

# innovation



**SINGULUS  
TECHNOLOGIES**

Figures Q 3- 2016

**SINGULUS** 

# SINGULUS TECHNOLOGIES

## Innovations for New Technologies

SINGULUS TECHNOLOGIES AG  
Q3-2016 - 2 -



**SINGULUS TECHNOLOGIES is a mechanical engineering company offering machines for vacuum thin-film and plasma coating, wet-chemical processes as well as thermal technology.**

- 1 Financials
- 2 SINGULUS TECHNOLOGIES Segments & New Areas of Application
- 3 SINGULUS TECHNOLOGIES Key Takeaways

# Overview Restructuring Concept

Step	Shareholder Structure	Equity/ Total Value in €	Number of Share Nominal Value Bond
Capital reduction	AA 100%	48.930.240	48.930.240 <b>160:1</b>
After a simplified capital reduction	AA 100%	305.814	305.814 <b>+ 5.760.000</b>
Capital increase against contributions	AA 5% AG 95%	6.065.814	6.065.814
Cash capital increase		2.021.938	2.021.938 <b>+2.021.938</b>
After cash capital increase		8.087.752	8.087.752
<b>New bond</b>	<b>SV 100%</b>	<b>12.000.000</b>	<b>100</b> <b>+ 2 New Bonds à 100 €</b>

AA = Old Shareholder, AG = Bondholder, SV= New Bondholder

- **Entry of completion of the capital increase on the Commercial Register of the company October 7, 2016**
- **The share capital had been increased from € 6,065,814 by the amount of € 2,021,938 to € 8,087,752**
- **Share listed on Frankfurt Stock Exchange listing started on October 12, 2016**
- **Proceeds for the company have been € 6.6 million**

# Shareholder Structure

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<b>VVG Familie Roland Lacher KG</b>	<b>16.24 %</b>
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<b>Universal-Investment-Gesellschaft mit beschränkter Haftung (i.e. FPM Funds)</b>	<b>12.05 %</b>
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<b>Prime Capital AG (i.e. Robus)</b>	<b>7.97 %</b>
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# Financial Overview 9 Months 2016

SINGULUS TECHNOLOGIES AG  
Q3-2016 - 7 -

	9 Months	9 Months
in million €	2015	2016
<b>Revenues</b>	57.7	36.7
<b>Order Intake</b>	84.4	144.1
<b>Order Backlog (30.09.)</b>	40.7	134.0
<b>EBIT</b>	-13.9	-14.7
<b>EBIT (operating)</b>	-12.4	-14.2
<b>EBITDA</b>	-10.5	-12.8
<b>Result before Tax</b>	-17.4	23.7
<b>Result for the Period</b>	-17.7	23.5
<b>Operating Cash Flow</b>	-8.7	11.6

# Profit & Loss Statement 9 Months 2016

SINGULUS TECHNOLOGIES AG  
Q3-2016 - 8 -

in million €	9 Months 2015	<b>9 Months 2016</b>
<b>Gross Revenue</b>	57.7	36.7
<b>Net Revenue</b>	57.0	35.9
<b>Gross Profit</b> (in % of Net Revenues)	10.2 (17.9%)	6.0 (16.7%)
<b>OPEX (Total)</b>	-24.1	-20.7
- R & D	-7.0	-5.7
- Sales & Customer Service	-9.0	-8.9
- GM & A	-7.3	-6.3
- Other Income/Expenses	0.7	0.7
- Impairment & Restructuring	-1.5	-0.5
<b>EBIT</b>	-13.9	-14.7
<b>Result for the Period</b>	-17.7	23.5
<b>EPS basic (in €)</b>	-57.55	10.11



# Financial Overview Q3 2016

SINGULUS TECHNOLOGIES AG  
Q3-2016 - 9 -

In million €	Q3 2015	Q3 2016
<b>Revenues</b>	28.5	12.1
<b>Order Intake</b>	11.3	12.6
<b>Order Backlog (as of 30.09.)</b>	40.7	134.0
<b>EBIT</b>	-4.1	-5.4
<b>EBIT (operating)</b>	-3.1	-4.9
<b>EBITDA</b>	-2.5	-4.7
<b>Result before Tax</b>	-5.2	-5.6
<b>Result for the Period</b>	-5.4	-5.7
<b>Operating Cash Flow</b>	-10.6	16.6

# Profit & Loss Statement Q3 2016

SINGULUS TECHNOLOGIES AG  
Q3-2016 - 10 -

in million €	Q3 2015	Q3 2016
<b>Gross Revenue</b>	28.5	12.1
<b>Net Revenue</b>	28.0	11.7
<b>Gross Profit (in % of Net Revenues)</b>	4.6 (16.4%)	1.7 (14.5%)
<b>OPEX (Total)</b>	-8.7	-7.1
- R & D	-2.8	-1.9
- Sales & Customer Service	-3.0	-3.1
- GM & A	-2.3	-1.9
- Other Income/Expenses	0.4	0.3
- Impairment & Restructuring	-1.0	-0.5
<b>EBIT</b>	-4.1	-5.4
<b>Result for the Period</b>	-5.4	-5.7
<b>EPS basic (in €)</b>	-17.33	-1.71

