

Sigenergy Energy Solution

Enjoy Green Energy by Bruno Van Bost



SIGENERGY

Introductie



Investor & Financing





Tony Xu

Founder & CEO

Created Global **No.1** PV Inverter Brand & Shipment

Maintained the record for consecutive **8 years**

Created China **No.1** AI computing chips & framework

1999 - 2010



Leader of Wireless Algorithm R&D

2010 - 2020



President of Smart PV Business

2020 - 2022



President of AI Business

2022



Founder & CEO

Founder & Team

500+

Up to now

Our team achieved the

No.1

global shipment of distributed inverter

The **President**

15 years The pioneer of string inverter in China

Leader of **Industrial design**

30 years Huawei Energy Product

Chief **Operation** Officer

24 years Huawei AITO Smart Car

Leader of **Hardware** R&D

15 years Since 1st gen. Huawei inverter

Chief **Marketing** Officer

15 years No.1 Branding in Solar & AI

Leader of **Software** R&D

10 years Since 1st gen. Huawei inverter

70%

R&D personnel

160+

Applied patents

Productie & Leveringen

2023

2 GWh + **4 GW**

Battery production capacity

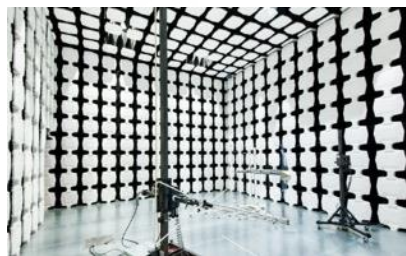
Power production capacity

2024

6 GWh + **12 GW**

Battery production capacity

Power production capacity



Productiecentrum
Lingang Nieuw gebied
China (Sjanghai)
Pilot vrijhandelszone



20,000+

square meter



Sigenergy Home Energieproducten en -oplossingen



Uitdagingen van BESS-toepassing

1 **Veiligheid**

2 **Installatie kosten**

3 **Systeem integratie**



3rd generatie Oplossing : Solar+ESS+EV Charing

Technologiedreven vooruitgang, marktgedreven transformatie

3

2023 - Future

Derde generatie: hoge integratie



- Inverter tech. development reaches a bottleneck phase
- ESS tech. becomes mature, and explosive ESS demand
- Long-term demand for EV charging infrastructure
- Distributed energy scenarios take the lead

Now

Reimagine with **native technology** rather than expanding with technical extensions

2

2014 - 2021

Tweede generatie: zonne-energie + **gescheiden** ESS



HUAWEI

Exclusive Market Share Surpasses 23% in 2020



Multiple MPPT, No Fuse, No Fans, Smart O&M...

And battery ready for future expansion

1

1991 - 2011

Eerste generatie: **ALLEEN** Solar



Maintaining a Global Market Share of over 30%

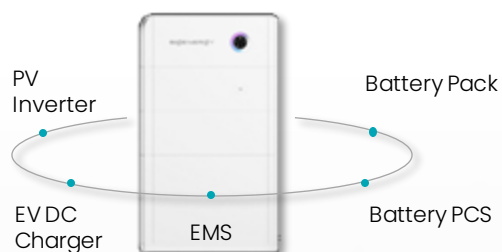
The first string inverter was introduced in 1991

The first central inverter was launched in 2003

Sigenergy brengt de nieuwe generatie ESS

Combinatie van geïntegreerd, slim systeem met ultraveiligheid om de gebruikerservaring te verbeteren

Sterk geïntegreerd



SigenStor

World-first 5-in-One energy system

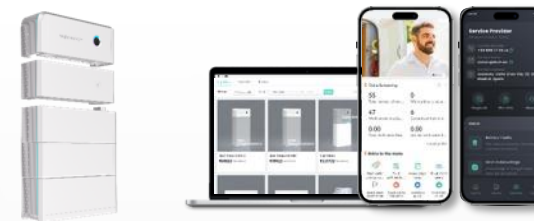
Volledig intelligentie



mySigen App

World-first integrated with GPT-4

Gericht op gebruikerservaring



Simple & interactive

Stackable installation, trackable user friendly

5-lagen batterij bescherming
5-lagen systeem bescherming

Bescherming van de veiligheid van het apparaat

Veiligheid van het systeem bescherming

Persoonlijke veiligheid bescherming

Gegevensbeveiliging bescherming



GDPR



ADPPA

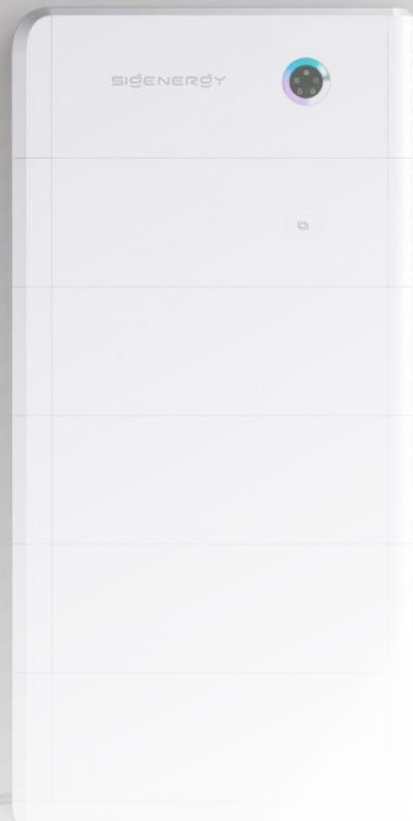
CCPA

CPRA



ISO27001

Ultra Veilig



SigenStor, 5-in-één BESS

Een nieuwe manier om energie te produceren, op te slaan, op te laden en te gebruiken



Germany
Red Dot
Design Award



Germany
IF Design
Award



USA
International Design
Excellence Awards



Germany
TUV Rheinland
All Quality Matters Award



* Finalist in drie grote wereldwijde designprijzen. Winnaar van de Duitse Red Dot Award

Prachtig Ontwerp voor een Beter ervaring

Aanpasbare sfeerverlichting



Eagle Eye Ring lights



Elegante sleek design



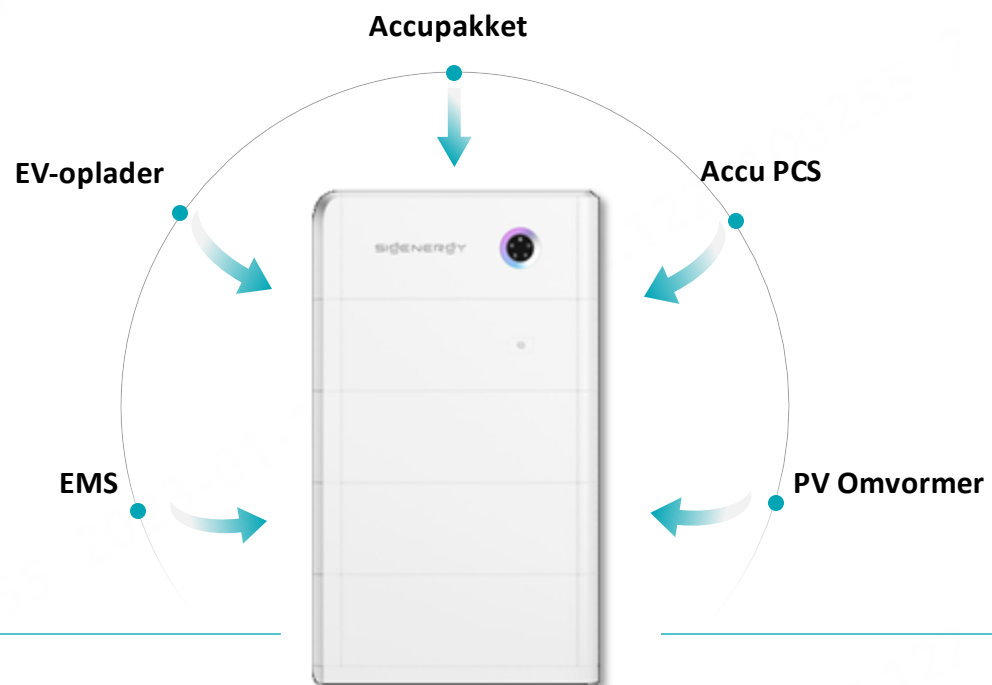
mySigen APP

SigenStor



Vijf-in-één

Eenvoudig ontwerp met een krachtige functie



Compatibel met verschillende scenario's

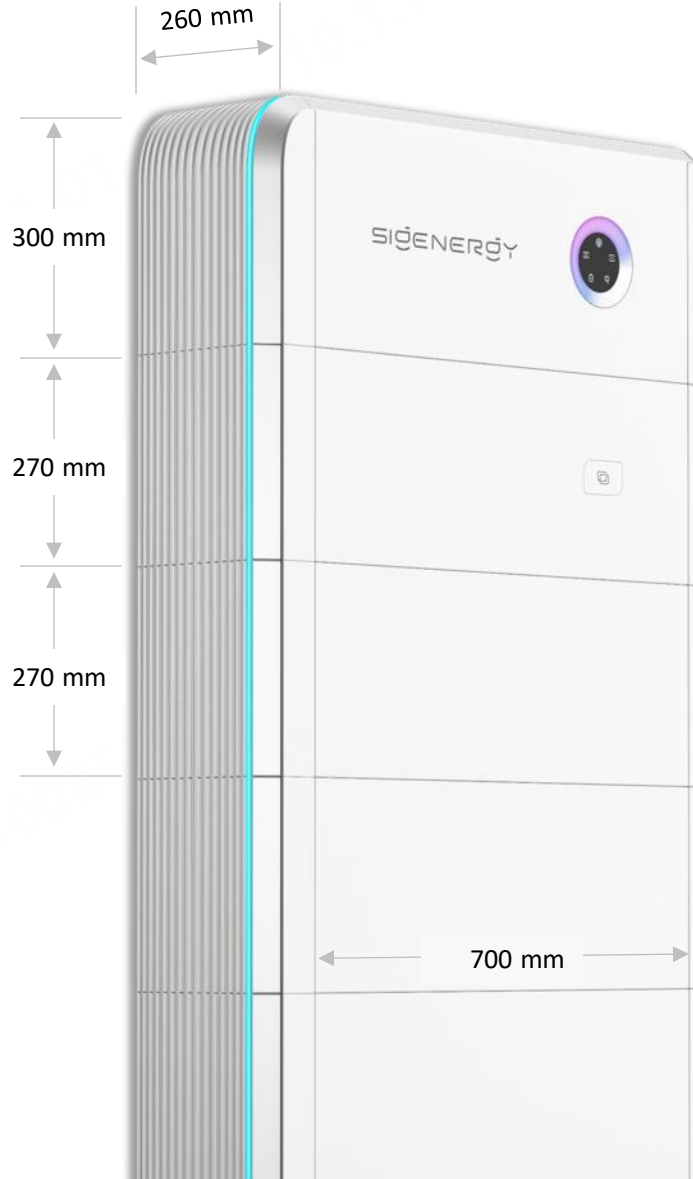
PV+ Energie
Opbergsysteem

AC-gekoppeld
opslagsysteem

PV + Energieopslag + EV
Laadsysteem

Off-grid
systeem





Sigen Energy Controller for solar + storage system

Single phase grid connection (kW)

