IBESA International Alliance | BATTERY & ENERGY STORAGE

# Top 5 European Solar, Storage & Digitalisation Market Trends for 2017 and Beyond

5 December 2017

Saif Islam | EuPD Research

IBESA International Alliance | BATTERY & ENERGY STORAGE

# The International Battery & Energy Storage Alliance

» Connect directly and easily with potential business partners.
» Positive positioning in markets and market segments as initiator, driver and accelerator.
» Increased attention by being listed on the IBESA website.

» Being continuously present with important target groups.
» Focused use of marketing budgets without money being wasted and with a positive ROI.
» Participation at key industry trade events as speaker and/or panellist.

» Extensive access to market data of many relevant markets.
» Huge saving effects through the provision of key figures.
» Free-of-charge market intelligence studies.

# Partners (Excerpt)

Bird & Bird

BYD Build Your Dreams

CENTROSOLAR

CleanView Capital Financing a clean energy future™

ENERGY STORAGE E3/DC

Eastman Empowering Lives

EATON Powering Business Worldwide

Eco Marine Global

electrovaya

ferroamp

flex

GILDEMEISTER energy solutions

ibvogt

SHARP

sonnen

SPANO PARTNERS HOLDINGS

STÄUBLI

VARTA

weisstechnik a schunk company

IBESA International Alliance | BATTERY & ENERGY STORAGE

# Events Organized by IBESA (Excerpt)

**Intersolar Summit Iran**
21 November 2017 | Tehran, Iran

**Digital Solar & Storage Europe 2017**
5 December 2017 | Munich, GER

**4th Exclusive Solar & Storage Business Circle – Middle East**
17 January 2018 | Abu Dhabi, UAE

**Intersolar Summit USA East 2018**
4 April 2018 | New York, USA

**Electrical Energy Storage Summit USA East**
5 April 2018 | New York, USA

**Solar, Storage & EV Charging Europe**
April 2018 | London, UK

**10th PV Briefing & Networking Forum Europe**
21 June 2018 | Munich, GER

**4th Exclusive Solar & Storage Business Circle – Europe**
20 June 2018 | Munich, GER

**Electrical Energy Storage Forum @ ees Europe**
20-22 June 2018 | Munich, GER

**17th PV Briefing & Networking Forum USA**
11 July 2018 | San Francisco, USA

**Electrical Energy Storage Forum @ ees North America**
10-12 July 2018 | San Francisco, USA

**4th Exclusive Solar & Storage Business Circle – USA**
11 July 2018 |San Francisco, USA

**3rd IBESA U.S. Storage Day @ Solar Power International**
24 September 2018 | Anaheim, USA

**Solar Trade Delegation Saudi Arabia**
October 2018 | Riyadh, Kingdom of Saudi Arabia

**Much more to come …**

# Technology Trends

# Economics of Energy Storage Systems



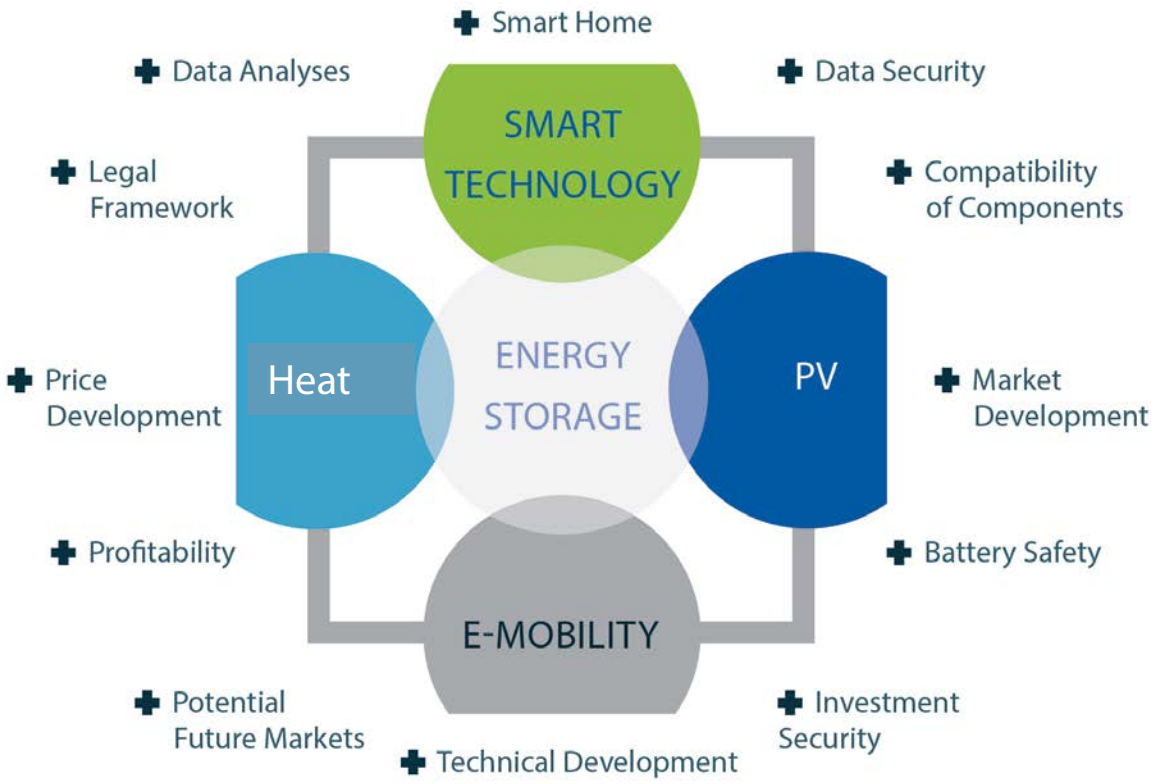
General trend towards high-voltage storage

- High-voltage storage offers advantages in terms of:
  - Reduced system costs due to a lower complexity of inverters
  - Less cabling is needed
  - Reduced conversion losses as the energy is already coherent with the voltage of most PV systems and the grid.

# Technology Trends – Integrated Energy Solutions

IBESA International Alliance | BATTERY & ENERGY STORAGE

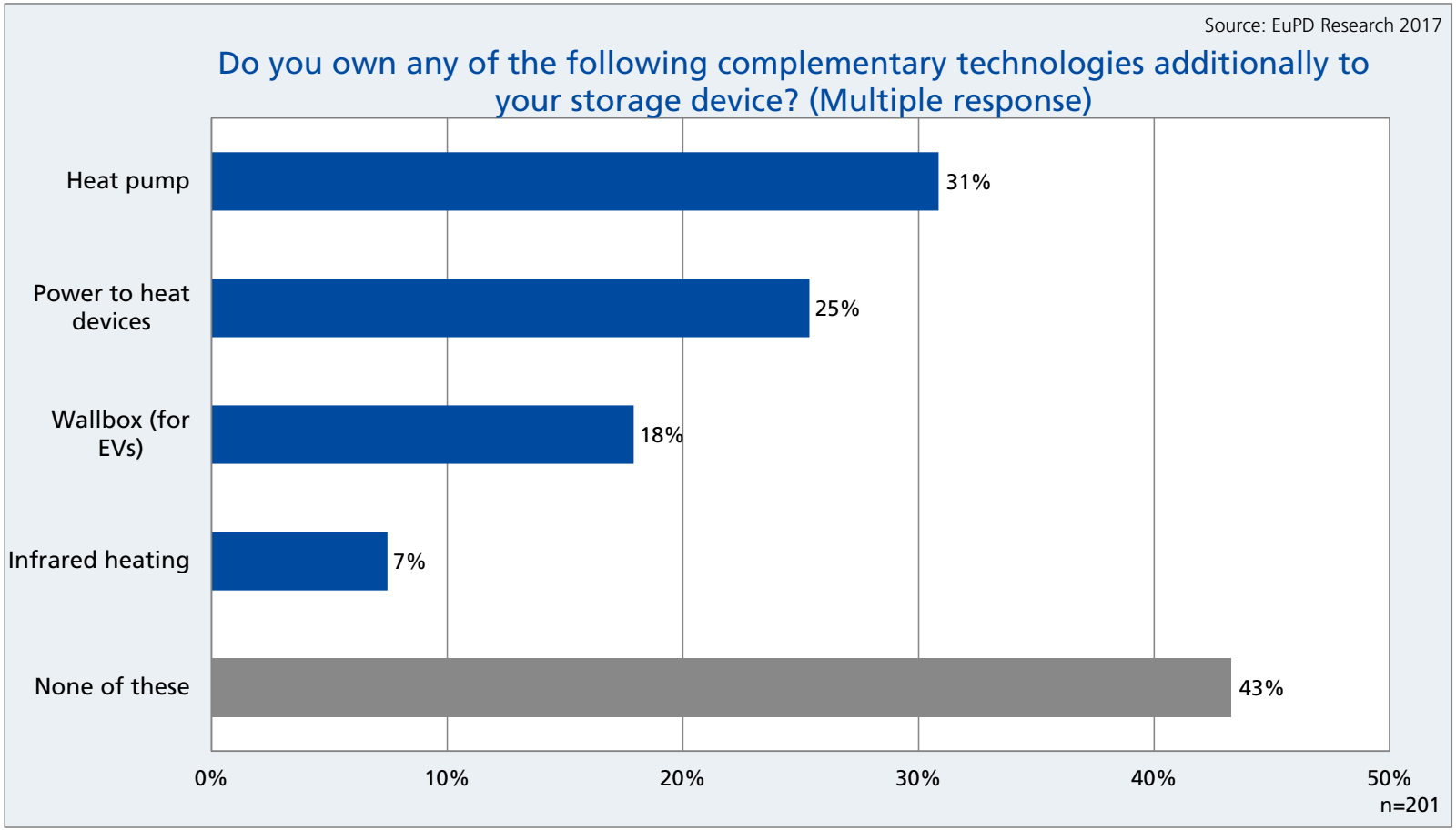
**Our focus area lies on energy storage – not in isolation, but in combination with…**