# Cash Flow Development

in million €	9 Months 2015	9 Months 2016
<b>Cash Flow from Operating Activities</b>	-8.7	11.6
<b>Cash Flow from Investing Activities</b>	-4.3	-0.7
<b>Cash Flow from Financing Activities</b>	-6.6	-2.4
<b>Total Cash Flow</b>	-19.6	8.5
<b>Cash and Cash Equivalents at the Beginning of the Period</b>	35.8	19.0
<b>Effect of Exchange Rate Changes</b>	0.4	0.0
<b>Cash and Cash Equivalents at the End of the Period</b>	16.6	27.5

# Balance Sheet

SINGULUS TECHNOLOGIES AG  
Q3-2016 - 12 -

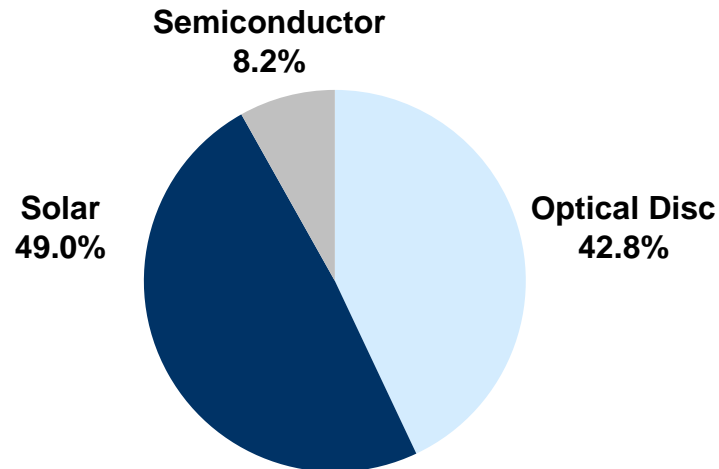
In million €	31.12.2015	30.09.2016
<b>Cash and Cash Equivalents</b>	19.0	27.5
<b>Total Current Receivables and other Assets</b>	23.2	17.8
<b>Total Inventories</b>	28.9	27.2
<b>Total Non-Current Assets</b>	21.0	18.7
<b>Total Assets</b>	92.1	91.2
<b>Total Current Liabilities</b>	36.3	50.2
<b>Total Non-Current Liabilities</b>	77.3	29.2
<b>Total Equity</b>	-21.5	11.8
<b>Equity and Liabilities</b>	92.1	91.2

# Employees

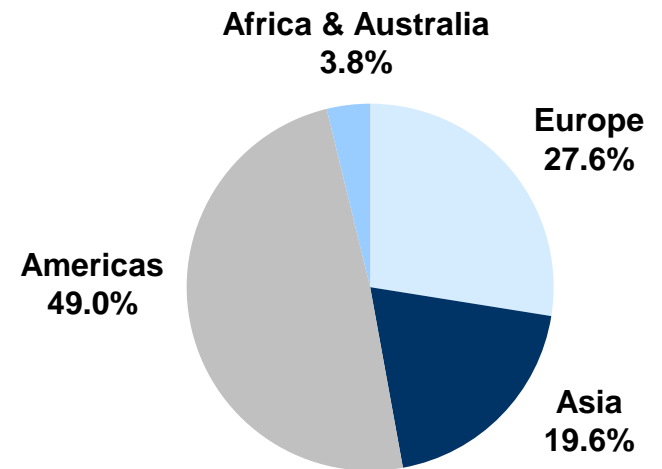
	Dec. 2015	9 Months 2016	Δ
<b>SINGULUS Group</b>	335	327	-8
<b>Domestic</b>	283	282	-1
<b>Abroad</b>	52	45	-7

