



***SMART SOLUTIONS TO DRIVE THE FUTURE***

**Optical Disc and Solar**

**SINGULUS TECHNOLOGIES AG**

**SINGULUS** 

- 2010
  - Start of expanded Solar Strategy
  - Major order for new Thin Film Solar Production System
  - First FAT for Front End System
  - Market share > 90 % in prerecorded Blu-ray Production Systems (excl. Sony)
- 2009
  - First shipment of SINGULAR
- 2008
  - Acquisition of Blu-ray business from Oerlikon
- 2007
  - Acquisition of STANGL
  - Start in the Solar equipment market
  - First revenues in Blu-ray replication lines
- 2006
  - Takeover of majority share in largest competitor HamaTech
- 2004
  - 2<sup>nd</sup> Mastering acquisition
- 2001/2002
  - Acquisition of injection molding and 1<sup>st</sup> Mastering company
- 1997
  - Introduction of DVD Inline Systems
- 1996
  - Introduction of CD Inline Systems
- 1995
  - Start of SINGULUS TECHNOLOGIES



	1997-2010
Metallizers	> 5000
SKYLINE CD	> 1990
SPACELINE DVD	> 1460
CD-R/DVD-R Systems	approx. 250
Blu-ray Systems	> 80
Si Photovoltaic Equipment	> 110
Thin Film Photovoltaic Equipment	> 25

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
SKYLINE	122	234	405	221	134	310	202	82	113	80	19	12
SPACELINE	17	26	99	79	182	183	255	149	123	113	72	17

## Overview 2010

- Orders in Solar Segment delayed
- Forecast for 2010 adjusted to € 118 – 125 million (previous € 130 – 135 million)
- Executive Board reevaluates balance sheet assets – depreciation and expenses of 67.8 Mio.€
- Optical disc activities centralized in Kahl
- Cost base improves
- Strong growth for Blu-ray achieved
- Order intake and order backlog higher compared to 2009
- Outlook 2011 for Blu-ray favorable
- Pick-up of Solar expected for 2011

# One Time Write-Offs

## No material cash impact

One-offs and expenses of € 67.8 million split up as follows

- Depreciation of tangible and intangible assets € 40.7 million
- Depreciation of capitalized R&D € 7.5 million
- Depreciation of account receivables & Inventories € 17.3 million
- Other restructuring charges € 2.3 million

# Preliminary Figures 9 Months 2010 (non audited)

in million €	2008	2009	2010
<b>Gross Revenue</b>	149.9	95.9	81.0
<b>Order Intake</b>	197.5	56.0	97.3
<b>Order Backlog (30.09.)</b>	103.4	30.3	43.7
<b>EBIT</b>	-40.7	-53.3	- 80.9
<b>EBIT (before one-offs and expenses)</b>	3.9	-13.9	- 13.1

# Employees

	<b>Dec. 31, 2009</b>	<b>June 30, 2010</b>
<b>HamaTech APE</b>	85	Sold in Q1
<b>STANGL</b>	148	142
<b>SINGULUS</b>	339	328
<b>SINGULUS Group</b>	572	470
<b>Domestic</b>	418	346
<b>Abroad</b>	154	124

