



The Future of the German PV Market

MAY 24, 2011

June 8–10, 2011

The World's Largest Exhibition
for the Solar Industry

New Munich Trade Fair Centre,
Germany

The World's Leading Exhibition-Series for the Solar Industry

**inter
solar**
connecting solar business

EUROPE
NORTH AMERICA
INDIA
CHINA



INTERSOLAR NORTH AMERICA
San Francisco | USA



INTERSOLAR EUROPE
Munich | Germany



INTERSOLAR CHINA
Shanghai | China



INTERSOLAR INDIA
Mumbai | India



| ABOUT INTERSOLAR EUROPE 2011

The World's Largest Exhibition for the Solar Industry

Exhibition Quick Facts

June 8-10, New Munich Trade Fair Centre

- 2,200 exhibitors
- 1,775,000+ square feet of exhibit space across 15 Halls
- 75,000 trade visitors (expected)

Conference Quick Facts

June 6-10, International Congress Centre Munich

- 200 world-class speakers
- 30+ sessions and workshops
- 2,500 attendees (expected)

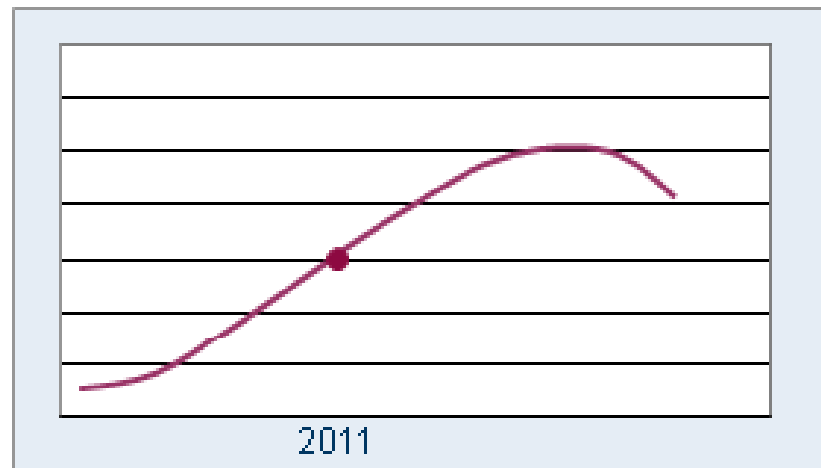
PV BUSINESS SOLUTIONS: RESEARCH, CONSULTING AND COMMUNICATION



- Sustainable integrated business solutions
- More than 650 research, consulting and communication projects successfully accomplished in the PV sector.
- Ten years of PV market experience
- World-market leader in primary research of global PV markets
- Leading consulting company within the CleanTech sector

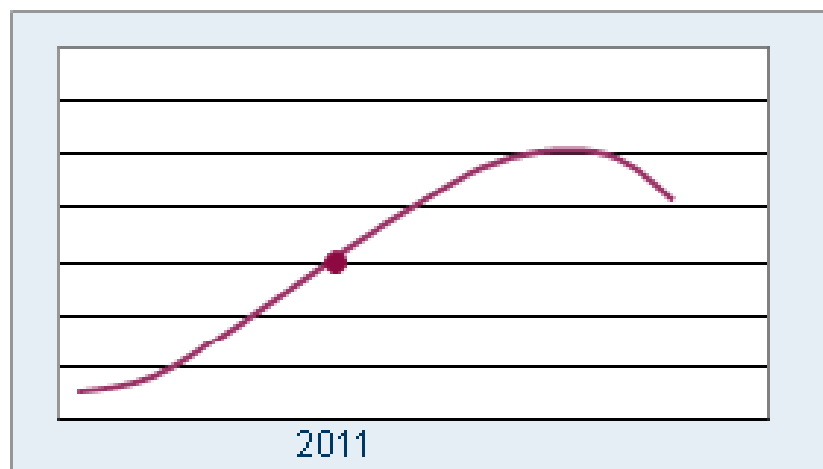
B. CURRENT SITUATION – PRICE DEVELOPMENT

| SATURATION – WHAT IS THE CURRENT STATUS QUO?



- Northern Germany is growing faster than Southern Germany,
- However, in a three year comparison increasing growth rates are to be stated in all regions and segments.
- Top(!)-roofs might already be occupied, however from a life-cycles point of view these are the first movers and the early adapters.

| SATURATION – WHAT IS THE CURRENT STATUS QUO?



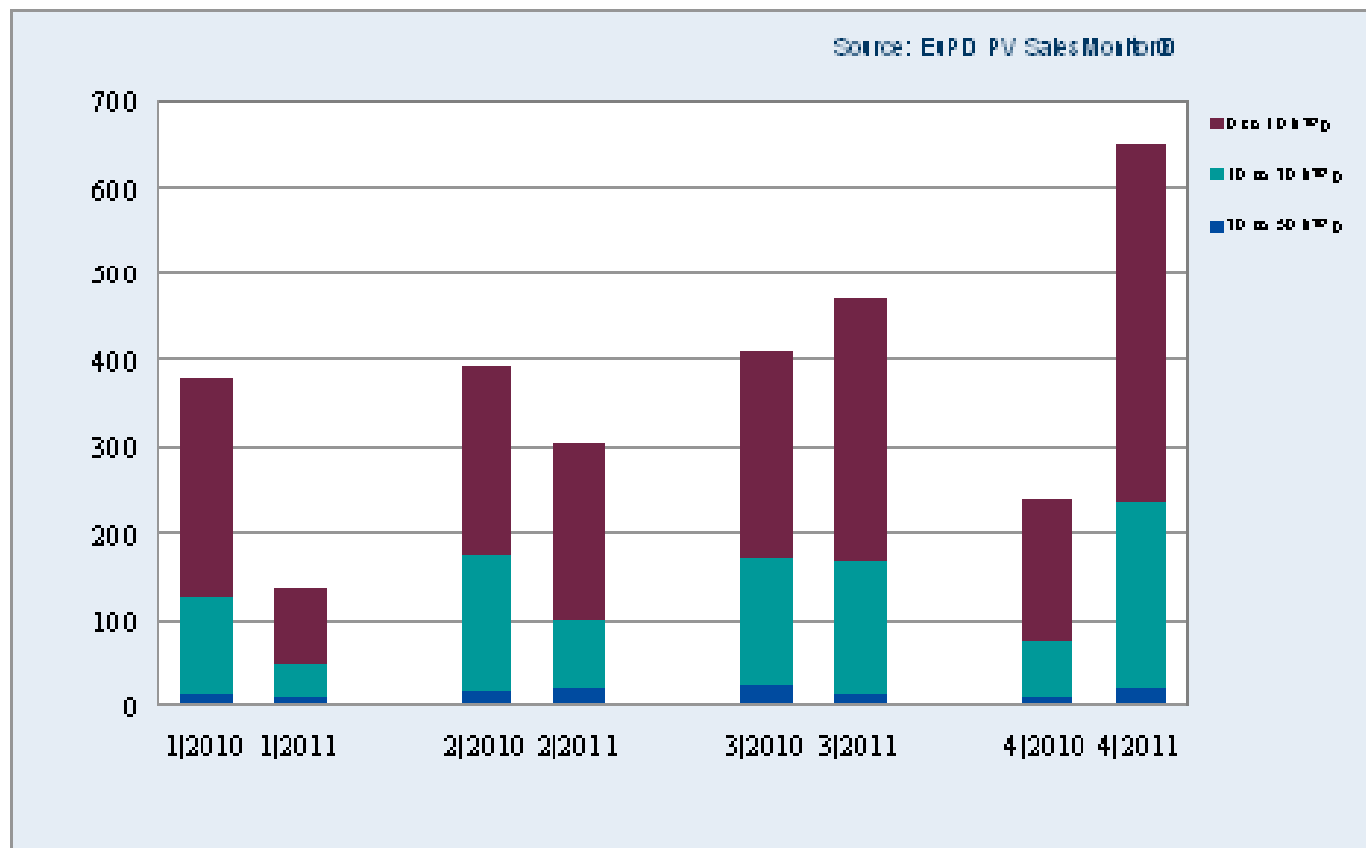
- Northern Germany is growing faster than Southern Germany,
- However, in a three year comparison increasing growth rates are to be stated in all regions and segments.
- Top(!)-roofs might already be occupied, however from a life-cycles point of view these are the first movers and the early adapters.

- The demand is high – at least in the small scale rooftop segment.
- The bigger the system the lower the conversion rate: Customers are waiting for decreasing system prices.

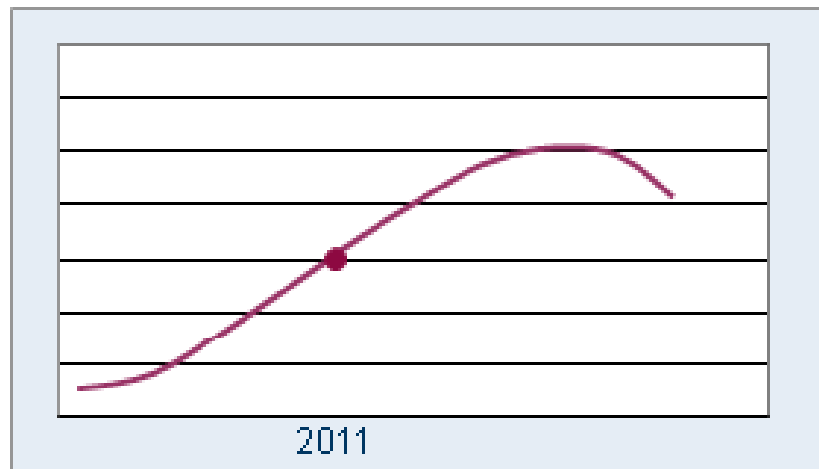
- According to PV Sales Monitor the majority of requested offers (beneath 50 kWp) refer to southern roofs.
- Thin-film or pyramid-shaped modules will help to explore the potential of western roofs.
- Except from the agricultural segment there are no visible indicators for saturation.

| Number of request for quotations is increasing

Requested quotations January to April – a two year comparison



| SATURATION – WHAT IS THE CURRENT STATUS QUO?



