

# BLACKOUT

**Grid Outages Germany 2006**

>20 minutes

**Renewables**

12.5% [Israel: <1%]

**Grid Outages Germany 2016**

~12 minutes

**Renewables**

33.8% [Israel: 3%]

# ELECTRICITY CONVENTION 2018: PREVENTING BLACKOUTS WITH UTILITY SCALE SOLUTIONS FROM SMA



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# RELY ON OUR MARKET LEADERSHIP IN BATTERY INVERTERS\* AND LONG-TERM EXPERIENCE IN UTILITY PV



More than **50 000**  
SMA battery systems  
installed around the world

More than **25**  
Years of experience  
with Battery Storage  
Systems

More than **30**  
GW installed capacity  
With Sunny Central  
Platform

**> 450** Service Employees  
worldwide ensure that your  
system is always in operation.

\* Applicable for battery inverters < 100 kW. According to IHS "Energy Storage Inverter (PCS) Report - 2016".

# ENERGY ON DEMAND WITH SMA LARGE-SCALE STORAGE SOLUTIONS



## Economical

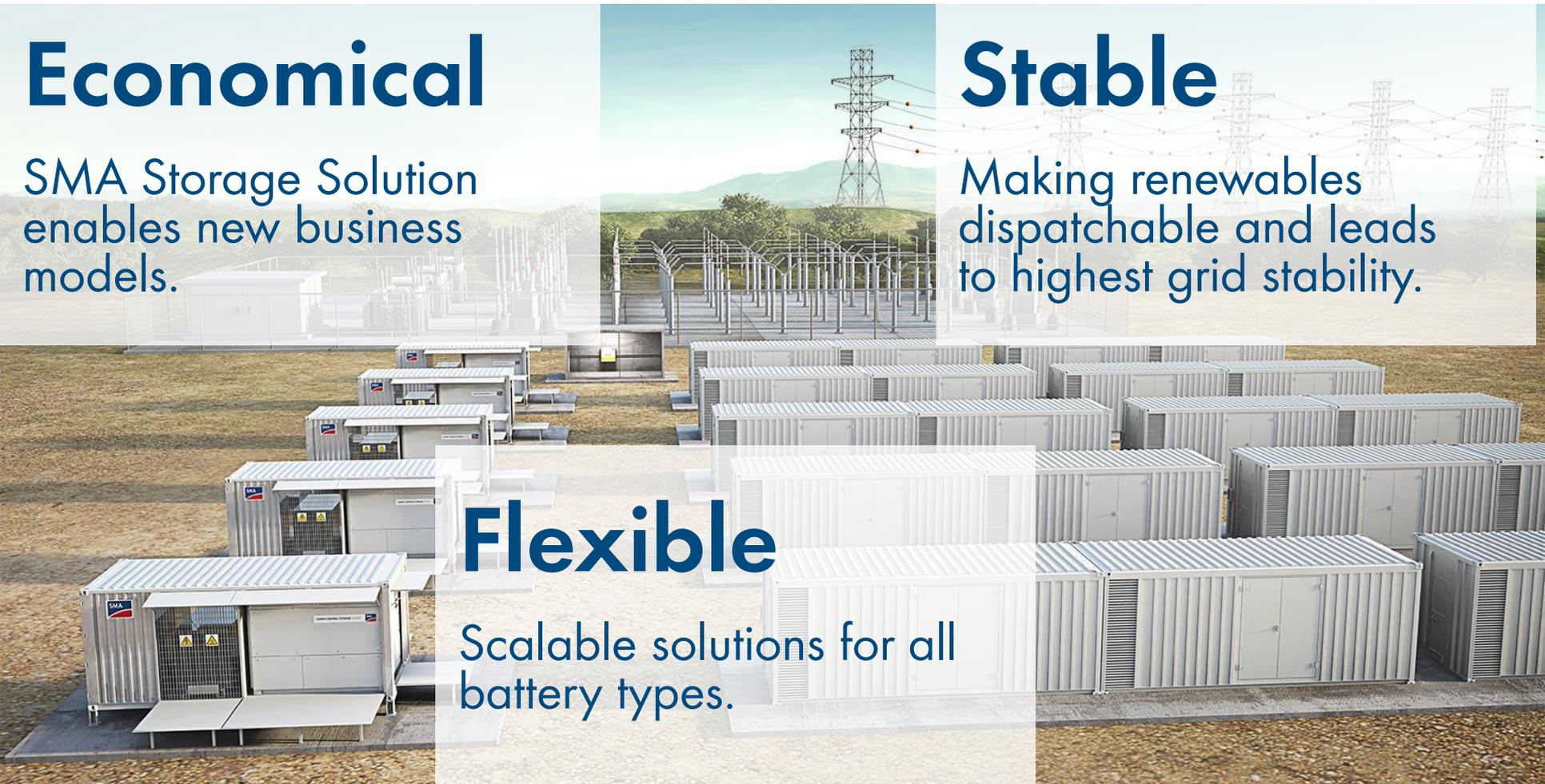
SMA Storage Solution enables new business models.