## Segment Optical Disc

- Mastering
- Molding
- Replication

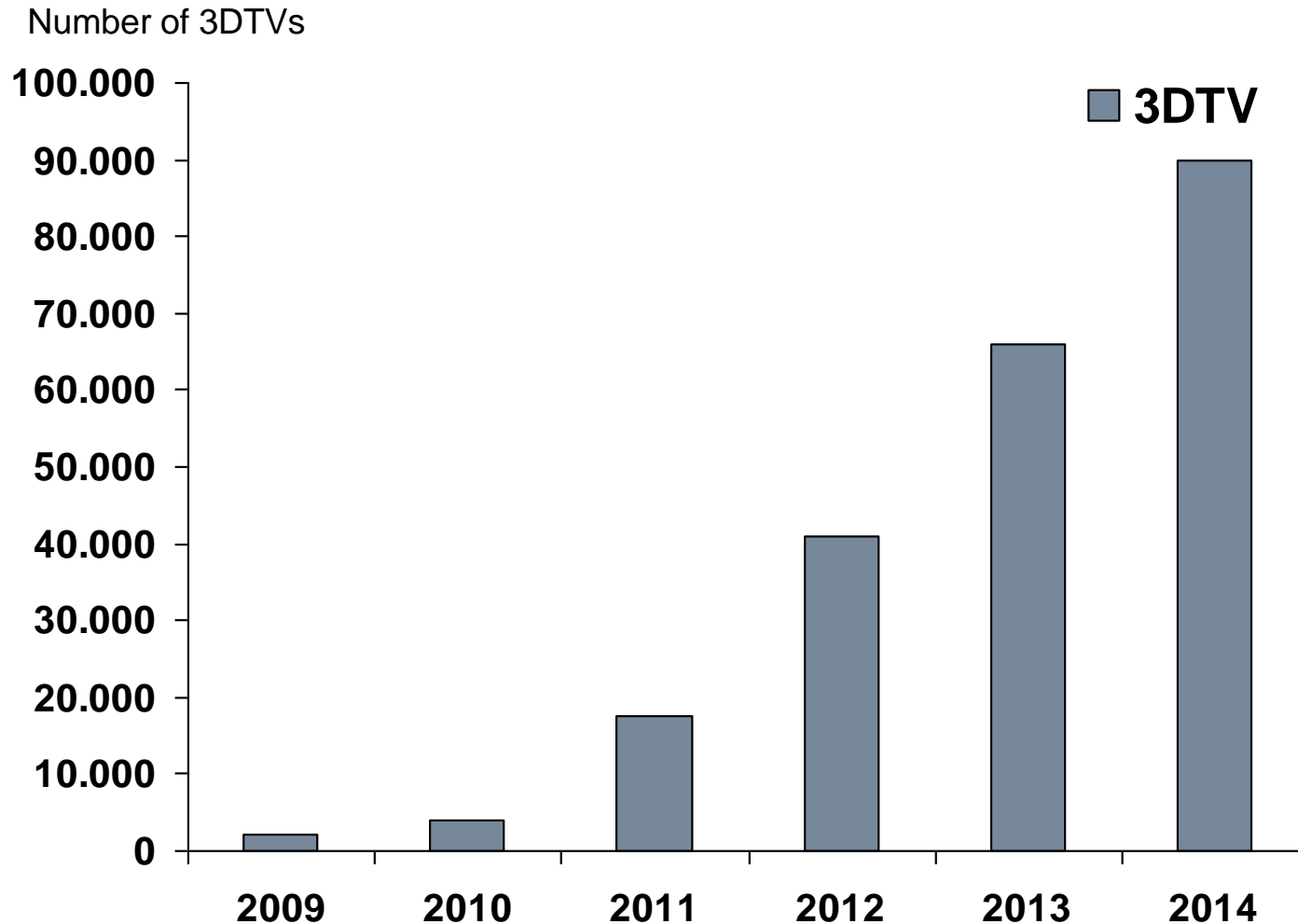


## Segment Solar

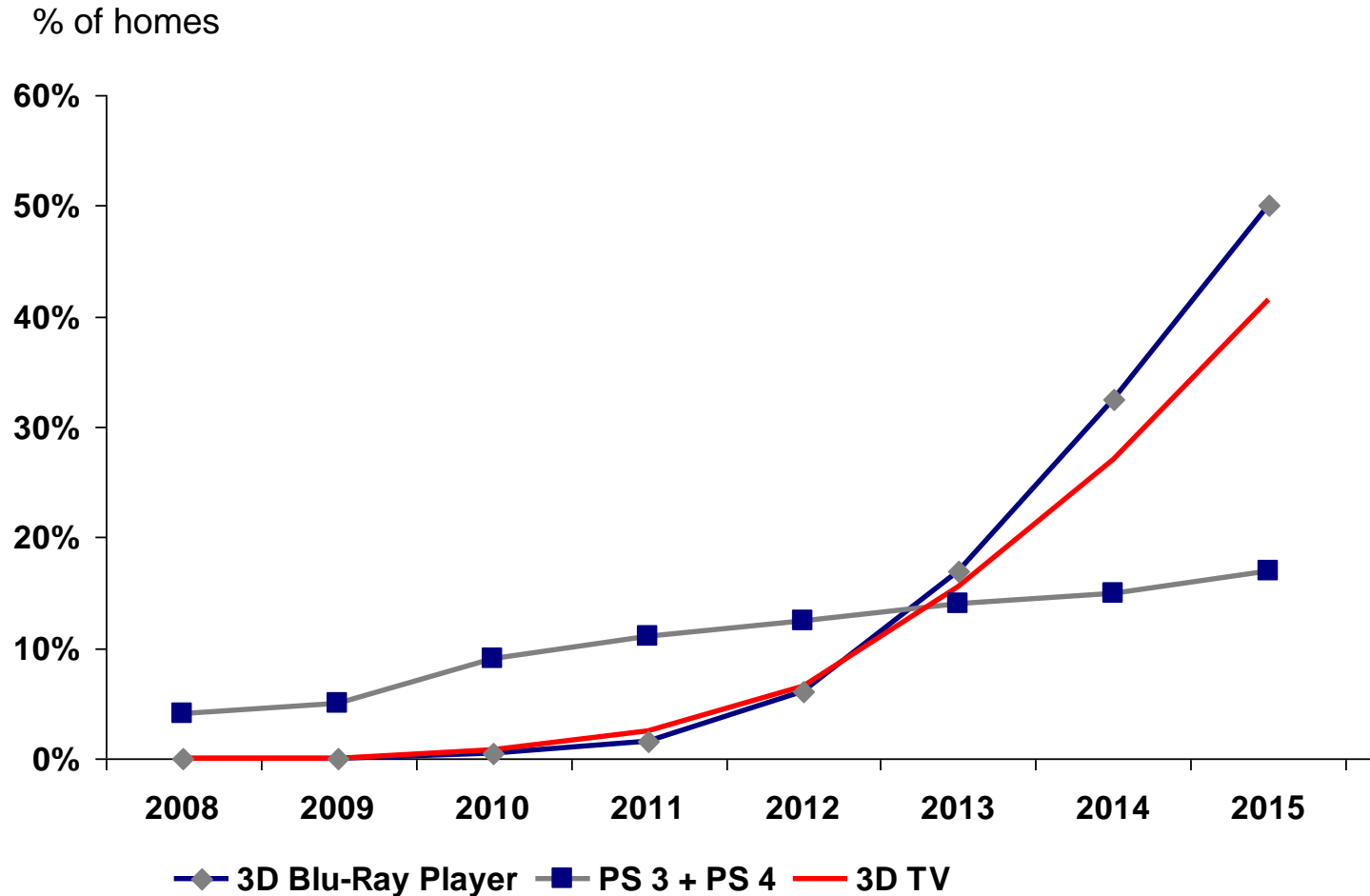
- Wet Processing
- Coating
- Systems Business