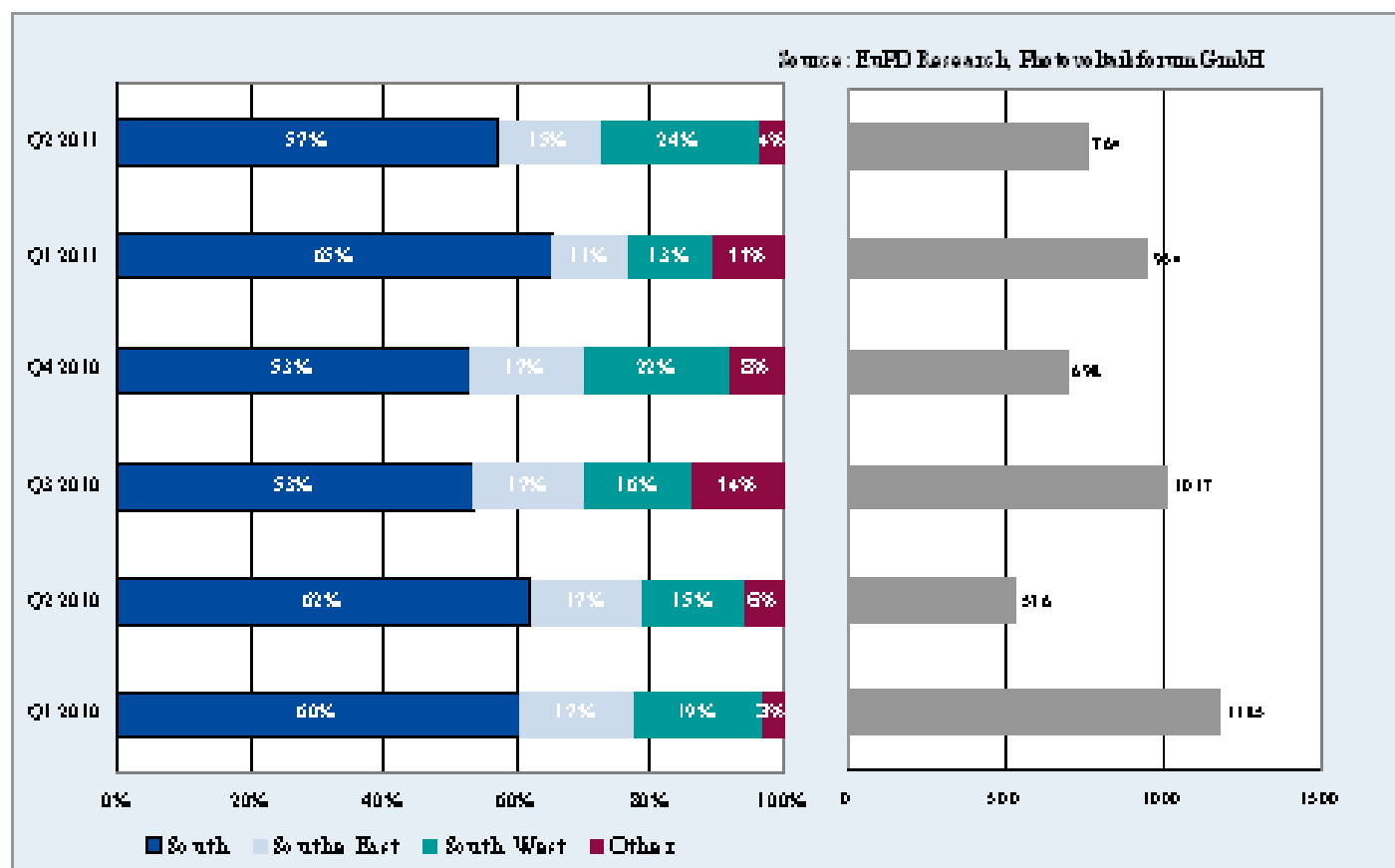
- Northern Germany is growing faster than Southern Germany,
- However, in a three year comparison increasing growth rates are to be stated in all regions and segments.
- Top(!)-roofs might already be occupied, however from a life-cycles point of view these are the first movers and the early adapters.

- The demand is high – at least in the small scale rooftop segment.
- The bigger the system the lower the conversion rate: Customers are waiting for decreasing system prices.

- According to PV Sales Monitor the majority of requested offers (beneath 50 kWp) refer to southern roofs.
- Thin-film or pyramid-shaped modules will help to explore the potential of western roofs.
- Except from the agricultural segment there are no visible indicators for saturation.

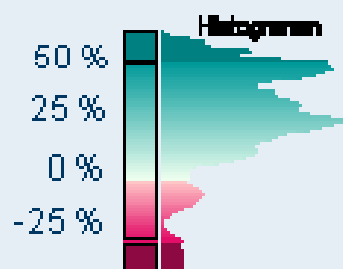
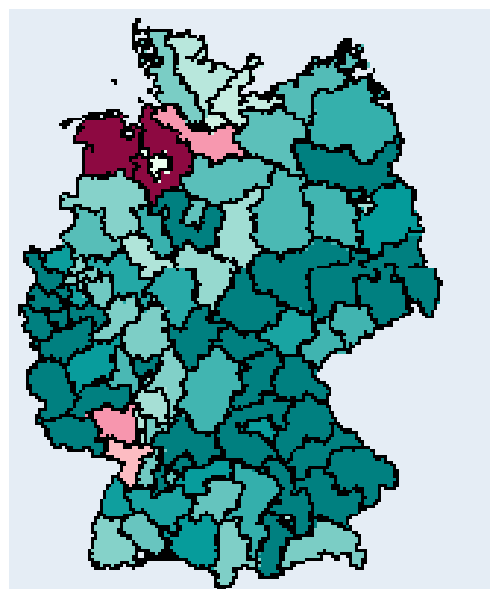
| PV SALES MONITOR – NO INDICATORS FOR SATURATION

Requested quotations January to April – a two year comparison

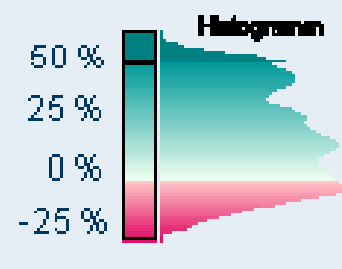
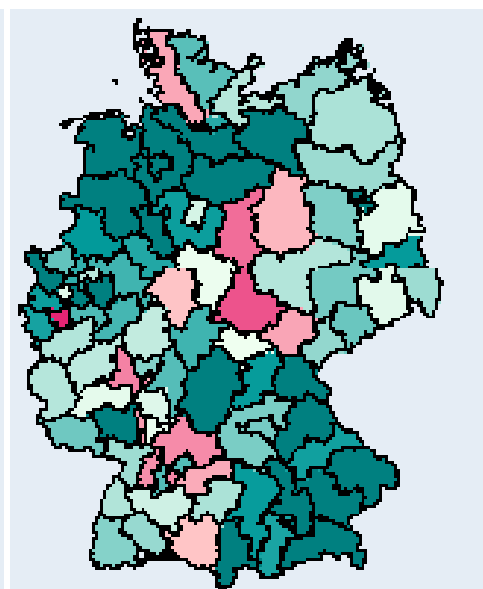


DEMAND - GROWTH IN THE SEGMENT < 10 KWP

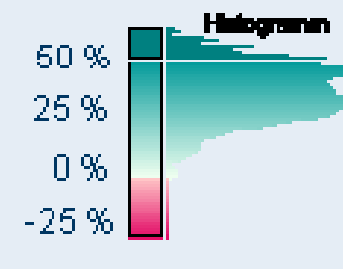
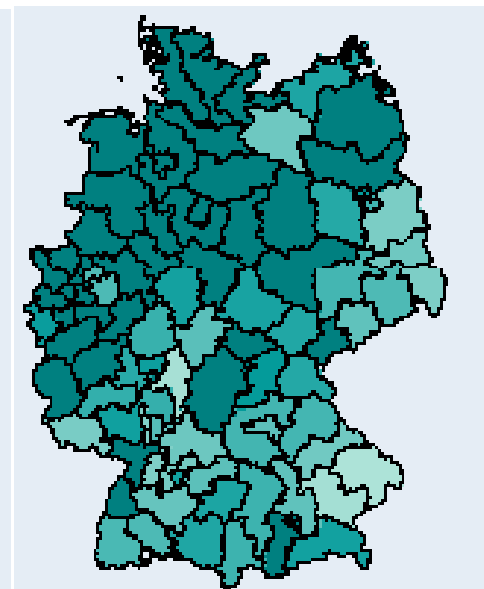
2007 to 2008