## Stable

Making renewables dispatchable and leads to highest grid stability.

## Flexible

Scalable solutions for all battery types.



# SOLUTIONS FROM ONE SINGLE SOURCE



## Turnkey solutions

500 to 6000<sup>1</sup> kW

MVPS 20 ft.



~500  
MW

MVPS 40 ft.<sup>1</sup>



Tailored power conversion systems as **true turnkey container solution**

## Battery Inverters

500 to 3000 kW



- Battery inverters with high power density and wide battery voltage range.

## Medium Voltage Blocks

2200 to 5500<sup>1</sup> kW



- Specially qualified MV blocks for **ANSI** markets perfectly match SMA inverters.

## System components



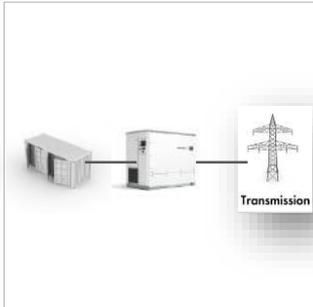
- Plant Controller for ongrid application for reliable monitoring and control.

## Service



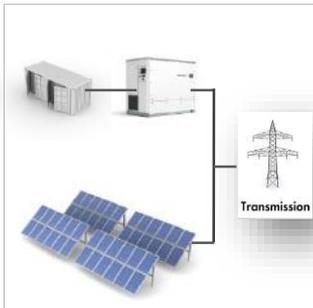
- Operation & Maintenance

> **SMA offers solutions for the entire value chain from DC to the MV grid worldwide.**



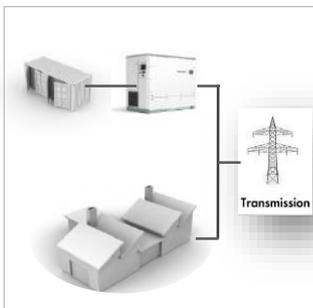
## 1. GRID SUPPORT

- > Ancillary services
- > Congestion relief (grid and generation capacity improvement)



## 2. INTEGRATION OF RENEWABLES

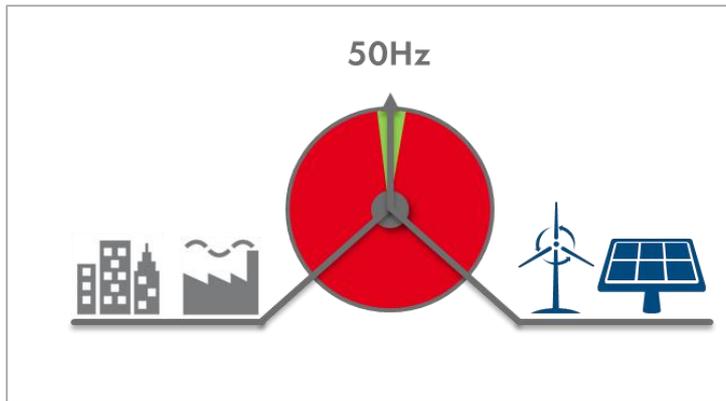
- > Ancillary services
- > PV ramp rate control
- > Energy shifting



## 3. INDUSTRIAL BEHIND-THE-METER (e.g. KIBBUTZ)

- > Peak load shaving
- > Peak/Energy shifting
- > Power Quality (reactive power supply, backup)

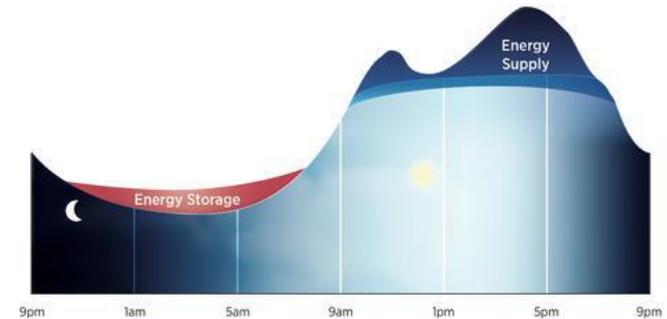
## Frequency Control



Mismatch between load and generation will be reflected into the grid frequency.

