

Getting Started with

Storage

A primer from BayWa r.e. Solar Systems

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Introduction

According to GTM Research, the U.S. energy storage market is projected to reach \$3.1 billion by 2022.* Since 2017, the residential segment has experienced 60.6% quarterly growth.**

With the capital costs of lithium-ion based products projected to decline by as much as 36% over the next five years, the economic justification for solar plus storage in residential settings will become even stronger.***

As storage continues to garner attention in the media and piques the interests of home and business owners, the number of inquiries to solar installers will continue to increase.

To assist you in fielding inquiries for grid-tied, residential storage, this primer reviews the essential differences between DC and AC coupled storage solutions, and will help you identify a quality solution based on your customer's needs.

To discuss in more detail, or to place an order, please reach out to your BayWa r.e. Solar Systems account manager or visit us online at: **solar-distribution.com**



In 2018, for the first time ever, installed home energy storage outpaced front-of-meter (largescale/utility).

* www.cesa.org/assets/2018-Files/ESTAP-webinar-slides-2.13.2018.pdf

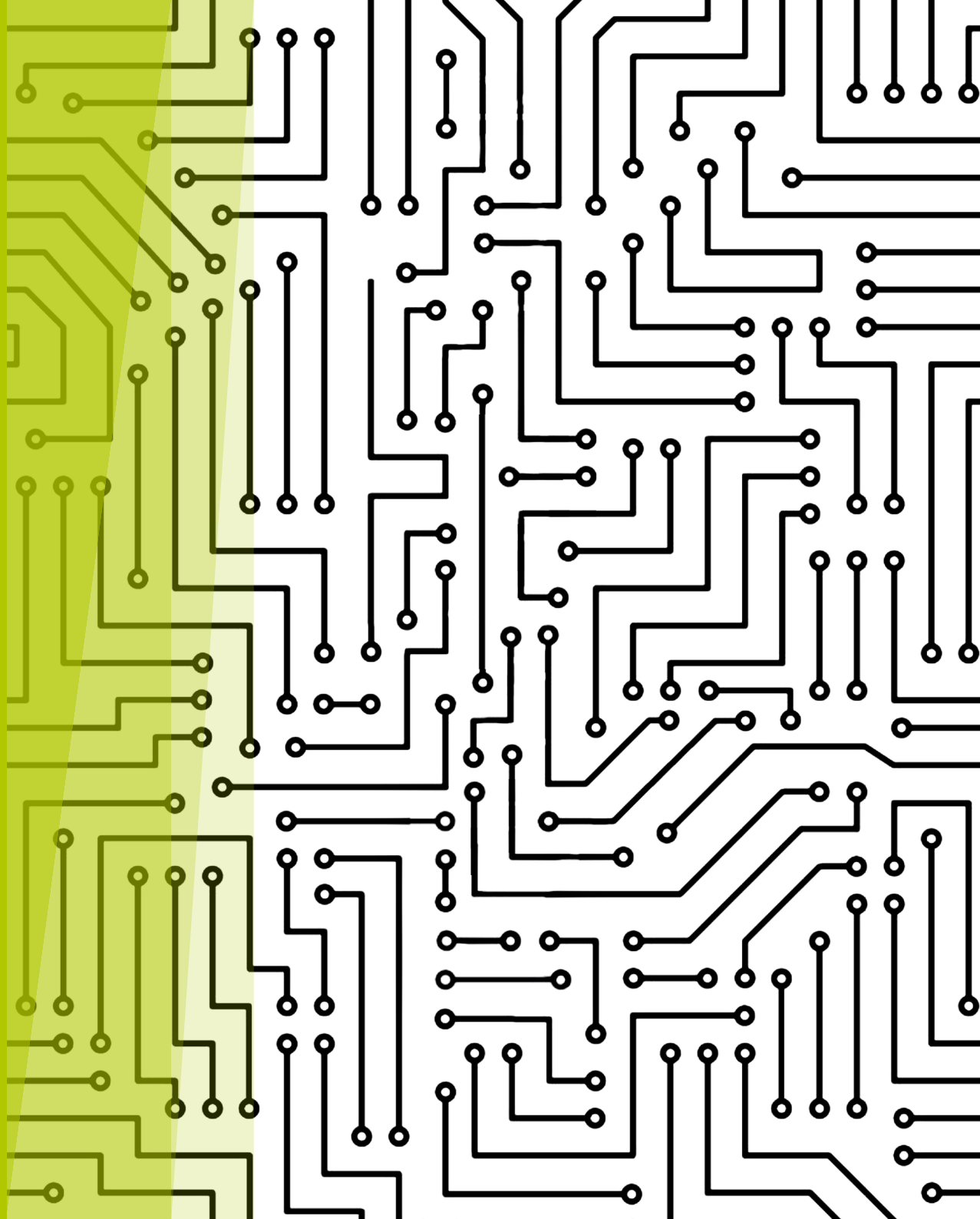
** pv-magazine-usa.com/2018/09/05/us-triples-energy-storage-installations-residential-grows-10x-to-become-largest-sector/

