



Collector certification across the world - challenge or opportunity

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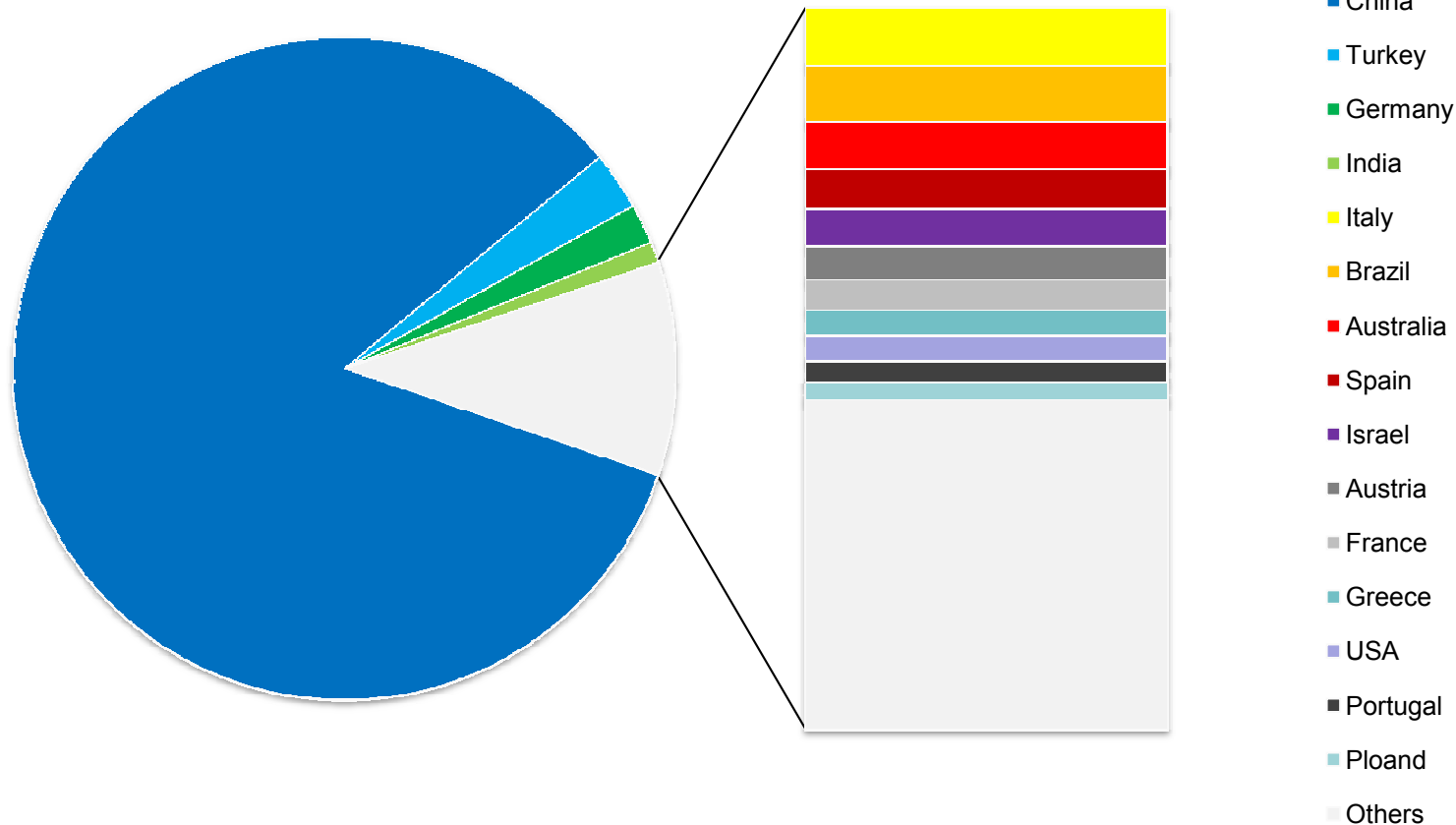
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Global collector market in 2010

