

SMA SOLAR TECHNOLOGY AG

# Warburg Highlights 2016

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June 30, 2016



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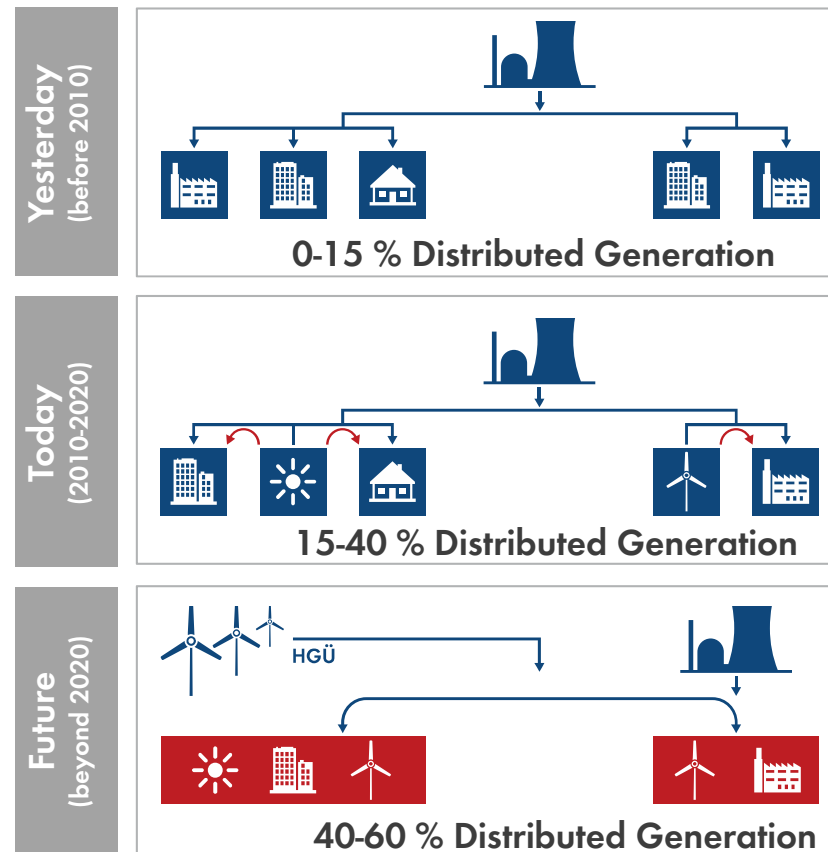
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# Fundamental Transition Towards Distributed Power Generation Shakes Up the Energy Sector



## Development of Power Generation



## Impact

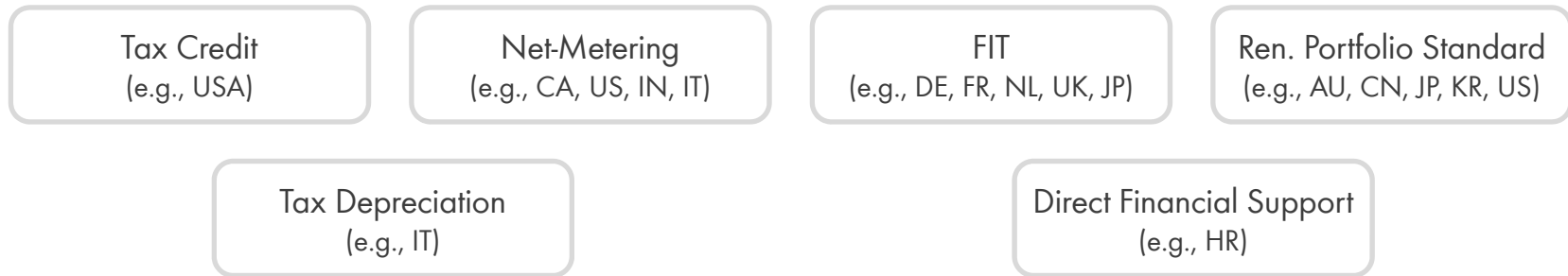
- > Electricity produced increasingly decentral, close to the customer. Conventional energy sources like coal and gas will take a back seat
  - > With many "energy producers" the energy market is far more fragmented than before
  - > Peak loads and seasonal peaks are reduced
  - > Utilities lose market share and are forced to implement a strategic reorientation
- 
- > Largely autonomous units produce their electricity demand by themselves and balance over- and undersupply
  - > Techn. developments will lead to convergence between power generation/thermal energy, generation/demand and generation/storage

> The solar inverter is the core of integrated, sophisticated systems

# Supporting Mechanisms for Renewable Energy Will Change With a Higher Share of Distributed Generation



## PV DRIVERS TO DATE



## FUTURE SITUATION




> Framework to support distributed power generation and new business models is necessary

# The Solar Industry Will Transform From a Pipeline to a Platform Business – Cyber Security Becomes Important



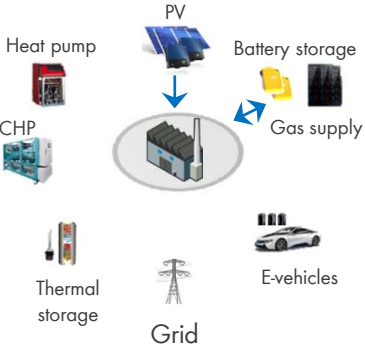
## TRANSFORMATION

Pipeline Business Model



- > Linear series of activities
- > Assets: IP, low cost manufacturing, market access

Platform Business Model



- > High value exchange between producer & consumer
- > Assets: information and interactions

## IMPACT

- > Renewable energy becomes the backbone of the energy supply. Modern communication systems are required to allow a fast convergence between supply and demand.
- > Solar inverters are the core of integrated, sophisticated systems. Therefore, solar inverters are considered as safety relevant control systems.
- > Surveillance technology could be built in PV system technology. Compromised equipment could cripple a nation's civilian infrastructure.
- > Transparent company structures<sup>1</sup>, equipment with high security standards<sup>2</sup> as well as IT server infrastructure located in countries with high security standards are therefore paramount for a successful transition into a platform business model.