3.0	3.68	4.0	4.6	5.0	6.0
-----	------	-----	-----	-----	-----

Three phase grid connection (kW)

5.0	6.0	8.0	10.0	12.0	15.0	17.0	20.0	25.0
-----	-----	-----	------	------	------	------	------	------

Sigen EV DC Charging Module (kW) Ready for V2X

12.5	25
------	----

Sigen Battery (kWh)

5.0	8.0
-----	-----

Support **1 – 6** batteries combined for a single stack

5 kWh – 48 kWh

Energy capacity range for a single stack



's Werelds eerste geïntegreerde DC-lader

V2X Klaar voor de toekomst



Max 25 kW DC-laden

* De werkelijk beschikbare kilometerstand na 1 uur opladen

SigenStor EVDC 25 kW^{1,2} 130 km

Traditionele EV-oplader 7 kW 40 km

Een 75 kWh EV opladen van 10% naar 90%² ► 2.5 uren

V2X



V2H

Meer back-up stroom voor thuis



V2G

Meer capaciteiten

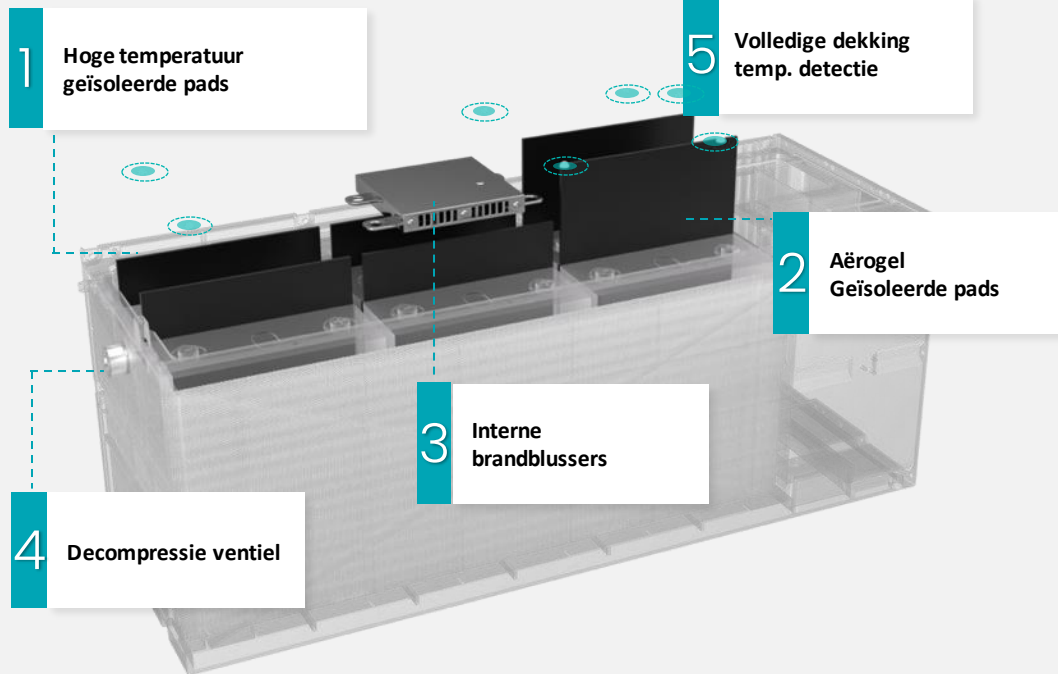
1. Raadpleeg het realistische verbruik per 100 km voor een EV uit de compacte klasse, gegevens afkomstig van P3 Charging Index Report 2022
2. SigenStor EC 25 kW module met SigenStor EVDC Laadmodule als voorbeeld

Allround Veiligheidsbescherming

Uitgebreide bescherming, van batterijniveau tot systeemniveau

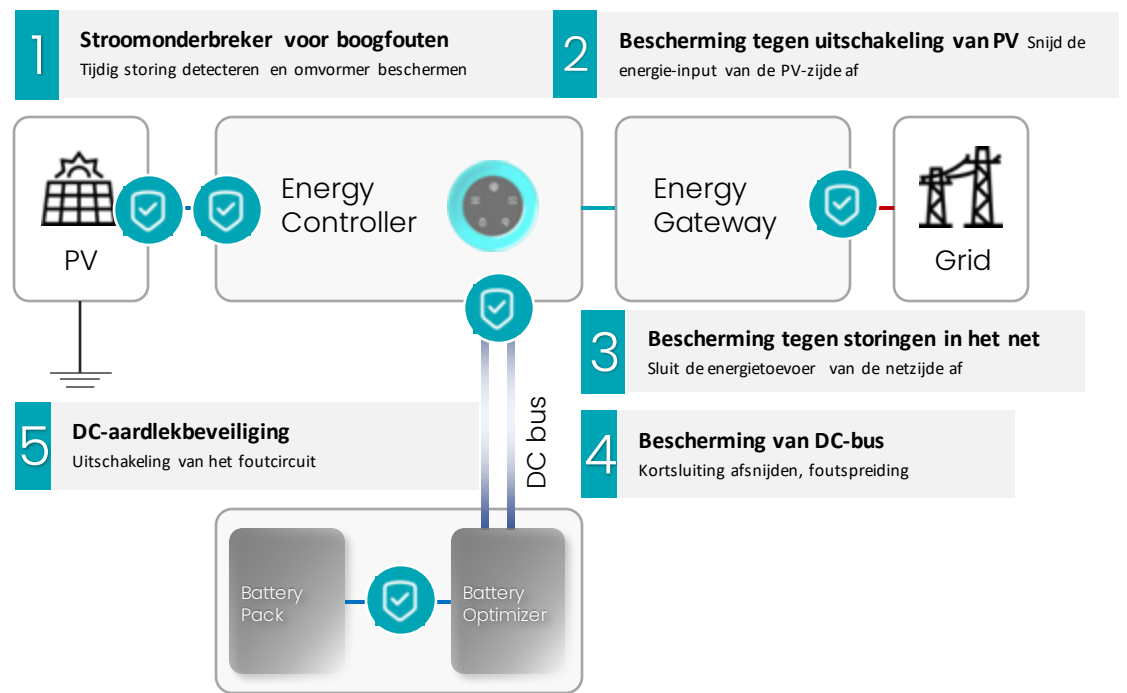
5

Lagen van batterijbescherming



5

Lagen van systeembescherming

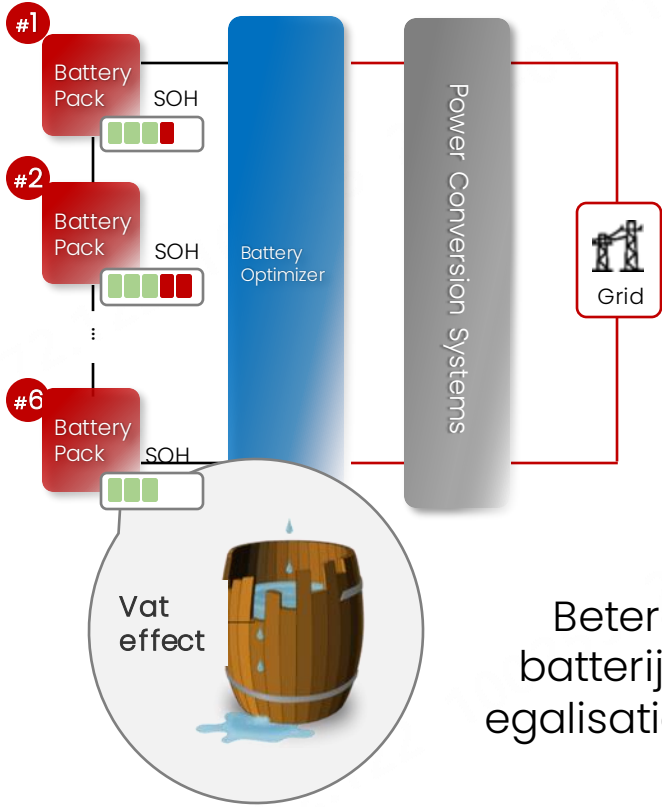


Vereenvoudig het BESS-beheer

Ondersteunt van gemengd gebruik van oude en nieuwe batterijen en verschillende celtypen