2008 to 2009

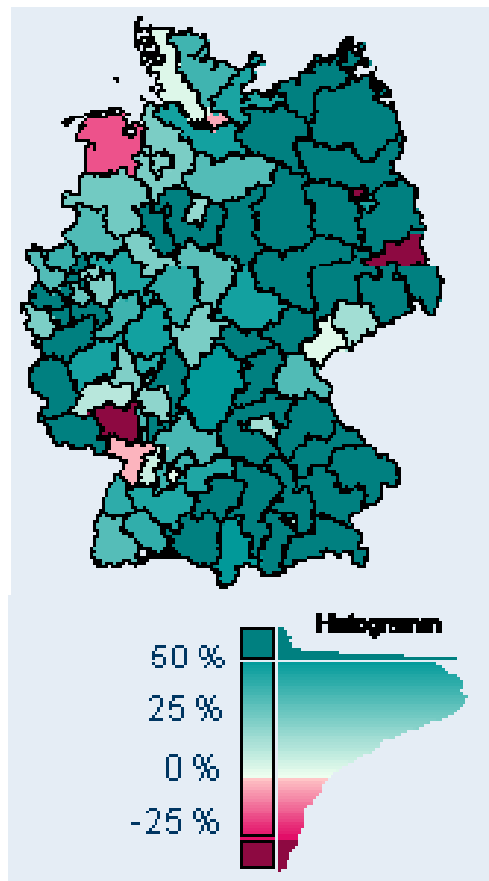


2009 to 2010

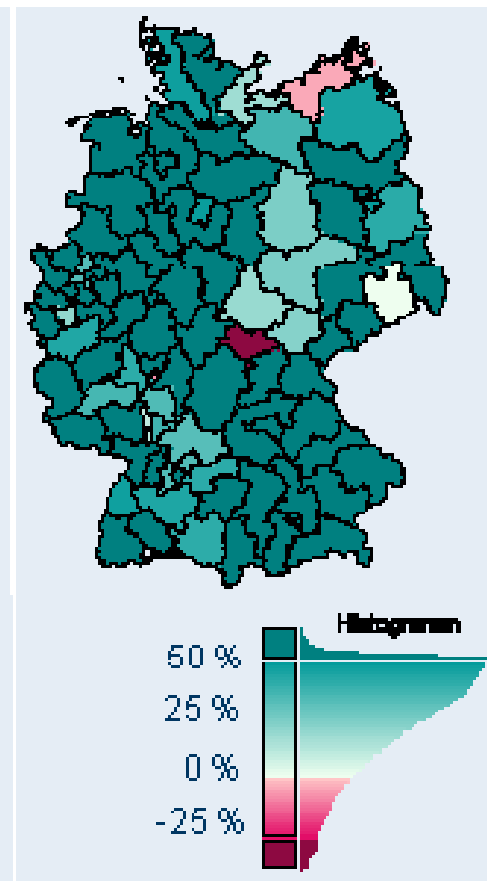


DEMAND - GROWTH IN THE SEGMENT 10 TO 50 KWP

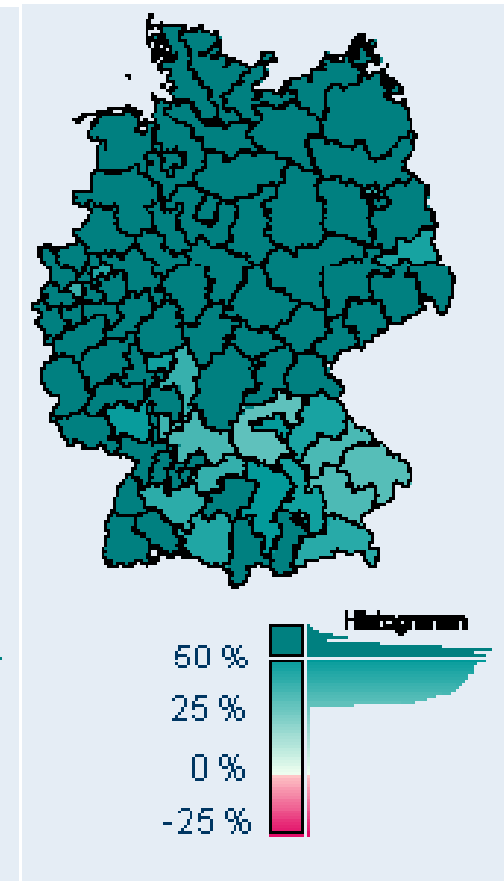
2007 to 2008



2008 to 2009

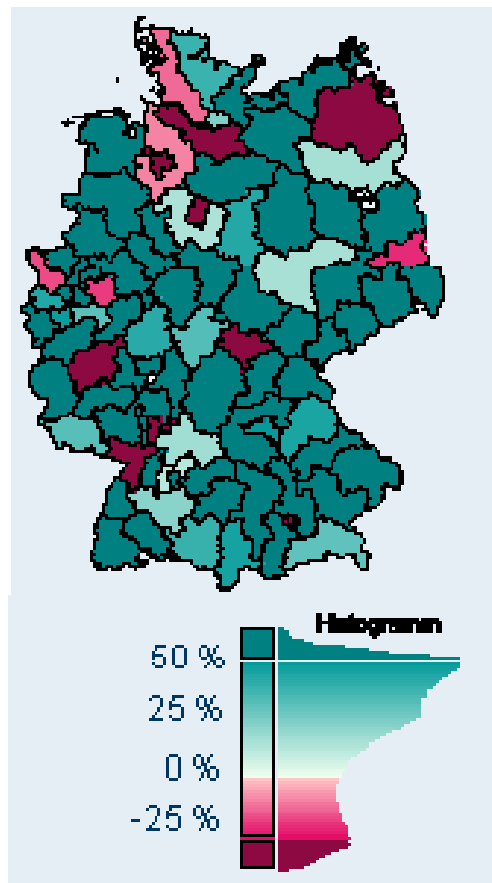


2009 to 2010

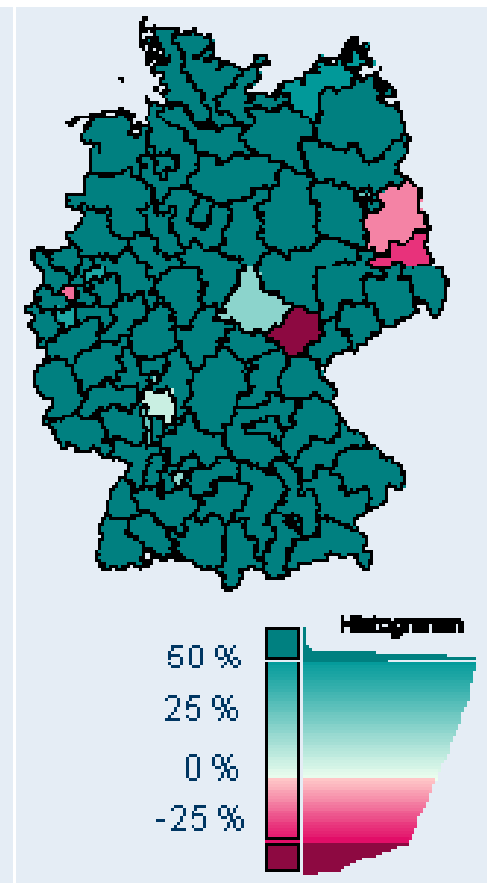


DEMAND - GROWTH IN THE SEGMENT 50 KWP TO 250 KWP

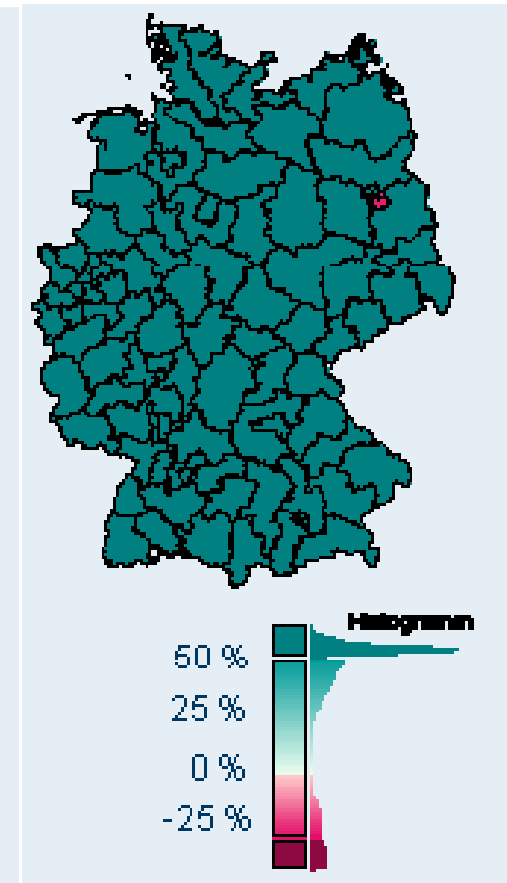
2007 to 2008



2008 to 2009

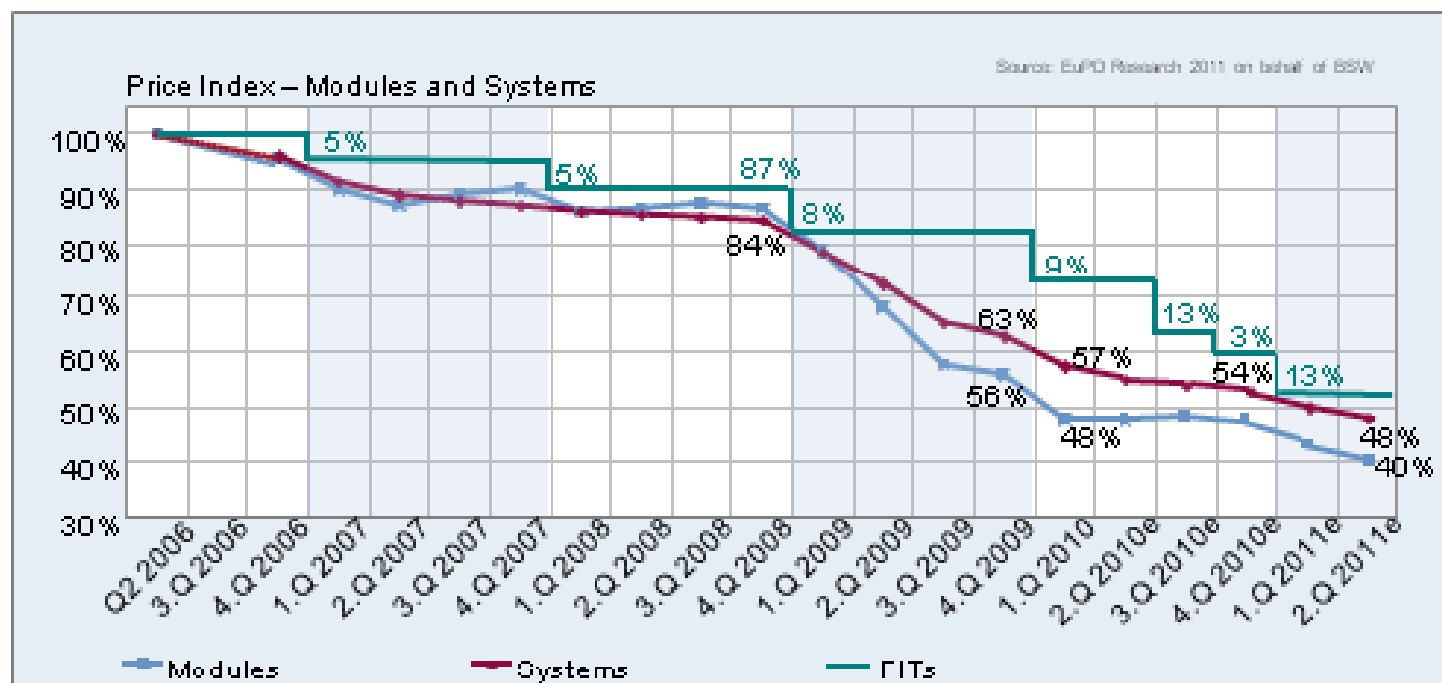


2009 to 2010



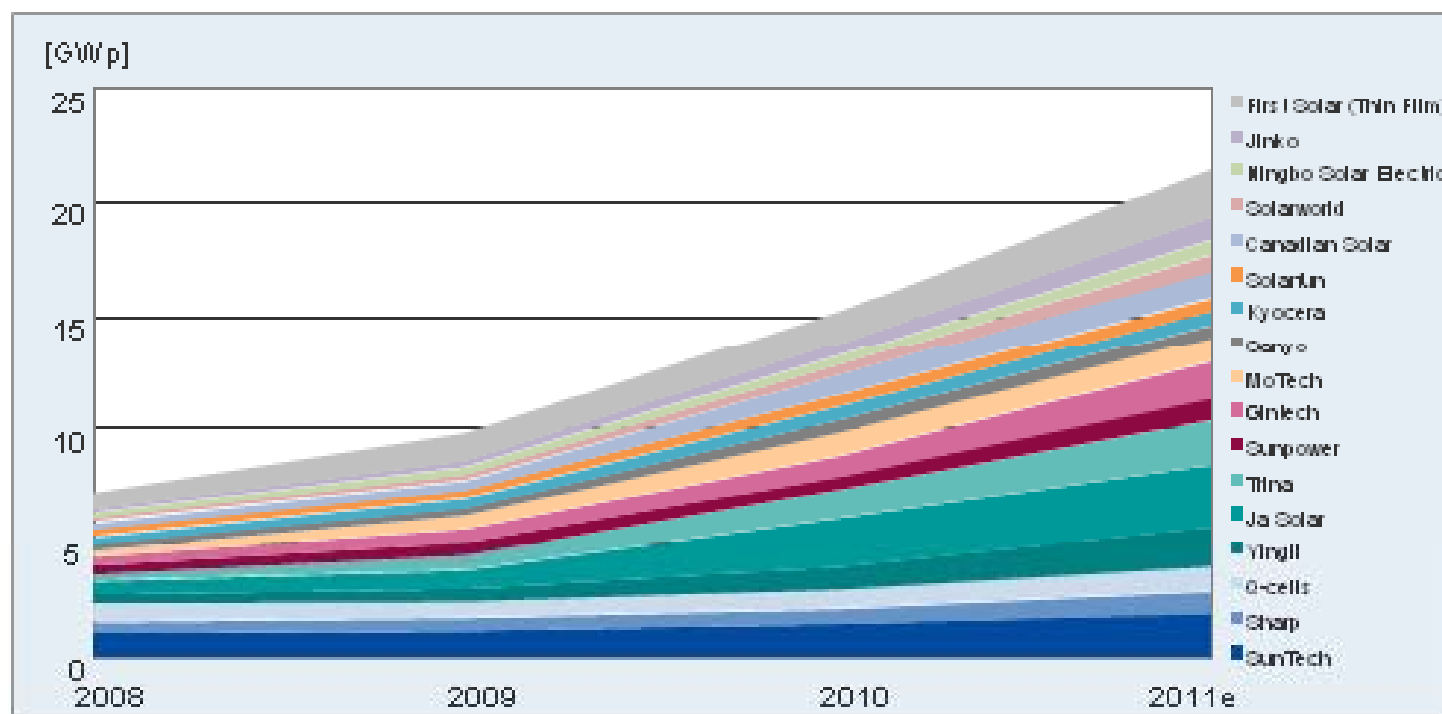
PRICE DEVELOPMENT – INCREASING PRICE DIVERSITY

2010 prices



- The gap between the green and the red curve is becoming wider.
- Prices are already declining.
- Especially the gap between brands is increasing.