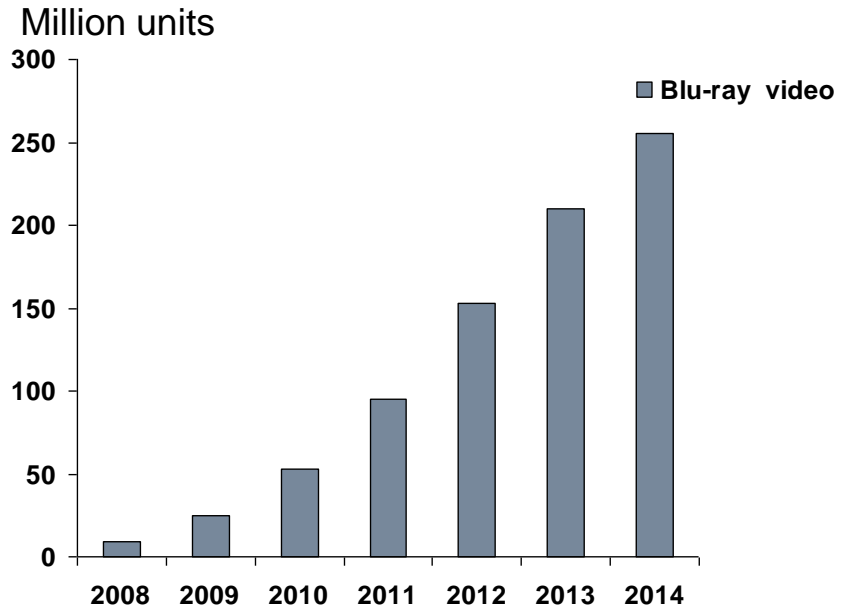
Abi Research, USA: Tremendous growth in 3D TV shipments over the next few years. 3.2 million 3DTVs will be shipped in 2010, with growth to over 90 million in 2014.



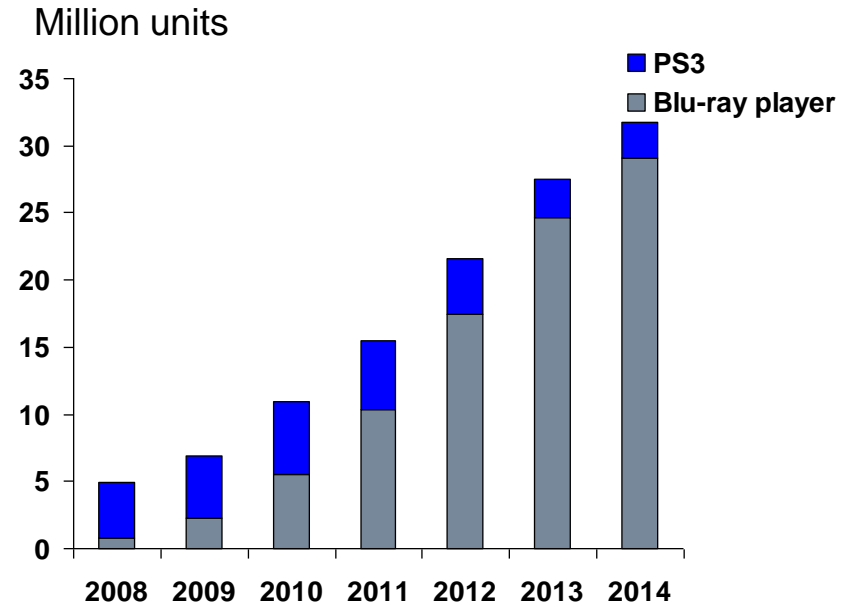
# Key 3D Platform Penetration Forecast: Western Europe



