

SMA SOLAR TECHNOLOGY AG

Analyst / Investor Presentation

Investment in Tigo Energy – SMA Makes Solar Modules Smart

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SMA acquired a 27% share in Tigo Energy to make solar modules smart and set foundation for data-based business



Rationale

- > The Module Level Power Electronics (MLPE) market is expected to grow by 10% p.a. until 2020 and had global sales of c. 700 mEUR in 2015¹.
- > The MLPE market segment is highly concentrated and technology is the main market entry barrier.
- > The Tigo TS4 product is technological superior to existing solutions and thus gives SMA the opportunity to enter the market and to capitalize on its global sales infrastructure in 20 countries.
- > SMA will make solar modules smart and establish foundation for data-based business models.

Technology

- > The Tigo TS4 is a universal module box designed to facilitate any solar module technology.
- > The base of the module box can selectively be equipped with unique cover options for different functions (e.g. Diode, Monitoring, Safety, Optimization, Longer String). This allows the customer to deploy only to their needs (pay what you need).
- > The TS4 normally works in by-pass (only when needed) and is using fewer components as other available technologies. Therefore, the TS4 is expected to have a longer life-time.

Deal

- > SMA subscribes a capital injection of 20 million USD to acquire 27% of Tigo Energy; Pierre-P. Urbon will have a seat on the Tigo board to represent SMA.
- > SMA gets exclusive global distribution rights for the new Tigo product TS4² for 30 months.
- > SMA will cooperate with Tigo in various areas to further enhance the system solution offered.
- > SMA keeps its full year guidance unchanged³. The transaction is expected to have a positive impact in the second half of 2016 already.

> For the first time SMA has access to the fast growing module power level electronics market worth more than 700 million EUR in 2015

1. Including the inverter needed for operation with the DC-MLPE (optimizer)

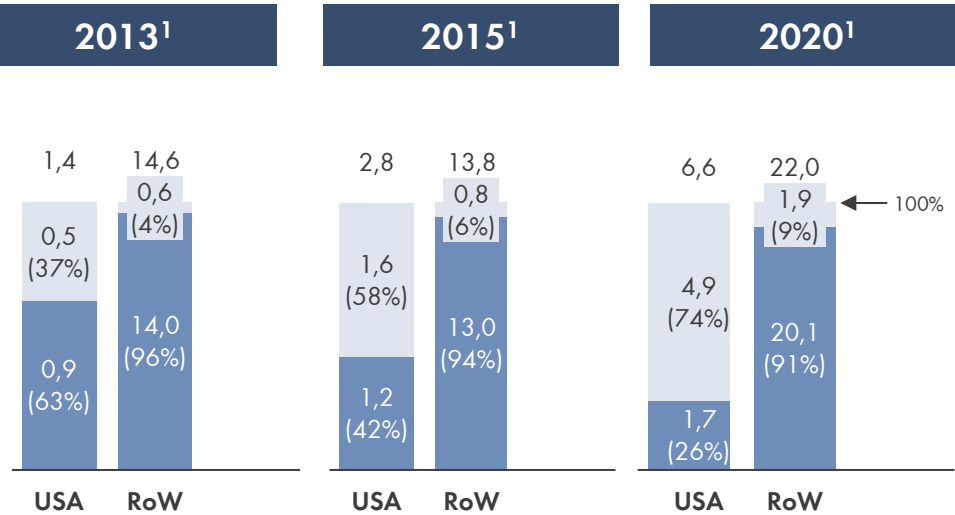
2. The exclusivity is for the TS4-Retrofit units

3. Full year guidance: Sales 2016: 950 million EUR to 1,050 million EUR; EBIT 2016: 80 million EUR to 120 million EUR

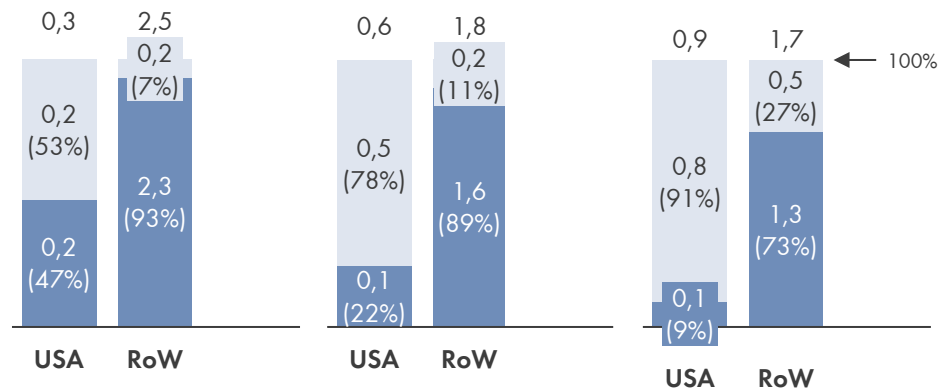
MLPE technology is expected to grow faster than the string technology in the coming years