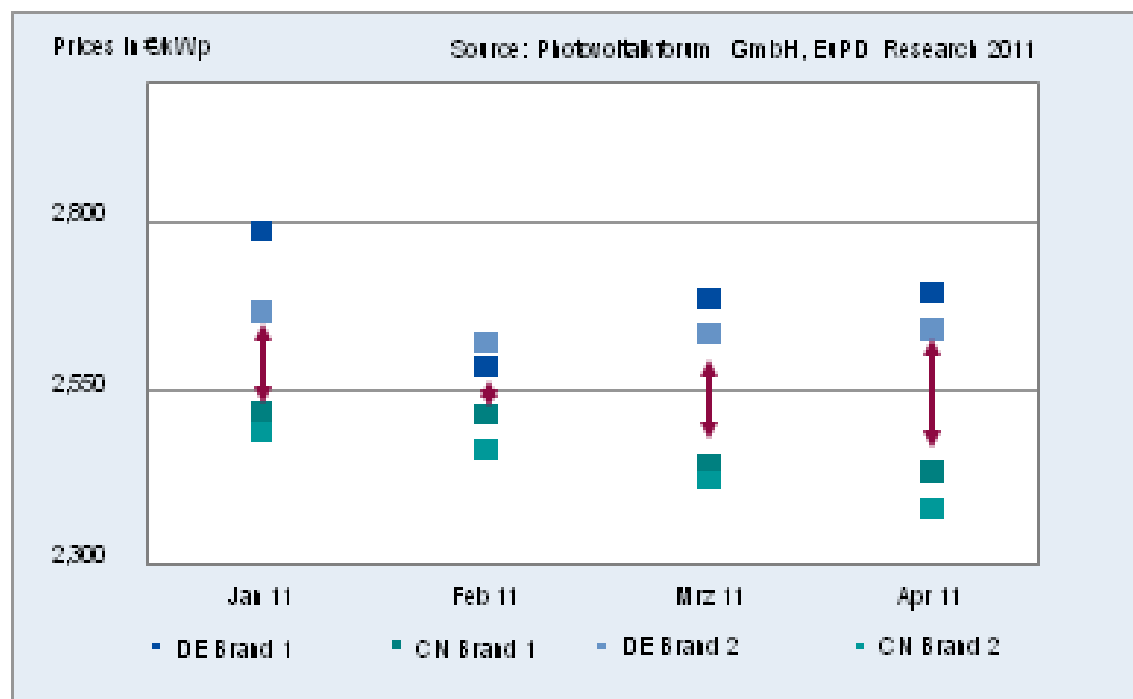
| SUPPLY: + 50 PERCENT COMPARED TO LAST YEAR



- Production capacities of biggest cell manufacturers grew from 9.8 GWp by the end of 2009 to 15.2 GWp by the end of 2010.
- Even if a moderate market growth is assumed the pieces of the cake become smaller.

| THE IMPACT – PRICE DEVELOPMENT

Is a price war impending?

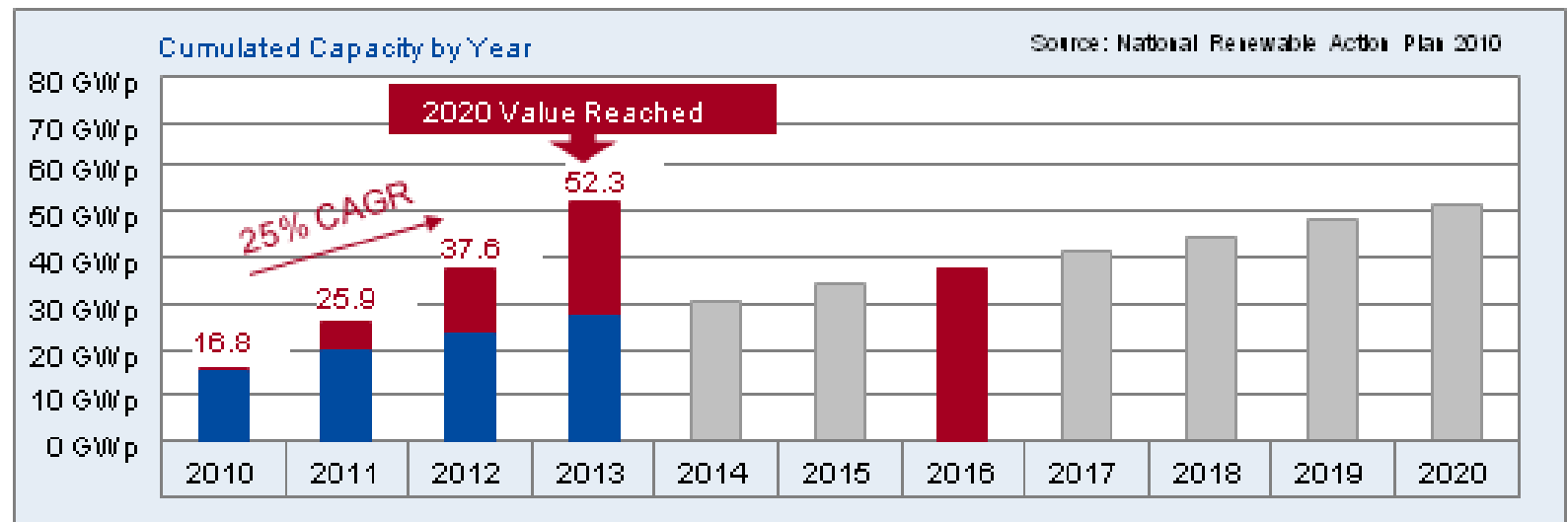


C. THE LEGAL FRAMEWORK – PV & FUTURE ENERGY PORTFOLIO

STARTING POINT II – AND WHERE WE ARE CURRENTLY HEADING

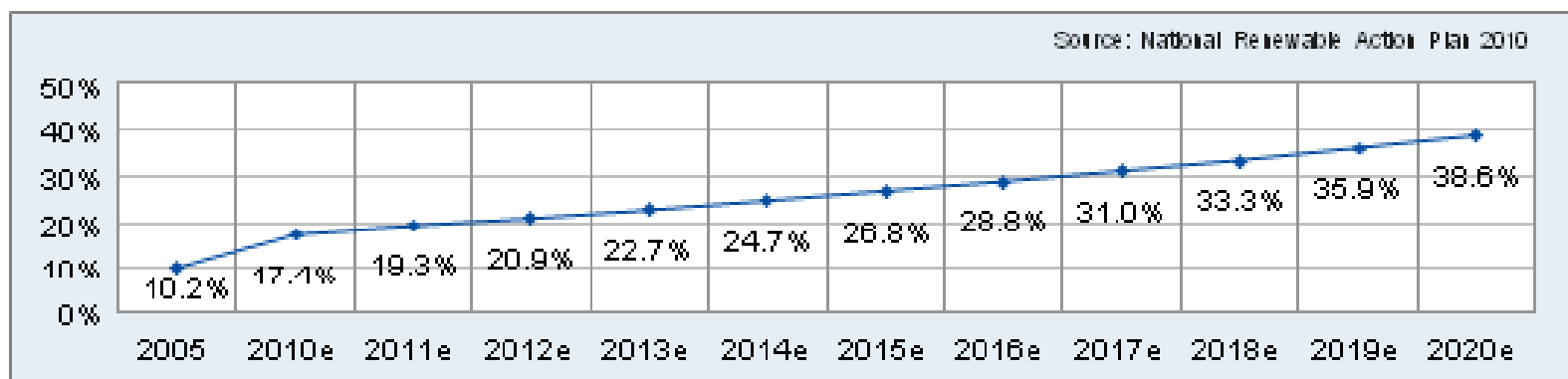
If the market continues growing, the 2020 projections might be in close reach already

- The 2020 projection of 52 GWp is based on an annually installed capacity of 3.5 GWp for years 2012 through 2020.
- If current installation volumes should continue to grow on a moderate level (25 percent) in the next two years, the 2020 projected installations could be reached as early as 2013.
- Even if new installations were to decrease by 20 percent YOY, the projected values will be reached no later than 2016.

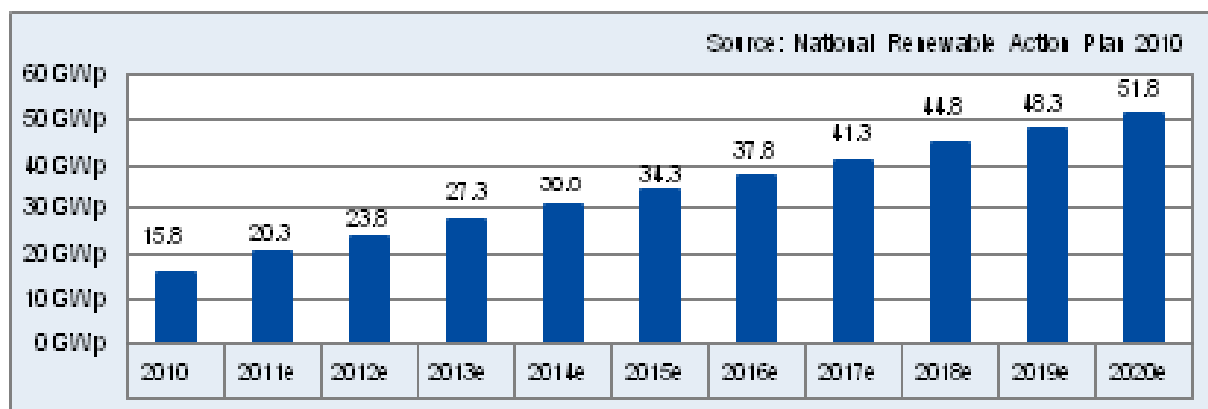


| STARTING POINT I – WHERE PV WAS SUPPOSED TO GO...