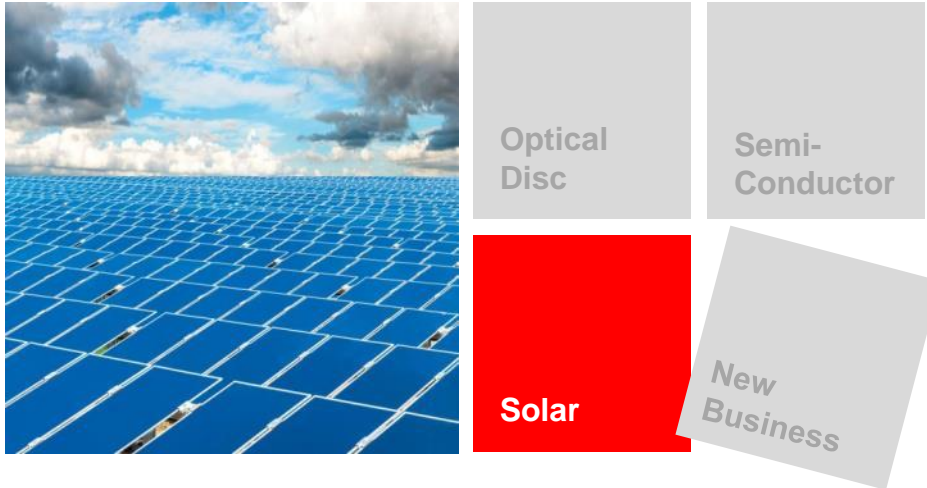
# Sales Split by Products & Region

## Products per 9 Month 2016



## Region per 9 Month 2016

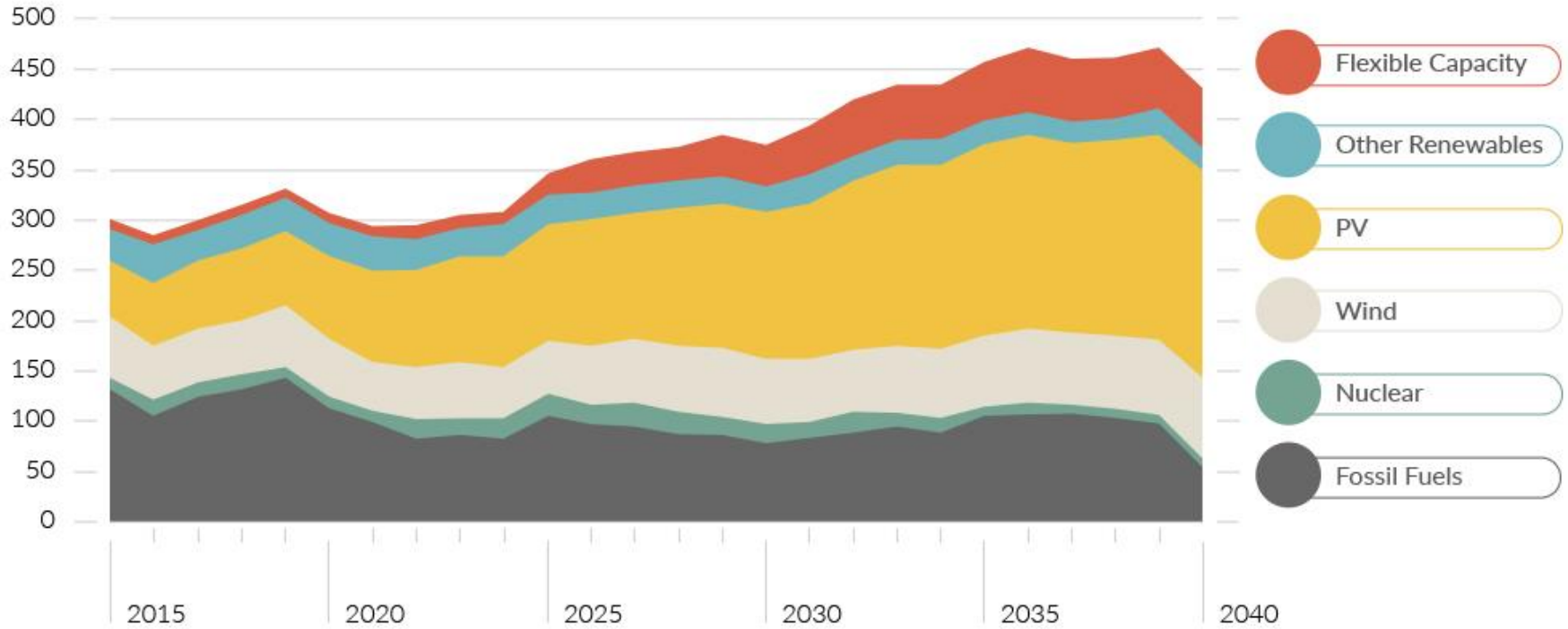




## Innovations for New Cell Production Technologies

- Thin Film Vacuum Coating Applications (Sputtering and Co-Evaporation)
- Thin Film Thermal Treatment (Selenisation and Sulphurisation)
- Wet Process Applications for Crystalline- and Thin Film Cells
- Production solutions for PERC and HJT Cells
- Systems Business