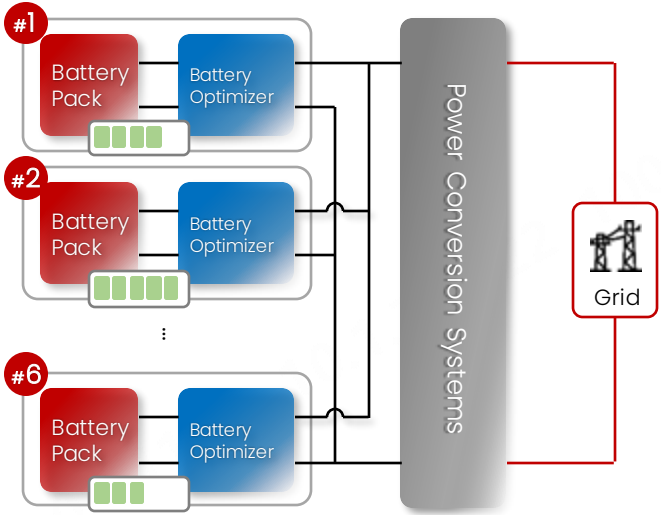


Packs Aansluiting in serie



Betere batterij-egalitatie

Packs-aansluiting parallel



Flexibele mix van pakketten tussen verschillend **Batterij SOH / SOC** of een andere cel **modes**

Toonaangevende beveiliging

Veel Home ESS-industrie pionierde met technologie, voor absolute veiligheid

Home Energy Safety Protection		Sigenergy	Vendor S	Vendor H
1	Battery Pack Full coverage temp. detection	+ 60%	✓	✓
2	Battery pack Aerogels insulated pad	✓	×	×
3	Battery pack High-temp. resistance insulated pad	✓	×	×
4	Battery pack internal fire extinguishers	✓	Onsite installation	✓
5	Battery pack decompression valves	✓	×	×
6	Battery pack Big cell capacity for low operating voltage	✓	×	×
7	Floating Terminal Wiring & Terminal temp. detection	✓	External wiring	External wiring
8	Inverter PV-PE Short-circuit protection	✓	×	×
9	Inverter PV disconnection protection	✓	×	×

Volledig verzekerd door Sigenergy

Bescherm de rechten en belangen van de klanten



CERTIFICATE OF INSURANCE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOW MAY HAVE BEEN REDUCED BY PAID CLAIMS.

TYPE OF INSURANCE:	PRODUCTS LIABILITY INSURANCE
INSURER:	LEADING INSURER: PICC PROPERTY AND CASUALTY COMPANY LIMITED CO-INSURER: CHINA PACIFIC PROPERTY INSURANCE CO., LTD.
INSURED/CERTIFICATE HOLDER:	1 Shanghai SIGEN New Energy Technology Co., Ltd. 2 Shanghai Sigeyuan Intelligent Technology Co., Ltd. 3 Shanghai Sigeyun Digital Technology Co., Ltd. 4 Suzhou Sigeyuan Intelligent Technology Co., Ltd. 5 Sigenergy Technology (Hong Kong) Limited 6 Sigenergy Technology Inc. ADDRESS: 11F, 18 Pujing Science and Technology Plaza, 2388 Chenhang Road, Minhang District, Shanghai, CHINA
POLICY NUMBER:	PZAI20230205000000203
INSURED PRODUCTS:	PV inverter/Battery inverter/Hybrid inverter/Battery pack/EV DC charging module/ EV AC charger/Energy gateway/Communication module/ Power sensor and packing materials, etc.
POLICY EFFECTIVE DATE:	01/07/2023 00:00AM, BEIJING STANDARD TIME
POLICY EXPIRATION DATE:	30/06/2024 24:00PM, BEIJING STANDARD TIME
COVERAGE:	LEGAL LIABILITY OF THE INSURED TOWARDS THIRD PARTIES FOR BODILY INJURY AND PROPERTY DAMAGE ARISING OUT OF: ANY PRODUCT MANUFACTURED, SUPPLIED OR SOLD BY THE INSURED; PLUS ANY LEGAL COSTS AND EXPENSES INCURRED WITH THE WRITTEN CONSENT OF INSURERS.
LIMIT OF LIABILITY:	USD3,000,000.00 ANY ONE ACCIDENT AND ANNUAL AGGREGATE The words "ANY ONE ACCIDENT" shall mean any one accident or series of accidents arising out of one event.
COVERAGE GEOGRAPHICAL AREA:	WORLD-WIDE (INCLUDING USA & CANADA)
CLAIMS & POLICY JURISDICTION:	WORLD-WIDE (INCLUDING USA & CANADA)
CLAIMS TRIGGER:	OCCURRENCE
EXTENSIONS:	Sunset Clause Cross Liability Absolute Asbestos Exclusion Electronic Date Exclusion Lead Exclusion
AUTHORIZER:	PICC PROPERTY AND CASUALTY COMPANY LIMITED MOODY'S RATING: A1

PICC PROPERTY AND CASUALTY COMPANY LIMITED
ADDRESS: NO. 8 Yun He Road, New District, Suzhou, Jiangsu Province, CHINA
TEL: (8611)83835009 POSTCODE: 215011 EMAIL: linyaozhm01@jiaopg.picc.com.cn



The People's Insurance Company
(Group) of China Limited

120th Fortune Global 500 (2023)

70+ years Brand History

10+ Subsidiary Companies

A1 Moody's Rating



Key Partners & Projects >>



Bodily Injury



Property Damage



Freight Transport



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Sigenergy Installation

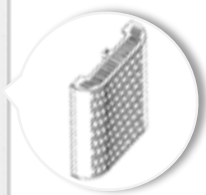


Eenvoudige en snelle installatie

| Sigenergy 15-min installatie



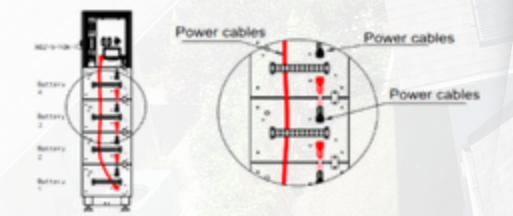
➤ **Geen externe bedrading nodig, veilig en betrouwbaar**



➤ **Tap-in decoratieve afdekkingen, geen schroeven nodig**

| De moeizame installatie

VS



Snel opstarten met inbedrijfstelling van 5 minuten

Alle apparaten zijn zelfgedetecteerd en automatisch in een netwerk opgenomen, 5 stappen om het opstarten van het systeem te voltooien



