



*Solar powering a green future™*

# Suntech Product Features and Benefits

February 2011

# Agenda




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1. Product Portfolio
2. Product Benefits
3. Product Outlook

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# Product Portfolio

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	<p><b>Standard</b></p> <p>STP 190S-24/Ad+</p> <p>STP 205-18/Ud</p> <p>STP 225-20/Wd    STP 245S-20/Wd</p> <p>STP 230-20/Wd</p>	<p><b>High Efficient</b></p> <p>PLUTO 215 Udm</p> <p>PLUTO 200 Ade</p>	<p><b>Design</b></p> <p>Just Roof 187</p> <p>Just Roof 195</p>
	<p><b>Standard</b></p> <p>STP 205-18/Ud</p> <p>STP 225-20/Wd    STP 245S-20/Wd</p> <p>STP 230-20/Wd</p>	<p><b>High Efficient</b></p> <p>PLUTO 215 Udm</p> <p>PLUTO 200 Ade</p>	<p><b>Large Scale</b></p> <p>STP 280-24/Vd</p>
	<p><b>Standard</b></p> <p>STP 225-20/Wd    STP 245S-20/Wd</p> <p>STP 230-20/Wd</p>		<p><b>Large Scale</b></p> <p>STP 280-24/Vd</p>

Aktuell

Zukünftig

## STP 190S-24/Ad+

- 190 Wp nominal power
- almost square monocrystalline cells
- 72 cells à 5 inch (125 x 125)
- handy format 1580 x 808 mm
- weight 15,5 kg
- glass thickness of 3,2
- excellent module efficiency of 14,9%
- silver frame
- drainage holes



## STP 205-18/Ud

- ❑ 205 Wp nominal power
- ❑ polycrystalline cells
- ❑ 54 cells à 6 inch (156 x 156)
- ❑ handy format 1482 x 992 mm
- ❑ 16,8 kg weight
- ❑ glass thickness of 3,2 mm
- ❑ high module efficiency of 13,9%
- ❑ silver frame
- ❑ drainage holes



## STP 225-20/Wd

- 225 Wp nominal power
- polycrystalline cells
- 60 cells à 6 inch (156 x 156)
- standard format 1665 x 991 mm
- 19,8 kg weight
- glass thickness of 3,2 mm
- high module efficiency of 13,6%
- silver frame
- drainage holes



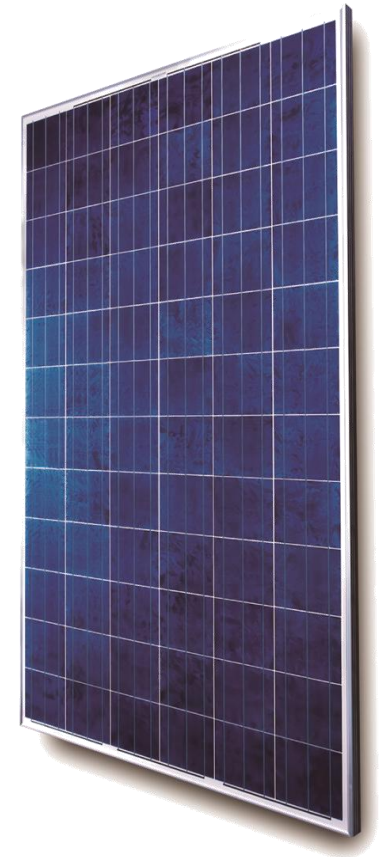
## STP 245S-20/Wd

- 245 Wp nominal power
- monocrystalline cells
- 60 cells à 6 inch (156 x 156)
- standard format 1665 x 991 mm
- 19,8 kg weight
- glass thickness of 3,2 mm
- high module efficiency of 14,8%
- silver frame
- drainage holes