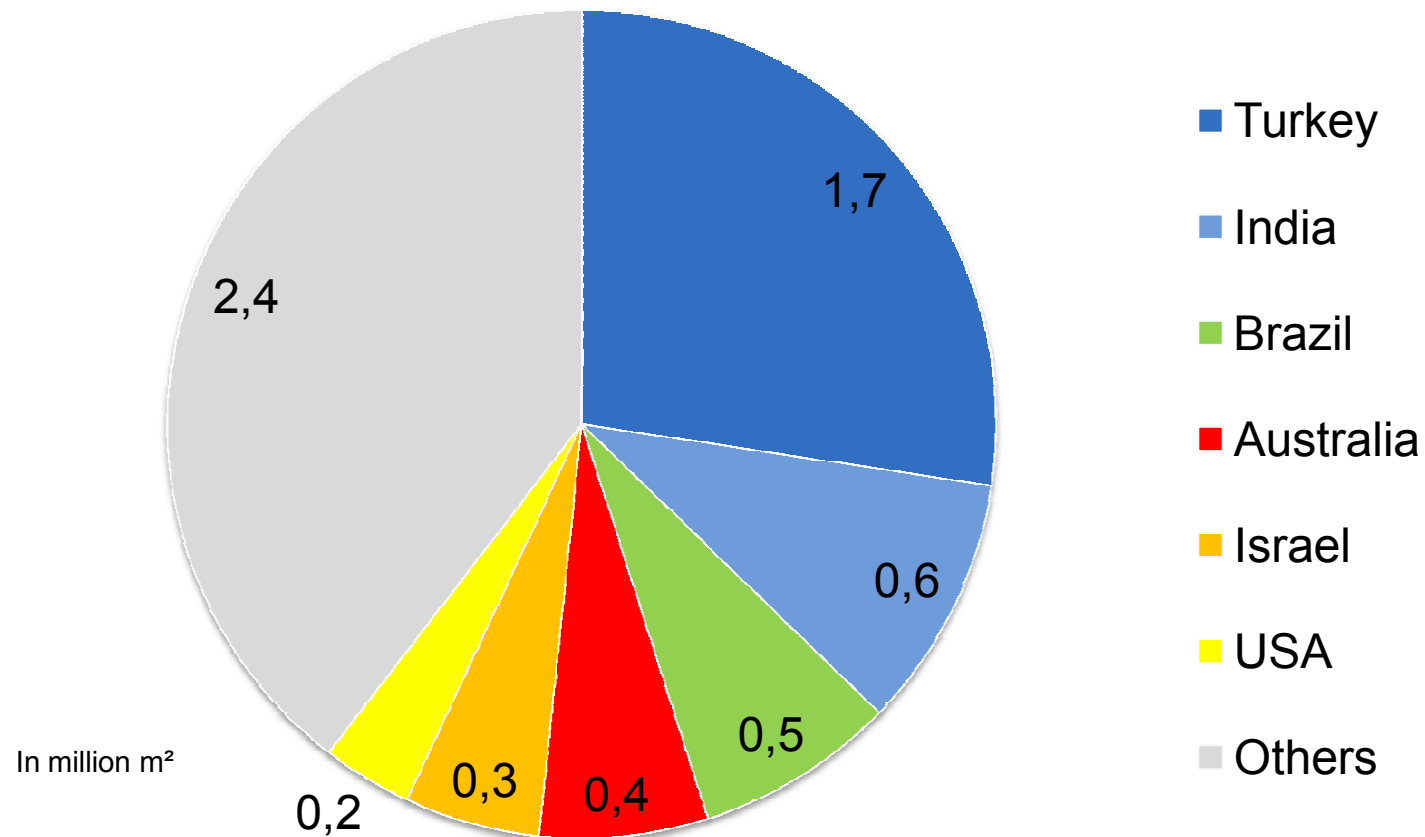
■ Total: 58.5 million m²



Reference: solrico

Global collector market in 2010

- without China and EU



Reference: solrico

Important National “Certification” Schemes

China	Turkey	India	Brazil	Australia	USA
Golden Sun	TSE mark	MNRE approval	PBE label	Standards Mark	SRCC
CGC	TSE	MNRE	Inmetro	e.g. SAI Global	SRCC
GB/T 6426 FPC GB/T 17581 ETC	TS EN 12975	IS-12933	RTAC001383	AS/NZS 2712 AS/NZS 2535.1	Standard 100
voluntary	voluntary	voluntary	voluntary	voluntary	voluntary
Not required by subsidy schemes	Not required by subsidy schemes	Required for federal subsidy scheme	Required for “my home my life” program	Verification required for REC registry	Required for federal tax credits

National certification schemes - China



- Golden Sun certification is only possible for big manufacturer (larger is not finally described) with appointed test facilities
- Golden Sun is voluntary and not linked to certification schemes
- So far, only Chinese public laboratories are accredited for collector certification (but some foreign ones are in preparation)
- For PV Module testing, also several TÜV Rheinland labs are accredited
- Testing, certification and factory inspection fee: around 60.000 RMB (about 7.000 Euro)
- Golden Sun manager are talking about 1-2 months lead time

National certification schemes - China

How to start the procedure?