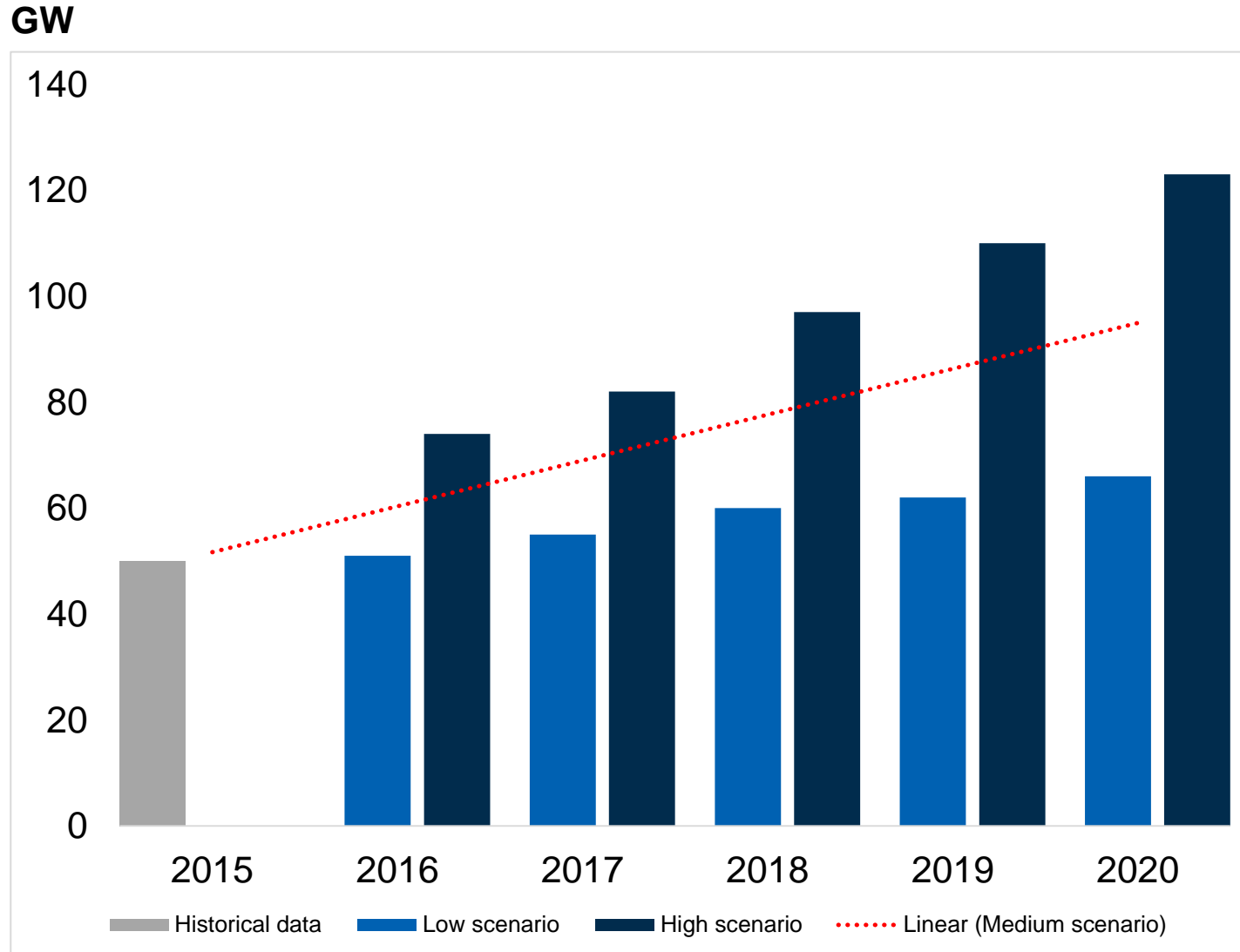
# Gross Capacity Additions by Technology (GW/Year)