~250ms Response time @ <1% band

## Peak Shaving / Capacity



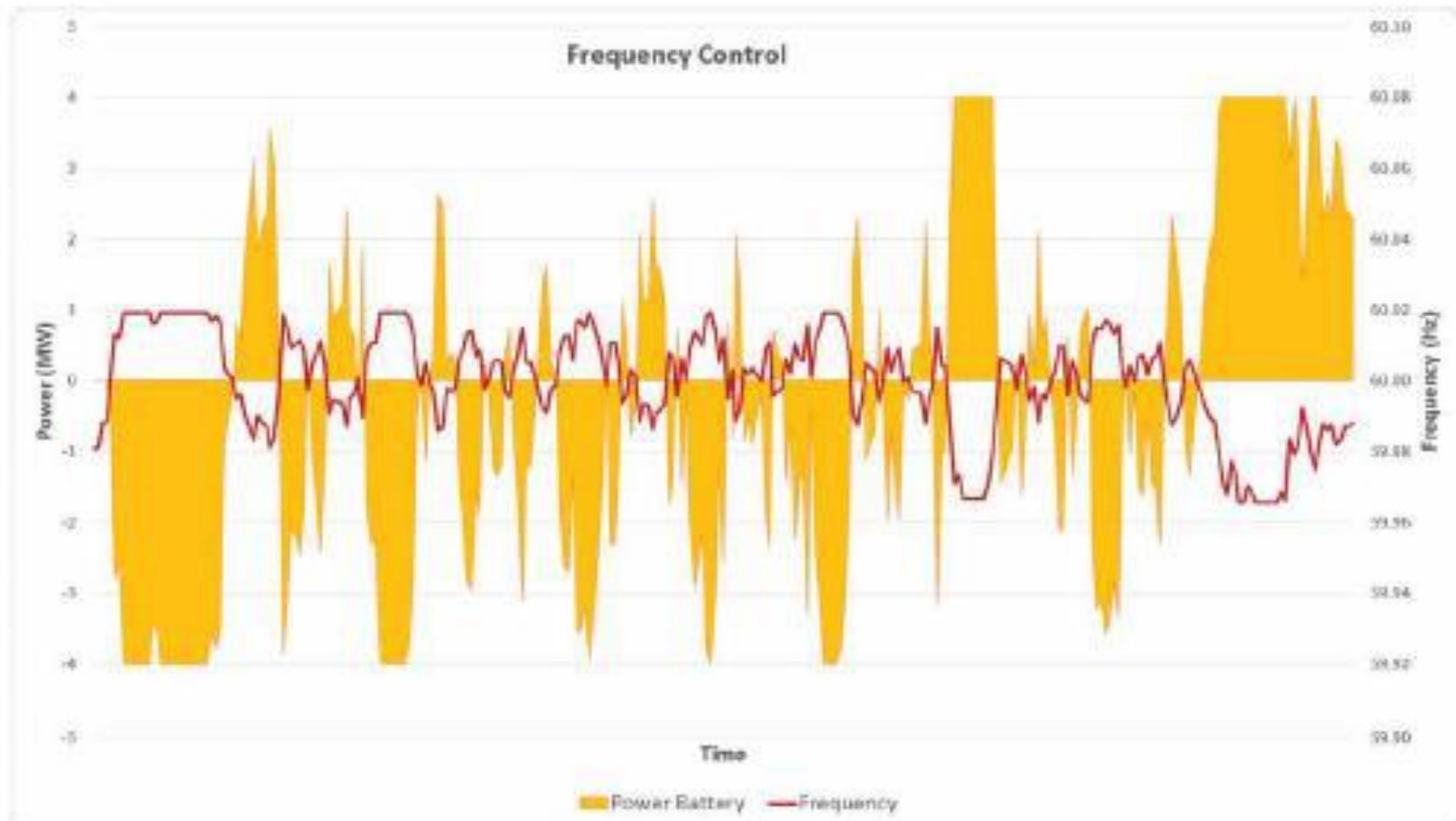
Peak shaving is becoming more attractive