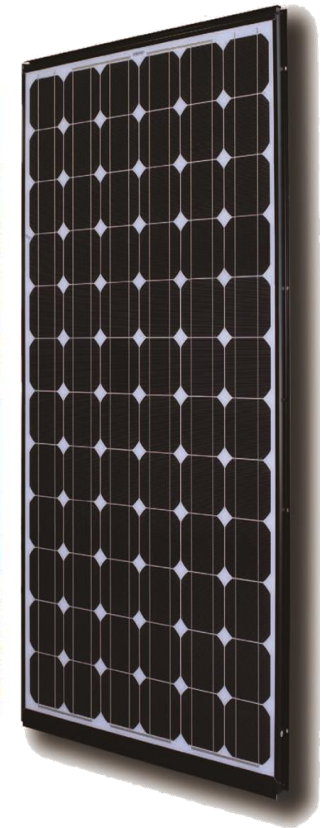
## STP 280-24/Vd

- 280 nominal power
- polycrystalline cells
- 72 cells à 6 inch (156 x 156)
- large scale 1986 x 992 mm
- 27 kg weight
- glass thickness of 4 mm
- excellent module efficiency of 14,51%
- silver frame
- drainage holes



## Just Roof™ – Fully Integrated PV System

- 187 Wp / 195 nominal power
- monocrystalline cells
- 72 cells à 5 inch (125 x 125)
- handy format 1621 x 841 mm
- 15 kg weight
- glass thickness of 3,2 mm
- aesthetic appearance
- black frame
- BIPV system (CSTB ongoing)



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# Product Benefits



Quelle: Installer Monitor EUPD Research 2010

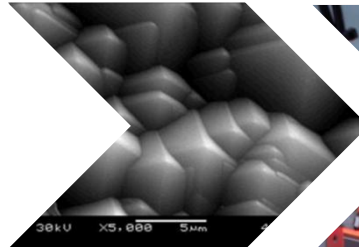
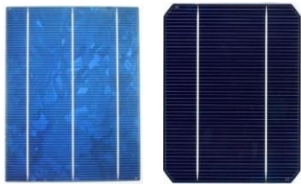


Quelle: Installer Monitor EUPD Research 2010

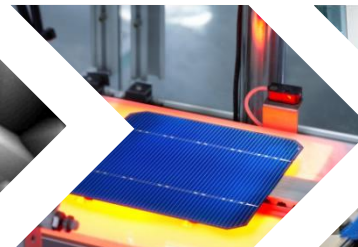
# Product Benefits - Quality

## 52 steps at the quality control:

### several check points on cell level



Intake control



div. measurements

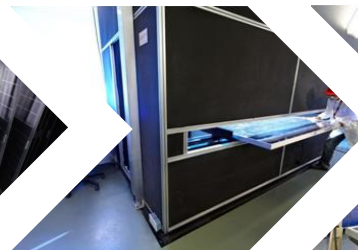


final inspections

### several check points on module level



components



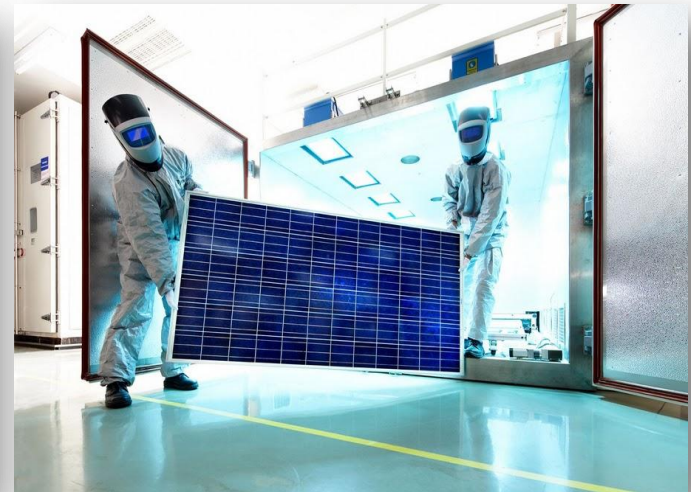
Module measurements



Pre delivery check

## Certified In-House Test Lab:

- SUNTECH is one of the few module manufacturer with an own test lab
- 1.400 m<sup>2</sup> canopied test area (biggest in China)
- 7.000 m<sup>2</sup> outdoor test area
- capable with more than 50 different kinds of tests according to or even beyond the IEC 61215 / 61730) and UL 1703 standard
- spot testing of raw materials, new products and production modules (5pc/line/week)





