

# SMA SOLAR TECHNOLOGY AG

## 9th Capital Markets Day

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# 1. Review 2016: Continued Success in a Fast Changing Environment



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# Positioning: SMA is the Global Market Leader for Photovoltaic System Technology with a Market Share of more than 20%<sup>1</sup>



- > Most preferred inverter brand<sup>2</sup> with an installed base of 55 GW worldwide.
- > Sales of >940 million €, thereof c. 45% in Americas, c. 30% in EMEA and c. 25% in APAC.
- > More than 3,100 employees, thereof 500 in Technology<sup>3</sup>.
- > High rate of innovation. More than 60% of sales is from products <3 years. Technology protected by patents, utility models and trademarks.<sup>4</sup>
- > At home in 20 countries with more than 650 specialized sales & service professionals.
- > Strong relationships to electrical wholesalers, solar EPCs as well as utilities in key solar markets.
- > TecDax listed since 2008; current market capitalization of c. 0.9 billion €.

**> SMA is financially rock solid and operated with a cash-break even point of less than €600m in 2016.**

1. Based on SMA inverter sales; see slide 16

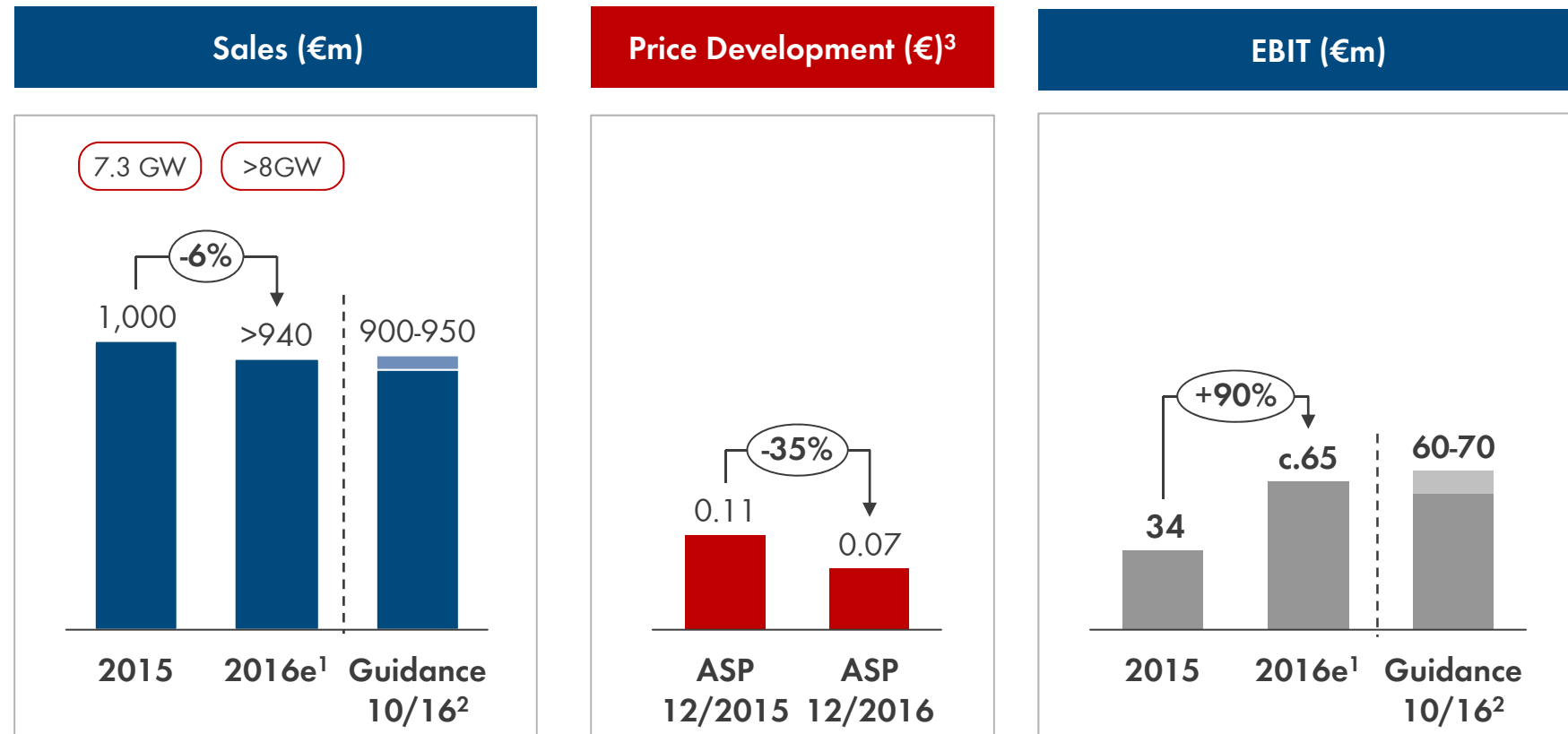
9th Capital Markets Day, 2017 2. IHS PV Inverter Customer Insight Survey (2016)

3. FTE: Full Time Employees w/o temporary workers, learners and interns

4. As of 31/12./2016: 869 granted patents and utility models, c. 600 ongoing application procedures, > 800 trademarks



# Financials: SMA Increased its Earnings Significantly in a Demanding Market Environment



> Unexpectedly high price pressure was the main reason for guidance adjustment.

## 2. Market & Competition



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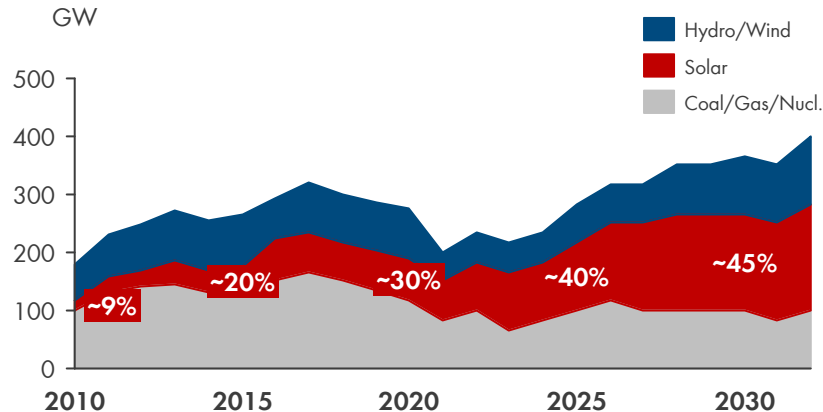
## 2.1 The Energy Internet is Coming – it's All About the Convergence of Electricity and Communication Networks



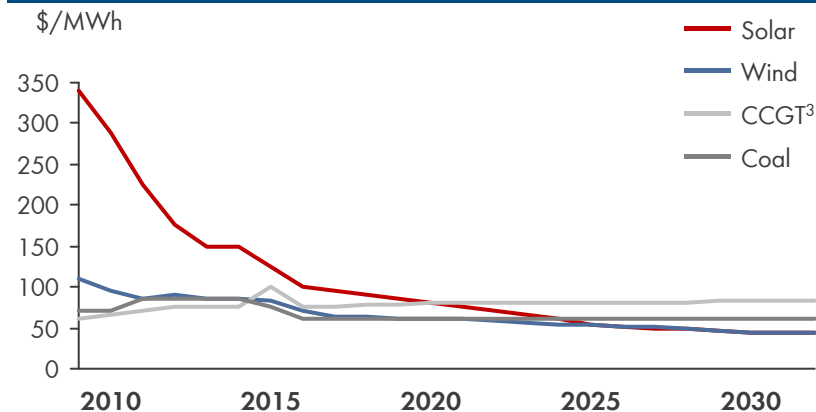
# The Importance of Photovoltaic Power is Expected to Increase Significantly due to Low Cost Points and Climate Targets



## Additions to Global Power Generation p.a.<sup>1</sup>



## Global Average Energy Cost (USD)<sup>2</sup>



## Growth Drivers

- > In 2030, new solar installations are expected to increase to c. 200 GW.
- > Global energy consumption is expected to increase by 2% p.a. especially due to the economic growth in emerging countries.
- > The replacement of fossil energy sources by renewables is expected to accelerate due to the fast reduction of consumer cost of electricity from solar and wind.
- > Climate targets will lead to new regulations. As a consequence, oil- and gas-fired boilers will be replaced by eco-friendly solutions.<sup>4</sup>
- > Mandatory CO<sub>2</sub> emission reduction targets will increase the population of hybrid and electrical vehicles.

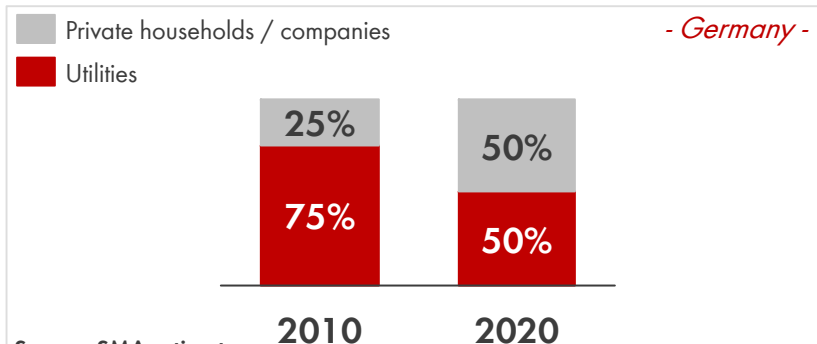
> **By 2020, PV is the most important energy source, because power is produced where it is consumed. PV technology has still room for further cost reductions.**



# Fundamental Transition Towards Decentralized Power Generation will Shake Up the Entire Energy Market



## Expected Structural Changes in Energy Supply



- > The energy internet<sup>1</sup> will allow a peer-to-peer communication and cost-effective distribution of energy.
- > Private households and companies will become a vital part of the new market structure.
- > Overall profit pools will decrease, because convergence of supply and demand is automatically managed by IoT platforms.
- > Shift of profits to platform and app provider.

> **SMA has the competency to introduce an energy market solution to optimize different sectors<sup>3</sup> within the next 12-18 months.**

## Impact on the Energy Infrastructure

- > With a much larger share of renewables in the energy mix and various decentralized energy producers<sup>2</sup>, an automated load management will be required to stabilize the grid.
- > The complexity of the energy internet will increase because of :



Storage



HVAC

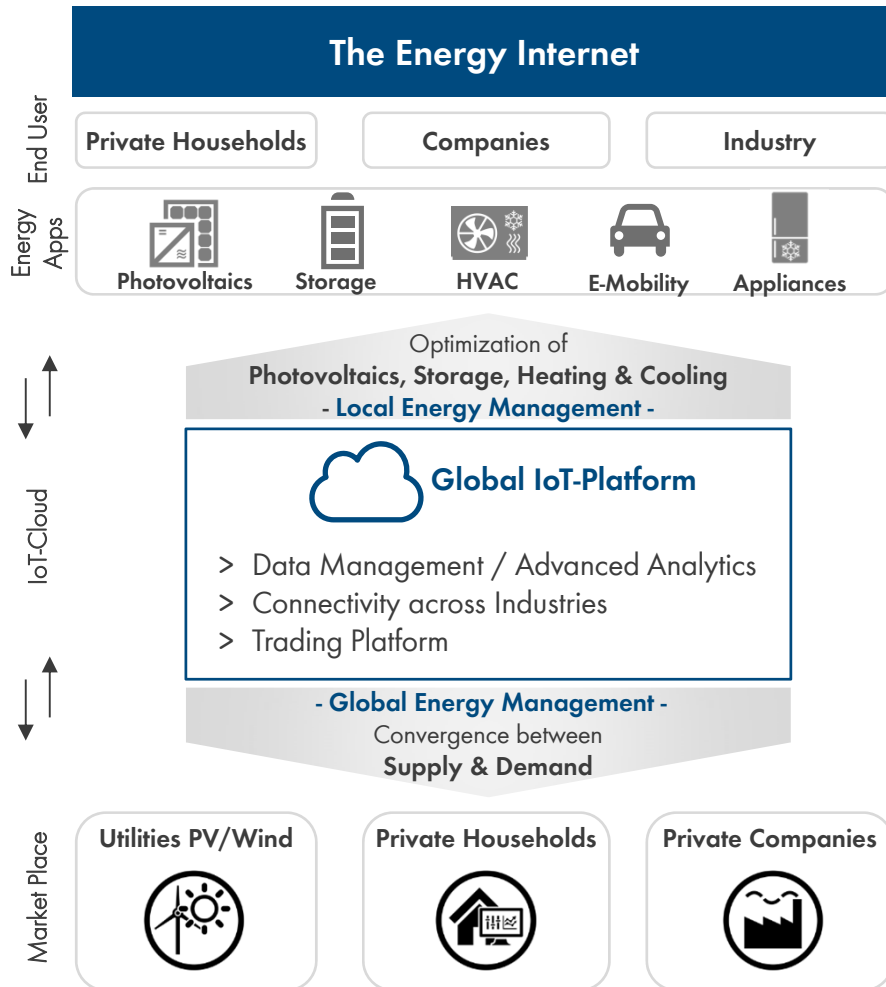


E-Mobility



Appliances  
(Load Mgmt)

# Automated Energy Management Will Become the Backbone of the Future Energy Market



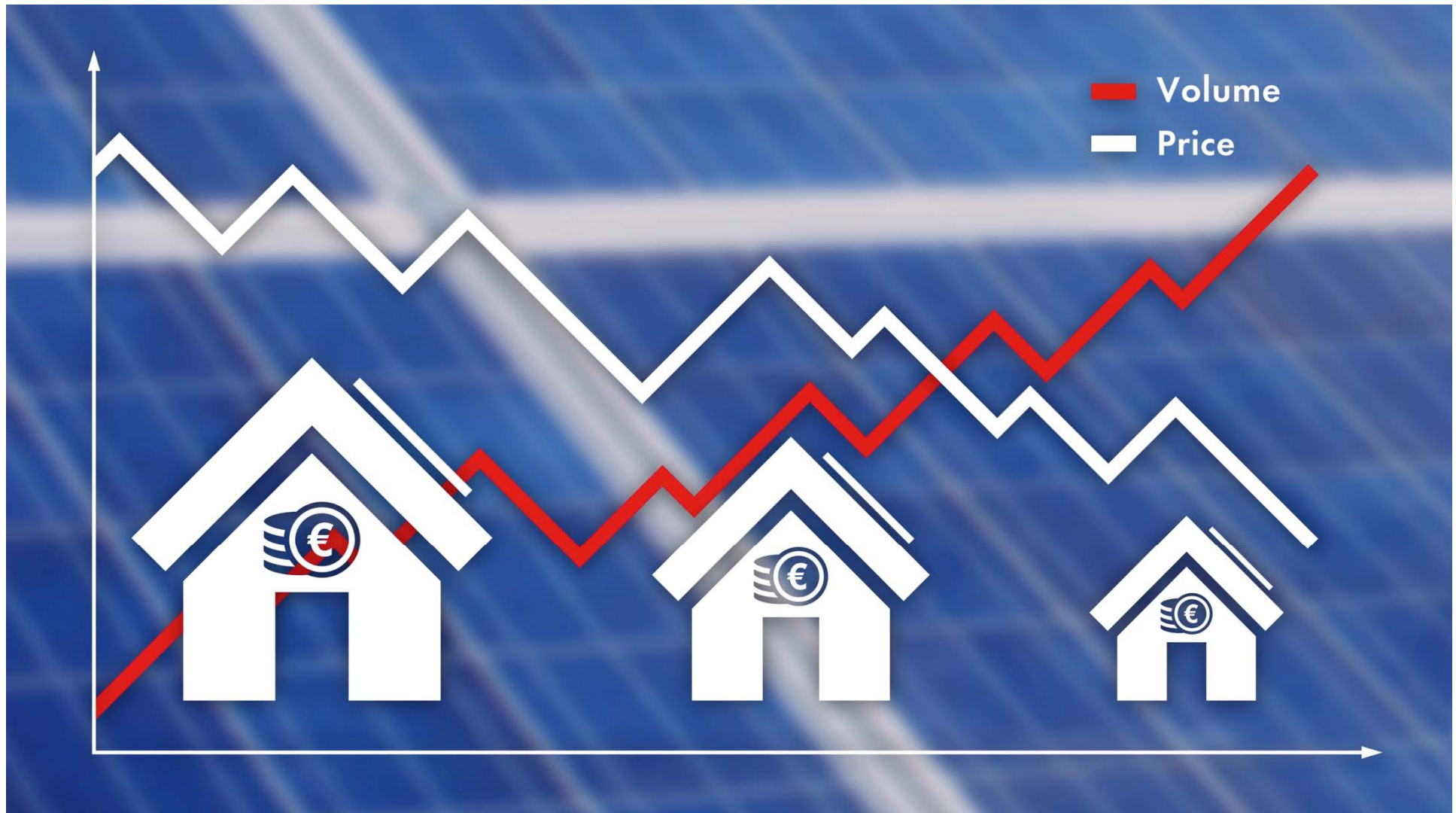
## Impact of Advanced Analytics

- > Matching of supply and demand across sectors (PV, Storage, E-Mobility, HVAC<sup>1</sup> Load Managed Appliance) is paramount to reduce overall energy costs.
- > Complexity of the convergence between sectors is automatically managed by energy apps. No compromise in lifestyle or work processes.
- > Leverage of cost savings across micro-grids is secured with open IoT architectures.
- > Additional services will arise within the next 3-5 years, once the energy market has the same level of digitization as other industries (retail, telcos or banking) have today.