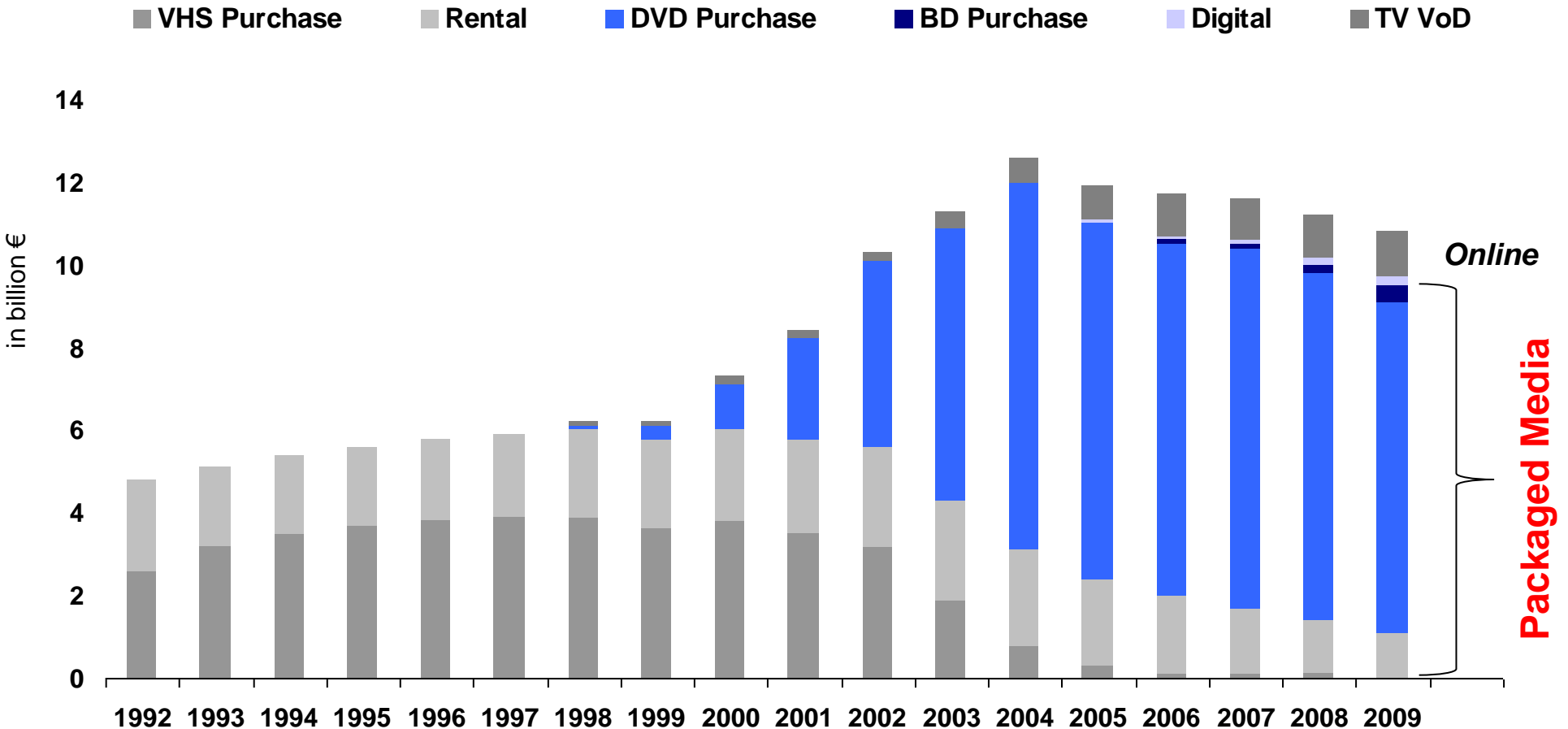
### Blu-ray disc sales



### Blu-ray player sales growth

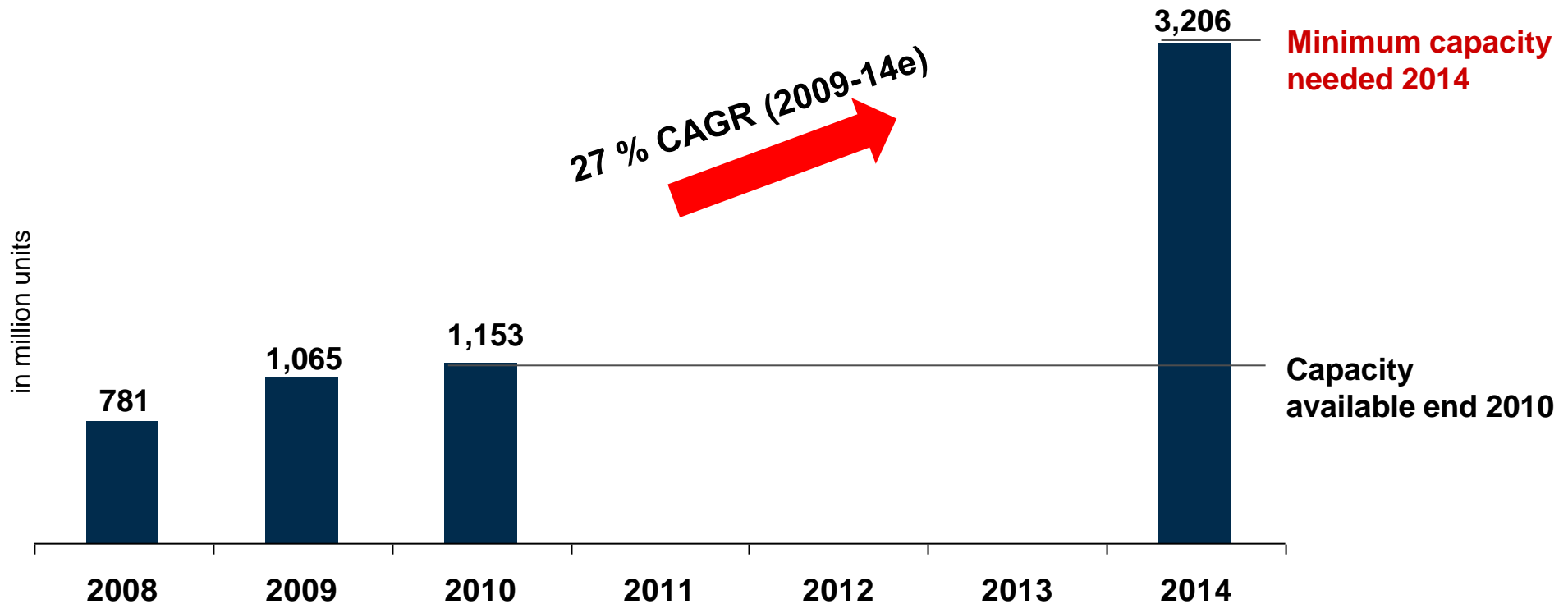


## Most people are not willing to pay for online content



Source: Replix Magazine, March/April 2010, Screen Digest

**Significant Growth potential is forecasted for the foreseeable future**



## High Margin Product BLULINE II

- Best of class
- Market share 90 % (excl. Sony)
- Excellent equipment performance
- > 80 Blu-ray systems installed base
- Platform for BD 75 & BD 100

