

MEYER BURGER

PROJECT INDIUM

# EVOLUTION INTO A SOLAR CELL AND MODULE MANUFACTURER

MEDIA PRESENTATION  
June 19, 2020

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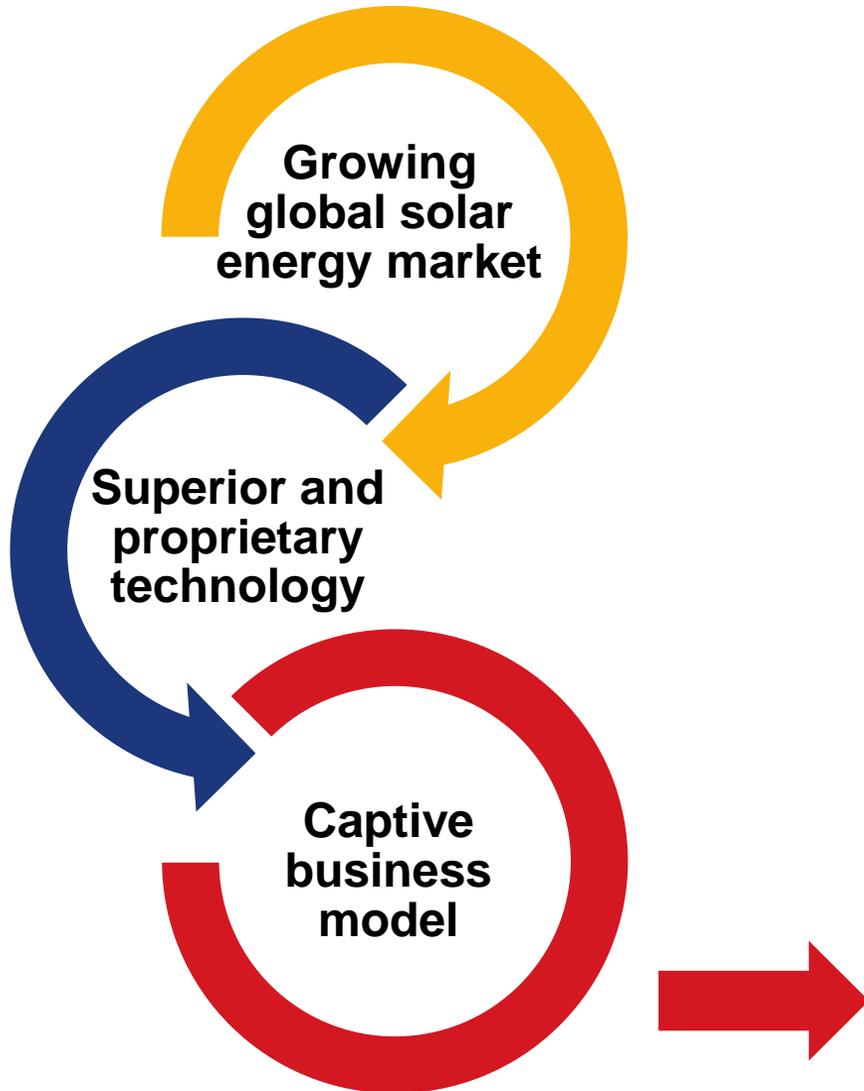
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# CORNERSTONES OF THE NEW STRATEGY



- The high-margin residential and commercial rooftop segment, which Meyer Burger is focusing on, is growing at an above-average rate of +8% per year in the target markets until 2027
- Meyer Burger Heterojunction/SmartWire has a 3-year technology advantage over standard technology, which is confirmed by the Fraunhofer Institute
- The full value of Meyer Burger's technology advantage can be captured as the Heterojunction/SmartWire technology is not supplied to third parties anymore

**High, sustained profit levels can be achieved on the basis of a superior technology and the captive business model**

# MEYER BURGER IS A TECHNOLOGY LEADER AND HAS SHAPED THE SOLAR INDUSTRY FOR YEARS



## Meyer Burger...

- is the backbone of the PV industry and has been the industrialization partner for over 20 years of the world's leading PV companies when launching new technologies
- has equipped the leading manufacturers of solar modules with production equipment
- has so far delivered 350 production machines for the current standard, PERC,<sup>1</sup> for a total capacity of 55 GW, i.e., more than 50% of total global PERC production capacity

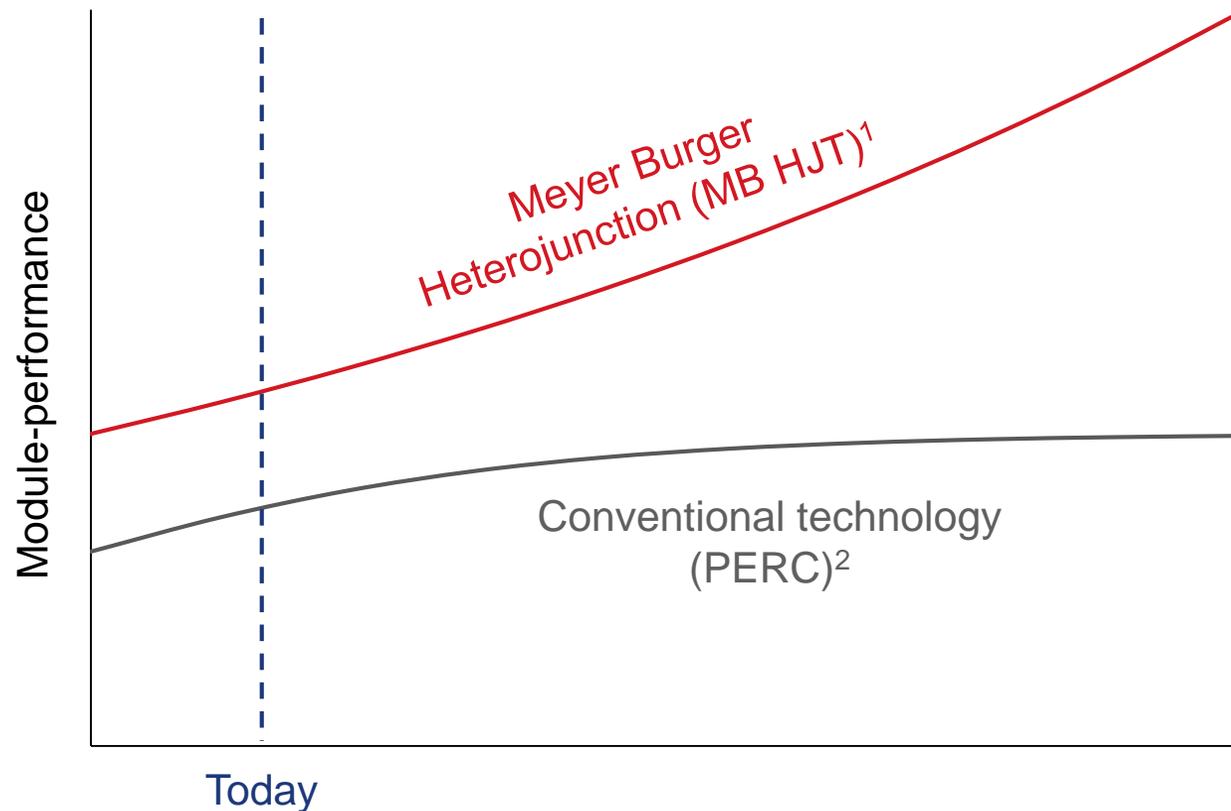
## Milestones since 1999

- ◆ 1999 Market introduction of the wire saw for the solar industry
- ◆ 2012 Market introduction of the industrialized PERC<sup>1</sup> technology, which is industry standard today
- ◆ 2013 Start of the development of the SmartWire technology
- ◆ 2014 Introduction of the diamond wire saw with patented double wire control
- ◆ 2016 Development of the later award-winning TOPCon system CAiA
- ◆ 2018 Major contract for Heterojunction/SmartWire equipment
- ◆ 2019 Proof of an industrial heterojunction/SmartWire production line  
Presentation of a 510 W bifacial module at Intersolar Munich  
Start of R&D cooperation with Oxford PV for the development of the HJT/Perovskite tandem cell technology

1) "Passivated Emitter and Rear Cell"

# MEYER BURGER IS AGAIN DRIVING THE NEXT PV TECHNOLOGY GENERATION

Meyer Burger's technology is far superior to PERC



- Fraunhofer ISE has confirmed in study: *“Meyer Burger has a lead of 3 years in terms of module efficiency (i.e., cell efficiency and module losses) over manufacturers that produce classic solar modules”*
- PERC is at the end of the technology life cycle, reaching limits performance improvement and thus cost reduction
- TOPCon is not yet ready for mass production and faces integration and cost problems
- Other HJT manufacturers are currently neither competitive with MB HJT and PERC nor market-ready

1) Including module SmartWire-Technology; 2) “Passivated Emitter and Rear Cell”

# KNOW-HOW AND MANUFACTURING EXPERTISE FOR CELL AND MODULE PRODUCTION ARE AVAILABLE

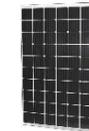


Meyer Burger has so far installed and commissioned the production lines for customers – Meyer Burger can now use this know-how itself

**Ideal timing for Meyer Burger to enter cell and module manufacturing, employing its superior MB HJT technology, because:**

1. Heterojunction/SmartWire technology is more efficient than both the current standard mono-PERC and other heterojunction technologies currently available
2. The current solution has been developed in Switzerland (Neuchâtel) since 2008 and has been brought to market maturity in the in-house pilot industrial plant in Germany (Hohenstein/Saxony) since 2016
3. With the successful installation of a 600 MW production line by Meyer Burger for a customer, the proof-of-concept in mass production is already provided

# INTEGRATED VALUE CHAIN: CAPTURE >15X MORE VALUE WITH CELL AND MODULE PRODUCTION



Equipment manufacturing

Cell manufacturing

Module manufacturing

By forward-integrating along value chain, Meyer Burger can increase the value captured from its proprietary, leading technology

**HJT equipment:**  
EBITDA for  
supply of 1 GW  
equipment

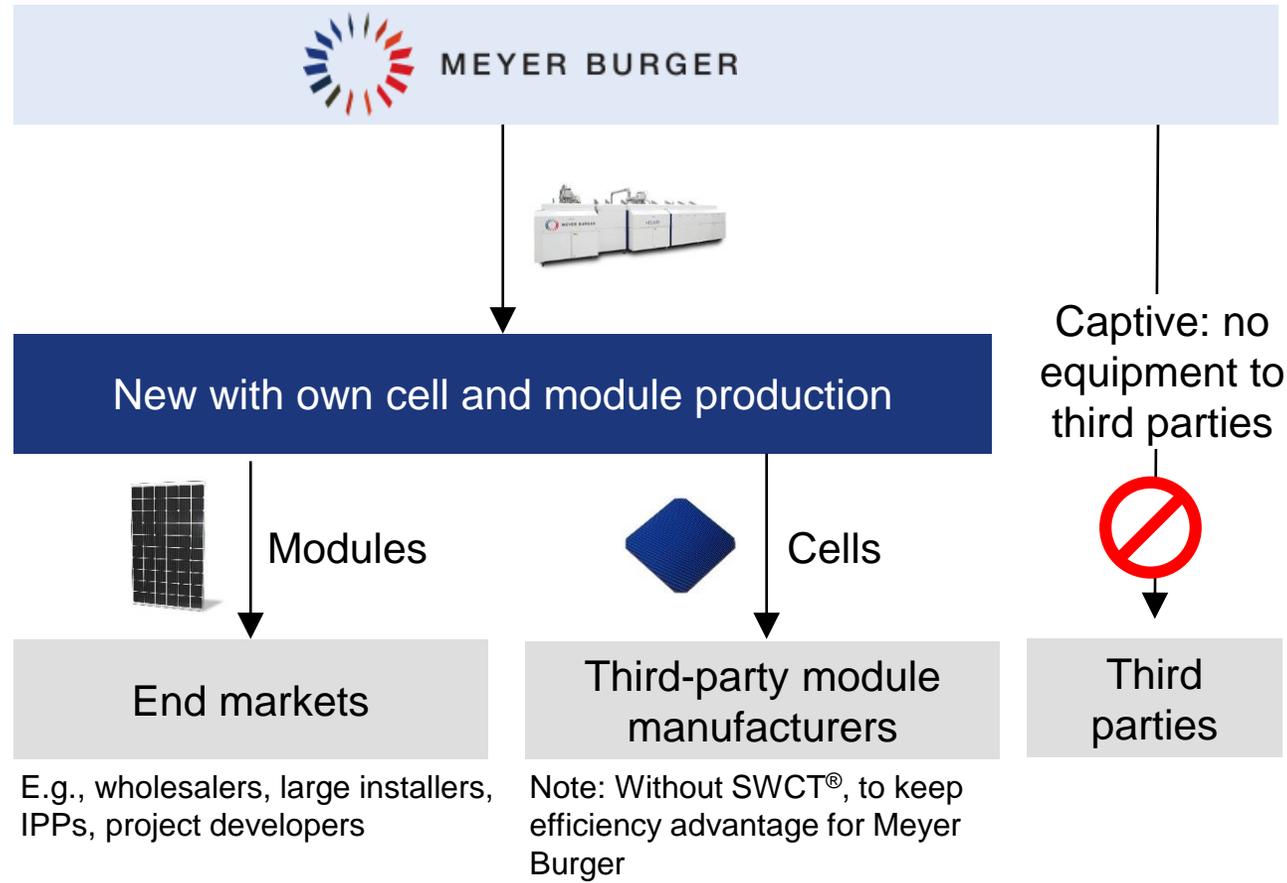
>15x

**Solar modules:**  
Achievable  
aggregate EBITDA  
on this equipment  
over a utilization  
period of 7 years<sup>1</sup>