> **SMA will form alliances with key players to improve positioning and remove market entry barriers.**



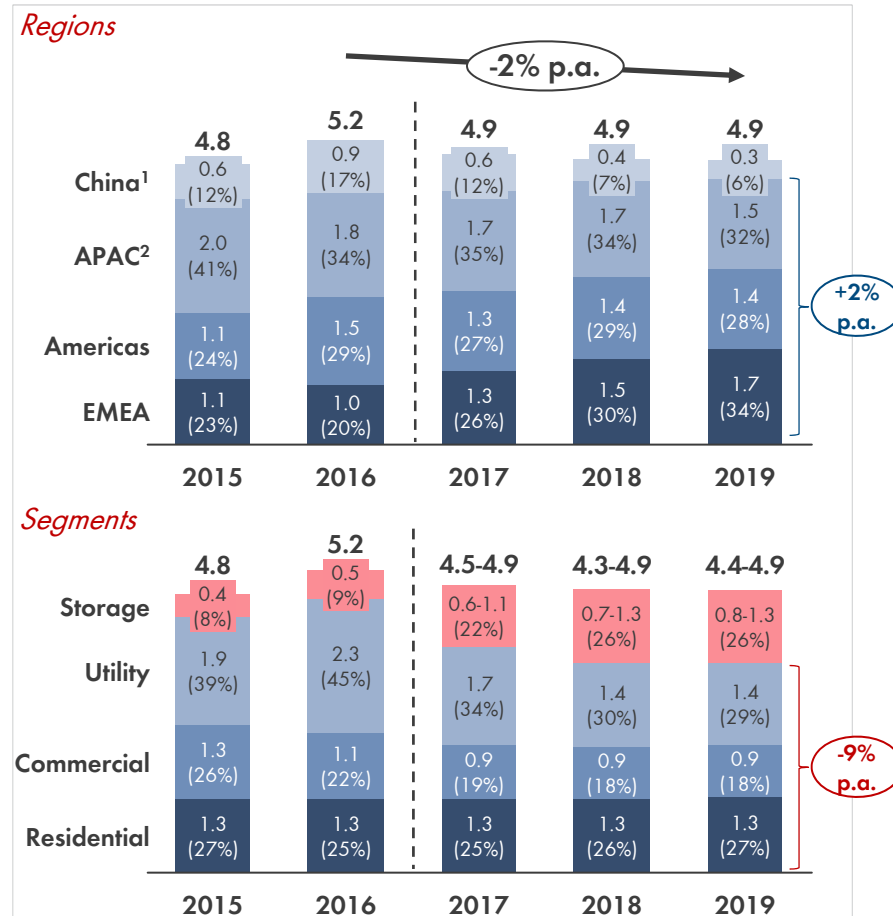
## 2.2 Market & Competition: New Price Point Will Change the Market Dynamic



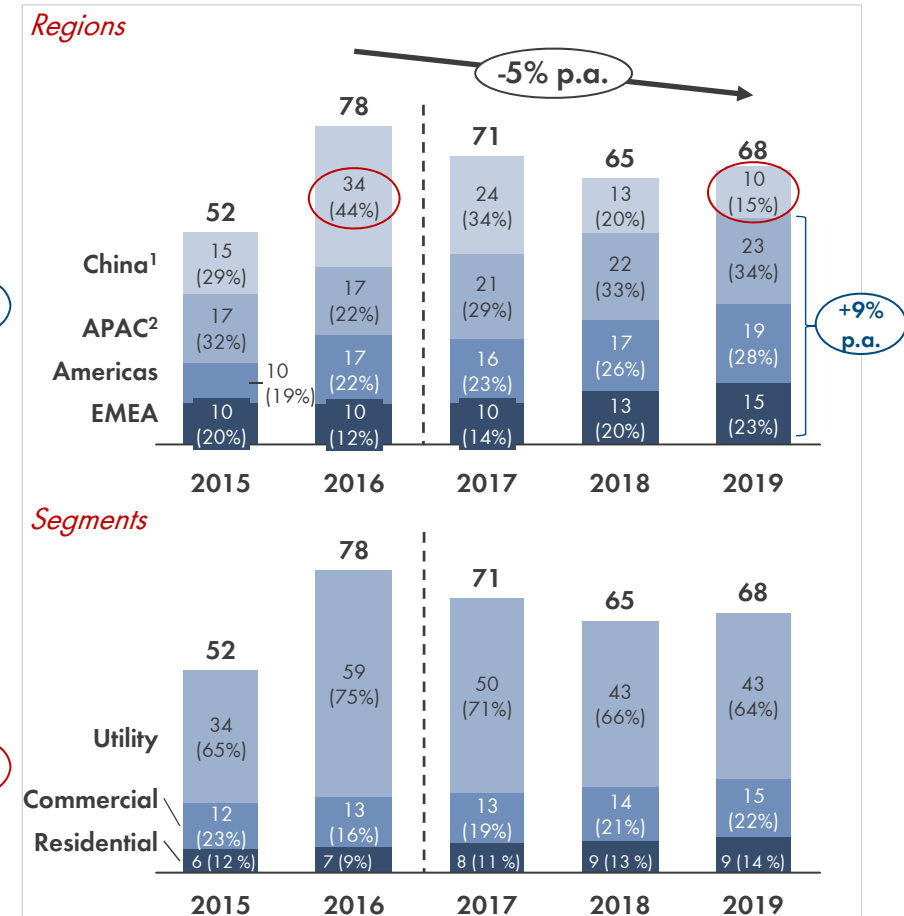
# The Chinese Solar Market is Expected to Decline by 70% Until 2019 - International Markets are Expected to Grow by 9% p.a.



## Global Inverter Revenues by Region/Segment (bn€)<sup>3,4,5</sup>



## Global New PV Install. by Region/Segment (GWdc)<sup>3,4</sup>



> Today, utility PV plants (<10 MW) are installed for less than 1 USD per Watt in the US.

1. China reduced the Feed-in-Tariff (FIT) by the end of June 2016 and set further FIT reduction for 2017;  
New National Solar target set in 13<sup>th</sup> Five-Year-Plan for Power released on Nov. 7<sup>th</sup> 2016 by NEA  
2. w/o China

3. SMA MI Market Model Q1 2017

4. Incl. ~1 GW Off-Grid Installations p.a.: Residential, Remote and Micro-Grid Applications

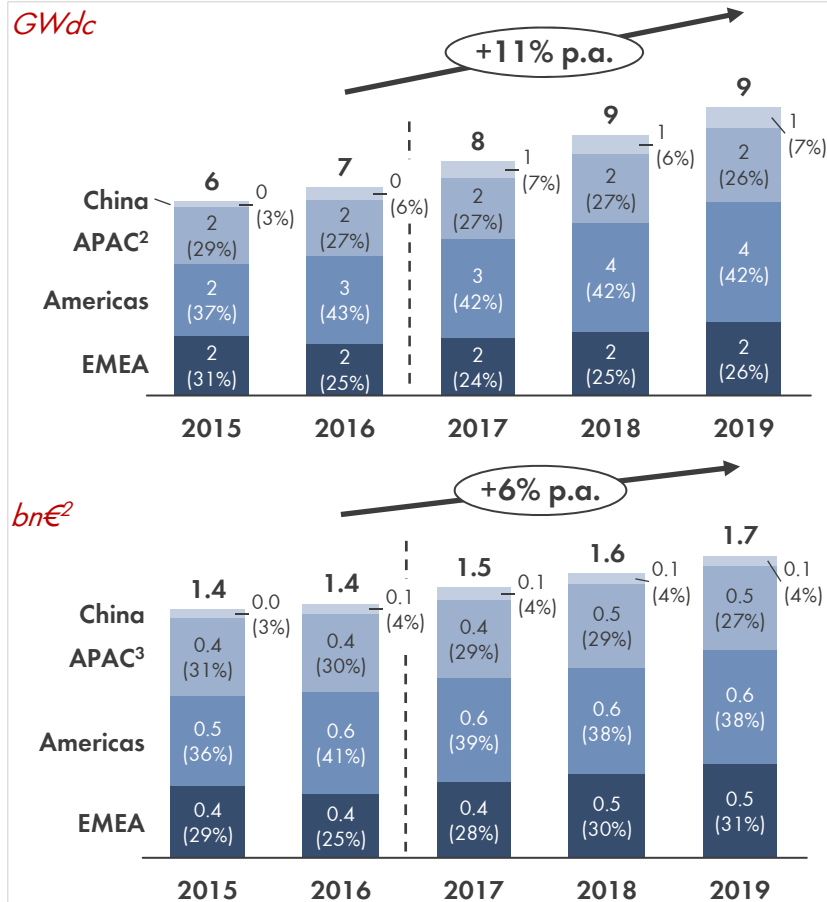
5. Incl. Inverter Potential for Retrofit



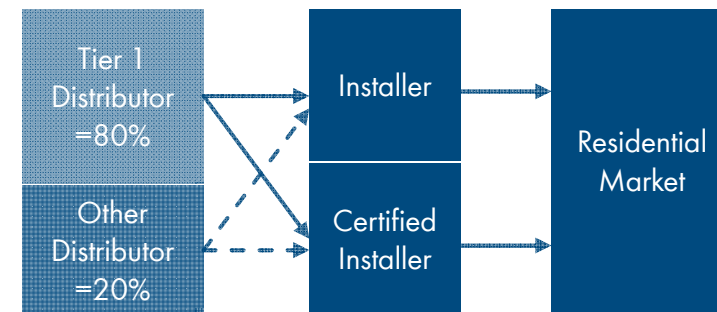
# Value and Volume Growth in the Residential Market is very much Driven by Storage Applications and MLPE Technology<sup>1</sup>



## Residential Market (GW/bn€)



## SMA's Go-To-Market Approach



- > **Key Residential Markets:**  
Europe, USA, Australia, Japan
- > SMA sells inverters and service products directly to electrical wholesalers (distributors).
- > Loyalty and volume in the channel is created by focusing on top distributors.
- > Transactional business (Pull) is created with installer visits and trainings. SMA has access to almost 10,000 installers. SMA conducted 1,500 trainings in 2016, thereof, 70% in EMEA, 20% in Americas and 10% in APAC.
- > With the new SMA/ Tigo solution and Sunny Boy Storage, SMA will tap into the rapidly growing segments of optimized PV and storage application.

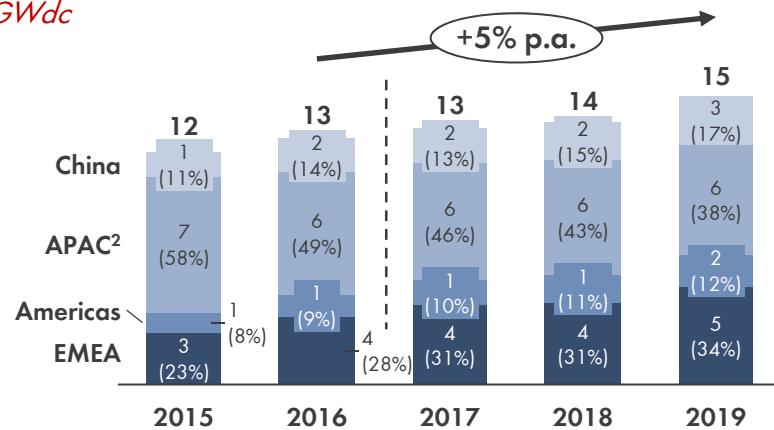
> **SMA generates c.175 m€ sales in Residential and has a global market share of c. 20% in 2016.<sup>4</sup>**

# Roof-Top Applications Account for >60% of the Commercial Market Segment – Commercial is the Most Attractive Segment

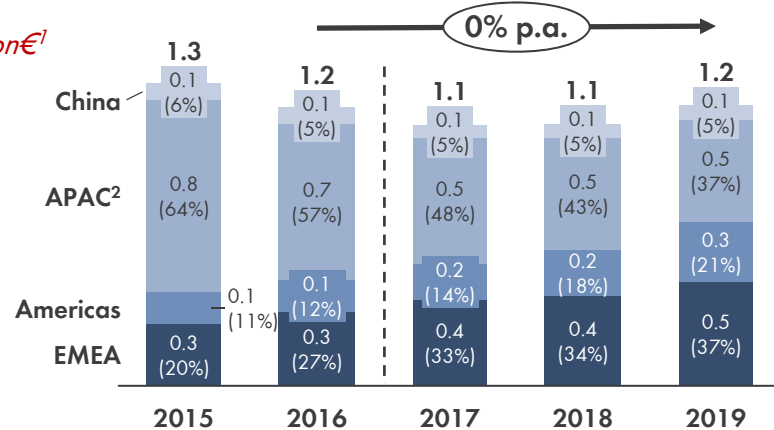


## Commercial Market (GW/bn€)

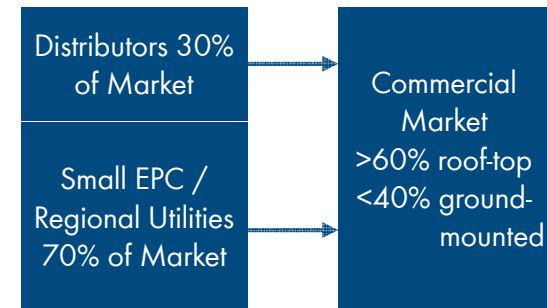
GWdc



bn€¹



## SMA's Go-To-Market Approach



> **Key Commercial Markets:** Europe, USA, Latin America, Africa, India, South-East Asia, Japan, China, Australia

- > SMA sells directly to small EPCs, regional utilities and the electrical wholesalers (distributors).
- > Project business is created with a consultative sales approach. SMA provides technical support to improve the plant design.
- > Education of project developers, investors, banks and other stakeholders is pivotal to accelerate project execution.
- > With the new STP Core1 SMA will offer additional services (e.g. energy management) to protect its outstanding position in the segment of roof-top commercial applications.