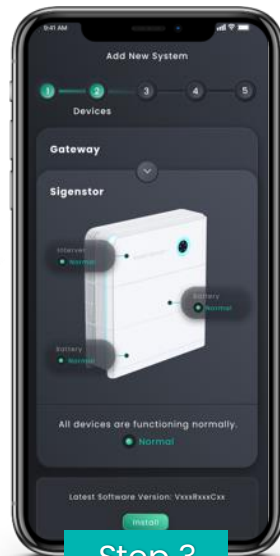
Step 1

Scan QR code
Create new plant



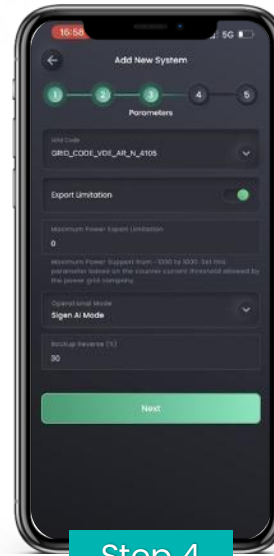
Step 2

Basic setting
Easy and key info.
to filled out



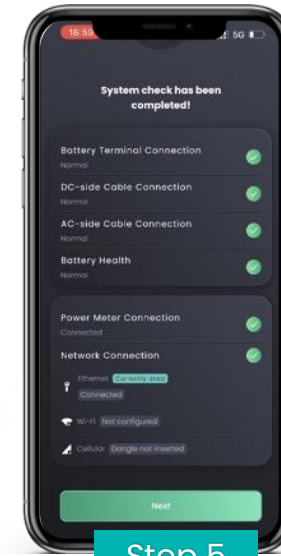
Step 3

Update software
Only take 2 minutes



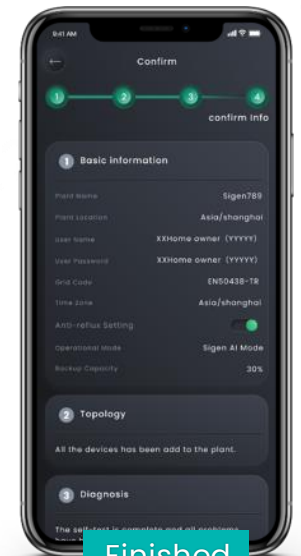
Step 4

Confirm parameters
Quick to check
preset parameters



Step 5

One-click diagnosis
Identify installation problems



Finished

Finish & Confirm

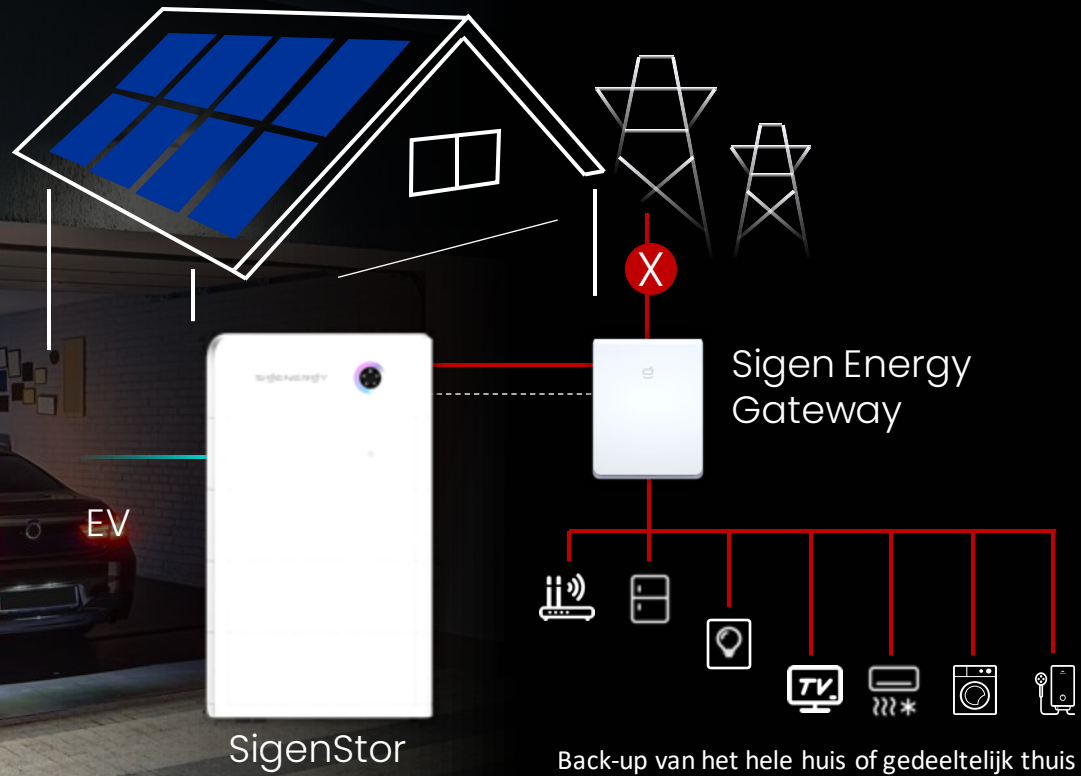
Sigenergy

Back up and off-grid



Zorgeloos energieverbruik

Automatische overschakeling naar back-upstroom en terug in een handomdraai



0 ms

Verstoring aan de laadzijde

Naadloos

UPS 10 ms

Computer & Televisie 20 ms

LED lamp 41 ms

500 ms
Gloeilamp



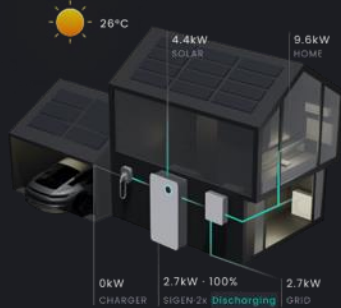
Sigenergy APP & Cloud Management



mySigen APP

Geavanceerde ervaring met energiebeheer in smart home

Homepage

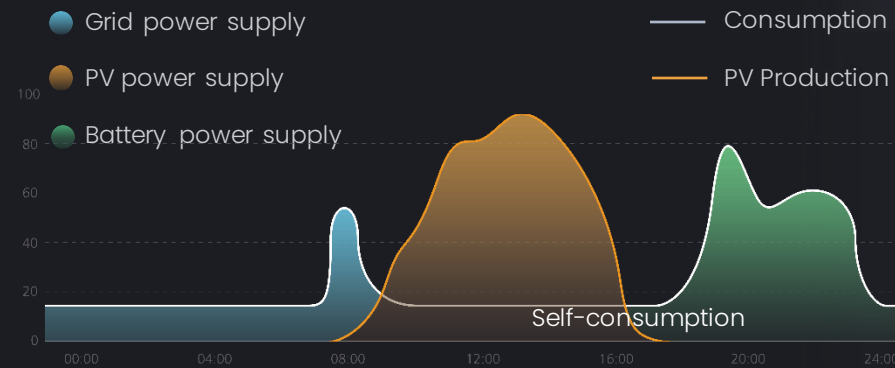


- Auto-networking
- Real-time energy flow
- 10 Seconds data refresh

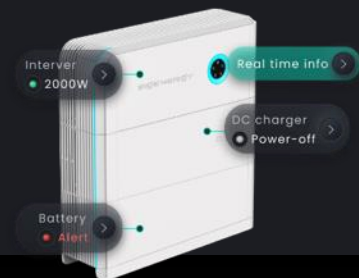
AI-suggestie

AI

- Suggest changing the operation mode
- Check if the system is overloaded
- Whether need to increase storage capacity



Real-time Monitoring



ChatGPT
Integrated in Q&A



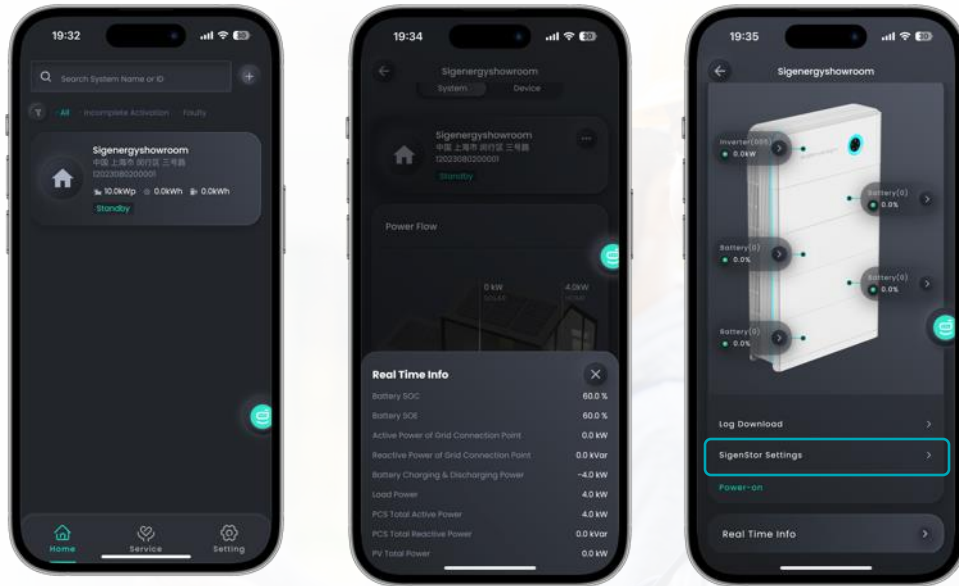
Schedule Smart
EV Charging



mySigen App: Eén app voor beide

Installateurs en huiseigenaren loggen in op de app met verschillende accountautoriteit

Portaal voor installateurs



Systems mgmt.

All systems installed display on one page

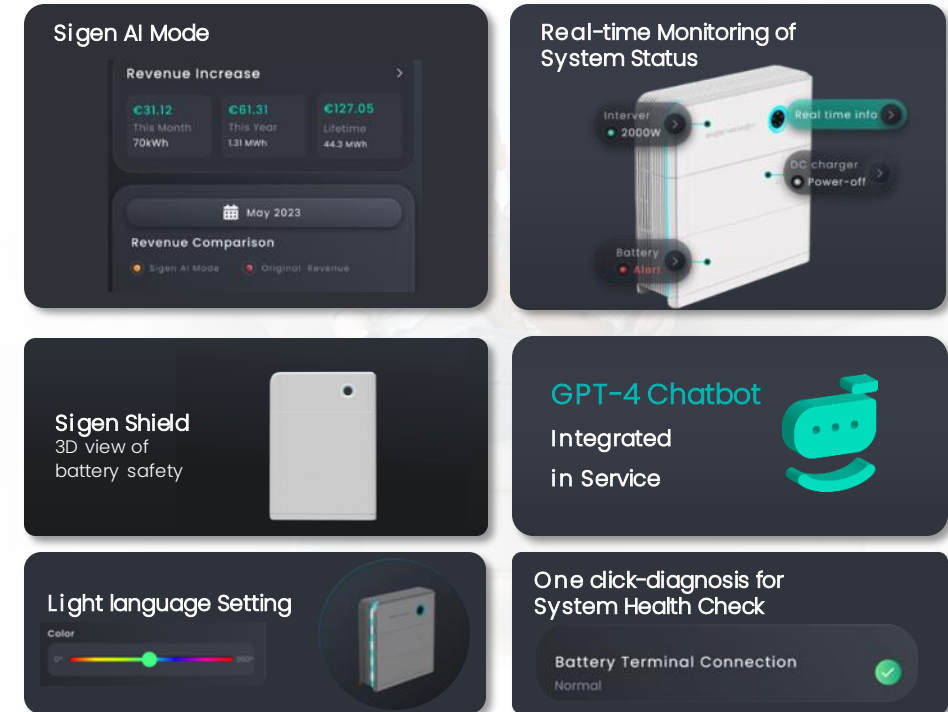
Track status

Clear view of real-time system status

Change settings

Remotely change system settings

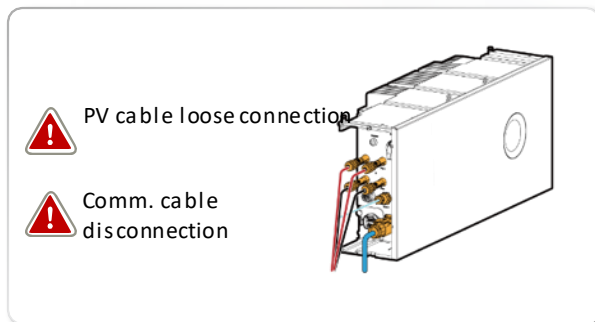
Portaal voor huiseigenaren



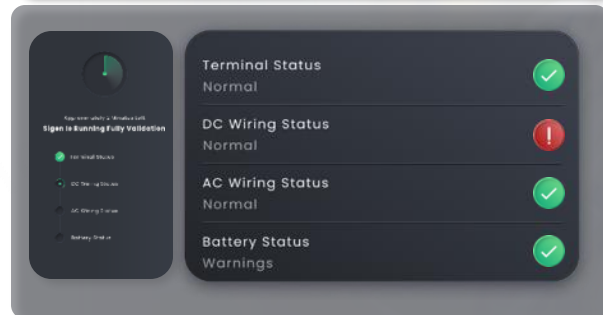
Diagnose in één klik

Voor installateurs om installatiefouten of storingen te identificeren;
Voor huiseigenaren om de status van het systeem te controleren