EBITDA for a supply of 1 GW equipment (left) vs. production of 1 GW modules over 7 years (right)

1) 7-year utilization period and 9% discount factor

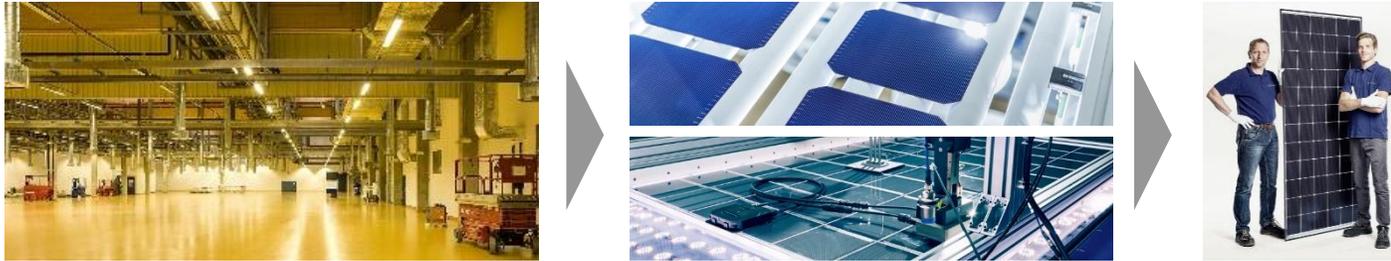
# THE CAPTIVE BUSINESS MODEL PROTECTS KNOW-HOW, TECHNOLOGY AND PROFITABILITY LONG-TERM



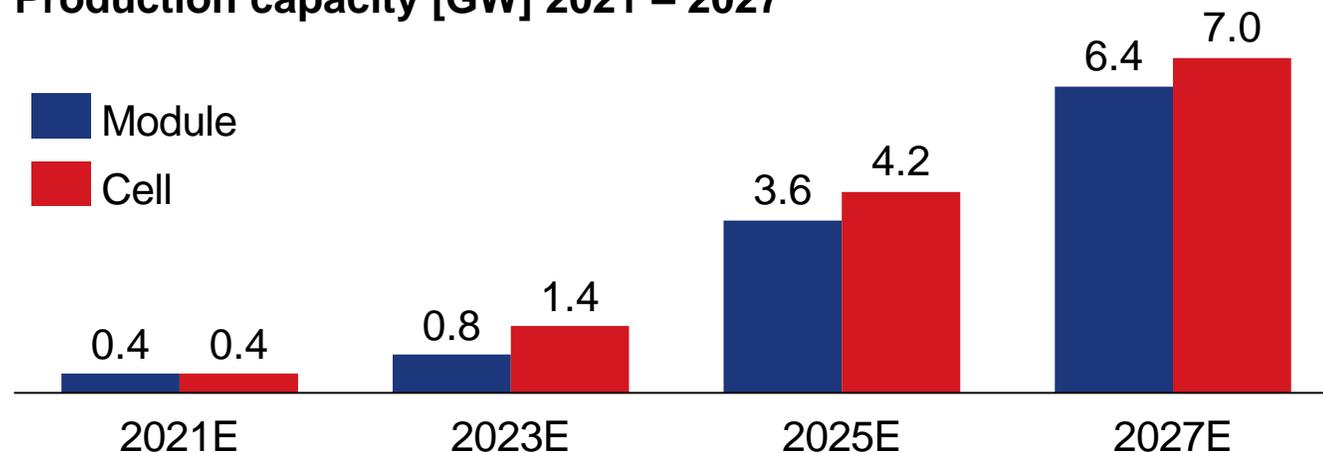
- Technology and know-how remain exclusively with Meyer Burger (except Oxford PV and strategic R&D partners)
- Total value capture remains in the company
- Further improvement on equipment will not be shared with third parties
- The worldwide standard PV equipment and service business will be continued
- Sale of cells to third-party module manufacturers used in the first years to
  - a) facilitate ramping in module sales and
  - b) obtain economies of scale and purchasing power

# ENTRY INTO PV CELL AND MODULE PRODUCTION WITH CLEAR CAPACITY EXPANSION GOALS

## Cell and module production in Germany



## Production capacity [GW] 2021 – 2027



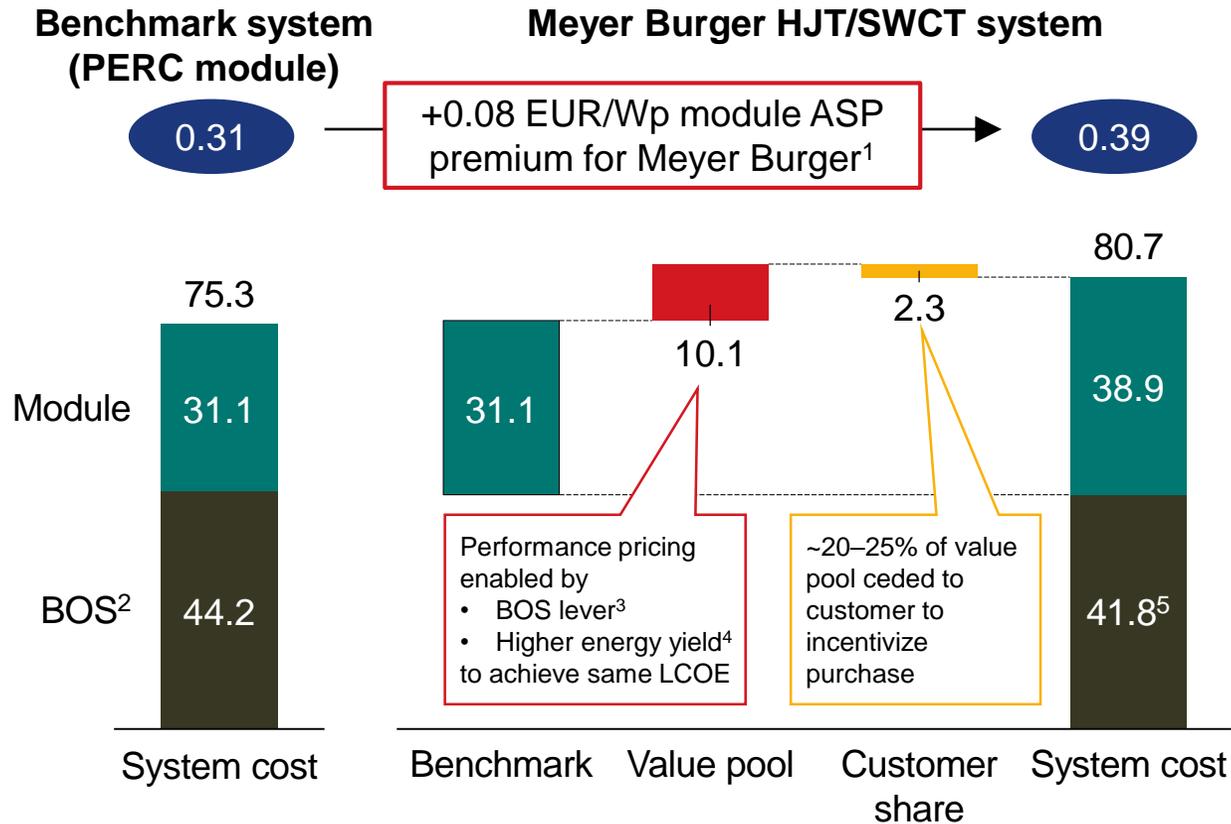
### Meyer Burger's goals:

- Become a European champion and global player for the production of high-efficiency cells and modules using Swiss technology, "Made in Germany"
- Sustainable superior R&D unit to further expand technological leadership
- Start with 400 MW to reach profit zone, then add 400 MW module plus 1 GW cells in next step
- Achieve an annual module production capacity of 5 GW by 2026
- Support the EU Green Deal plan by establishing local PV production

# MODULE PERFORMANCE ENABLES LOWER LCOE FOR UTILITY CUSTOMERS AND PRICE PREMIUM FOR MB



Utility segment – total system cost, example 100 MWp U.S. [EUR m]

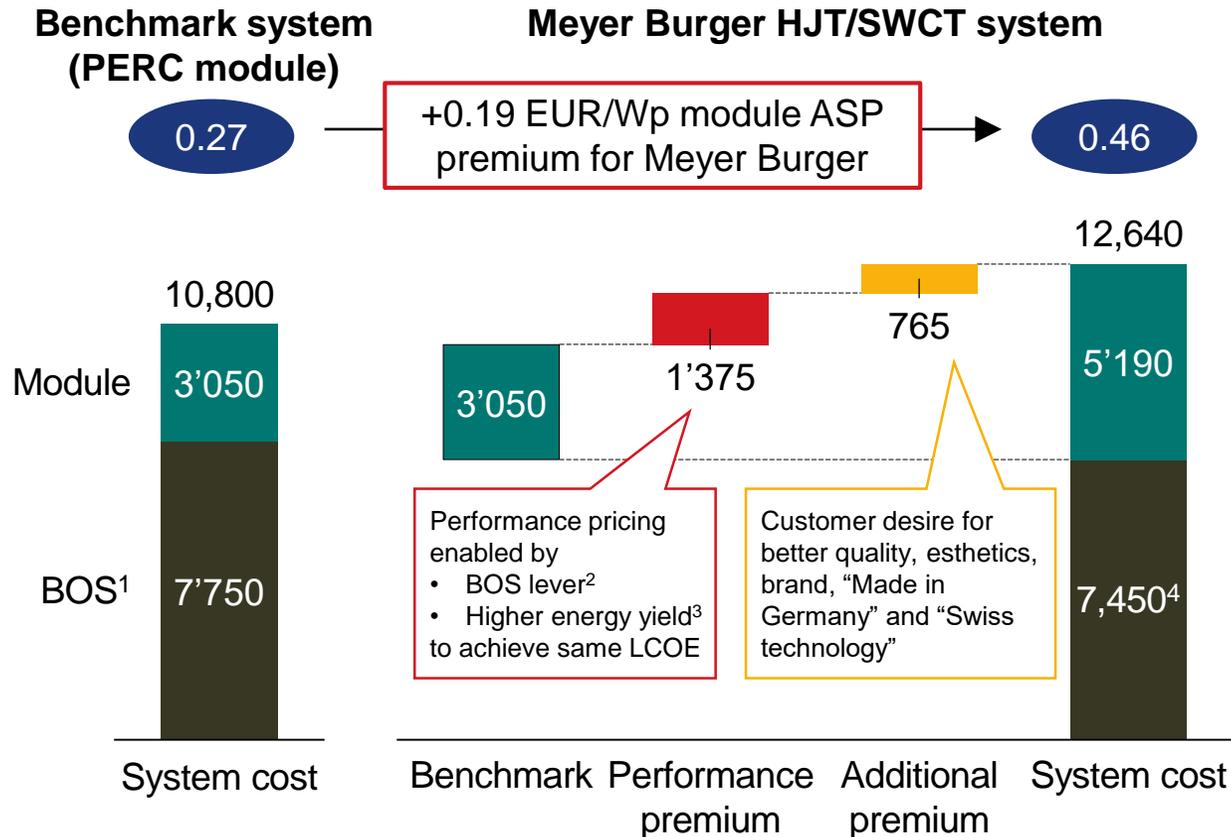


- Meyer Burger provides considerable end-customer benefit, reducing LCOE through:
  - Higher efficiency, reducing BOS cost
  - Better high-temperature energy yield
  - Lower lifetime degradation
  - Better bifaciality (yield on backside)
  - Better angular response
- To reward better performance, customers are willing to pay higher module price – value pool is determined such that LCOE savings are offset by module price premium
- Around 20–25% of value pool to be ceded to end customer to incentivize purchase

Assumptions: System – 100 MWp; Year – 2020; 1) Module ASPs include 20% Section 201 import tariff; For some time after market introduction, business plan anticipates discounts down to PERC level until bankability and market acceptance of performance gains is fully established; 2) Balance-of-system; 3) BOS lever: Higher module power requires less modules for the same area leading to e.g., less cables, mounting structures, installation, etc.; 4) Improved performance due to e.g., lower temperature coefficient and lower degradation translate into more energy generation over lifetime; 5) BOS cost is reduced vs. benchmark system BOS cost because of BOS lever

# RESIDENTIAL CUSTOMERS PAY LARGE PRICE PREMIUM FOR HIGHER PERFORMANCE AND QUALITY

🏠 Residential rooftop segment – total system cost, example 8 kWp Germany [EUR]



