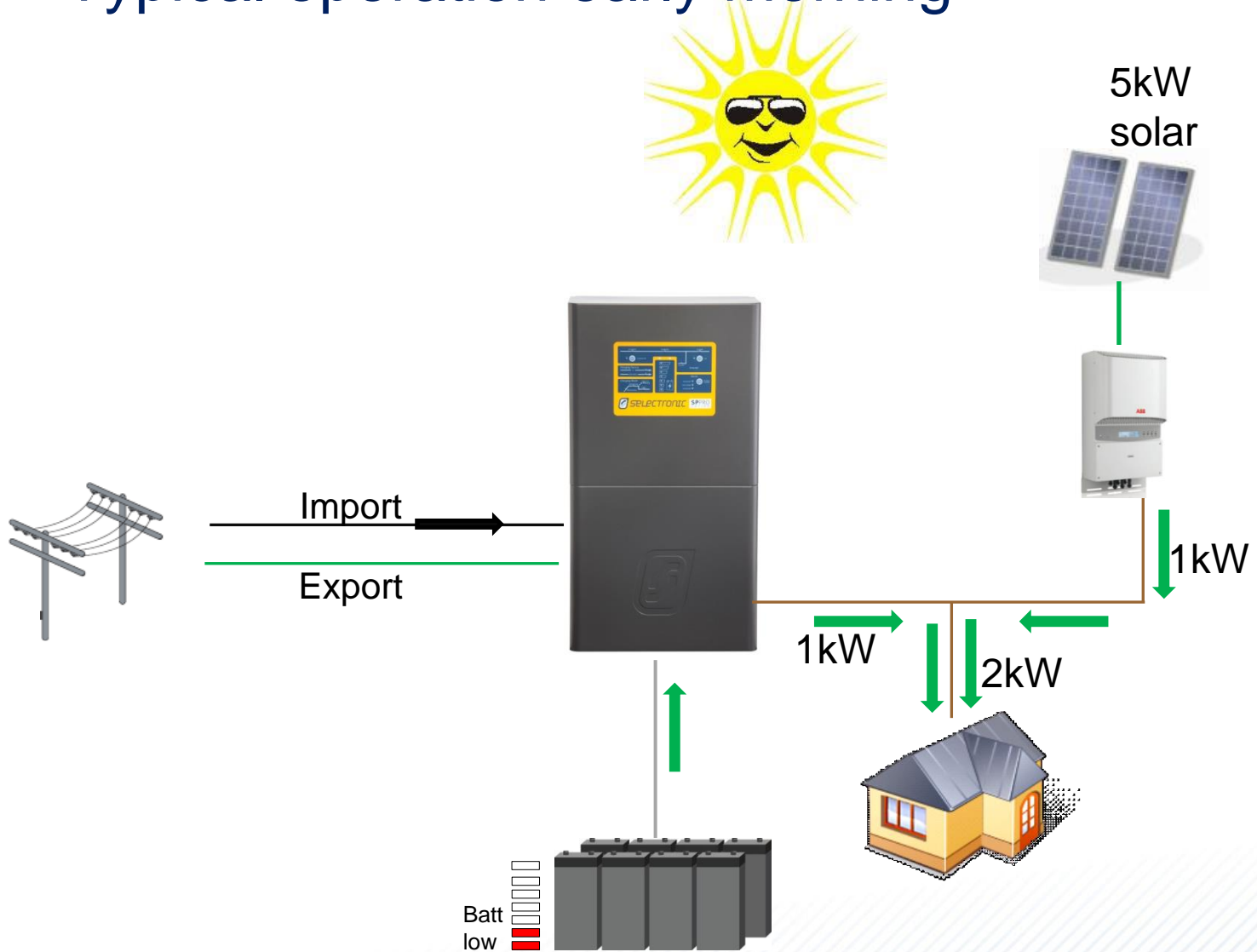
What can a good storage system do?

- Provide backup in a grid outage
- Allows Solar to continue operating during outage
- Send excess Solar to batteries instead of grid
- Recharge batteries from grid when/if you choose
- Use the grid when you want to continued.....

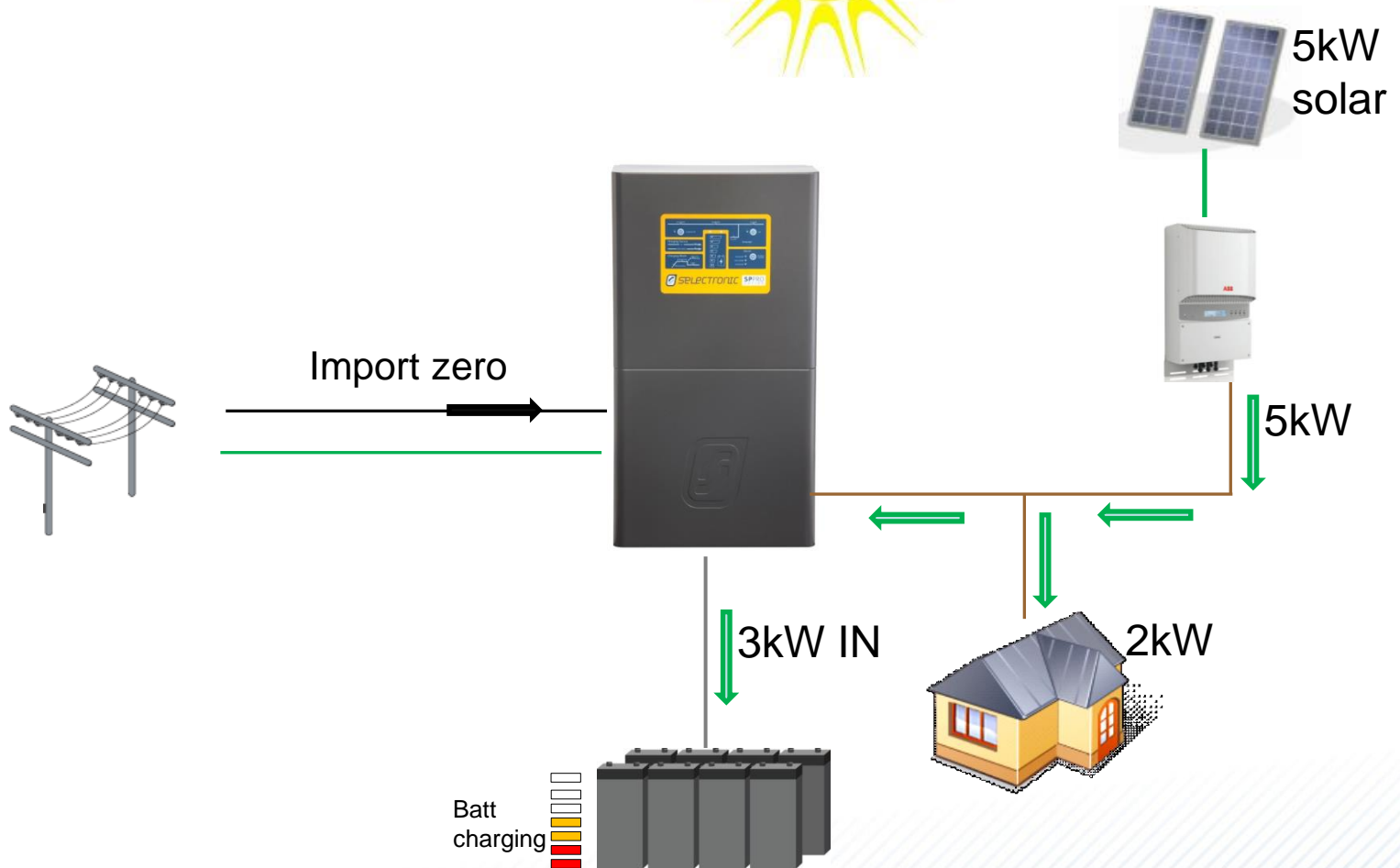
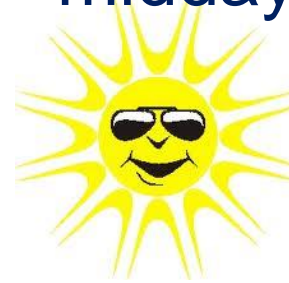
What can a good storage system do do?