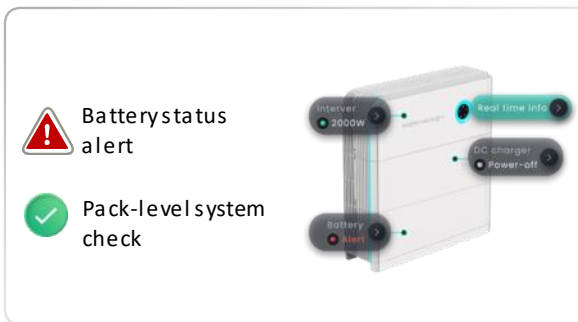
Installers during commissioning



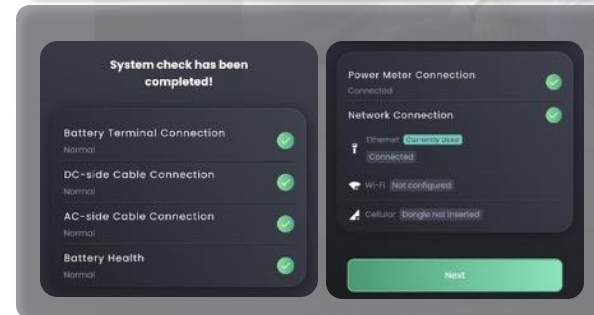
Identify potential problems in the installation process



Homeowners in daily use

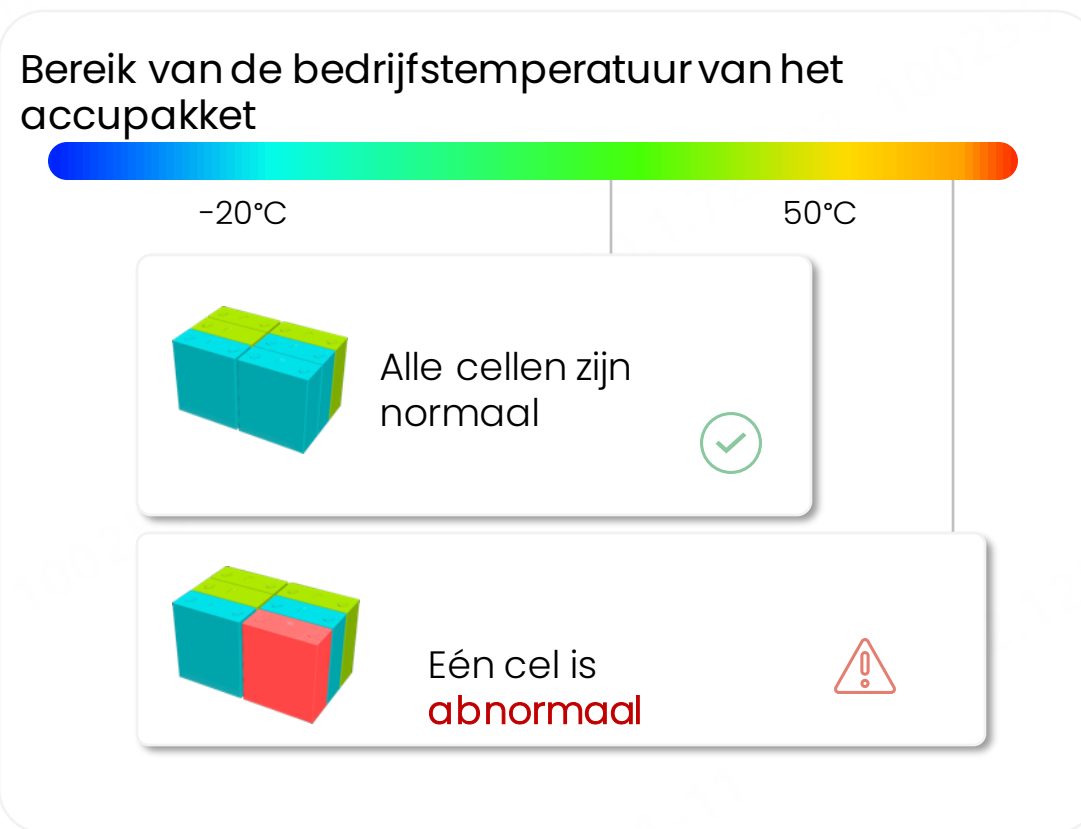
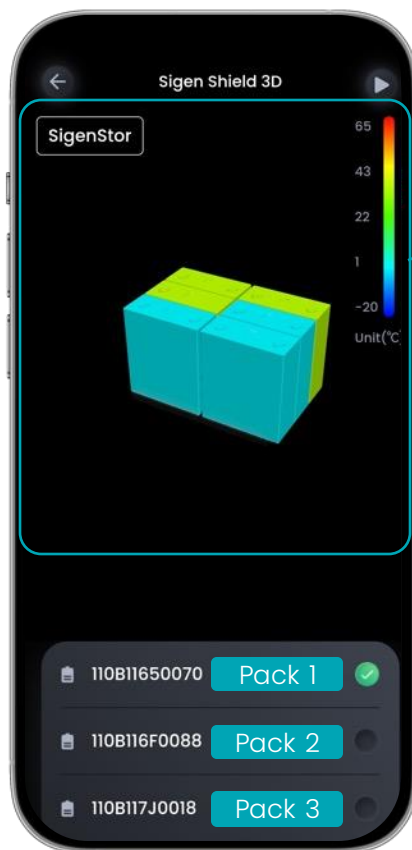
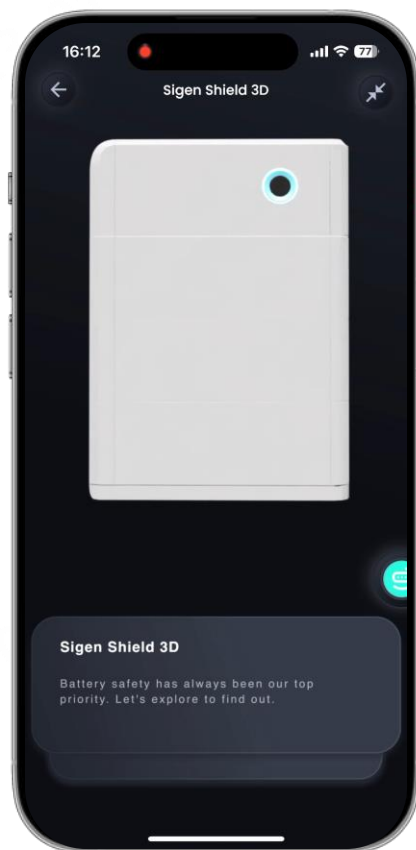


Check system health status for peace-of-mind energy usage



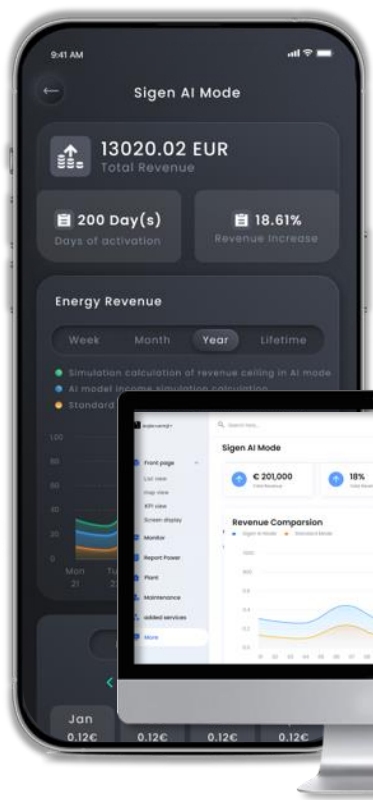
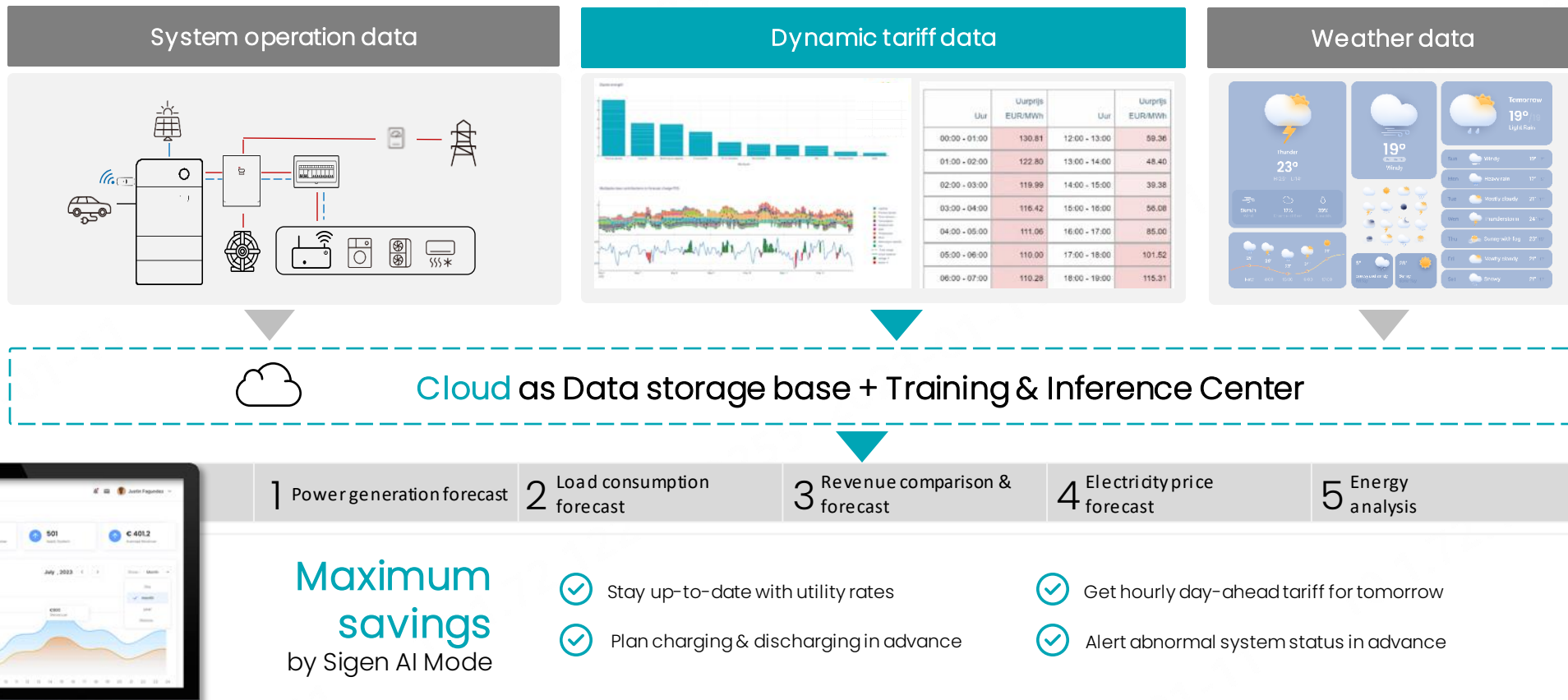
Geniet van een 3D-weergave ultraveiligheid