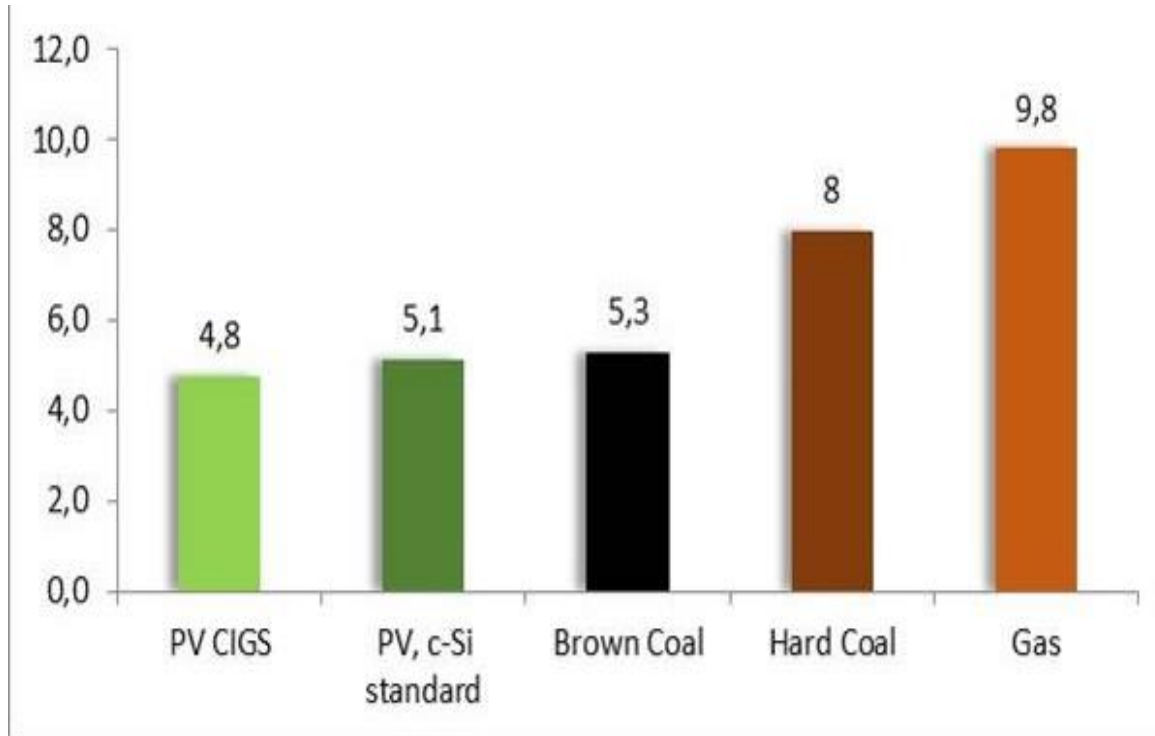


# Growing Global PV Market

## 60 GW in 2016 - 70 GW in 2017

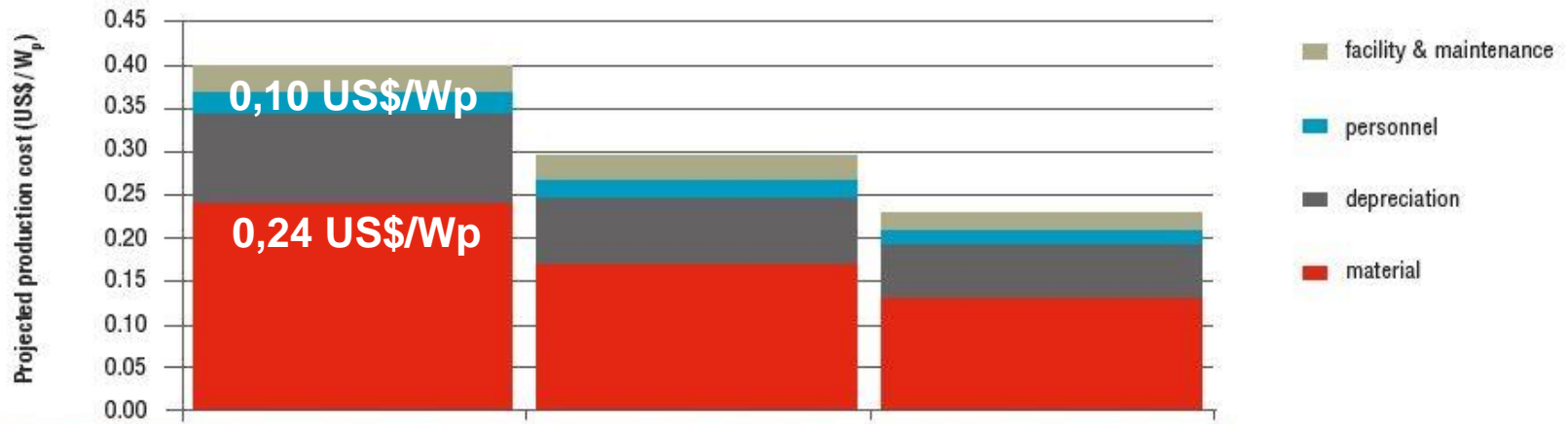


# Levelized Cost of Electricity of new Power Plants (€ct/kWh)



Source: Fraunhofer ISE/ IPA Dec. 2013 „Study for planning and construction of an xGW factory for the production of forward looking PV products in Germany“ (0.5 GWp/a, Sevilla - Note: in this study, PV costs are projected for products from a GWp fab, the costs for fossile driven power plants are today's)

