



QAiST

Quality Assurance in Solar Heating
and Cooling Technology

European Certification and Labeling – Boosting your Solar Thermal Business with the Solar Keymark

Stephan Fischer

**Institute for Thermodynamics and Thermal Engineering (ITW)
Research and Testing Centre for Thermal Solar Systems (TZS)**

**University of Stuttgart
Pfaffenwaldring 6, 70550 Stuttgart, Germany
Email: fischer@itw.uni-stuttgart.de
Internet: www.itw.uni-stuttgart.de**

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TZS/ITW



Research and Testing Centre for Solar Thermal Systems Institute of Thermodynamics and Thermal Engineering University of Stuttgart

More than 30 years of experience in solar thermal

Education (Thermodynamics, heat transfer, heat pumps, solar energy, etc.)

Research (heat transfer, storage technology, solar technology, solar cooling, etc.)

Testing :

> 950 collector tests

> 150 heat store tests ca. 150 Speicherprüfungen

>100 system tests

>80 controller tests



Certification

Certification

refers to the confirmation of certain characteristics of an object, person, or organization. This confirmation is usually provided by some form of external review, education, or assessment.



Product Certification

Product Certification

is the process of certifying that a certain product has passed performance and quality assurance tests or qualification requirements stipulated in regulations or that it complies with a set of regulations governing quality and minimum performance requirements.

Different Certification Schemes

- ISO 9001 Certification for management systems
- CE-Certification for Products
- RAL Certification
- ...
- Keymark Certification of products



Why Standards and Certification ?

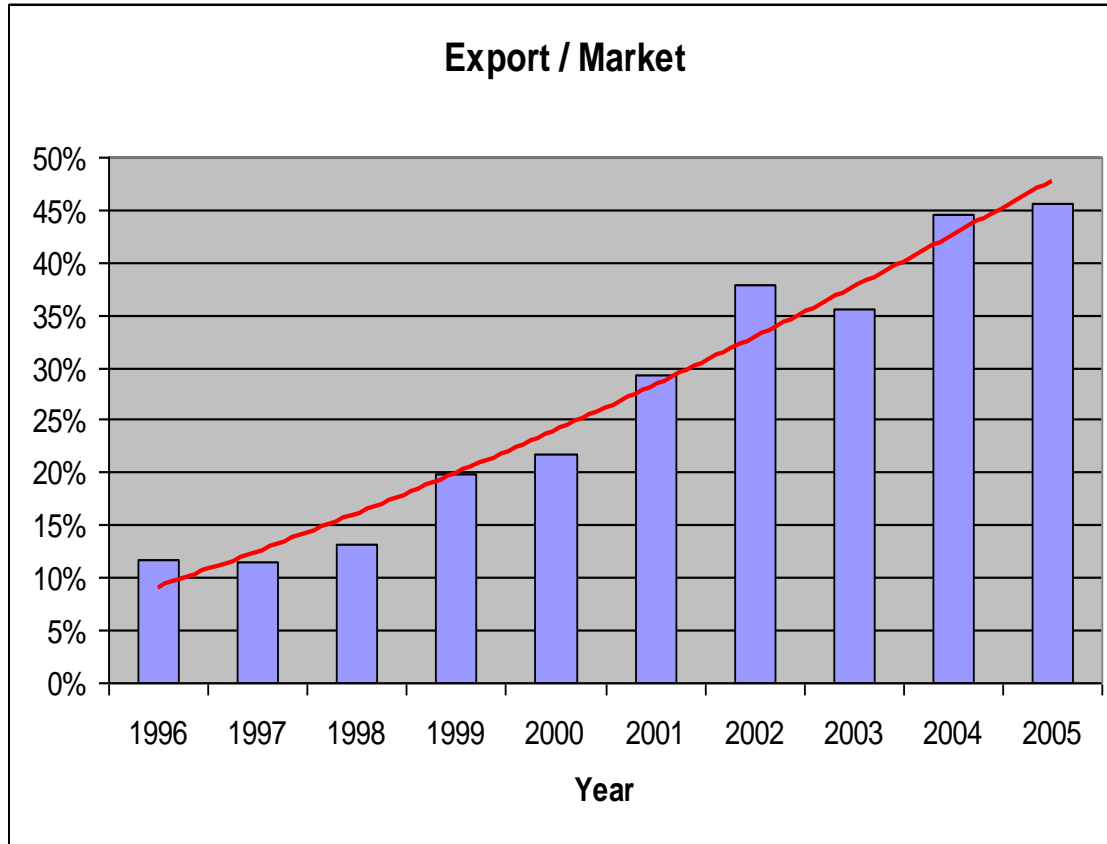
Why **Standards/Certification** ?