*** www.utilitydive.com/news/lazard-falling-clean-energy-costs-dont-yet-spell-the-end-of-baseload-gene/509913/

DC Coupled Solution

Visualize it

How to set up a DC coupled system.

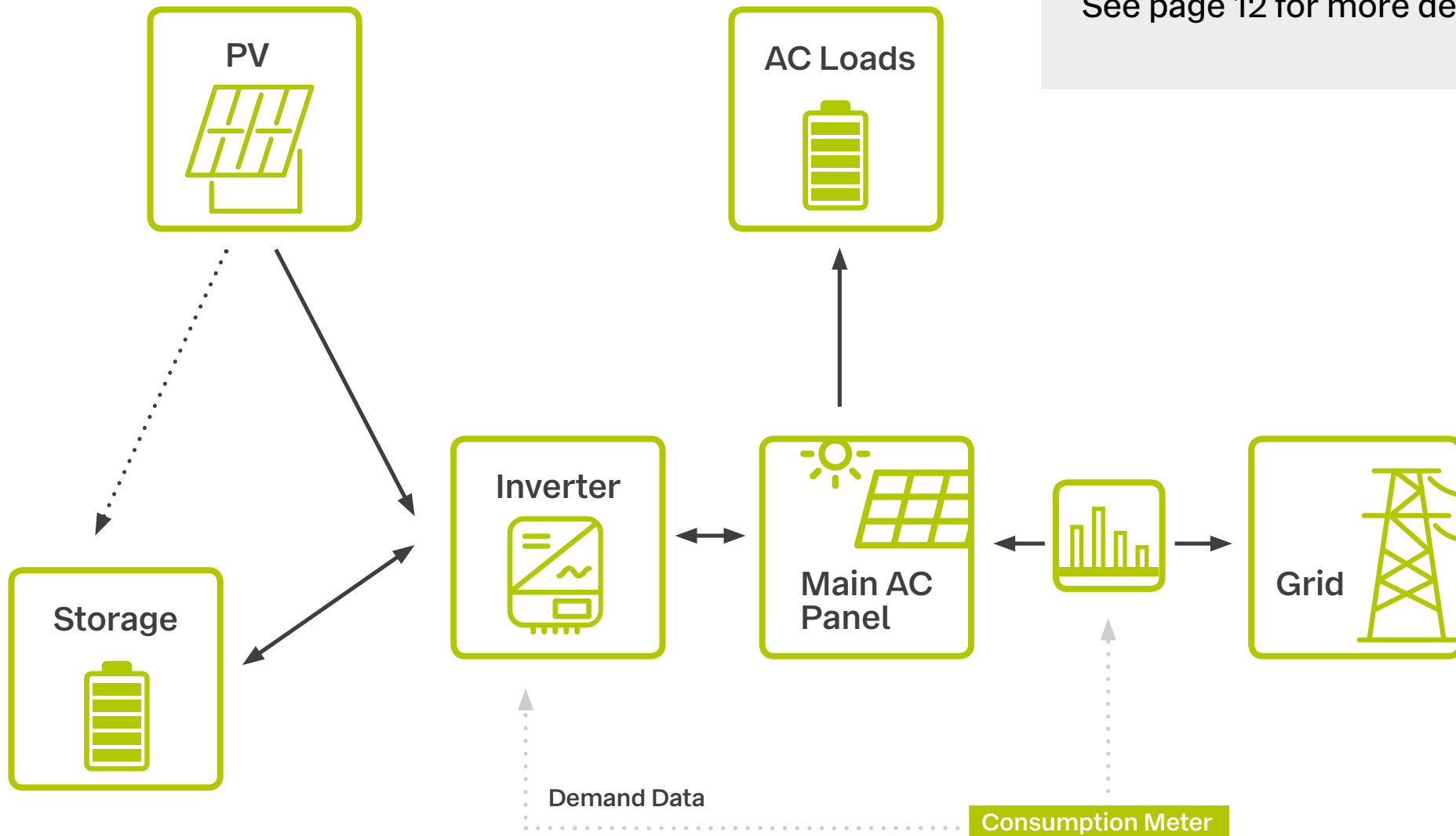


Basic DC coupled solution

Examples of DC coupled options include:

SolarEdge StorEdge (all sizes).

See page 12 for more details.



DC Coupled Solution

Pitch it

How to talk about DC coupled applications.



DC coupled storage options are an excellent fit for customers who do not yet have PV and are looking to install solar and storage at the same time. This is the most time and cost efficient way of doing that.

Efficiency

- DC coupled architecture enables PV generation to be captured more directly by battery storage.
 - Batteries store DC power and modules generate DC power.
 - Power only needs DC:DC voltage conversion for DC coupled options resulting in higher roundtrip energy efficiency of the entire system.
- DC coupled architecture reduces the amount of hardware required for installation.
 - The same inverter manages input and output for both PV and storage.
 - PV and storage can be managed under a single breaker without a service panel upgrade, simplifying installation.
 - Fewer pieces of required hardware usually means reduced installation time and/or expense.

Reliability

- PV and Storage inverter managed under a single manufacturer's warranty.
- Single inverter hardware and software manages system power in on-grid functions such as self-consumption and time of use shifts, as well as back up power in case of grid interruptions.*
- Provide emergency power to specified breakers via a dedicated loads subpanel.*

Note: This information does not represent the full breadth or limitations of any system. Always familiarize yourself with system specific information as needed.

* Any backup option will include output limitations. Learn more about each system to understand performance limitations therein.

AC Coupled Solution

Visualize it

How to set up an AC coupled system.