Quelle: Installer Monitor EUPD Research 2010

# Product Benefits - Performance

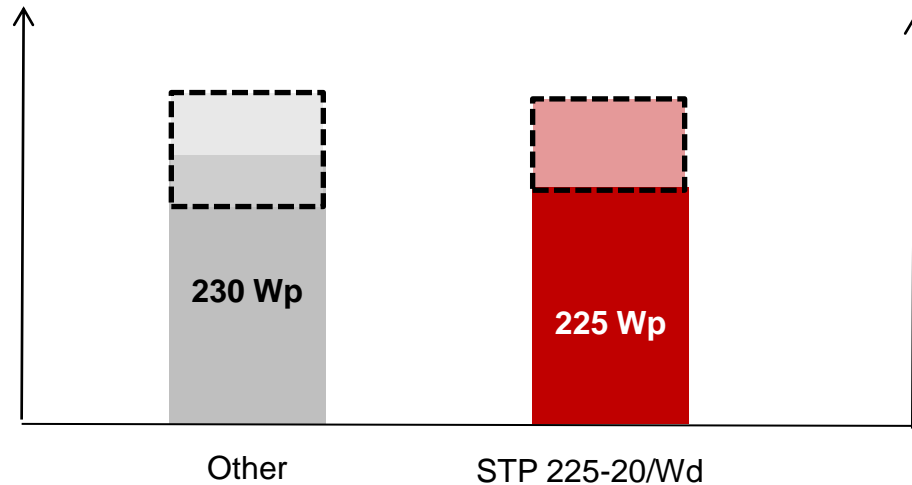


## Performance on Module Level:

- Positive Power tolerance von 0 – 5%

Suntech	Sharp	SunPower	Kyocera	First Solar	Yingli
0/+5W %	-5%/10%	±5%	±5%*	±5%	±3%

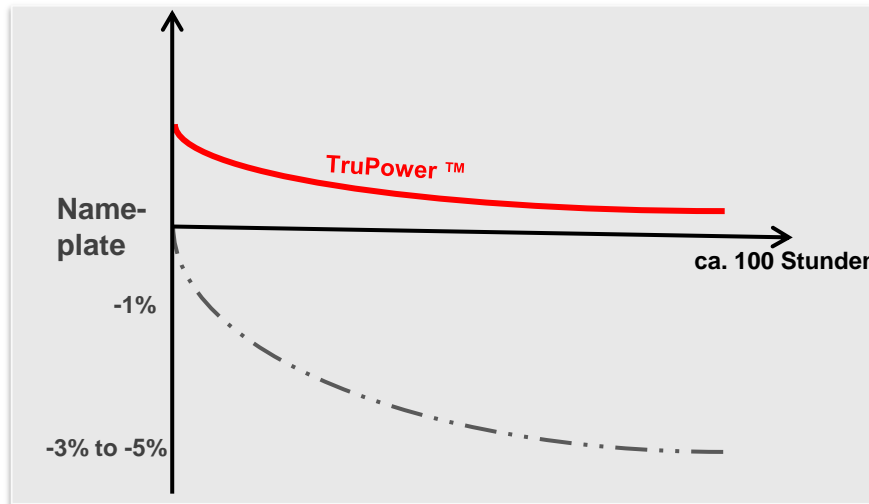
\*below 205W (other: 0/+5W)





## Performance on Module Level:

- SUNTECH's TruPower™ neutralizes the initial LID effect



**SuntechTruPower™ Process**

Industrial Standard Cell Process

- Industry Standard Doping Process causes 3-5% initial LID (3-5 % LID)
- Suntech TruPower™ Process virtually eliminates the initial LID effect (0 % LID)

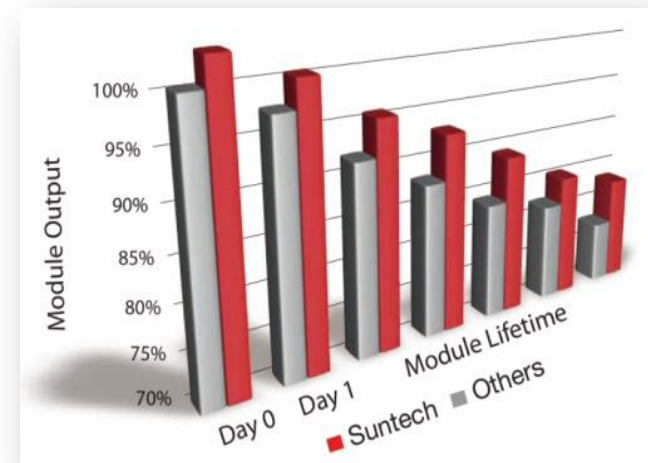
# Product Benefits - Performance

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## Performance on Module Level :