Source: [http://en.openei.org/wiki/Main\\_Page](http://en.openei.org/wiki/Main_Page)

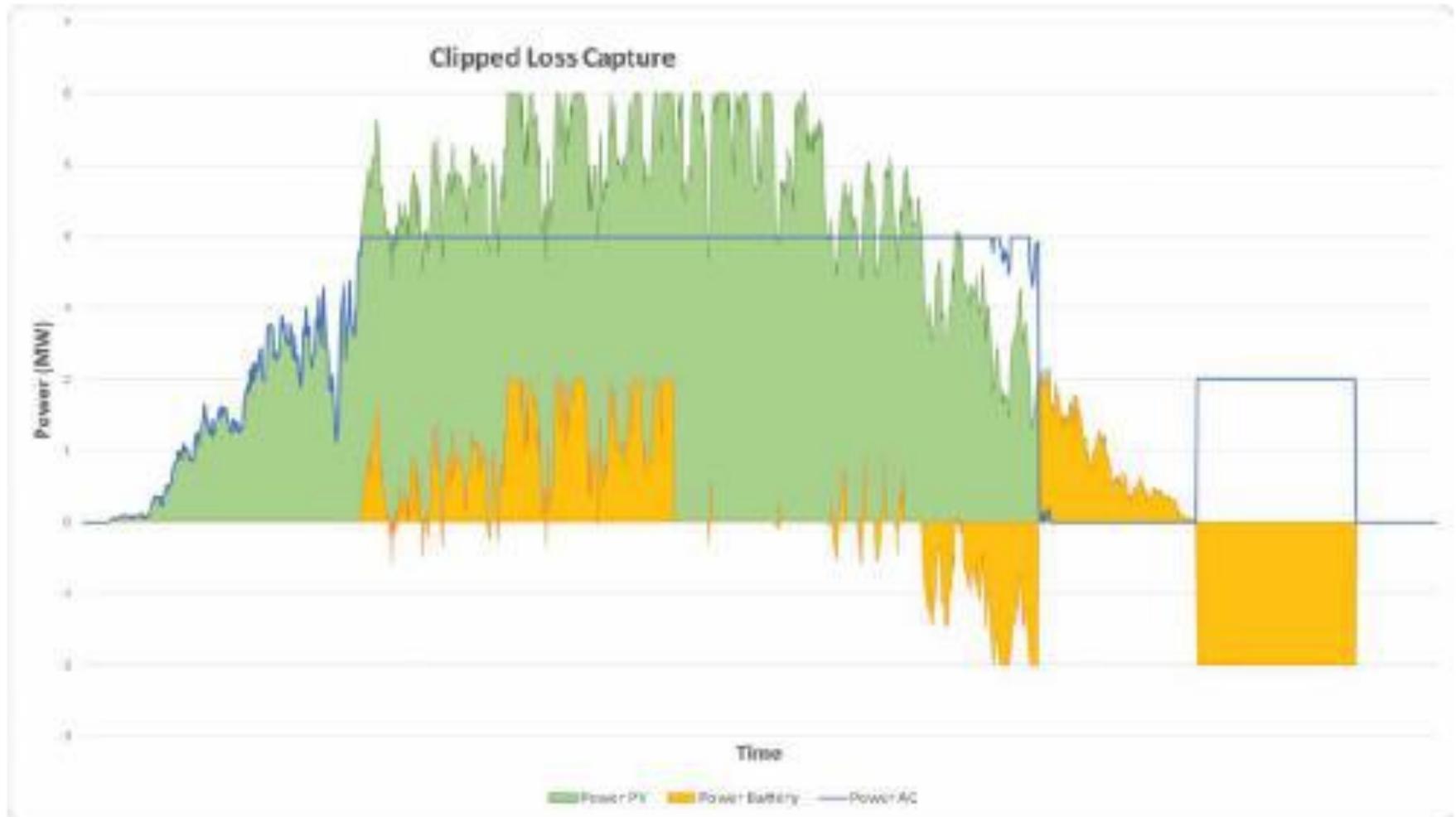
Providing the needed power for 1 or 2 hours per day is needed in many grids.