The key objective: 39 percent renewable share by 2020



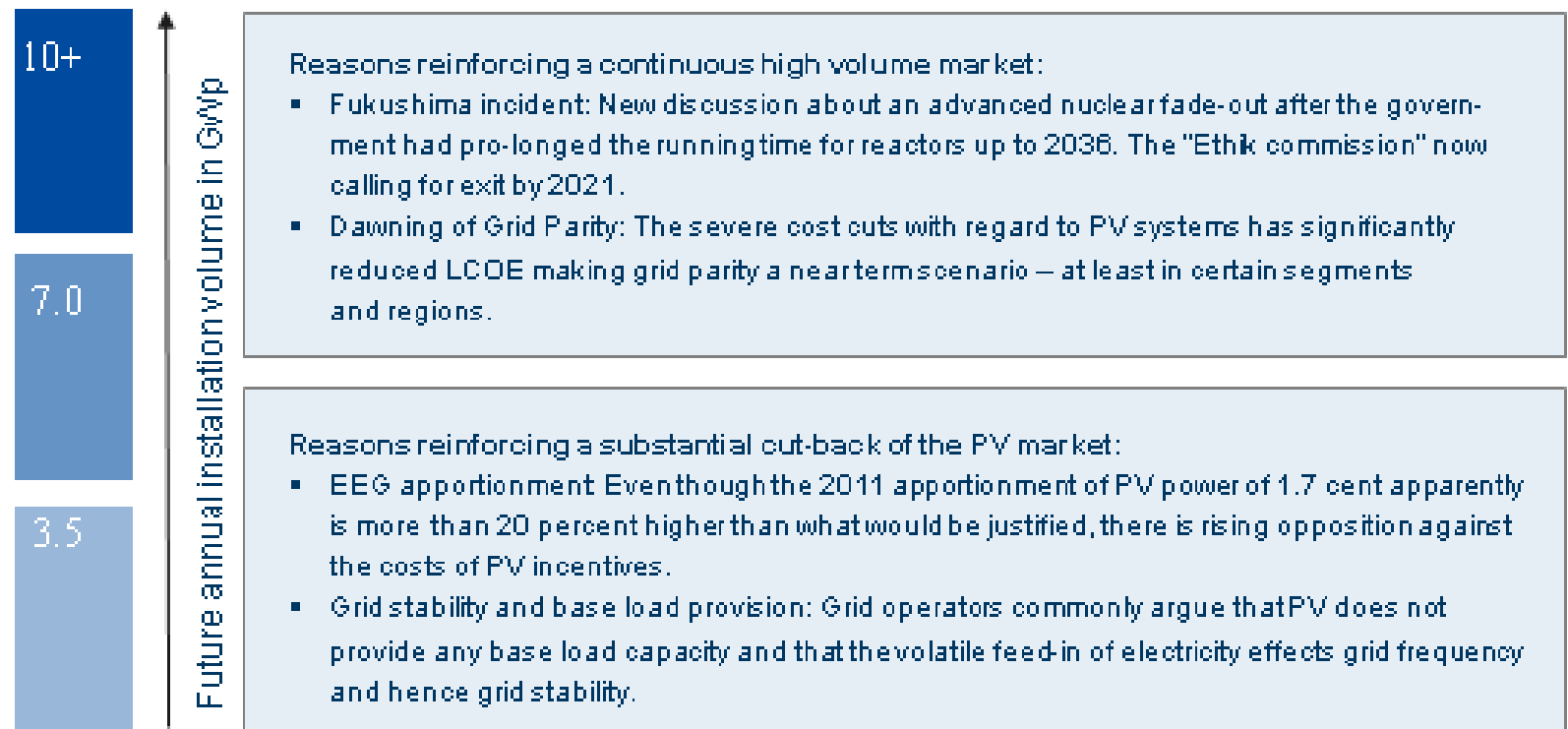
The current projection for PV: 52 GWp cumulated capacity by 2020



I THE CONSEQUENCE: FURTHER ADJUSTMENTS WILL TAKE PLACE...

On 1st January 2012, the new EEG will come into effect

There is no doubt that further FIT reductions will take place to ease down the tremendous growth of the German PV market. However, the Fukushima incident and the newly fueled nuclear power debate might limit the room for cutting back on renewable energy sources.



| SETTING-UP A NEW EEG – THE AMENDMENT PROCESS

The current status of the EEG amendment and key upcoming milestones



| SETTING-UP A NEW EEG – STEP 1: THE EXPERIENCE REPORT

The recently released experience report contains the following recommendations:

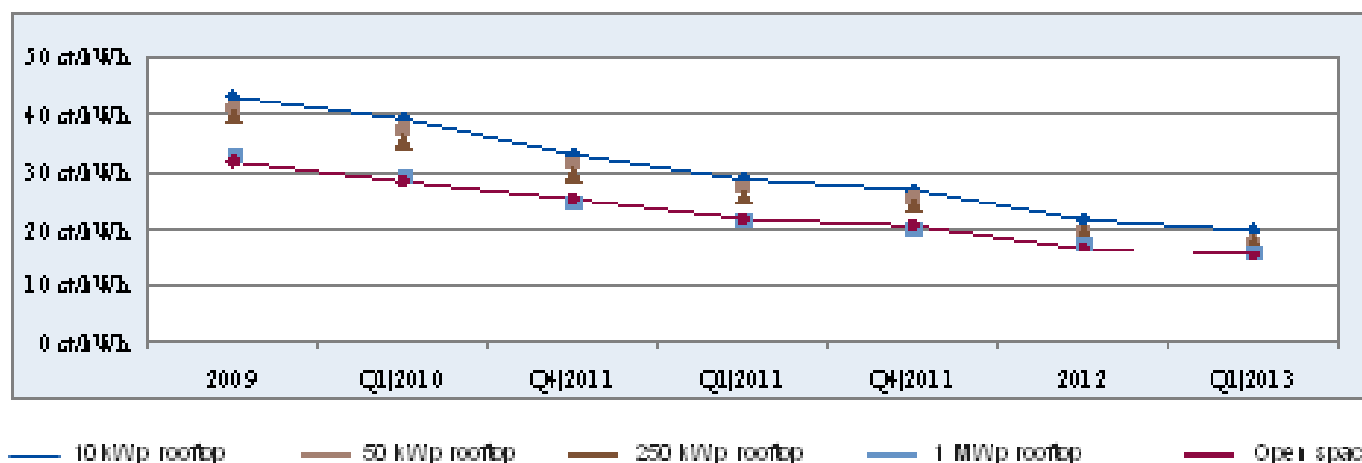
- Re-grouping of rooftop system classes – Three classes instead of four should apply: <30 kWp, 30-500 kWp, >500 kWp
- Maintaining of "breathing cap" mechanism – Maximum degression of 24 percent, thereof up to 9 percent on 1st Jan and up to 15 percent on 1st July (as of 2013)
- Pro-longing of self-consumption premium – The reports calls for additional measures to support R+D with regard to storage solutions, outside the EEG (→ "Förderinitiative Energiespeicher")
- Inclusion of PV into the feed-in management – As indicated in mid 2010, PV will be included in the feed-in management for renewable energies which applies a feed-in stop for peak power situations
- No systems on nature reserves – There will no longer be a FIT for PV systems on conversional sites that are labeled as nature reserves
- No BIPV premium – Premium for façade-integrated systems recommended outside the boundaries of the EEG (e.g. retrofit investment subsidies and R+D support)

EEG EXPERIENCE REPORT | IMPLICATIONS

Key Implication: FiTs will continue to decline

System type	2008	2009	Q1 2010	Q4 2010	Q1 2011	Q4 2011	System type	2012	Q1 2013
up to 30 kWp	46.73	43.01	39.14	33.03	28.74	27.02	up to 30 kWp	21.84	19.88
30-100 kWp	44.48	40.91	37.24	31.42	27.34	25.70	30-500 kWp	19.66	17.89
100-1000 kWp	43.99	39.38	35.23	29.73	25.87	24.32	> 500 kWp	17.47	15.90
> 1000 kWp	43.99	33.00	29.37	24.79	21.57	20.28			
Open space *	33.49	31.94	28.43	25.37	22.07	20.75	Open space *	16.77	15.26

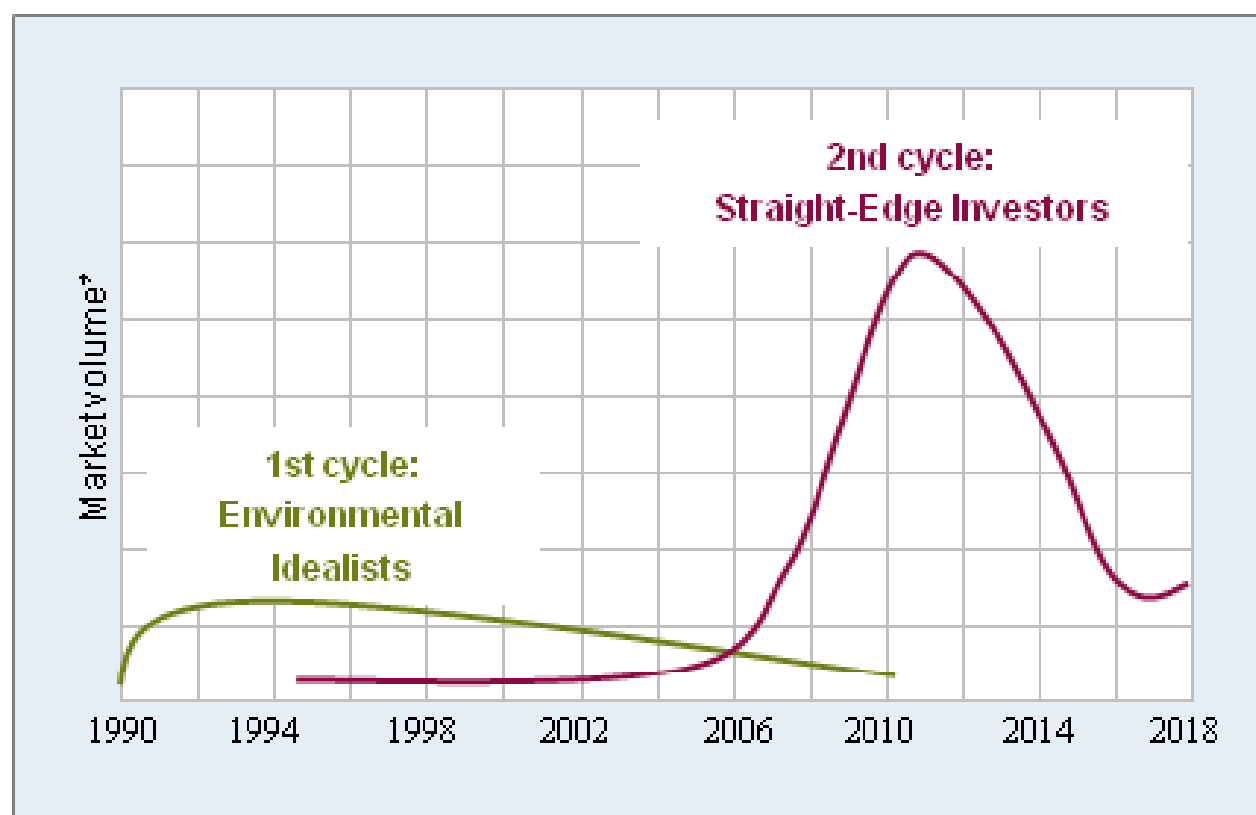
* As of 2010: open space tariff for conversion spaces