Een 3D-weergave van de veiligheidsvoorzieningen van de interne verpakking en weergave van de celtemperatuur



Sigen AI Mode: toegang tot dynamisch tarieven

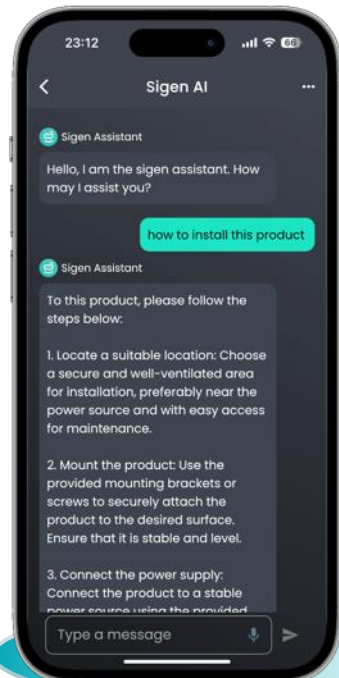
Aangedreven door Sigen AI-modus voor slimme elektriciteitsoplossingen op maat



GPT-4 Krachtige en intelligente service

Geef snelle antwoorden op vragen en vereisten van gebruikers in realtime

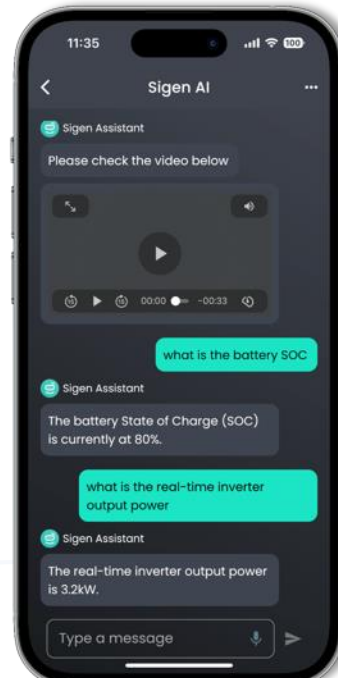
After-sales service bot



24/7 snelle ondersteuning

Sigen AI biedt onmiddellijke reacties op alle problemen die u tegenkomt met behulp van het Sigen-energiesysteem.

Energie-analist voor thuis



Nauwkeurige inzichten

Sigen AI vertrouwt op gegevens die zijn opgeslagen in de Sigen Cloud om u te helpen uw energieverbruik en -opwekking te analyseren.

Apparaat management assistent



Apparaten in huis beheren

Sigen AI kan uw instructies opvolgen om uw huishoudelijke apparaten te beheren, zoals de Sigen EV AC-lader, Sigen Gateway, warmtepompen, generatoren, enz.

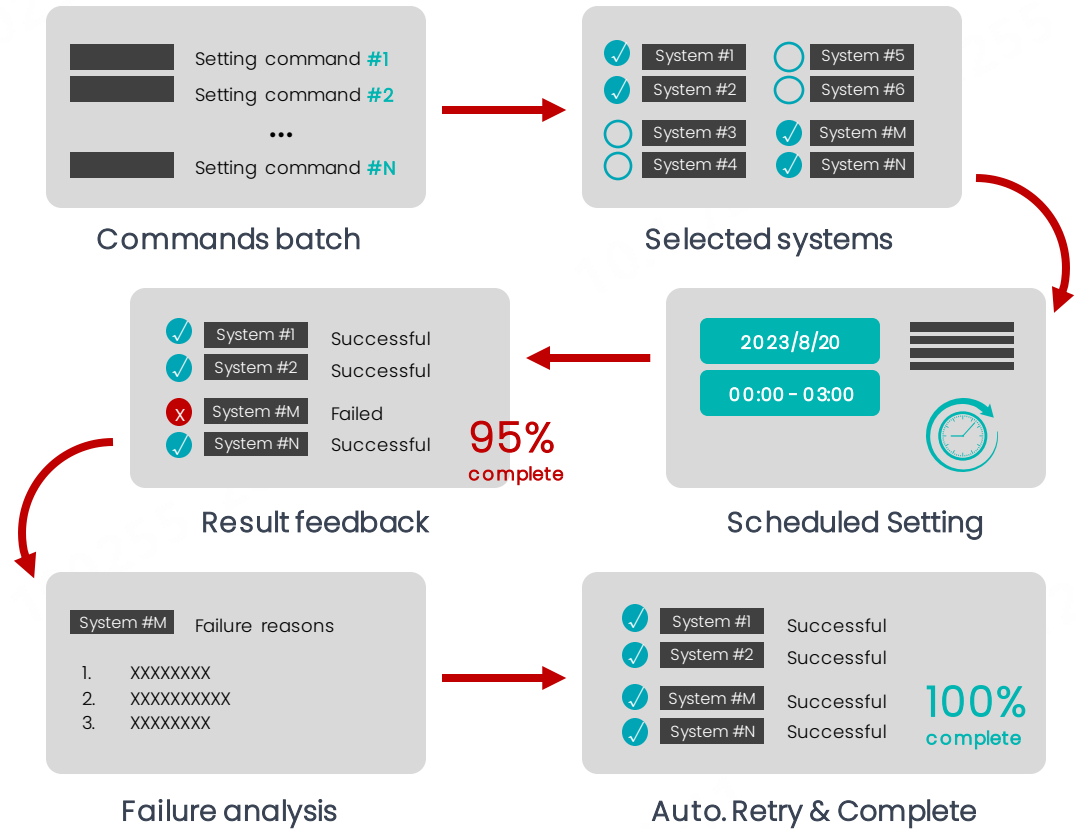
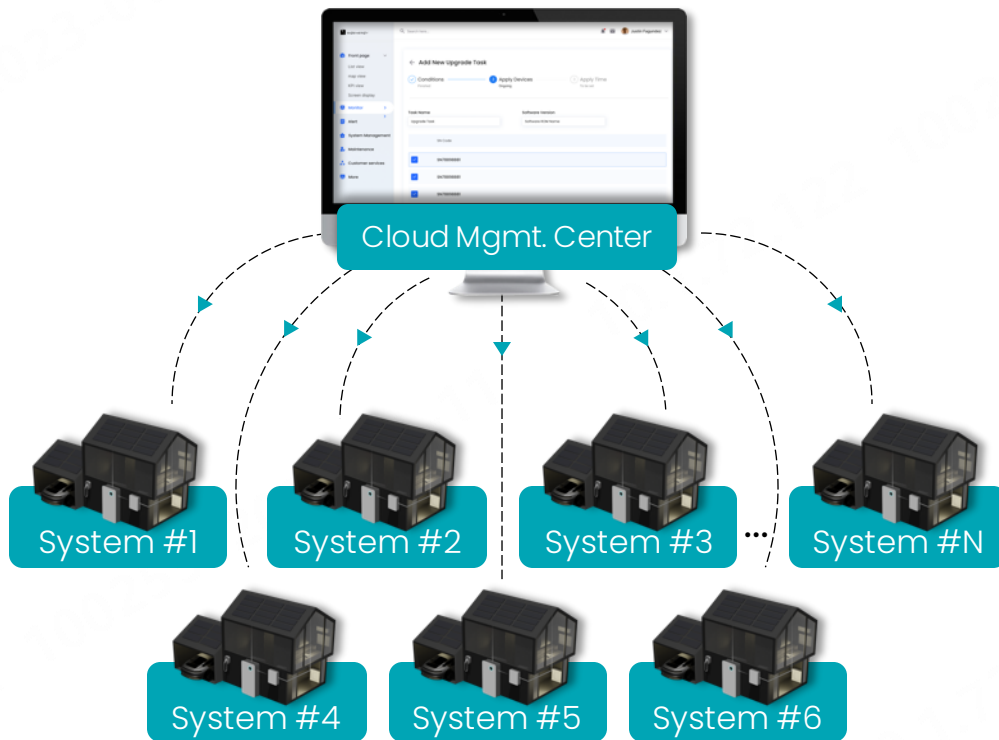


Alle talen worden ondersteund



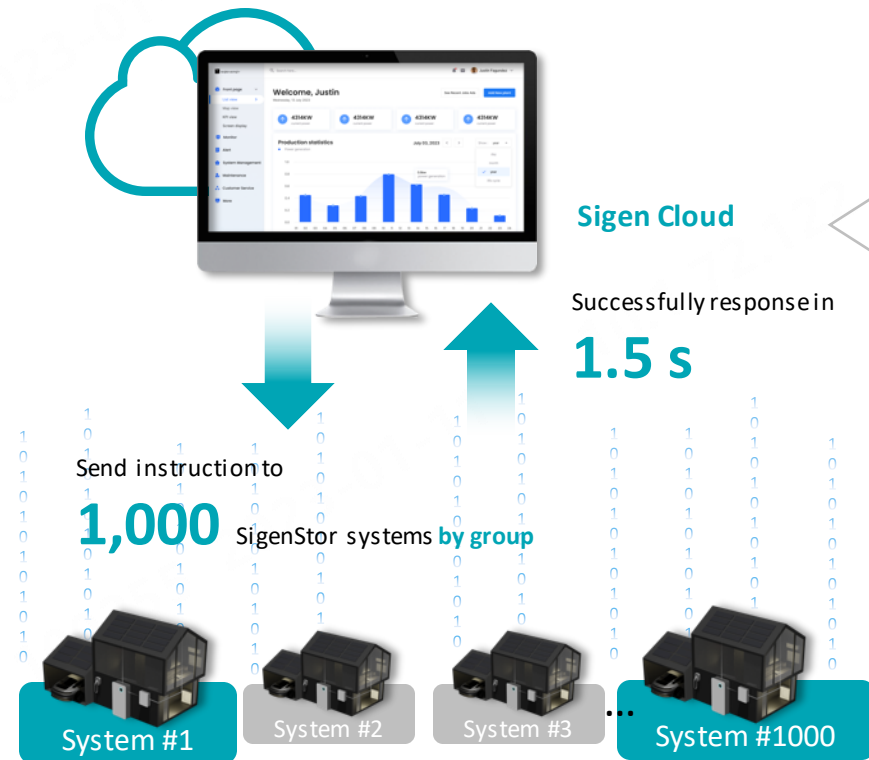
Batch configuratie op afstand ondersteund

