

Q.CELLS
YIELD SECURITY

- ✓ ANTI PID TECHNOLOGY (APT)
- ✓ ADDITIONAL POWER BOOST (APB)
- ✓ 360° EFFICIENCY (TDE)

CLAIMING LEADERSHIP MEANS PROVING IT

THE SAFE CHOICE FOR SECURE YIELDS

The next generation CIGS solar modules by Q-Cells

NEW TECHNOLOGY –
FOR EVEN HIGHER
YIELDS!

Q.CELLS

Q-CELLS QUALITY WITH NO COMPROMISES PAYS OFF FOR YOU TOO!

MORE COST-EFFECTIVE THANKS TO EXPERIENCE

Q-Cells is the technology leader in the photovoltaics industry. Founded in 1999, Q-Cells had developed into the world's largest solar cell manufacturer in just a few years. With our comprehensive expertise we have been setting standards in the industry regarding power, reliability, aesthetics, and simplicity of installation for 10 years. What's more, we don't only claim leadership, we prove it with hard facts.

INNOVATION ENSURES QUALITY

As a primary innovation driver in the solar industry, we set the pace for standards in the industry:

- 2004** Introduction of the 6-inch cell standard.
- 2007** Introduction of the 3-busbar layout at cell level.
- 2008** Increase in resilience due to hot-spot free cells thanks to unique hot spot protect (HSP) quality controls.
- 2010** World record efficiencies of thin-film modules and introduction of the first full-square monocrystalline cells.
- 2011** Increase in yield reliability thanks to innovative Anti PID Technology (APT).
- 2011** Enhanced yield security thanks to the unique Traceable Quality (Tra.Q™) laser-marking technology, which guarantees traceability and forgery protection.

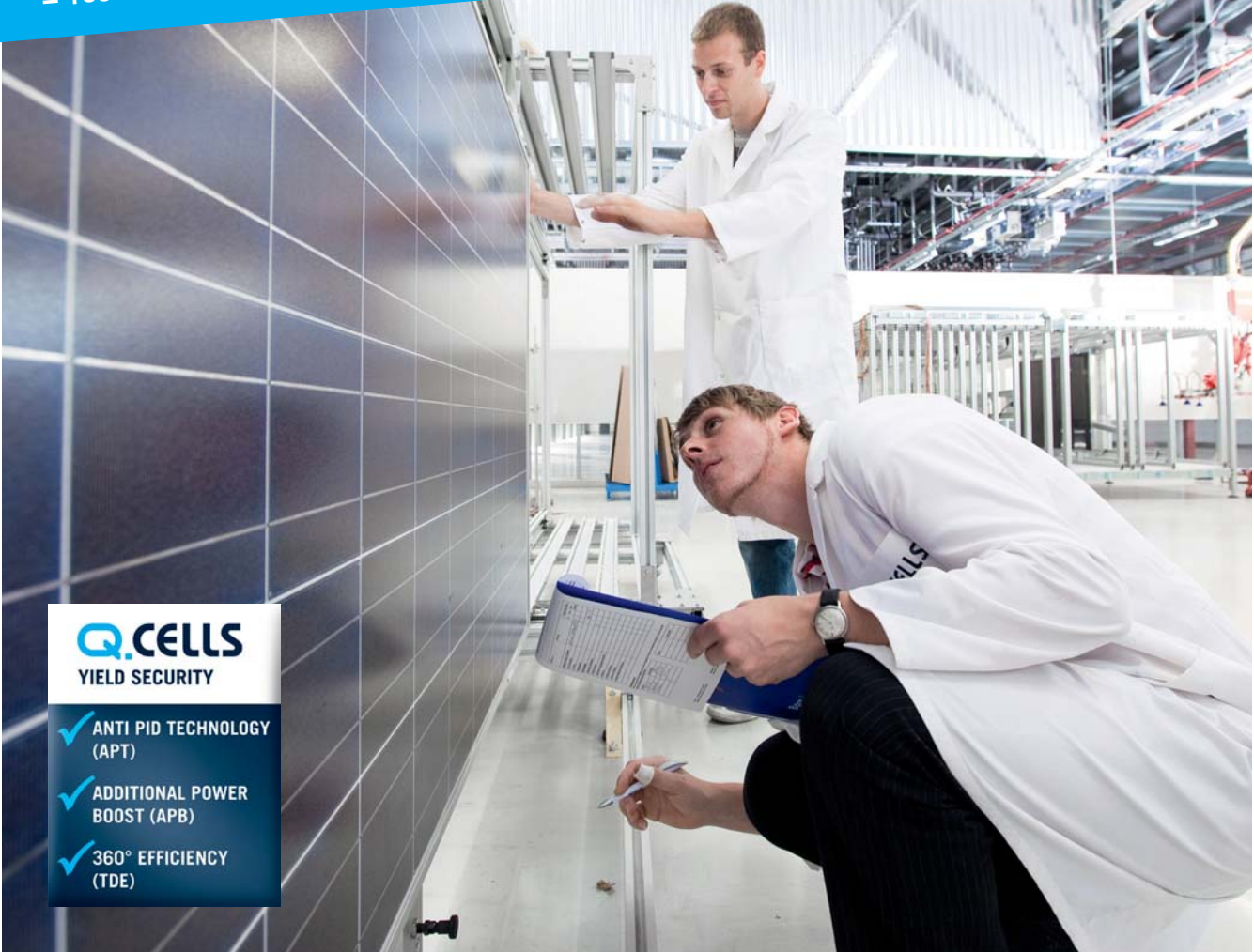
Our innovations facilitate the decision to choose Q-Cells solar modules as a choice that pays off.