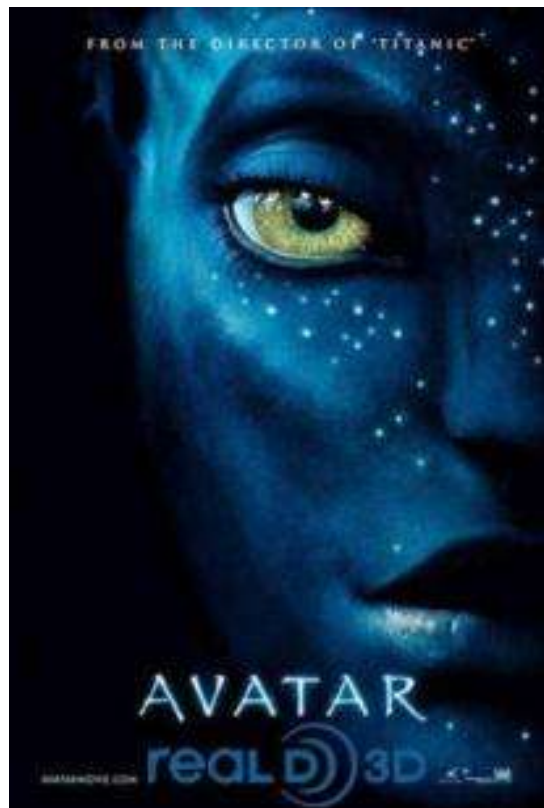


## CRYSTALLINE

- Ready for Dual Layer Blu-ray
- Well-established in the market



## 3D Movies are the killer application for Blu-ray



<http://www.bluray-3d.de>

## Segment Optical Disc

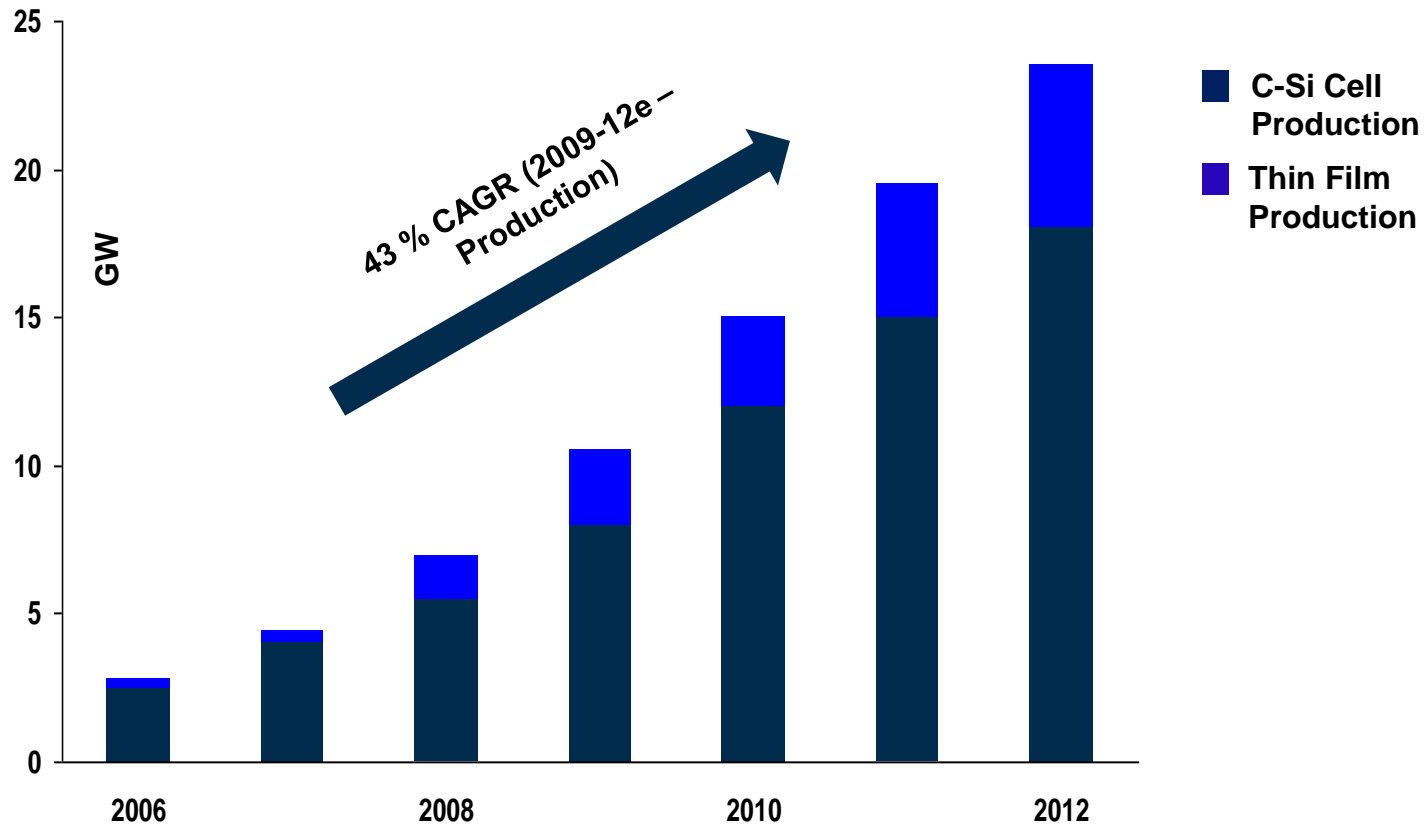
- Mastering
- Molding
- Replication



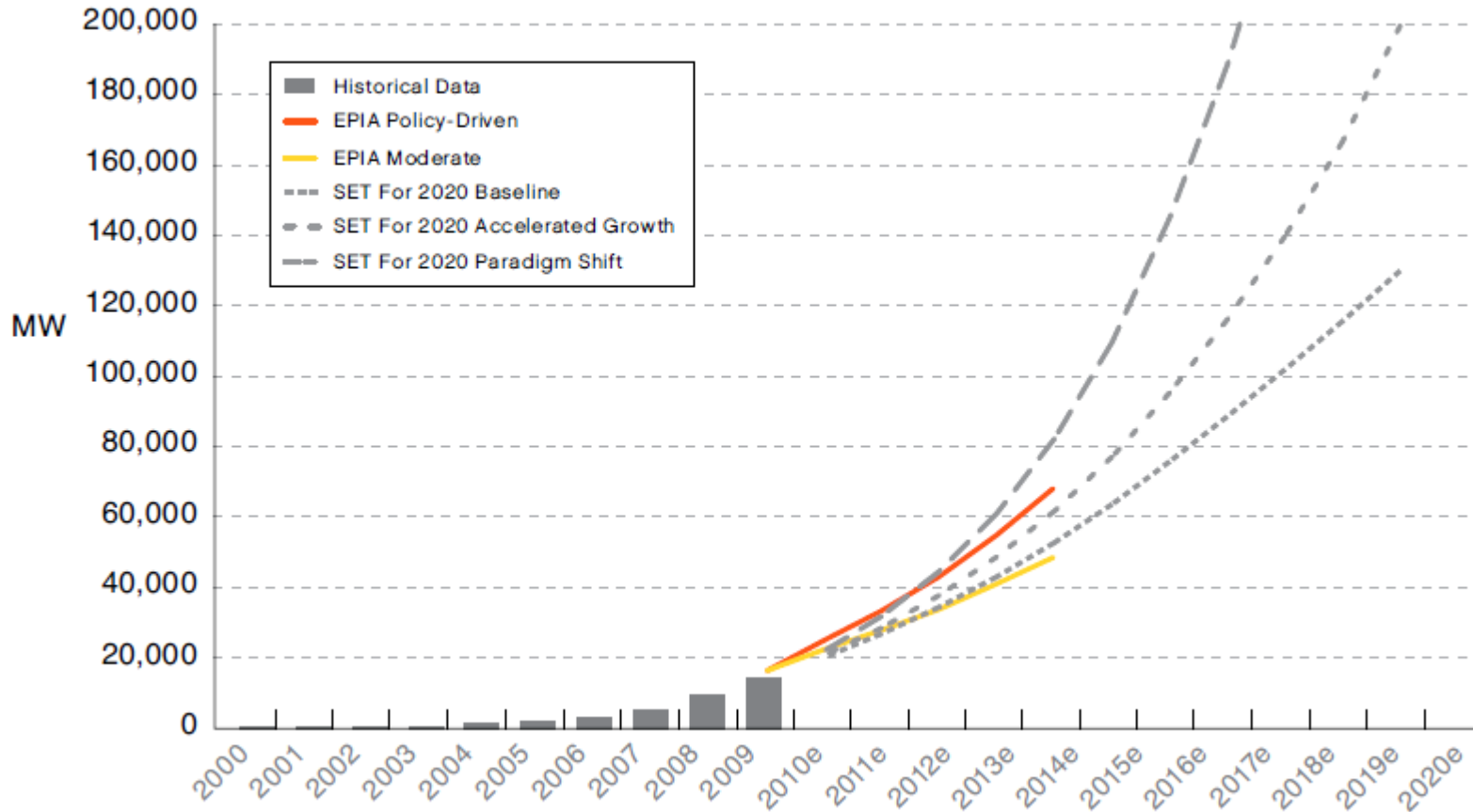
## Segment Solar

- Wet Processing
- Coating
- Systems Business





## Paradigm Shift: Targets up to 12% of the EU electricity consumption from PV by 2020



## Overall Objectives

- Wet processing
- AR coating
- Handling systems
- Dedicated equipment for industrial use
- Complete inline systems





**Raw Material Cleaning  
Wafer Degluing/Cleaning**

**c-Si Cell Processing  
Batch- & Inline System**

**Loading/Un-Loading Systems  
Automation Systems**

## LINEA

- Strong Modular Inline Concept
- Excellent Uniformity due to Chemical Treatment
- High Chemical Exchange Rate on Surface
- Single Side Etching
- No Roller Marks
- Minimized Wafer Contact
- Low Breakage Rate
- Wafer Size (feasible for thin wafers)
- Easy Integration with Automation



## SINGULAR

- Static Inline
- Reduced Handling Steps
- Reproducible Process Results
- High Flexibility in:
  - Process Sequences
  - Wafer Type & Size
- ICP Plasma Concept
- Modular Concept
- Low Cost of Ownership
- Prepared for New Cell Concepts
- Good Color Uniformity





SOLARE System for Batch Production of Si Solar Cells with SILEX and one SINGULAR offering approx. 30 MW