# Technology Trends – Integrated Energy Solutions

IBESA International Alliance | BATTERY & ENERGY STORAGE

Heat applications today are often used as a complementary technology. Mobility applications, however, are popular, too.

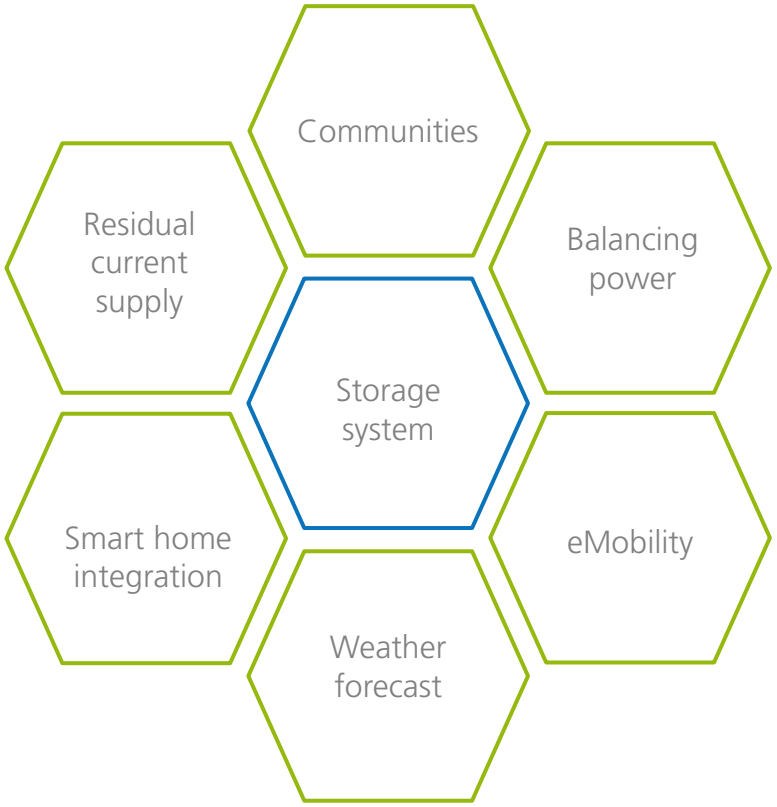


# Application Areas

# Application Areas - Communities

IBESA International Alliance | BATTERY & ENERGY STORAGE

## Market development – new business models, new chances?




> Customers have higher expectations
→ „all-in-one-solutions“

> Storage suppliers need to react

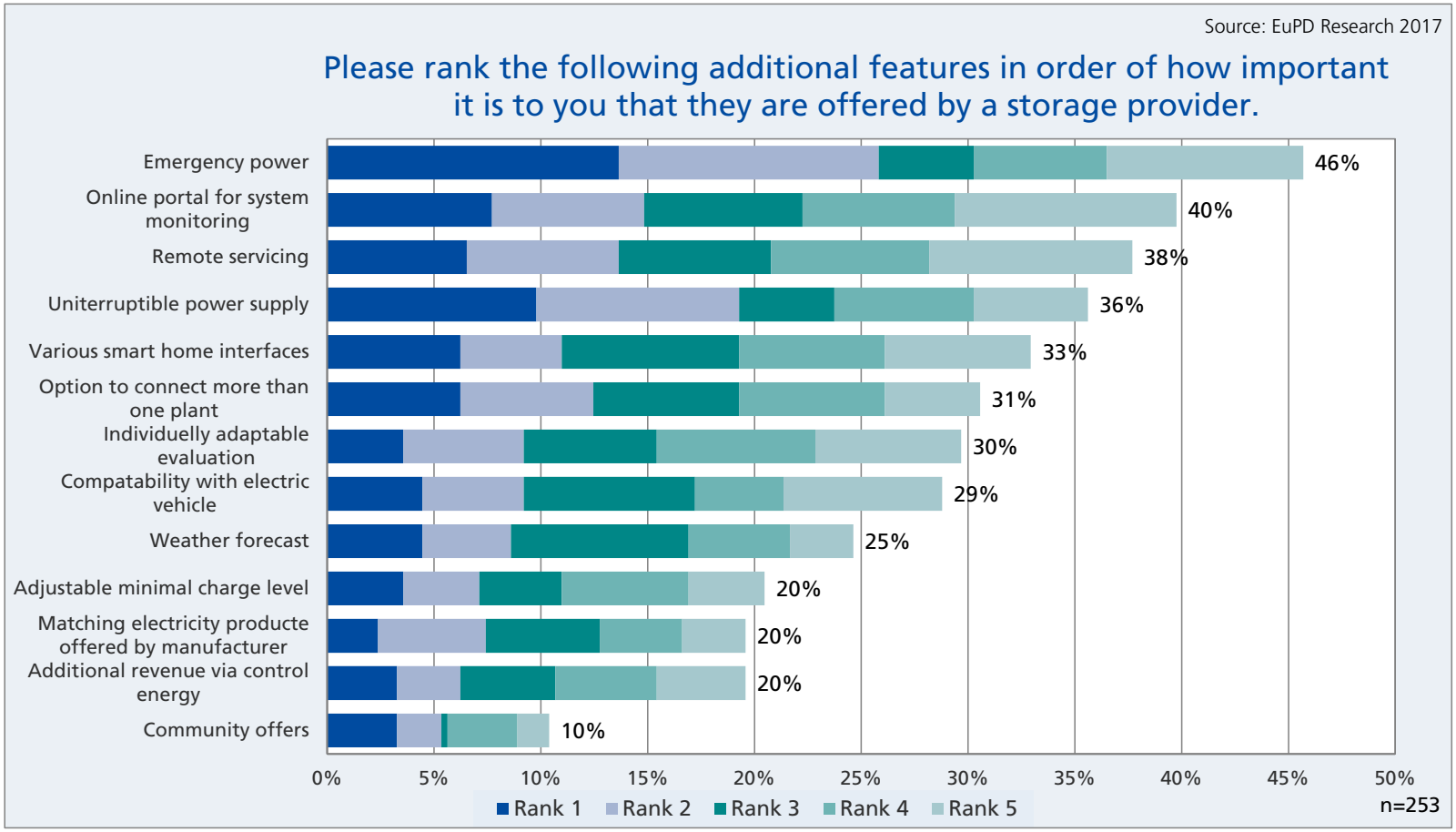
> by broadening their portfolio