**> Only equipment free of any cyber-security concern shall be used to build up the new energy system**

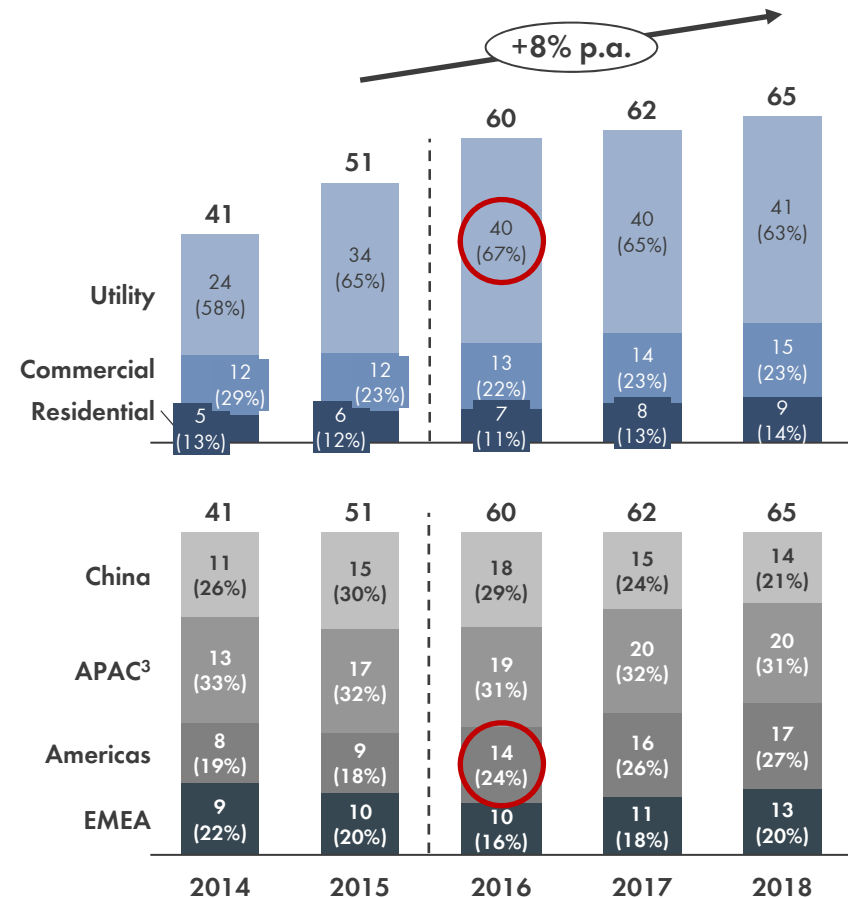
1. No undisclosed connections to the government  
2. Only PV equipment that is free of software to facilitate cyberwarfare (confirmed by independent test)

# SMA Expects New PV Installations to Reach 60 GW in 2016, Thereof 60% in China, the U.S. and Japan



- > SMA reduced its mid-term outlook due to the expected national target reduction in China. We expect growth of approx. 8% p.a. in global new installations until 2018. The main drivers are among others long-term incentive programs (e.g., ITC in the U.S.) and CO<sub>2</sub> emission targets.
- > Americas and India will become the driving force of new installations. EMEA will regain importance and account for 20% of global new installations in 2018. In contrast, the relevance of China will decrease in future years.
- > There will be no significant change in breakdown of the segments Residential, Commercial and Utility in the next years. The Utility segment will play the major role covering almost two thirds of the market and will be dominated by China, India and the U.S. by 2018.
- > The emerging markets of South East Asia, Latin America and Middle East show a promising potential and account for more than 10% of global demand.