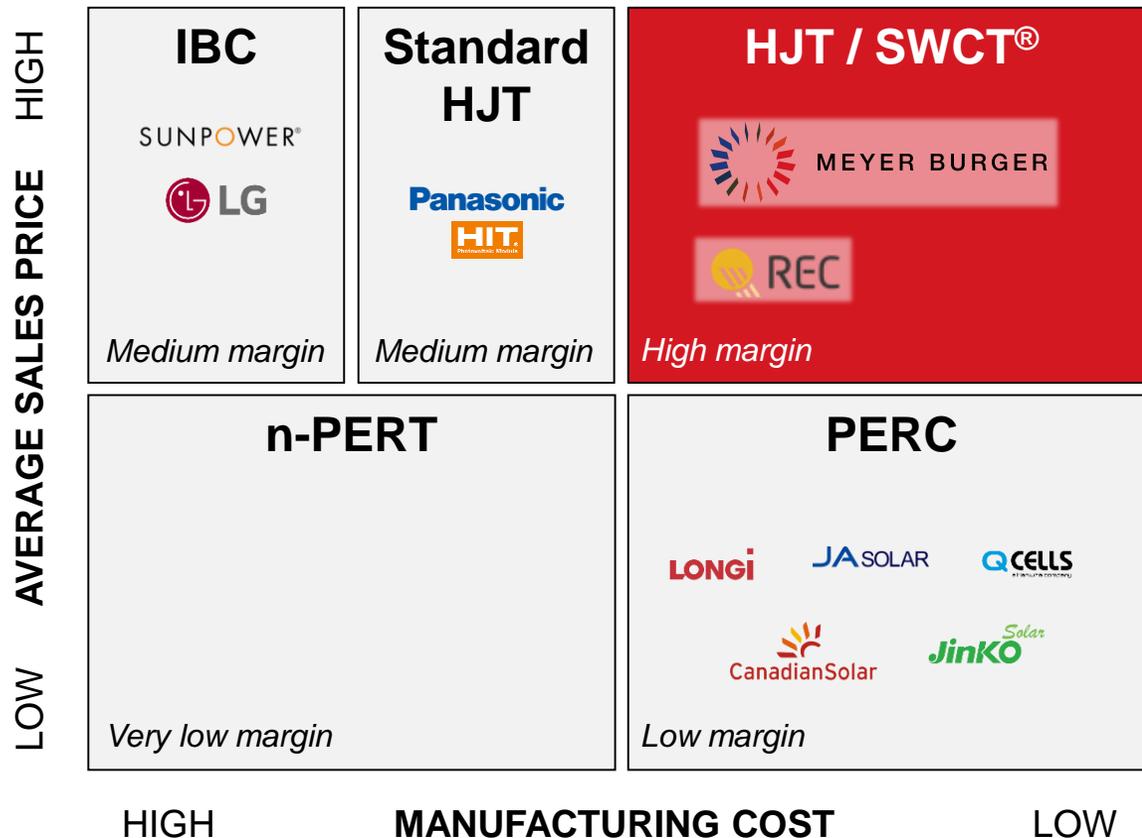
- End customer benefits from BOS savings due to higher efficiency, as well as higher energy yield, both lowering levelized cost of energy (LCOE)
- To reward better performance, customers are willing to pay a higher module price – this performance premium offsets LCOE savings
- On top of performance premium, customers in premium segment are willing to pay additional premium for higher quality, esthetics and "Made in Germany" / "Swiss technology"
- Reference for additional premium are premium competitors LG, REC, SunPower

Assumptions: System – 8 kWp, Year – 2020, Total module cost include wholesaler and installer margins; 1) Balance-of-system; 2) BOS lever: Higher module power requires less modules for the same area leading to e.g., less cables, mounting structures, installation, etc.; 3) Improved performance due to e.g., lower temperature coefficient and degradation translate into more energy generation over lifetime; 4) BOS cost is reduced vs. benchmark BOS cost because of BOS lever

# MEYER BURGER CAN OBTAIN UNIQUE MARKET POSITIONING, ENABLING HIGH MARGINS

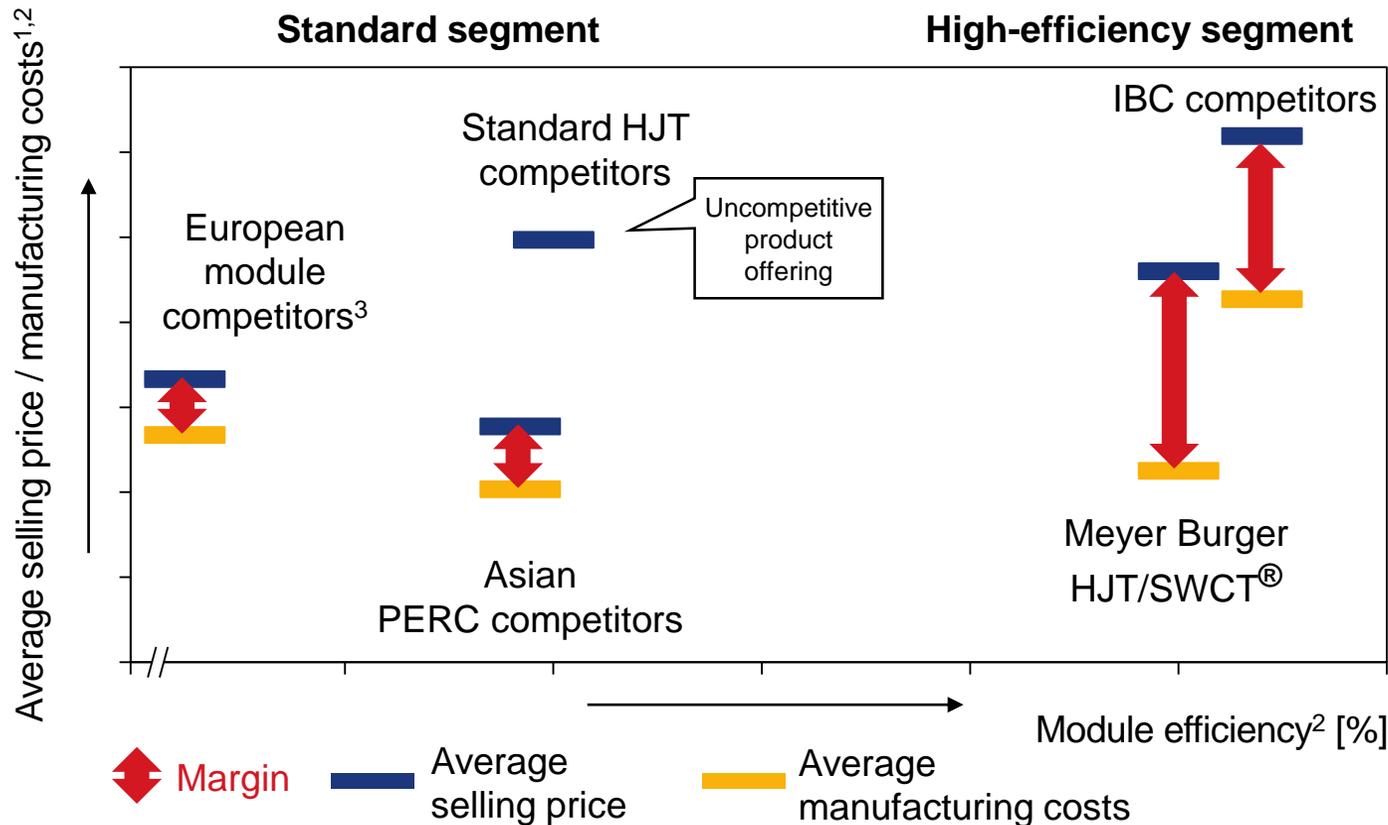


## Market positioning and key competitors



- Technology advantage enables unique market positioning and high margins
- Captive model protects this advantage long-term
- Meyer Burger as the first player to be competitive in all market segments (rooftop and utility-scale)
- Competitors in premium segment like SunPower, LG and Panasonic have higher manufacturing costs
- PERC manufacturers cannot offer modules in the premium segment

# MEYER BURGER CAN OBTAIN UNIQUE MARKET POSITIONING, ENABLING HIGH MARGINS



- The captive business model prevents competitors' access to HJT/SWCT®, so that Meyer Burger can maintain margins long-term
- PERC: low-margin commodity business with exhausted cost reduction potential
- High-efficiency competition: very high prices due to positioning as a premium product in the residential market – but with significantly higher production costs

Source: Company datasheets, Solarmedia (Q4 2019), PVInfoLink, analyst reports, expert interviews;

1) Average sales price: reference prices from publicly available sources for “black-black” modules; production costs: COGS, incl. D&A; 2) average of several manufacturers for different categories; 3) module production with purchased Asian cells of medium performance class

# VALUE-ORIENTED SEGMENT STRATEGY IN SELECTED MARKETS

Meyer Burger will focus its PV cell and module sales activities on the following segments and markets:

## Segments

- 1 Rooftop (residential and small commercial)



- 2 Utility-scale<sup>1</sup>



## Focus markets



### Targeted segments:

- Rooftop (premium segment): Customers value Meyer Burger technology for its high performance, quality and aesthetics
- Utility-scale: Advantages of Meyer Burger technology are recognized in this very price sensitive segment, because they enable lower electricity generation costs (LCOE) compared to standard technology<sup>2</sup>

**Focus markets:** Europe, U.S., Australia, Japan

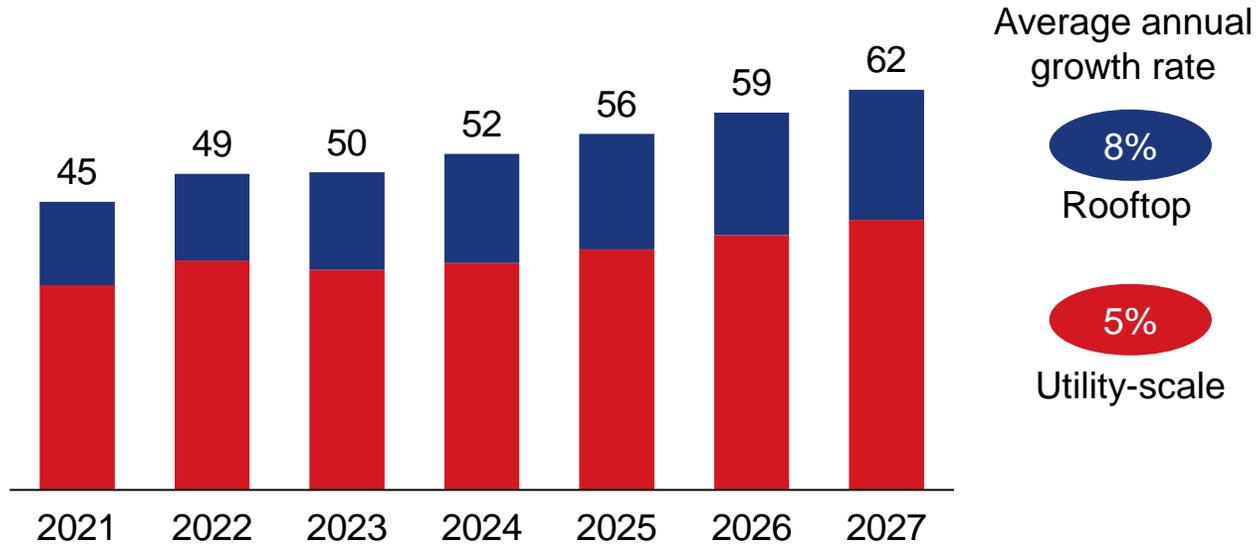
- Decent market size
- Price premium is achievable and accepted by market participants

1) May include large commercial segment to the extent that price differentiation is possible; 2) Solar leasing companies also primarily driven by LCOE considerations for residential and small commercial

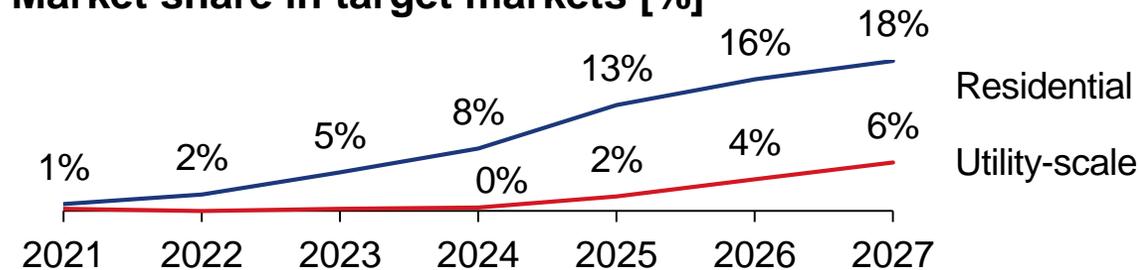
# MEYER BURGER PURSUES VALUE-ORIENTED SEGMENT STRATEGY TO GAIN MARKET SHARE



Annual PV market size in target markets<sup>1</sup> [GWp]