- Applicants shall obtain the certification application form (QPG0101) from CGC
- Manufacturer have to send application form together with requested material documents to CGC (China General Certification center)
- CGC shall make the initial reviewing as well as the formal reviewing
- After the contract is signed, CGC will send notice to the test center and factory inspection experts
- Manufacturer can advise CGC which lab they want to test their products but CGC keep the authority to appoint the test lab (usually by region)
- Test requirements out of GB/6424-1997 and GB/T17581-2007 almost the same as EN 12975 (only irradiation and wind speed requirements differs)
- Testing must follow the test sequence strictly
- Solar Keymark test report is not accepted
- After final review, CGC will issue the Golden Sun certificate

National certification schemes - Turkey



- TSE label given by Turkish Standards Institution
- Voluntary “registration”, not linked to subsidy schemes
- TSE is following TS EN 12975
- Thermal performance tests will be done in TSE related labs
- Reliability tests will be done at manufacturer laboratories and will be verified by TSE
- Testing and certification fee ca. 3.000 TRY (1.300 Euro)
- Turn around time for testing and certification ca. 2 months
- Solar Keymark won't be accepted
- Annually factory inspections by TSE auditors
- Performance test will be repeated every 2 years

National certification schemes - India



- No certification scheme for collectors available
- Subsidy scheme requires IS-12933 testing/ „certification“
- Several national test labs are authorized
(Madurai Kamaraj University; Pune University; Sardar Patel Renewable Energy Research Institute (SPRERI); Devi Ahilya University; Indore and Solar Energy Centre, Gwalpahari)
- Certification fee is low (< 100,- Euro) testing fee: no information
- Turn around time 2.5.. 3 months
- Ca. 25 large scale manufacturer and 100 small players (subcontracted to large ones) actually listed
- For flat plate collectors, Bureau of Indian Standards IS-12933 is followed
- Solar Keymark won't be accepted

National certification schemes - India

How to start the procedure?

- Manufacturer have to apply for registration on approved list of suppliers at MNRE (Ministry of New and Renewable Energy)
- Registered manufacturer can send collector samples along with raw material samples (piece of copper fins and pipes, aluminum frame etc.) for „certification“
- Flat plate collector manufacturer should have BIS certification to apply to MNRE with a copy of certificate for getting listed as approved manufacturer
- For tube collectors, there are no standards available, but they are being framed
- IS-12933-5 compared with EN 12975-2:
 - Sequences are nearly similar to EN standard, but only steady state test
 - Static pressure test with two times max. operating pressure
 - Minimum Irradiation level for shock tests is only 700 W/m²
 - Impact test with steel ball (150 g) at 1 m height 3 times at each corner
 - Transmittance test for glass covers required

National certification schemes - Brazil



- Conformity evaluation program „PBE“ by „labeling“ covers solar thermal collectors among other things
- All kind of collectors that fits to „RAC – Regulamento de Avaliacao da Conformidade“ (INMETRO No 395/2008)
- Different standards mentioned like EN 12975-2; Ashrea 93 & 96; NBR10184; ASTM E 823-81 and FSEC-GP-5-80
- Currently a voluntary program without linked subsidy schemes, but required for governmental programs
- Government wants to make it mandatory
- No certification fees beside laboratory testing costs
- So far only Brazil laboratories accepted (GREEN/PUC, Minas/MG & IPT/SP)
- Solar Keymark or SRCC tests are not accepted

National certification schemes - Brazil

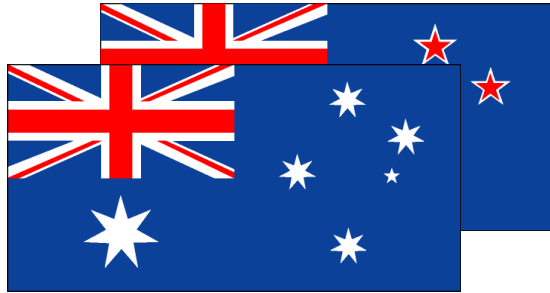
Currently Certification procedure:

- Process has started by request of the Brazilian manufacturer association
- The Brazilian government, through the INMETRO, has established the rules for the qualification resulting in the RAC
- Ranking and most reference numbers will continue to be based on gross area.