Global New PV Installation by Segment/Region (GWdc)<sup>1,2</sup>



## > The expected reduction in the national target in China will accelerate the consolidation process

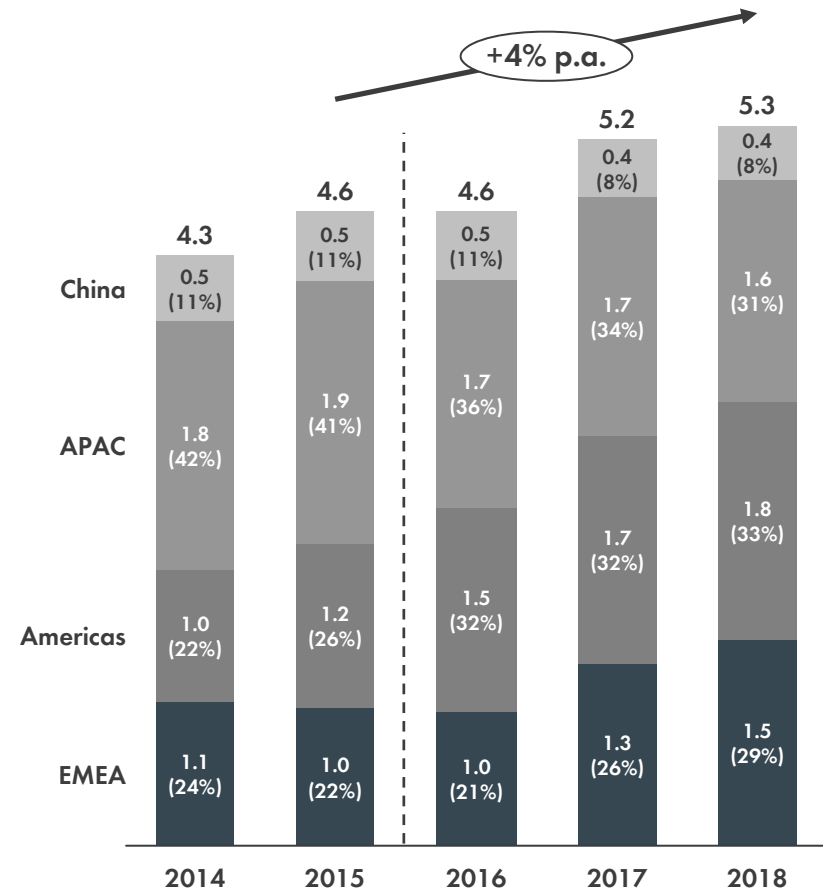
1. SMA MI Market Model Q2 2016  
 2. Incl. 1 GW off-grid installations: residential, remote and micro-grid applications  
 3. w/o China

# Americas and EMEA Will Become the Value Drivers of the Solar Industry—China Accounts for Less Than 10% of Global Sales



- > SMA estimates an acceleration in price pressure in all regions and segments due to the consolidation process. Global inverter sales are expected to grow by up to 4% p.a. to €5.3 billion until 2018.
- > Revenues in China are expected to decline by 20% to only €400 million. This represents 8% of global sales.
- > Revenues in Japan benefit from strong pipeline of already approved PV projects. However, already implemented FIT-cuts will almost half revenues until 2018. India is expected to see lower price reductions because current price levels are already low. Other markets in APAC are expected to develop positively.
- > The extension of the ITC will support attractive growth rates in the U.S. Other markets in the Americas region (e.g., Brazil, Chile, Mexico) will experience sales growth as well.
- > The European markets are expected to decline, mainly due to unfavorable incentive schemes. However, Africa and Middle East have a chance to overcompensate the sales decline in Europe.

Global Inverter Revenues by Region (bn EUR)<sup>1,2</sup>



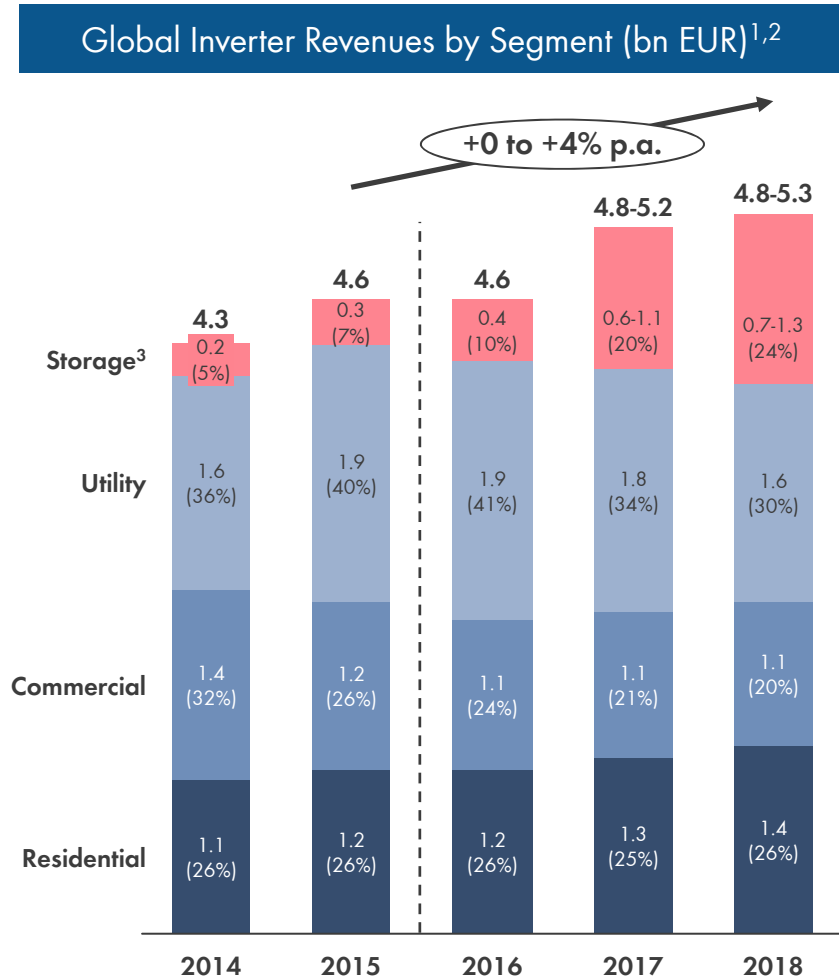
> **Global weighted average levelized cost of electricity from photovoltaics is estimated to be on the level of onshore-wind by 2025<sup>3</sup>**

