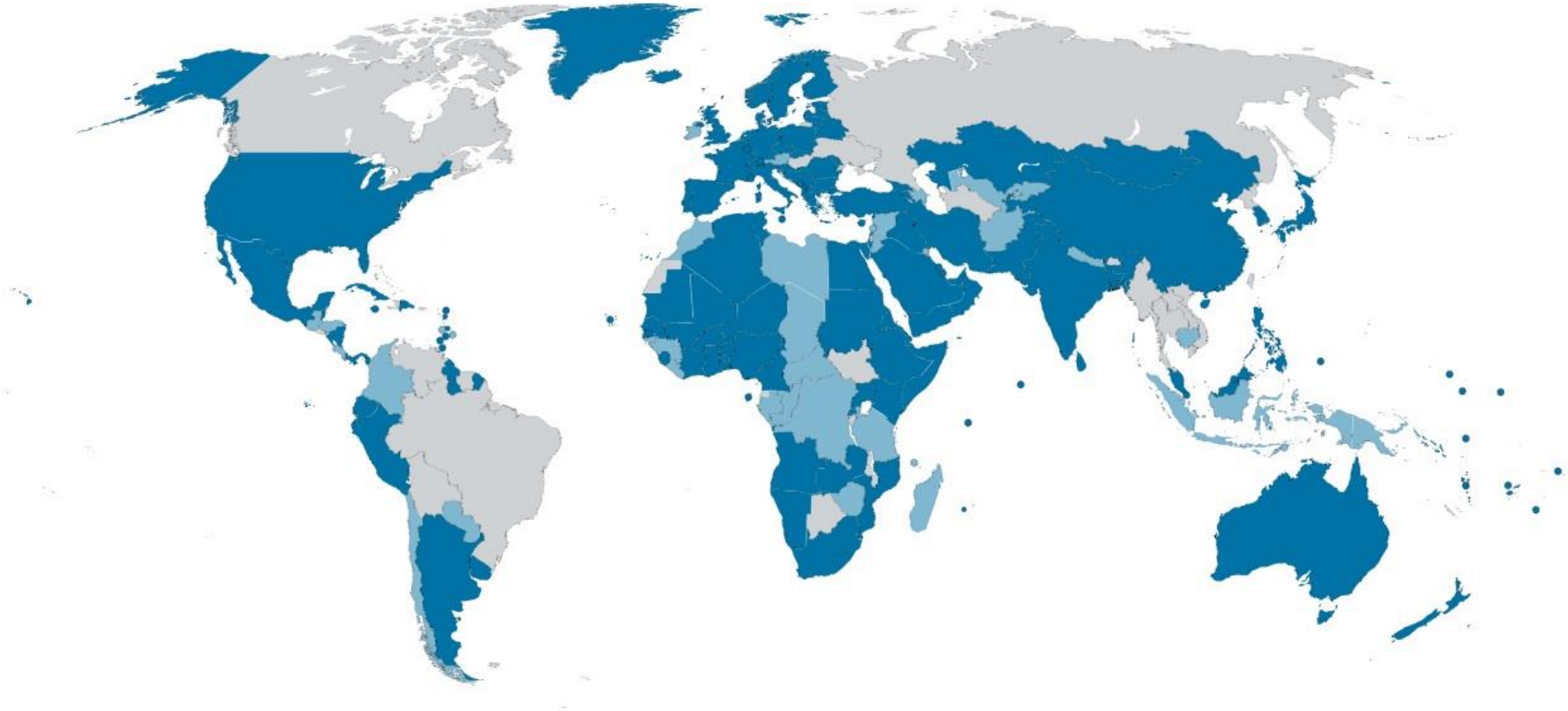
Quality Infrastructure in Support of Solar Water Heating Markets