- Increase grid capacity
- Cap grid capacity

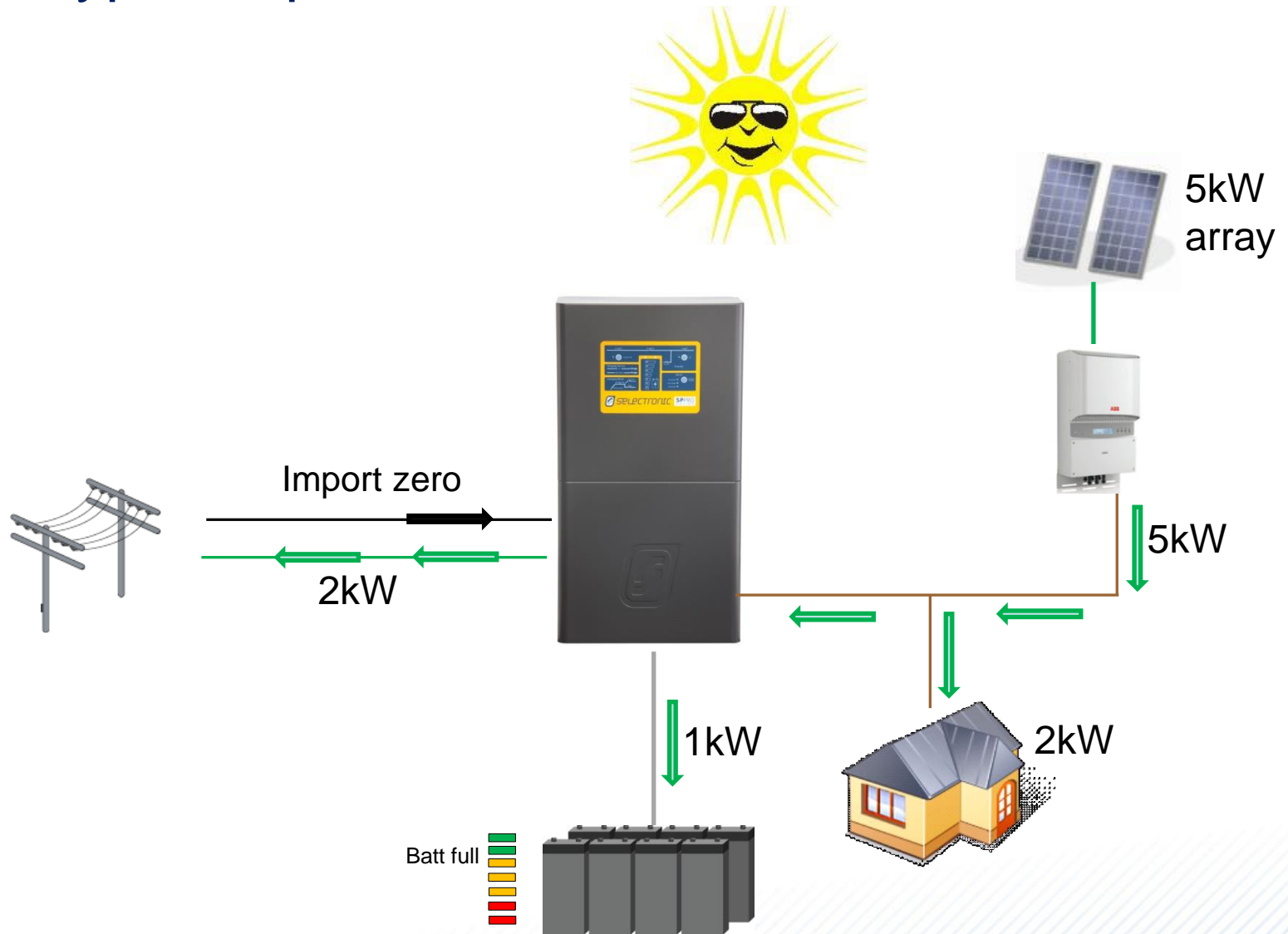
Typical operation early morning



Typical operation - midday

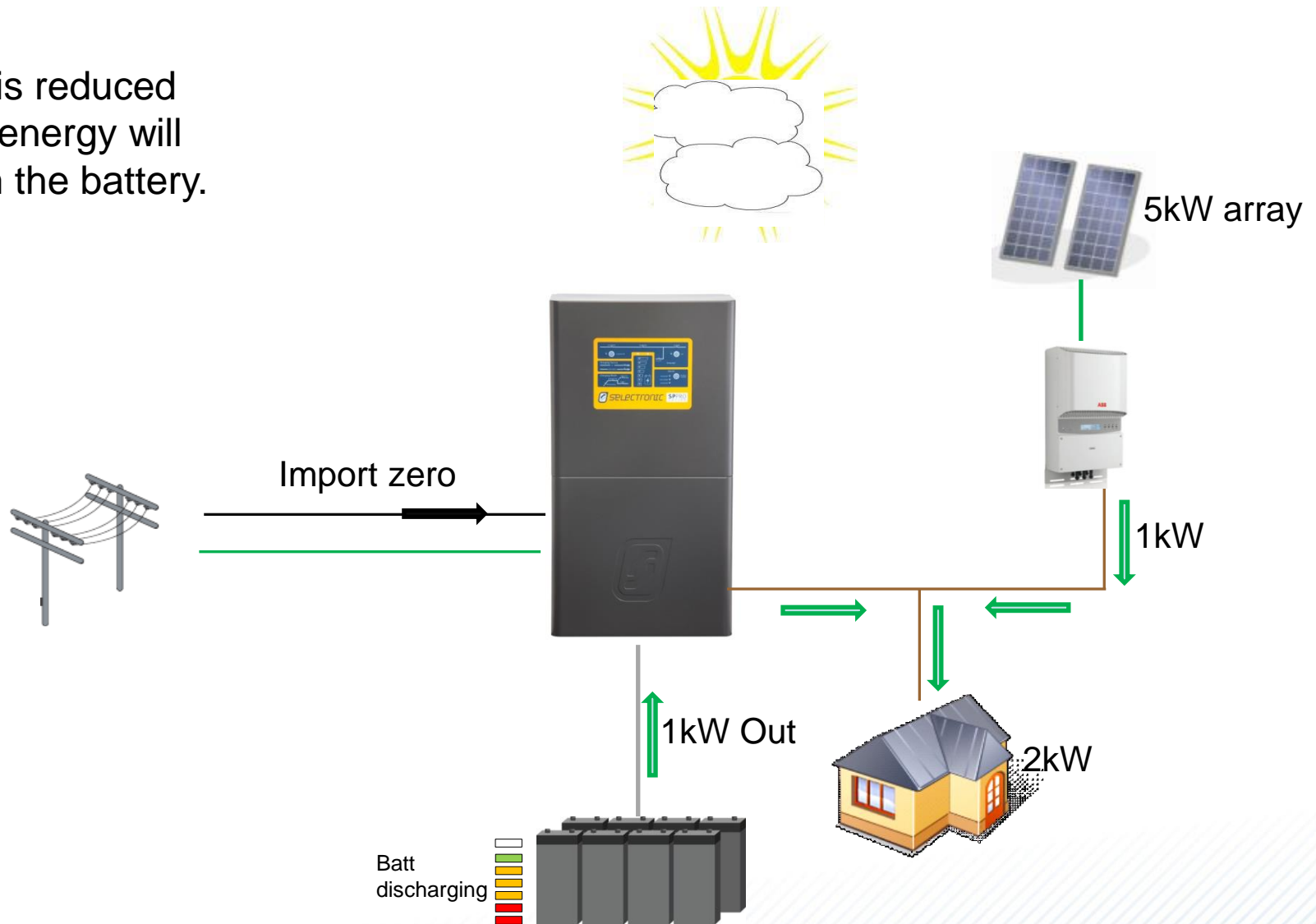


Typical operation – mid afternoon



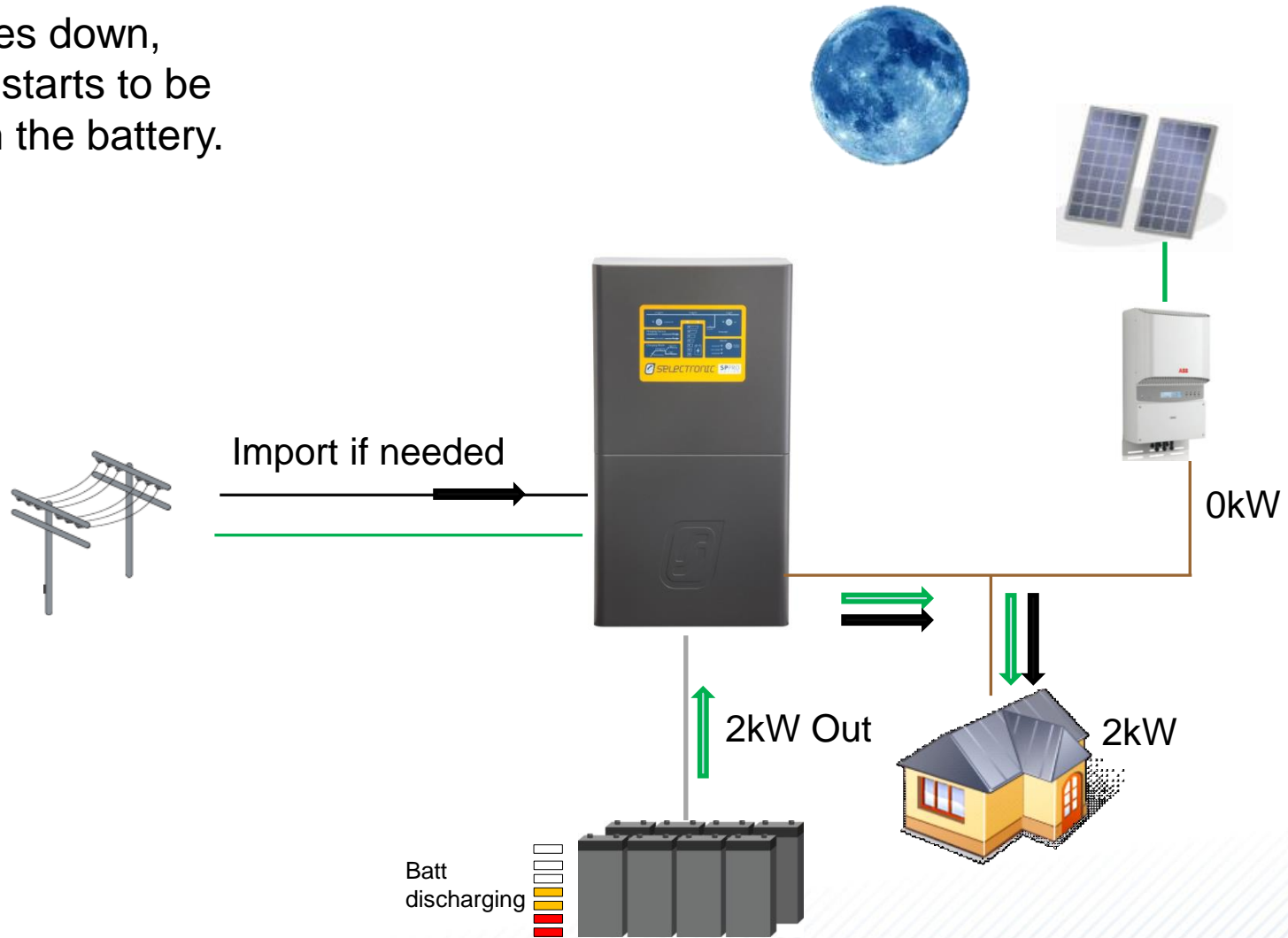
Typical operation – mid afternoon clouds