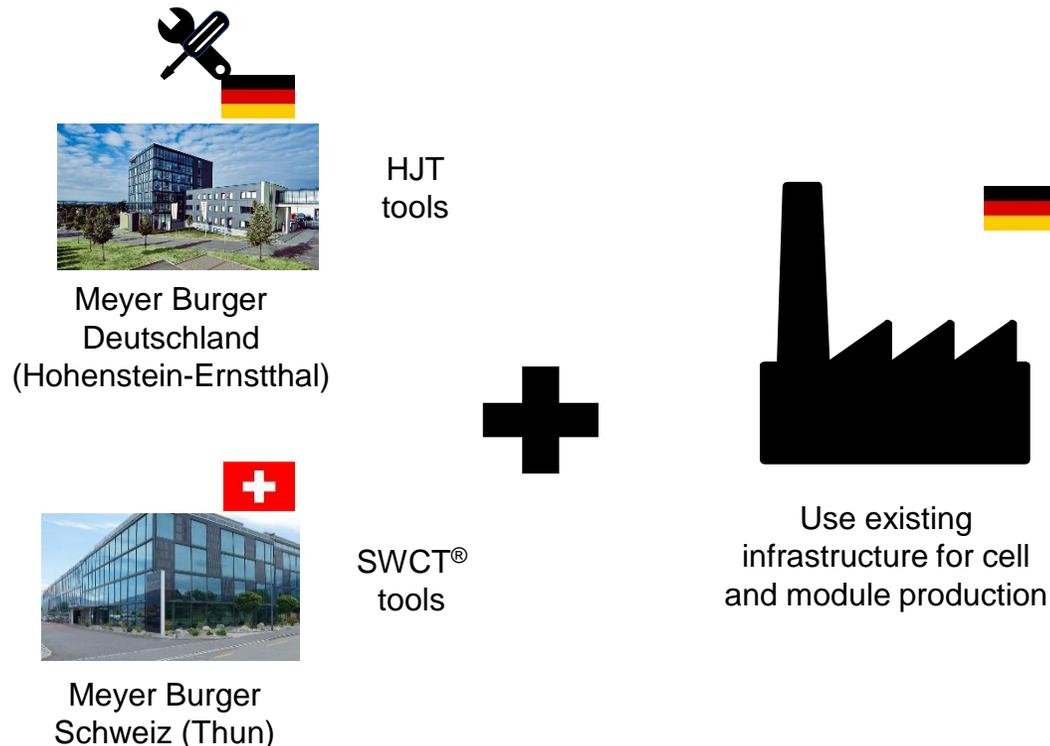


Market share in target markets [%]



- Rooftop: Meyer Burger focuses on the high-margin premium segment
- Utility-scale: Market share will be gradually increased as soon as first pilot projects have proven the “bankability” and the higher energy yield per area in practice
- As part of the preparations for the business model transformation, Meyer Burger has already sounded the product interest of potential European and U.S. customers and has received written letters of intent (LOIs) to purchase a total of over 2 GW cells and modules per year

# FAST PRODUCTION AND SALES RAMP-UP POSSIBLE DUE TO AVAILABLE INFRASTRUCTURE AND PERSONNEL



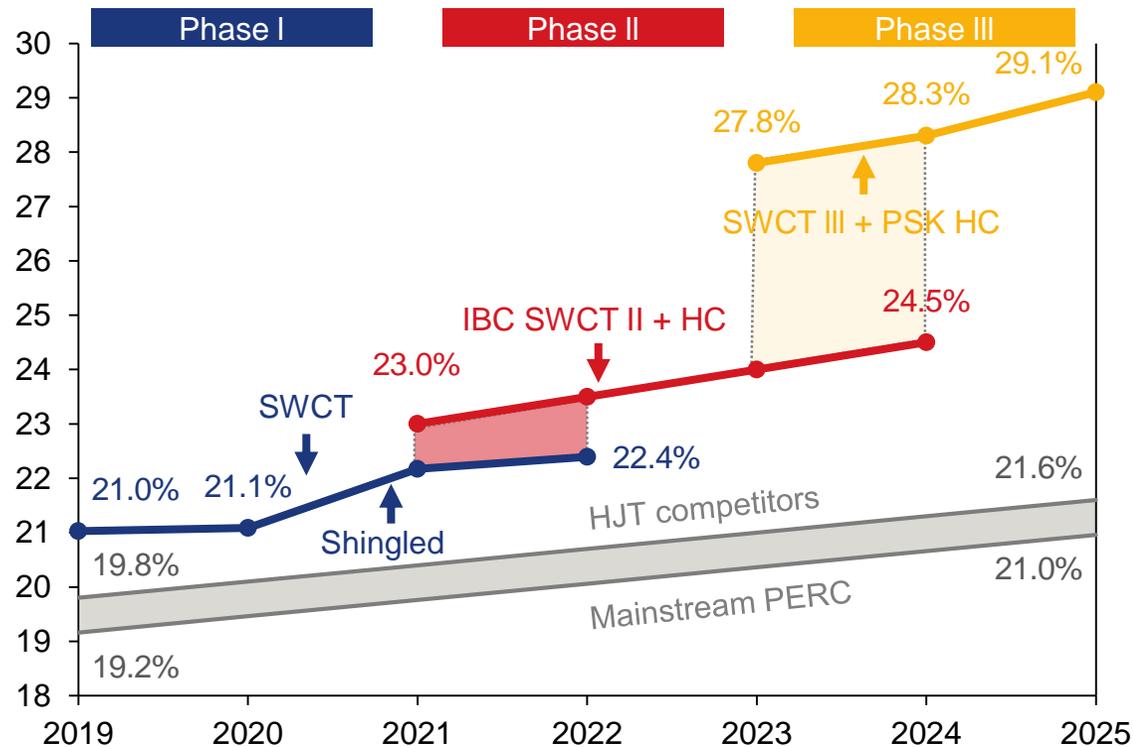
- Former cell and module factories and logistics centers are available for immediate use in Germany at attractive conditions; locations offer potential for up to 5 GW capacity expansion
- At the “historical” solar manufacturing hubs, skilled workers, engineers and sales forces can be hired quickly – a critical success factor and unique in the Western world
- Existing infrastructure and available skilled personnel should enable production and sales start in Q2/2021
- Capex savings of EUR ~30m possible by using existing infrastructure

# VERIFIED TECHNOLOGY ROADMAP SECURES TOP POSITION AND FURTHER IMPROVEMENT POTENTIAL



MEYER BURGER ROADMAP  
CONFIRMED BY FRAUNHOFER

Avg. module efficiency [%]



- Current business plan is based on Meyer Burger’s superior “Phase I” HJT technology,<sup>1</sup> which is proven and protected by various patents
- Verified module efficiency roadmap suggests further improvements that further extend the lead over HJT competitors and mainstream PERC manufacturers
- With its stake in Oxford PV and the related perovskite technology, Meyer Burger is already investing in future technologies with further potential for performance improvements

Note: 2020 values based on average module efficiencies based on datasheets; year-on-year increase based on CPIA; 1) In business plan, no technology improvements beyond continuous improvement program (CIP) benefits assumed  
Source: Meyer Burger, CPIA

# PROPRIETARY BUSINESS MODEL WITH REDUCED RISKS



## Attractive returns

### 1 Value-driven segment strategy

Only selected segments and markets in which price premiums are possible are served

### 2 Sustainable margins

With captive business model, know-how as well as cell and module technology remain within Meyer Burger

### 3 Upside potential

Thanks to the innovation potential of the R&D roadmap, Meyer Burger expects to be highly profitable in the long-term

## Derisked investment

### 4 Proven technology

Meyer Burger has successfully proven the mass-production readiness of its Heterojunction/SmartWire technology and acceptance in the market

### 5 Existing sites and capabilities

Availability of existing PV infrastructure and capabilities in Germany allow for a fast go-to-market approach with the envisaged production capacities

### 6 Long-term secured investment

Further broadening of innovation potential is provided by Meyer Burger's share in Oxford PV and the cooperation on perovskite technology

# TRANSACTION AT A GLANCE

## Option I (CHF 165m)



### Option I: A split transaction consisting of a PIPE & Backstop transaction and a rights issue

1. A CHF 30 million – CHF 55 million capital increase with the exclusion of subscription rights ("PIPE") whereby PIPE investors in the simultaneously executed rights issue must commit to a CHF 1 backstop for each CHF 1 investment in the PIPE transaction; plus
2. A rights issue in the amount of CHF 110 million – CHF 135 million with tradable subscription rights, preserving the subscription rights of existing shareholders
3. Condition: Minimum gross proceeds from the entire capital increase of CHF 150 million
4. Up to now, more than half of the maximum size of the PIPE and thus more than one third of the total capital increase has already been guaranteed at a subscription price of CHF 0.05 by commitments of a number of PIPE and backstop investors consisting of existing shareholders (e.g., Sentis Capital - a total of CHF 30 million, CHF 15 million PIPE & CHF 15 million backstop) as well as additional investors, whereby the commitments are subject to certain commercial and legal conditions
5. The PIPE and Backstop Investors that are already shareholders of Meyer Burger have committed themselves in this respect to fully exercise their subscription rights within the framework of Transaction Alternative I, whereby the shares thus subscribed are deducted from the Backstop Commitment
6. In Phase II until July 6, 2020 at the latest, potential qualified investors have the opportunity to participate in the PIPE & Backstop transaction

## Option II (CHF 165m)



### Option II: Standard rights issue

1. A CHF 165 million capital increase with tradable subscription rights preserving the subscription rights of existing shareholders
2. Condition: Minimum gross proceeds from the entire capital increase of CHF 150 million
3. A backstop underwriting of an existing shareholder of Meyer Burger, Sentis Capital, in the amount of CHF 50 million has been delivered, being subject to commercial and legal conditions
4. The final subscription price will be determined immediately prior to the Extraordinary General Meeting by the lead banks and the Company, depending on the market situation at that time

# TOWARD SUCCESS WITH NEW EXPERIENCED MANAGEMENT AND BOARD OF DIRECTORS

**VRP**  
Franz Richter



## Chairman of the Board of Directors since May 2020

- Since 2016 CEO of Süss MicroTec SE, DE-Garching
- 2007 – 2016 CEO and founder of Thin Materials, DE-Eichenau
- 2005 – 2007 President of the segment Semiconductor Equipment, Unaxis, at OC Oerlikon, CH-Pfäffikon
- 1990 – 2004 Various positions at Süss MicroTec, incl. CEO and COO of Süss Holding and CEO of Karl Süss Verwaltung GmbH
- 1988 – 1990 Scientist at Fraunhofer Institute for Laser Technology, DE-Aachen
- 1985 – 1988 Scientist at Carl Zeiss, DE-Oberkochen

**CEO**  
Gunter Erfurt



## CEO since April 2020

- Member of Executive Board since 2017 (COO: Feb–Aug 2017; CTO: Sep 2017–Mar 2020)
- 2015–2017 Managing Director & Member of Executive Board of Meyer Burger Germany
- 2011–2015 Managing Director of Solarworld Innovations GmbH
- 2009–2011 Global Head Planning & Investment / Technology Transfer at Solarworld AG
- 2006–2009 Head of Planning and Investment Solarworld Industries America
- 1999–2005 Various positions at Deutsche Solar & Saxon Academy of Sciences and Humanities

**CFO**  
Manfred Häner



## CFO since 2018

- 2016–2018 Independent consultant
- 2012–2016 Group CFO, Investor Relations, Real Estate & IT at CPH Chemie + Papier Holding
- 1999–2010 Group CFO, Deputy CEO & Secretary of BoD<sup>1</sup> of Micronas Semiconductor Holding
- 1991–1998 Division CFO & Deputy CEO of Sulzer International
- 1988–1991 Head of Finance, Administration and HR of Sulzer España
- 1976–1985 Various positions in Finance & Controlling at Sulzer

# OUTLOOK



In line with the expected demand for Meyer Burger's high-quality products, Meyer Burger intends to increase annual capacity to 1.4 GW of cell and 0.8 GW of module production by the beginning of 2022 by raising a total of around CHF 180 million of debt in 2021/22.

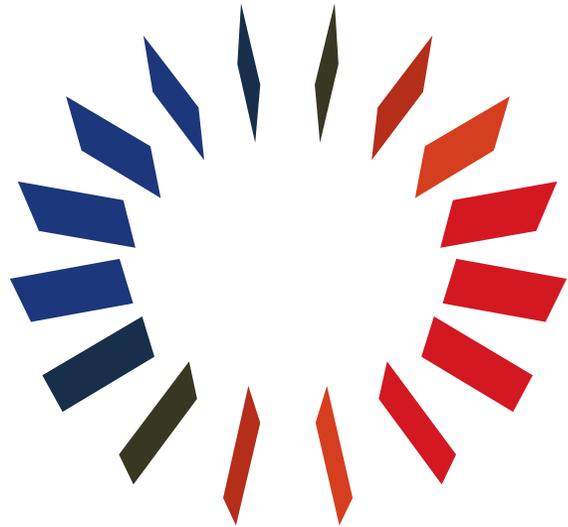
On this basis, Meyer Burger expects annual sales of CHF 400 million – CHF 450 million and an EBITDA margin of 25% – 30% within three years.