INTERNATIONAL RENEWABLE ENERGY AGENCY - IRENA

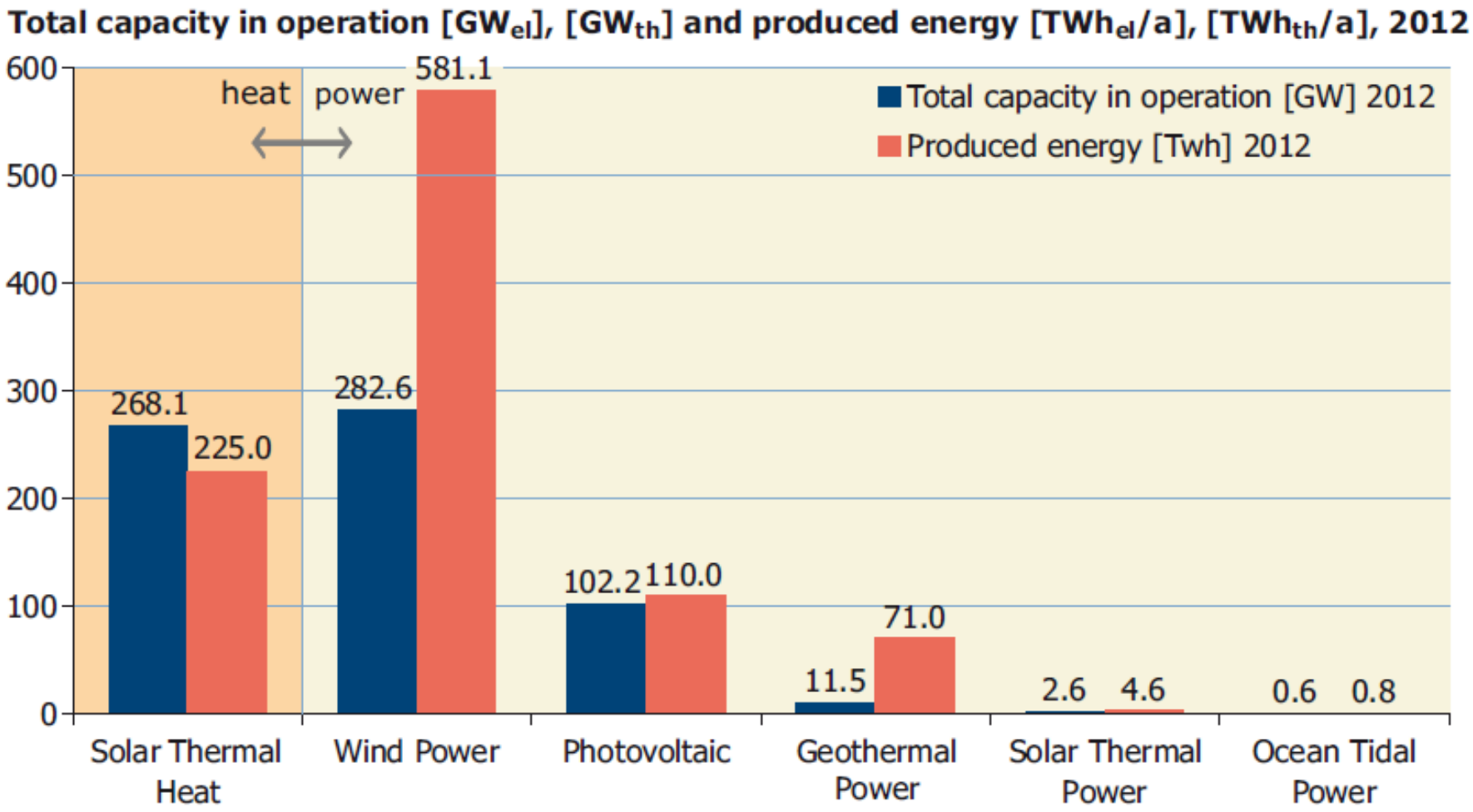
Cyprus, May 2014

IRENA's Membership

Members: **167 affiliates - 130 ratified**



Solar Water Heaters (SWH) Global Installed Capacity by end of 2011



Source: IEA-SHC

SWH is one of the RE technologies more deployed globally in terms of installed capacity