D. THE CHALLENGE

| THE ERA OF "STRAIGHT EDGE INVESTORS" IS COMING TO AN END

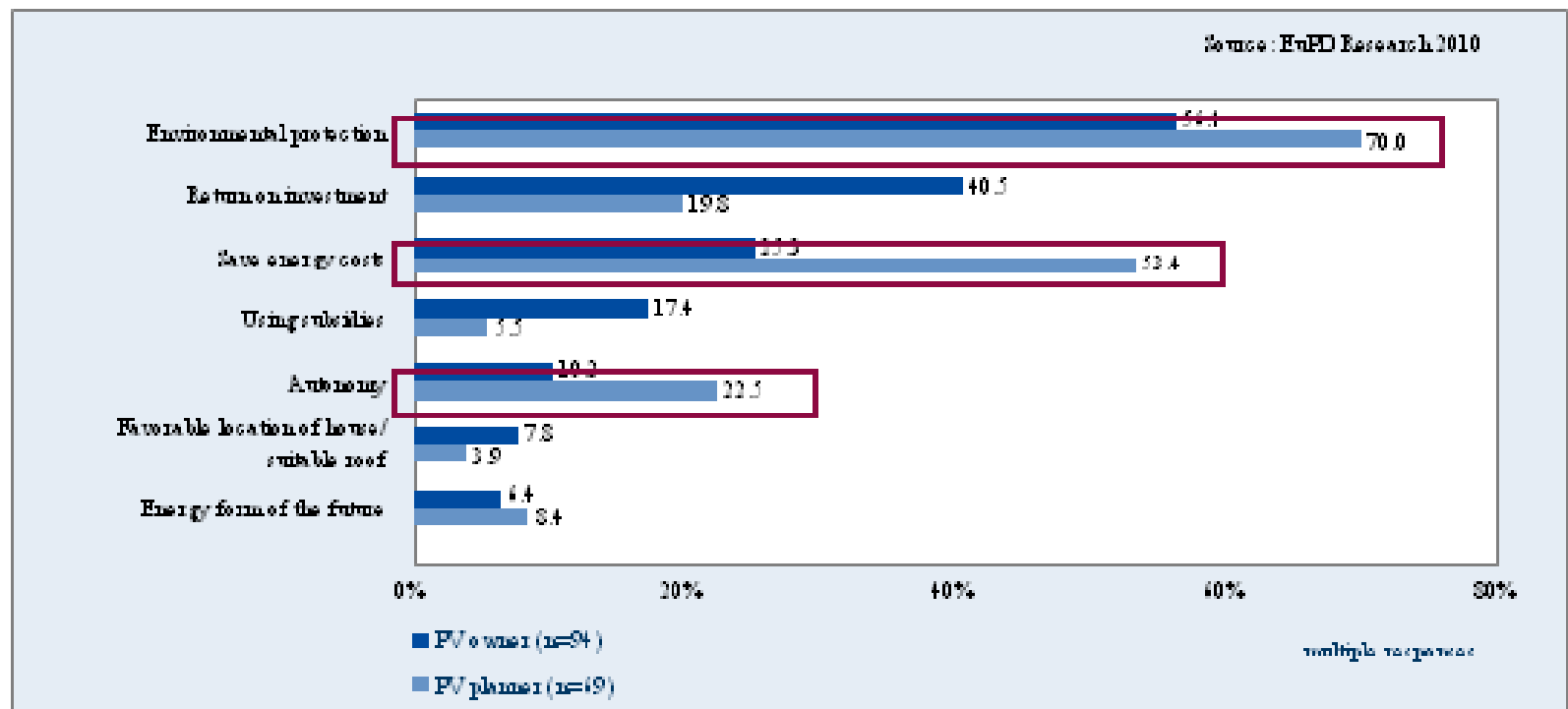
The IRR as the central market driver is losing ground



*indicative

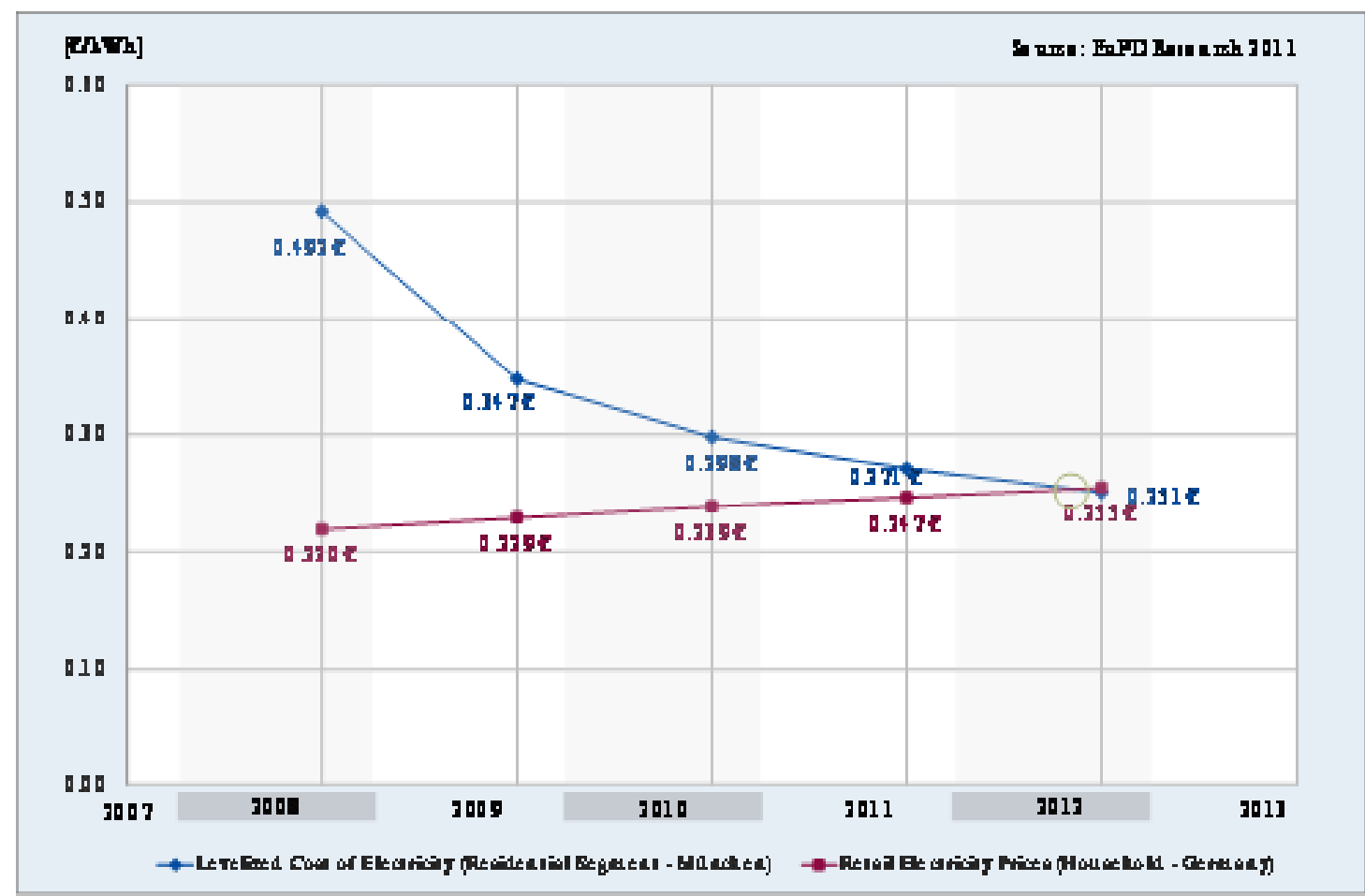
| NEW MARKET DRIVERS ARE ALREADY IN SIGHT...

Reasons for the Purchase or Planning of a PV Plant (unaided)

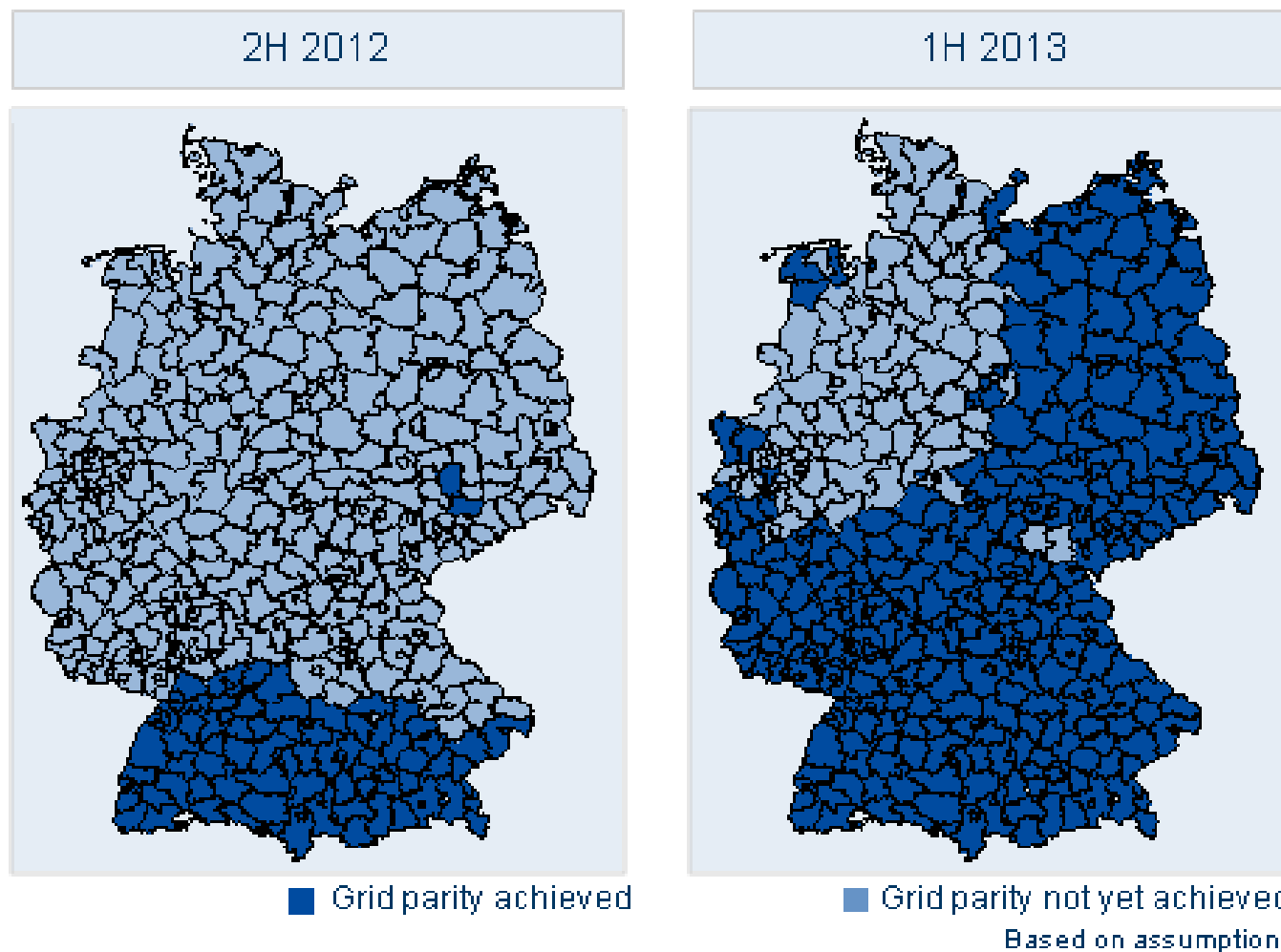


- Decreasing FITs and an increasing electricity price will lead to a paradigm shift from "making money" to "saving money"
- Net-metering and self-consumption are likely to benefit from this shift

| ...AND GRID PARITY IS ON THE HORIZON

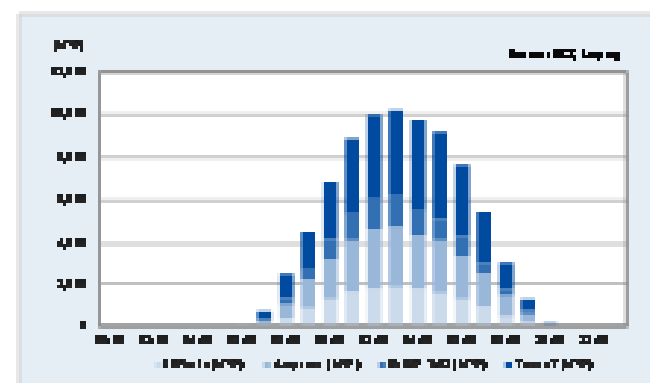
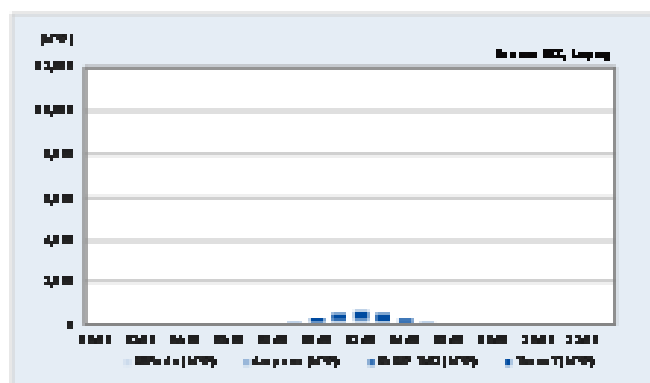


| GRID PARITY – RESIDENTIAL SEGMENT | GERMANY

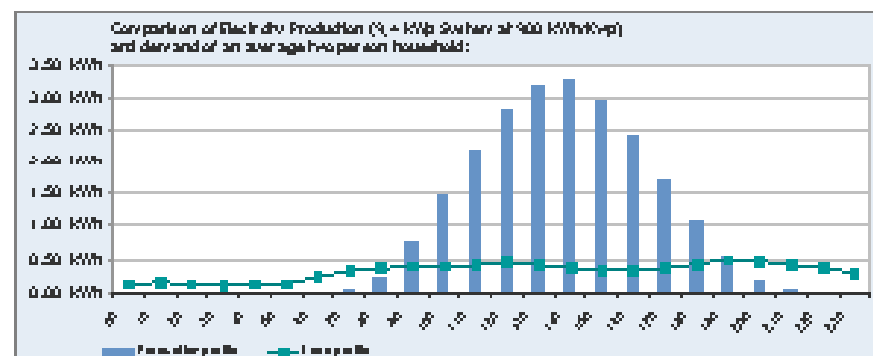


| HOWEVER, NO NEW ERA WITHOUT NEW CHALLENGES!