When PV is reduced additional energy will come from the battery.



Typical operation – sundown.

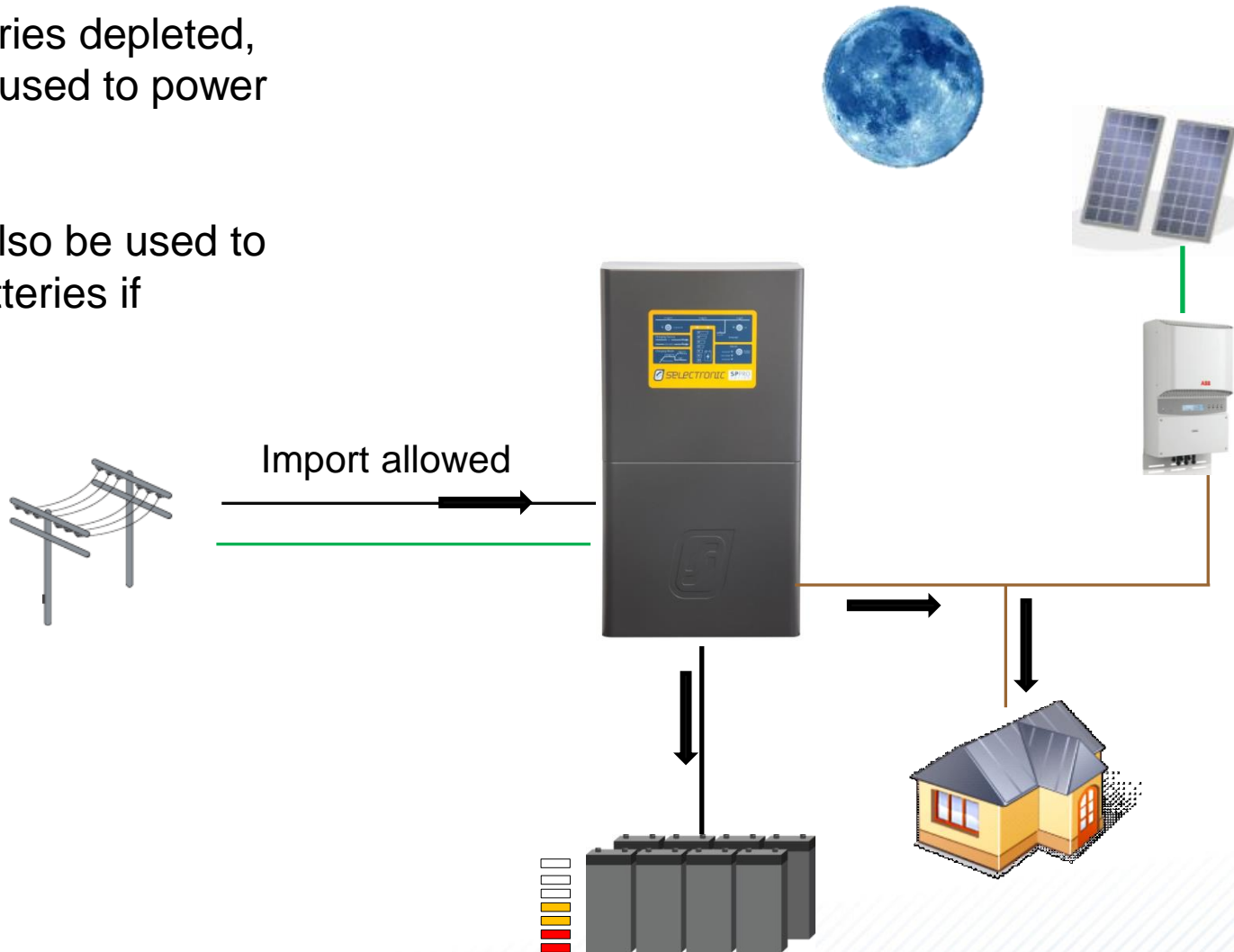
As sun goes down,
stored PV starts to be
taken from the battery.



Typical operation – battery depleted.

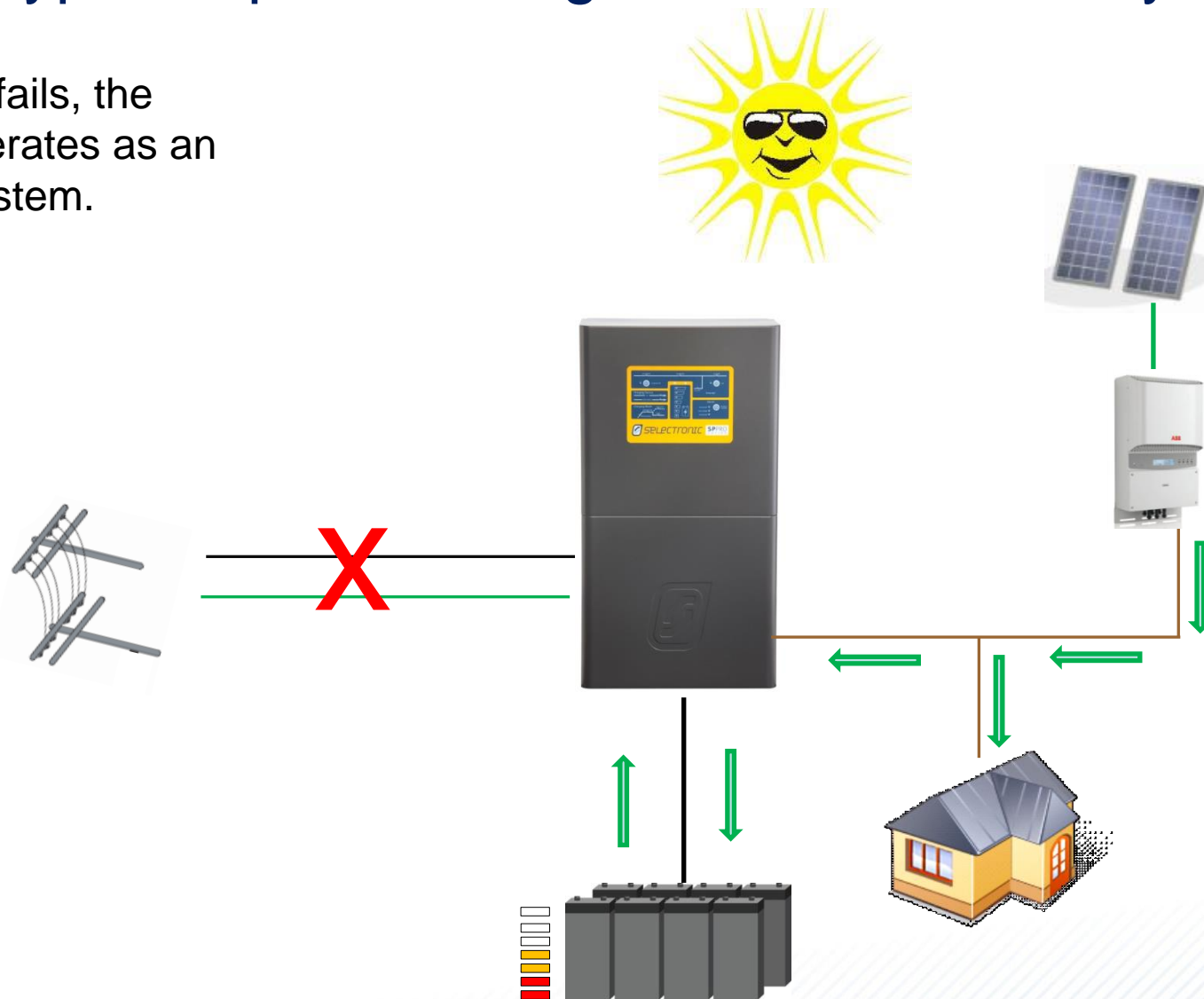
After batteries depleted, the grid is used to power the load.