Solar Water Heaters (SWH) Installed Capacity per Capita

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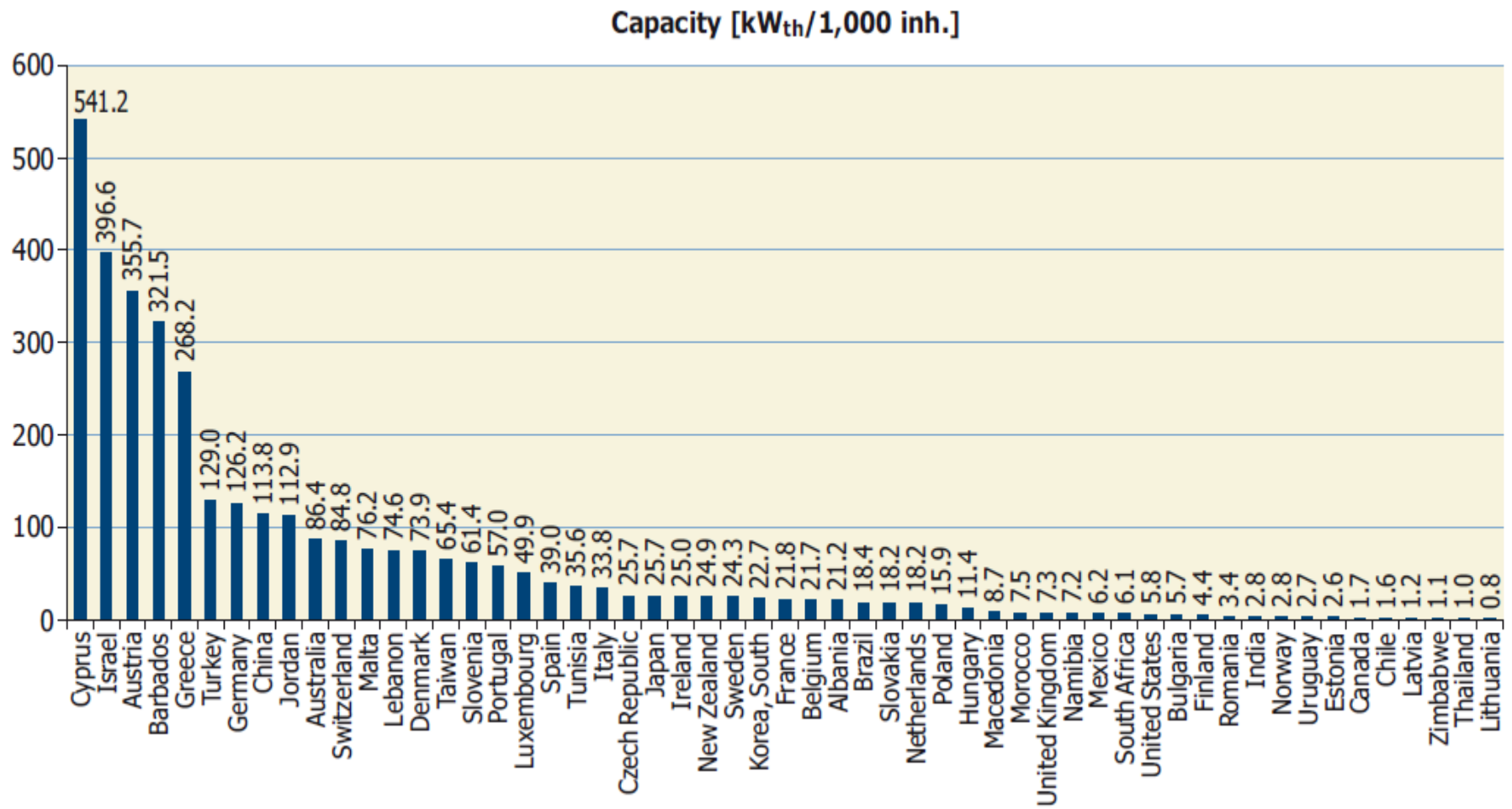
Cyprus is leading in SWH installed capacity per capita

A number of States with islands are also deploying SWH, e.g. Basbados, Greece, Malta



Expectations from Different Stakeholders - International Standardization supports meeting expectations

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Policy Makers & Regulators

- Supporting Compliance to Regulations and Legislation
- Design of incentive mechanisms linked to quality requirements

Standards Makers

- Facilitating Trade
- Facilitating Communication and Understanding

Manufacturers & Installers

- Common Performance Specifications
- Testing, Sampling
- Materials
- Quality Assurance / Quality Control

Investors and Fiscal Support

- Confidence and Trust in what is being funded
- Ability to clearly specify what is being funded
- Ability to verify and audit investment