...on grid level: Integration of fluctuating electricity generated by PV into the grid



...on customer level: Different production & consumption patterns in households



| MORE FLEXIBILITY NEEDED – WHAT CAN BE DONE?

With regard to PV, flexibility can be achieved by...

Energy Management
Tools

Educating the consumers

- Yield monitoring of PV systems
- Production forecast based on weather data
- Direct control of single appliances



| MORE FLEXIBILITY NEEDED – WHAT CAN BE DONE?

With regard to PV, flexibility can be achieved by...

Energy Management
Tools

+

Smart PV Inverter
Technology



The brain of a future PV system – linked to the grid

- PV inverter as hub and center for data acquisition, communication and control
- Regulates electricity flows and takes decision whether generated energy can be self consumed, fed into the grid, or saved based on requirements
- play a key role as interface between primary generation and electricity grid
- Integrate protection and grid monitoring
- Provide system monitoring and control
- Act as interface between grid and local storage

| MORE FLEXIBILITY NEEDED – WHAT CAN BE DONE?

With regard to PV, flexibility can be achieved by...

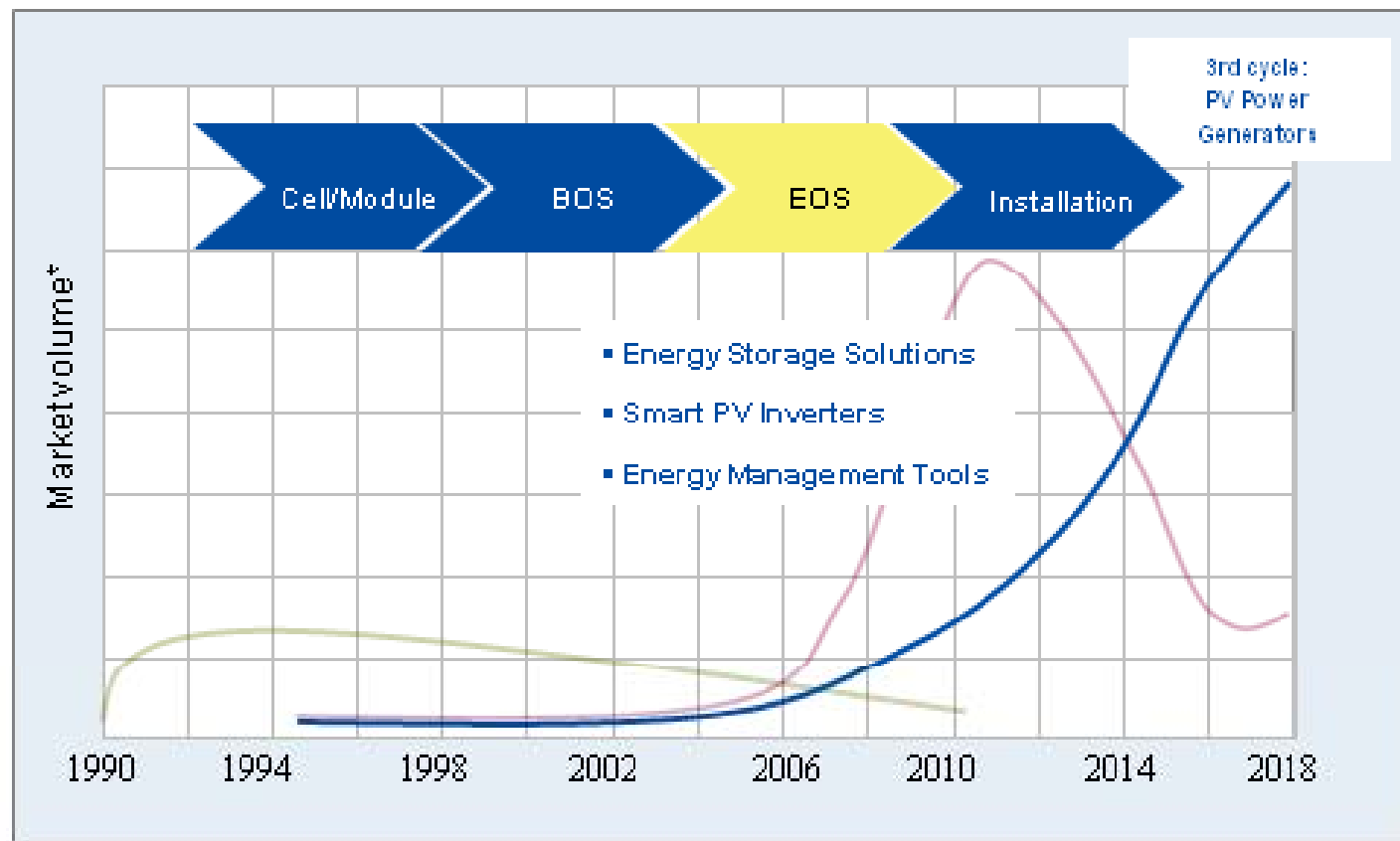


The back-up option

- Improved energy distribution, since energy can be provided depending on demand available – regardless of the generation time
 - Improved synchronization of supply and demand possible
- Maximization of local consumption → up to 70% realistic