# Projected CIGS Production Costs using Available Technology and Leveraging Cost Reduction Potential



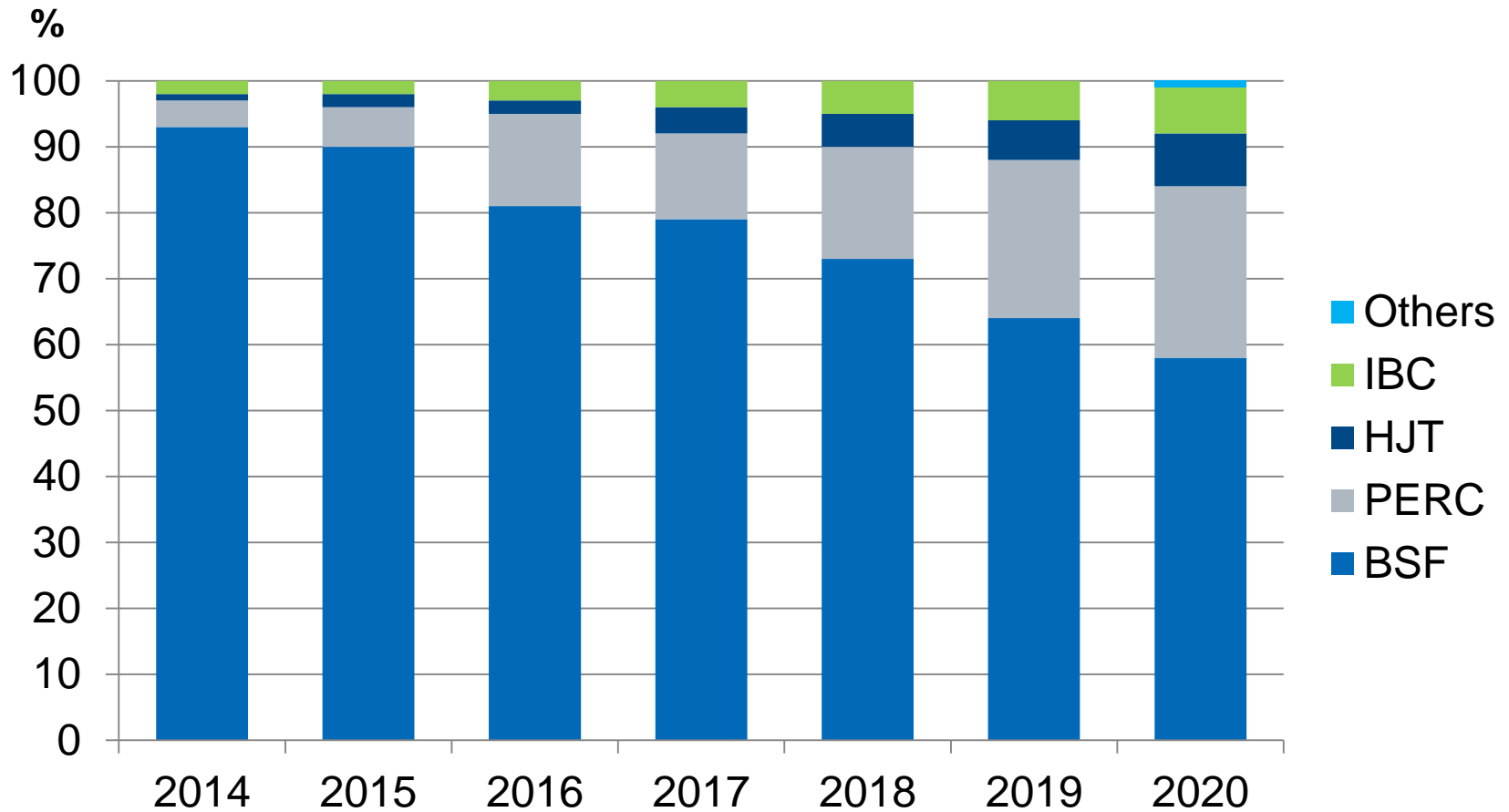
	Present fab	Next gen fab	Upgrade & scale next gen fab
Capacity	150 MW <sub>p</sub> /a	250–500 MW <sub>p</sub> /a	500–1000 MW <sub>p</sub> /a
Average efficiency	14.3%	16%	18%
Reductions versus present fab		material -20% capex -20%	material -30% capex -30% f&m -20%

Source: [www.cigs-pv.net](http://www.cigs-pv.net)