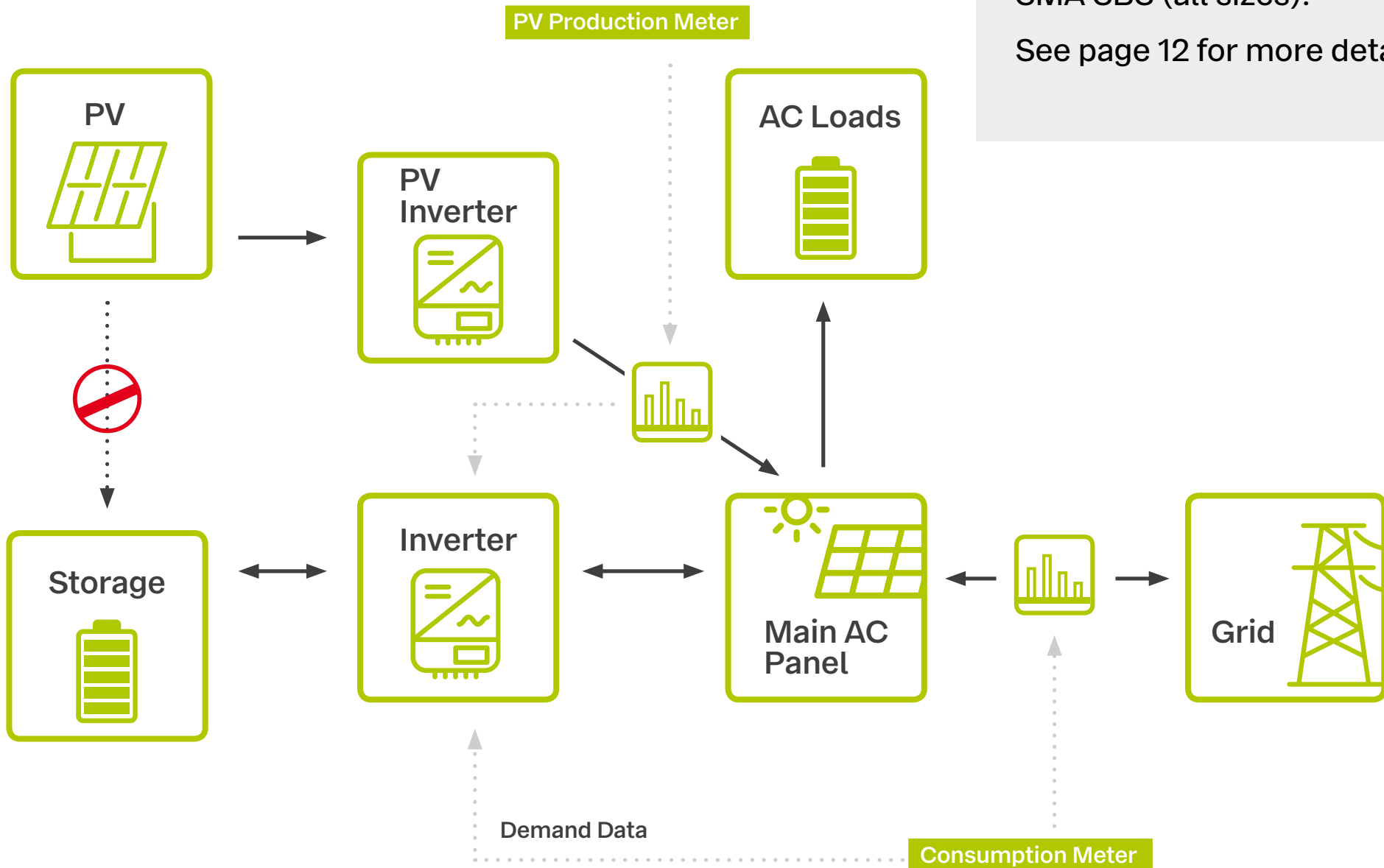


Basic AC coupled solution

Examples of AC coupled options include:

SMA SBS (all sizes).

See page 12 for more details.



AC Coupled Solution

Pitch it

How to talk to homeowners about
AC applications.



AC coupled storage solutions are a great fit for customers who already have solar. Retrofits are a brand-new business opportunity for solar installers to sell storage to their existing PV customers.

Efficiency

- A great opportunity to lower customer acquisition costs.
 - Run a targeted campaign to your existing PV customers to offer home storage options.
 - Access state incentive public records to identify additional target customers.
 - Creates future sales opportunities for customers who prefer to add storage at a later time.
- Highly efficient AC:DC conversion on battery inverter minimizes round trip losses.
- Minimize the need to retrain sales, engineering, and installation teams, by retaining your current preferred PV inverter and matching it with any AC coupled storage solution.

Reliability

- Reduce the potential for a single point of failure of both PV and battery output in an emergency.
- Some AC coupled solutions offer backup options that allow customers to leverage PV production when the grid is down.*

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* Any backup option will include output limitations. Learn more about each system to understand performance limitations therein.