Gecentraliseerd beheer op aangepaste apparaten



VPP supported for grid reliability

Het bieden van een platform voor het samenvoegen van DER's en het verzenden van commando's voor VPP



Virtual test (batch setting) results by Sigenergy

Key Open API, overvloedig voor API-aanroep van klanten

1 Instructions

Indicator signal

- Real (Active) power
- Reactive power
- Frequency

Control signal

- Low/High voltage ride through
- Storage operation Mode
- TOU settings

Attribute signal

- Rated voltage
- Rated frequency
- Maximum absorbed power

* More instructions not listed

2 Send instructions in groups

3 Subscription for auto data push

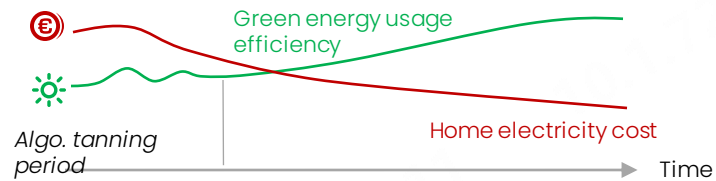
- I. Alarm change data
- II. System change data (e.g., ESS capacity increase)
- III. Power plant status change data (e.g., on-line or off-line)

AI-empowered, Self-evolving System

Integrate AI with energy deeply, brings real efficiency improvement

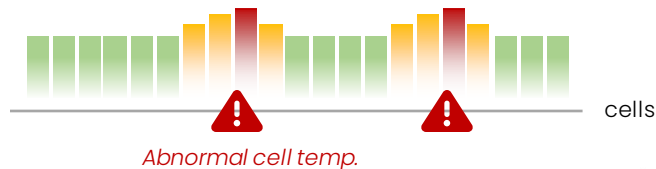
1 AI-assisted Energy Planning

Algorithms optimize power generation / Consumption to reduce electricity costs



2 AI-assisted Safety Protection

Algorithms provide advance warning to reduce potential safety risks



3 AI-assisted Scheduling

Support home second-level VPP process better engaged in the electricity trading market



4 AI-assisted Customer Service

The first big AI model in the field of renewable energy



GPT-4

Sigenergy

C&I Energie-oplossing



Eén toepassing voor alle scenario's

1

Max. eigen
verbruik



Optimize the self-consumption of solar energy to maximize cost savings.

2

Piek-dal
arbitrage



Optimize operation on real-time utility rates to capture differentials and boost revenue.

3

Ononderbroken
stroomvoorziening



Ensure uninterrupted power supply for backup loads when power outages occur.

4

VPP
Trading



Support the participation in the electricity market through VPP by aggregating DERs.

5

Uitbreiding
netcapaciteit



ESS relieves grid pressure, saving costs on transformer upgrades or replacement.

Nieuwe manier om C&I-energiesystemen te bouwen

1

Flexible configuration

Highly flexible in ESS capacity configuration. Invest your solution as needed.

2

All

Scenarios covered

One solution supports both AC & DC coupling, and both on-grid & off-grid applications.

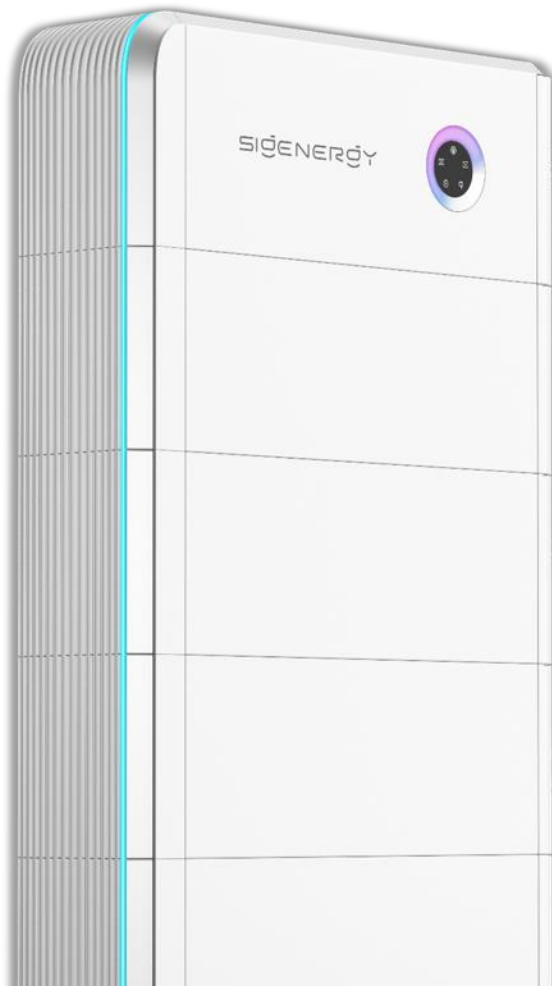
3

Simple Install. & usage

From installation to daily O&M, Sigenergy ensures simplicity in every aspect.

SigenStor, Ideaal voor C&I Energie-oplossing

Meerdere units parallel geschakeld, flexibeler in C&I BESS Systems



Sigen Energy Controller
for C&I Energy systems

15.0 17.0 20.0 25.0 kW

Sigen Battery

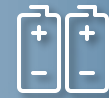
5.0 8.0 kWh

5 kWh - 48 kWh

Energy capacity range for a single **stack**



Both **AC & DC**
coupling systems supported



Both **On & Off-**
grid systems supported



48 kWh - 1440 kWh

Energy capacity range for a single **system**

Rig

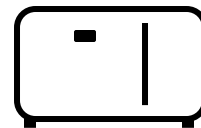
SigenStor, kwalitatief in hoge geïntegreerde oplossing

Single **SigenStor**

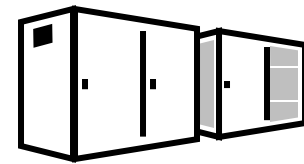
Inverters: **25 kW** x 1 Batteries: **8 kWh** x 6



Traditional solar + ESS energy solutions

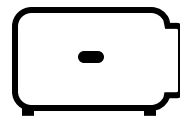


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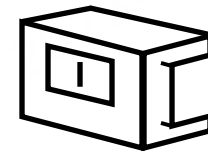