# HIGHLIGHTS OF THE NEW MEYER BURGER



1. Heterojunction/SmartWire technology is superior to the current standard, mono-PERC, as well as other currently available heterojunction technologies in terms of efficiency and energy yield
2. Captive business model enables capturing full value from Meyer Burger's technological leadership and protects know-how
3. Premium products at relatively low manufacturing costs enable a unique positioning in the PV industry and sustained profitability of Meyer Burger
4. With the successful production ramp-up of the technology by a customer, the proof-of-concept in mass production has already been provided
5. Existing infrastructure and available skilled personnel should enable production and sales start in Q2/2021
6. The “Green Deal” and the European climate targets provide a tailwind for the re-establishment of the solar industry in Europe

**MANY THANKS FOR  
YOUR ATTENTION**



**MEYER BURGER**

## Short-to medium-term outlook (3 years horizon) – MBT Group Consolidated Financials

- › Expected Revenue: CHF 400m – CHF 450m
- › Expected Gross Profit Margin: 45% – 50%
- › Expected EBITDA Margin: 25% – 30%
  
- › Expected Net Debt / EBITDA 0.25x – 0.5x
  
- › CAPEX (for equal cell and module capacity, in aggregate):
  - Equipment sourced from Meyer Burger EUR 70–90m/GW for initial investment; reducing to EUR 55–65m/GW from 2023 on (figures at arms length pricing, including margin for Meyer Burger)
  - Third-party equipment EUR 45–55m/GW
  - Building and facility EUR 70–90m/GW; for the first factory build phase of 0.8 GW module and 1.4 GW cell capacity, savings of EUR 22–28m can be expected due to existing buildings
  
  - Ratio of CAPEX for cell to module capacity c. 80% : 20%

### Assumptions:

- › In addition, a further CHF 260m – 340m of financing can be raised to implement phase II of our new business plan – additional 1.4 GW installed cell and module capacity - in the base case, the required financing for phase II is to be raised in 2023, but potentially to be accelerated depending on developments over the next 18 months

### Long-term goals (> 5 years horizon) – MBT Group Consolidated Financials

- › Revenue: > 2.0bn
- › EBITDA Margin: > 30%
  
- › Ratio Net Debt / EBITDA: net cash



"MEYER BURGER HAS A LEAD OF AROUND 3 YEARS OVER MANUFACTURERS WHO PRODUCE CLASSIC SOLAR MODULES IN TERMS OF MODULE EFFICIENCY (CELL EFFICIENCY AND MODULE LOSSES)" – FRAUNHOFER REPORT 05/2020

## GLOBAL CELL / MODULE PRODUCTION

- › Trend towards continued increased output and efficiency of solar modules worldwide with manufacturers choosing:
  - (i) monocrystalline p-type silicon wafer, (ii) increase in wafer area, (iii) cell division, (iv) PERC and (v) wire connection
- › HJT/SWCT<sup>®</sup> on par with Sunpower's A-Series in terms of module efficiency and yield, while being superior to all other cell/module combinations of competitors
- › HJT already reaches cell efficiencies of 23.8% superior to PERC with currently 22.3%, with HJT constantly being developed further, while PERC enhancement has slowed recently

## HJT/SWCT<sup>®</sup> PROOF OF CONCEPT AND SCALABILITY

- › Meyer Burger demonstrated successful mass production of HJT/SWCT<sup>®</sup> in co-operation with REC (100MW & 600MW) of 370W modules (21.2% module, implied 23.8% cell efficiency)
  - 
    - › Cell efficiency of up to 24.5% possible at 1GW production
  - 
    - › Competitive production cost for HJT/SWCT<sup>®</sup> already today with further cost reduction potential
- › Pursuant to Fraunhofer estimates, the higher module efficiency and higher yield of HJT/SWCT<sup>®</sup> allow a price premium in the market
  - › Bifaciality >90% proves superiority above all other module types, providing an additional positive effect on price premium for the power plant segment

## MEYER BURGER'S DECISIVE ADVANTAGE

- › SWCT<sup>®</sup> Meyer Burger has a wire connection that reduces module losses similar to half-cells and multiwire interconnection used in PERC
- › **Meyer Burger's roadmap to further increase cell and module efficiency is plausible and realistic.** Concepts as "negative gap", "HJT-IBC/SWCT<sup>®</sup>" and "HJT/Perovskite/SWCT<sup>®</sup>" lead to the expectation of a further above average development of module efficiency and reduction of manufacturing costs according to Fraunhofer
- › **Knowhow of HJT-IBC from CSEM and HJT/Perovskite by OxfordPV provide very useful additions to secure the future R&D roadmap according to Fraunhofer**



## HJT/SWCT<sup>®</sup> ADVANTAGES AND COMPETITION

- › SWCT<sup>®</sup> while being more expensive, has decisive advantages: (i) high positioning tolerance, (ii) low temperature process (suitable for HJT, HJT/perovskite), (iii) processing of very thin wafers (cost reduction), (iv) high, (v) easy repair possibility before lamination
- › Meyer Burger holds patents on a specific form of HJT and SWCT<sup>®</sup> equipment; therefore HJT can be produced by other manufacturers, although mostly at significantly lower quality regarding cell and module efficiency and higher cost
- › Likely that classic solder-wire connection will also work on HJT, circumventing SWCT<sup>®</sup>, but at higher cost and lower technology readiness; manufacturers also provide adhesive stringers as alternative, which is inferior to SWCT<sup>®</sup> in terms of module efficiency
- › Meyer Burger faces numerous competitors who offer equipment for HJT cell production, however no alternative supplier of SWCT<sup>®</sup> exists

# KEY BENEFITS OF HETEROJUNCTION TECHNOLOGY (HJT)

THE TECHNICAL SUPERIORITY OF HJT ENABLES COST SAVINGS, MORE POWER AND HIGHER ENERGY YIELDS FOR END-CUSTOMERS

## TECHNICAL SUPERIORITY



**Cell efficiency of 24%:** Exceptionally high efficiencies are achieved through combining the advantage of crystalline silicon cells (c-Si) with their good light absorption and the superior passivation characteristics of amorphous silicon (a-Si)



**Temperature coefficient of -0.25%/K:** The high passivation of amorphous silicon results in an exceptionally low temperature coefficient; the possibility to use thin wafers for HJT cells (e.g., 120  $\mu\text{m}$ ) can further reduce the temperature coefficient



**Lowlight sensitivity:** The amorphous silicon in HJT cells increases the cells ability to capture a larger proportion of diffuse light than pure crystalline silicon cells



**Relatively low first year (<2%) and annual degradation (<0.25%):** Immunity to LID<sup>1</sup> of the n-type silicon wafer and protection against PID<sup>2</sup> through the extremely conductive TCO<sup>3</sup> that acts like a Faraday cage reduces year 1 and annual overall degradation respectively



**Exceptional bifaciality factor<sup>4</sup> of >90%:** The symmetric structure of HJT cells makes them bifacial 'by nature', significantly increasing the bifaciality factor relative to bifacial PERC cells (e.g., c. 75%)

## BENEFIT FOR END-CUSTOMER

A

**Cost savings** for BOS<sup>5</sup> components, because higher efficiency technology requires less modules/area for same power

B

**More power**, because higher efficiency technology deploys more power on same area

**Higher energy yield**, because lower efficiency loss at operating temperature

**Higher energy yield**, because more diffuse light is converted into electricity<sup>6</sup>

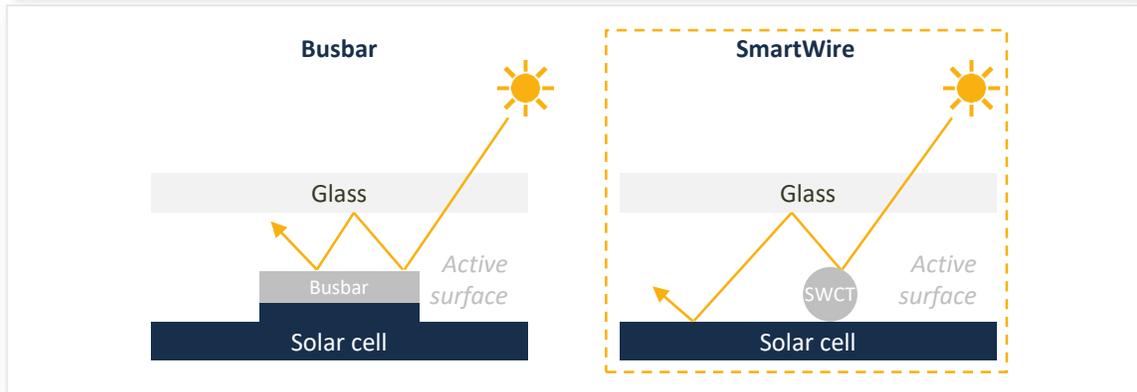
**Higher energy yield**, because actual efficiency remains closer to nameplate efficiency during lifetime of technology

**Higher energy yield** for bifacial modules, because more of the incident light on the rear surface can be converted to electricity

1) Light-induced degradation; 2) Potential-induced degradation 3) Transparent conductive oxide; 4) Ratio of the nominal efficiency at the rear side, with respect to nominal efficiency of the front side; 5) Balance-of-system; 6) This impact is not accounted for in the value driver analysis and business plan (upside potential)

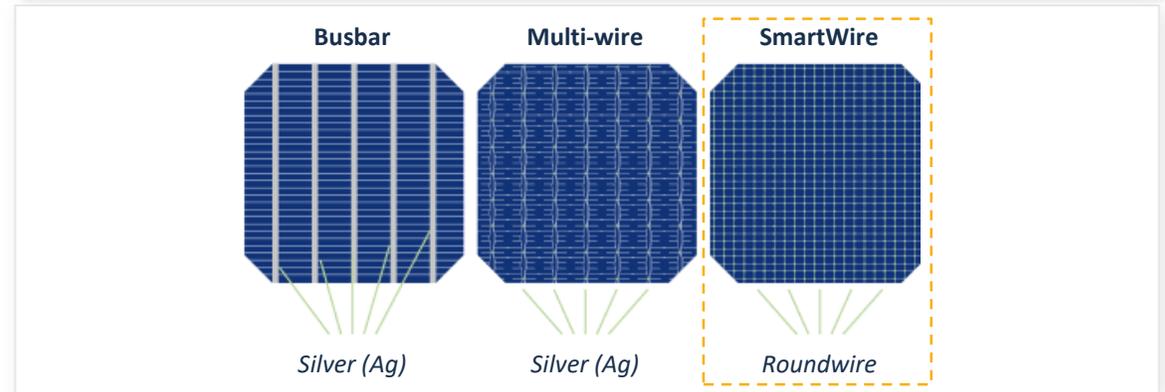
THE COMBINATION OF HIGHER ENERGY YIELD AND LOWER PRODUCTION COSTS MAKES SWCT® COMPARATIVELY IN ITS CLASS THE MOST COST-EFFICIENT CONNECTION METHOD FOR SOLAR CELLS WITH LITTLE USE OF PRECIOUS METAL

## AT A GLANCE



- › SWCT® encompasses the electrical and mechanical connection of solar cells encapsulating them into strings
- › This patented technology allows very cost-effective and resource-friendly mass production of high-performance, top-quality solar modules
- › SWCT® is fairly versatile as almost all cell and module types can be processed, including state-of-the-art developments such as bifacial HJT glass/glass solar modules
- › An overall increase in solar module output of about 2% is possible using SWCT® versus Busbar
- › SWCT® addresses the most important technical requirements of cell connection: minimal shading of the active cell surface and low electrical resistance
- › Compared to conventional square busbar connections, the round, thin SWCT® wires reduce shading of the solar cell by up to 20% due to their significantly smaller contact surface. The active surface of the solar cell – the area that can absorb light and convert it into electrical energy – is thus considerably larger

## FEATURES



- › SWCT® uses an innovative foil wire electrode that comprises up to 38 impeccably aligned wires to connect solar cells. The electrodes are aligned in parallel and fixed in position by means of an electrode foil resulting in a series-connected set of cells – a "string"
- › The lower process temperature of SWCT® encapsulation also prevents thermal stress on the strings, particularly important for HJT cells that react sensitively to temperatures over 200 degrees Celsius
- › SWCT® benefits from a reduced silver consumption: Only 0.095g of the precious metal is required for the metallization of a bifacial HJT cell with SWCT®. This reduces silver consumption by up to 66%, and module material costs by 6%, compared to other technologies
- › The winning combination of higher energy yield and lower production costs currently makes SWCT® currently a cost-efficient connection method for solar cells

# KEY BENEFITS SMARTWIRE CONNECTION TECHNOLOGY (SWCT®)

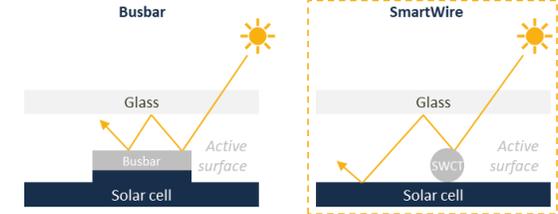


MEYER BURGER

1

## MAXIMAL ABSORPTION OF SUNLIGHT

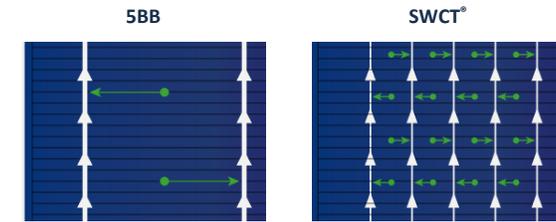
- › The geometrical shape of the thin round wire reduces the effective shading on the active surface of the solar cell by up to 20% due to their significantly smaller contact surface
- › Sunlight is reflected on the round wire surface and trapped in the module



2

## MINIMAL ELECTRICAL LOSS

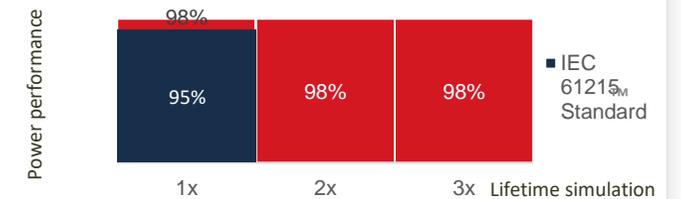
- › SWCT® reduces the electrical loss by spreading the current with up to 38 wires
- › 2% increase in module output is thus possible