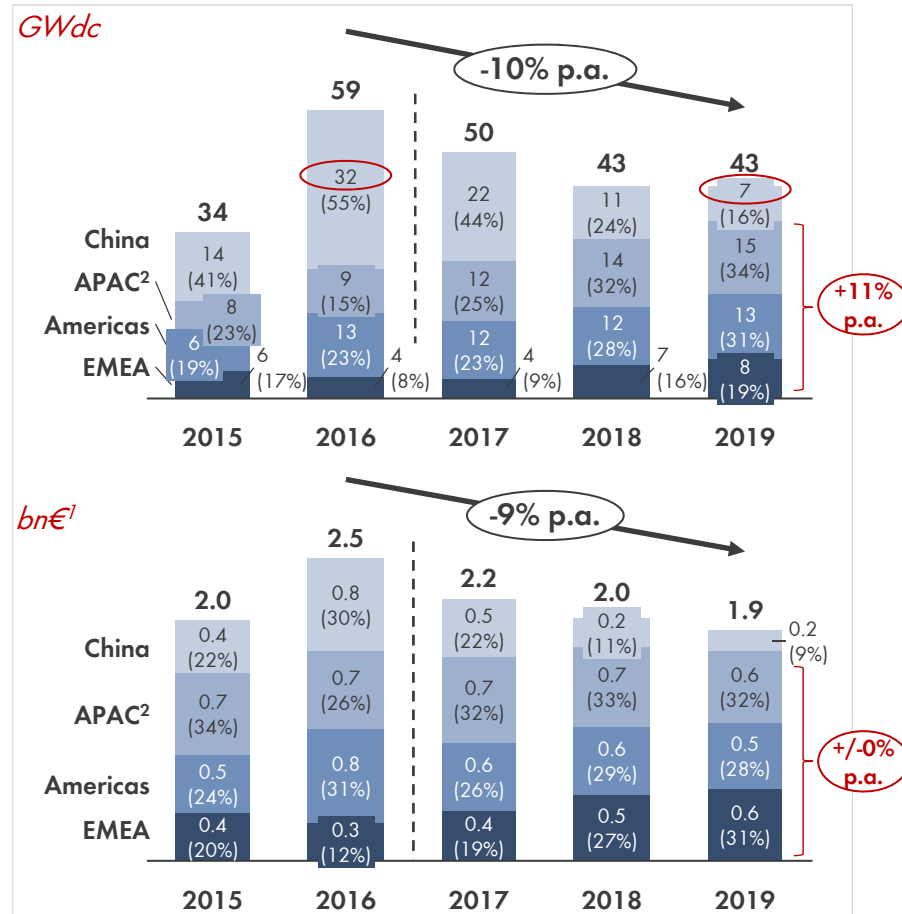
> SMA generates c. 260 m€ sales in Commercial and has a global market share of c. 25% in 2016.<sup>3</sup>



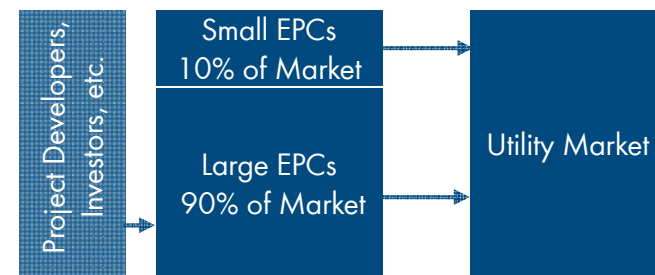
# The Utility Market is the Biggest Segment – Growth Drivers are the Low Energy Generation Costs and the Speed of Installation



## Utility Market (GW/bn€)



## SMA's Go-To-Market Approach



> **Key Utility Markets:** USA, Latin America, Middle East, India, South-East Asia, China, Japan, Australia

- > SMA sells complete solution (incl. med/high voltage equipment) directly to large and small EPCs as well as to regional utilities.
- > Project business is created with a consultative sales approach. SMA provides technical support to improve the plant design (incl. grid simulation) and to secure fast commissioning.
- > SMA offers long-term O&M services, extended warranty, spare parts, etc. to secure technical uptime.
- > With the new 5 MW turnkey solution SMA offers the best specific price and fastest execution for MW projects.

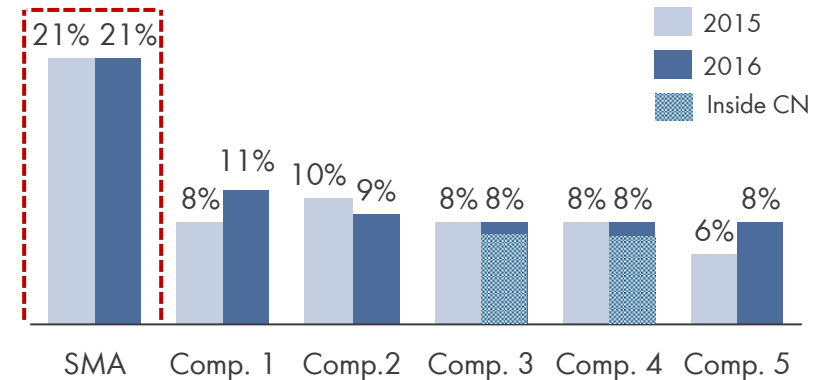
> **SMA generates c. 400 m€ sales in Utility and has a global market share of c. 20% in 2016.<sup>3</sup>**

# Two Decades of Market Leadership has a Name: SMA Accounts for 21% of Global PV Inverter Sales

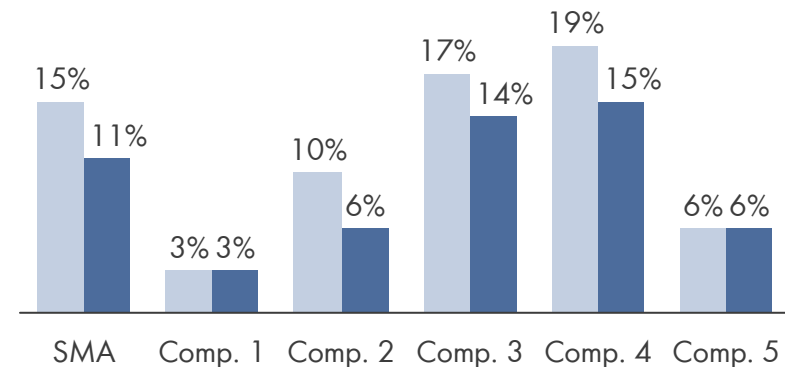


- > There is NO global inverter market. Due to the local requirements and the wide range of applications<sup>1</sup> the inverter market is very fragmented.
- > SMA is the only global player with a complete portfolio in all segments. Therefore, SMA has the highest market share in sales for more than two decades.
- > Some competitors mainly benefit from local market developments. The biggest Chinese solar inverter player only shipped inverters for 40m\$ during the first nine months 2016 in international markets, while domestic sales accounted for 95% of its sales.
- > Some other competitors benefit from little or no competition in certain PV applications (e.g. optimizer / micro-inverters).
- > Some large conglomerates survived in the PV inverter business only because of cross-subsidization (e.g. with medium voltage technology).

Revenue based Market Share<sup>2</sup>



GW based Market Share<sup>2</sup>



> **Current export restrictions as well as compliance standards may impact the ability of Chinese competitors to serve international markets.**



# SMA is the Most Experienced PV System Technology Provider with a Complete Portfolio as well as High Innovation Rate



Competitor Environment <sup>1</sup>						
	SMA	Competitor 1	Competitor 2	Competitor 3	Competitor 4	Competitor 5
<b>Company</b>						
PV = Core business	✓	✓	✗	✗	✓	✗
PV Market Exp. >10 years	✓	✗	✓	✗	✓	✗
Inst. Inverter Cap. >25 GW	✓	✗	✗	✗	✗	✗
<b>Product Spectrum</b>						
MLPE <sup>2</sup>	✓	✓	✗	✗	✗	✗
String Inverter	✓	✓ <sup>3</sup>	✓	✓	✓	✗
Central Inverter	✓	✗	✓	✗	✓	✓
Energy Management	✓	✓ <sup>3</sup>	✗	✗	✗	✗
O&M	✓	✗	✓	✗	✗	✗
<b>Regions</b>						
EMEA	✓	✓	✓	✓	✓	(✓)
Americas	✓	✓	✓	(✓)	(✓)	✓
APAC	✓	(✓)	✓	✓	✓	✓

✓ Applicable/Strong Presence    (✓) Limited Presence    ✗ Not applicable/No Presence

> Large competitors have increasing difficulties to localize products & services.

# The Solar Inverter Industry has high Market Entry Barriers



## € Cost-Related Market Entry Barriers

- > International sales & service network to reduce risk
- > Complete product portfolio to offer best solution
- > High quality to increase return<sup>1</sup>
  - > Temperature management
  - > AC/DC ratio
  - > Communication, control and grid management
- High bankability to reduce financing costs

## 💡 Time-Related Market Entry Barriers

- > Innovative technologies to reduce costs
- > Experience in PV, storage and HVAC to combine sectors
- > Grid connection know-how to secure grid stability
- > Early market entry to create customer loyalty

## 🔒 Regulatory Market Entry Barriers

- > Know-how to localize products (e.g. UL, JET)
- > Ethics to act compliant
- > Transparent structure to reduce cyber-security risks

### Case Study:

**String Inverter (SUN2000-25KTL-US)**

**Smart**

- 6 string intelligent monitoring and 800h time saving for fault detection
- Real-time operation monitoring
- Adaptive Edge MPPT for fast tracking

**Efficient**

- Max. efficiency 98.6%, DC efficiency 98.0%
- Saving AC cable investment up to 20% without 1% loss

**Safe**

- DC ARD compliant to IEC 61881
- DC disconnect integrated, safe and convenient for maintenance
- Ground fault protection
- Category C surge protection for both DC and AC

**Reliable**

- No need for external fans with natural cooling technology
- Outdoor application of IP65/IP66

**Competitor never received UL Certificate**

> Price is important, but compliance is priceless.

### 3. Technology & Portfolio: SMA is Well Positioned to Benefit from the Energy Internet



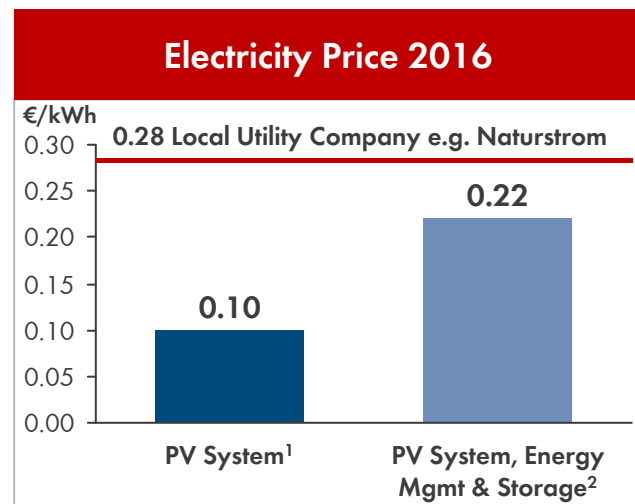


# Residential PV Becomes Part of an Energy Efficiency Solution Within the Smart Home



**Yesterday:  
Produce & Forget**

Up to **30%**  
Self-Sufficiency



**Today & Future:  
Be Part of the Energy Internet with a Smart Home**

Up to **80%**  
Self-Sufficiency

■ SMA ■ Alliance Partners

**PV Inverter System**

- PV Inverter
- Module Level Power Electronics

**Energy Management & Storage**

- Appliances like washing machines
- Heat, Ventilation & Air Conditioning (HVAC)
- E-Mobility & charging equipment

**Energy Monitoring**

- Sunny Portal for installers
- Sunny Places for end customers

**Services**

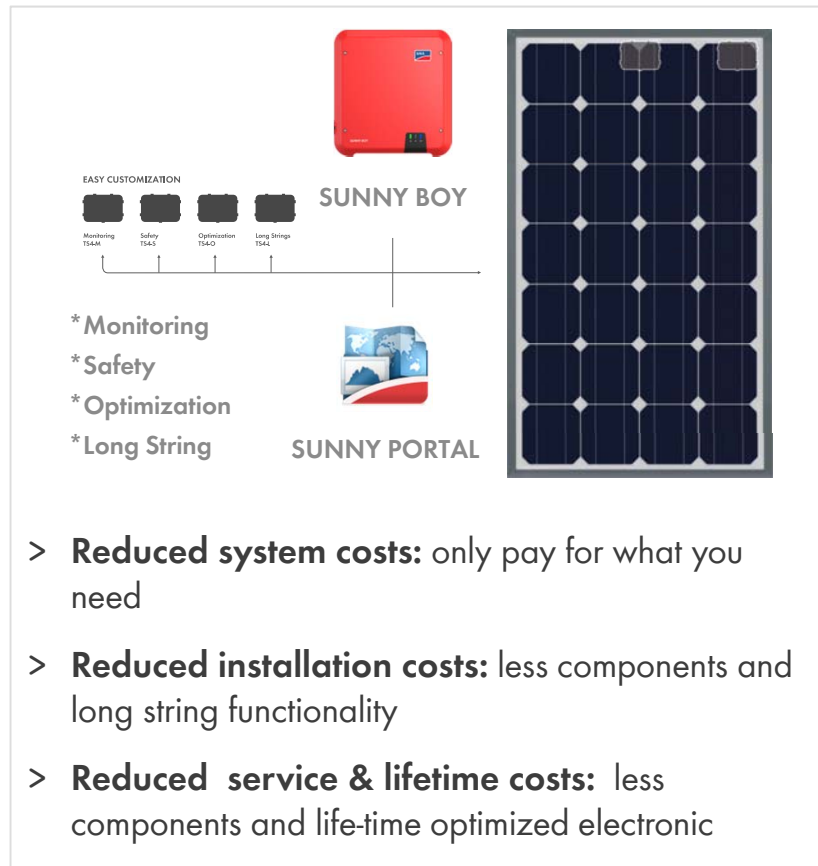
- Smart Connected care free services

> **SMA is able to combine PV with storage and HVAC to optimize the sectors fully automatically.**

# Residential Customers get the Highest Degree of Self-Sufficiency at Lowest Costs with SMA PV System Technology

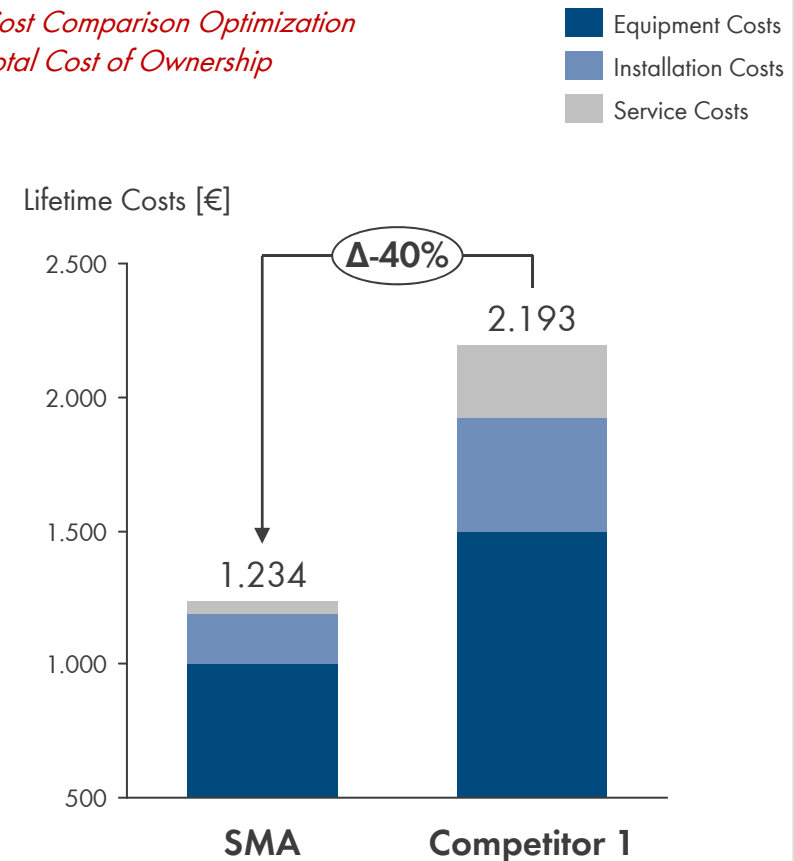


## Selective Deployment: A Game Changer in MLPE



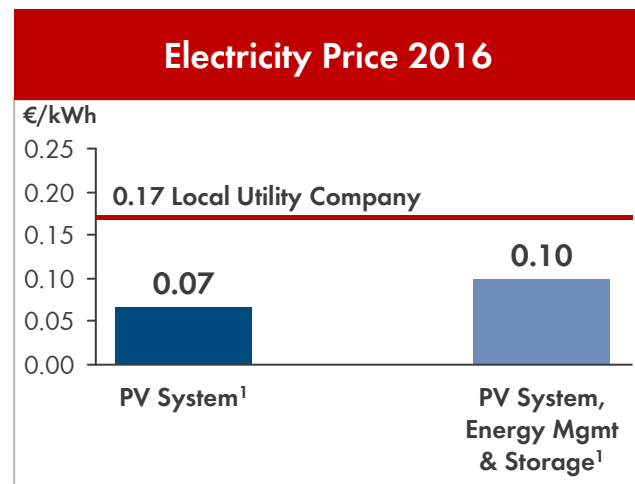
## The Same Energy Output with Less Investment