Grid can also be used to charge batteries if desired.



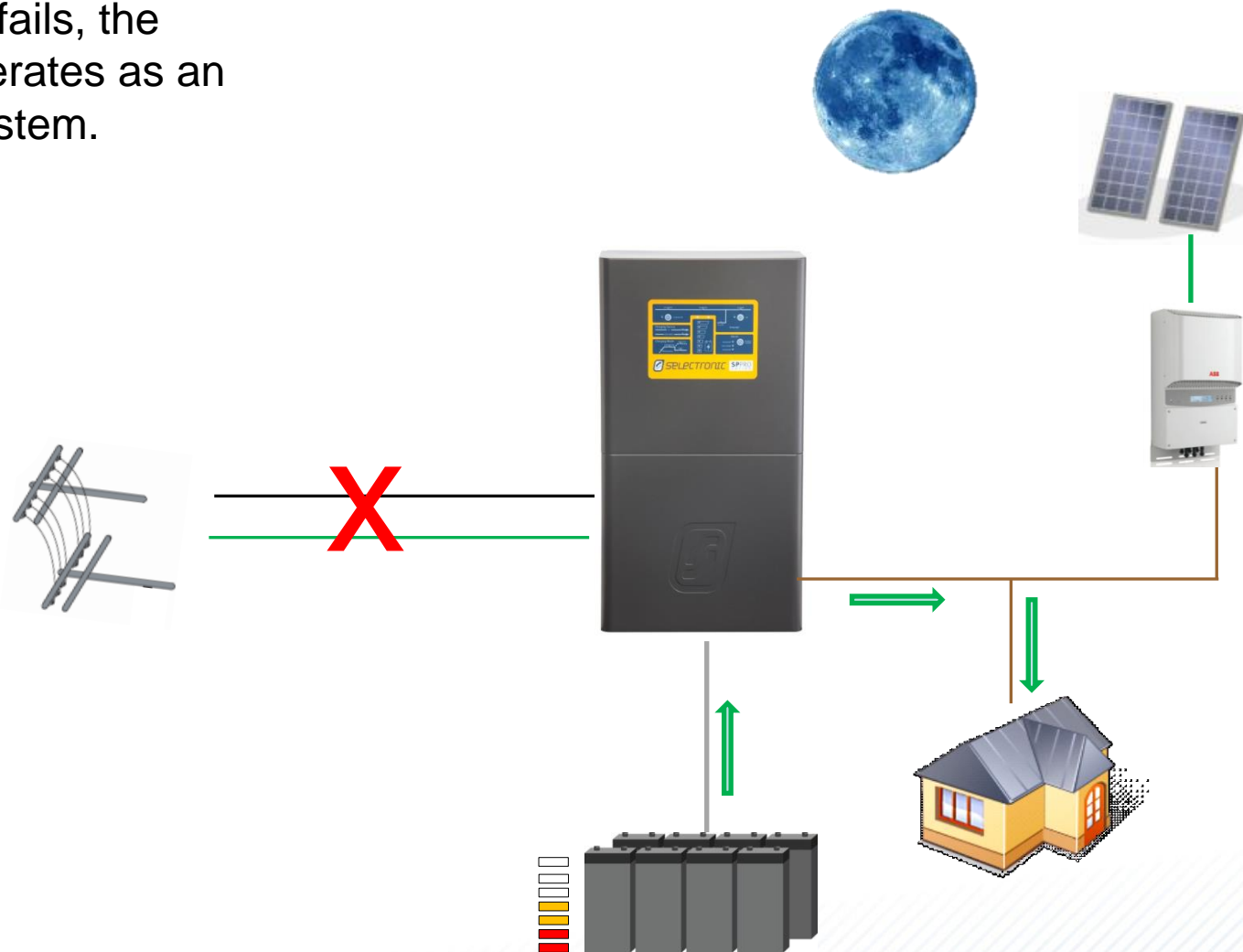
Typical operation – grid failed and sunny.

When grid fails, the system operates as an Off Grid system.



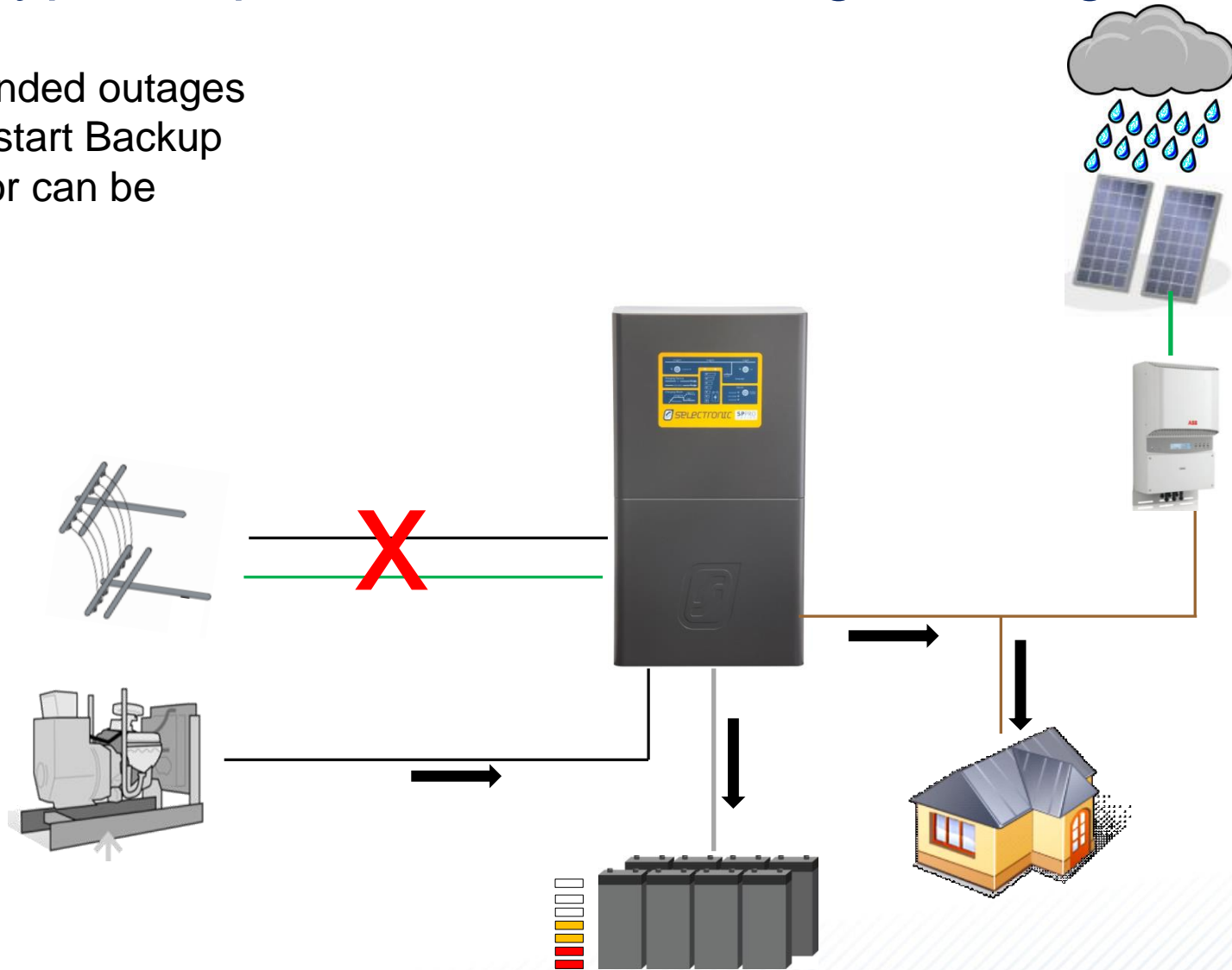
Typical operation – grid failed no sun.

When grid fails, the system operates as an Off Grid system.