DC & AC Storage Applications

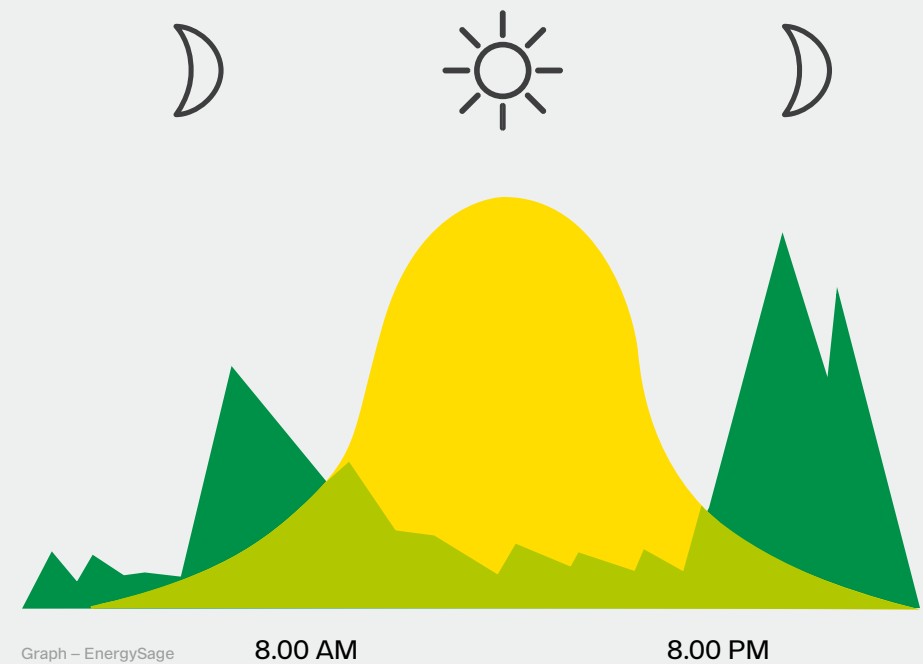
Apply it

Choose products for specific applications.

- Export Control/Peak Shaving
- Self Supply/Zero Export
- Limited Backup
- Whole Home Backup

Typical day with a solar battery system



- Consumption of stored energy
- Consumption of solar energy
- Solar energy production



DC Coupled Storage Applications

Applications / Product Combinations	Export Control / Peak Shaving	SelfSupply / Zero Export	Limited Backup* via Critical Loads Panel	Whole Home* Backup via Main Panel
SolarEdge StorEdge + LG Chem RESU	 Meter, 2 CT	 Meter, 2 CT	 Autotransformer, Meter, 2 CT	

AC Coupled Storage Applications

Applications / Product Combinations	Export Control / Peak Shaving	SelfSupply / Zero Export	Limited Backup* via Critical Loads Panel	Whole Home** Backup via Main Panel
SunnyBody Storage + LG Chem RESU (Type C)	 Meter, 2 CT [^]	 Meter, 2 CT [^]	 Meter, 2 CT, Backup loads panel**	 SMA Backup Box*
SunnyBoy Storage + BYD	 Meter, 2 CT [^]	 Meter, 2 CT [^]	 Meter, 2 CT, Backup loads panel**	 SMA Backup Box*

[^] Depending on inverter pairing, a PV production Mtr/2CT may be required.

* Limited backup requires purchase of additional components.

** Whole home solutions are limited to maximum inverter output.

Example DC & AC BOMs

Order it

Choose a bill of materials.



Example DC coupled BOMs

Smart Energy Management

Purpose	SKU	Oty
SolarEdge StorEdge	SE7600A-USS2RNCB2	1
LG Chem RESU 10H*	LGC-RESU10H	1
SolarEdge1PH, 240V Elec. Meter	SE-MTR240	1
CCS Single 200-Amp CT	SE-ACT0750-200NA-1	2

Emergency Backup Power

Purpose	SKU	Oty
SolarEdge StorEdge	SE7600A-USS2RNCB2	1
LG Chem RESU 10H*	LGC-RESU10H	1
Auto-Transformer for StorEdge	SE-AUTO-TX5000 (backup)	1
SolarEdge1PH, 240V Elec. Meter	SE-MTR240	1
CCS Single 200-Amp CT	SE-ACT0750-200NA-1	2

Emergency backup power will require separate purchase of additional hardware**

* LG Chem RESU10H Secondary batteries optional.

** Additional hardware required, depending on system designed.

Example AC coupled BOMs

Smart Energy Management

Purpose	SKU	Oty
SMA Sunny Boy Storage	SMA-SBS	1
LG Chem RESU 10H	LGC-RESU10H (Type C)	1
Consumption Meter	CCS-WNC3Y-208-MB	1
Single 200-Amp CT	CCS-ACTL-0750-100	2

Whole Home Backup

Purpose	SKU	Oty
SMA Sunny Boy Storage	SMA-SBS	1
BYD Battery Box 10.24kW*	BYD-BASE-BCU BYD-B-PLUS-H-2.56	1 4
200A SMA SBS Automatic Backup Unit	SMA-SBSABU-200-US-10	1

Limited Backup Power

Purpose	SKU	Oty
SMA Sunny Boy Storage	SMA-SBS	1
BYD Battery Box 10.24kW*	BYD-BASE-BCU BYD-B-PLUS-H-2.56	1 4

* Battery type and quantity dependent on system design.

** Additional hardware required, depending on system designed.

Limited backup power will require separate purchase of additional hardware**



r.e.think energy

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