- SUNTECH' s TruPower™ means for you:
  - ✓ modules with **high power** at average
  - ✓ modules **without LID** effect
  - ✓ guaranteed **nominal power**
  - ✓ **Customer satisfaction** due to better PV system performance
  - ✓ improved **refinancing** time
  - ✓ more power for the **same money**



**You get at the least what you have paid for.**

# Product Benefits - Performance



## Performance On System Level:

- SUNTECH´ s current sorting
- In a serial connection the weakest current determines the total strength of current in the string
- Example taken from a customer flash list:

Installed capacity <b>without</b> current sorting			
<b>String 1</b> Ø 222,6 Wp à 25	Impp Max. 7,82 A	$\Delta = 0,21 \text{ A}$	= Ø 216,66 Wp à 25
	Impp Min. 7,61 A	$\Delta = 2,69\%$	
<b>String 2</b> Ø 222,6 Wp à 25	Impp Max. 7,85 A	$\Delta = 0,20 \text{ A}$	= Ø 216,93 Wp à 25
	Impp Min. 7,65 A	$\Delta = 2,55\%$	
<b>String 3</b> Ø 222,3 Wp à 25	Impp Max. 7,81 A	$\Delta = 0,25 \text{ A}$	= Ø 215,14 Wp à 25
	Impp Min. 7,56 A	$\Delta = 3,20\%$	
<b>String 4</b> Ø 222,9 Wp à 25	Impp Max. 7,77 A	$\Delta = 0,24 \text{ A}$	= Ø 216,05 Wp à 25
	Impp Min. 7,53 A	$\Delta = 3,09\%$	
			<b>= 21,62 kWp</b>



## Performance On System Level :

- Without current sorting the installer gives away power
- Due to FIT cuts it is more and more difficult to get a good ROI

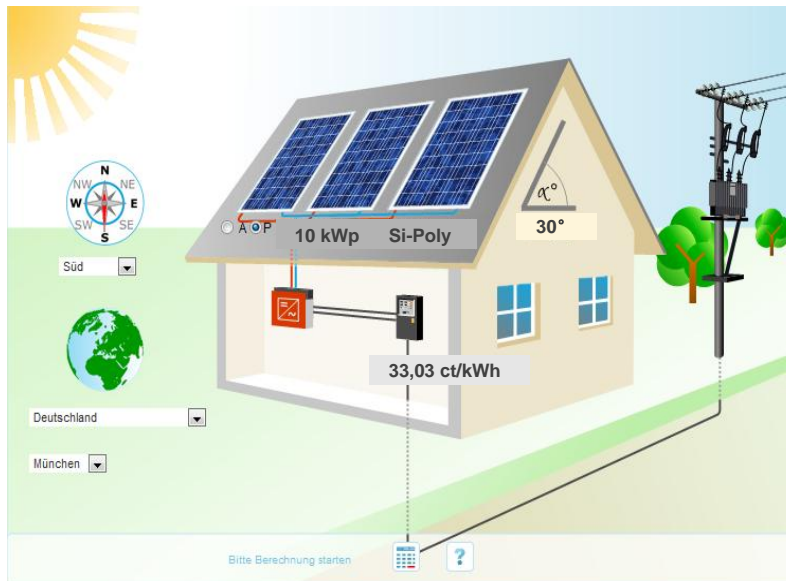
Installed capacity <b>with</b> current sorting			
<b>String 1</b> Ø 221,4 Wp à 25	Impp Max. 7,65 A	$\Delta = 0,12 \text{ A}$	= Ø 217,92 Wp à 25
	Impp Min. 7,53 A	$\Delta = 1,57\%$	
<b>String 2</b> Ø 222,5 Wp à 25	Impp Max. 7,68 A	$\Delta = 0,03 \text{ A}$	= Ø 221,63 Wp à 25
	Impp Min. 7,65 A	$\Delta = 0,39\%$	
<b>String 3</b> Ø 223,5 Wp à 25	Impp Max. 7,73 A	$\Delta = 0,05 \text{ A}$	= Ø 222,04 Wp à 25
	Impp Min. 7,68 A	$\Delta = 0,65\%$	
<b>String 4</b> Ø 222,9 Wp à 25	Impp Max. 7,85 A	$\Delta = 0,12 \text{ A}$	= Ø 219,68 Wp à 25
	Impp Min. 7,73 A	$\Delta = 1,53\%$	
			<b>= 22,03 kWp</b>