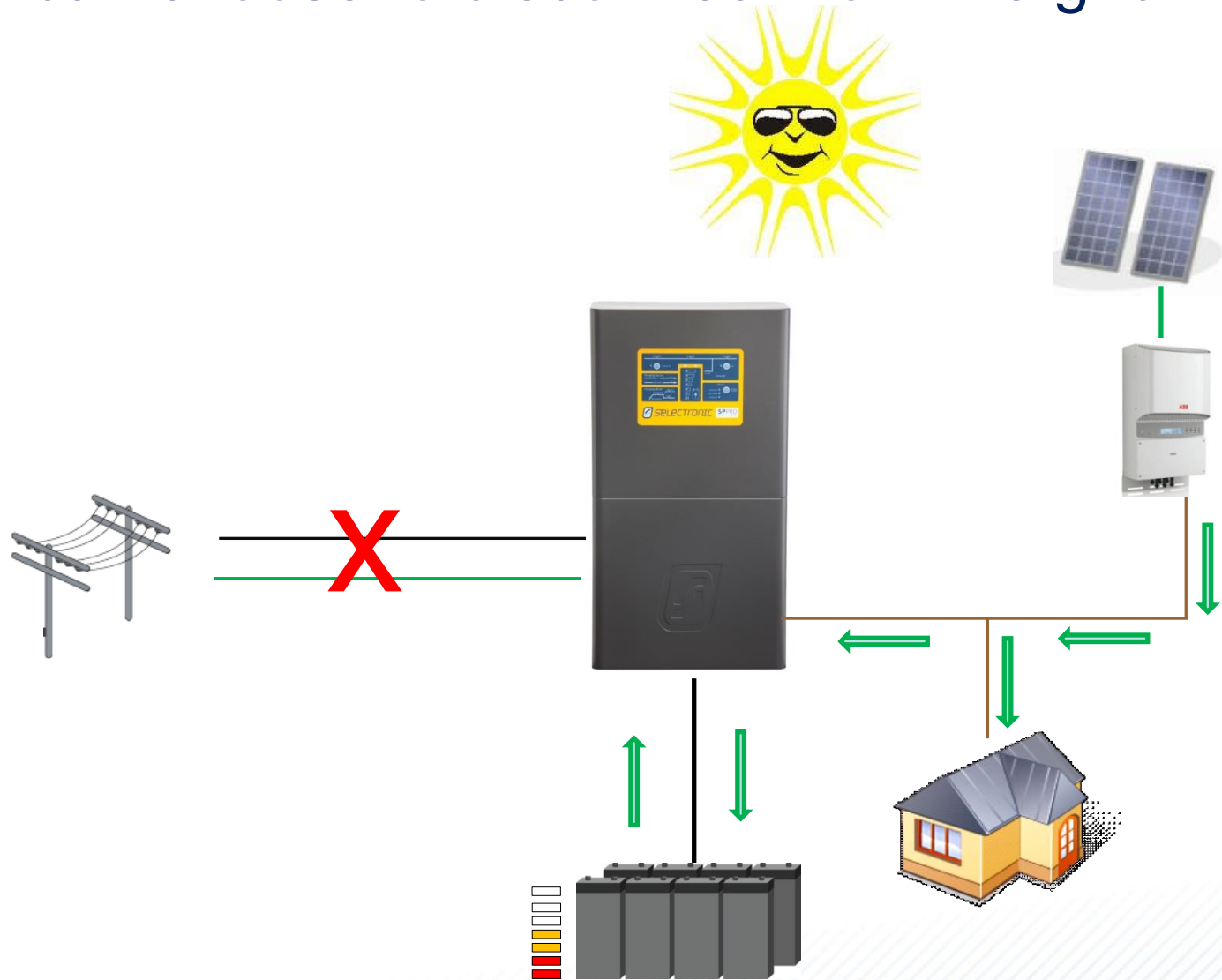


Typical operation – extended grid outage.

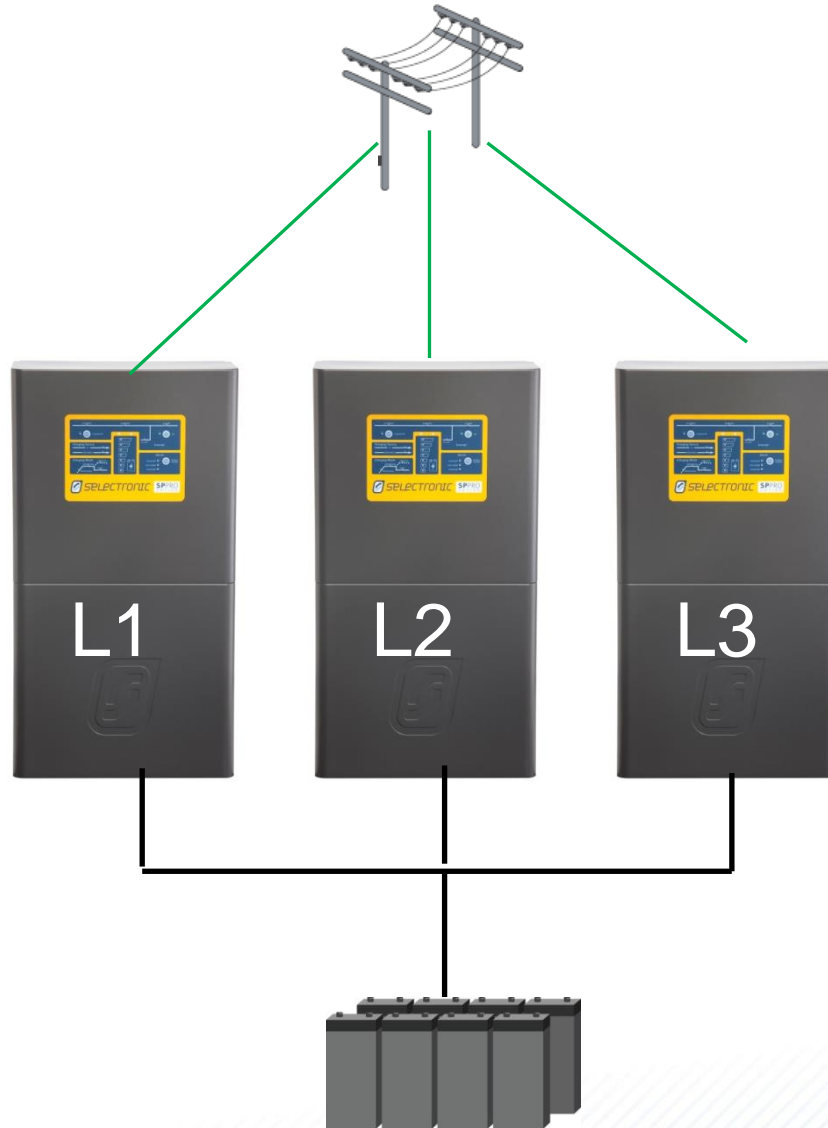
For extended outages an auto start Backup generator can be utilised.



You can choose to disconnect from the grid



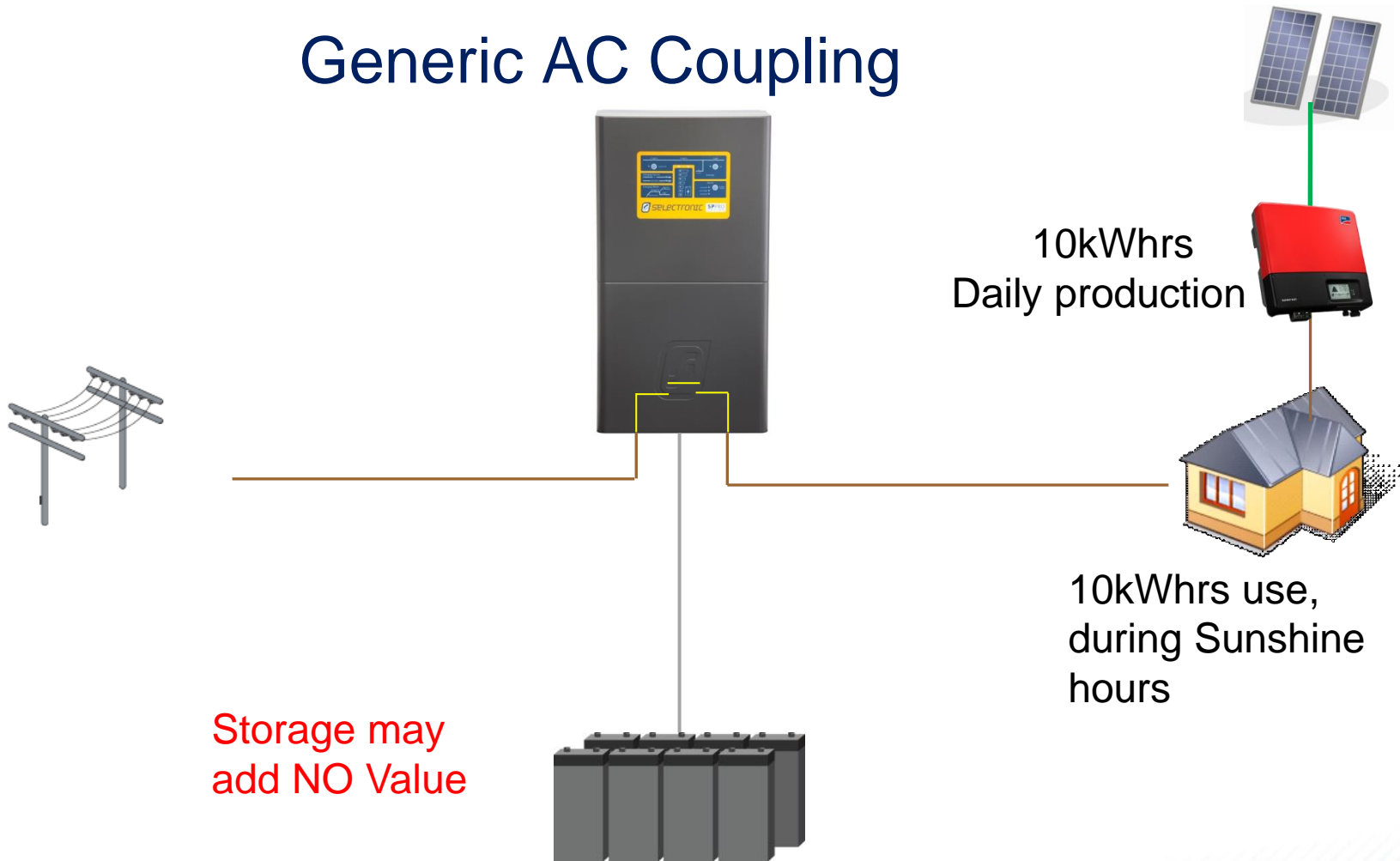
Three Phase



Common battery bank allows energy to be shared between phases.