### Cost Comparison Optimization Total Cost of Ownership

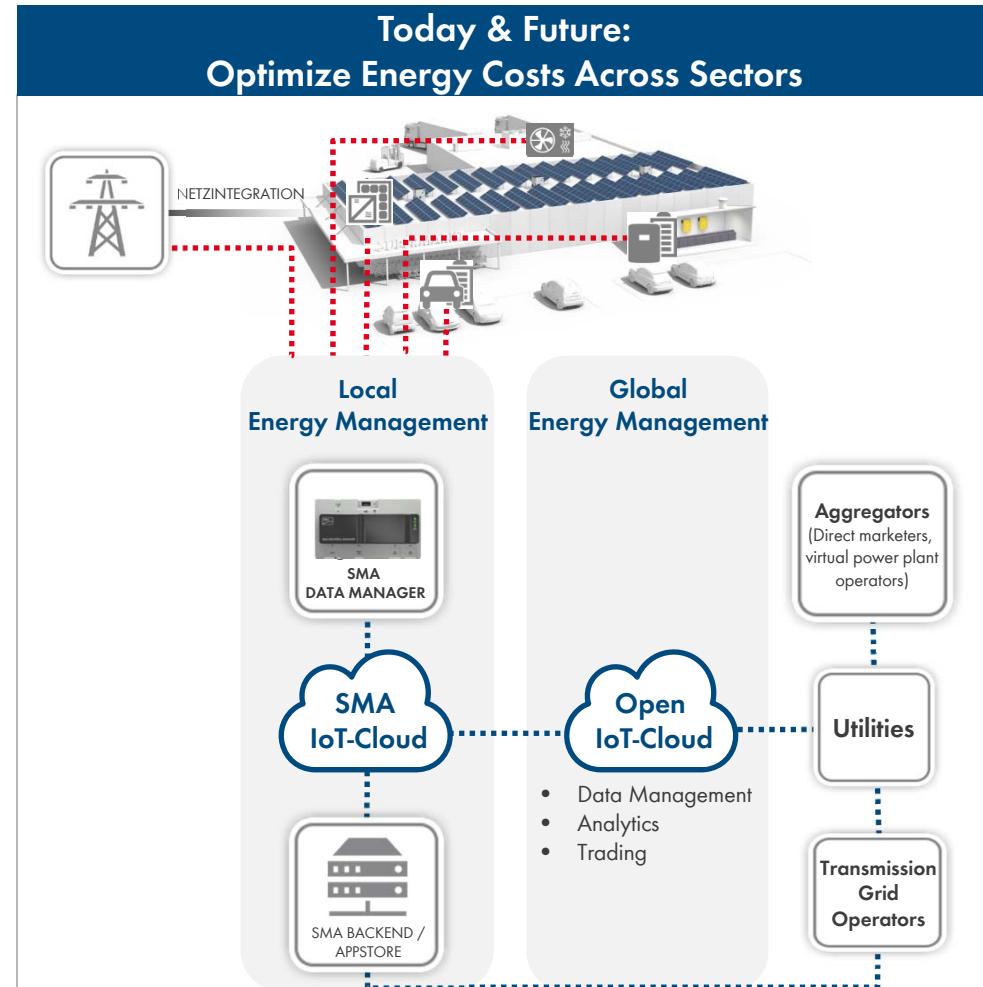


> **SMA's game changing Power+ Solution, which is based on SMA's leading string inverters and Tigo module level power electronic has been launched in January 2017.**

# SMA is Able to Combine PV with Storage and HVAC to Optimize the Sectors Fully Automatically



> Real estate investors will quickly include energy management solutions in their offering, because of their similar cashflow profile.





# SMA Advanced Energy Management Functions has a Significant Impact on the Electricity Bill



## Sunny Tripower Core1

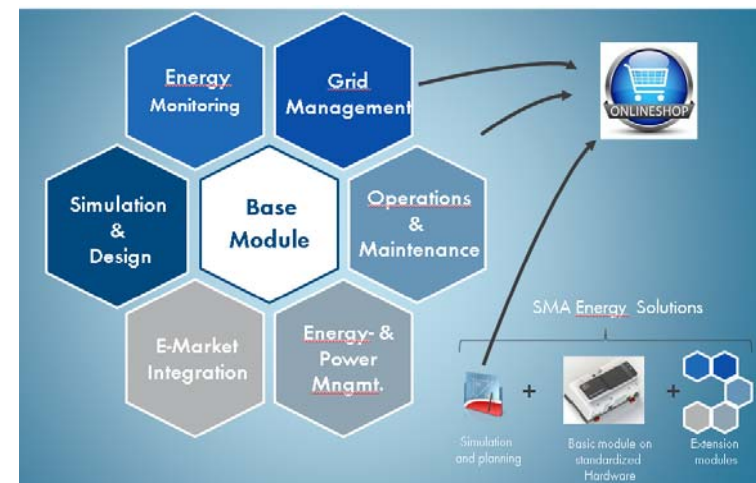


- > **60% faster installation** to lower total cost of ownership (OpEx)
- > **Minimized LCOE<sup>1</sup> with reduced risk** due to 6 independent MPP trackers for optimum energy production and the intelligent SMA OptiCool™ active cooling system
- > **Seamless grid integration**
- > **Perfectly optimized** for commercial rooftops and ground mount solar projects

## Customer Benefit of Energy Management

Reducing energy costs by:

- > **Leveraging energy efficiency potentials** due to sophisticated visualization & data analytics
- > **Optimizing energy supply** by managing local consumption and production
- > **Generating additional revenues** by bringing excess energy and local flexibility to the market

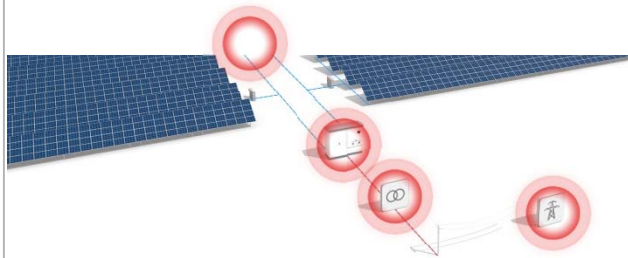


> **SMA was the first inverter manufacturer who focused on ease of installation.**

# SMA Utility Operates as a Comprehensive System Provider on Medium and High Voltage Level

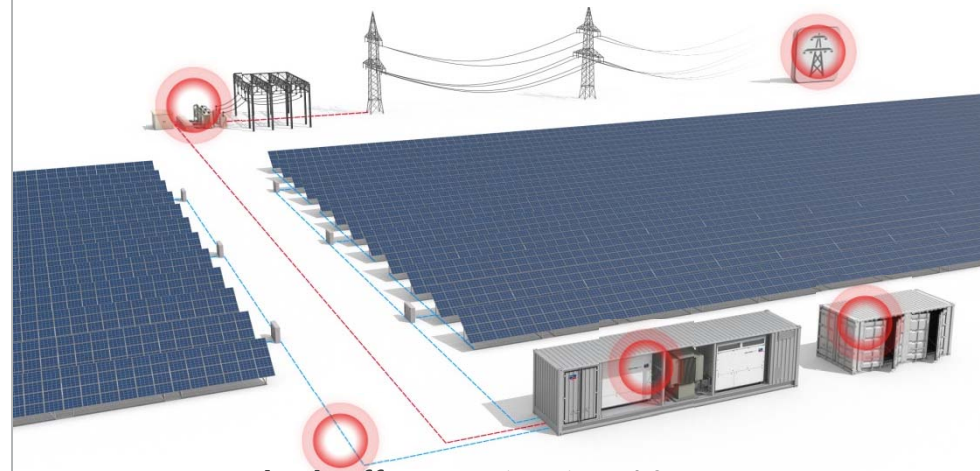


## Yesterday: Feed-in Tarif Business Model



- > Focus on **high efficiency** ( $\eta \nearrow$ )
- > Power Sizes of **100 kW**
- > 600 V DC technology
- > Less modules per inverter (**low DC/AC ratio**)
- > Main markets were in **Europe, especially Germany**

## Today: PPA Driven Business Model<sup>1</sup>



- > Maintaining **high efficiency** ( $\eta \rightarrow$ ) and focus on **Uptime**  $\nearrow$
- > Power Sizes of **5 MW**
- > **Reduced eBOS by up to 10%** with 1,500 V DC
- > More modules per inverter (**high DC/AC ratio**)
- > Global market with many **different local requirements** (standards and environmental)
- > Focus on **grid stability**, O&M, monitoring and storage

> **SMA has excellent competencies to handle the complexity of large-scale power plants.**

# SMA Utility Provides Its Customers up to 99.998% Uptime



## 5 MW Turnkey Solution

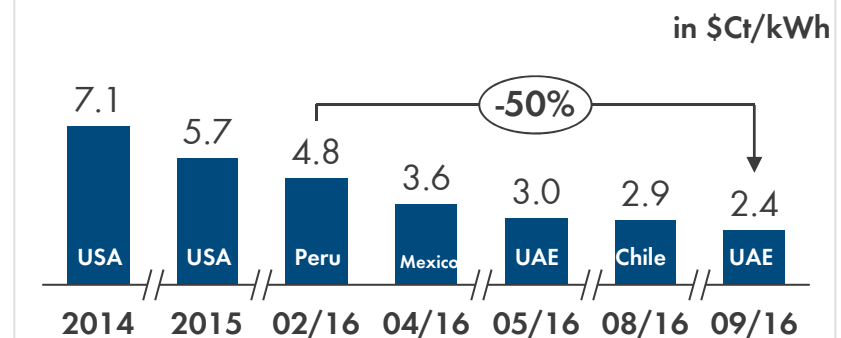


- > **Reduced risk** with high current connection and full operator safety by arc-tested solution.
- > **Max. yields** over entire lifetime by comprehensive PV-system design for all components
- > **Ease of installation** with only DC and MV cables to be connected and commissioning to be concluded
- > **Reduced costs** with standard shipping dimensions, minimized time for costly crane and on-site works

## Competitor Comparison

	SMA	Comp. 1
Design flexibility	+	o
System integration	++	-
Ease of transport & installation	++	+
Yield	+	+
Availability	++	o

## Total Global Utility Scale PPA's Unsubsidized Record Low<sup>1</sup>



- > **SMA offers together with Siemens an aligned technical solution from DC to high voltage grid, share of global network and abilities and joint product development.**



# Service Business Becomes a Key Differentiator in the Solar Industry

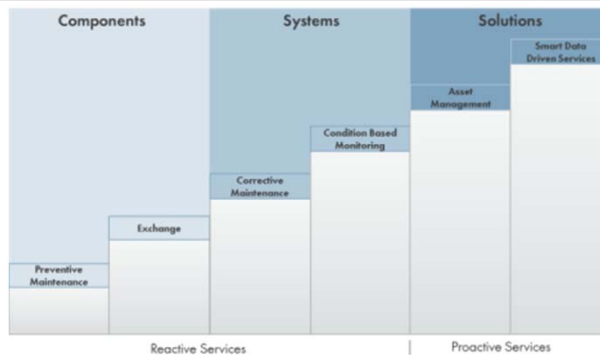


## Key Facts



- > More than 1.7 GW under O&M
- > More than 600 service professionals worldwide
- > More than 100 service hubs worldwide

## Business Model



## Portfolio - Service



- > High order backlog for service of €395m; majority from warranty extension<sup>1</sup>
- > High profitability (EBIT > 10%)
- > High volume installations in Europe before 2010 now become an interesting business for re-powering

## > SMA transforms from traditional (technical) services to value added Services

# The Solar Market is Decentral and Includes Storage



## Yesterday: Funded Rural Electrification



- > Focus on rural, off-grid electrification
- > Market depending on **financing** and **development aid**
- > Main markets Africa and Asia
- > Power sizes up to **300 kW**

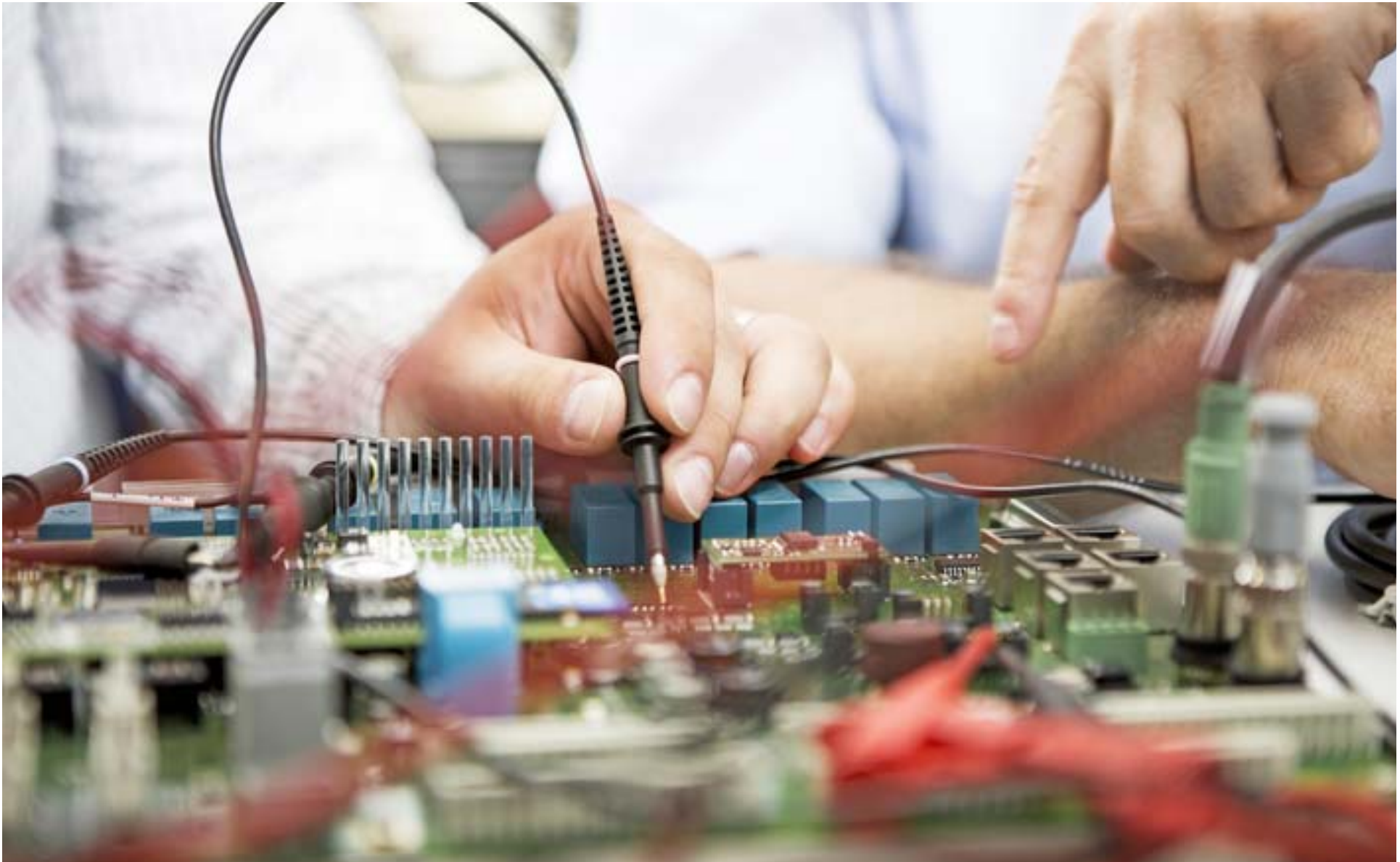
## Today and Future: Seamless Integration of Renewables in any Market