Verification & Auditing

- Clear processes, procedures and specifications
- Consistency
- Harmonised approach
- Protocols established

Users of the Products and Services

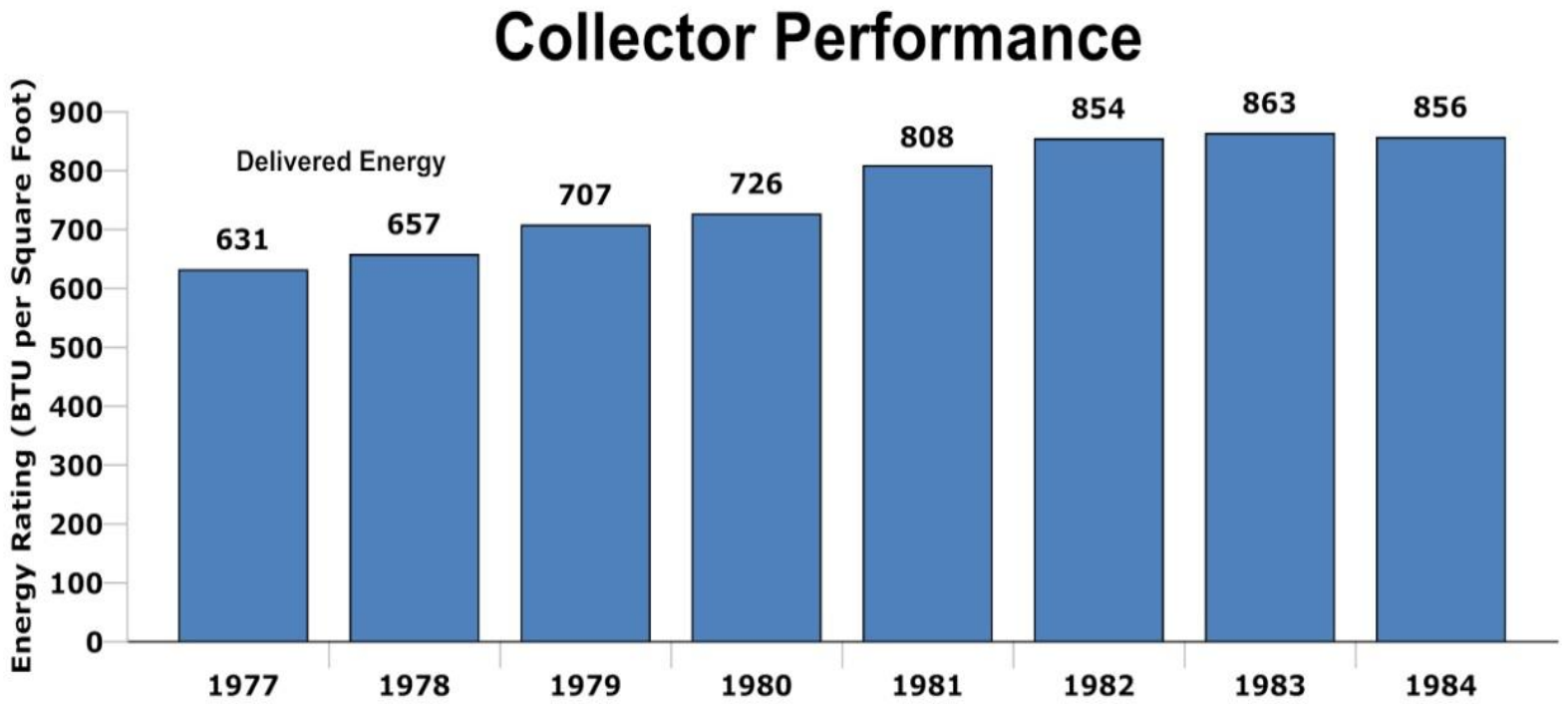
- Confidence
- Trust
- Consistency
- Understanding – performance, safety

IRENA (2013) "International Standardisation in the Field of Renewable Energy"