Due to the cost reduction in storage system solution, it is very economically attractive solution

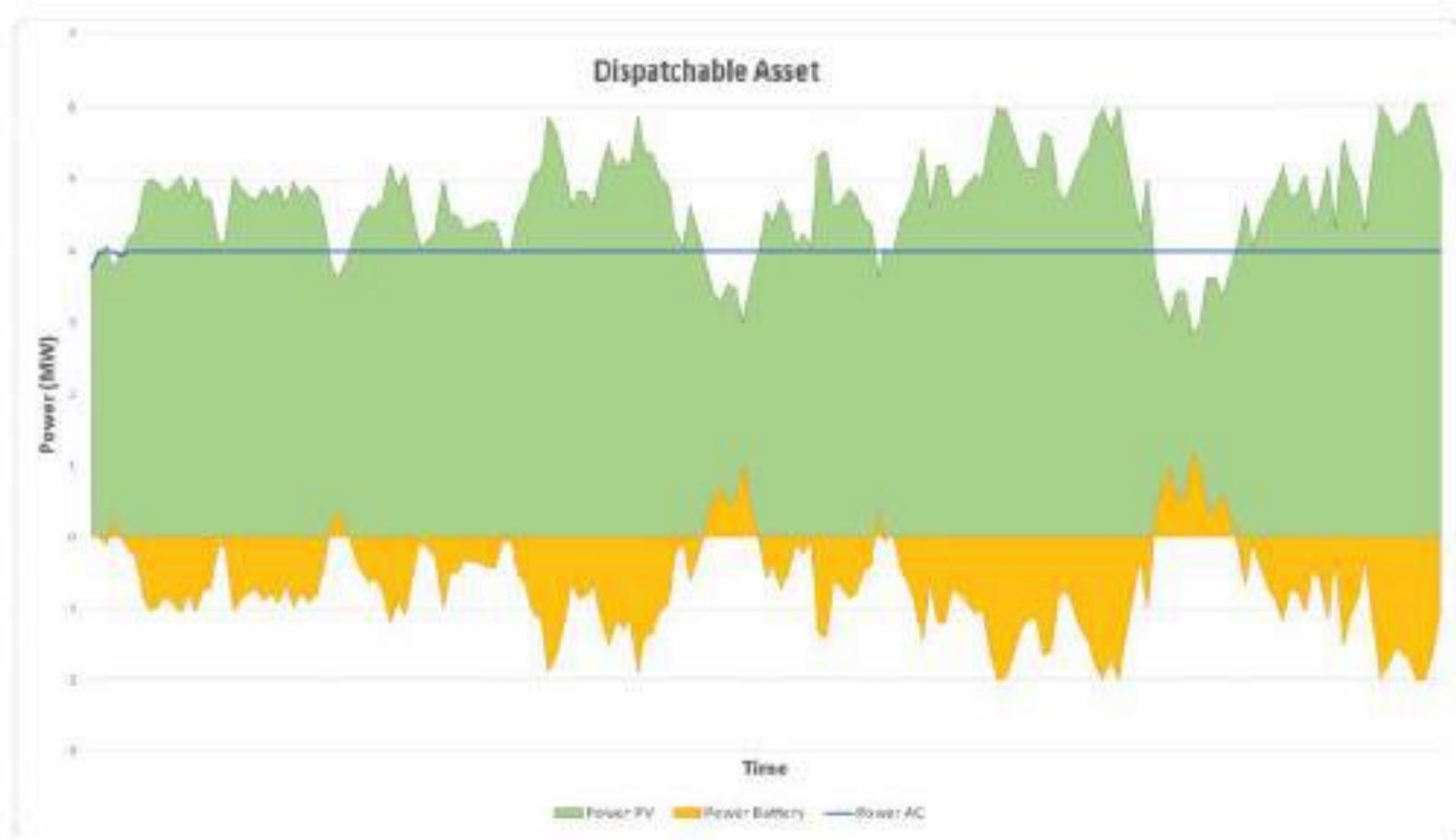