> via co-operation strategies

# Application Areas - Communities

IBESA International Alliance | BATTERY & ENERGY STORAGE

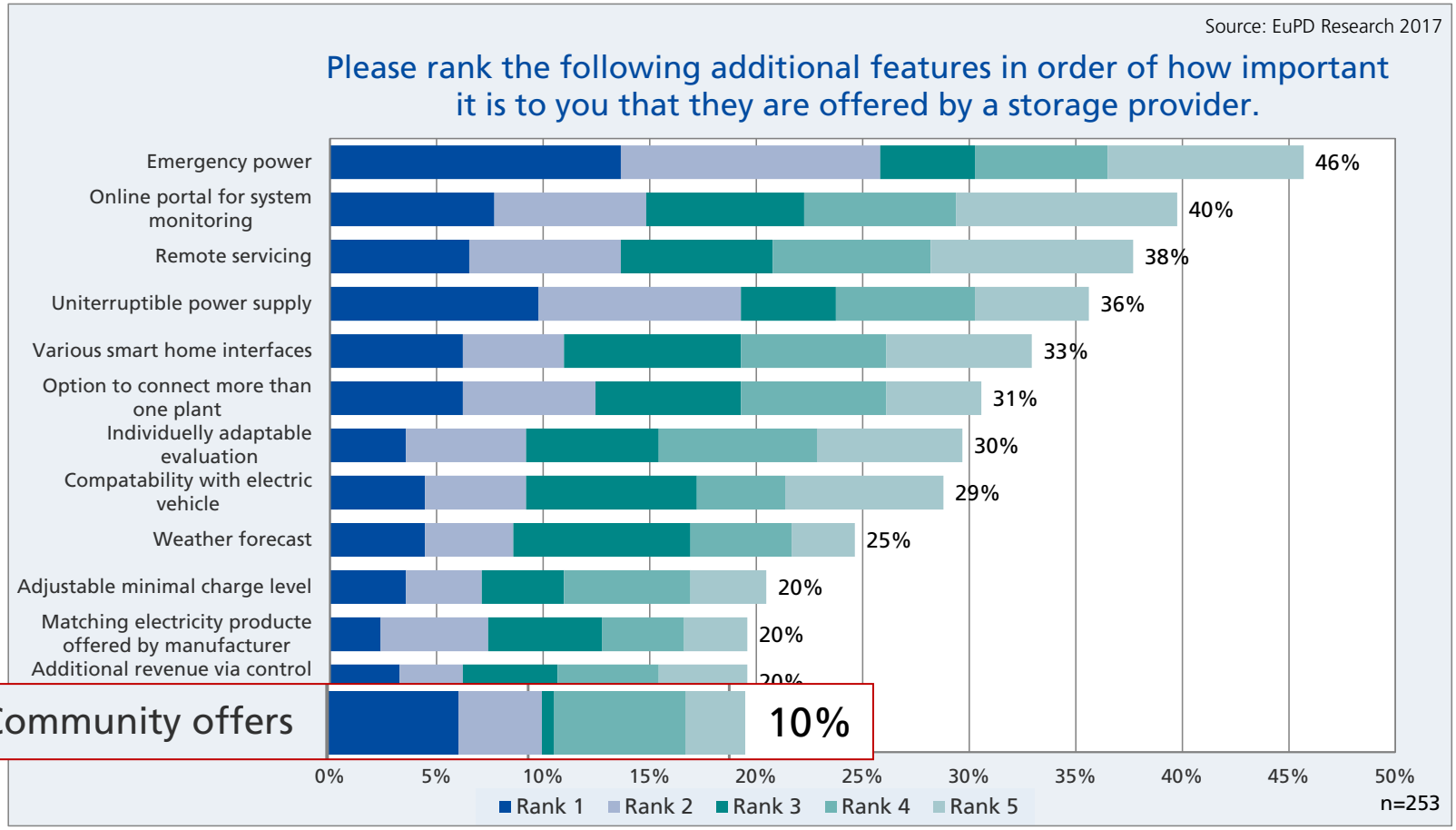
Communities as well as similar offers are not key factors such as additional features of a storage system are, however…



# Application Areas - Communities

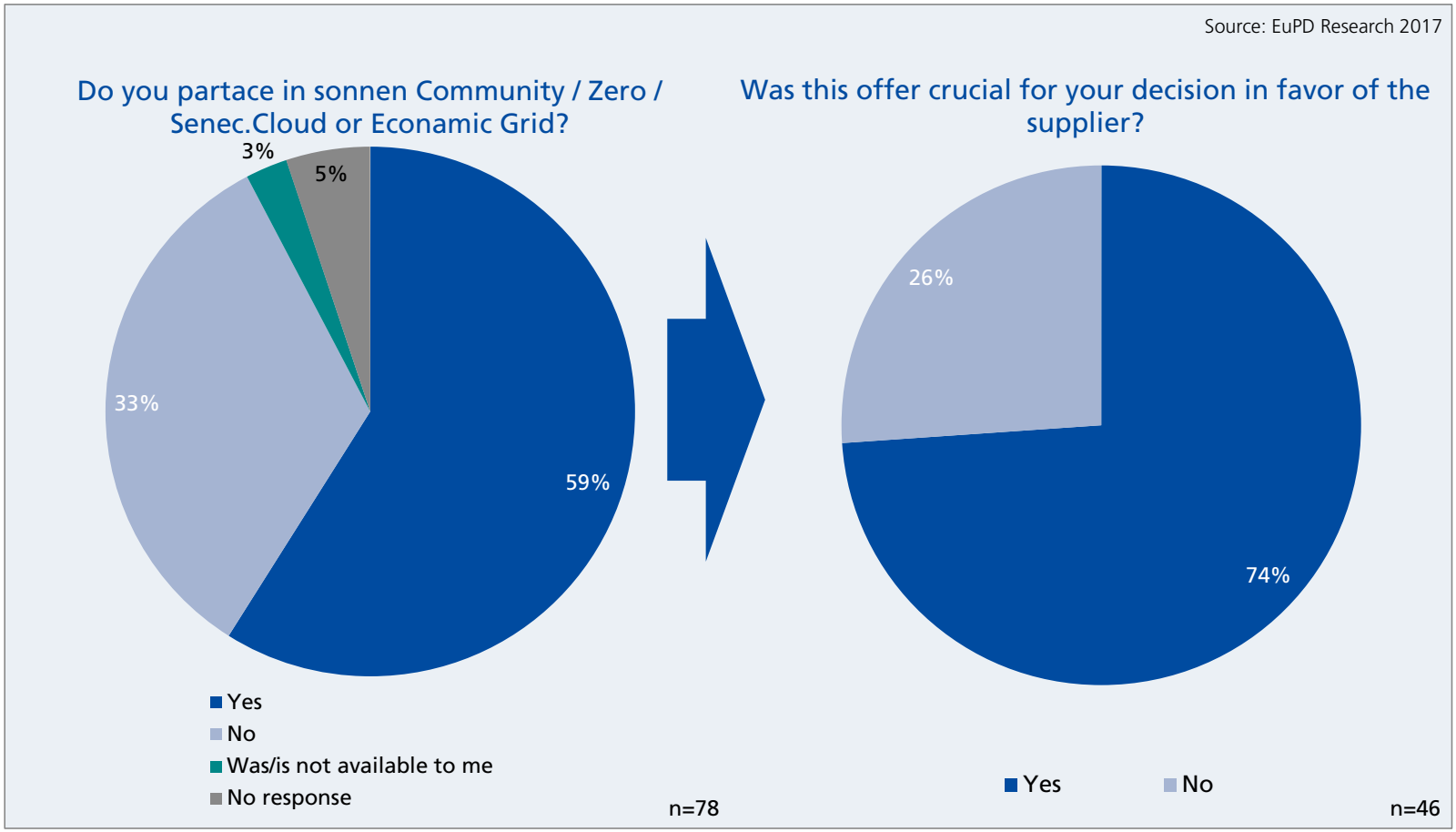
IBESA International Alliance | BATTERY & ENERGY STORAGE

Communities as well as similar offers are not key factors such as additional features of a storage system are, however…



# Application Areas - Communities

… it can be a crucial factor for certain end customers.