1. Prices for revenue calculation according to IHS (EUR/Wac); SMA MI Market Model Q2 2016  
 2. Incl. system technology for storage applications (best case scenario)  
 3. International Renewable Energy Agency: 2025 PV: 0.06 \$; Onshore Wind: 0.05 \$

# System Technology for Storage Applications Will Drive Global Inverter Revenues



- > The storage market is in a very early development stage. Therefore, revenues from system technology for storage applications are very difficult to estimate. In the best case, this segment accounts for up to 24% of global sales in 2018.
- > Revenues for the utility and commercial segments are impacted by share of countries with ultra-low average selling prices (e.g., China, India).
- > Growth in global residential sales is very much driven by strong U.S. demand.
- > Only inverter manufacturers with a complete product portfolio for all solar applications (incl. system technology for storage), a truly global presence as well as a good quality of the balance sheet have a chance to benefit from the market development.
- > The ability to transform the business model towards a platform business will become paramount for solar inverter players.



> **Sales with system technology for storage applications extremely driven by the development of battery costs**

1. Prices for revenue calculation according to IHS (EUR/Wac); SMA MI Market Model Q2 2016  
 2. Incl. demand for replacement inverters  
 3. Incl. all applications (e.g., hybrid, behind the meter, in the grid, co-located, etc.)



# SMA Increased Its Claim to the Growing Market of Energy Management and Services



## PHOTOVOLTAIC SOLUTIONS

- Operations & Maintenance
- Energy management
- Service

**DATA-BASED  
BUSINESS  
MODELS**

## PHOTOVOLTAIC SYSTEMS

- Medium-/high-voltage technology
- System technology for storage and hybrid
- Communication products
- Sunny Portal

## PHOTOVOLTAIC PRODUCTS

- Solar Inverter
- Smart Module Technology (MLPE)
- Battery inverter

> **Our main goal is to easily integrate PV in existing and new energy infrastructure and optimize its use at lowest energy costs**

# SMA's Complete Product Portfolio Offers Solutions for All Requirements Worldwide



**SUNNY CENTRAL**

**24 GW** cumulative installed inverter capacity

**Utility**

**SUNNY TRIPOWER**

**13 GW** cumulative installed inverter capacity

**Commercial**

**SUNNY BOY**

**13 GW** cumulative installed inverter capacity

**Residential**

**SUNNY BOY STORAGE**  
**SUNNY CENTRAL STORAGE**  
**SUNNY ISLAND**

**Storage**

**O&M / WARRANTY EXTENSION**

**Service**

> SMA's cumulative installed power of nearly 50 GW forms the basis for a successful service and storage business.

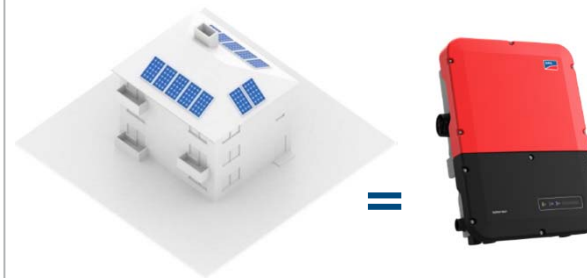
# Tigo's New Product Architecture Offers the Next Generation of Module-Level Power Electronics



## Market

- > The MLPE market is expected to grow by 10% p.a. until 2020 and had global sales of >€700m in 2015.
- > The MLPE market is highly concentrated and technology is the main market entry barrier. Current MLPE players serve various channels (channel conflict).
- > The existing MLPE solutions<sup>1</sup> are expensive, because every solar module has to be equipped with power electronics.
- > Since only c. 20% of the solar modules in residential systems<sup>2</sup> need optimization of any kind, the Flex MLPE<sup>1</sup> technology from SMA/Tigo offers the most cost-effective solution for customers.

## Flexible Design



*String inverter with 3 MPPTs for flexible design...*



*...plus Tigo for most cost-effective optimization*

> **Flex MLPE from SMA/Tigo: More energy, less investment**

1. Optimization, Safety, Monitoring Functions  
2. For Commercial and Utility applications the ratio is even lower

# SMA's Products and Flagship Project Received Multiple Awards at the Intersolar 2016



## SUNNY BOY STORAGE

- > SMA's solution opens up a wide range of applications: New installation, retrofit, storage without PV plant.
- > Particulary designed for LG high voltage batteries and Tesla Powerwall. However, customers have free choice of battery brand, battery size and battery technology.



## SUNNY BOY SMART ENERGY

- > The Sunny Boy Smart Energy is a combination of a modern PV inverter and a battery as the key component of the integrated storage system.
- > Increased self-consumption and easy use of home generated solar power.



## FLAGSHIP PROJECT IN THE CARIBBEAN: PV Hybrid System on the Island of St.Eustasius

- > SMA introduced the largest battery storage system in the Caribbean with the latest SMA products:
- > Fuel Save Controller 2.0 L; Sunny Central Storage 1000, 73 Sunny Tripower 25000 for 1.7 MW load.

> **SMA's products and system know-how create the basis for a successful platform business**

# Q1/2016 Financial Summary: SMA has a Balanced Revenue Distribution - This is Unique in the Solar Industry



## Key Financials (in € million)

	Q1 2015	Q1 2016	Δ
MW sold	1,710	2,075	+21%
Sales	226	254	+12%
Residential	48	46	-4%
Commercial	39	60	+53%
Utility	114	115	+2%
Service (external)	11	13	+16%
Other Business	14	20	+38%
Gross margin	17%	25%	
EBITDA	13	42	n.m.
EBIT	-5	25	n.m.
Thereof one-offs <sup>1</sup>	-3	0	n.m.
EBIT w/o one-offs	-2	25	n.m.