- Industry: To avoid market barriers: Avoid bad quality products
→ **Avoid bad reputation** → Avoid bad impact on market development
- User: Possibility to choose **quality products**
- Authorities: Check the requirements set in **regulations and subsidy schemes**

Why **European** Standards/Certification?

- Industry: To avoid market barriers: Time and money for testing in many different countries to many different standards
→ **One large market**
- User: Larger production volume & lower testing costs
→ **Cheaper quality products**
- Authorities: **Standards available** – no need for making special national standards

Why Standards and Certification ?

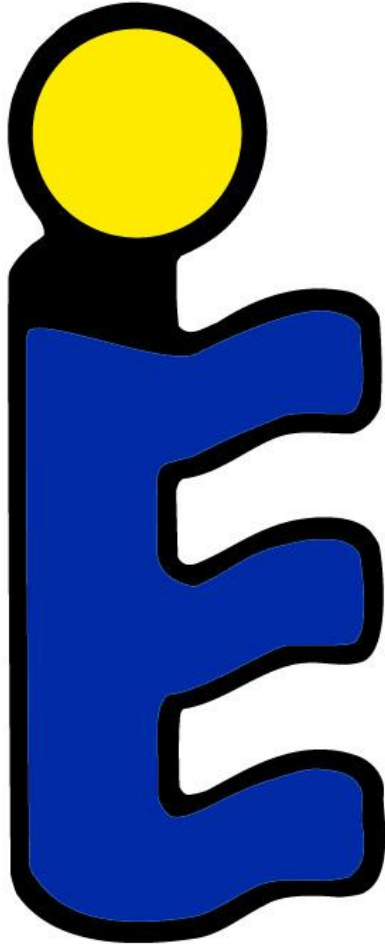


Why **European** Standards/Certification?

- Strong increase in collector export in Europe from the mid 90'ties
- Now > 50 % of collectors produced in EU are "crossing" borders

*European Trade of Solar Thermal Products December, 2007
J.E. Nielsen, SolarKey Int.
Project: SolarKeymark-II*

Keymark Certifications



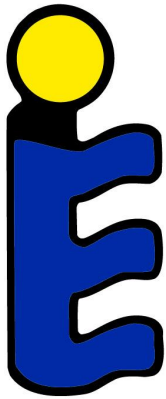
- fire extinguisher
- Insulation material
- coffee machines
-
- Solar thermal collectors and factory made systems (Solar Keymark)

**the mark is owned by CEN
(European Committee for Standardization)**

Keymark Certification Structure

CEN

(European Committee for Standardization)



Certification body (CERTIF, CSTB, DINCERTCO, SP,)

Test laboratories (CSTB, INETI, ISE, ITW, SPF.....)

Independent inspectors (auditors)

Complete list on: www.solarkeymark.org

Solar Keymark Certification



Wish for one quality label for Europe to reduce existing trade barriers and as basis for local subsidy schemes

**Goals: One test
accepted all over Europe and high
product quality**

Basis for the Solar Keymark Zertifizierung



EN 12975-1: Solar Collectors - Part 1 - General Requirements

EN 12975-2: Solar Collectors - Part 2 - Test Methods

EN 12976-1: Factory made systems - Part 1 - General Requirements

EN 12976-2: Factory made systems - Part 2 - Test methods

**ENV 12977-1: Custom built systems
Part 1 General requirements**

**ENV 12977-2: Custom built systems
Teil 2 - Test methods**

**ENV 12977-3: Custom built systems
Teil 3 - Performance characterization of stores for
solar heating systems**

Collector tests according to EN 12975

1. Thermal performance testing
 - test under steady state conditions(indoor and outdoor)
 - test under quasi-dynamic conditions
2. Durability and reliability testing
 - internal absorber pressure test
 - high temperature resistance
 - exposition test
 - external thermal shock
 - internal thermal shock
 - rain penetration test
 - mechanical load test
 - stagnation temperature
 - final control