3

## HIGH DURABILITY AND RESILIENCE

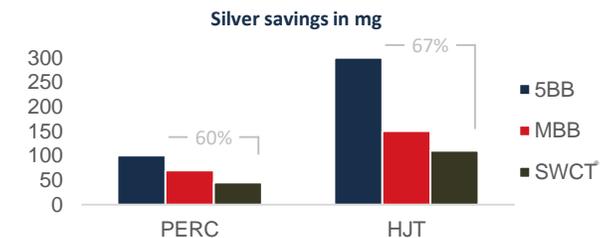
- › Modules with SWCT® meet IEC criteria in triplicate, which is far beyond the industry standard
- › In addition, the modules are highly resistant to mechanical stress and tolerate a wide range of climatic conditions



4

## RESOURCE SAVER

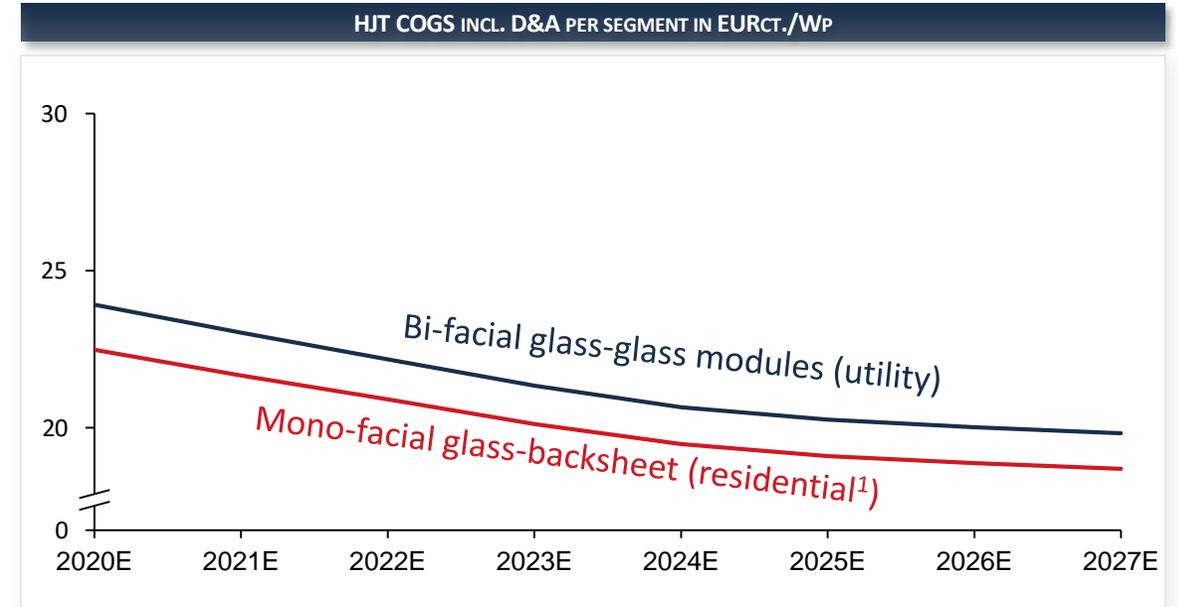
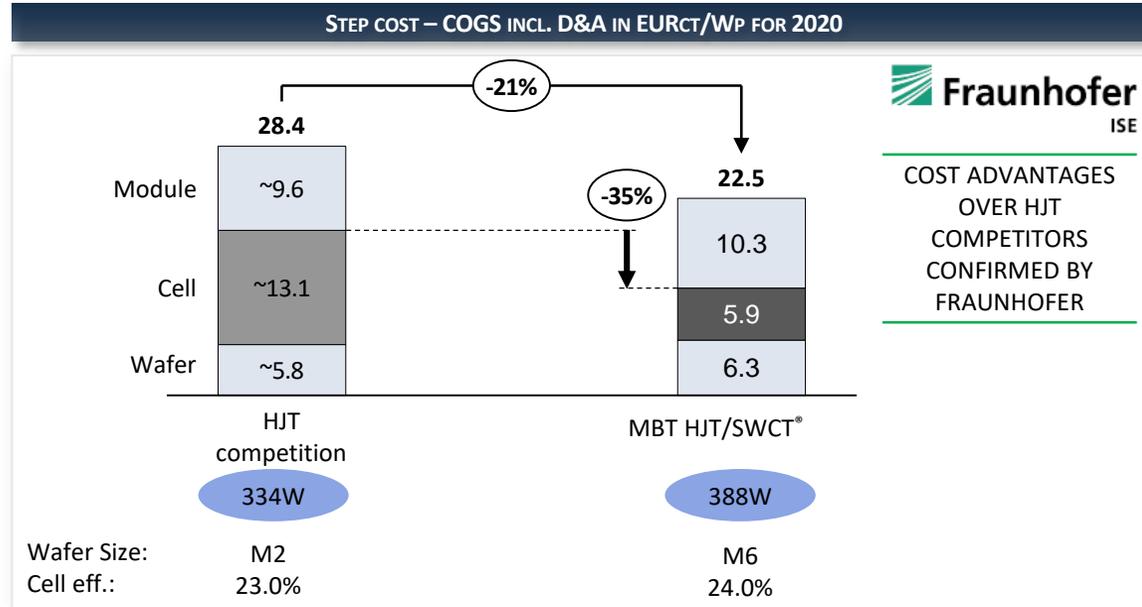
- › SWCT® with significant reduction in silver consumption
- › Copper electrodes are encased using an exclusive alloy and are mounted directly on the thin contact fingers without a silver busbar print
- › SWCT® it is a resource-saver and futureproof<sup>1</sup> as it does not use any indium or lead and already fulfills the RoHS Directives for hazardous substances



Notes: 1) Fraunhofer Gutachten 05/2020  
Source: MBT SWCT® Factsheet 05/2019

# COSTS OF GOODS SOLD FOR HJT/ SWCT® TECHNOLOGY

MEYER BURGER'S ADVANCED HJT TECHNOLOGY: 35% COST ADVANTAGE AND SUBSTANTIALLY HIGHER GROSS MARGIN EXPECTED IN CELL PRODUCTION VS HJT COMPETITION



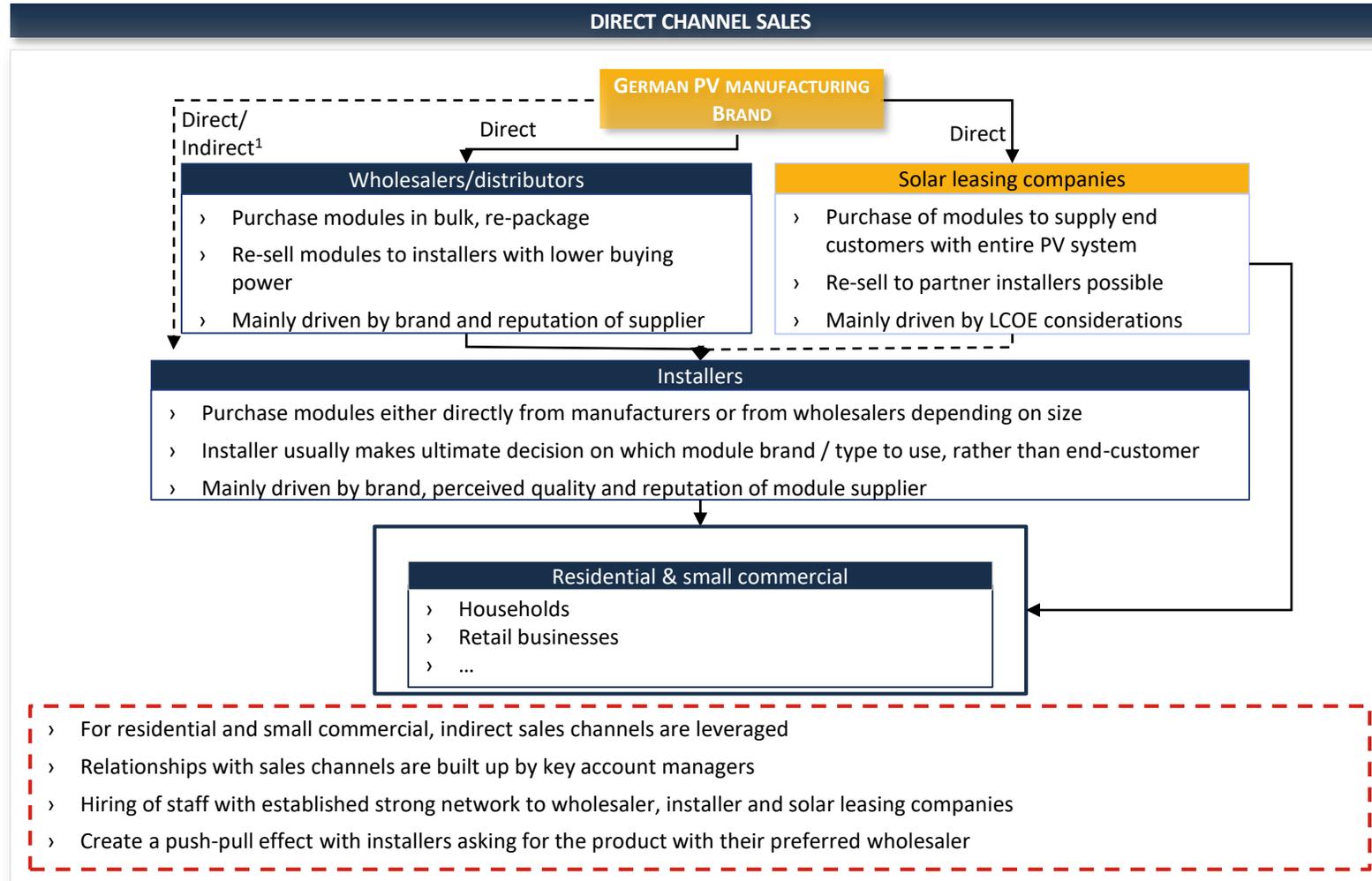
- › Two key features differentiating Meyer Burger's technology from mainstream HJT competition
  - 35% lower cell production cost and overall ~20% cost advantage
  - ~50W higher output per module (10 power classes) enabling higher ASPs
- › Reasons for significant cell cost advantage:
  - Proprietary SWCT® enables significantly lower silver paste consumption
  - MBT has collected significant know-how compared to competitors, allowing MBT to have higher production yield and to use larger wafers (M6 versus competitors' M2)
  - MBT's operational excellence, developed through its own HJT pilot line, leads to lower use of consumables, lower unscheduled down times and more efficient line utilization

- › COGS are for market-ready HJT/SWCT® technology of Meyer Burger (see 'Phase I' in R&D roadmap) based in Germany
- › COGS reductions are based on wafer price reduction, cell and module BOM reduction, improved processing on e.g., silver consumption due to economies of scale, utilization of next generation cell equipment and improved local supply chain

Note: Wafer cost for HJT competition updated to April 2020; 1) In selected markets also used in utility segment  
Source: Meyer Burger business plan, PV Info Link Report, Dec. 2019

# DUAL BRAND APPROACH TO LEVERAGE CUSTOMER REACH

GERMAN PV MANUFACTURING BRAND WITH STRONG HISTORY IN RESIDENTIAL & SMALL COMMERCIAL SEGMENT, WHILE MEYER BURGER SHALL BE THE -GO-TO BRAND IN THE UTILITY SEGMENT



**RESIDENTIAL & SMALL COMMERCIAL**

**GERMAN PV MANUFACTURING BRAND**

- › For residential and small commercial segment, previous brand envisaged to be leveraged
- › Brand has a high reputation with installers and end-customers and stands for high quality modules
- › Well-known brand in the PV industry, in particular in the U.S. and Europe, which is a good fit to Meyer Burger's envisaged market strategy