YOUR SUCCESS IS OUR BENCHMARK

That's why Q-Cells offers comprehensive service including yield simulation and monitoring, technical training sessions, and professional support provided by our engineers on site. This allows you to transform our competence into your success.



**CERTIFIED QUALITY MANAGEMENT ACCORDING TO ISO 9001
+ TESTING METHODOLOGY WITHOUT COMPROMISES
= 100 % QUALITY WITH COMPREHENSIVE PERFORMANCE WARRANTIES!**



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YIELD SECURITY

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- ✓ ADDITIONAL POWER BOOST (APB)
- ✓ 360° EFFICIENCY (TDE)

**QUALITY PRODUCTS
+ COMPREHENSIVE ON-SITE SERVICE
= PROFITABLE SOLUTIONS FOR ALL!**



UTILIZE THE MOST EFFICIENT AND MOST ELEGANT THIN-FILM MODULES ON THE MARKET!

EXCELLENT YIELD, MULTIPLE POSSIBILITIES, INCREASED SUCCESS

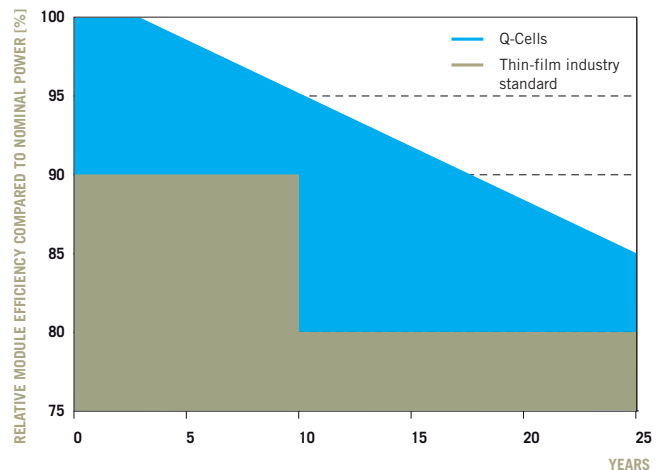
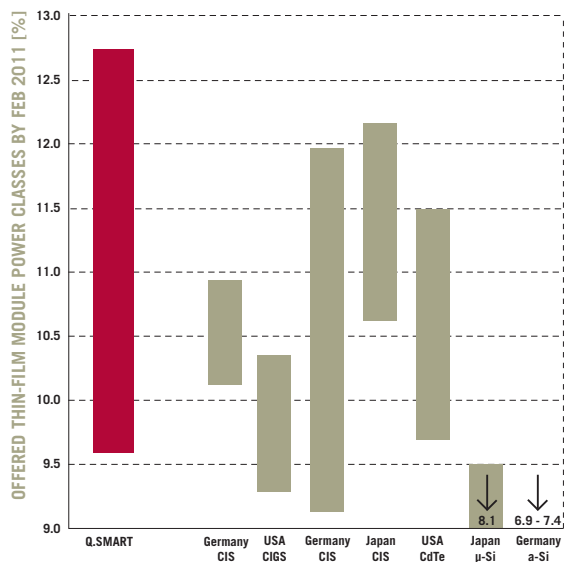
High yield opens up new market potential, even in less-than-ideal mounting situations and low-light conditions:

- **NEW!** With up to 13.4%, Q.SMART modules offer the highest efficiency of all thin-film modules and deliver excellent yields even in low-light conditions: **Highest yields per installed area.**
- **NEW!** Due to the new Anti PID Technology (APT) we prevent power loss caused by potential induced degradation¹: **Maximum yield security.**
- **NEW!** Our Additional Power Boost (APB) allows for up to 15% additional power due to positive sorting and light soaking effect: **More power for your money.**
- **NEW!** Our modules exhibit the 360° Efficiency (TDE) achieving high yields even in less than ideal positions – northern or western orientations, vertical or flat: **A multitude of installation options.**
- **NEW!** 25-year linear performance warranty, no degradation within the first 3 years and extended 10-year product warranty even for installations < 30 kWp²: **Secure investment.**
- Comprehensive quality controls to guarantee reliable high performance modules: **Fewer claims.**

FOR CUSTOMERS WITH PRIME AESTHETIC IN MIND

- The uniform, black Q-Cells CIGS modules can be used in a wide range of applications: from roofs to facades. The unframed modules are ideal for nearly parallel mounting on flat roofs. An excellent choice for architecturally demanding projects.
- Sustainable performance: Q.SMART modules are lead-free and comply with the EC ROHS Directive (Restriction of Hazardous Substances). Ideal for ecology-minded customers.

Q.SMART: HIGHEST EFFICIENCY AND THE BEST WARRANTIES



Q. SMART offers 5 % greater efficiency than its closest competition. With the Additional Power Boost due to our positive sorting and the light soaking effect, Q.SMART modules can even achieve efficiencies up to 14.4 % increasing the gap to the next competitor to 16 %. No thin-film module is more powerful. And crystalline modules are only a stone's throw away, anymore.

Don't accept the standard. Q-Cells is the only producer of thin-film modules offering a 25-year linear performance warranty and an extended 10-year product warranty. We guarantee that the power of a new Q.SMART module:

- achieves at least the nominal power within the first 3 years,
- decreases max. 0.7% per year from year 4,
- achieves at least 85% of the nominal power after 25 years².

¹ Leakage currents from the PV module can cause significant yield losses in a phenomenon known as potential-induced degradation (PID) and arise within the first months of operation. Q-Cells prevents any risk of PID right on cell level. APT test conditions: -600 V, wet module surface, 25 °C, 300 h

² Subject to registration, and in accordance with the valid regional warranty.



Q.SMART 80-95

PERFECT HARMONY OF EFFICIENCY AND AESTHETICS

TYPE Framed CIGS thin-film module.

POWER With up to 95 Wp and 12.5 % efficiency, highly efficient thin-film module.

- Black pin-stripe surface and black frame.
- Positive sorting +5/-0 Wp: Extra yield.
- With its sought after aesthetics and multiple installation possibilities, Q.SMART is the architecturally versatile choice among solar modules.
- The all-rounder: Ideal for private rooftop and facade installations in all orientations.



Q.SMART UF 75-95

MORE POSSIBILITIES: IDEAL FOR ROOF-PARALLEL INSTALLATIONS

TYPE Unframed CIGS thin-film module.

POWER With up to 95 Wp and 12.7 % efficiency, most efficient thin-film module on the market.

- Black pin-stripe surface and black sealant border.
- Positive sorting +5/-0 Wp: Extra yield.
- Frameless design allows for self-cleaning of the module even when installed roof-parallel on flat roofs.
- The smart: Ideal for building-integrated and facade installations in all orientations as well as private flat roofs.



Q.SMART UF L 95-115

OPTIMAL UTILIZATION OF SPACE ON LARGE ROOF SURFACES

TYPE Unframed CIGS thin-film module.

POWER With up to 115 Wp and 12.2 % efficiency on 0.94 m².

- Black pin-stripe surface and white sealant border.
- Positive sorting +5/-0 Wp: Extra yield.
- Frameless design allows for self-cleaning of the module even when installed roof-parallel on flat roofs.
- Increased power: The large module format allows optimal utilization of space in roof-parallel installations.
- The space wonder: Ideal for commercial and industrial flat roofs.