Durability and reliability testing



Rain penetration test



Internal thermal shock

History of Solar Keymark Certification



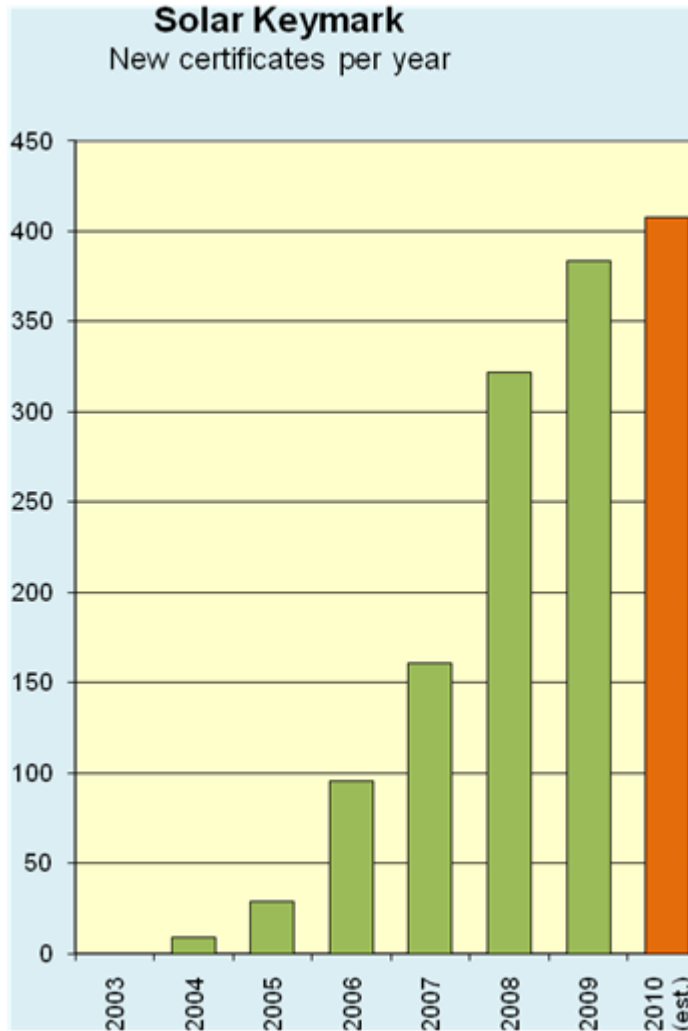
- **Solar Keymark project 2000 – 2003,**
all major European test labs involved
- **Solar Keymark label established**
March 2003
- **first collector Solar Keymark**
issued 11.09.2003
- **first factory made system Solar Keymark**
issued 13.12.2004
- **Solar Keymark II project 2006 - 2007**

The four pillars of the Solar Keymark



- 1. Audit of quality management system by an independent inspector**
- 2. Inspection of the production line and picking of test samples by an independent inspector**
- 3. Complete test according EN 12975 and EN12976 respectively**
- 4. Periodic surveillance**
 - yearly inspection of quality system**
 - physical inspection every second year**