**UTILITY-SCALE**

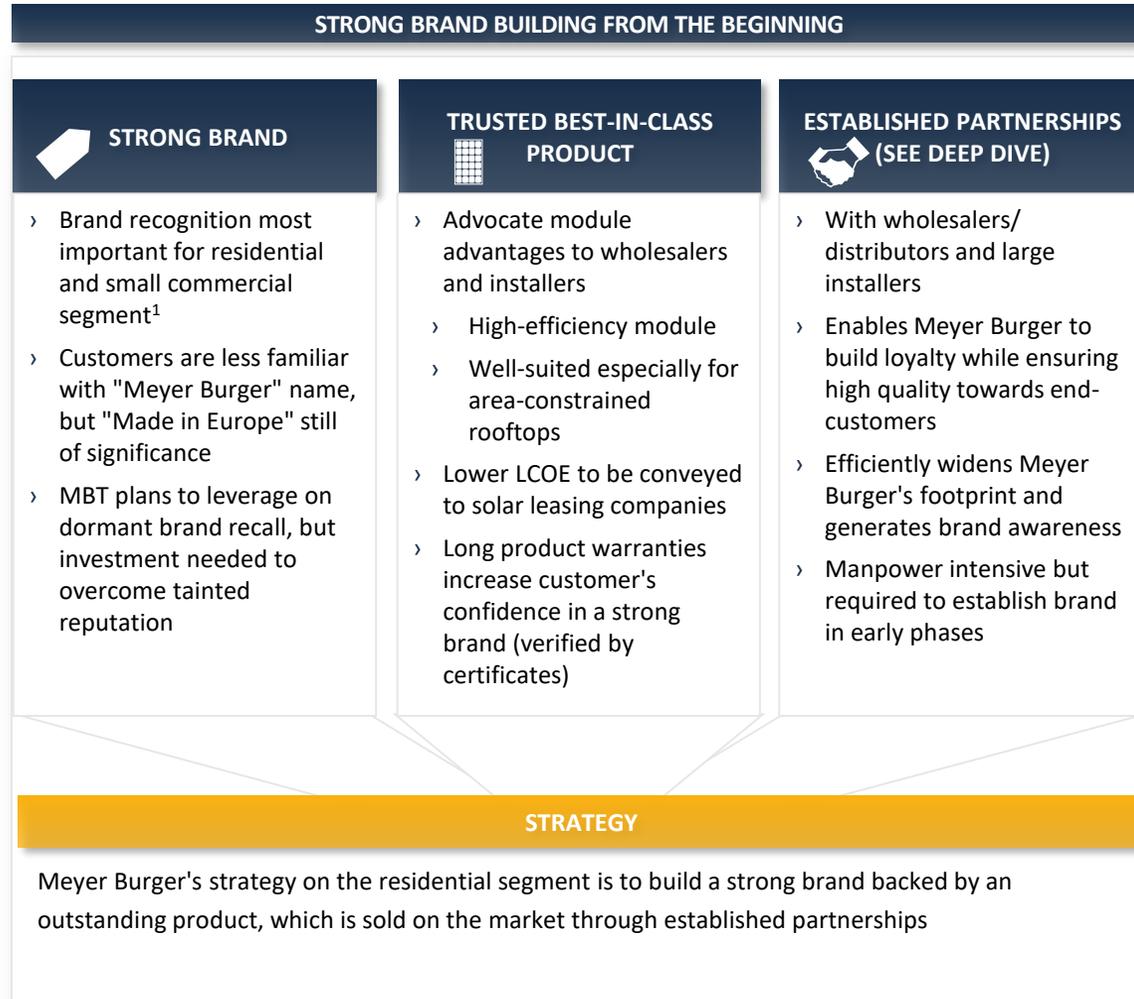
 MEYER BURGER

- › Buildup of a new performance-driven (= lowest LCOE) module brand using Meyer Burger's existing reputation in the PV industry
- › The brand stands for high-quality and innovation resulting in best-in-class results

**TWO-BRAND APPROACH ENABLES MEYER BURGER TO DIFFERENTIATE PRICING, USP AND MARKETING STRATEGIES PER END-CUSTOMER SEGMENT**

Notes: 1) Dependent on market, e.g., possible in US, more difficult in Germany because of channel conflicts

WHILE MEYER BURGER RELIES HEAVILY ON STRONG BRAND BUILDING RIGHT FROM THE BEGINNING, THE FOUR-STAGED SALES CHANNEL ROADMAP SERVES AS FRAMEWORK SHORT- TO LONG-TERM



Notes: 1) For wholesalers/distributors and installers



STRONG DISTRIBUTION PARTNERSHIPS WITH WHOLESALERS AND INSTALLER PROGRAMS DRIVE SALES AND BOLSTER THE PRICE PREMIUM OF MEYER BURGER PRODUCTS



## DISTRIBUTION PARTNERSHIPS

- › With wholesalers/distributors to establish scalable and regional/local networks
- › Superior sales relations and support are often honored with high loyalty
- › Distribution partners are expected to
  - › Advocate Meyer Burger premium value proposition to installers
  - › Sell at premium, add value to MBT's network and profit from established strong relationships
  - › Allow Meyer Burger to maintain stocks in different markets when using partners' warehouses
  - › Profit from sales and product trainings, incentive and rebate programs, co-branding

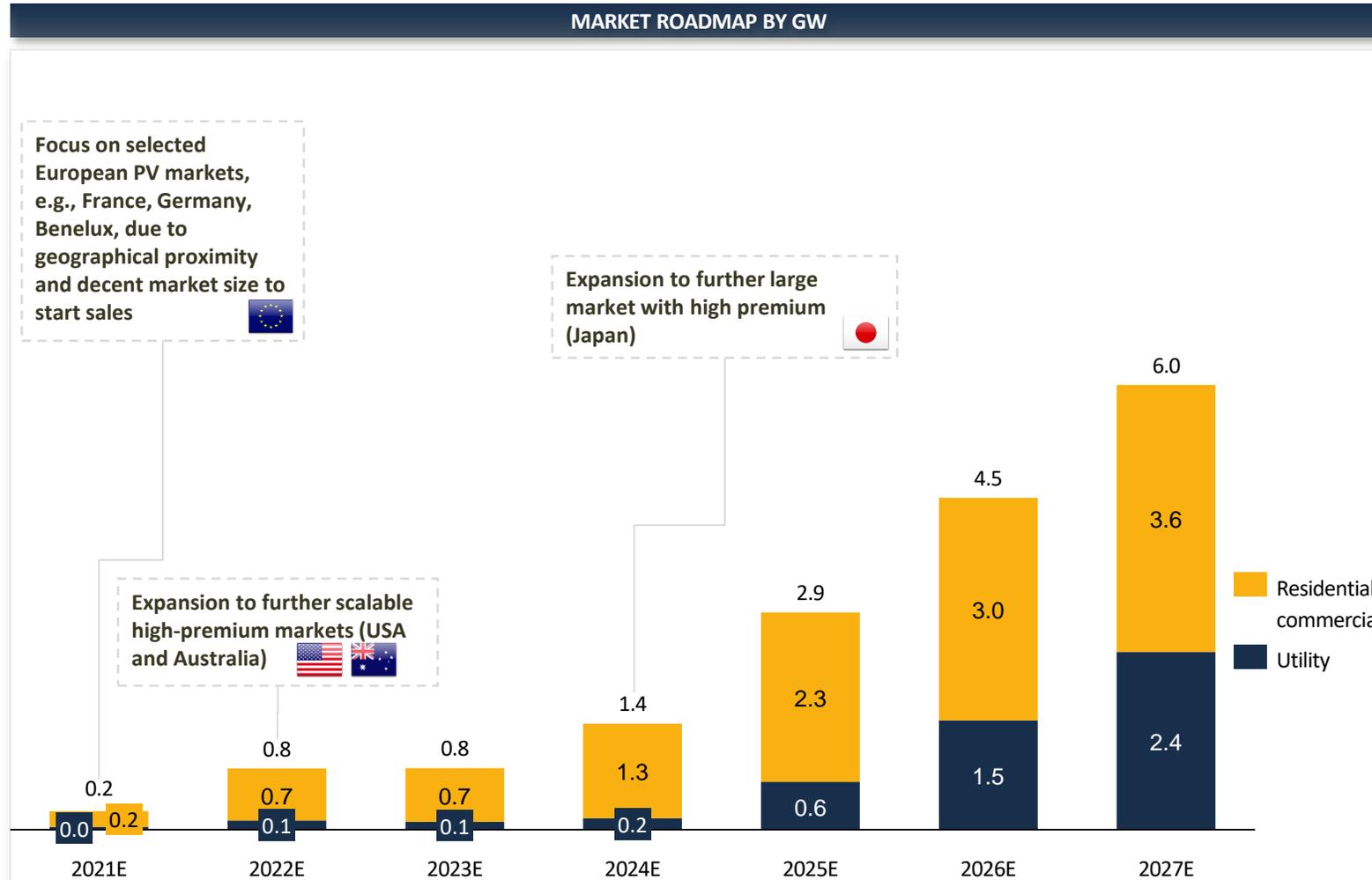
**Achieve price premium and build long-term loyalty**



## AUTHORIZED INSTALLER PROGRAMS

- › With large installers, ensuring high quality among installers as well as customer proximity
- › Long-term cooperation with installers is major loyalty factor within distribution network
- › Drives demand to distributors and potentially improve forecast accuracy
- › Features may include:
  - › Sales and technical trainings
  - › Co-op funds to support partners while increasing brand awareness and penetration (e.g., co-branded apparel, co-branded off-/online ads, event expenses)
  - › Lead generation through Meyer Burger, e.g., its website, as benefit in the mid-term

THE MARKET ROADMAP CLEARLY SHOWS A FOCUS ON RESIDENTIAL AND COMMERCIAL MARKETS AND A STEP-BY-STEP INCERASE IN THE UTILITY SEGMENT



### VISION AND EXPANSION

- › Become a European champion and global player for the production of high-efficiency cells and modules using "Swiss technology" made in Germany
- › Reach an annual module production capacity of >5GW by 2027
- › Support EU green energy transformation plan (Green Deal) through set-up of local PV manufacturing and R&D facility

**Expansion initially focused on Europe with global expansion in markets with demand for "Made in Europe" and quality is of a greater focus allowing for a price premium**

#### STRATEGY FOR MARKET SEGMENTS

**Residential/commercial:**

- › Enter and address multiple markets
  - › limited addressable market for high-premium products, reasonable market share

**Utility:**

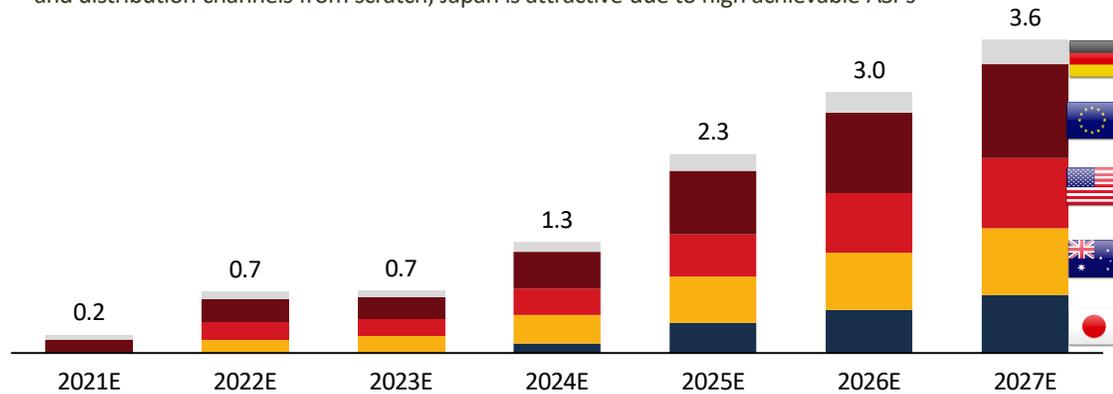
- › Focus on individual markets with willingness to pay a premium for high-efficiency modules
  - › high addressable market, low market share

# INCREASING IMPORTANCE OF TARGETING KEY MARKETS

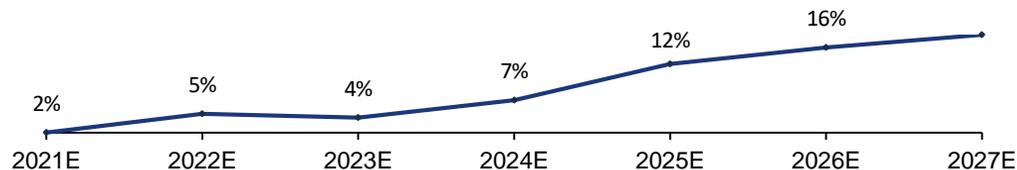
THE EU, USA AND AUSTRALIA ARE KEY RESIDENTIAL AND COMMERCIAL MARKETS FOR THE FIRST THREE YEARS AFTER RAMP-UP; IN LATER YEARS JAPAN EXPECTED TO PLAY AN INCREASING ROLE AS A MAJOR OFFTAKE COUNTRY

## EXPECTED SHIPMENTS RESIDENTIAL SEGMENT

- › Germany and the Benelux countries are the focus markets for the residential segment in Europe due to their geographic proximity and high ASPs
- › Simultaneously, Meyer Burger plans to enter further European markets such as France, Italy, Spain, Switzerland and others in 2021 to build a solid reputation and track record in neighboring European markets
- › Starting in 2022, Meyer Burger plans to enter two large residential markets USA and Australia due to the high achievable ASPs and the overall market size
- › The Japanese market is expected to be supplied from 2024 due to the need to build customer networks and distribution channels from scratch; Japan is attractive due to high achievable ASPs

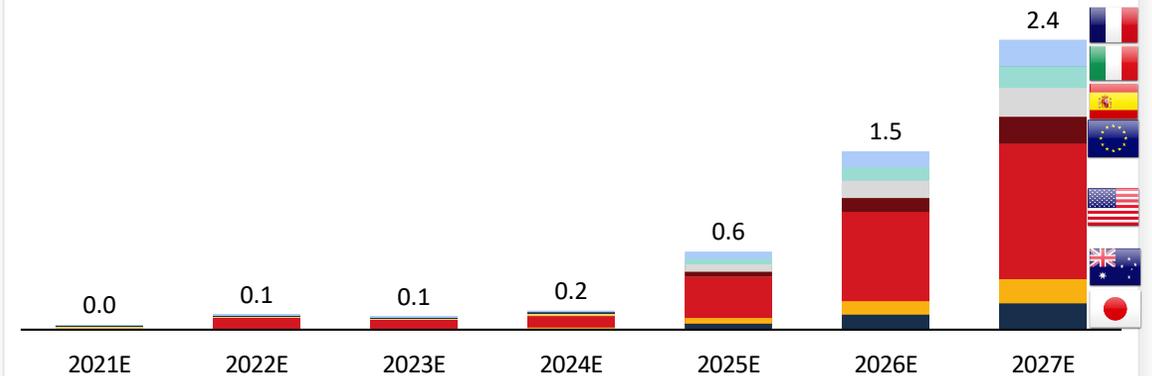


Share of residential and small commercial markets in target countries [%]