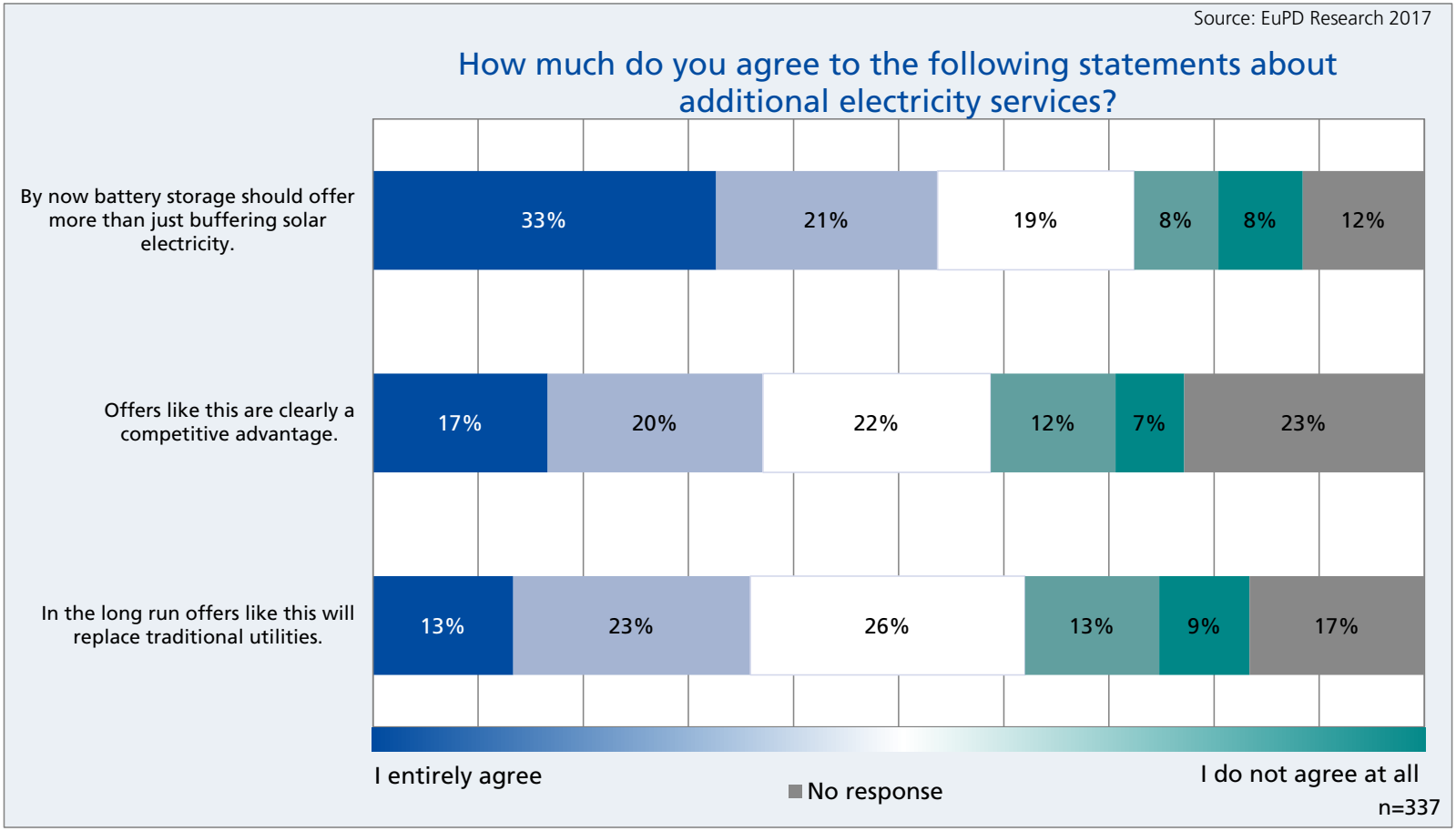
# Is there future potential for additional electricity offers by energy storage providers?

# Application Areas - Communities

IBESA International Alliance | BATTERY & ENERGY STORAGE

As shown below, the future potential of additional electricity services is huge.

Source: EuPD Research 2017

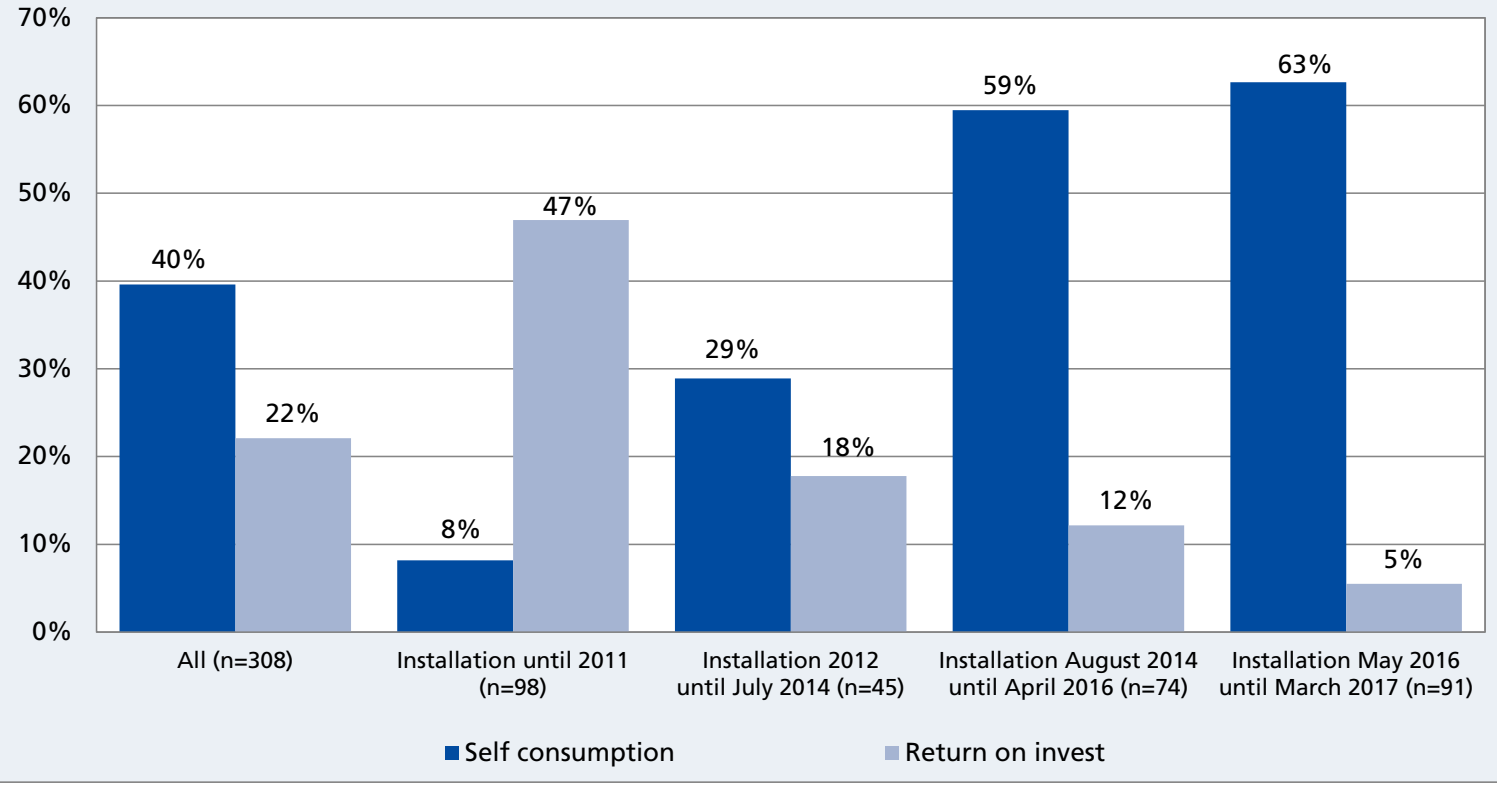


# Application Areas – Commercial Users

IBESA International Alliance | BATTERY & ENERGY STORAGE

Over the years, self-consumption has gained in importance for PV business customers, whereas return-on-invest is not as important as it used to be.