## Performance On System Level :

- Installed capacity without current sorting: 21,62 kWp
- Installed capacity with current sorting: 22,03 kWp

$\Delta$  0,41 kWp -> 2%



2% means in € (10 kWp):

= 66\* € /year

= 1320\* € /20 years

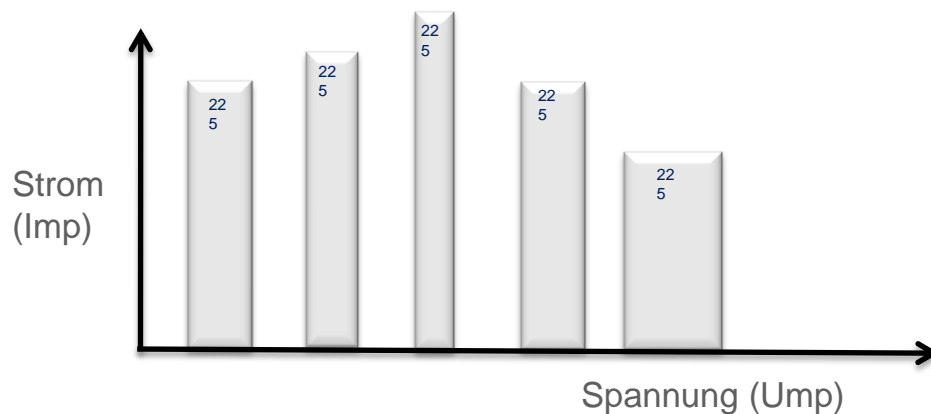
\* Suntech takes no responsibility for errors and/or omissions with regards to the content

Roof angle= 30°  
orientation = Süd  
location = Munich, Germany



## Performance On System Level :

- All SUNTECH core products are presorted
- SUNTECH doesn't calculate an extra fee
- Better system performance guarantees customer satisfaction
- Delivery comes in three different classes: I1, I2 und I3



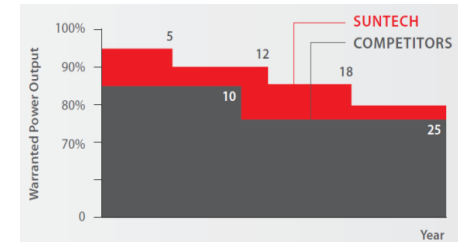


Quelle: Installer Monitor EUPD Research 2010

# Product Benefits - Reliability

## Product and power output warranty:

- 5 years of product warranty
- Equated power output warranty
- Based on the nominal power



Suntech	Sharp	SunPower	Kyocera	First Solar	Yingli
95% / 5 years 90% / 12 years 85% / 18 years 80% / 25 years	90% / 10 years 80% / 25 years	90% at 12 years 80% at 25 years	90% at 10 years 80% at 20 years	90% at 10 years 80% at 25 years	90% at 10 years 80% at 25 years
<i>Pnom</i>	Pmin	Pmin	Pmin	Pnom	Pmin
<i>Warranted Power Advantage:</i>	<b>Suntech +9.0%</b>	<b>Suntech +8%</b>	<b>Suntech +27.9%</b>	<b>Suntech +3.5%</b>	<b>Suntech +6.7%</b>

## Analyze-Project Mercury:

- Analyze of PV systems around the world
- Comparison of the calculated system power to the real power output
- Specific influencing factors (orientation, location etc.) are calculated
- Targets:
  - How is the system performance with Suntech modules?
  - Bankability
  - generating provable selling arguments