## Key Financials (in € million)

	Q1 2015	Q1 2016	Δ	
Free cash flow (Adj.)	-8	38	n.m.	
Depreciation	19	17	-11%	
Capex	19	7	-62%	
Net cash	286 <sup>2</sup>	323	+13%	
Total assets	1,160 <sup>2</sup>	1,173	+1%	
NWC ratio <sup>3</sup>	22% <sup>2</sup>	21%		
	<b>2015</b>		<b>2016</b>	
	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	
Sales	203	270	301	254
Gross margin	18%	23%	26%	25%
EBITDA	8	38	54	42
EBIT	-9	18	30	25
One-offs	2	-13	-10	0

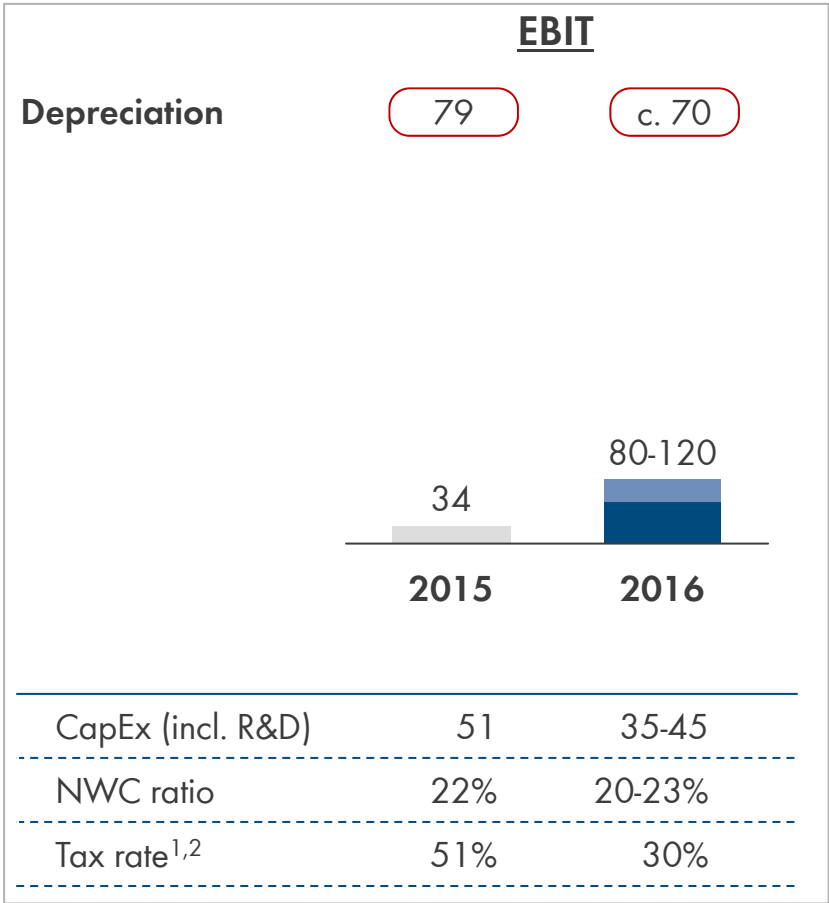
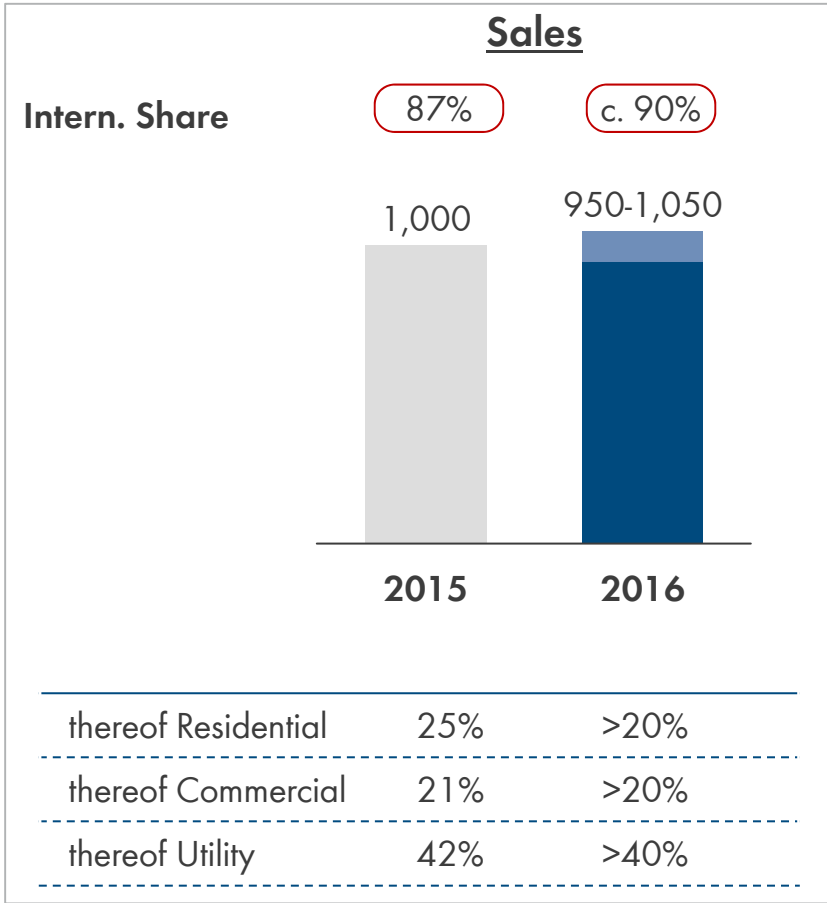
1. See appendix on slide 26 for more details  
2. As of 2015/12/31