Solar Keymark Applications



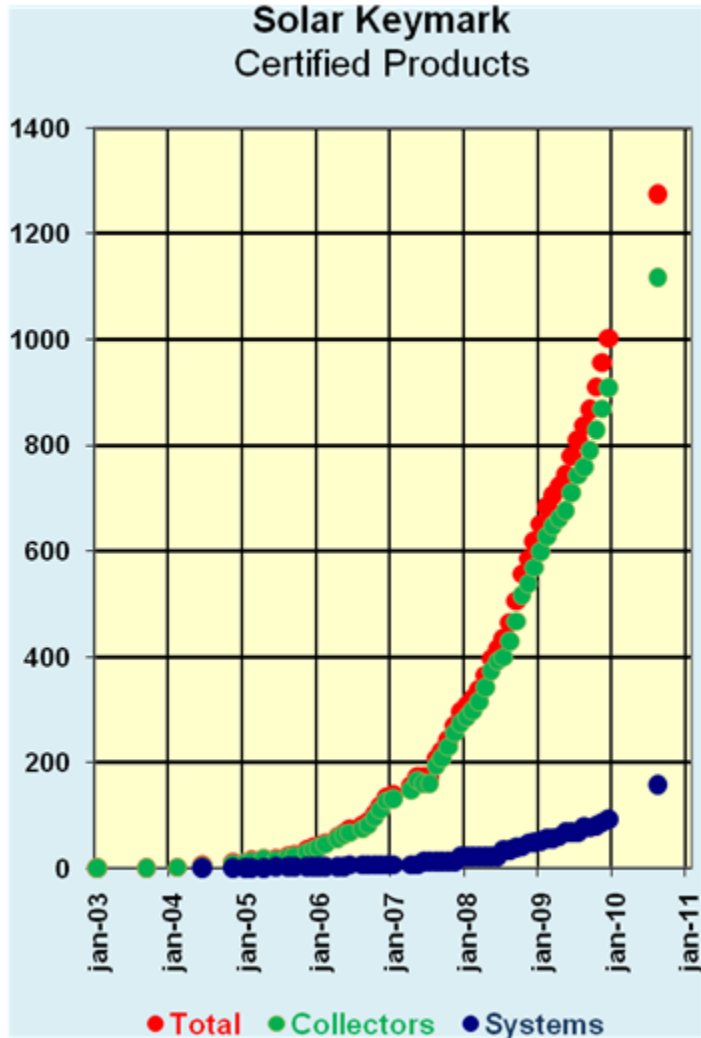
Weak start in 2003/2004

Picking up in 2005 to 2007

Drastic increase 2008

Moderate increase since 2009

Development of Solar Keymark Certification



Status: 15.11.2010

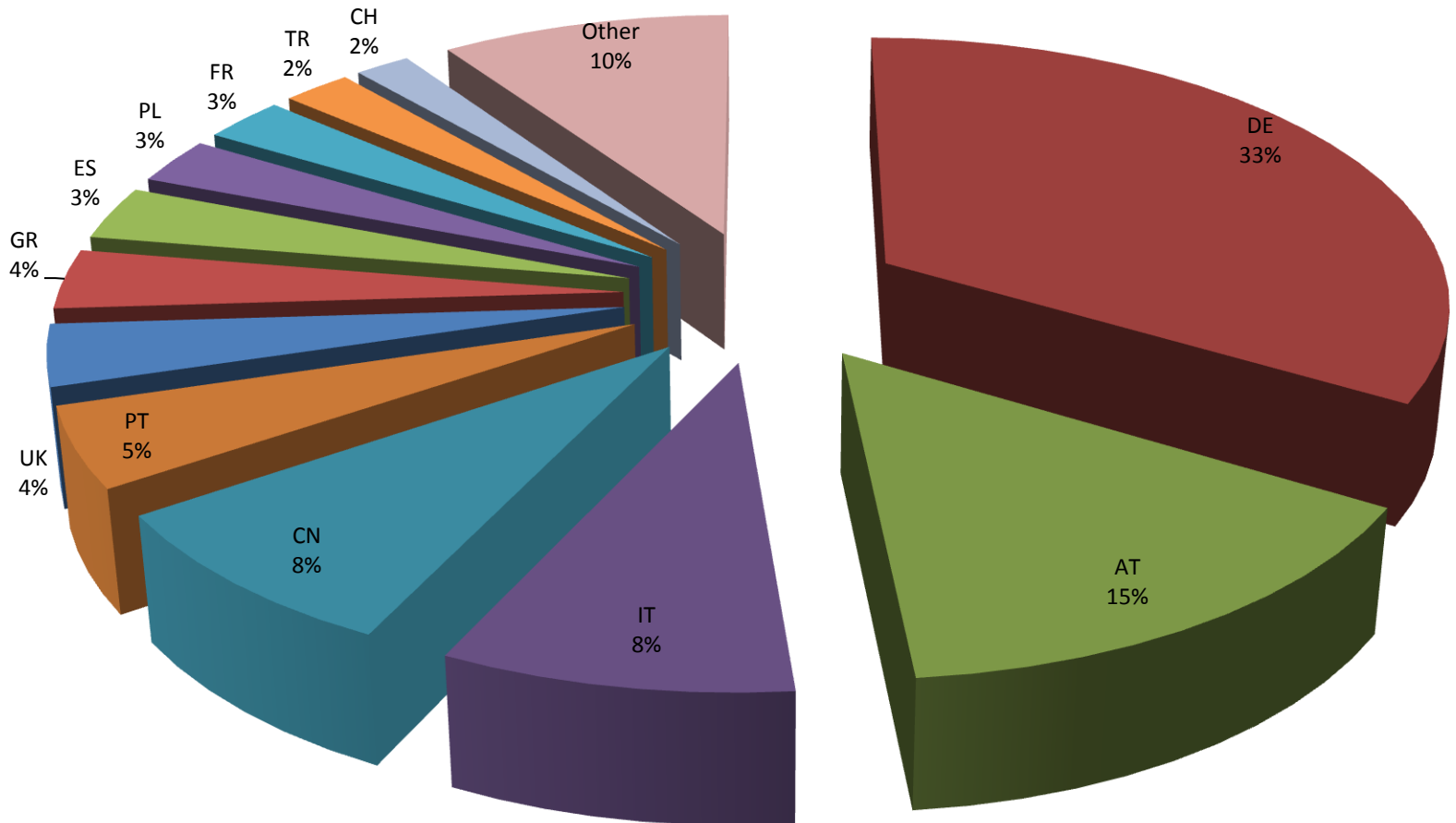
Total: 1286 Certificates

Collectors: 1147 Zertifikate

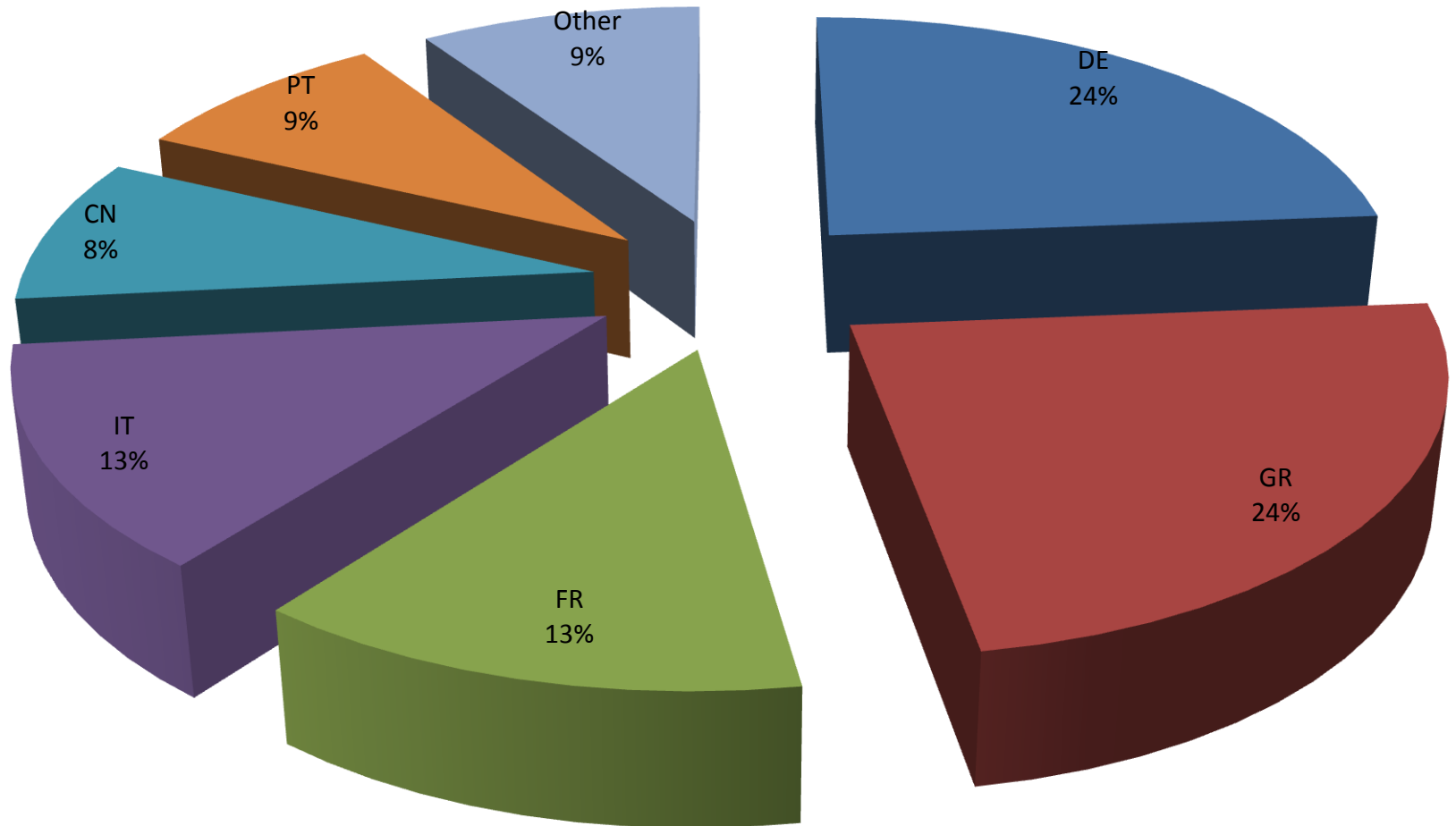
Systems: 139 Zertifikate

Certificate holder in 33 countries

Solar Keymark Certification Collectors



Solar Keymark Certification Systems



Solar Keymark testing

Features:



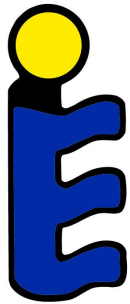
- Uniform European quality label for thermal solar collectors and "factory made systems"
- Manufactures now have the possibility to get certification of the performance and quality of their products (collector / system)