- > Stationary Storage Market becoming mature: from private client towards public utilities investment resulting in unique market growth rates<sup>1</sup>
- > Storage solutions as an enabler for the renewable-based energy supply
- > **SMA utilizes PV proven PV inverter technologies** to offer the most cost effective storage solutions in each market segment

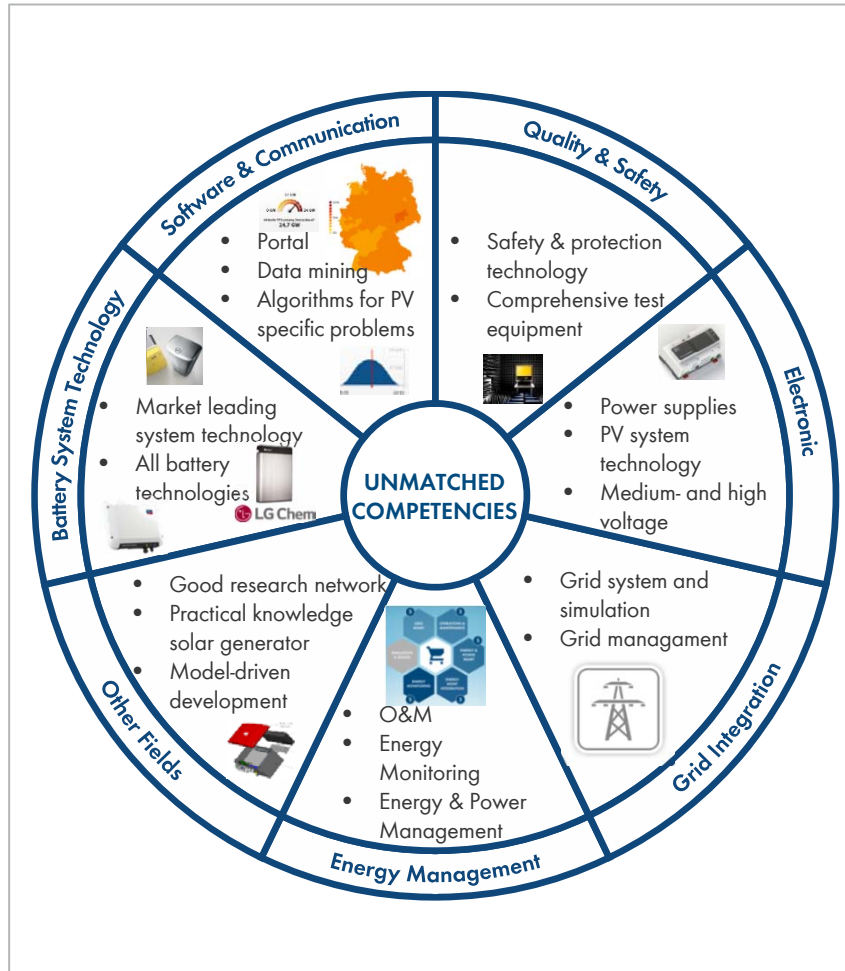
> **SMA provides storage solutions for all battery types and all applications.**

#### 4. Positioning: SMA's Long-Lasting Leadership is a Result of our Comprehensive Competencies





# PV Know How: SMA is an Engine of Innovation With Unmatched Competencies in the PV Industry



We have **380** employees in R&D in Germany, Thereof 90 in research and 290 in development  
Furthermore **90** developers in China



Thereof **35** engineers with doctoral degree



**5** Business Units with ca. **80** employees, for Product Management, Segment Strategy and Project Management



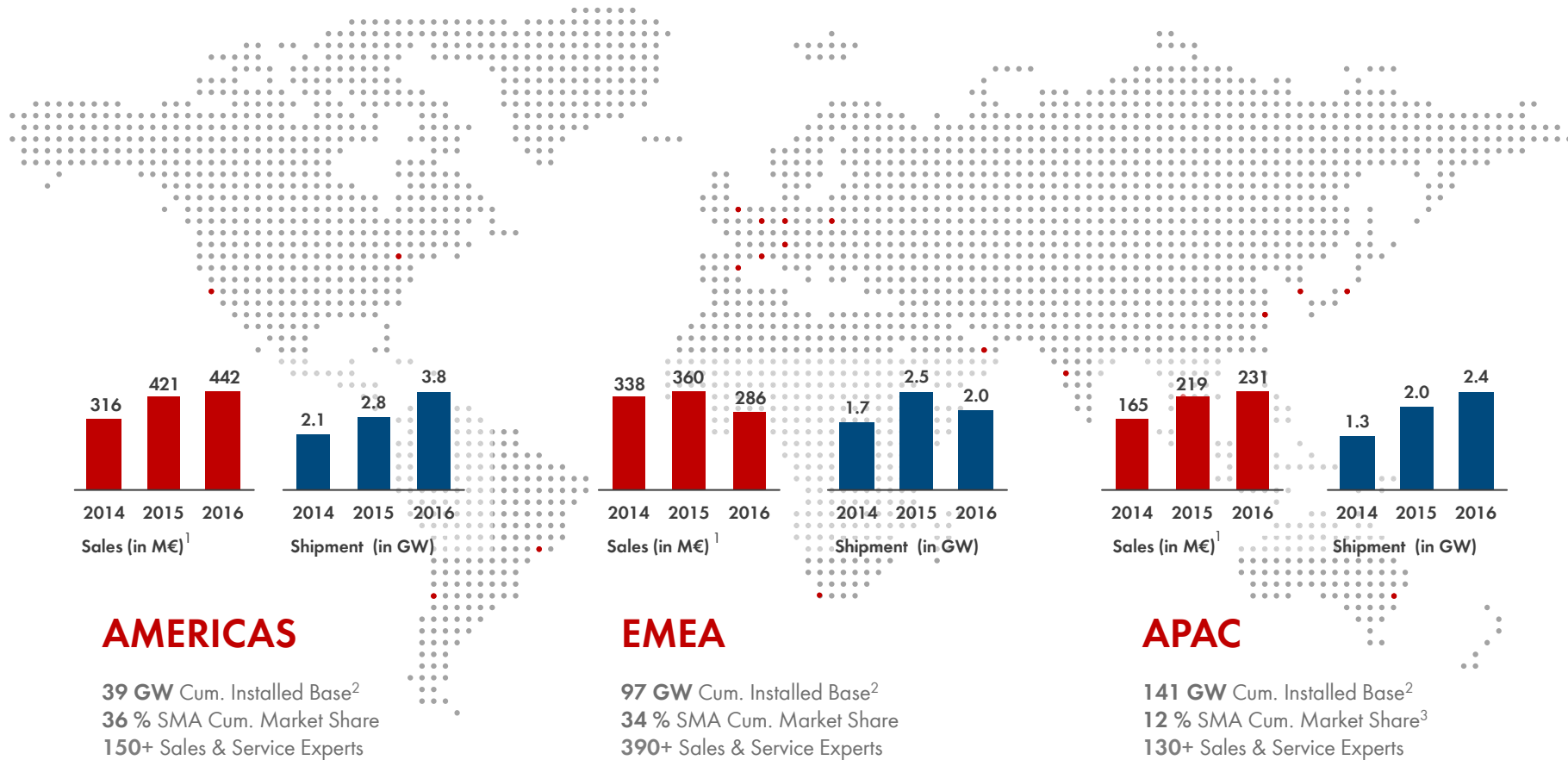
Globally, SMA has been granted ca. **870** patents and utility models, c. **600** ongoing application procedures and > **800** trademarks

# Portfolio: SMA has a Modern and Complete Portfolio for all Segments



RESIDENTIAL	COMMERCIAL	UTILITY	OFF-GRID
<p>MLPE SB 1.5/2.5 SB 3000-5000</p> <p>SB 5000-12000 SB 3600/5000SE</p> <p>SB 3000-7700 US SB 3500/4500/5400 JP</p> <p>SUNNY HOME MANAGER SMA ENERGY METER SUNNY PLACES</p> <p>Extended Warranty Remote Service System Check</p>	<p>STP 20000TL/25000TL STP 15000TL STP 10000/20000TL-JP</p> <p>STP 12000/15000/20000/24000/30000-US STP 75 STP CORE 1</p> <p>STORAGE SOLUTION COMMERCIAL</p> <p>SMA CLUSTER CONTROLLER SMA INVERTER MANAGER SMA INVERTER MANAGER</p> <p>STP MV STATION SUNNY PORTAL SUNNY DESIGN</p> <p>Commissioning Extended Warranty Upgrade Operation &amp; Maintenance</p>	<p>SUNNY CENTRAL CP XT SUNNY CENTRAL CP-JP SUNNY CENTRAL 2.2/2.5 MW</p> <p>SUNNY CENTRAL STORAGE SUNNY CENTRAL-US 1.85/2.2/2.5 MV STP 12-30 kW, IEC and US</p> <p>SUNNY TRIPOWER 75 SMA Power Plant Controller SMA String Combiner/Monitor</p> <p>GPM SCADA and Monitoring solutions Siemens grid connections on High- and Medium Voltage level</p> <p>MV POWER STATION STP MV STATION MV BLOCK</p> <p>Commissioning Extended Warranty Preventive Maintenance Operation &amp; Maintenance</p>	<p>SUNNY BOY STORAGE SUNNY HOME MANAGER SMA ENERGY METER</p> <p>SUNNY ISLAND 4548-US/6048-US SUNNY ISLAND 6.0/8.0H SUNNY ISLAND 3.0/4.4M</p> <p>6/12/36x MULTICLUSTER-BOX 6/1236 FUEL SAVE CONTROLLER</p> <p>SUNNY CENTRAL STORAGE 500/1000 SUNNY CENTRAL STORAGE 2200/2500</p> <p><b>SMA SERVICE</b></p> <p>Supplementary Services Extended Warranty Preventive Maintenance Commissioning</p>

# Global Presence: SMA has an Unmatched Global Infrastructure of PV Sales and Service Experts



1. w/o sales deductions (2014 incl. Railway: -14 m€; 2015: -18m€; 2016: c. -13m€)  
 2. Cumulated installed inverters in GWac by end of 2016  
 3. Share excl. China; incl. China 6%

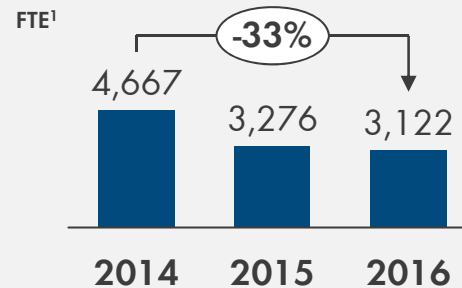


# Flexibility: SMA is Fast, Highly Flexible and Financially Stable



## SPEED

Ability to Act Fast

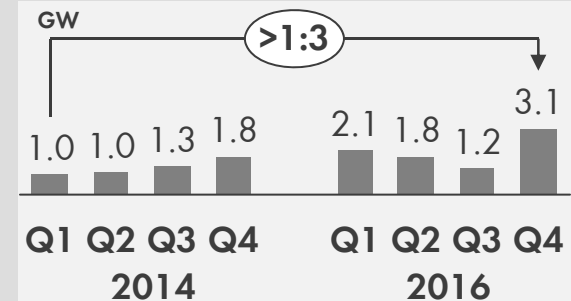
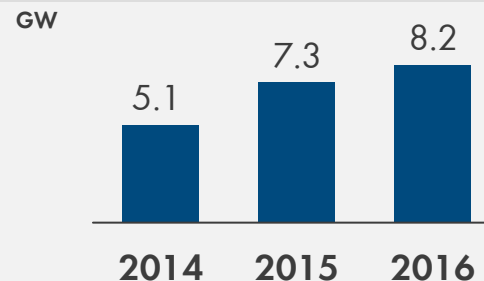


### Action Taken:

- > Closure Denver within 6 months
- > Additional share of temporary employees > 20%
- > Flexible payment system

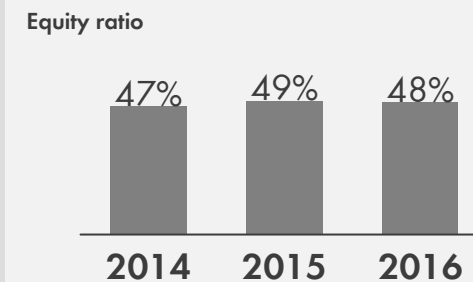
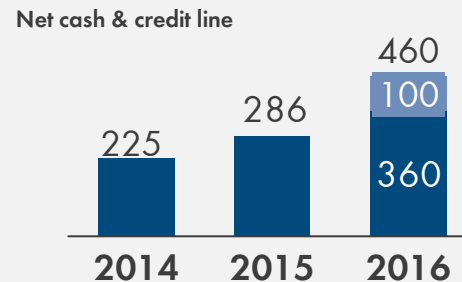
## FLEXIBILITY

Infrastructure to Act Flexible



## STABILITY

Financials to Act Independently



## 5. Financials: SMA is Financially Stable and Has an Attractive Operational Leverage



# Over Years SMA Successfully Managed Rapidly Changing Market Conditions whilst Protecting the Gross Margin



## Phase 1 – Feed-in Tariff

- High price pressure in all segments
- Shift from Europe to Asia and Americas
- Shift in PV application (Residential to Utility)

## Phase 2 – Change in Drivers

- Accelerated price pressure
- Stable regional mix/ product mix
- Introduction of storage

## Initiatives

- > Acquisition of Zeyersolar to improve sourcing and portfolio (2012)
- > Entered into O&M-service business to generate stable cash-flows (2013)
- > Strategic alliance with Danfoss to improve competitiveness (eg. joint procurement; 2014)
- > Consolidated global infrastructure to improve break-even (2014/16)
- > Reduced headcount by 35% since 2012 to lower costs
- > 120 cost improved products since 2012 to protect gross margin

GW

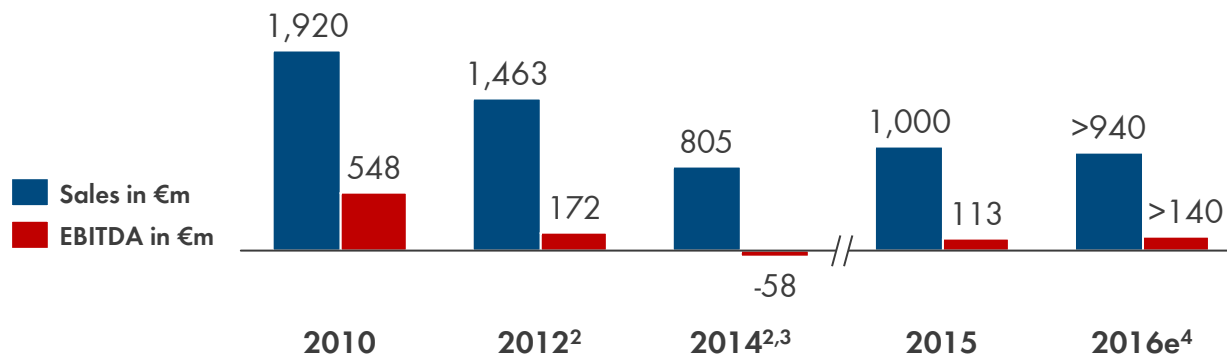
7.8

7.2

5.1

7.3

8.2



Total FTE<sup>5</sup>

3,749

4,800

4,667

3,276

3,122

Gross margin<sup>1</sup>

39%

27%

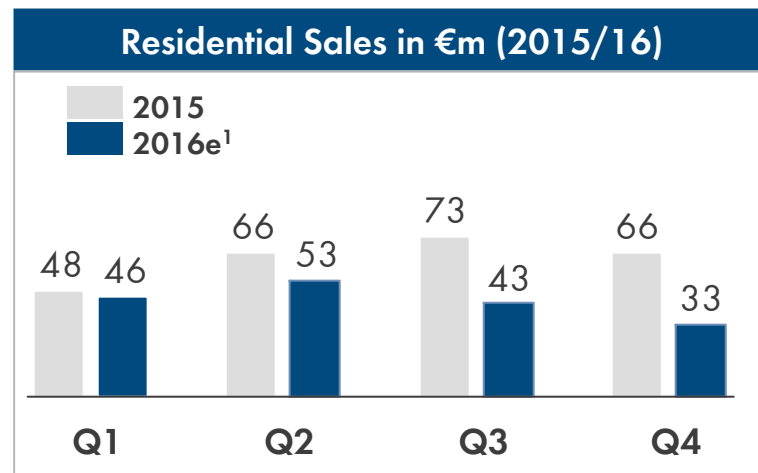
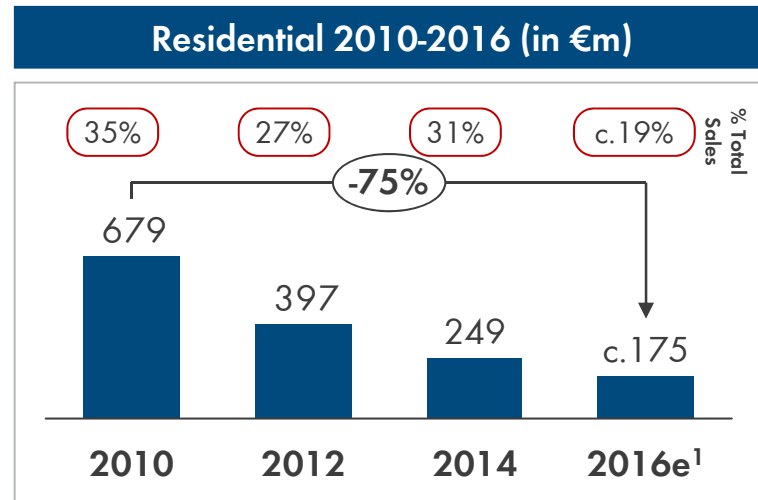
19%

22%

26%

> SMA has a proven track record to cope with high price pressure and a rapidly changing market environment.