3. NWC= inventory+trade receivables-trade payables (no advanced payments included); as of last twelve month's sales

# SMA Management Confirms Guidance 2016 – The Second Half 2016 is Expected to be Stronger



## Guidance 2016 (in € million)



1. Loss carryforwards of €220m as of 2015/12/31 in Germany (SMA AG)

2. Tax Rate 2015 incl. One-Off from tax audit (2010-2012)

3. Thereof Americas 41%, EMEA 52% and APAC 7%; thereof Utility 23%, Commercial 6%, Residential 4%, Other Business 10% and 57% Service,

which will be recognized over a period of 5-10 years

# 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 game changing new products
- ✓ 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
- ✓ Conservative guidance, despite unique positioning
- ✓ Stable shareholder structure with Danfoss as strategic anchor investor
- ✓ Experienced management team

ENERGY  
THAT  
CHANGES



SOCIAL MEDIA  
[www.SMA.de/Newsroom](http://www.SMA.de/Newsroom)





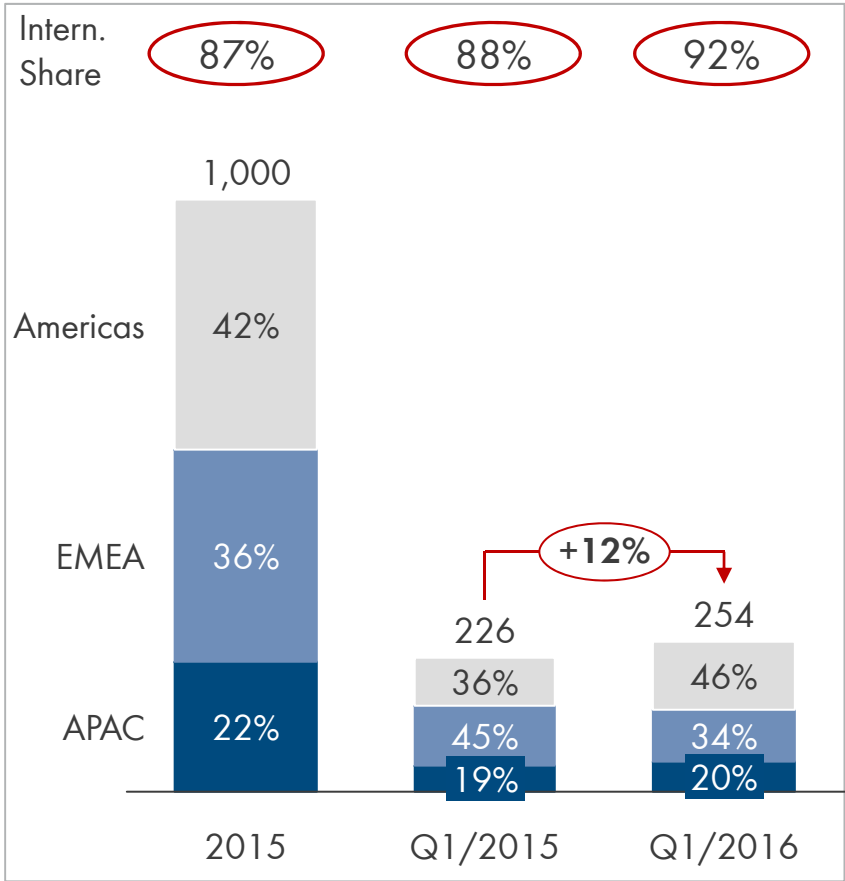


BACK UP

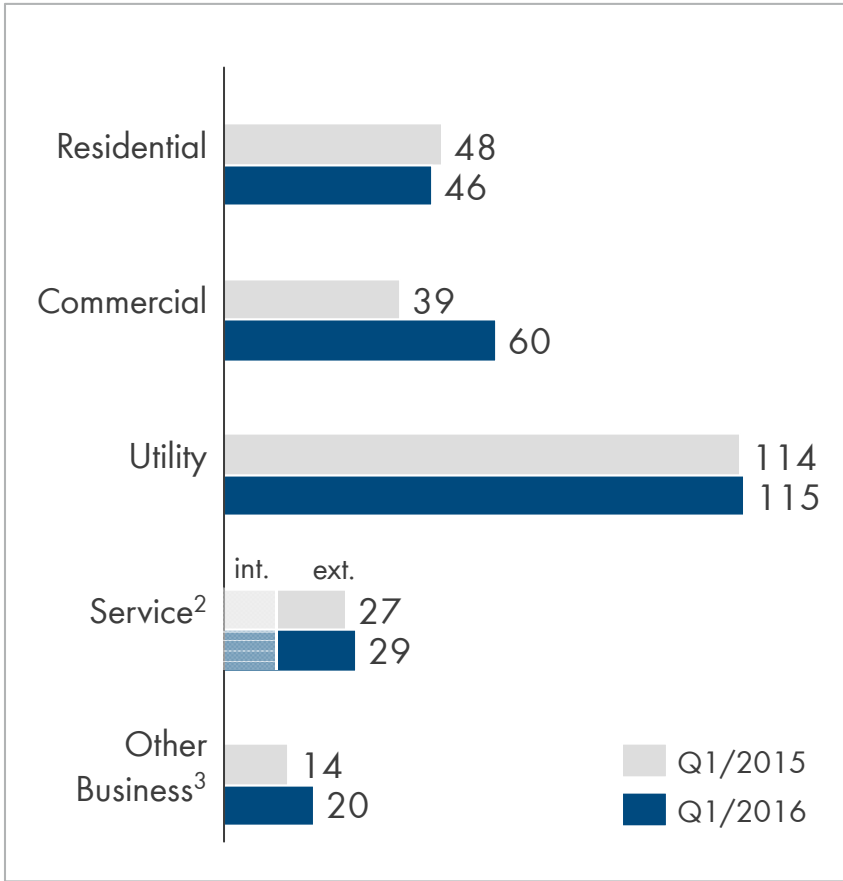


# Americas was the Strongest Growth Region<sup>1</sup> while EMEA Slowed Down due to FIT Cuts in the UK

## Group Sales (in € million)



## Sales by Segment (in € million)



> Commercial was the key growth driver with an increase of more than €20 million Y/Y (c. 75% of total growth)

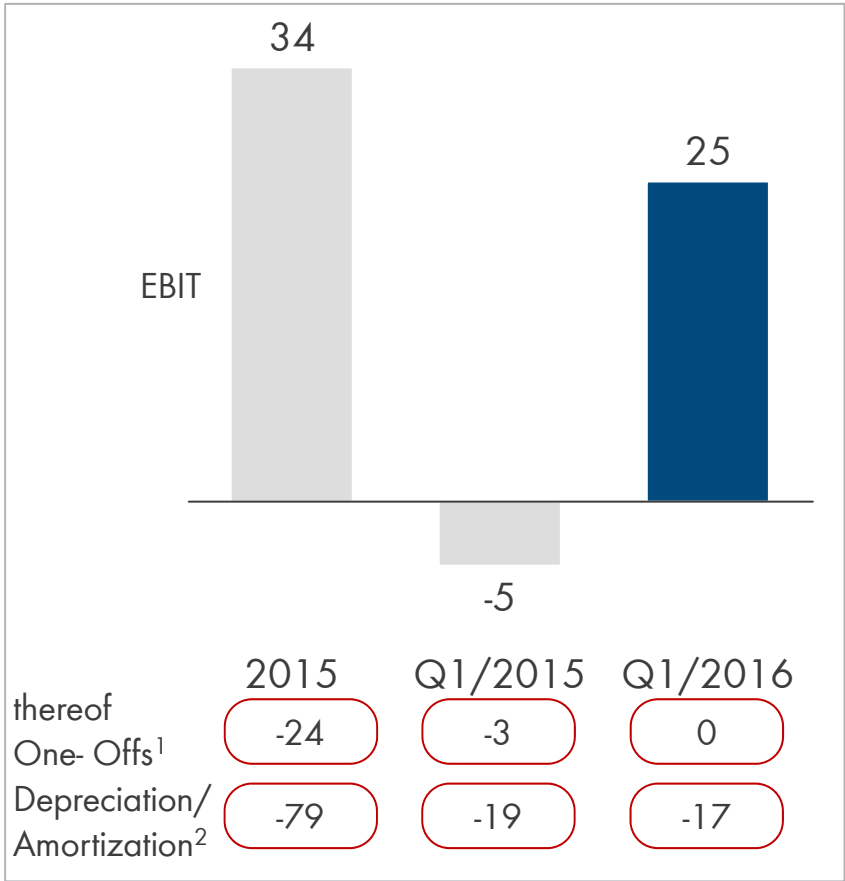
1. Q1/16: Americas +43% Y/Y  
2. Internal sales (Q1 2015: €16m; Q1 2016: €16m)