EXCELLENT PERFORMANCE FOR A VARIETY OF APPLICATIONS!

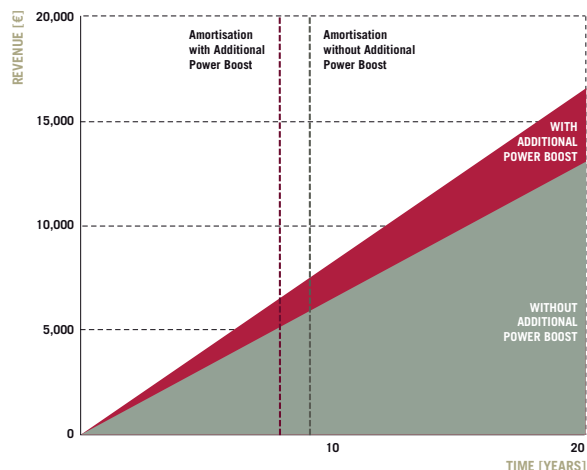
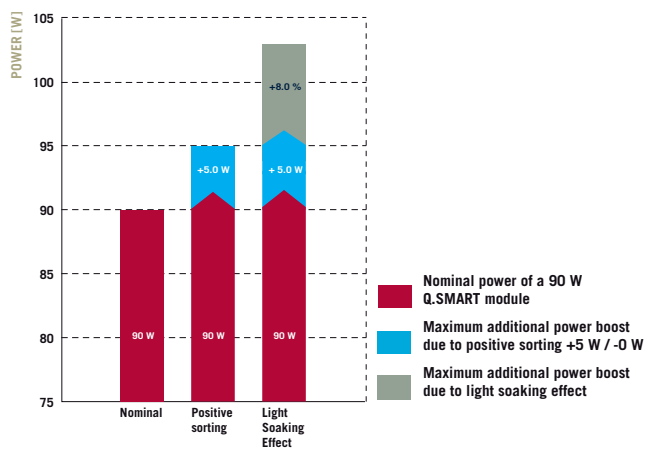
CIGS SOLAR MODULES – OPTIMAL YIELDS IN ALL SITUATIONS

REGION (ANNUAL INSOLATION)	ROOF PITCH	ANNUAL YIELD ²
	[°]	[kWh/kWp]
North Germany (Hamburg) (947 kWh/m ²) ¹	30	868
	3	775
Central Germany (Berlin) (1.009 kWh/m ²) ¹	30	933
	3	821
South Germany (Munich) (1.149 kWh/m ²) ¹	30	1,068
	3	948

¹ Horizontal irradiation

² PV Sol simulation with Q.SMART UF 90 W, SMA inverter, southern roof orientation

MORE YIELD WITH THE ADDITIONAL POWER BOOST (APB)



There is only a handful of thin-film producers offering positive sorting. Even less offer the additional power boost after installation due to the light soaking effect. Due to this effect, initial solar exposure optimizes the photoactive layer in the module within the first months of operation, resulting in a boost of the actual power of the module.

Generally, producers make a remark on their data sheets that their modules will achieve the stated nominal power after a certain time of insolation. Thus, they make their customers pay for the light soaking effect. But not with Q-Cells - we pass the Additional Power Boost on to our customers.

Due to the Additional Power Boost, Q.SMART modules can achieve up to 14.4 % module efficiency. This not only is world record but also means maximum yields and shorter amortisation time for our customers.

The graph exhibits the revenues and amortisation times of a residential 4 kWp Q.SMART 95 W installation in Munich, Germany. Without the Additional Power Boost, the amortisation time is approximately 9 years. Including the potential Additional Power Boost of up to 15 % (5 W positive sorting, 8 % light soaking effect), the amortisation time is reduced to only 7.8 years.