## EXPECTED SHIPMENTS UTILITY SEGMENT

- › Spain, France and Italy shall be the first utility markets to be supplied in 2021 due to their geographic proximity and ability to build reference plants with selected customers
- › From 2022, USA expected to become the focus market for utility-scale, due to higher than average achievable ASPs, high interest for high efficiency bi-facial modules and associated premia for Meyer Burger
- › After 2022, Meyer Burger aims to further supply the Australian utility market given its high demand for bi-facial modules and sizable market with customers accepting premia in return for higher performance



## RECOVERY OF EU SUPPLY CHAIN AND SET-UP OF ESSENTIAL SUPPLIERS COVER THE BASE FOR LARGE SCALE PRODUCTION

### ESSENTIALS FOR GROWTH

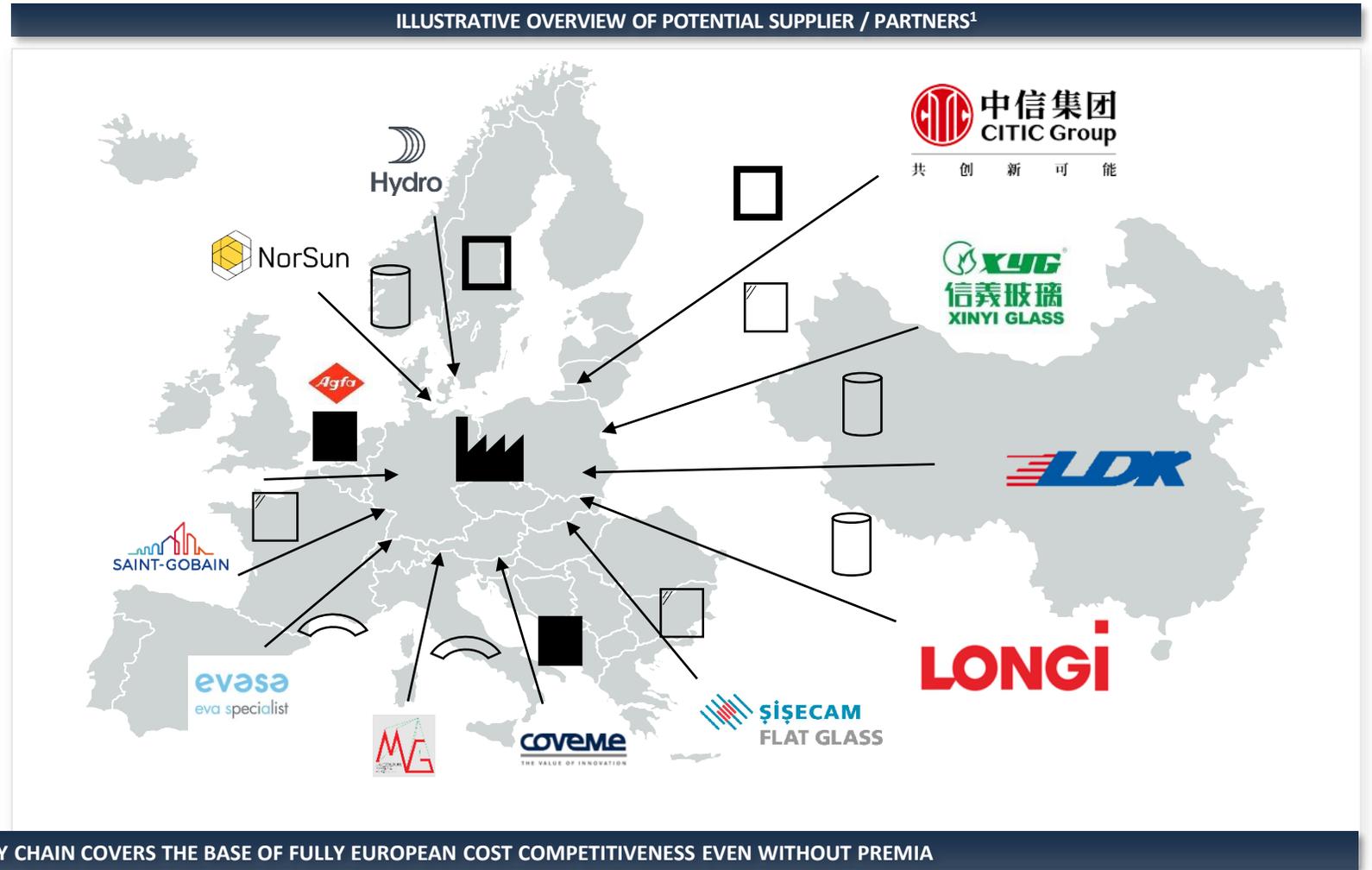
-  Critical component – procurement strategy to diversify among Chinese suppliers; small volumes can be procured from European supplier
-  Glass: Critical component – procurement strategy to diversify among European and Asian suppliers
-  Frame
-  Encapsulant
-  Backsheet

› Meyer Burger cell production in the heart of Europe well-connected to suppliers

**According to Fraunhofer:**

- › EU PV manufacturer landscape: Mainly remaining module manufacturing at relatively low production volumes (compared to China)
- › Made-in-Europe premium (sustainable product) would fully compensate still existing cost difference between EU and China based manufacturing scenario
- › "Recovery" of EU supply chain could lead to fully cost competitiveness even without premiums
- › Strong and sustainable EU PV market development necessary

### ILLUSTRATIVE OVERVIEW OF POTENTIAL SUPPLIER / PARTNERS<sup>1</sup>



The map illustrates the geographical distribution of potential suppliers for PV components. Arrows point from various locations in Europe and China to icons representing different components: cylinders for critical components, squares for glass, frames, and backsheets, and arcs for encapsulants. The suppliers shown are:

- Hydro
- NorSun
- Agfa
- SAINT-GOBAIN
- evasa (eva specialist)
- MG
- coveme (THE VALUE OF INNOVATION)
- SHİSECAM (FLAT GLASS)
- CITIC Group (中信集团) with tagline "共 创 新 可 能"
- XYG (信义玻璃 XINYI GLASS)
- LDK
- LONGI

"RECOVERY" OF EU SUPPLY CHAIN COVERS THE BASE OF FULLY EUROPEAN COST COMPETITIVENESS EVEN WITHOUT PREMIA

Note: 1) Company logos are only examples for potential supplier  
Source: Fraunhofer

DUE TO THE COMBINATION OF LEADING TECHNOLOGY, COOPERATIONS, POTENTIALLY RELYING ON EXISTING PV FACILITIES IN GERMANY AND THE ALIGNMENT OF THE NEW BUSINESS MODEL WITH THE POLITICAL AGENDA, FORESEEABLE RISKS CAN BE TO SOME DEGREE MANAGED IN THE FUTURE

RISK	LIKELIHOOD	IMPACT	MITIGATION / COMMENTS
<b>INCREASED COST OF OPERATIONS</b>			<ul style="list-style-type: none"> <li>› Lack of economies of scale of European manufacturers compared to China is more likely to decrease in the future due to potential "recovery" of EU supply chain of parts productions, political support and technology advancements</li> </ul>
<b>LACKING DEMAND</b>			<ul style="list-style-type: none"> <li>› Market in the past mainly driven by Chinese demand, with overseas market expected to take up around 65% market share in 2020</li> <li>› U.S. and Indian market likely to grow, Middle-East to grow by 2GW, as UAE and Saudi Arabia set to join GW-club</li> <li>› China's demand likely to be delayed, due to new solar policy to be announced by Chinese government</li> </ul>
<b>ASP PREMIUM REDUCTION</b>			<ul style="list-style-type: none"> <li>› Business plan ASPs are priced for module at around 3-4 power classes lower than MBT HJT / SWCT® modules</li> <li>› Falling ASPs premia expected to have a slight impact on gross margins in the current business plan in the mid-term but expected to have a longer term impact</li> <li>› No technology improvements (all anticipated) reflected in the business plan</li> </ul>
<b>INCREASED COST TO SET UP PRODUCTION</b>			<ul style="list-style-type: none"> <li>› Cost plan includes acquisition of facilities of dormant PV manufacturer potentially creating CAPEX savings</li> <li>› Risks of delayed production site set-up possible, but unlikely</li> <li>› Ramp-up cost for hiring and training relatively low, due to existing past PV industry employees in Saxony and Saxony-Anhalt</li> </ul>
<b>COMPETITION</b>			<ul style="list-style-type: none"> <li>› Large-scale n-type cell production mainly in U.S, Europe, Japan, Korea and Australia – HJT / SWCT® provides higher efficiency than competitors</li> <li>› Verified R&amp;D roadmap shall provide further advantages in the future with even higher reachable efficiency rates</li> </ul>
<b>TECHNOLOGY</b>			<ul style="list-style-type: none"> <li>› HJT / SWCT® ahead of competition – business model change to captive model shall cater the need of technology safety and protection</li> <li>› Further R&amp;D pipeline verified by Fraunhofer</li> <li>› Co-operation with Oxford PV stimulates future R&amp;D pipeline for HJT-perovskite modules</li> </ul>

High  
Medium  
Low

# MEYER BURGER'S VALUE-DRIVEN SEGMENT STRATEGY IS EXPECTED TO CAPTURE SUBSTANTIAL PREMIA

AS MEYER BURGER PLANS TO PARTNER BOTH WITH INSTALLERS AND SOLAR LEASING COMPANIES, THE BUSINESS MODEL SHALL CAPTURE HIGH PREMIA AS EACH HAVE AN INCENTIVE TO MINIMIZE THEIR LOCE

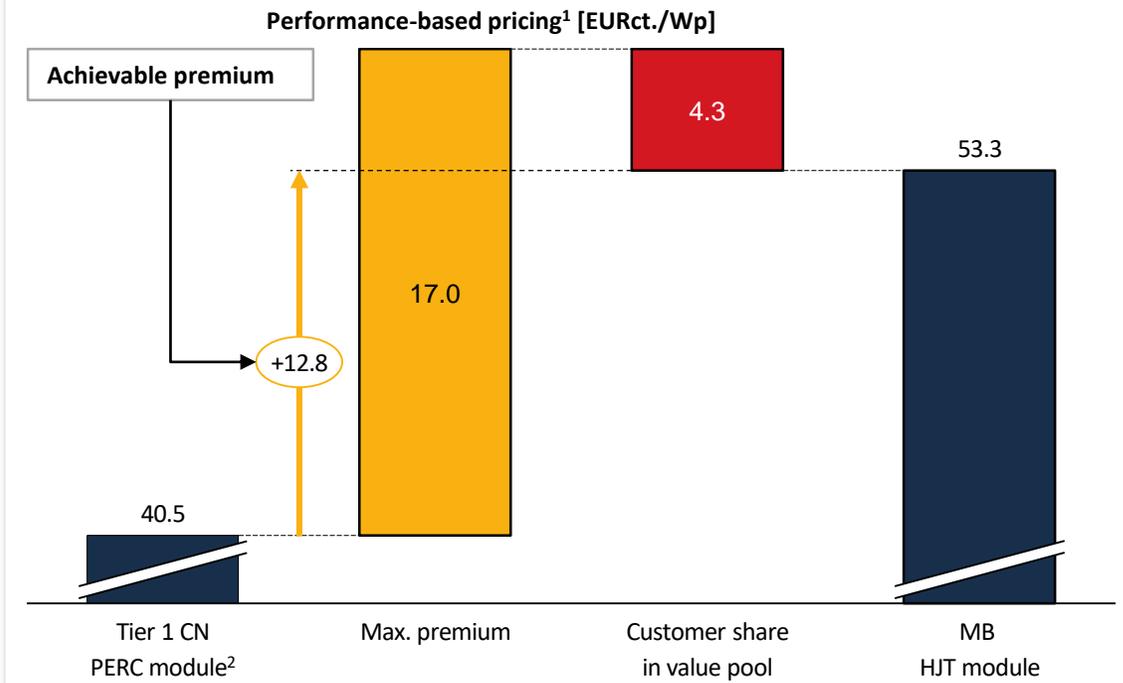
## RESIDENTIAL SEGMENT (US EXAMPLE)

- › Solar leasing companies fund the installation of solar modules on residential roofs and then sell the electricity produced to residential customers for a fixed monthly fee
- › This is different from installers who sell the solar systems to residential customers directly
- › The difference between the levelized cost of energy (LCOE) of the solar system and the fixed monthly fee determines the return for solar leasing companies
- › Consequently, these companies are interested in minimizing LCOE to maximize returns



## ACHIEVABLE PREMIUM

- › Corporate customers such as solar leasing companies are expected to value the technology advantage of Meyer Burger modules
- › Performance is expected to justify high premia to achieve same levelized cost of energy (LCOE) as competition
- › Sharing value with customer leaves attractive achievable premia for Meyer Burger and compelling sales argument



Notes: 1) Comparison of LONGi HiMo1 320W (PERC) against Meyer Burger M6 wafer solution 390W (HJT); 2) Price includes import duties for 2020 as set out in Section 201

Sources: Apricum research, various datasheets