Market Support – Standards enable benchmarking and further improvement of SWH

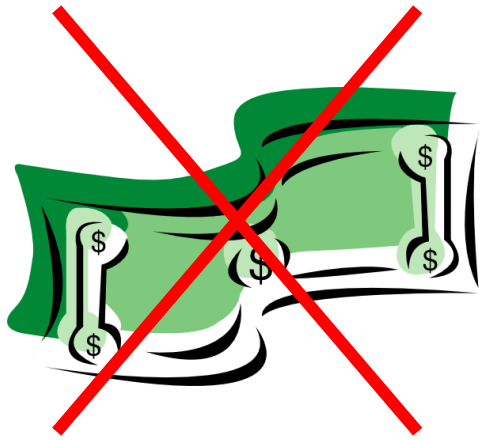
Implementation of quality schemes promotes a faster improvement in technology performance

Solar water heating collectors efficiency improved by 36% between 1977 and 1981 after testing was required in Florida in 1976



IRENA (In Press) "Quality Infrastructure for Small Scale RET"

Market Support – Access to sources for financing



Poor Quality

High Risk

Decreased Trust in a Technology

No Finance

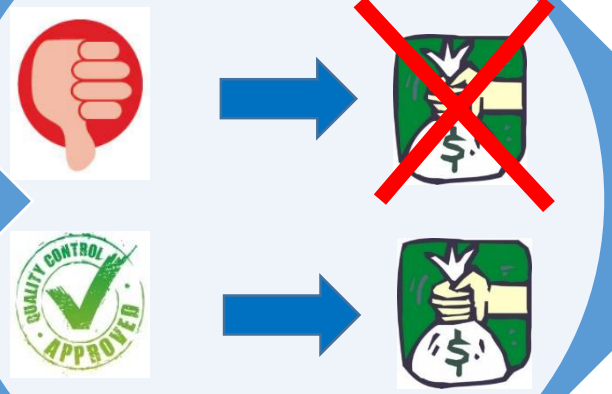
"A principle of project finance is that debt should not bear the risk of the technology."

In order to minimize the first technology-related risk, modules have to be certified in accordance with international standards. Unfortunately, it is common knowledge that a successful certification is not enough for predicting the expected lifetime of a module: a failure in a certification process only suggests that a long life is unlikely. Certification is therefore a necessity but not sufficient.

Source: Holz, F. "The myth of PV module manufacturers' bankability in project financing" Deutsche Bank AG