INCREASE THE ELECTRICITY FROM THE SAME ROOF – Q.SMART UF L AND CRYSTALLINE MODULES ON A 378 m² FLAT ROOF¹

MODUL TYPE		Q.SMART UF L 110	CRYSTALLINE MODULE 240
Module capacity	Wp	110	240
Country of origin		Germany	China
Type of installation	°	3 (nearly roof-parallel)	30 (conventional tilt angle)
Number of modules		394	88
Power	kWp	43.34	21.12
Return of investment ²	€	121,000	64,000
Annual yield ³	€/a	11,205	6,131

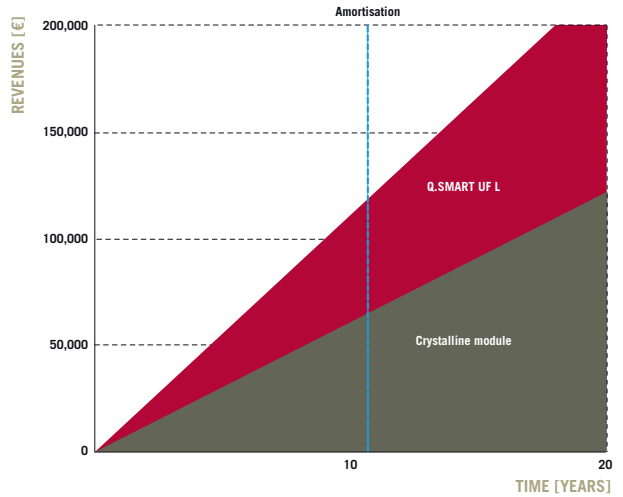
¹ Model calculation for Q.SMART UF L (without consideration of Additional Power Boost) and crystalline modules; yield values from PV Sol; southern roof orientation, Munich. Information provided without guarantee

² Installation costs calculated used are average german installation costs for crystalline and thin-fi lm modules respectively 2010 in €/kWp in acc. with EuPD

³ Calculation based on German feed-in tariff valid from July 2011

Q.SMART UF L is the best solution for large flat roof installations. In contrast to crystalline modules, Q.SMART UF L can be installed nearly parallel to the roof, so you not only reduce the installation time and costs, but can install more MWp, and thus achieve an increased annual yield. The higher initial investment required for Q.SMART UF L amortizes itself as fast as the crystalline modules. Thereafter, you can double your profits over the same area!

MODEL CALCULATION FOR Q.SMART UF L (CIGS)



WITH Q.SMART UF L YOU CAN FIT MORE POWER ON YOUR ROOF!

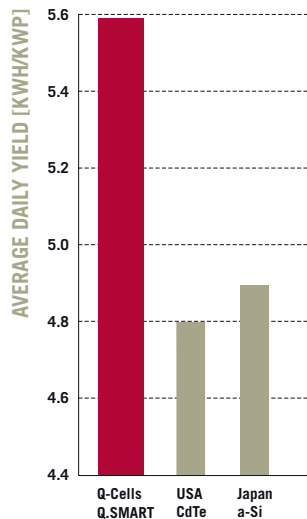
WE PUT OUR PERFORMANCE PROMISE TO THE TEST ON A DAILY BASIS!

MEASURABLE PERFORMANCE IS CONFIRMATION OF OUR QUALITY

We test our modules to the extreme in the Desert Knowledge Australia Solar Center (DKASC) benchmark comparison. Together with around 20 competitors, solar modules have been monitored in desert conditions in the heart of Australia's outback. Q-Cells solar modules are one of the top performers in this side-by-side comparison*.



Alice Springs, Australia, August 2010 - July 2011



SARAGOSSA, SPAIN

Q.SMART UF L is the best solution for large flat roofs. The large module area and nearly roof-parallel installation allows for complete utilization of the roof. On average, over four times as many Q.SMART UF L modules can be installed on a roof-parallel system as crystalline solar modules can be on an elevated solar module system. Within the first year, this installation has exceeded the forecasted yields by 19%!

APPLICATION	Commercial, roof-parallel flat roof installation
INSTALLED CAPACITY	861.19 kWp
COMMISSION DATE	April 2010
MODULES	Q.SMART UF L
SPECIFIC YIELDS	May–December 2010: 1,088.33 kWh/kWp (Source: Teulades S.A.)

* Desert Knowledge Australia, the Australian Government, the Government of the Northern Territory, and the project manager of CAT Projects accept no legal responsibility for results and conclusions arising in connection with the data of the DKASC.

Q-CELLS: TESTED IN CHALLENGING DAY-TO-DAY SITUATIONS



RIEUX, FRANCE

“With yields of 302 kWh within the first 3 weeks after installation, this east-oriented system performs even better than my own, perfectly south-facing system with crystalline modules by a well-known German competitor.”