and external sales (Q1/2015: €11m; Q1/2016: €13m) 18  
3. Including Zerversolar

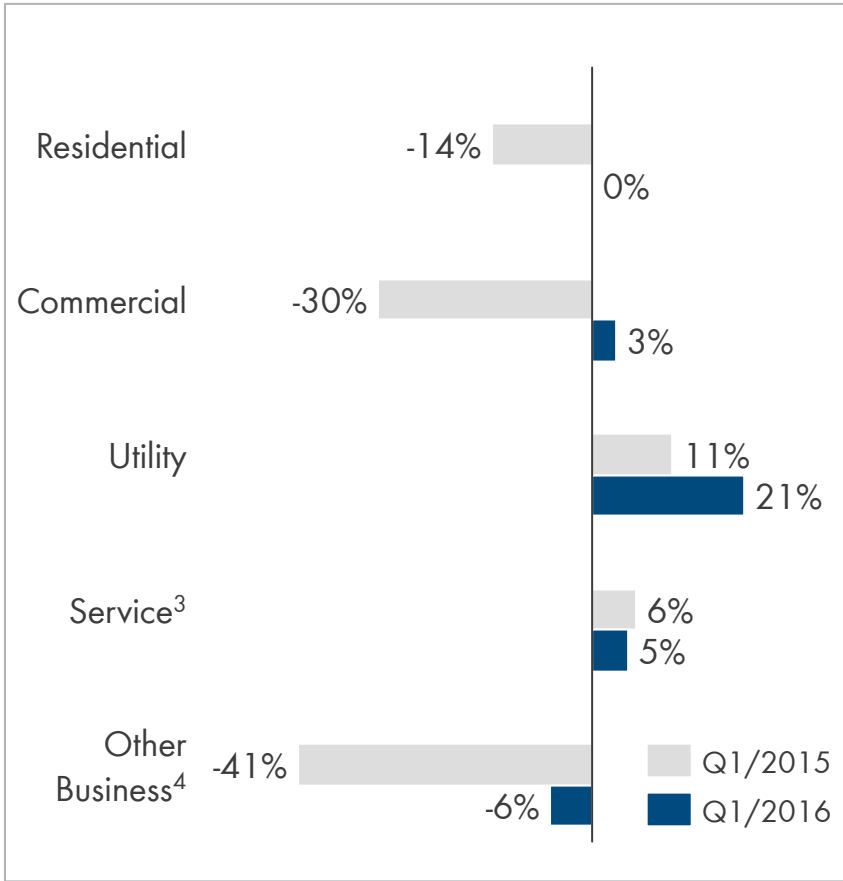


# All of SMA's Core Business Units are Profitable in Q1/2016 - Earlier than Expected

**EBIT (in € million)**



**EBIT-margin by Segment (in %)**



> **Margin improvement due to new products and fixed cost reduction**

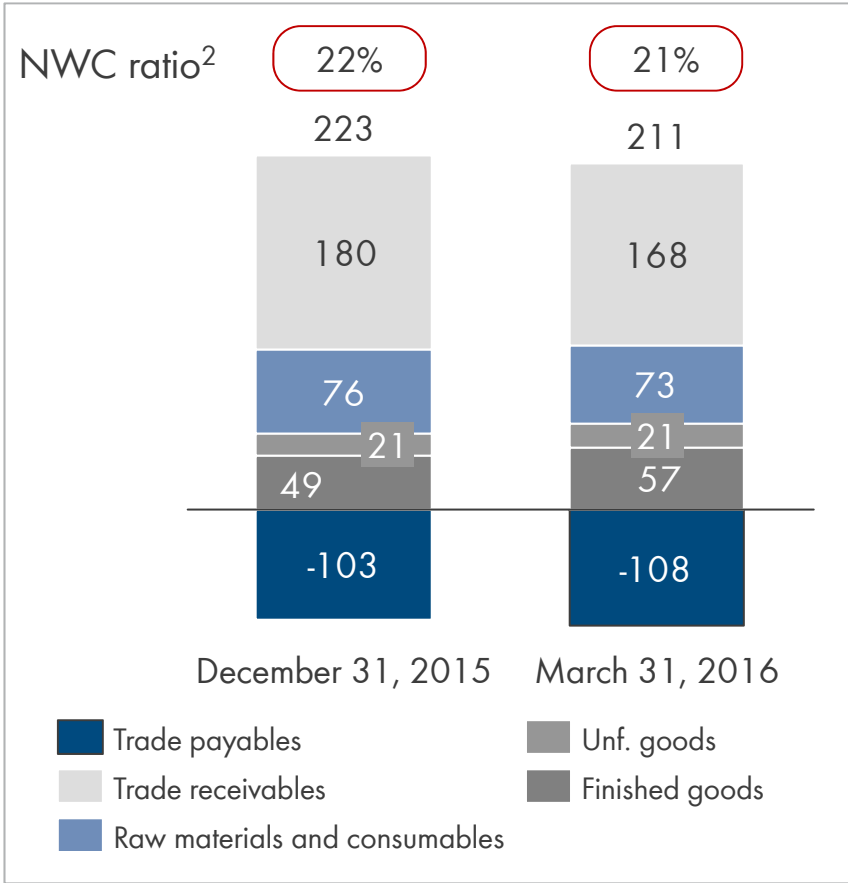
1. See Appendix on slide 26 for more details  
 2. Including €0m One-Offs (Q1/15: €1m)

3. In relation to internal and external sales  
 4. Including Zerversolar



With an Equity Ratio of c. 50% and High Net Cash of €323m, SMA is Rock Solid

Net Working Capital (in € million)<sup>1</sup>



Group Balance Sheet (reclassified, €m)

	2015/12/31	2016/03/31	Δ
Non current assets	471	453	-4%
Working capital	326	319	-2%
Other assets	38	40	5%
<b>Total cash</b>	<b>325</b>	<b>361</b>	<b>11%</b>
Shareholders' equity	570	585	3%
Provisions <sup>3</sup>	170	171	1%
Trade payables	103	108	5%
Financial liabilities <sup>4</sup>	39	38	-2%
Other liabilities <sup>3</sup>	278	271	-3%
<b>Total</b>	<b>1,160</b>	<b>1,173</b>	<b>-1%</b>

> **SMA has proven its bankability by signing a long-term revolving credit facility of €100m with Commerzbank, Deutsche Bank und Hessische Landesbank**

1. NWC= inventory+trade receivables-trade payables (no advanced payments included)  
 2. As of last twelve months sales  
 3. Not interest-bearing

4. Includes not interest-bearing derivatives : €1m (Q1/2015: €8m)