# SINGULUS TECHNOLOGIES Provides all Key Production Steps for a CIGS Fab



# Crystalline Cell Capacity by Technology



# SILEX II Wet Processing System for Heterojunction Solar Cells

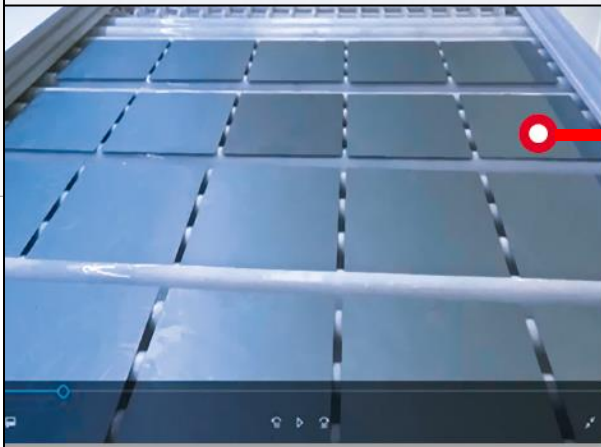
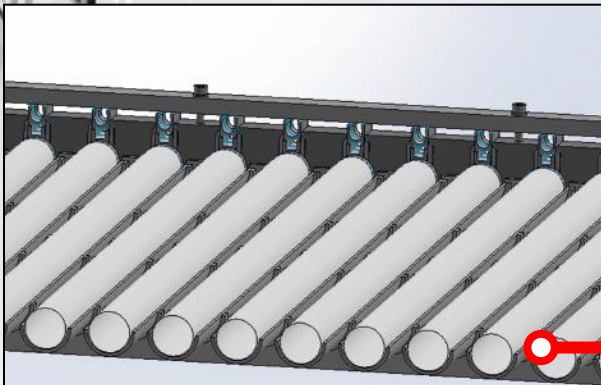
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# New Product Development: LINEX Inline Wet Process Equipment

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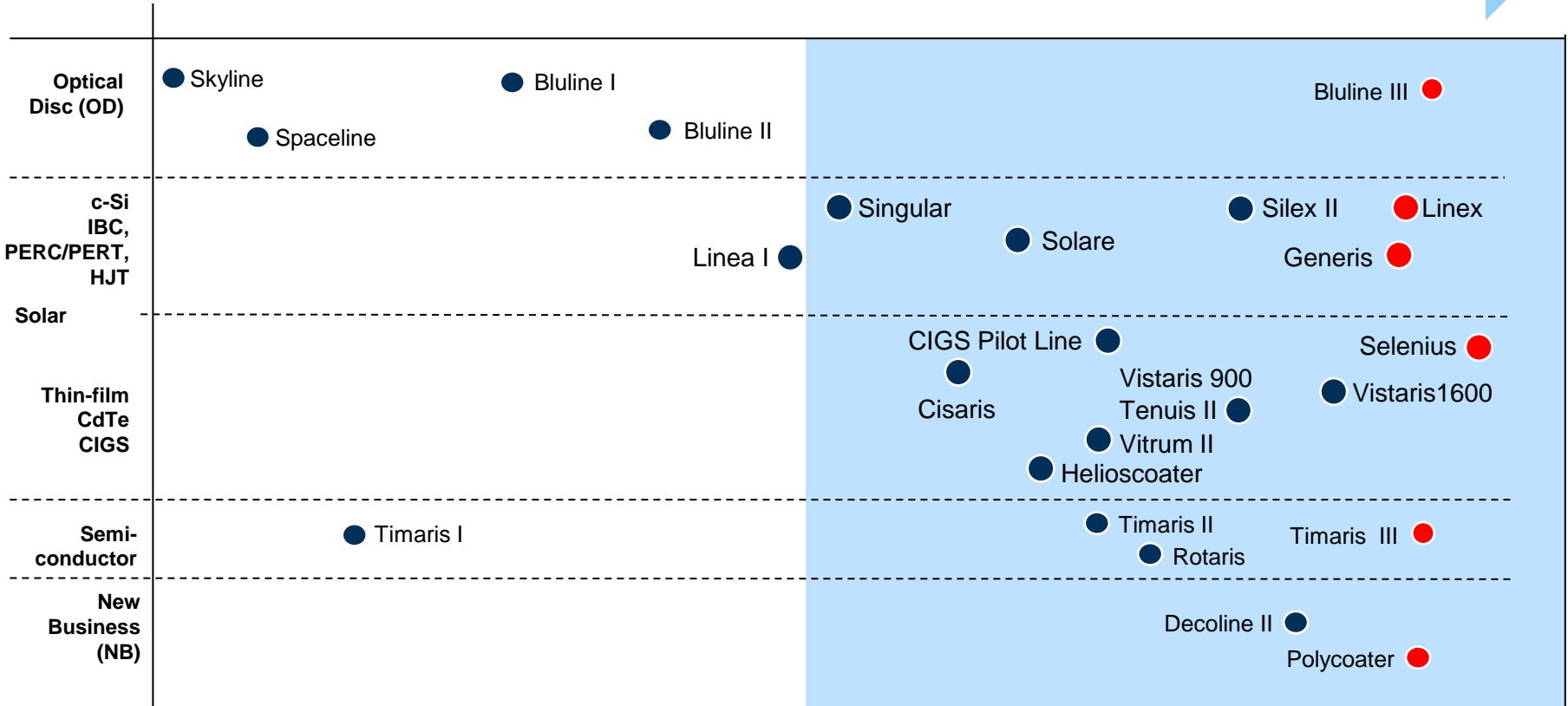
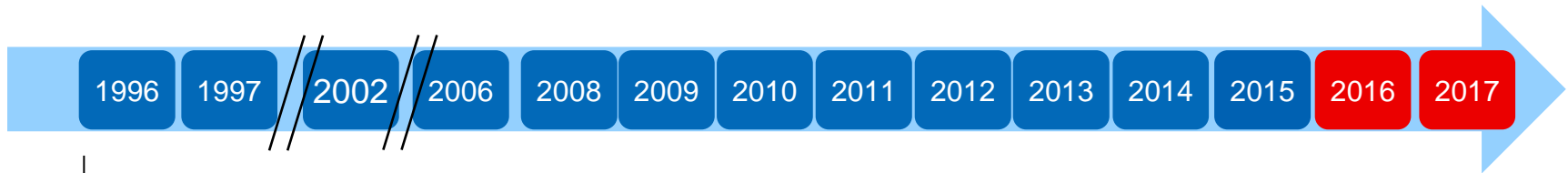