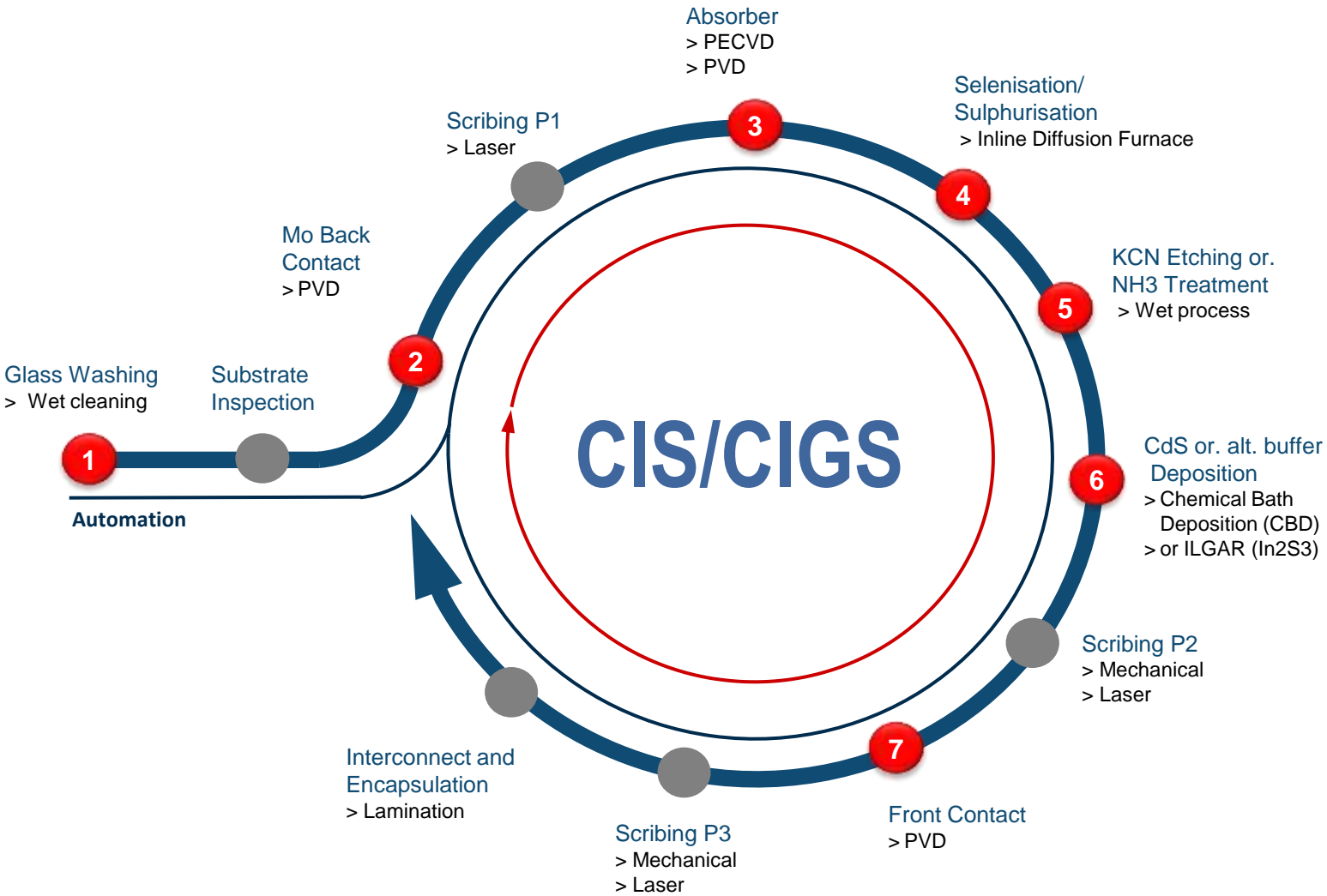
SOLARE System for Inline Production of Si Solar Cells with LINEA and two SINGULAR & a back-end with double capacity offering approx. 60 MW







## SINGULUS enables cost-effective CIS/CIGS & CdTe Thin Film Cell Manufacturing

- Wet Processing
- Alternative Cd-free Buffer Layer - ILGAR
- Inline Diffusion Furnace
- Transparent Conductive Oxide (TCO) etching as wet bench
- Washing machines





Singulus Product Portfolio	
1	VITRUM Clean
2	PVD Back Contact
3	PVD Absorber
4	INSE
5	VITRUM KCN
6	TENUIS altn. ILGAR or IMPEDIO
7	PVD TCO

-  SINGULUS
-  Cooperation Partner
-  Singulus Automation
-  Process Support/ Integration

## Wet Process Applications / Cleaning / Washing / Etching Coating



**CIS/CIGS/CIGSse**

**TENUIS**

Single Side

CdS/ZnS Buffer Layer

Glass Substrates

up to 1600x1200 mm

Inline

**CIS/CIGS/CIGSse**

**IMPEDIO**

Single Side

CdS/ZnS Buffer Layer

Flexible Substrates

up to 1000 mm width

Inline

**CIS/CIGS/CdTe/a-Si**

**VITRUM**

Cleaning/Etching

(e.g. TCO/KCN/NH3)