New certification rules:

- Rules are under review, ISO 9001 requirements will be added and almost all tests will follow NBR 15747-2 (essentially a translation of EN 12975-2)
- Under the new rules, manufacturer will have 2 ½ years time for getting ISO 9001 accreditation and collector tests done. They will have to go through full accreditation process, which is currently very slow and bureaucratic
- RAC download (only in Portuguese):
<http://www.inmetro.gov.br/legislacao/rtac/pdf/RTAC001383.pdf>

National certification schemes – Australia and New Zealand



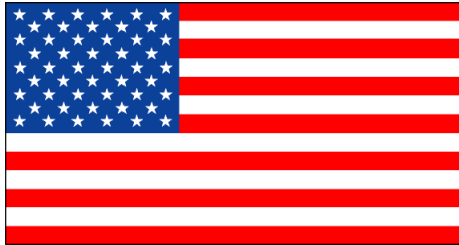
- Mandatory Renewable Energy Target in particular the Small-scale Renewable Energy Scheme requires AS/NZS 2712 testing for collectors
- Solar Keymark test reports according to EN 12975-2 will be accepted as a basic test.
- Test labs need to be accredited by an ILAC member (International Laboratory Accreditation Cooperation ; the scope must include AS/NZS 2712 and AS/NZS 2535.1)
- Additional requirement of AS/ NZS 2712:
 - 10 days stagnation test (12 hours per day) including a post stagnation performance test
 - Rain penetration test differs from current EN approach, but close to new EN/ISO draft
 - Impact resistance test either with 25.4 mm steel ball or 25 mm ice ball

National certification schemes – Australia and New Zealand

The way to get **Standardmark** certification (e.g. by SAI-Global)

- First step is always applying to SAI Global (including first payment)
- After definition of products and standards, SAI-Global defines the test requirements for model range
- If there are pre existing reports (e.g. following EN 12975-2/ accredited test lab), this will be taken into account for the definition of required tests
- SAI-Global define tests and samples needed (selected by laboratory)
- SAI Global advice lab & client of test program
- Sample selection and submission to lab
- Conduct test program as advised
- Issue report to SAI-Global (direct!) and client
- Assessment of report, advise applicant, proceed with process of certification
- Final step: issuing of certificate!

National certification schemes - USA



- SRCC OG-100 for solar thermal collectors
- Required by state and local authorities
- Subsidy schemes mostly require SRCC certification
- Several labs in the USA (7), Europe (9), Asia (1) and Australia (1) accredited
- Certification fee is linked to sold m² collector area
- Turn around time 1... 3 months (for certification)
There was a major improvement over the past three years!
- Nearly 900 glazed collectors are rated and certified (including different sizes within a collector family)
- SRCC Standard 100 is mainly following ISO 9806
- Testing must follow the test sequence strictly
- Solar Keymark won't be accepted

National certification schemes - USA

The way to get **SRCC** certification (by SRCC)

- First step should always be applying to SRCC
- After definition of products and standards, SRCC confirm the test requirements (Important, if for example the testing and operating flow deviate from the strict SRCC requirements)
- Test sample picking could be performed either according to Solar Keymark or SRCC requirements
- Test lab send the report to SRCC (direct!) and client
- Assessment of report, advise applicant, proceed with process of certification
- Final step: issuing of certificate!
- FAQ list for manufacturer available: http://www.solar-rating.org/faq/OG100_faqs.pdf

Within the first three years of SRCC Standard 100 testing, TÜV Rheinland had performed more than 70 collector tests for SRCC certification!