## New Roller Concept

## Applications

- Final Clean
- SDE & alkaline texturing
- Acidic texturing & polishing
- Single side etching & PSG removal

# New Product Development 2016/2017



● Existing product portfolio

● currently in our product pipeline



## THIN FILM DEPOSITION

### Thin Film Deposition

- Sputter deposition (DC, RF, MF, Bipolar, pulsed)
- Evaporation (thermal evaporation)
- CVD
- PECVD (ICP,  $\mu$ -Wave)

## SURFACE ENGINEERING

### Surface Engineering

- Embossing, imprint nano lithography
- Injection molding
- Functionalization
- Oxidation
- Plasma cleaning & etching
- Lacquering & bonding

## THERMAL PROCESSING

### Thermal Processing

- Rapid thermal processing
- Conditioning
- Annealing

## WET CHEMICAL

### Wet Chemical

- Cleaning/washing
- Etching/polishing
- Texturing
- Conditioning
- Chemical bath deposition
- Developing



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## Finance

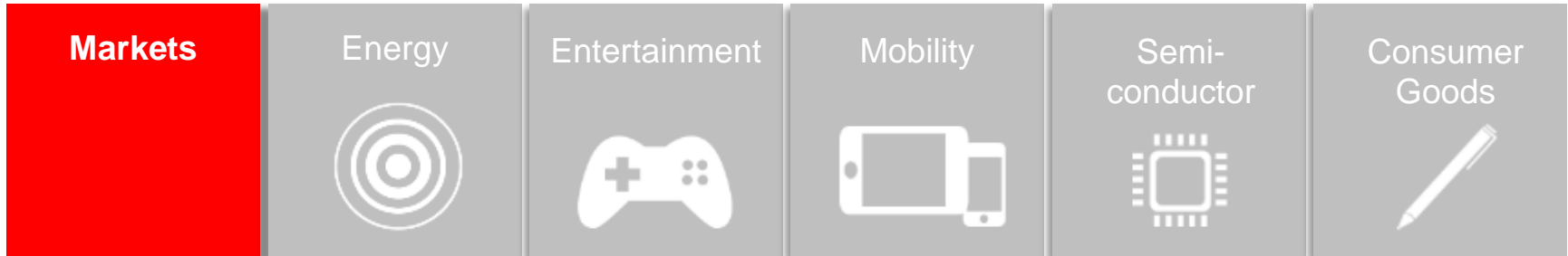
- \_ Bond restructuring and capital increase for cash successfully completed
- \_ Equity ratio positive at 13 %
- \_ High order intake and order backlog
- \_ Restructuring income results in positive net profit

## Objectives in Solar Market

- \_ Strengthen the position of technical leadership in CIGS segment
- \_ Realizing global opportunities for CIGS production lines
- \_ Further develop the existing position in growing Heterojunction solar cells market
- \_ Introduction of new products by cooperating with GCL as leading wafer supplier
- \_ Delivering on crystalline silicon based PV in developing countries

## Strengths of SINGULUS TECHNOLOGIES

- \_ Company sees himself as leader in CIGS PV market
- \_ Innovator in Heterojunction PV market
- \_ Know how, skills & experience for new technologies
- \_ Using existing core competences for introduction of new applications
- \_ Financially stable after completing restructuring



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## Forward-Looking Statements

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Various known and unknown risks, unpredictable developments, changes in the economic and political environment and other presently not yet identifiable effects could result in the fact that the actual future results, financial situation or the outlook for the company differ from the estimates given here.

We are not obligated to update the forward-looking statements made in this presentation unless there is a legal obligation.