Effective Policy Incentives – Linked to Quality Requirements

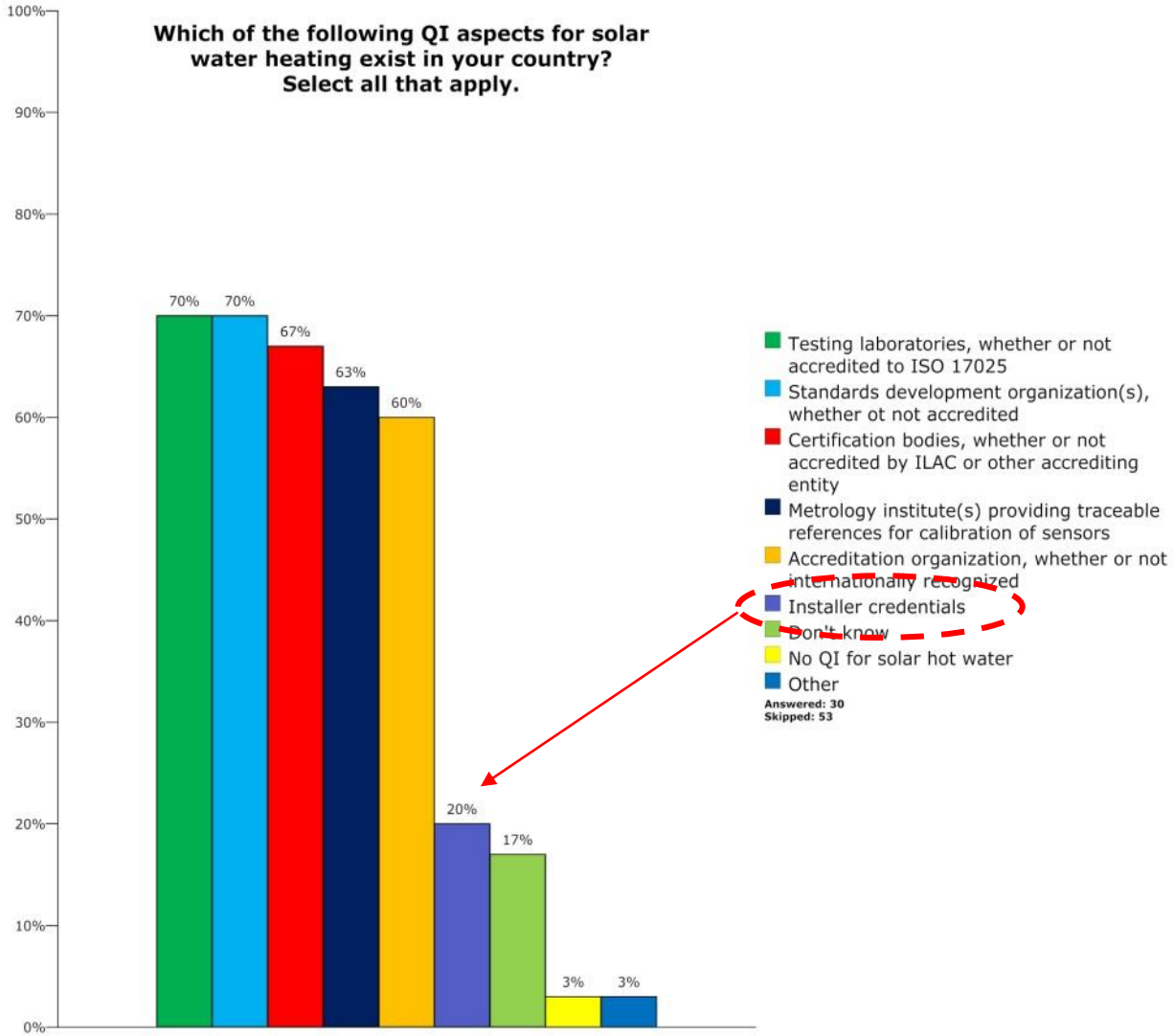
Quality requirements can be linked to national incentive schemes for RET (e.g. FiT)



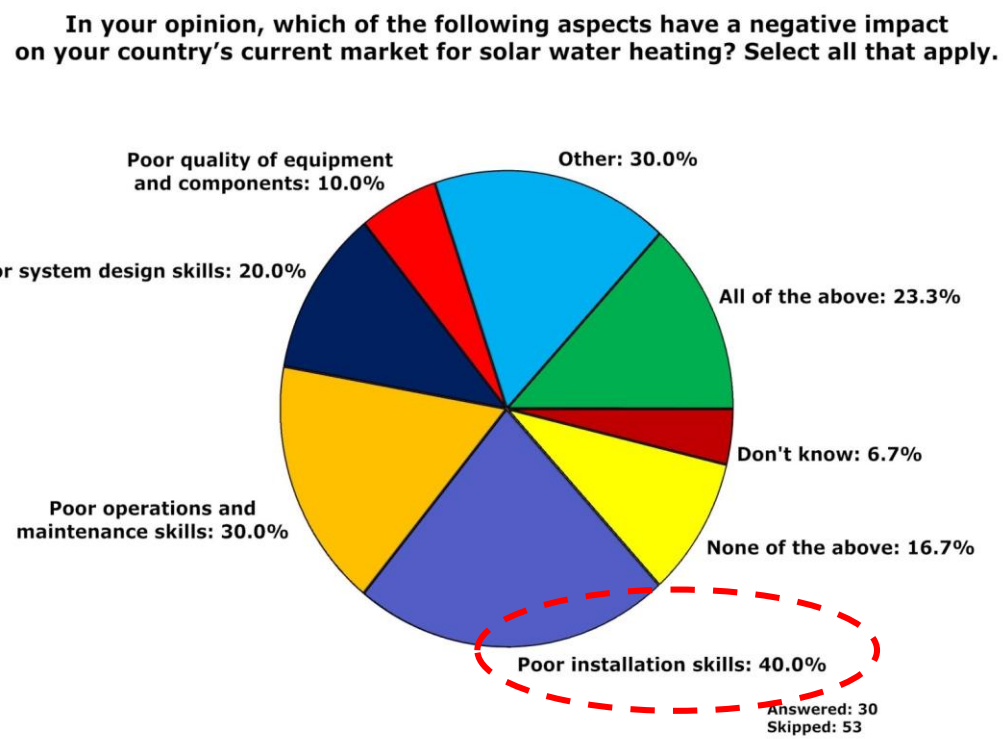
Result: National RET markets develop based on high quality systems