Conclusion

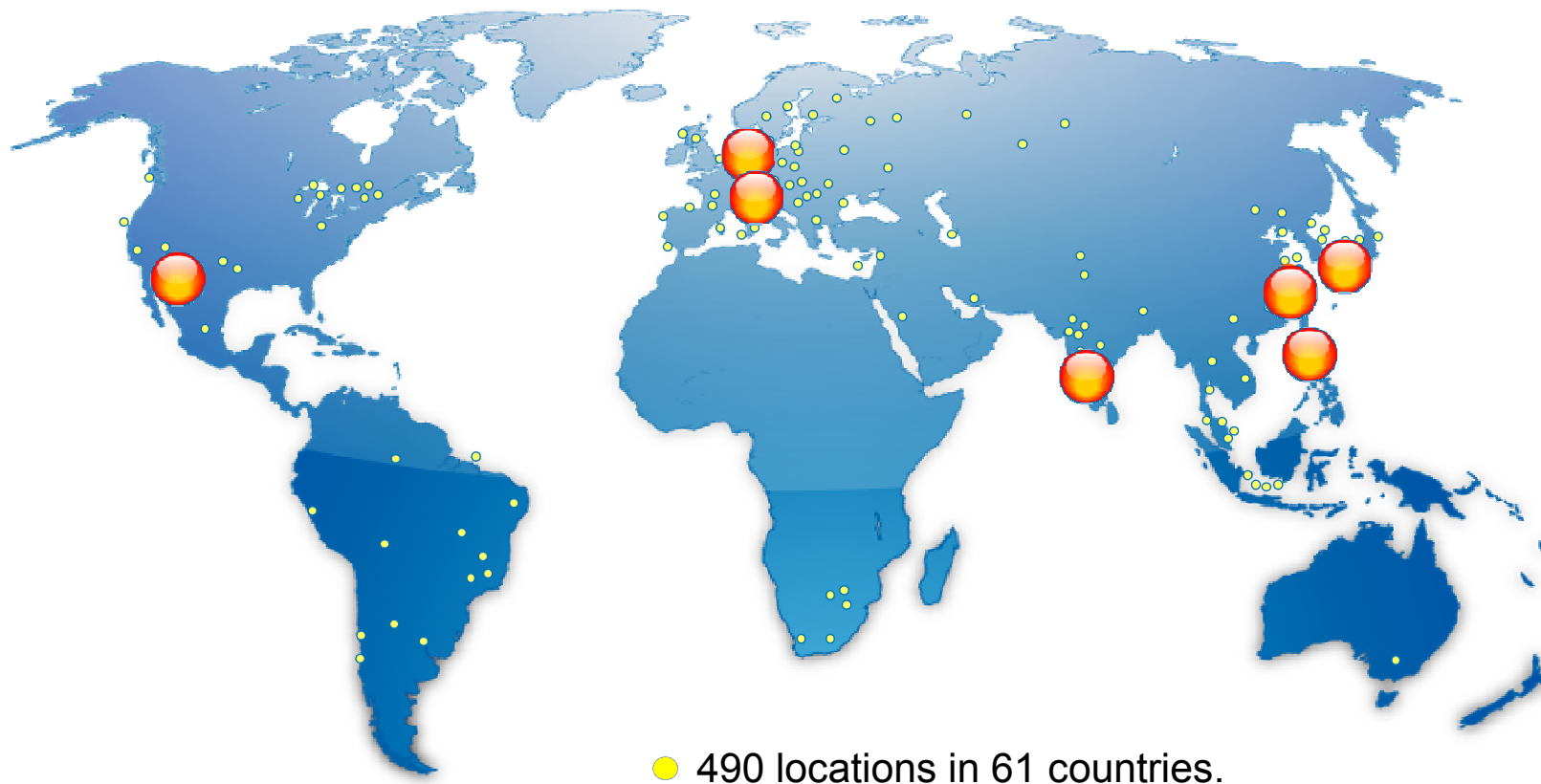
- Global certification is a challenge
- There are different certification bodies for each local market
- It is not possible to perform tests in only one laboratory
(But TÜV Rheinland is always trying to enlarge their accreditation scope and certification body recognitions.)
- Standards for testing are not harmonized, but mainly following ISO 9806 and EN 12975
- More and more national subsidy schemes are linked to certification schemes
- Some national programs may be only open for local manufacturer
- Some countries have still testing bottle necks (like Brazil), others have overcome this problem (like USA)

Outlook: Global certification scheme

- First step: harmonized basic collector testing standard EN ISO 9806
 - Draft ready for public inquiry
 - Release of final EN ISO 9806 version within 2013
 - Classification for different climates important basis for worldwide standard
- Intermediate step: acceptance of EN ISO 9806 tests + local requirements
 - Good opportunity to cover the main markets
 - Additional tests for special local conditions still required
- Final step: a global quality mark, which covers a wide range of climate conditions
 - Harmonization of certification schemes and certification bodies
 - Harmonization of testing laboratory quality

TÜV Rheinland - Worldwide Presence

● Solar Master Laboratories in Germany, Ancona/ Italy, Bangalore, Daya/Taiwan, Yokohama, Shanghai und Tempe/Arizona



TÜV Rheinland - Worldwide Presence

- TÜV Rheinland Energy and Environment GmbH Cologne, Germany:
Solar Keymark, SRCC, AS/NZS, PV-module testing (Golden Sun PV), PV component testing
- TÜV Rheinland Energy and Environment GmbH Ancona, Italy:
Outdoor test field for solar thermal and PV testing applications
- TÜV Rheinland PTL Tempe, Arizona:
Solar Keymark, SRCC, Golden Sun (in preparation), PV-module and component testing
- TÜV Rheinland Shanghai:
Solar Keymark, PV-module and component testing
- TÜV Rheinland India, Bangalore;
TÜV Rheinland Taiwan and
TÜV Rheinland Japan :
PV-module and component testing

We are ready to face the next great challenge!



Thank you for your attention!