Nellis AFB, USA 5/ 14 MW



Trujillo, Spain 35 MW

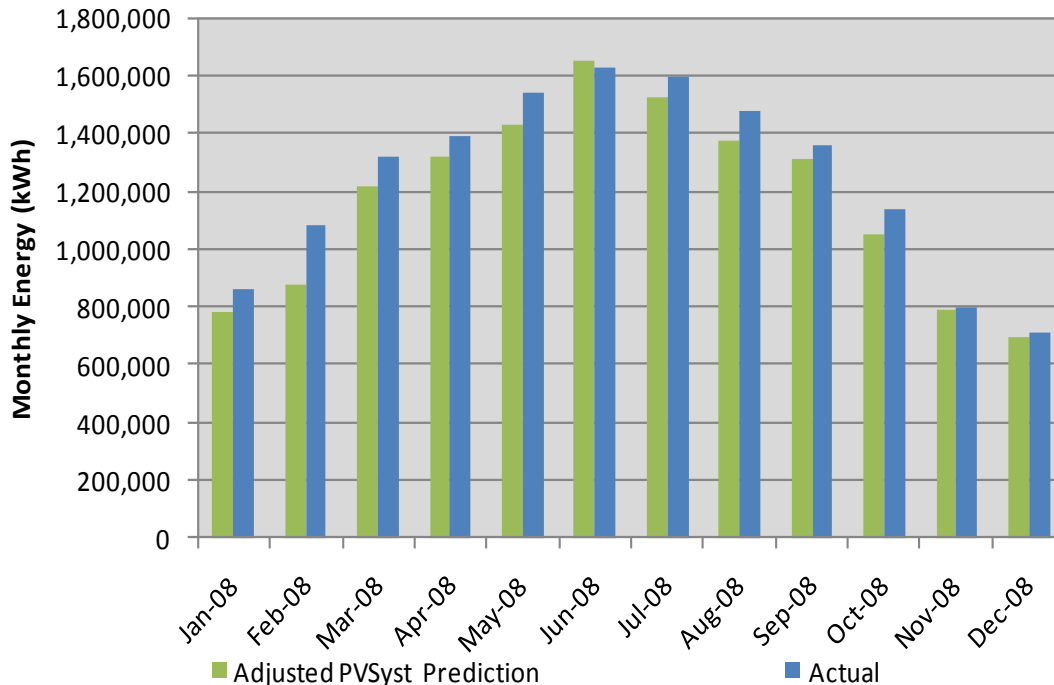


# Product Benefits - Summary

## Project Mercury:

- Analysis:

Real System Performance=	14,889,037
Calculated System Performance=	14,022,479
Over Production=	6%



### System Details

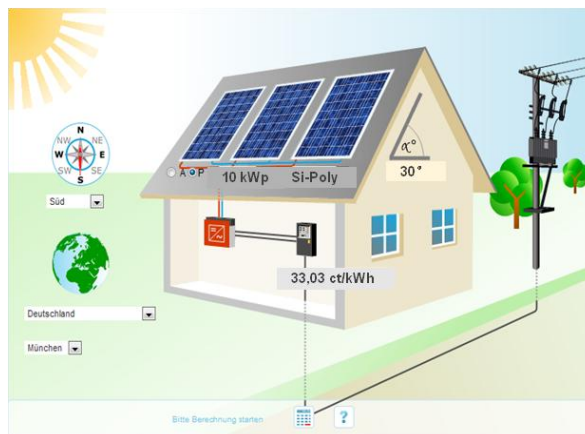
Location:	USA
Climate:	Cool, Bright
System Size:	>5 MW
Application:	Utility
Date of Installation:	December 2007
Type of Module	STP 280W & STP 270W
Type of Inverter	Xantrex GT500E
Mounting Structure:	Wattsun Single-Axis

# Product Benefits - Summary

## PV Sol Simulation:

- Comparison of Suntech modules against big competitors
- Simulation from 18.01.2011 with current technical values

	STP225-20/Wd	YL230-29b	TSL230PC05
Nameplate Power	225 Wp	230 Wp	230 Wp
Yield	1.096 kWh/kWp	1.046 kWh/kWp	1.044 kWh/kWp
<b>Difference to Suntech</b>		<b>- 5%</b>	<b>- 5%</b>



