Hybrid Storage Systems

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ARE YOUR CUSTOMERS
CONFUSED OR 
ENTHUSED?

Your customer's worst fears 
are amplified by your fears.

Sales Strategists by Cathy Finney
Grid Connect as we know it

Sun up

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

Grid Tie inverter

Peak price
Grid Connect as we know it

After Sun Down

Buy back your excess solar
12 - 52c/kWh

≈

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

- Backup Source
- Battery inverter
- Battery
- Convert Solar to 240V AC
Battery Inverter types

Battery inverter with internal Solar Converter
Battery Inverter types

- Grid inverter
- Battery inverter
- Battery
Battery Voltages

Battery Voltage
24V, 48V, 120V DC
Battery Voltage

Tesla Battery Voltage
350-450V DC
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
Energy shifting

Without Batteries

With Batteries

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Commercial application - reducing supply capacity charges (peak shaving)
Rural SWER line with limited capacity

20kW + Inverter

Energy above line capacity supplied from stored energy

PV Optional
Backup some circuits or all circuits

Lighting
Power Points
Power Points
Discretionary Loads
Grid ONLY Loads, HWS, Oven etc

SP PRO controlled contactor, switched off with low Battery
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 do?

- Increase grid capacity
- Cap grid capacity
Typical operation early morning

Import 5kW solar

Export 1kW

Batt low

1kW 2kW

1kW

5kW solar

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Typical operation - midday

Import zero

5kW solar

3kW IN

2kW

Batt charging
Typical operation – mid afternoon

Import zero

2kW

5kW array

5kW

1kW

Batt full

2kW

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POWER
PERFORMANCE
PASSION
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.

Import allowed
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

10kWhrs Daily production

Storage may add NO Value

10kWhrs use, during Sunshine hours
Scenario #2
Generic AC Coupling

20kWhrs Daily production

10kWhrs use, during Sunshine hours

10kWhrs can be stored
Retrofitting to existing system

Battery inverter

Any brand Grid Tie

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POWER PERFORMANCE PASSION
Before installing storage. Maximise use of Solar

No Load Management

Sleeping: 4kWhrs
Breakfast: 6kWhrs
At work: 10kWhrs
Dinner: 10kWhrs

Load
PV

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Before installing storage. Maximise use of Solar

With Load Management

- Sleeping: 4kWhrs
- Breakfast: 10kWhrs
- At work: 6kWhrs
- Dinner: 6kWhrs

Load
Solar output
Scenario #3
Managed AC Coupling

10kW Solar

5kW Battery Inverter

Solar reduction cable

Export not allowed

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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

Daytime use
7kWh

Exportable energy
10kWh

5kW
17kWh

POWER
PERFORMANCE
PASSION
Online Hybrid Sales calculator

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?