MICHAEL VON GALLERA, CEO NIU SOLAR

APPLICATION	Residential rooftop installation
INSTALLED CAPACITY	2.9 kWp
COMMISSION DATE	April 2011
MODULES	Q.SMART UF 85 W



FRANKFURT MESSE, GERMANY

Q.SMART UF L are architectural space wonders. With this installation more than 6,500 modules form a photovoltaic roof at the top level of a parking lot. The installation is project of the Sonneninitiative e.V.

APPLICATION	Commercial flat roof installation (car port)
INSTALLED CAPACITY	612 kWp
COMMISSION DATE	August 2010
MODULES	Q.SMART UF L 90 W and 95 W



Q.SMART PRODUCTION HALL, GERMANY

Q.SMART modules are architecturally versatile. This solar system in Thalheim shows the frameless Q.SMART UF modules as an aesthetically sophisticated facade installation.

APPLICATION	Commercial facade installation
INSTALLED CAPACITY	17 kWp
COMMISSION DATE	2008
MODULES	Q.SMART UF
SPECIFIC YIELDS	January – December 2010: 705.2 kWh/kWp (performance ratio 84 %)



LEIPZIG, GERMANY

This photovoltaic rooftop installation provides a residential house with clean solar power since 2009.

APPLICATION	Residential rooftop installation
INSTALLED CAPACITY	4 kWp
COMMISSION DATE	2009
MODULES	Q.SMART 75 W

SOMETHING YOU CAN RELY ON: Q-CELLS SERVICE!

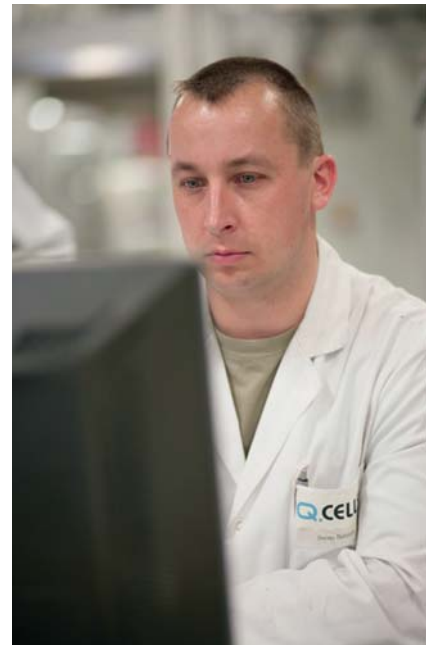
WE ARE TENACIOUS WHEN IT COMES TO A SUCCESSFUL PARTNERSHIP

If you want to stay in business tomorrow, you have to do one thing above all today: listen. We listen carefully to the requirements of our customers. This allows us to advise and support you right from the word go: from initial planning through to recycling your system at the end of its service life.

LONG-TERM GUARANTEES INSTEAD OF EMPTY PROMISES

Certified quality management and automated production processes with ongoing checks are our guarantee for highest quality. And it clearly pays off for you – thanks to high-quality modules with long-term stability and top yields.





PRACTICAL ASSISTANCE, NOT MERE LIP SERVICE

We are there for you if you have any questions or problems. Our highly-competent, telephone support staff is available to assist you in a flash – we don't put you through to a call center, but to experienced technicians, who can even help you on site if necessary.

We are tackling problems today so they don't affect you tomorrow:

- As a member of PV Cycle, we ensure that your end-of-life modules can be returned free-of-charge.
- Together with the German Fire Department, Q-Cells published the first firefighting directives for module fires in 2010.

WE ARE WITH YOU EVERY STEP OF THE WAY

As a Q-Cells quality partner you don't just benefit from high quality products. We also provide you with support in the marketing of the Q-Cells modules.

WARRANTY*

- 10-year product warranty
- 25-year linear performance warranty

* Performance warranty: At least nominal power within first 3 years, thereafter max. 0.7% annual degradation, min. 85% of nominal power after 25 years. Full performance and product warranty in accordance with the valid regional warranty terms.

COOPERATIVE MARKETING BRINGS MORE SUCCESS

- Professional training: Training program for your employees and installation technicians
- Sales documentation and advertising material for installers and operators
- Support in advertising and trade fair appearances
- Personalizable marketing tools, e.g. advertisements
- Certification as official partner
- Listing as official partner on Q-Cells websites and advertising materials

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