VALUE CREATION BY NEW SOLUTIONS

Enhancement of System (EOS) as an added value

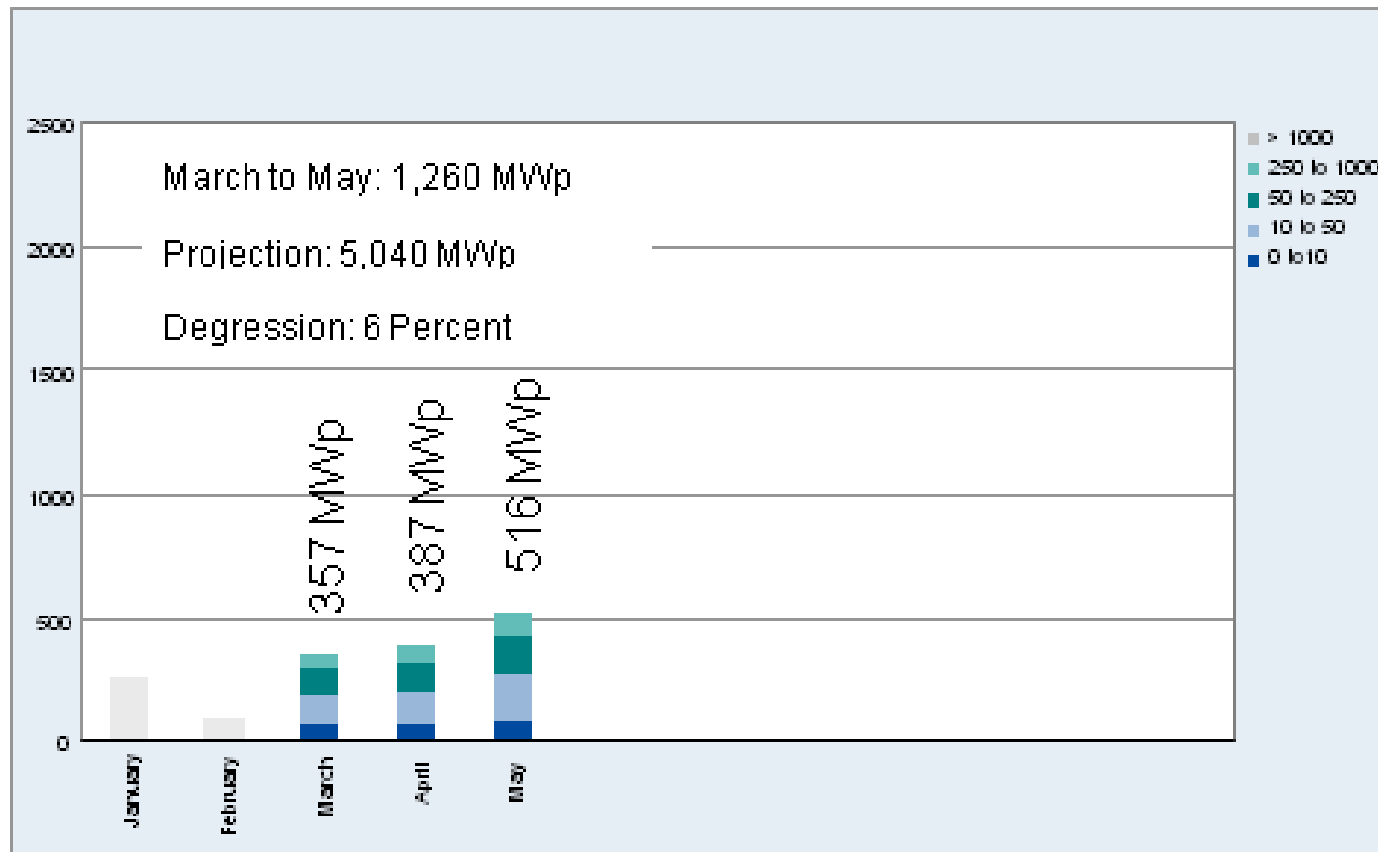


*indicative

E. THE FORECAST – YEAR 2011
...BECAUSE YOU WANNA KNOW!

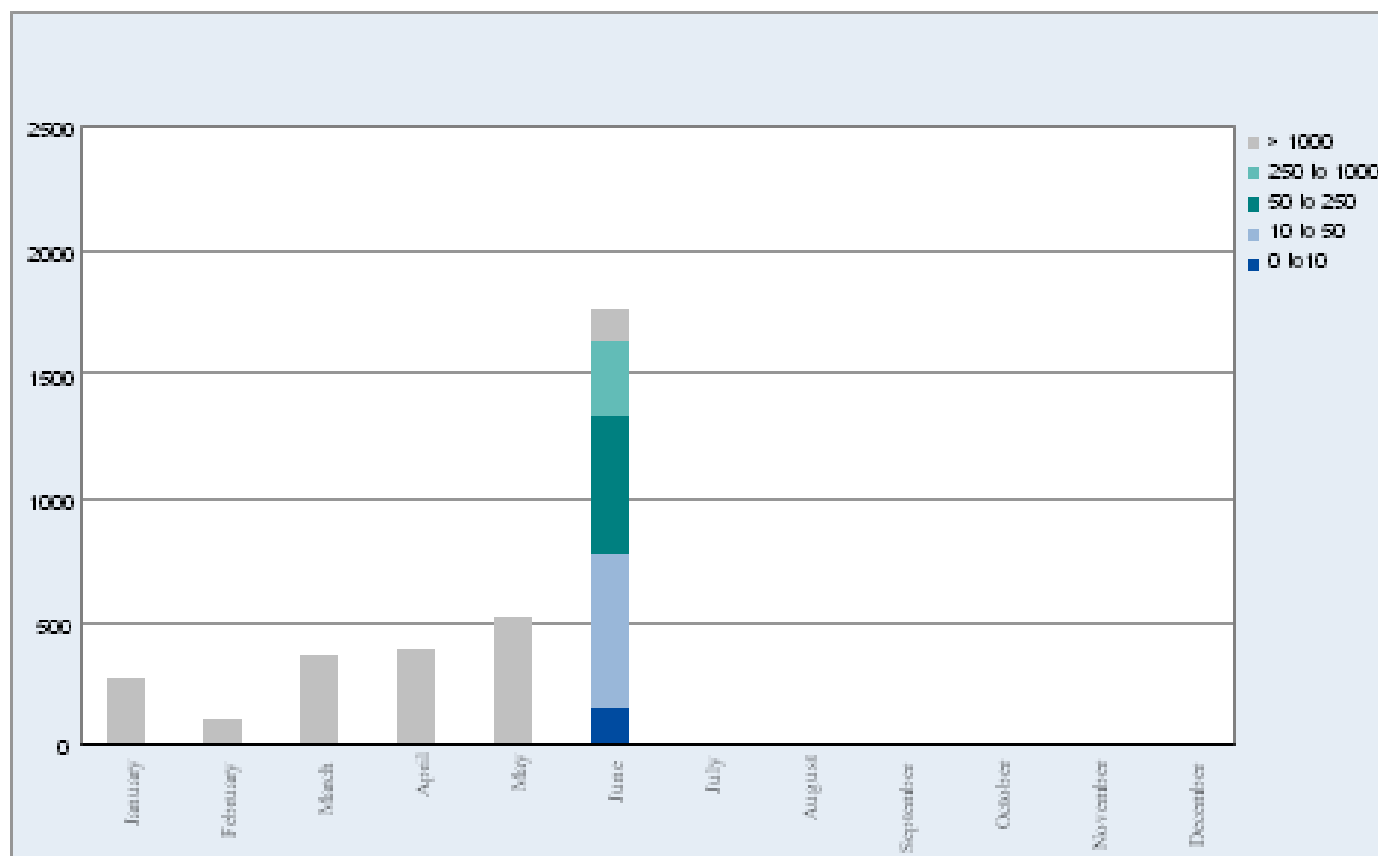
| THE DETAILED FORECAST

„Sluggish“ demand till May



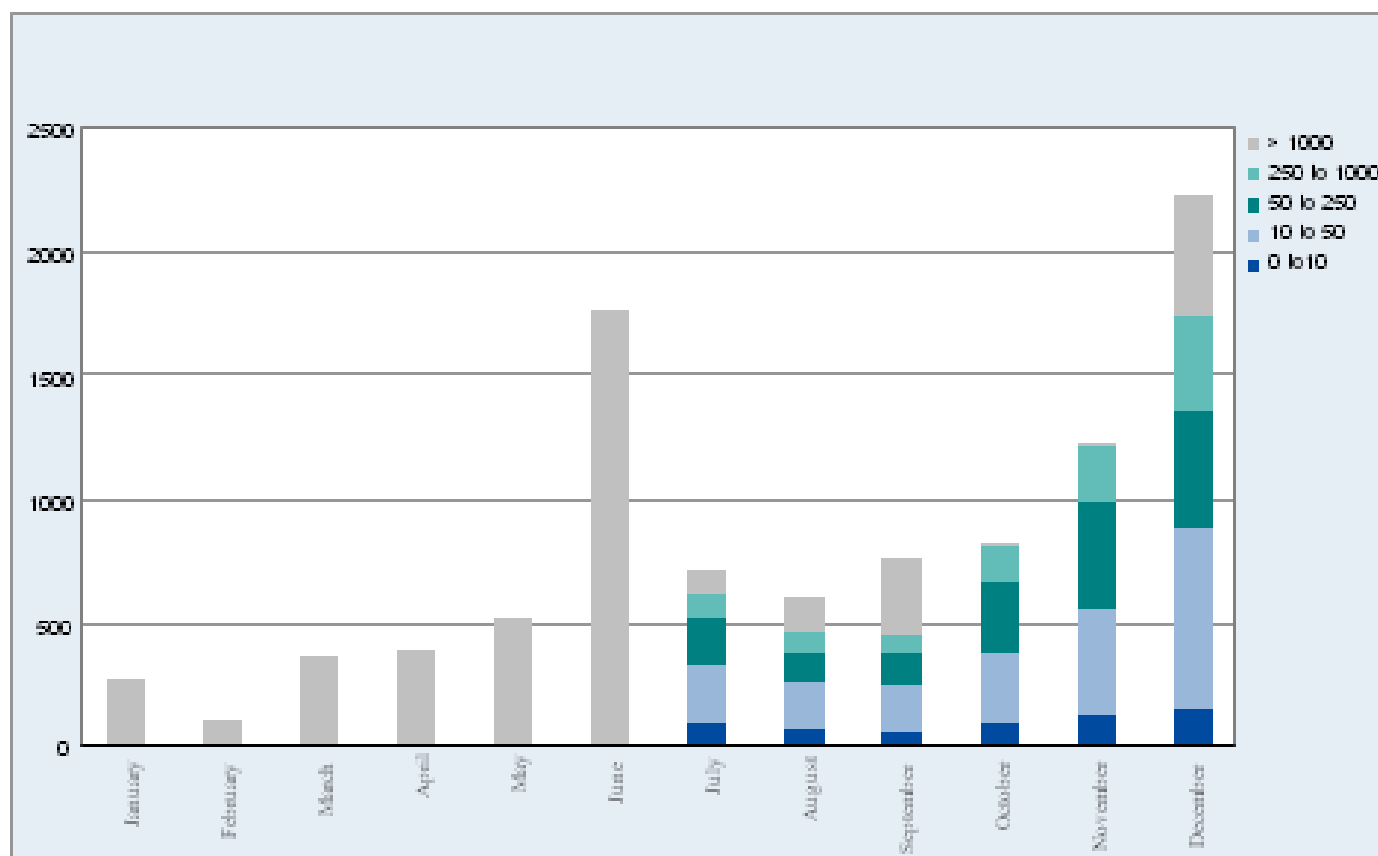
| THE DETAILED FORECAST

A first peak in June



THE DETAILED FORECAST

Strong growth in H2



| QUESTION MARKS

- When will module prices stabilize so that the pipeline can open?
- When will the German Net Agency report figures for the months March, April and May so that degeneration can be clarified?
- How much can German installers install on German roofs in the second half of 2011?
- The German Renewable Energies law (EEG) regulates that existing systems will have to be retrofitted with a second meter. Will this prevent potential customers from investing in PV?
- How big is the threat of a net collapse as a consequence of halt in newly installed capacity?

I DISCLAIMER

NEITHER HOEHNER RESEARCH & CONSULTING GROUP GMBH NOR ANY OF ITS EMPLOYEES MAKES ANY WARRANTY, EXPRESS OR IMPLIED, OR ASSUMES ANY LEGAL LIABILITY OR RESPONSIBILITY FOR THE ACCURACY, COMPLETENESS, OR USEFULNESS OF ANY INFORMATION, PRODUCT, OR PROCESS DISCLOSED. THIS PRODUCT WAS PREPARED USING PROFESSIONAL METHODS AND WITH GREAT CARE, TAKING ACCOUNT OF RELEVANT LEGISLATION. THE DATA CONTAINED IN THIS PRODUCT IS BASED ON SURVEYS OF SAMPLE POPULATIONS, CONDUCTED USING STANDARD STATISTICAL METHODS. AS SUCH, THE STUDY IS SUBJECT TO A CERTAIN STATISTICAL ERROR RATE AND IS BASED EXCLUSIVELY ON THE FACTS WHICH WERE AVAILABLE AT THE TIME OF THE SURVEY. THE AUTHORS MAKE NO GUARANTEES THAT ANY DECISION BASED ON THE INFORMATION PROVIDED WILL BENEFIT YOU IN SPECIFIC APPLICATIONS, OWING TO THE RISK THAT IS INVOLVED IN DECISION-MAKING OF ALMOST ANY KIND.

REFERENCE TO ANY SPECIFIC COMMERCIAL PRODUCT, PROCESS, OR SERVICE BY TRADE NAME, TRADE MARK, MANUFACTURER, OR OTHERWISE DOES NOT NECESSARILY CONSTITUTE OR IMPLY ITS ENDORSEMENT, RECOMMENDATION, OR FAVORING BY HOEHNER RESEARCH & CONSULTING GROUP GMBH. OUR SALES PEOPLE, RESEARCH ANALYSTS, AND OTHER PROFESSIONALS MAY PROVIDE ORAL OR WRITTEN MARKET COMMENTARY TO OUR CLIENTS THAT REFLECT OPINIONS THAT ARE CONTRARY TO VIEWS AND OPINIONS EXPRESSED IN THIS PUBLICATION. THE VIEWS AND OPINIONS OF AUTHORS EXPRESSED HEREIN DO NOT NECESSARILY STATE OR REFLECT THOSE OF HOEHNER RESEARCH & CONSULTING GROUP GMBH.

NO PART OF THIS PUBLICATION MAY BE REPRODUCED OR DUPLICATED IN ANY FORM BY ANY MEANS OR REDISTRIBUTED OR PUBLISHED WITHOUT THE PRIOR WRITTEN CONSENT OF HOEHNER RESEARCH & CONSULTING GROUP GMBH. UNAUTHORIZED COPYING OF THIS PUBLICATION IS CONSIDERED A BREACH OF COPYRIGHT.

EuPD Research | Headquarters: Europe

Adelestrasse 134 | D-53113 Bonn | Telephone +49 (0) 228-971 43-0 | Fax +49 (0) 228-971 43-11
welcome@epd-research.com | <http://www.epd-research.com>

EuPD Research | Headquarters: USA

7905 SW 96 Street | Miami | FL 33156 | USA | Telephone +1 (305)-274-3689
welcome@iro-isa-corp.com | www.iro-isa-corp.com

Contact

Markus A.W. Hoehner | CEO
hoehner@irog.at

EuPD Research® is a brand of HOEHNER RESEARCH & CONSULTING GROUP GmbH.



Member of ESOMAR World Research

THANK YOU VERY MUCH FOR YOUR ATTENTION!

VISIT US AT OUR BOOTH A4.410

JOIN OUR JOINT FORCES FOR SOLAR INTELLIGENCE &
NETWORKING FORUM

09. JUNE, 2011 | 4.00 pm-6.00 pm

INNOVATION EXCHANGE AREA, HALL B2

SEE YOU AT INTERSOLAR



INTER SOLAR EUROPE

Munich, Germany
June 8–10, 2011
www.intersolar.de



INTER SOLAR NORTH AMERICA

San Francisco, US A
July 12–14, 2011
www.intersolar.us



INTER SOLAR INDIA

Mumbai, India
December 14–16, 2011
www.intersolar.in



INTER SOLAR CHINA

Beijing, China
December 7–9, 2011
www.intersolarchina.com