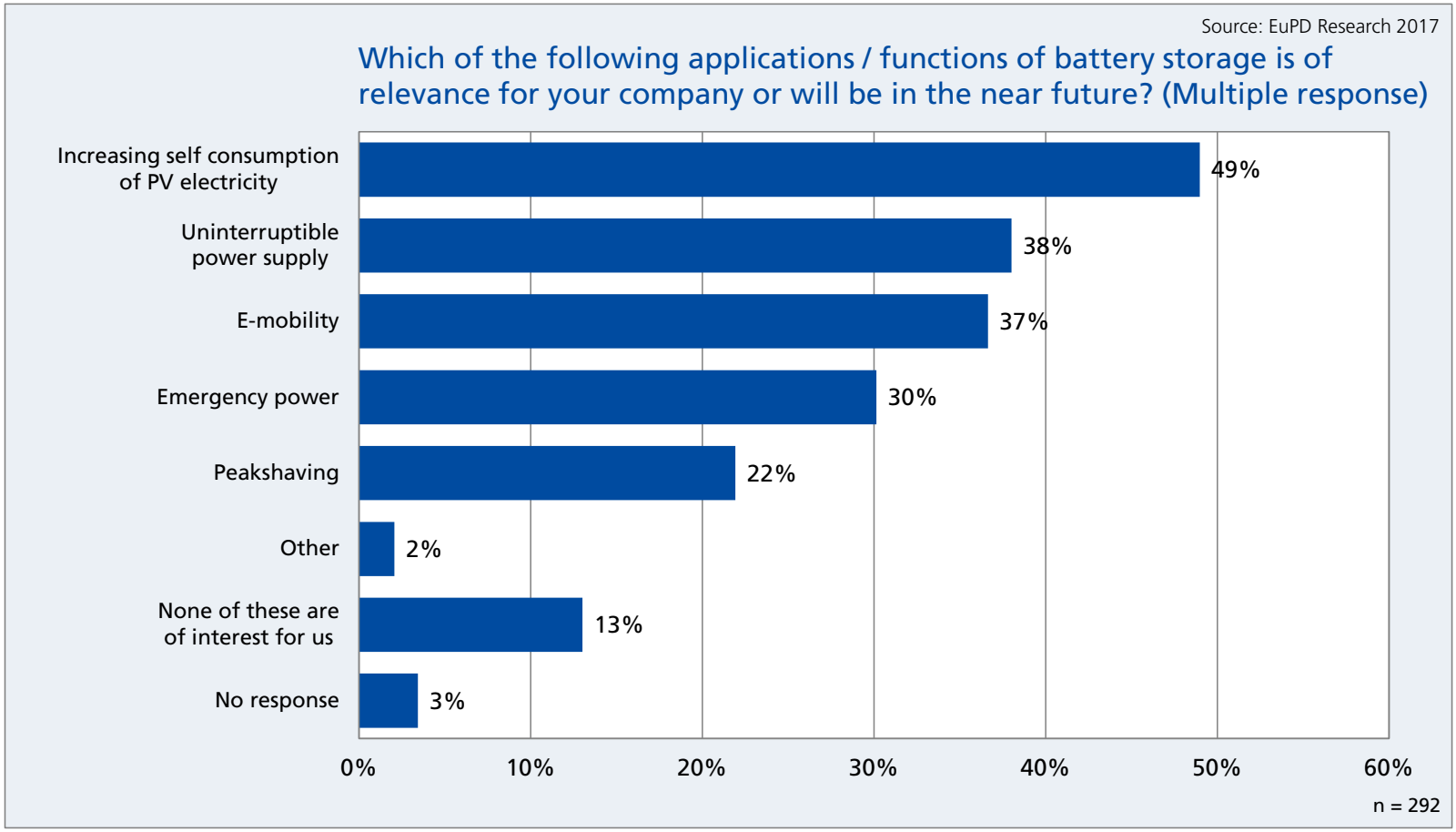
Source: EuPD Research 2017



# Application Areas - Commercial Users

IBESA International Alliance | BATTERY & ENERGY STORAGE

Next to self-consumption, an uninterruptible power supply is most crucial for PV business customers .



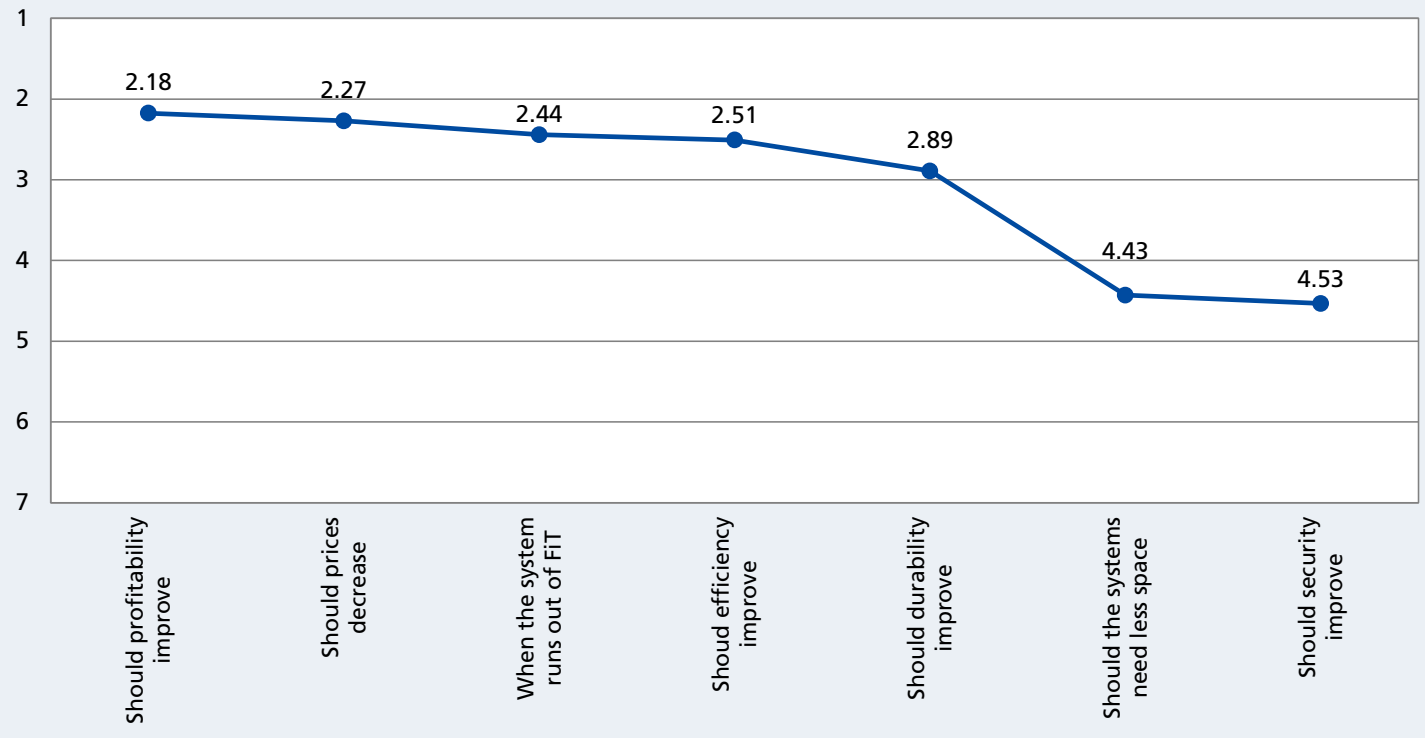
# Application Areas - Commercial Users

IBESA International Alliance | BATTERY & ENERGY STORAGE

Financial factors are essential when PV business customers consider investing in energy storage. Also, retro-fit offers a lot of potential.