# FREQUENCY CONTROL



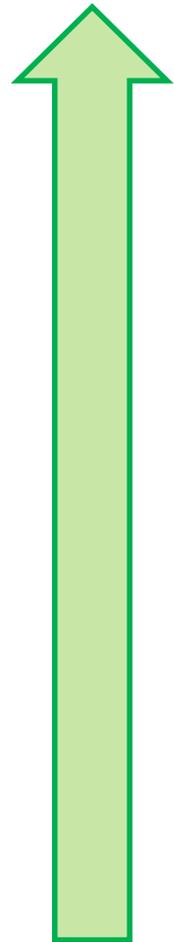
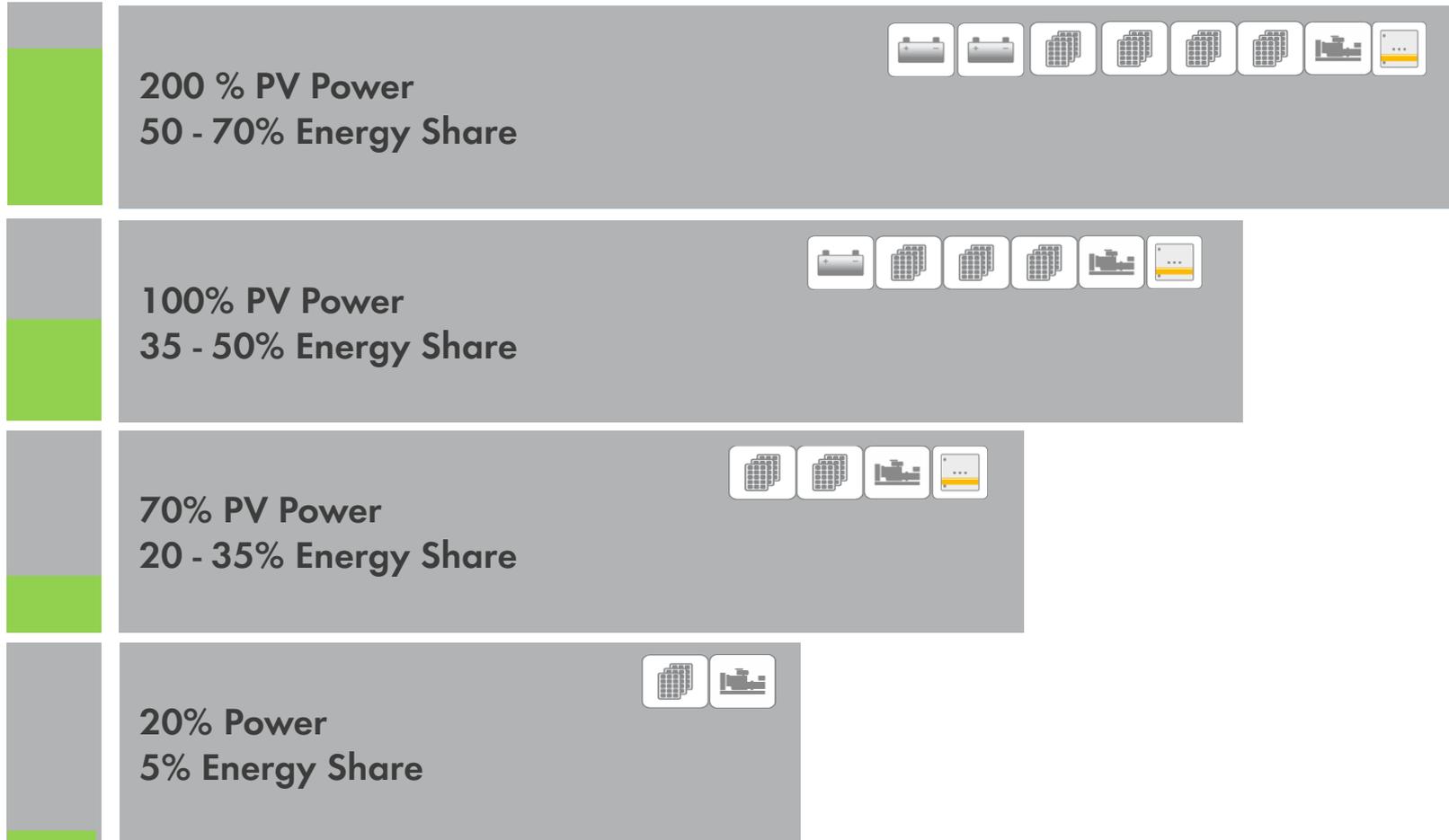
# CLIPPING LOSSES