String vs. MLPE in GW



String vs. MLPE in EUR



- > Module Level Power Electronics (MLPE) technologies (Power Optimizer; Micro-Inverter) are nowadays highly accepted in the solar market. MLPE are mainly used in residential and commercial applications.
- > SMA's market model assumes the MLPE market to grow to 1.3 bn EUR until 2020 (+10% p.a. from 2015). In the same time the string inverter market will decline to 1.4 bn EUR (- 4% p.a. from 2015).
- > The MLPE market is concentrated. The main market entry barrier is the cost-effective technology. Mainly two specialized manufacturers with a limited regional presence serve the market so far.

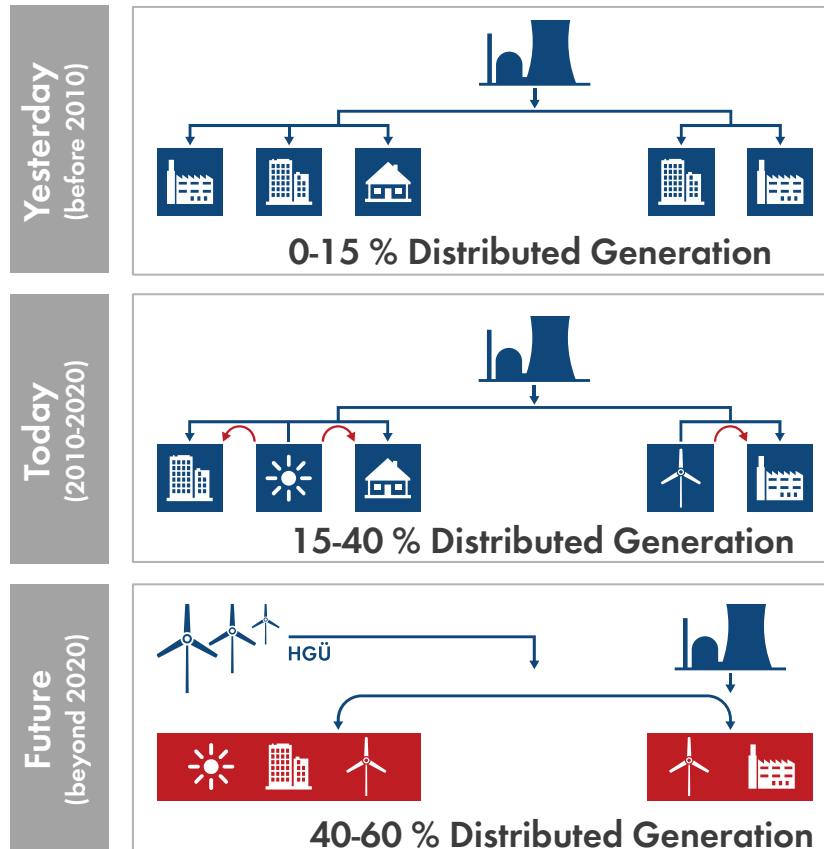
> The technology in the solar industry becomes more diverse – For a sustainable success a full technology portfolio with MLPE-, string- and central inverter technology is paramount.

1. Based on SMA Market Model Q1 2016; includes Residential and Commercial sales for inverters and optimizers.


The transition towards a decentralized world shakes up the market – Access to data will become a success factor



Development of Power Generation



Data is Key for the New Market Design

- > Electricity produced is increasingly decentral, close to the customer
 - > The new market design requires automated and energy efficient consumption to minimize electrical peaks. A higher level of connectivity is required
 - > Solar modules are largely invisible and do not communicate with their environment. In future, the inverter has the role to bundle all information (generation & consumption) in order to integrate PV power into the new eco system
- 
- > Private households and companies 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

- > **SMA invested in Tigo to make solar modules smart and to set the basis for data-based business models in an energy environment with a larger share of distributed generation.**

Tigo has a long-lasting experience in module level power electronics and developed a game changer with the TS4