Source: EuPD Research 2017

How do the following scenarios influence your decision to invest in storage? Please state under which circumstances you would be most likely to invest in a storage unit? | Average rank

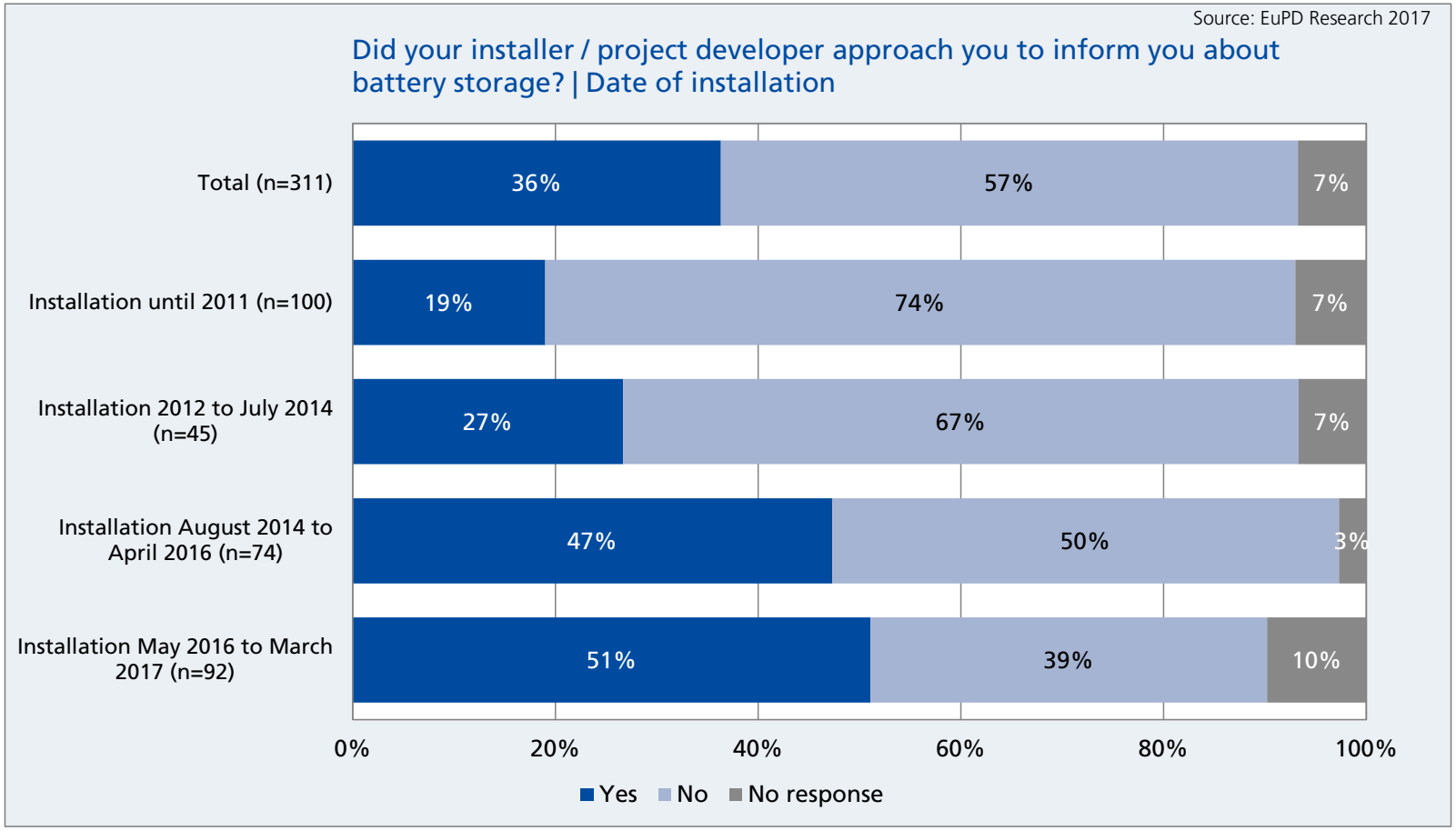



n = 98

# Application Areas - Commercial Users

IBESA International Alliance | BATTERY & ENERGY STORAGE

Considering the time of installation, the trend of pro-active installers is recognizable. They approach the customer actively in regards to storage.

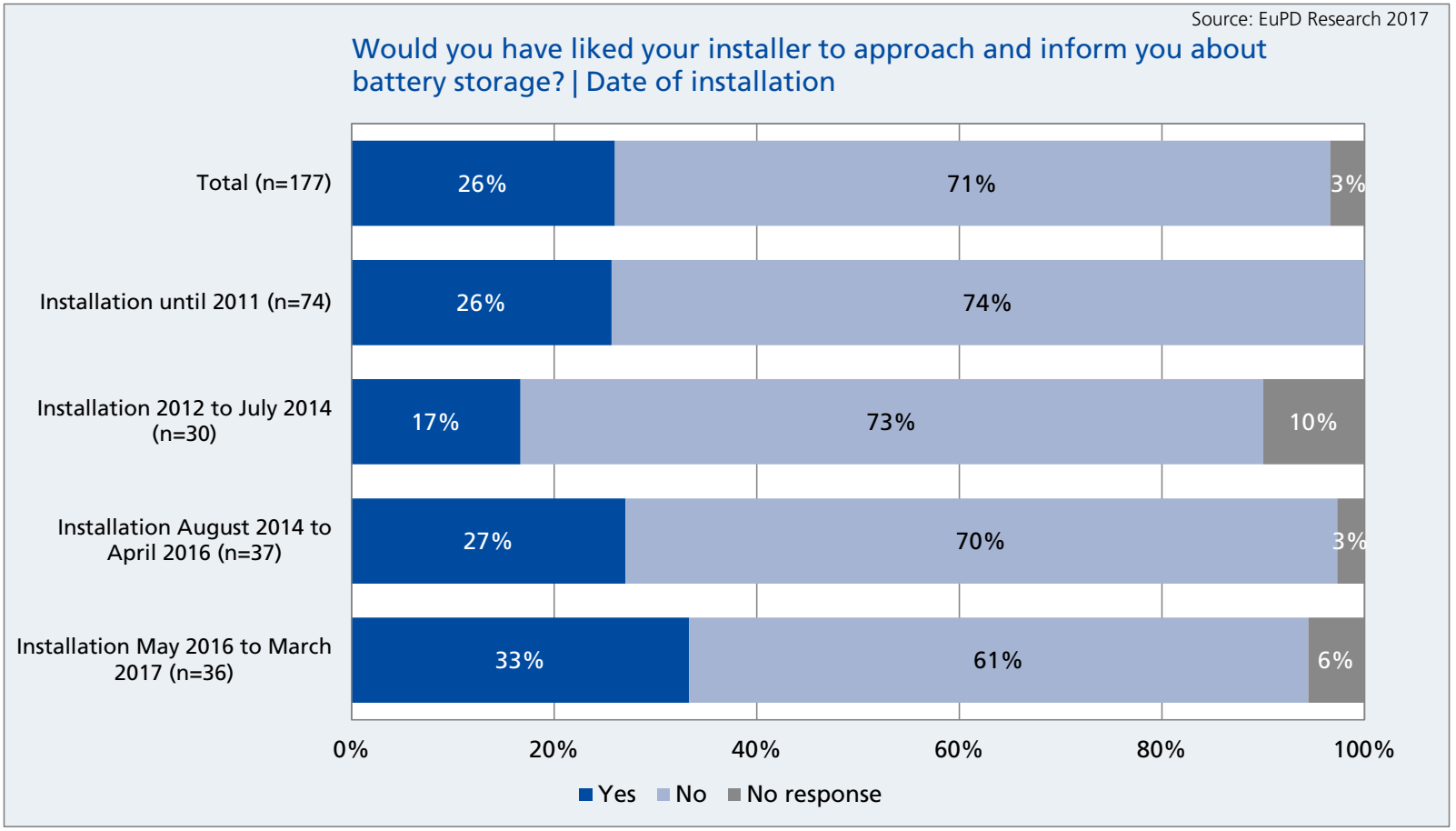


# Application Areas - Commercial Users

IBESA International Alliance | BATTERY & ENERGY STORAGE

It is evident that commercial customers increasingly seek consultation on storage. This offers a huge potential for energy storage.