# DISPATCHING PV + WIND



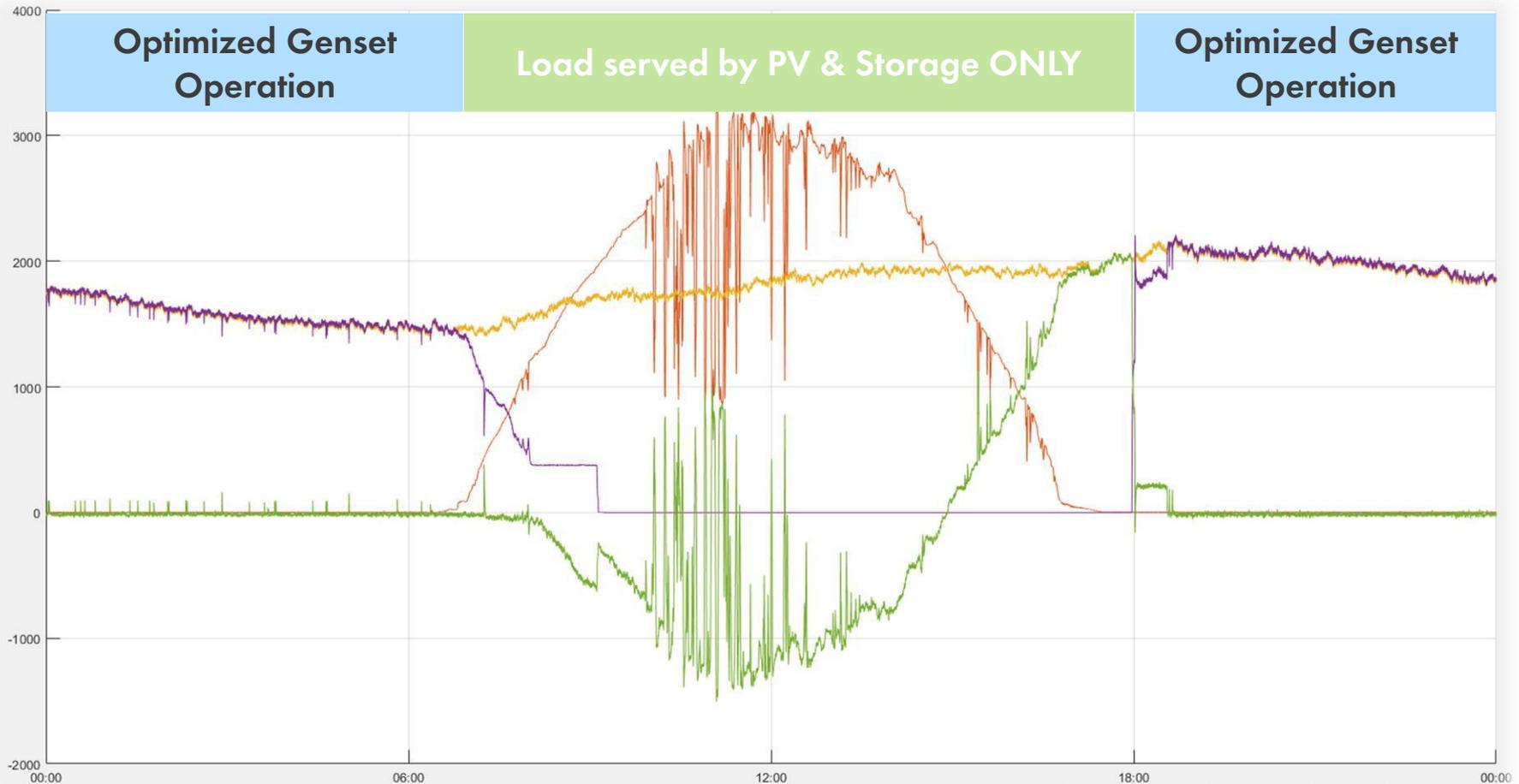
# WITHOUT BATTERY STORAGE SOLUTION THE RENEWABLE PENETRATION WILL NOT REACH ITS POTENTIAL



# ENERGY ON DEMAND WITH SMA LARGE-SCALE STORAGE SOLUTIONS



# SAMPLE DAY IN OPERATION



**VIDEO VON SUNBELT ST EUSTATIUS:**  
<https://www.youtube.com/watch?v=P8ljKZnoO8>

# BLACKout?

Don't worry – use **SMA!**

# BLACKstart!



# FUTURE PROOF

**Start a power plant**

**Providing secure power**

**Starting distributed grids**

# **SMA IS AN ENGINE OF INNOVATION**

**70 GW INSTALLED BASE**

**1 BILLION US-\$ SALES**

**ALL RELEVANT COUNTRIES**

**3,500 EMPLOYEES**



**Providing Safe Energy Solutions.**

SOCIAL MEDIA  
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