# Residential Business is Impacted by the Shift Towards MLPE-Technology in 2016



- ### Sales Development
- > Sales decline of 75% since 2010 is mainly due to the collapse of European solar markets and portfolio-gap (MLPE-technology)<sup>3</sup>
  - > Specific price reduction of >5% p.a. at stable power size and increased functionality (e.g. rapid shut down; integrated communication).
  - > Sales decline 2016 is mainly due to US-business (shift towards MLPE/AC-module technology as well as to TPO-companies<sup>2</sup>).
  - > Positive momentum in APAC and EMEA in 2016 due to new channel partners and dual brand strategy (SMA / Zeyersolar).
  - > Negative One-offs of €3m in 2016.

- ### Measures to Improve Profitability
- > Bundling of Sunny Boy and Smart Connected package to improve differentiation and to protect margin.
  - > New Sunny Boy generation (3-5 kW 1phs) with significantly improved cost structure in Q1/2017 and Sunny Boy (4-10 kW 3phs) in Q4/2017.
  - > Introduction of AC-coupled storage system to address the large retrofit market (Partner with LG Chem, Tesla).
  - > Create business relationship with key TPO-companies in the USA.
  - > Investment into Tigo Energy (4/2016) to enter global MLPE market; launch of next optimizer generation in Q1/2017 (US/APAC/EMEA).

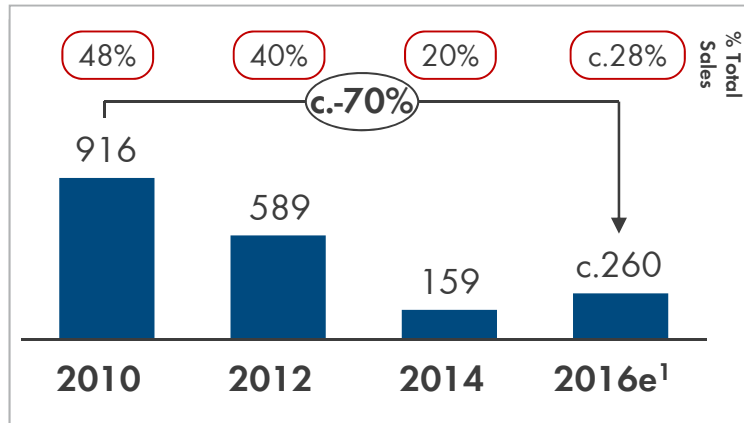
> **2017 will be a transition year for the residential business. Cost-improved Sunny Boy inverter as well as MLPE and Storage Technology will pave the way for sales growth.**



# The Success of the Commercial Segment is a Result of Cost-Improved Products for Key Markets and New Channel Partners



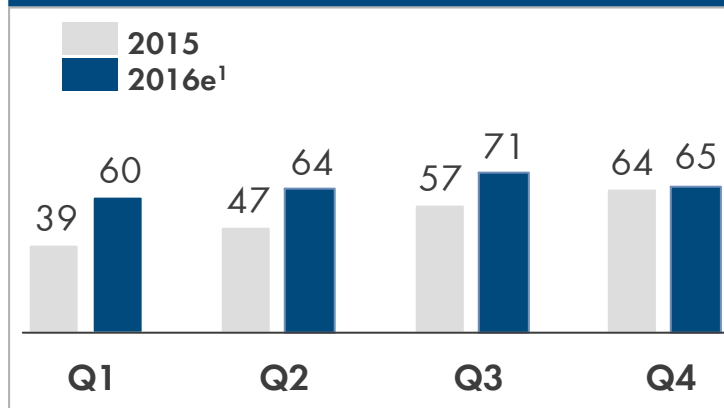
## Commercial 2010-2016 (in €m)



## Sales Development

- > Sales decline of >70% since 2010 only due to collapse of European solar markets. Since 2014 strong growth in non-EMEA markets (+125%).<sup>2</sup>
- > Spec. price decline by >10% p.a. since 2010 mainly due to power-up and new technologies (e.g. 3phs). Significant functionality improvements since 2010 (e.g. # of MPPT, integration of Combiner Box & Monitoring).
- > In 2016 the EMEA business was overall stable; Strong growth in APAC, esp. in JP, IN, AUS, as well as in the USA due to new channel partners and localized products.

## Commercial Sales in €m (2015/16)



## Measures to Improve Profitability

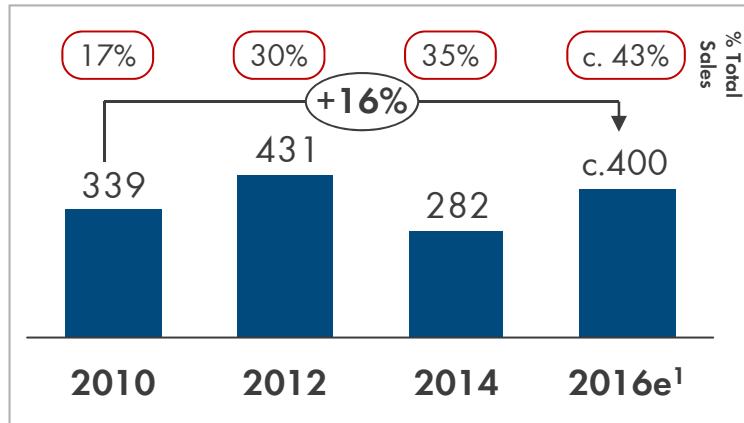
- > Introduction of new Sunny Tripower Core1 and power-up Sunny Tripower 60 to 75 kW (+25%).
- > Development of new energy management software to combine sectors (PV, HVAC, Storage, E-Mobility). Establish strategic alliances to benefit from digitization of the energy sector.
- > Development of a completely new generation of three-phase inverters for ground-mounted commercial applications.
- > Investment into Tigo Energy (4/2016) to enter global MLPE market; Launch of next optimizer generation for commercial applications (Q4/2017).

> The new cost-efficient Sunny Tripower Core1 for roof-top applications will be the key revenue driver in 2017.

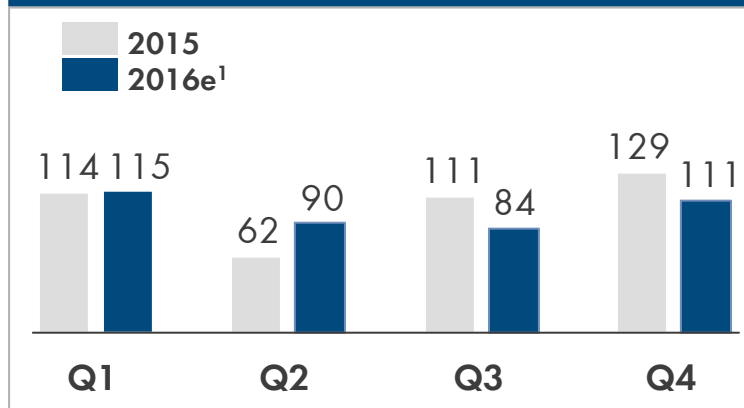
# Total Cost of Ownership (TCO) for the Entire System Technology is the Key Driver for the Utility Business



## Utility 2010-2016 (in €m)



## Utility Sales in €m (2015/16)



## Sales Development

- > Significant change in regional sales profile since 2010.<sup>2</sup>
- > Specific price reduction of >10% p.a. since 2010 mainly due to power-up and cost-out. Improved TCO due to new technologies (e.g. 1,500 Volt), integration of critical components (e.g. transformer, switchgear) as well as ease of installation (e.g. container).
- > Strong growth in 2016 in Americas, India and Japan partly compensated slow down in demand in UK, Thailand and Philippines.
- > In 2016 the utility business was impacted by the trend towards a decentralized system layout of smaller MW-projects (e.g. below 30 MW) as well as from the push-out of projects in the US (ITC-extension).

## Measures to Improve Profitability

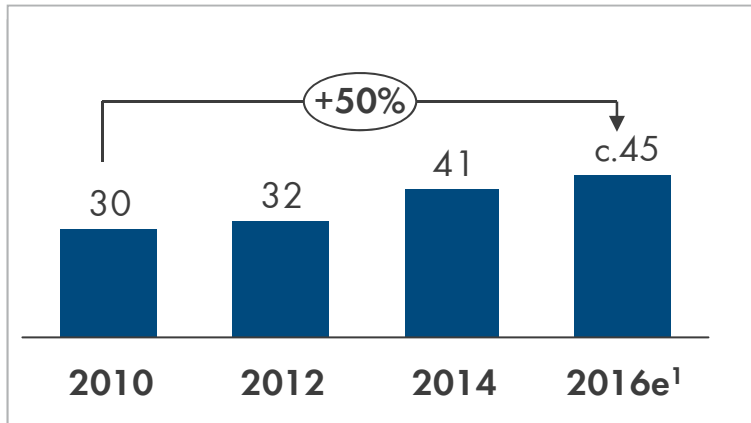
- > Expand the alliance with Siemens to align technical solution from DC to high voltage grid, sharing the global network and joint project development
- > Introduction of 1,500 Volt (USA) to reduce eBOS by up to 10%
- > Introduction of 5 MW MVPS turnkey solution to secure lowest specific system costs.
- > Power-up Sunny Central 2.8 MW (+10%) to reduce specific costs.
- > Advancement in energy storage to accelerate sales with grid stabilization applications

> The new Sunny Central 5 MW MVPS turnkey solution offers the most cost-efficient system technology for large utility-scale projects and will become a key revenue driver in 2017.

# The Large Installed Base of Utility Plants is the Main Driver for the O&M Business



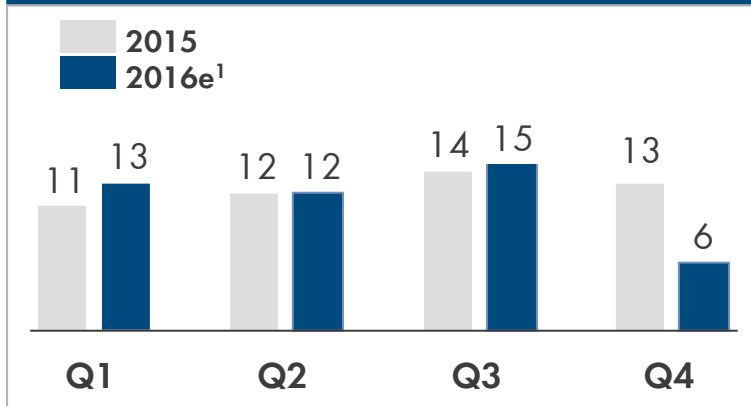
## Service 2010-2016 (in €m)



## Sales Development

- > Significant change in regional sales profile since 2010.<sup>2</sup>
- > High order backlog of €393m as of Dec. 31, 2016 (+6%). Thereof, 20% for O&M service business, 70% for warranty extensions and 10% others. The O&M contracts have a duration between 5 and 15 years.
- > Decline in Q4/2016 sales is mainly due to adjustment of revenue recognition and its allocation to future periods.<sup>3</sup>

## Service Sales in €m (2015/16)



## Measures to Improve Profitability

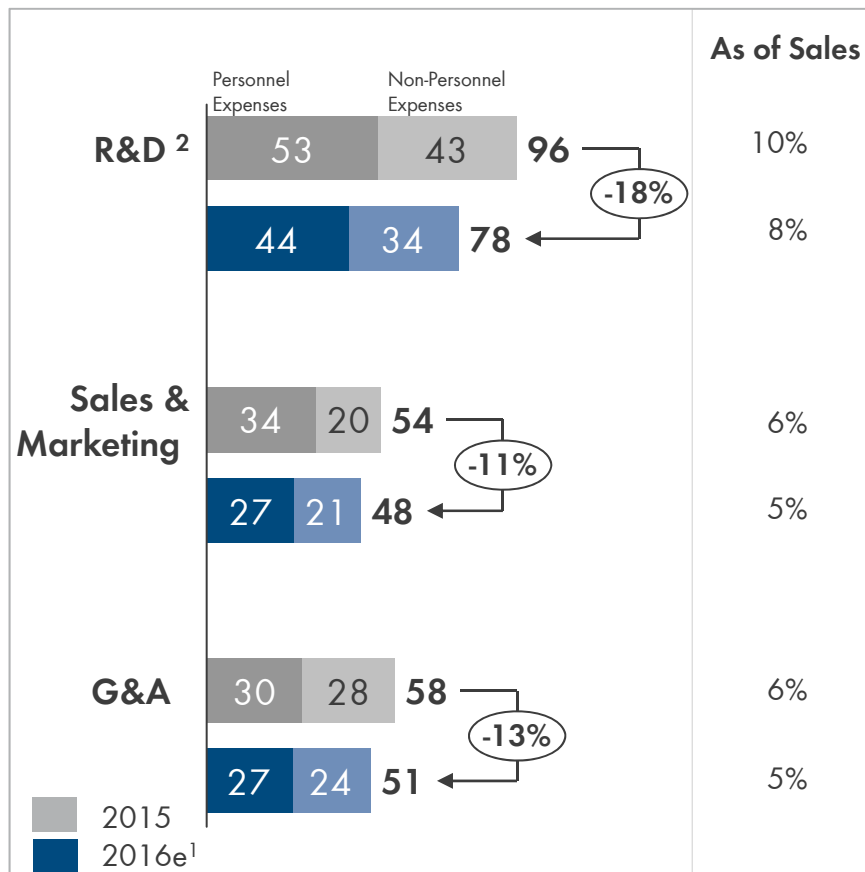
- > Expansion of the O&M service activities in the regions South America and APAC to leverage existing infrastructure.
- > Introduce new service products for the upcoming retrofit market (especially EMEA) to benefit from SMA's high installed base and the replacement of broken inverters from competitors.
- > Implement service partner concept in smaller PV markets to reduce the cost base.

> Since response time is the key in Service, SMA very much benefits from its unique infrastructure.