Source: EuPD Research 2017



# Economics of Energy Storage Systems

# Economics of Energy Storage Systems

IBESA International Alliance | BATTERY & ENERGY STORAGE

- Economics of a PV system (German location)
- Annual data for PV-(storage) system costs, PV feed-in tariff and electricity price for private households

**PV system**

| | |
|---|---|
| O&M | 1.0% |
| interest rate | 2.0% |
| share of debt | 100% |
| Solar radiation | 900 kWh/ kWp |
| degradation | 0.25% |

**Framework conditions**

| | |
|---|---|
| electricity price increase (p.a.) | 1.50% |
| inflation rate | 1.5% |

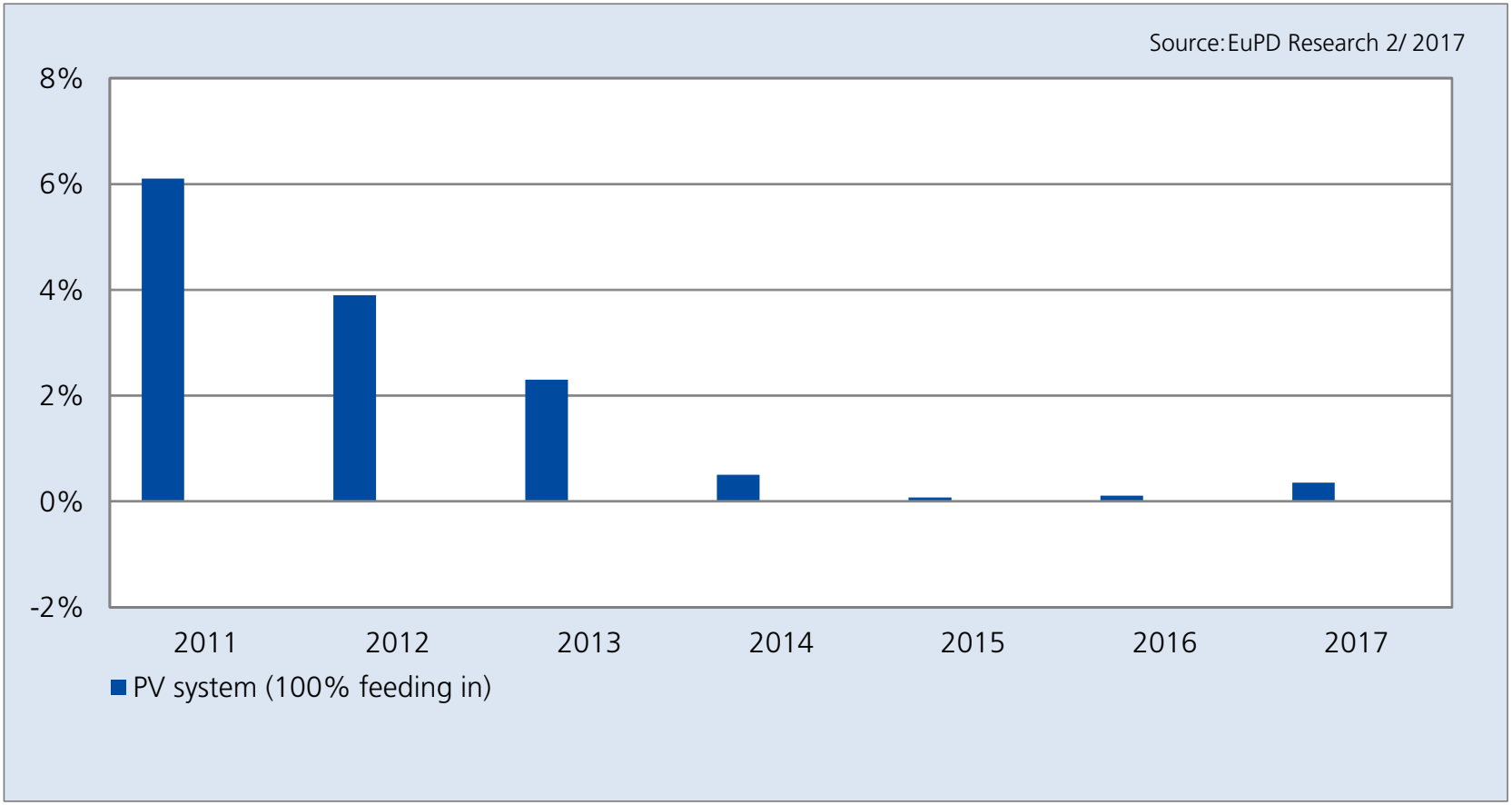
**Storage system**

| | |
|---|---|
| O&M | 0.50% |
| System efficiency | 85% |

# Economics of Energy Storage Systems

IBESA International Alliance | BATTERY & ENERGY STORAGE

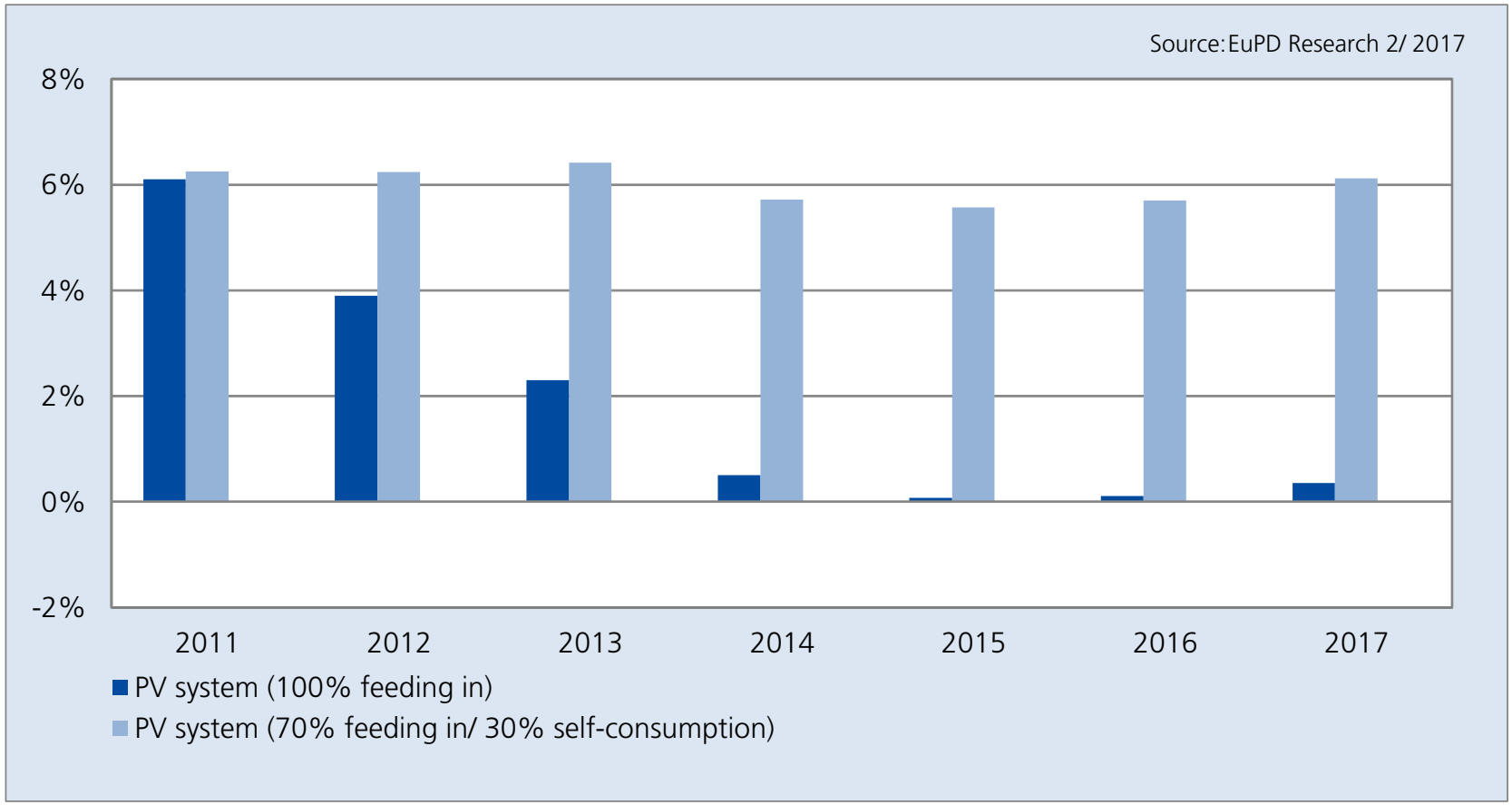
At the latest since 2014 it has not been feasible to feed in 100% of PV generated electricity to the grid.