- > Tigo was founded in 2007 and is headquartered in Los Gatos/Silicon Valley, California, USA
- > 55 employees (thereof 17 in Research & Development)
- > Products are certified for all countries and installed in over 22,000 sites (2kW to 7MW)
- > Over 1,200,000 units shipped
- > 100 terabytes of data collection

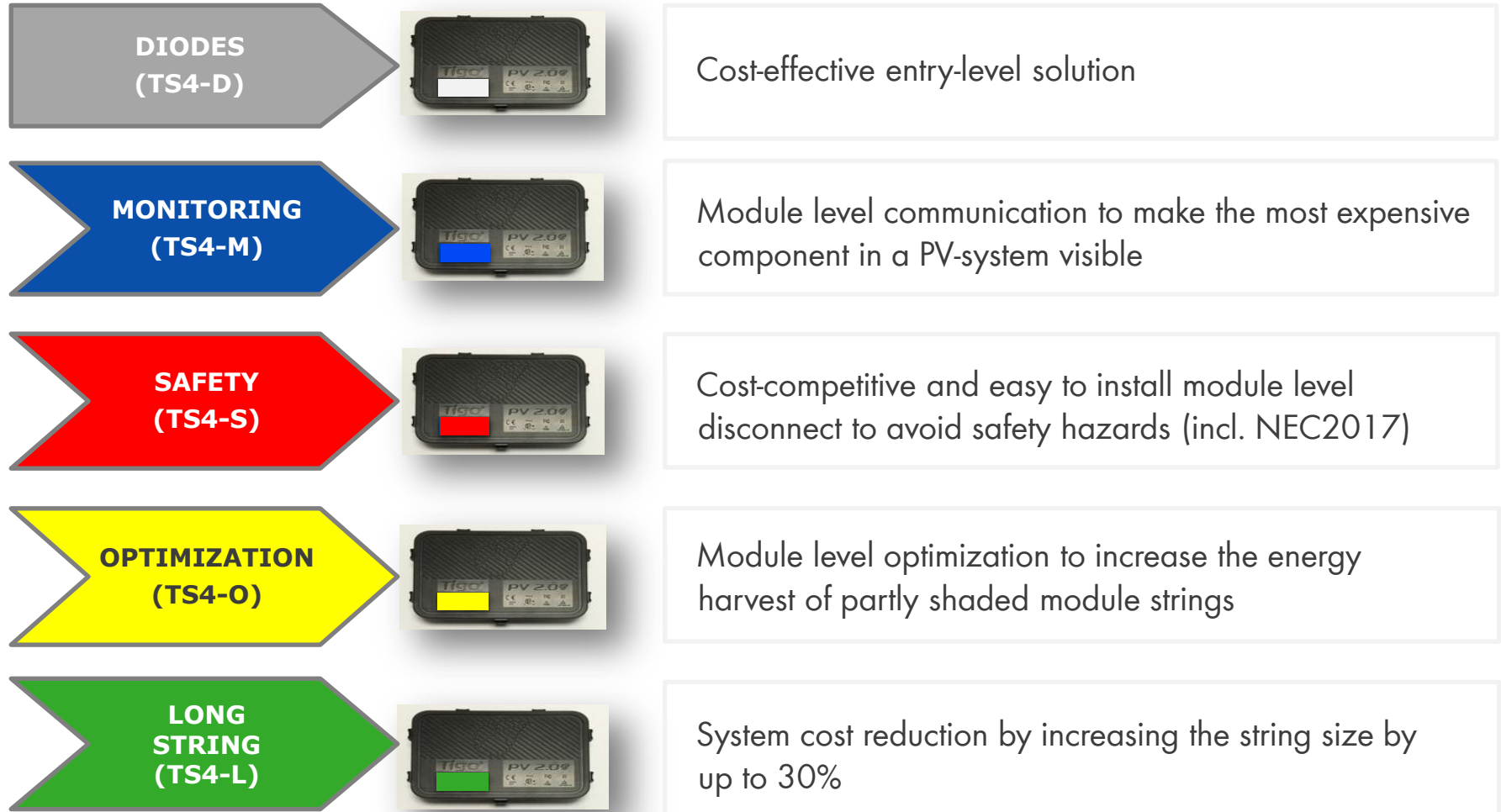


- > All existing and new solar modules can become smart – today solar modules are invisible and not communicating with their environment
- > Designed for selective deployment of functionality – you only pay for what you need
- > Highest energy harvest and long life-time, because Tigo optimizers are normally in by-pass mode and the number of components is low¹
- > Low installation costs, since the string size can be increased and additional components for safety requirements are not necessary