### 5% means in € (10 kWp):

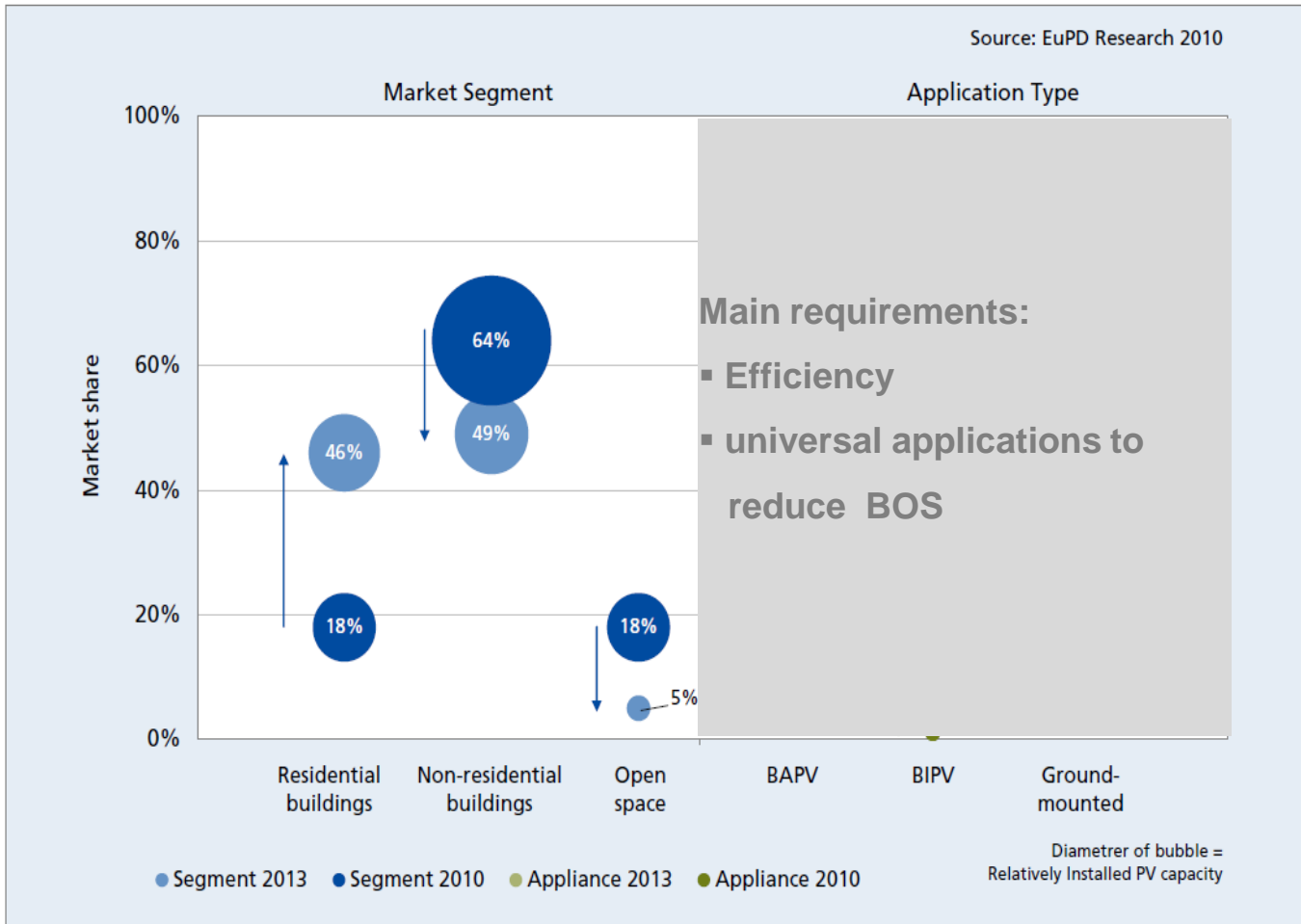
- = ~ 165\* € /year
- = ~ 3300\* € /20 years

\* Suntech takes no responsibility for errors and/or omissions with regards to the content

Roof angle= 30°  
orientation = South  
Location = Munich, Germany

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# Product Outlook



Quelle: Installer Monitor EUPD Research 2010

## HiPerforma PLUTO 200-Ade / 220-Udm

- High efficient modules
- Mono- und polycrystalline cells
- Superior module efficiency from up to 15,7 %
- Silver frame
- Drainage wholes
- Excellent temperature behavior:  
Mono =  $P_{max} -0,38\%/^{\circ} C$  ( $-0,48\%/^{\circ} C$ )  
Poly =  $P_{max} -0,40\%/^{\circ} C$  ( $-0,45\%/^{\circ} C$ )
- **addition to capacity in Q3 2011**



## STP230-20/Wd / STP245S-20/Wd

- Focus on standard module design - 60 cells
- Economy of scale effects
- Mono- und polycrystalline cells
- 6' cells(156 x 156)
- Improving nominal power from poly to 230 Wp (225 Wp)
- Silver frame
- Drainage wholes
  
- **STP245S-20/Wd approx. available in Q2 2011**
- **STP230-20/Wd approx. available in Q3 2011**





Thank you