IRENA (2013) "International Standardisation in the Field of Renewable Energy"

IRENA's Study - Gaps on certified competency for SWH installers



IRENA's survey showed that poor installation is one of the factor which affects SWH markets more negatively



Source: IRENA (In Press) "Quality Infrastructure for Small Scale RET"

Quality assurance schemes should be affordable for the local market

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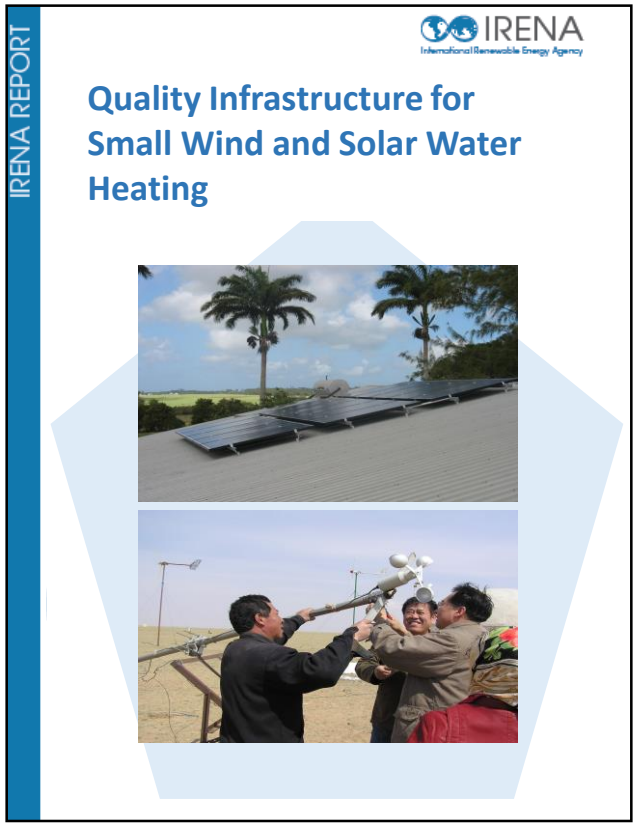