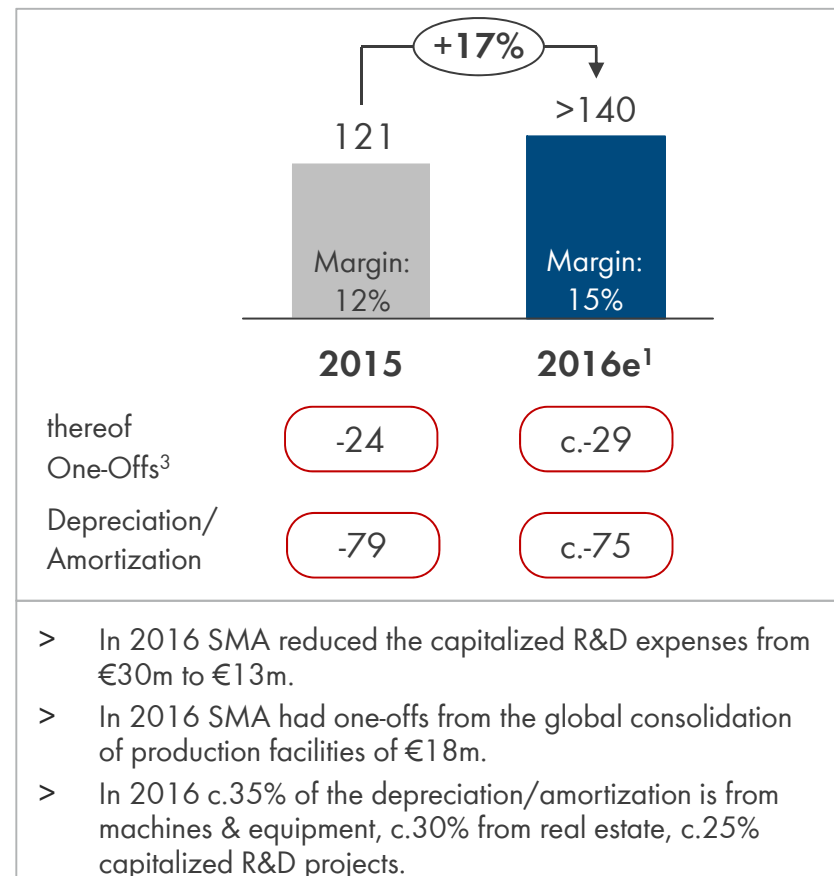
# In 2016, SMA Improved the Cost Structure and Increased the EBITDA-Margin to 15%



## Functional Costs (in €m)



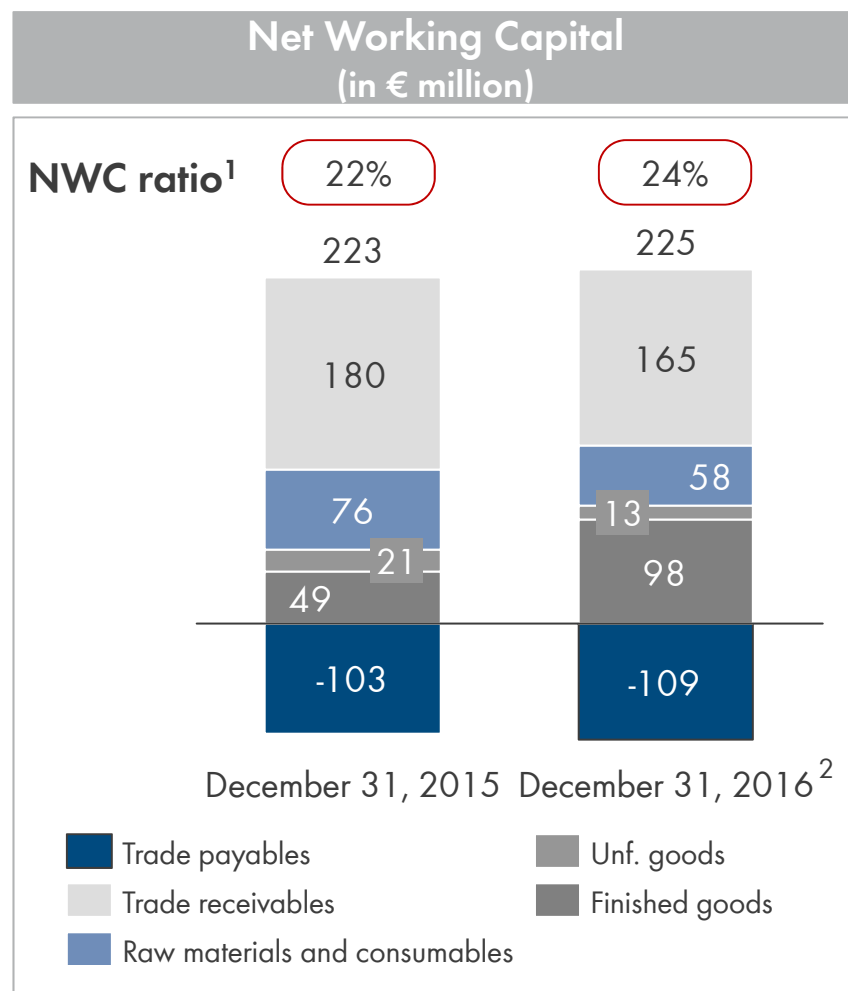
## EBITDA (in €m)



> In 2016, SMA operated with a cash break even of less than €600m.



# With an Equity Ratio of Almost 50% and Net Cash of More Than €360m, SMA is well Prepared for the Future



**Group Balance Sheet , reclassified**  
(in € million)

	2015/12/31	2016/12/31 <sup>2</sup>	Δ
Non-current assets	471	423	-10%
Working capital	326	334	2%
Other assets	38	65	71%
Total cash	325	385	18%
Shareholders' equity	570	582	2%
Provisions <sup>3</sup>	170	177	4%
Trade payables	103	109	6%
Financial liabilities <sup>4</sup>	39	23	-41%
Other liabilities <sup>5</sup>	278	316	14%
<b>Total</b>	<b>1,160</b>	<b>1,207</b>	<b>4%</b>

## > Majority of finished goods will be shipped in Q1 2017.

## 6. Strategy & Guidance 2017



## 6.1 Strategy: SMA has a Sound Strategy in Place





# We Have Developed our Strategy as a Team



Development of the Strategy



Strategy Sessions at Headquarter

International Roadshow  
(Americas, EMEA, APAC)



> SMA is different in many ways – also when it comes to the strategy process.



# SMA has a Sound Strategy in Place to Benefit from the Future Energy Market Design



## Positioning



## Strategic Goals 2020

### Global Market Leader in all Segments

We want to be #1 in the RESIDENTIAL, COMMERCIAL, UTILITY, SERVICE and OFF-GRID & STORAGE segments

### SMA is a Provider of Systems and Solutions

By 2020, sales of non-PV inverters are expected to rise from around 20% of total sales to > 40%.

### Sustainable Profitability and low Capital Intensity

SMA strives for continuous efficiency improvements. If necessary, the profitability will be ensured by means of reductions in structural costs.

### Development of SMA by means of Disruptive Approaches

SMA will invest in start-ups.

### SMA is an Attractive Company

We live by our values and provide freedom for responsible entrepreneurial action. We stand out due to fairness, internationality and sustainability.

> **SMA will become an integral part of the new energy market.**

## 6.2 Guidance 2017: SMA Management Expects Continued High Price Pressure as Well as Market and Segment Shifts

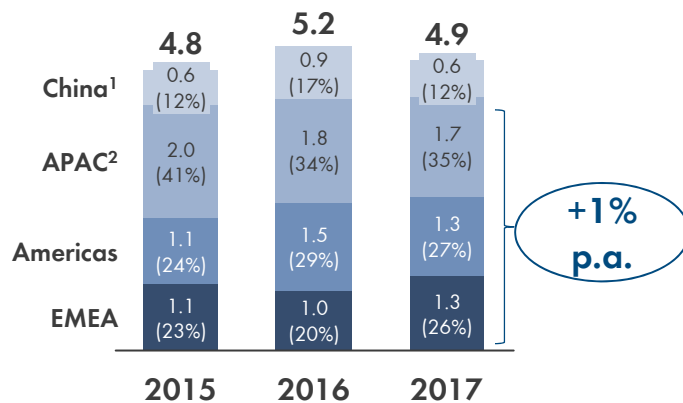


# SMA's Financial Performance Depends on Global Demand, Price Dynamic and SMA's Market Share

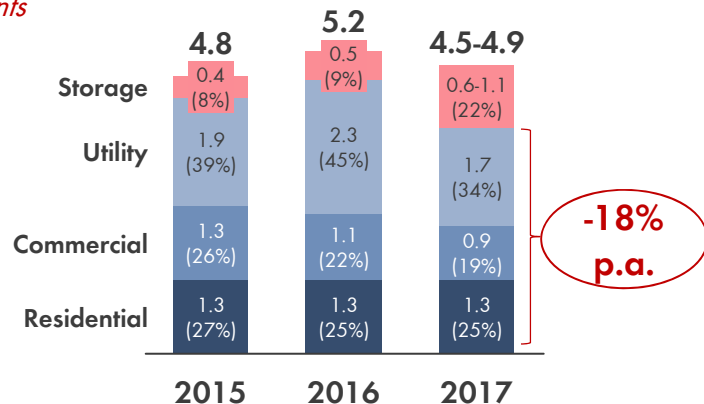


## Global Inverter Revenues by Region/Segment (2015-2017; bn€)<sup>3,4,5</sup>

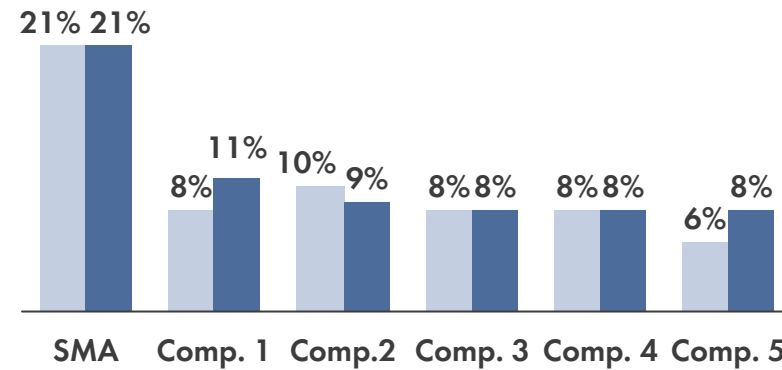
### Regions



### Segments



## Revenue based Market Share 2016



- > Global revenues w/o China are expected to be flattish in 2017.
- > This is only because of the strong growth in the storage segment (best case scenario).
- > Without Storage global revenues are expected to decline by 18%.

## > The storage segment is the key value driver in the PV industry.

1. China reduced the Feed-in-Tariff (FIT) by the end of June 2016 and set further FIT reduction for 2017; New National Solar target set in 13<sup>th</sup> Five-Year-Plan for Power released on Nov. 7<sup>th</sup> 2016 by NEA  
2. w/o China

3. SMA MI Market Model Q1 2017

4. Incl. ~1 GW Off-Grid Installations p.a.: Residential, Remote and Micro-Grid Applications

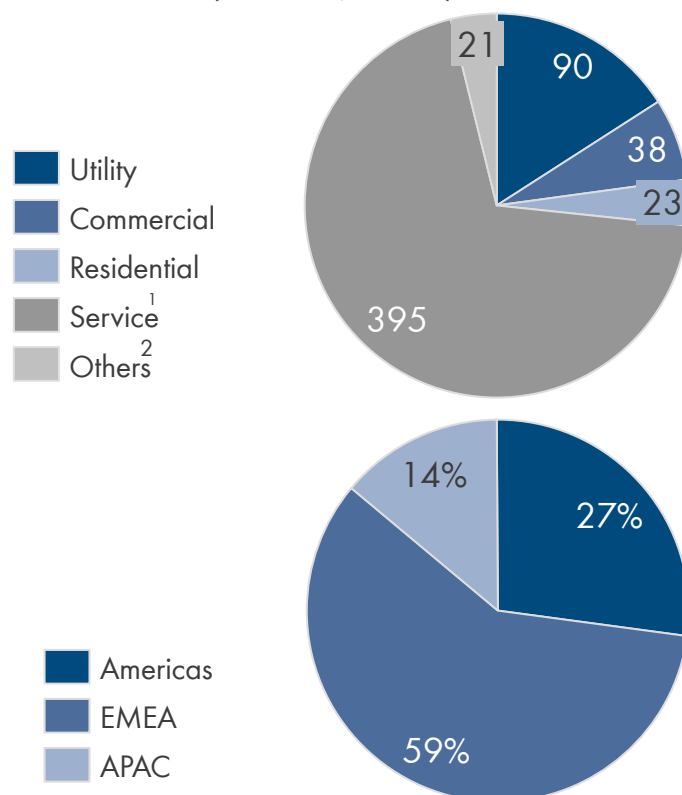
5. Incl. Inverter Potential for Retrofit

# SMA Experienced an Increased Order Intake Since the Beginning of 2017

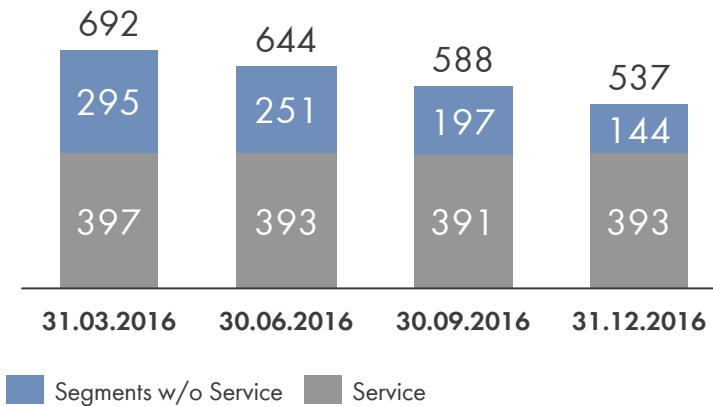


## Order Backlog by Segment & Region (m€)

Total €568m (Jan. 24, 2017)



## Order Backlog by Segment (Q1 to Q4/2016; m€)



- > SMA has a continuous high order backlog of almost €400m for the service business. Thereof, ca. 75% from EMEA countries and >20% from Americas and the remainder for the APAC region.
- > The order backlog for products increased by ca. 20% since the beginning of 2017 to more than €170m. Compared to December 31, 2015 the decrease of almost 50% is mainly due to North America and EMEA.
- > In 2015 US-customers ordered mainly Sunny Centrals to secure the delivery in 2016. A large project for South America increased backlog at the end of 2015 as well.