Vendor A PV Inverter
100 kW

Vendor B ESS
250 kW/500 kWh

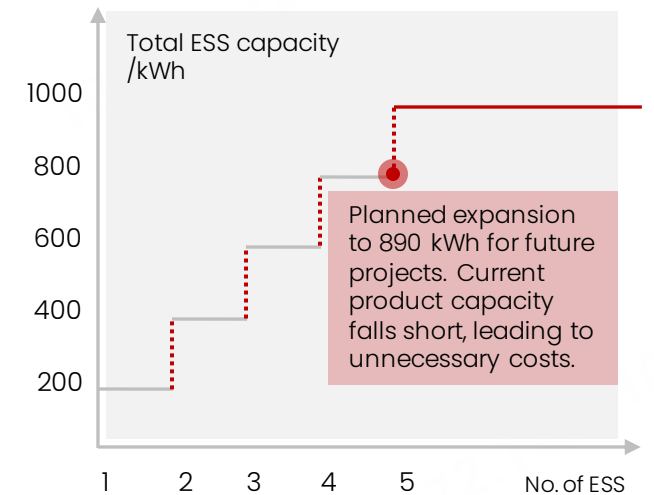


+



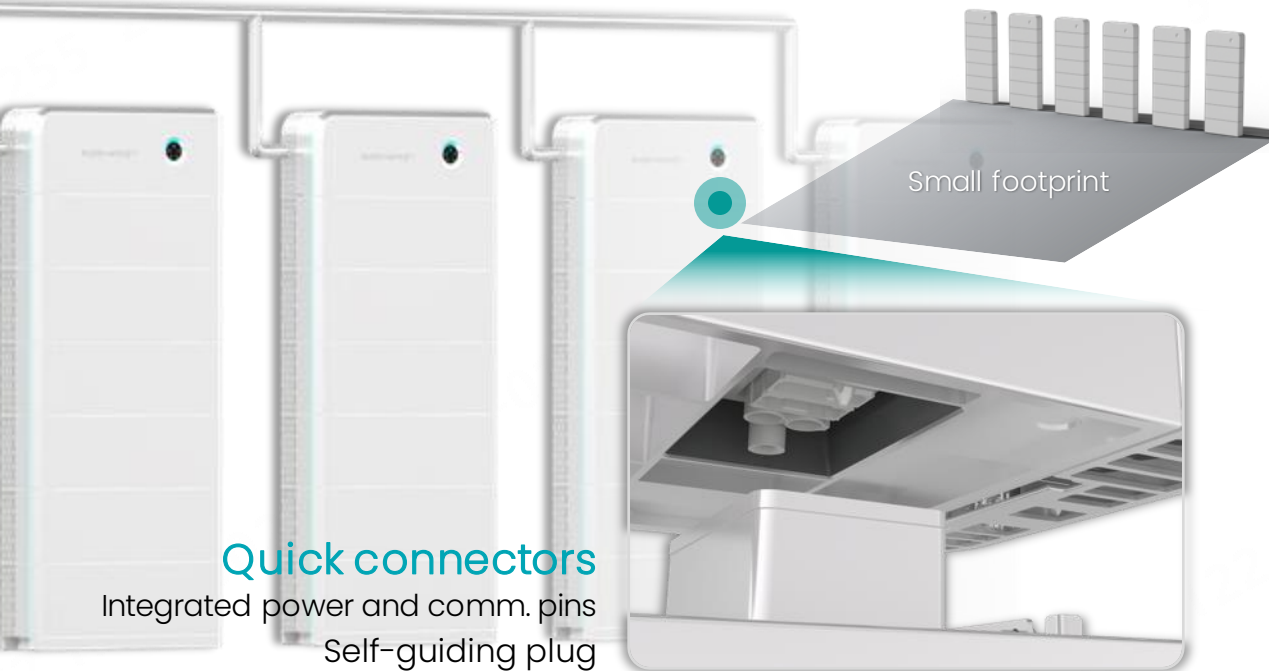
Vendor C PV Inverter
115 kW

Vendor D ESS
100 kW/200 kWh

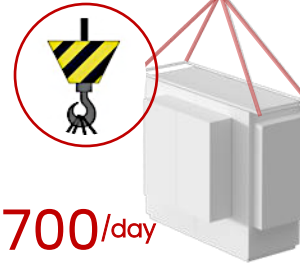


Stapelbaar, modulair én hoge installatiekosten besparend

- ✓ Lighter per stack
- ✓ Easier to install
- ✓ Smaller footprint required



1 Crane & hoisting required



€700/day

Special cranes for cabinet

4 Special & large foundation

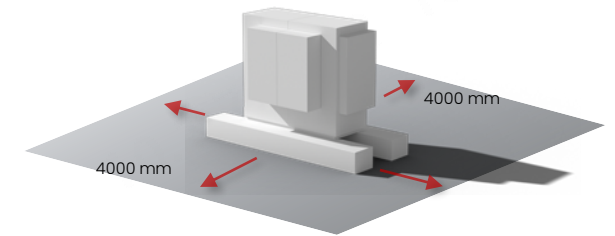


€30,000

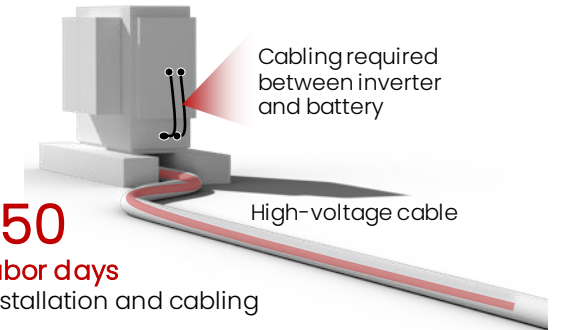
Concrete foundation is required

2 More footprint required

More space for ventilation and passing through



4 Exposed high voltage cables



€11,250

/ 4.5 x 5 labor days

Complex installation and cabling

Geen zorgen over weersinvloeden, vrij van O&M

SigenStor System Protection Rating



6X: No ingress of dust; complete protection against contact

X6: Protection from water, even from powerful jets of water



Annual Maintenance Labor-day: 0

Annual Maintenance Cost: €0

Multiple check items needed brings high OPEX



<p>Check per 6 months</p> <p>Air conditioner</p> <p>Smoke sensors</p> <p>Power supply</p> <p>Temp. sensors</p> <p>...</p>	<p>Check per 12 months</p> <p>Air inlet/outlet</p> <p>Wire connection</p> <p>Safety function</p> <p>Software version</p> <p>...</p>	<p>Check per 12 months</p> <p>Earthing</p> <p>SPD</p> <p>Fan</p> <p>Screw</p> <p>...</p>	<p>Check per 24 months</p> <p>Battery capacity</p> <p>Internal resistance</p> <p>Switch box</p> <p>Refrigerant</p> <p>...</p>
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Annual Maintenance Labor-day: 7 days

Annual Maintenance Cost: €3,500

Batterij-optimizers op cel basis & meer MPPT's voor hogere opbrengsten

SigenStor

16 MPPTs per 100kW system

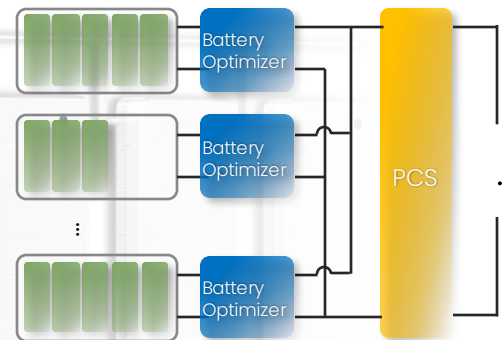
DC/AC ratio = 1.6

System yields increased by

3%+

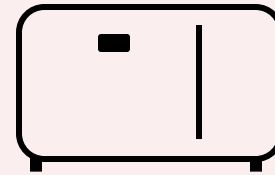
Parallel connection

Flexible mix of packs among different battery SOH/SOC



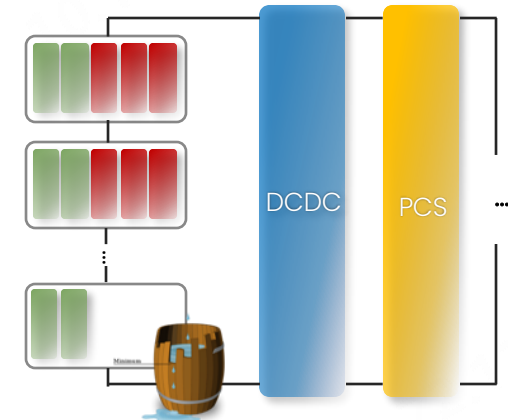
12 MPPTs per 110kW system*

DC/AC ratio = 1.5



Aging of the internal material, resulting in a relatively high internal resistance, which caused a significant drop in output voltage.

Traditional BESS systems



Cask effect

Minder investeren, minder zorg en meer opbrengsten

Flexible

- 1 5kWh / 8 kWh flexible matching
- 2 Max. on-grid capacity 1.44 MWh
- 3 Support both AC&DC coupled

Lower CAPEX

- 1 Stackable installation
- 2 Auto. system networking
- 3 DC coupling, saving cables

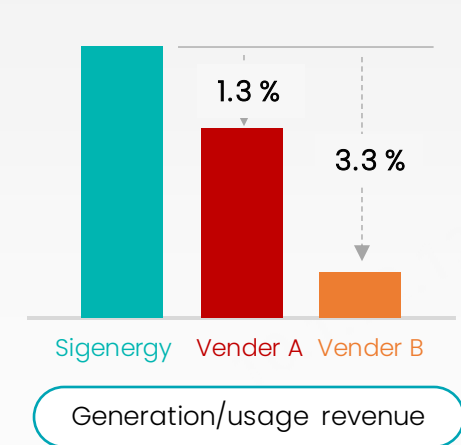
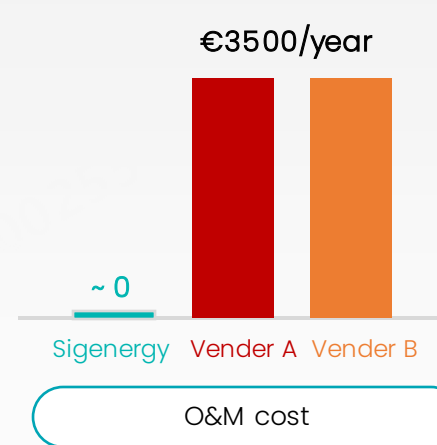
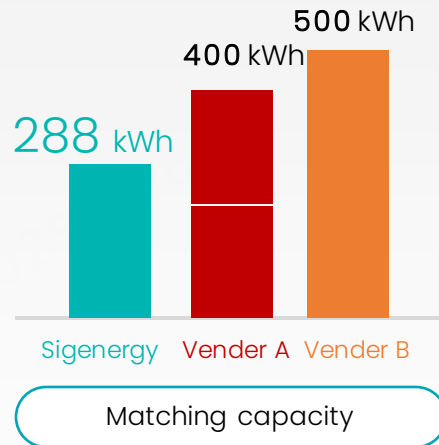
Lower OPEX

- 1 IP66, maintenance-free
- 2 5-layer battery/system protection
- 3 SOC visualization, no calibration

Higher Yield

- 1 Multi MPPTs & built-in battery optimizer
- 2 DC coupling for lower cable losses
- 3 AI powered, optimal operation for more

*Based on a 2000m² Rooftop PV+ESS Plant – 150 kWac Solar + 300 kWh BESS



Sigenergy brengt u en uw klanten...

Uitgebreide verbetering, ver voor op de concurrentie		Sigenergy	Vendor S	Vendor H
Simple Installation & Expand	Integrated design, simplified system	Integrated design, simple installation	Separate devices	Separate devices
	Quick connection, no external wiring required	Floating terminal , quick plug	Complex external wiring	Complex external wiring
	Fast networking on APP, simple system startup	Automatic	Manual	Manual
	Battery in parallel, simplifies inventory mgmt.	✓	✓	✓
All-round Safety Protection	Large capacity cells, safer and more reliable	280 Ah , 10000 times lifecycle	<100 Ah, 6000 times	<100 Ah, 6000 times
	Comprehensive battery protection	High-temp. resistance insulated pad Aerogels insulated pad Internal fire extinguishers Decompression valves	Fire extinguisher only installed onsite	Internal fire extinguisher only
	Inverter PV-PE short-circuit protection	✓	✗	✗
Boost Energy Usage Efficiency	Integrative DC charging module	✓	✗	✗
	Quick switching to backup mode	Switching time 0 ms	Switching time about 3 s	Switching time about 2 s
	V2X power supply	V2X ready	✗	✗
Intelligent Mgmt. Upgraded	High communication rate	Fast Ethernet 100 Mbps	RS485 9600 bps	RS485 9600 bps
	Cloud-native energy management system	✓	✓	✗
	AI-assisted home energy management	✓	✗	✓