Solar Keymark testing - Advantages 1/3



- product is picked out from the production or stock of the manufacturer
- complete documentation of the product is required
- improvement of weak quality management systems at the manufacturer
- manufacturer can learn from the experience and the expertise of the inspector

Solar Keymark testing - Advantages 2/3



- collector is tested completely according to EN 12975
- system is tested completely according to EN 12976
- periodic surveillance
 - yearly inspection of quality system
 - physical inspection every second year

Solar Keymark testing - Advantages 3/3



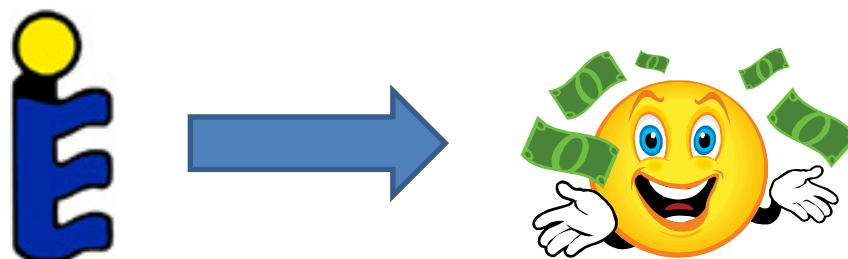
⇒ high and constant quality of the Solar Keymarked products available on the market



Solar Keymark Status and Outlook

Solar Keymark is a voluntary certification scheme

But obligatory in connection with some national subsidy schemes



CE-marking of collectors is underway, covering safety and structural requirements

CE-marking relates directly to EC law and is obligatory

Final Goal : Global Testing and Certification

Globalisation – market for collectors is now international / worldwide

→ global certification scheme needed

Solar Keymark does (so far) only work with European certification bodies and European standards

Work on ISO standards re-initiated → harmonisation of ISO / EN collector standards

→ global certification scheme based on ISO standards !

End

Thank you very much for your attention!