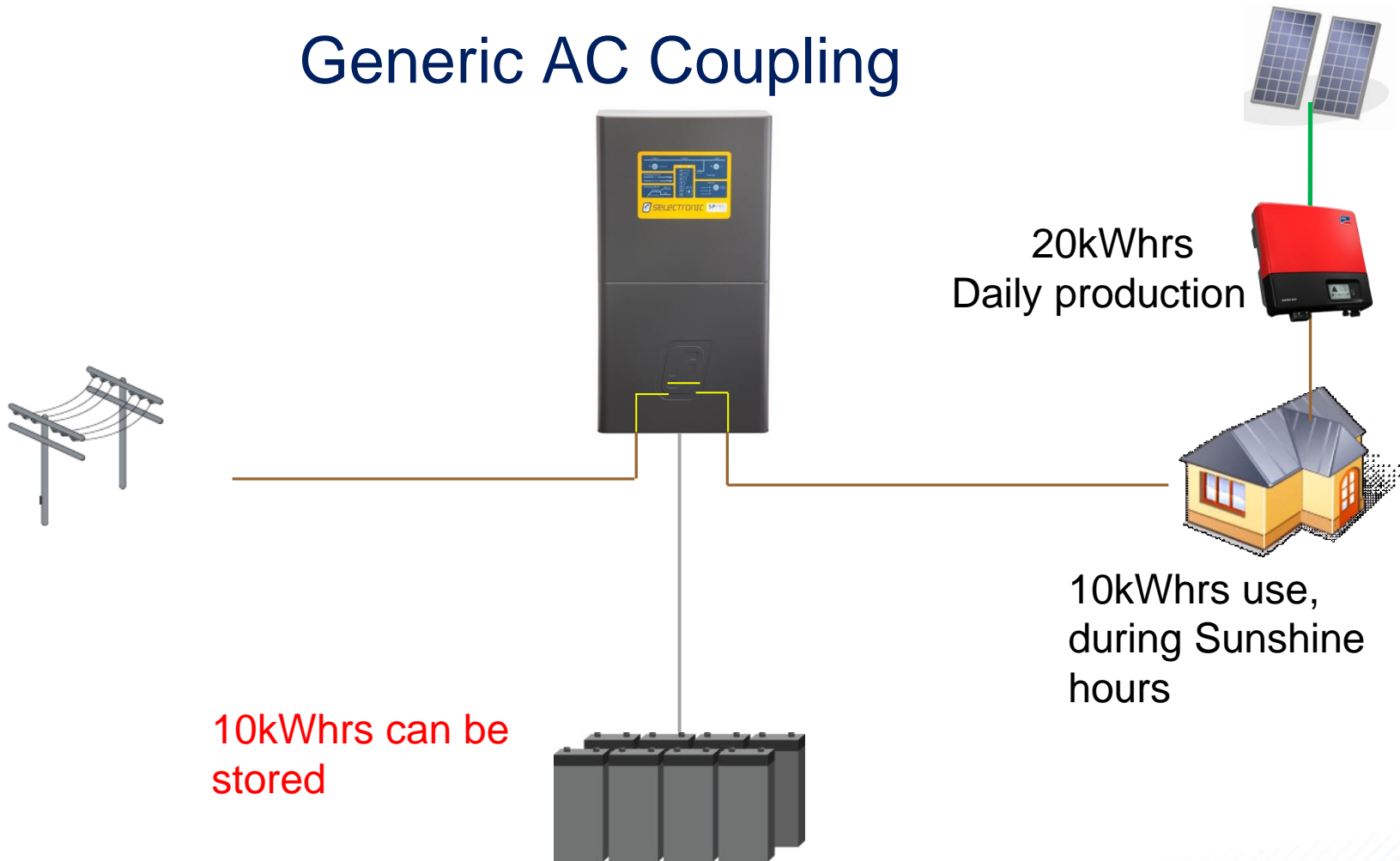
Scenario #1

Generic AC Coupling

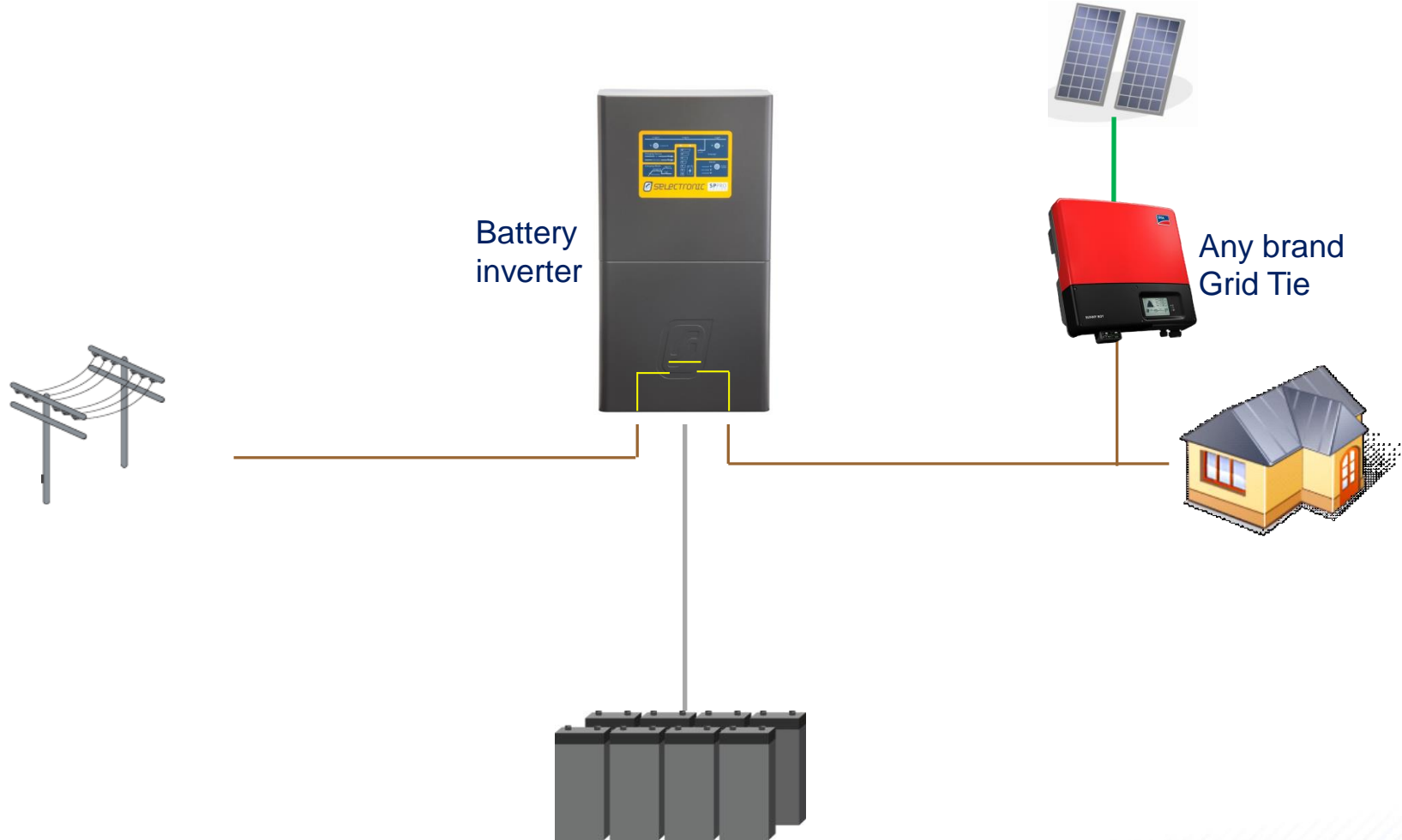


Scenario #2

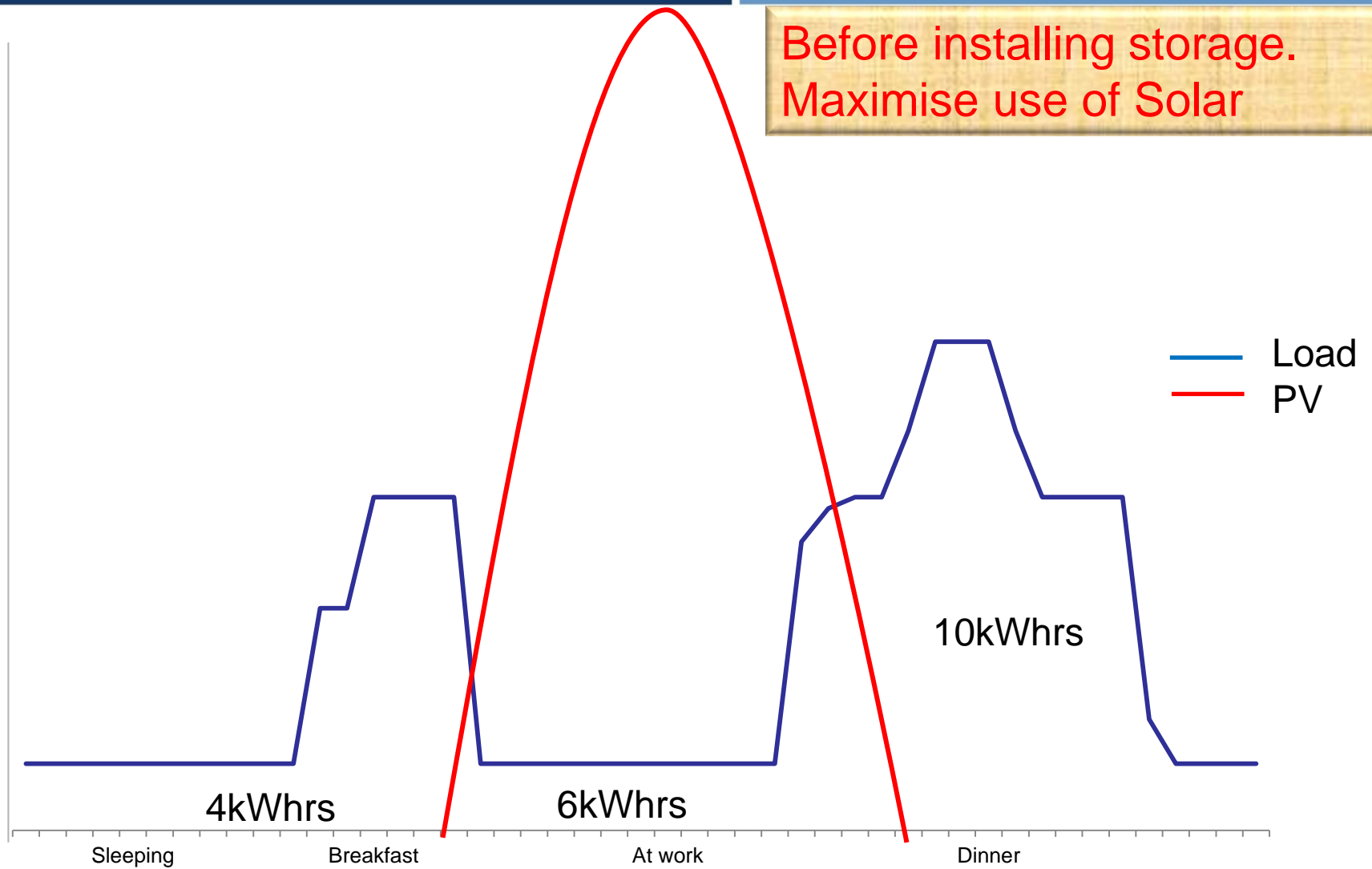
Generic AC Coupling



Retrofitting to existing system

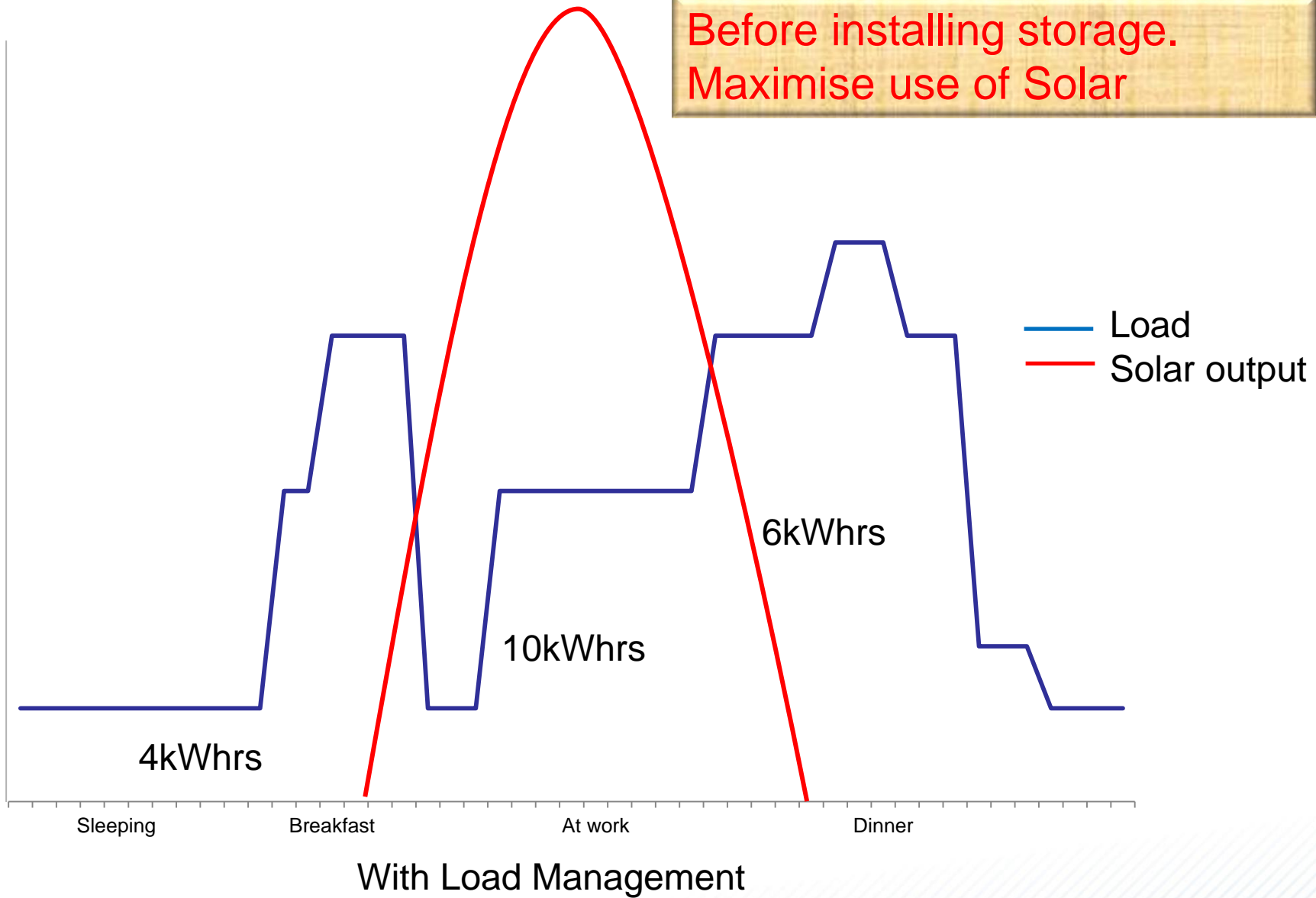


Before installing storage.
Maximise use of Solar



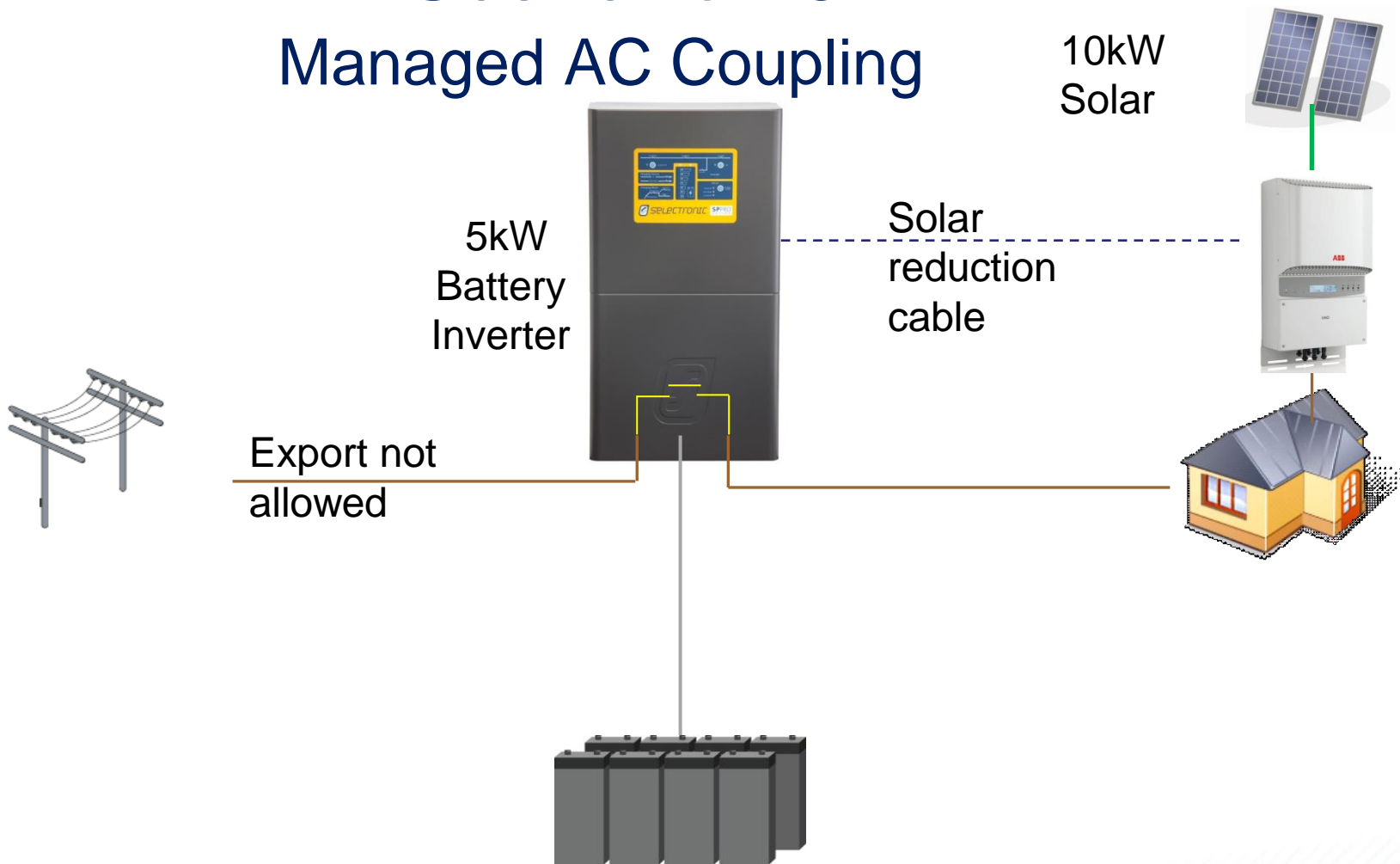
No Load Management

Before installing storage.