# Economics of Energy Storage Systems

IBESA International Alliance | BATTERY & ENERGY STORAGE

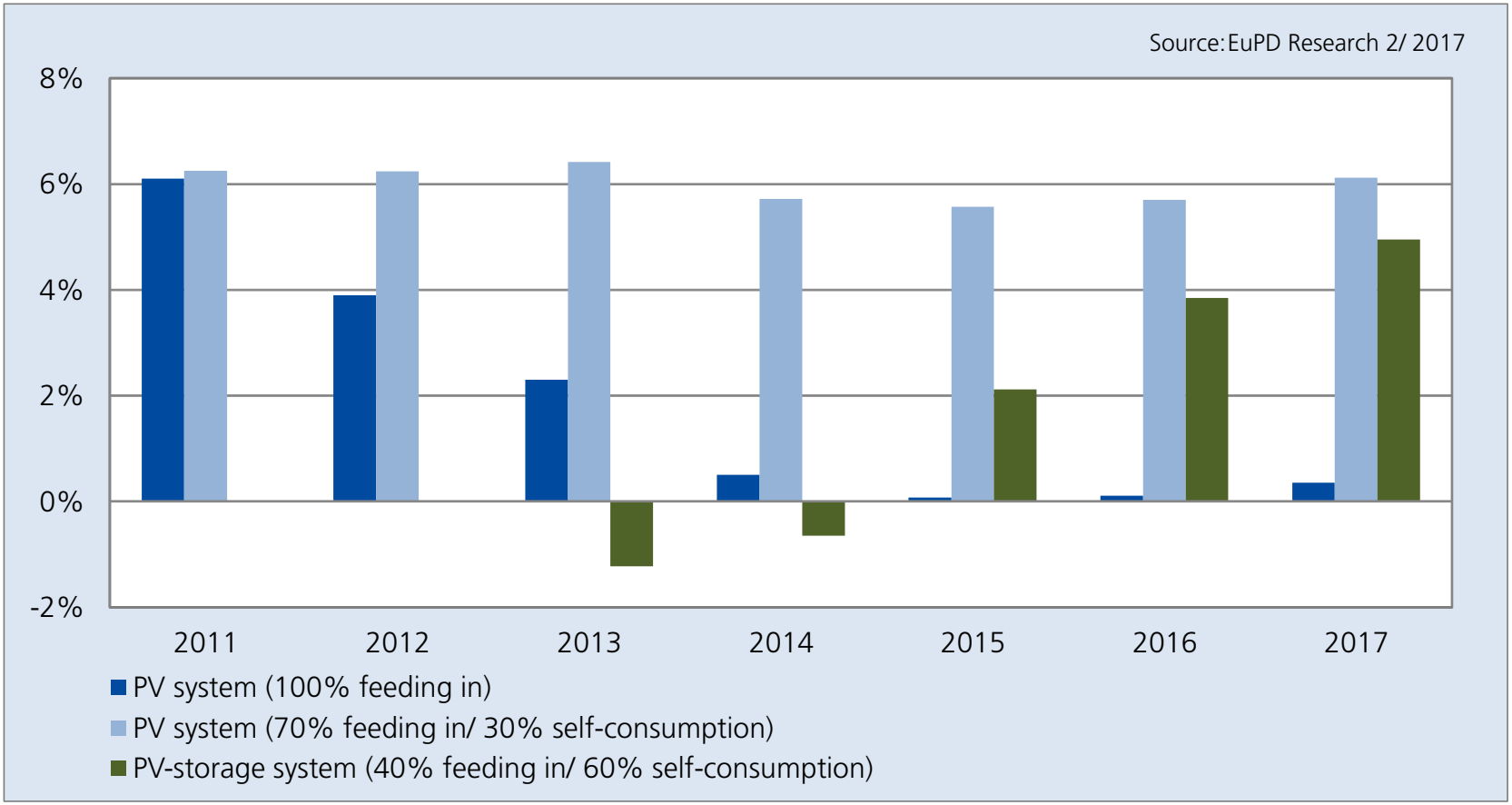
Facing decreasing feed-in tariffs and increasing electricity prices, PV systems with self-consumption reach an attractive return-on-invest.



# Economics of Energy Storage Systems

IBESA International Alliance | BATTERY & ENERGY STORAGE

Based on strong reductions in storage system prices, PV storage systems became economical in 2015.



# Economics of Energy Storage Systems

## Applications for Storage Systems

| Application area | Effect | Market driver |
|---|---|---|
| Self-consumption | Minimization of grid power procurement | High electricity prices |
| | Maximization of the ROI | No feed-in tariff |
| | Maximization of self-consumption | No feed-in to the grid possible |
| Electricity price arbitrage | Utilization of electricity price fluctuations to load cheap electricity and to discharge electricity when prices are high | Electricity tariffs with fluctuating prices during the day |
| Energy market | Offer of services at the electricity balancing market | Prices and demand for control energy |
| Island operation | Access to electricity generation or replacement of classic off-grid supply (diesel generators) | Bad or no connection to the grid |
| | | High diesel prices |
| Emergency power | Maintaining of the electricity supply when the grid breaks down | Vulnerable electricity supply / power outages |
| Capacity tariffs | Usage of energy storage to reduce the power input of consumption | Specific electricity tariffs |

# Top 5 European Market Trends for 2017 and Beyond

IBESA International Alliance | BATTERY & ENERGY STORAGE

## What comes next?

Who are the main **customers** in the future and how do they behave?

Which **new customer segments** will come up new?

Who are the main **competitors**?

Which **countries** have the most attractive market conditions?

Which **business models** will determine the future storage market?

# Top 5 European Market Trends for 2017 and Beyond

IBESA International Alliance | BATTERY & ENERGY STORAGE

## | What comes next?

Who are the main customers in the future and how do they behave?

> Residential customers remain important, but the market conditions influence the target group significantly

Which new customer segments will come up new?

Who are the main competitors?

Which countries have the most attractive market conditions?

Which business models will determine the future storage market?

# Top 5 European Market Trends for 2017 and Beyond

IBESA International Alliance | BATTERY & ENERGY STORAGE

## What comes next?

Who are the main **customers** in the future and how do they behave?

> Residential customers remain important, but the market conditions influence the target group significantly

Which **new customer segments** will come up new?

> Business and retrofit customers offer a huge potential, but are not targeted enough yet

Who are the main **competitors**?

Which **countries** have the most attractive market conditions?

Which **business models** will determine the future storage market?

IBESA International Alliance | BATTERY & ENERGY STORAGE

## What comes next?

Who are the main customers in the future and how do they behave?

> Residential customers remain important, but the market conditions influence the target group significantly

Which new customer segments will come up new?

> Business and retrofit customers offer a huge potential, but are not targeted enough yet

Who are the main competitors?

> The storage market is attractive for many market players (utilities, automotives etc.), which increases competitive pressure and leads to lower prices

Which countries have the most attractive market conditions?

Which business models will determine the future storage market?

IBESA International Alliance | BATTERY & ENERGY STORAGE

## What comes next?

Who are the main **customers** in the future and how do they behave?

> Residential customers remain important, but the market conditions influence the target group significantly

Which **new customer segments** will come up new?

> Business and retrofit customers offer a huge potential, but are not targeted enough yet

Who are the main **competitors**?

> The storage market is attractive for many market players (utilities, automotives etc.), which increases competitive pressure and leads to lower prices

Which **countries** have the most attractive market conditions?

> Besides Germany, Italy and other European markets show growth potentials

Which **business models** will determine the future storage market?

IBESA International Alliance | BATTERY & ENERGY STORAGE

## What comes next?

Who are the main **customers** in the future and how do they behave?

> Residential customers remain important, but the market conditions influence the target group significantly

Which **new customer segments** will come up new?

> Business and retrofit customers offer a huge potential, but are not targeted enough yet

Who are the main **competitors**?

> The storage market is attractive for many market players (utilities, automotives etc.), which increases competitive pressure and leads to lower prices

Which **countries** have the most attractive market conditions?

> Besides Germany, Italy and other European markets show growth potentials

Which **business models** will determine the future storage market?

> Communities and other services (balancing power) show potential – as long as the market conditions are good

# About the data

IBESA International Alliance | BATTERY & ENERGY STORAGE

## | The presentation is based i.a. on the following reports by EuPD Research

### Installer Analysis

> European PV InstallerMonitor

> European PV Storage Market Insights

> Surveys amongst installers regarding buying process, procurement channels, brand choice and satisfaction concerning PV storage


### End Customer Analysis

> EndcustomerMonitor 7.0

> Survey amongst PV system-owners and planners regarding the buying process for PV storage systems, background and buying motivation as well as brand awareness and choice

> Business & Industry Monitor 2.0

> Survey of German home-owners with larger PV systems (between 30 and 250kWp, with focus on brand management, buying process and energy storage

# International Battery & Energy Storage Alliance


## Headquarters
Adenauerallee 134
D-53113 Bonn
Phone +49(0)228-97143-0
Fax +49(0)228-97143-11
info@ibesalliance.org
www.ibesalliance.org

## EuPD Research
Saif Islam
Senior Consultant
Phone +49(0)228-97143-20
s.islam@eupd-research.com
www.eupd-research.com