> **The newly developed Tigo TS4 is as easy to install as a power plug or USB stick.**

1. E.g. the Tigo TS4 does not possess a step-up converter. The step-up is in the inverter.

The Tigo TS4 is a technological superior solution to increase the energy harvest at the lowest costs and highest reliability

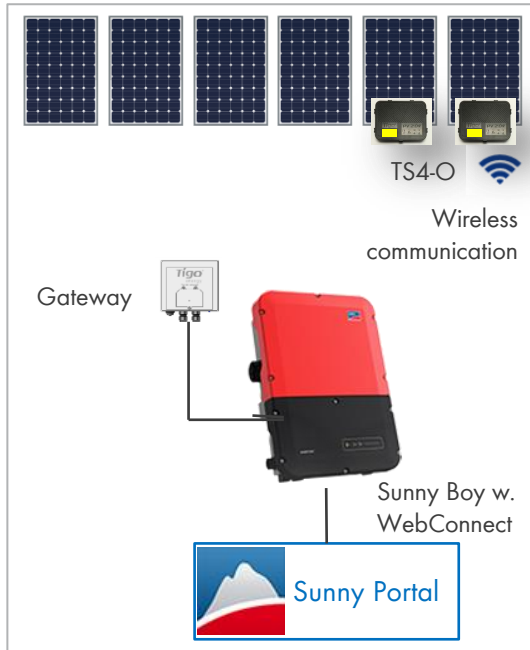


> With the modular concept the system cost can be further reduced. Due to the system design, the energy harvest and system reliability is further increased.

Joint SMA and Tigo TS4 offering provides a range of attractive options. The selective deployment is a game changer.

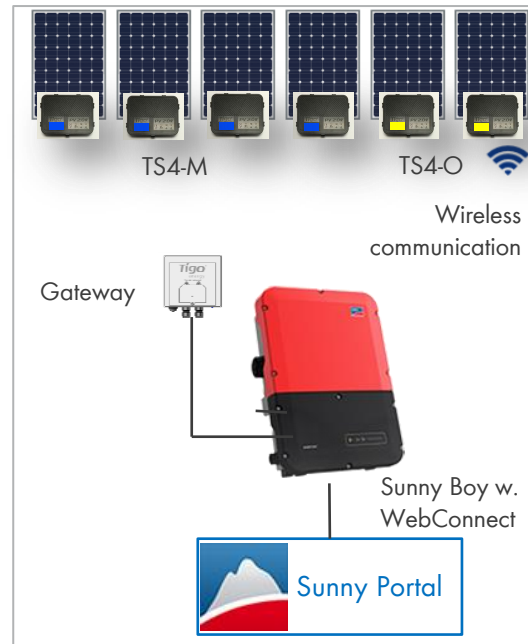


Selective Optimization



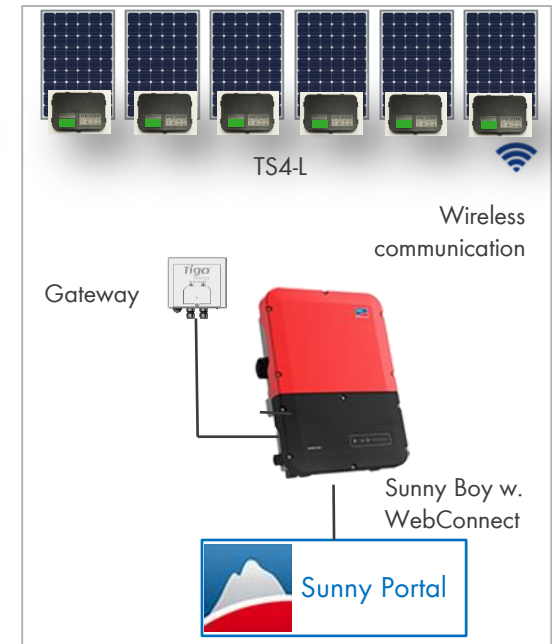
Highest energy harvest at lowest possible cost

Selective Optimization & Monitoring



Highest energy harvest combined with module level monitoring

Long String Feature



Less system cost due to longer string length without higher component cost

> The Tigo system works seamlessly together with the Sunny Boy¹ and will ensure highest energy harvest and system reliability.

1. SMA will integrate the Tigo Cloud Connect into the SMA Sunny Boy inverter until the end of 2016 at the latest. This will improve the system cost and ease of installation further.

ENERGY
THAT
CHANGES



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