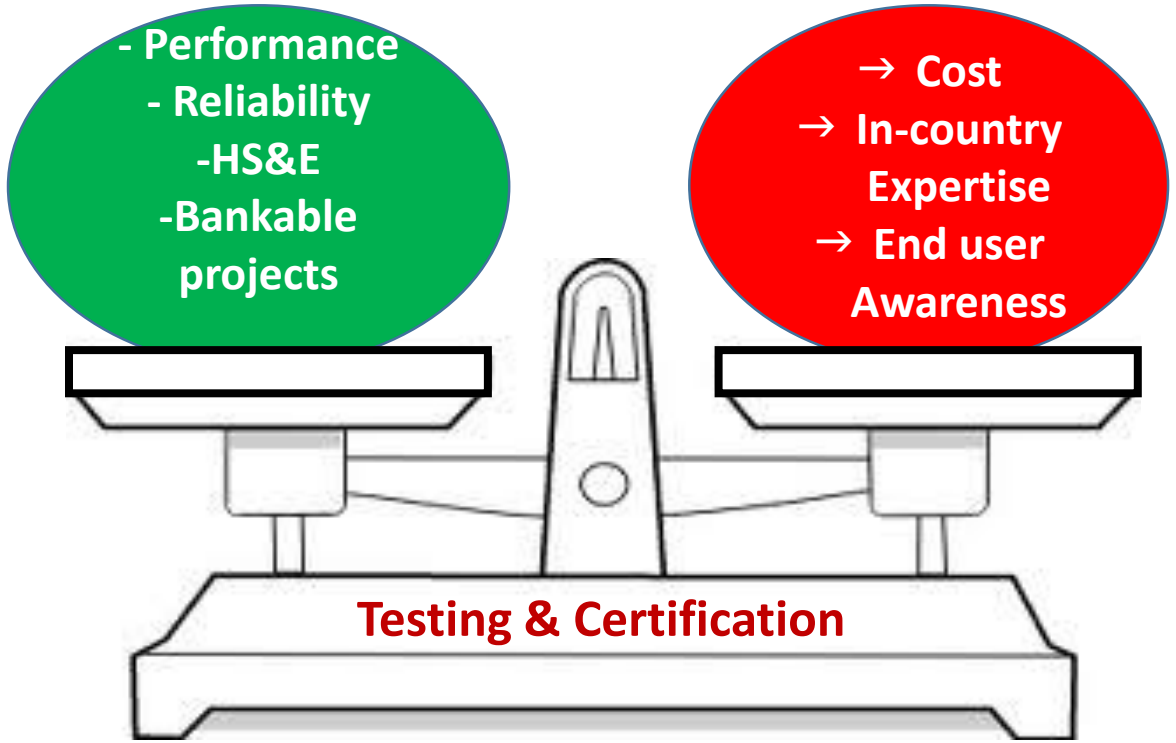

IRENA is developing recommendations to establish national quality infrastructure for small wind turbines and solar water heaters based on local market developments

IRENA (In Press) "Quality Infrastructure for Small Scale RET"

Quality assurance requirements for SWH should develop hand-in-hand with local market stages

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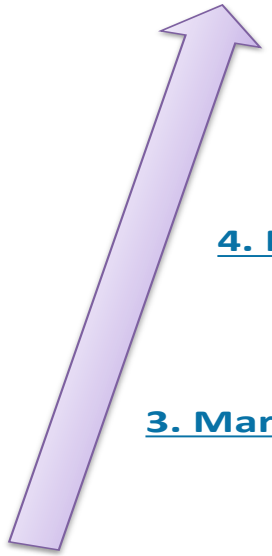
SWH Market and QI Stages

Increased SWH Quality Assurance



5. Mature Market

Accreditation: For test labs, certification bodies, training, inspections
QI/Market: standards maintenance; support regional/international QI; reduce SWH incentives and QI development budget
International QI: Link with groups developing Global Mark for collectors (and systems in the future)

4. Market Consolidation

Certification: establish certification bodies, design review against SWH standard criteria; component-test-based system ratings and listings
Test labs: approach international standards, ISO9806/ISO9459: collector tests, collector ratings/listing; SWH ratings by component test method
QI/market: end-user incentives requiring QI; national standards maintenance, aid regional/international standards development

3. Market Growth

Testing: establish test labs for reliability testing, as in ISO9806-2; calculate simulated SWH ratings using component estimation method, public postings
Training: refine courses/test/levels ⇒ certified practitioners
QI/market: begin end-user incentives. Complete national standards, aid in regional QI development

2. Market Introduction

Training: establish courses for SWH practitioners and import inspectors
Demonstration projects: build public awareness, training
QI/Market: develop national standards from ISO9806 and ISO9459; require certified imports. Possible support for in-country SWH manufacturers

1. Market Assessment

Studies: solar resources, current SWH market; identify in-country experts and industry
Analyses: cost/benefit for SWHs and cost of SWH QI options
Planning: national and/or regional QI and policy plans with options

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QI linked to Market Stages

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Market Assessment

-Develop QI strategy that addresses the needs to resolve specific barriers

-Assess in-country expertise (manufacturers, industry association, retailers, installers, university professors, etc.)

Market Introduction

-Setting up demonstration projects (familiarize end users, provide installer training opportunity, collect basic data, etc)

-Develop practitioner training

-Train import officials on needed credentials for SWH (Require certification from the SWH country of origin?)

Market Growth

-Identifying test labs that can be developed in a low cost, or basic way producing unaccredited test results (performance and durability)

-Credential/certify SWH practitioners

-Initiate policy incentives for end users

Market Consolidation

-Develop Consumer Labels based on unaccredited, third party testing to international standards

-Installer training should have defined curricula and testing for master trainers

-Develop incentives and market requirements needed to get the market started

Market Maturity

-All of the elements of a comprehensive QI system are instituted

-Accredited certification based on accredited test results to IEC standards.

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For More Information on IRENA Publications and Activities in Quality and Standardization for Renewables visit our web site at

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