Maximise use of Solar



Scenario #3

Managed AC Coupling

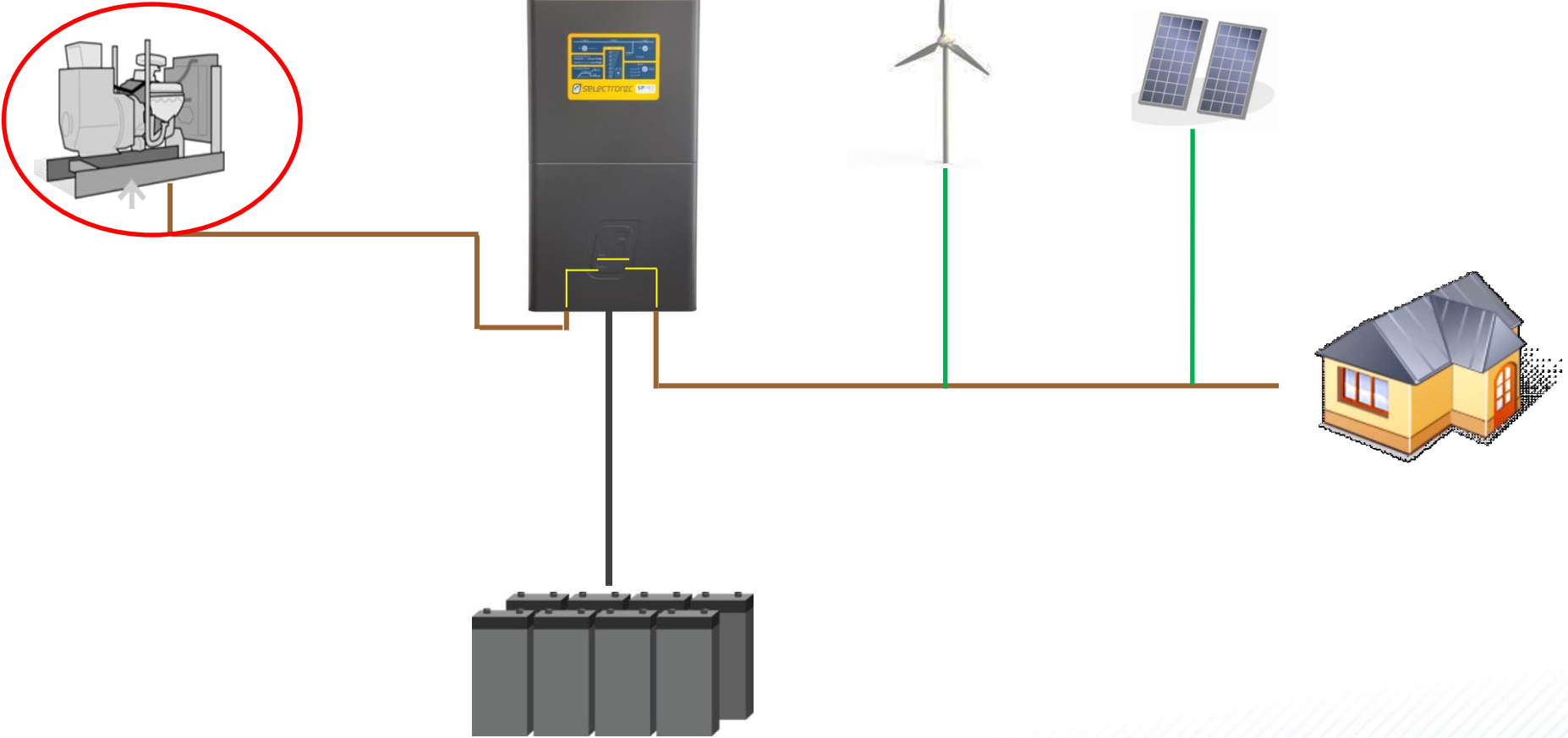


The questions

- Can I disconnect the meter so I can save the network capacity charges?

Off Grid

Backup source

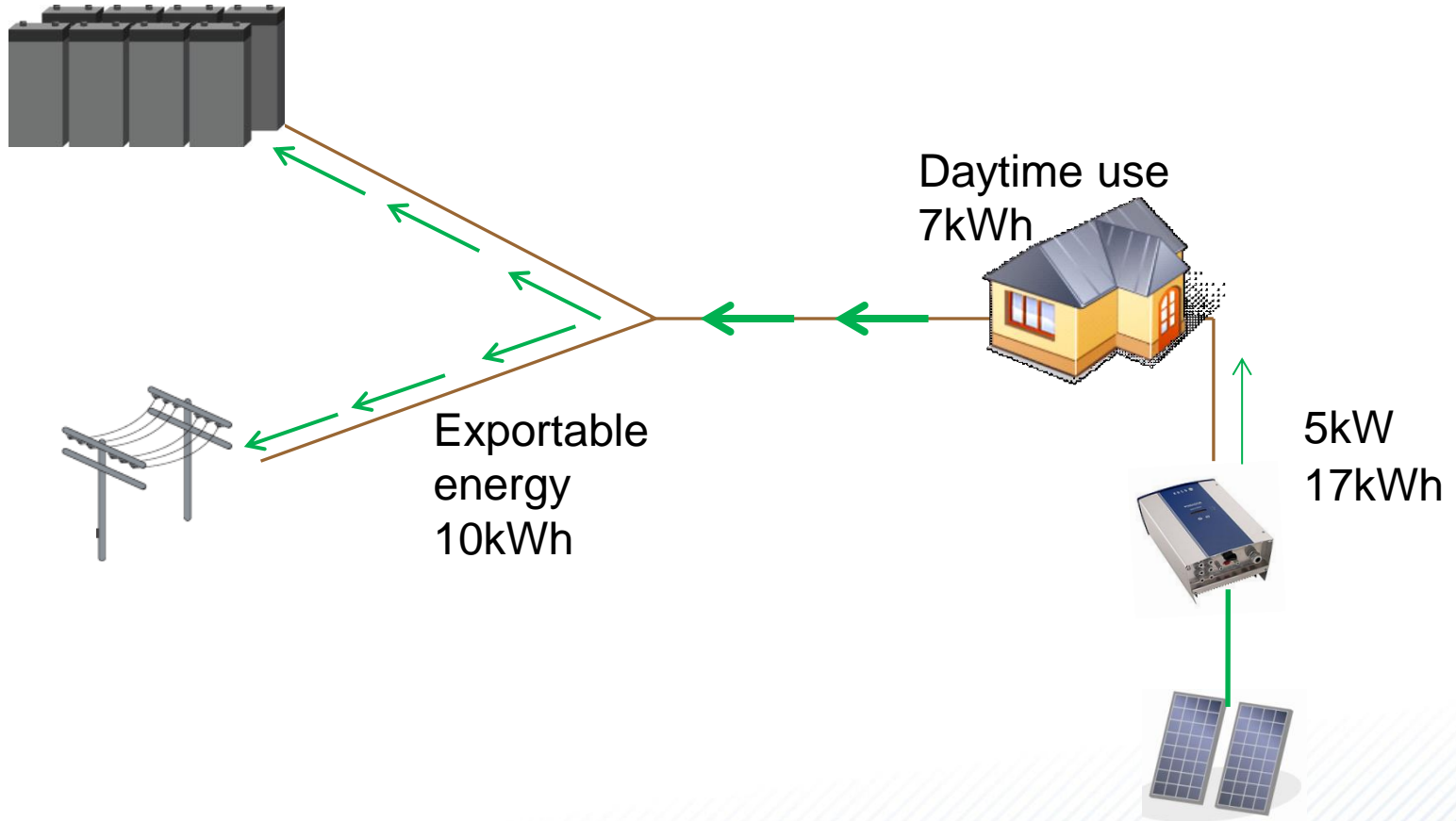


The questions

- *Can I disconnect the meter?*
- Not every house can have a generator.

How do I size a system?

Total Daily Load
20kWh



Online Hybrid Sales calculator



www.selectronic.com.au/stella

What to look for.

- Make sure you know your objectives.
- Is the system updateable.
- Written performance guarantee.
- Look for experience.
- Use a local supplier/installer.
- Watch for long warranties from new companies.
- Stick to brand names
- If it seems to good to be true.???

Thank-you.

Questions?



Find us on 