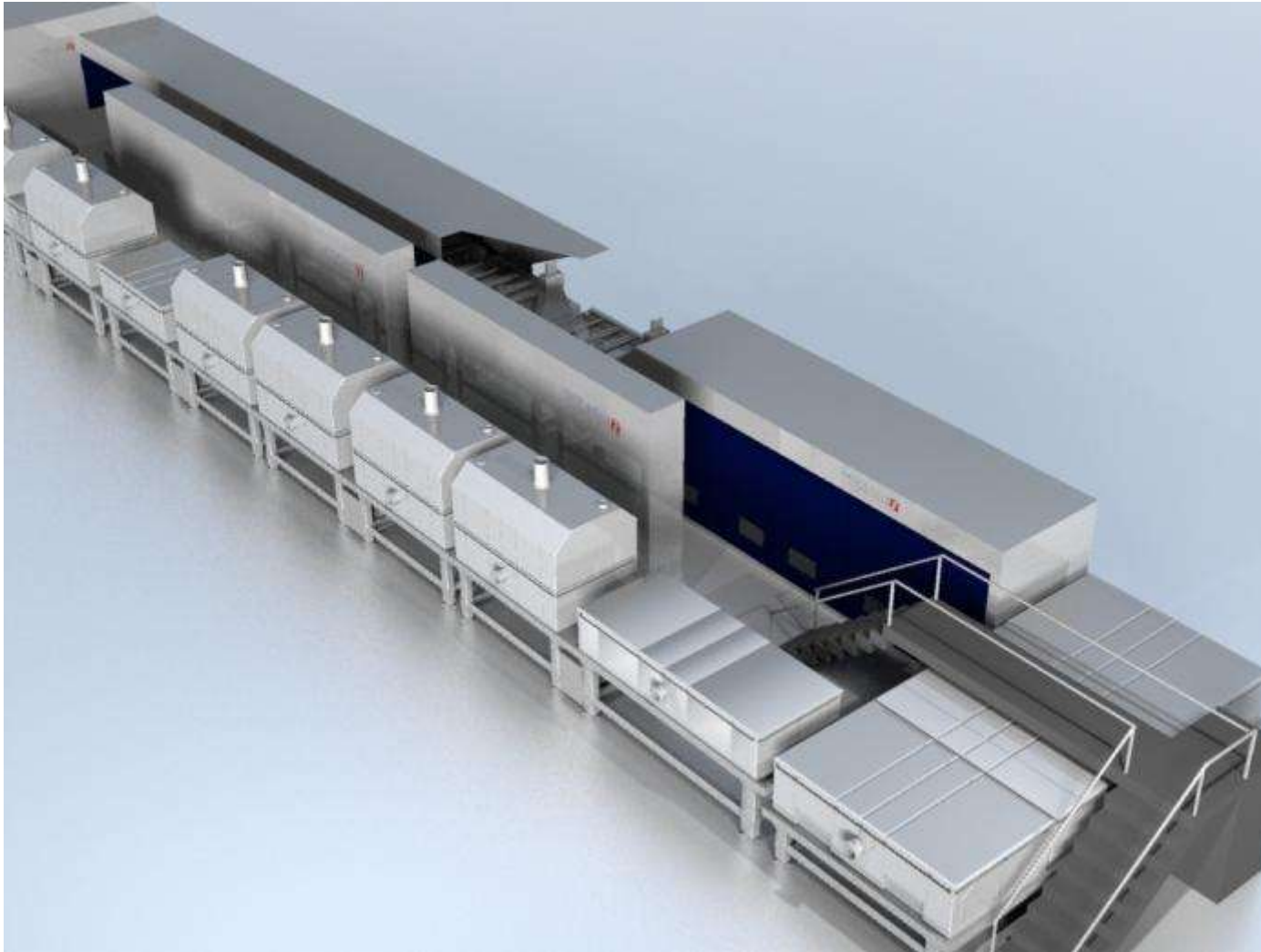
Glass Substrates

up to 2600x2200 mm

Inline



## 2<sup>nd</sup> Generation for Inline Diffusion Furnace Optimized Cycle Time



- Orders for SINGULAR machines
- Integrated PV production systems
- More orders for inline diffusion furnace
- Stronger thin film market
- Active R & D for new cell design
- Stronger development of the asian sales network

- 1<sup>st</sup> Order for inline diffusion furnaces
- FAT for 1<sup>st</sup> front end system
- Complete solutions with partners

- Cooperation with HZB for ILGAR
- Large Order for flexible CIGS solar cells
- Shipment of 1<sup>st</sup> SINGULAR

- Takeover of Stangl
- Start of SINGULAR development
- Inline Wet Processing for SI cells

2007

2010

2011

## 1. Clear Product Strategy

- Best of Class PV Production Equipment
  - Innovation
  - Cost reduction
  - High yield + high throughput
- Integrated PV Production Systems
  - Inline Solution
  - Automated Handling
- Optional Complete PV Lines
  - Complete solutions with partners

## 2. Active participation in new cell design

## 3. Contribution to reach grid parity faster

## 4. Integrator of PV production technology

## 5. Transfer of „Optical Disc“ inline concept to PV production



## Optical Disc

- Only global one-stop supplier and No. 1 for Blu-ray equipment
- Strong growth for Blu-ray in the next years
- Profitable products with good margins
- Strong growth for Blu-ray machines in 2010 achieved
- Production know how for the coming market of rewritable/recordable Blu-ray (BD-RE/BD-R)

## Solar

- Projects for complete systems in negotiations
- Well positioned in attractive, sharply growing solar market
- SINGULUS AR coating technology establishing itself
- Setup of improved sales network in Asia
- Solar segment expected to break-even in 2011

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## Forward-Looking Statements

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