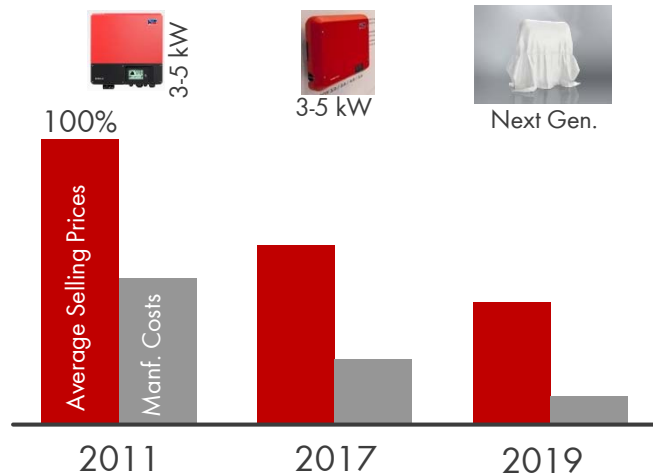
> **Currently, there is no catalyst for customers to order well in advance. Actually, the decline in module prices causes a late order behavior in all segments.**



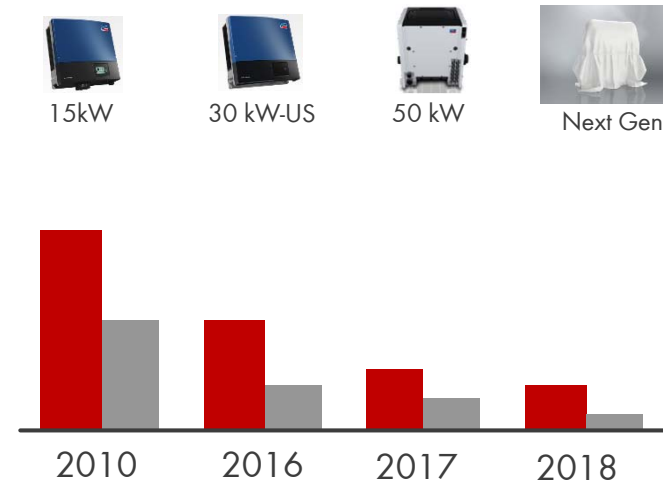
# SMA's Product Development Pipeline and Structured Cost-Out Process will Help to Protect the Gross Margin in the Mid-Term



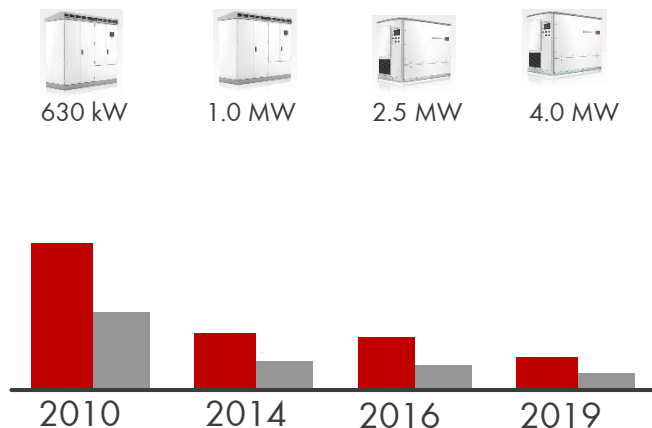
## Residential



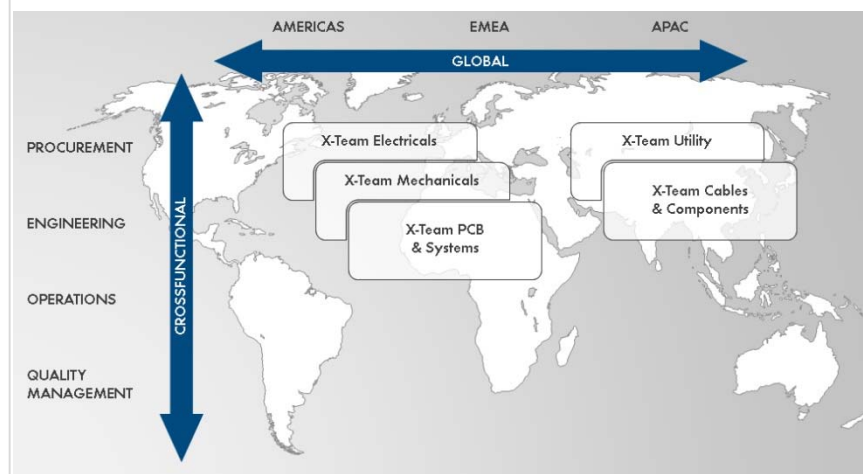
## Commercial



## Utility



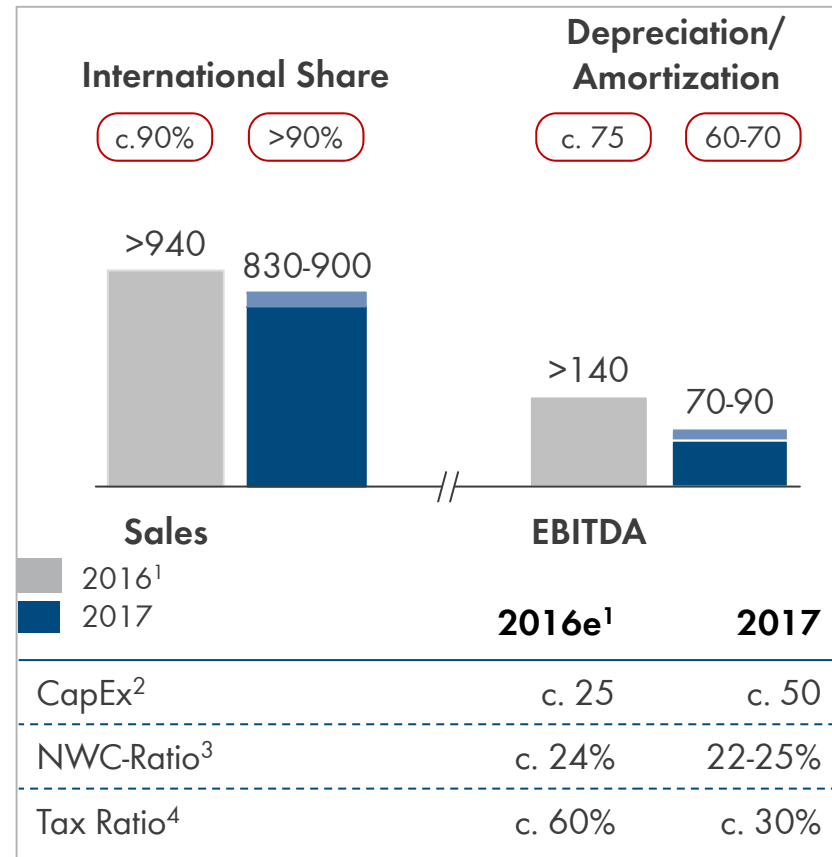
## Organization for Cost-Out



# The SMA Management Estimates a Decline in Sales and Profit due to the Accelerated Price Pressure in the Solar Industry



## Guidance 2017 (m€)



## Management Comments

- > SMA plans to increase its market share in sales terms in the trad. PV-segments<sup>5</sup> in 2017 due to new products and new customers.
- > SMA expects a strong sales growth in the storage segment. Because the market dynamic in storage is very much determined by new customers and regional requirements, SMA's management does not expect to grow as fast as the best case market scenario.
- > SMA expects high price pressure of >10% in all segments and regions. Key decision criteria besides price are product quality, service, product features, compliance and cyber-security.
- > SMA expects a decline in sales between 4% and 13%. More than 20% of sales will be from non-PV-inverters<sup>6</sup> In the mid-term, non-PV-products will add sales to the existing PV inverter business.
- > SMA will introduce new products and solutions in the course of 2017 to protect the gross margin. The price pressure across the entire portfolio is higher than the cost reduction.
- > With the next generation of products and the expansion into energy management services, SMA expects to improve the gross margin from 2018 onwards.
- > The fixed cost structure will benefit from the consolidation of the global production infrastructure from Q2 2017 onwards.

> **With the next product generation and the expansion of the solution business SMA strives to improve profitability from 2018 onwards.**

1. Preliminary figures

2. Higher CapEx in 2017 mainly due to new test equipment and IT-infrastructure

3. Net Working Capital Ratio (NWC) as of last 12 months sales

4. High tax ratio in 2016 is due to one-offs (tax audit)

5. Residential, Commercial, Utility and Service

6. Medium-voltage equipment, energy management solutions

# Investment Highlights: Attractive Investment Opportunity



- ✓ Direct exposure to the global solar market
- ✓ SMA has been the #1 for solar inverters for more than 2 decades
- ✓ Proven technology and new solutions for the energy Internet
- ✓ Flexible business model and best-cost sourcing strategy
- ✓ Powerful sales and service infrastructure
- ✓ Bankable partner due to high equity ratio, net cash position and credit facility
- ✓ Stable shareholder structure with Danfoss as strategic anchor investor
- ✓ Experienced management team with proven track record

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BACK UP

# Experienced Management Team With a Proven Track Record



## Managing Board



**Pierre-Pascal Urban**  
(born 1970)  
Contracted until 2022

**CEO/CSO**



**Dr. Jürgen Reinert**  
(born 1968)  
Contracted until 2019

**CTO/COO**



**Ulrich Hadding**  
(born 1968)  
Contracted until 2019

**CFO**

## Responsibility

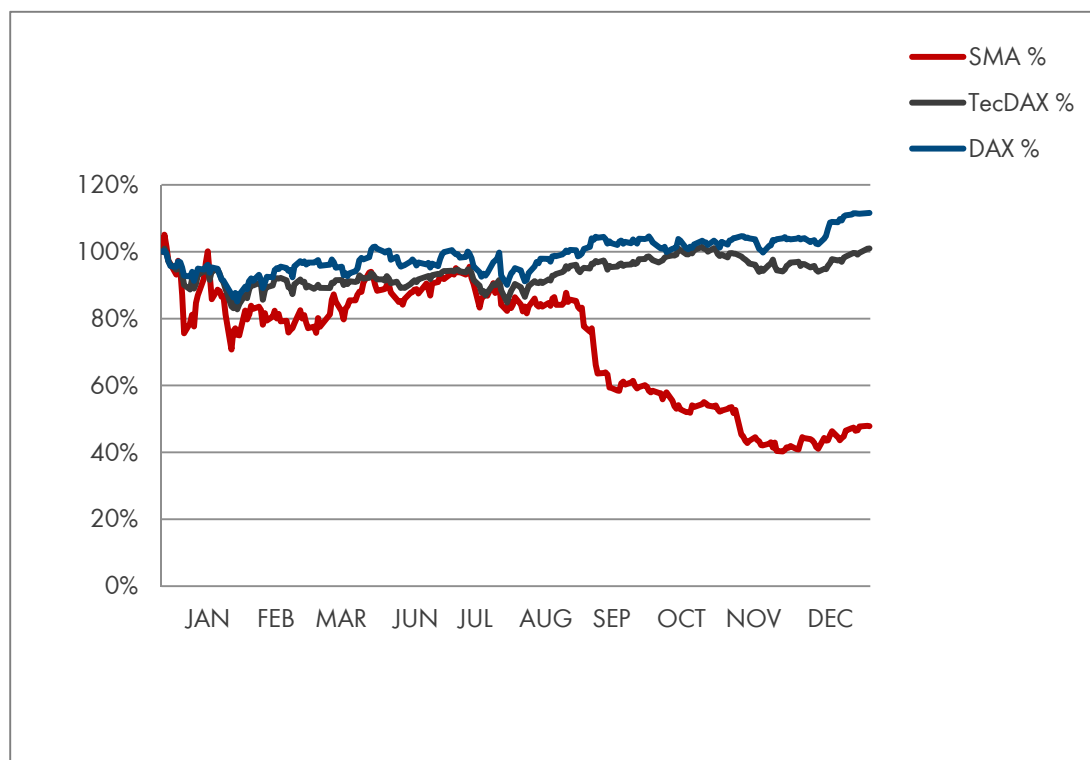
Chief Executive Officer,  
Strategy, Sales, Service  
Operations, Communication,  
Business and Organizational  
Development, Internal Audit

Deputy Chief Executive Officer,  
Research & Development (R+D)  
Business Units, Operations,  
Information Technology (IT)

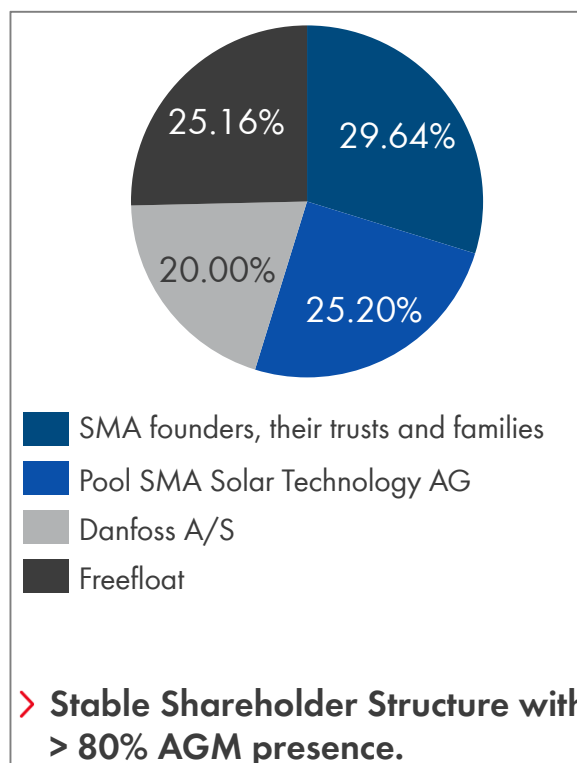
Finance, Human Resources,  
Legal, Governance/Compliance,  
Labor Director

# SMA Shares Shows Significant Volatility Based on Changing Industry Outlook

## Share Price Development 2016



## Shareholder Structure<sup>1</sup>



> Trading continues to be dominated by US hedge funds.

## INVESTOR RELATIONS



**TecDAX**

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### **SMA plans Roadshows in:**

Q1/2017	London / Zurich
Q2/2017	London / Edinburgh
Q3/2017	London / Frankfurt

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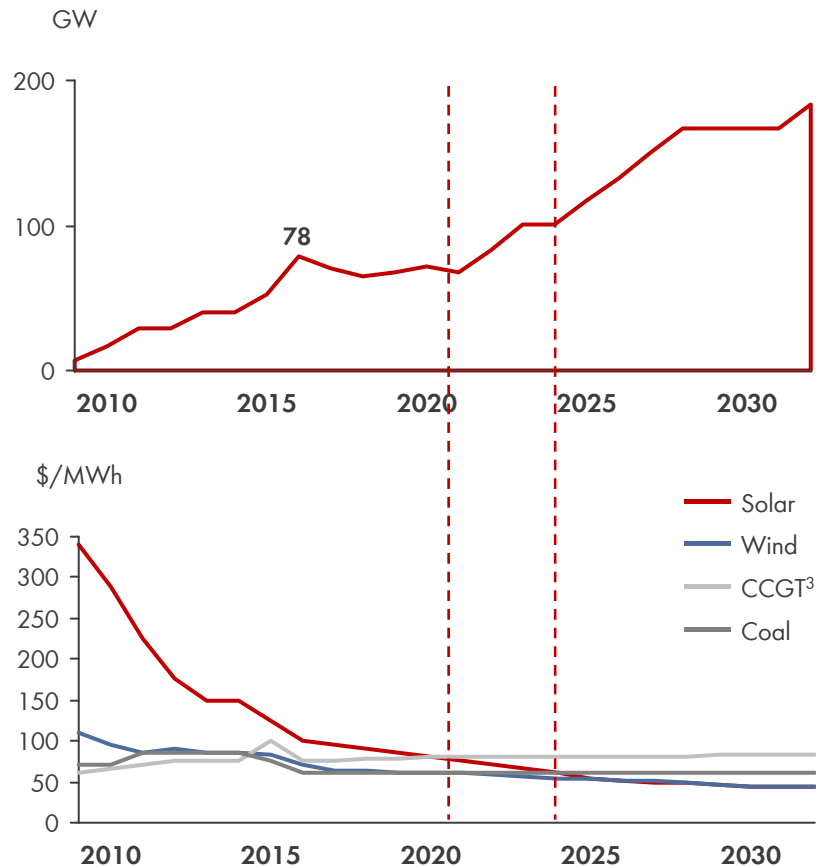
### **Publication of the SMA Group 2016 Annual Report:**

Mar 30, 2017	Publication of the SMA Group 2016 Annual Report
	Analyst Conference Call: 09:00 a.m. (CET)



Solar is expected to show significant growth in the early 20' by becoming more attractive than other energy sources

### Additions of Solar Power p.a.<sup>1</sup> / Global Avg. Energy Costs (USD)<sup>2</sup>



### Comments

- > Solar is expected to undercut coal in the middle of the twenties.
- > But solar may be the preferred energy form before 2025 showing noticeable growth rates already in the early twenties, when beating gas.
- > This means solar becomes highly attractive after 2020 with a continuing annual growth.
- > BNEF<sup>2</sup> forecasts 3,900 GW of installed solar capacity by 2040. This means that solar will rank first with a share of 29% of global installed energy capacity.

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