Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin
Nationales Metrologieinstitut

INTERNATIONAL COOPERATION

EXTERNAL EVALUATION – SHORT REPORT

Lead assessor: Ms Suzana Lange

Technical assessor: Mr Giovanni Bellenda

Strengthening Quality Infrastructure for Photovoltaic in Tunisia

Country | Region:	Tunisia | MENA
Project number:	2014.2496.9
Project term:	01/2016 - 12/2019
Political partner:	Ministry of Industry and Small and Medium Enterprises
Implementing agency:	National Agency for Energy Regulation
PTB | Working Group:	9.34
PTB | Project Coordinator:	Ms Laura Blomenkemper
Date:	24.05.2019

This is an independent evaluation. The contents represent the view of the evaluator and cannot be taken to reflect the views of PTB.

List of abbreviations

ANME	*Agence Nationale pour la Maîtrise de l'Energie* National Agency for Energy Regulation
BMZ	*Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung* Federal Ministry for Economic Cooperation and Development
CETIME	*Centre Technique des Industries Mécaniques et Electriques* Technical Centre for Mechanical and Electrical Industry
CoPil	*Comité de Pilotage* Steering Committee
CSPV	*Chambre Syndicale du photovoltaïque* Association of Tunisian Photovoltaic Installation Workers
CT	*Comité Technique* Technical Committee
CTMCCV	*Centre Technique des Matériaux de Construction, de la Céramique et du Verre* Technical Centre for Building Materials, Ceramics and Glass
DAC	Development Assistance Committee
DGITT	*Direction Générale De L'Infrastructure Industrielle Et Technologique* Department of Industrial Infrastructure and Technology
EU	European Union
GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit* German Development Cooperation Agency
IEC	International Electrotechnical Commission
INNORPI	*Institut National de la Normalisation et de la Propriété* Tunisian Standards Institute
MIPME	*Ministère de l'Industrie et des Petites et Moyennes Entreprises* Ministry of Industry, Small and Medium-Sized Enterprises
PTB	*Physikalisch-Technische Bundesanstalt* National Metrology Institute of Germany
PV	Photovoltaic
PV QI Project	BMZ funded project "Strengthening quality infrastructure of photovoltaic energy in Tunisia" implemented by PTB
OECD	Organisation for Economic Cooperation and Development
QI	Quality Infrastructure
RTTE	*Réseau Tunisien pour la Transformation de l'Energie* Tunisian Network for Energy Transformation
STEG	*Société Tunisienne de l'électricité et du Gaz* Tunisian Electricity and Gas Company
SUPSI	University of Applied Sciences and Arts of Southern Switzerland
ToR	Terms of Reference

1. Project Description

The evaluation covers the implementation period January 2016 - March 2019 of the project "Strengthening Quality Infrastructure for Photovoltaic in Tunisia" (PV QI Project), implemented by the German national metrology institute Physikalisch-Technische Bundesanstalt (PTB). The end of the four-year project is currently foreseen for December 2019, with a potential follow-up project. The current project has a total funding amount of EUR 1,500,000, financed by the German Federal Ministry for Economic Cooperation and Development (BMZ).

The political partner of the PV QI Project in Tunisia is the Department of Industrial Infrastructure and Technology (DGIIT) of the Ministry of Industry and Small and Medium Enterprises (MIPME), which is the institution responsible for QI in Tunisia. Both core partner laboratories of the PV QI Project, the Technical Centre for Mechanical and Electrical Industry (CETIME) as well as the Technical Centre for Building Materials, Ceramics and Glass (CTMCCV), are under the umbrella of MIPME. The Tunisian execution organisation of the project is the National Agency for Energy Regulation (ANME) under the umbrella of the Ministry of Energy (which recently merged with MIPME). ANME is responsible for, among other things, approving PV installers and for granting subsidies. Around 50 approved Tunisian installers are organised in the Tunisian Association of PV Installation Workers (CSPV). Additional implementing partners of the PV QI Project are public QI institutions such as the national standardisation institute (INNORPI), energy stakeholders such as the Tunisian Electricity and Gas Company (STEG) as well as non-governmental institutions such as Tunisian Network for Energy Transformation (RTTE).

The objective of the PV QI Project is to contribute to improving the quality of the PV installations and to strengthening user confidence in this technology through the development of a functioning QI in the PV related fields. The PV QI Project focuses on low-voltage small-sized PV installations for private households and companies. It works in parallel on the improvement of the quality of both the equipment and the installation to ensure that PV components are of high quality and that professional companies correctly install them. In addition, awareness-raising activities are supposed to increase the demand for these QI services in the PV sector.
Regarding equipment, the PV QI Project approach is to set up testing capacities for PV modules and inverters in accordance with international standards. Regarding installations, the PV QI Project develops mechanisms to improve the quality of the installations, such as a practical guide for installers and a label for installation companies. Improvements in equipment and installations aim to reduce deficiencies of PV installations and thereby increase the trust of private households and companies as users of low voltage PV installations. To increase the demand for testing and certification services as well as the trust in the PV technology, the project has one component on awareness raising, which targets the private sector (mainly installers), the broad public and policy-makers.

2. Assessment of the project

The aim of the evaluation is to identify changes that have occurred as a result of the PV QI Project, to find out which are the success factors and to provide recommendations. The lead evaluator assessed the project on the basis of the five internationally recognised criteria of the OECD Development Aid Committee (DAC) and the five success factors of the management model Capacity WORKS. PTB has expressed a specific interest in questions related to improved communication and collaboration among the different stakeholders, from identification of the partners to planning and monitoring of the activities up to conflict resolution.
The lead evaluator is Ms Suzana Lange, a freelance consultant for quality assurance of international cooperation projects. She has a Master's degree in Political Sciences and is a certified organisational developer. Mr Giovanni Bellenda was partly involved in the evaluation as a technical evaluator. He is an engineer, PV expert and technical expert responsible for the PV laboratory at the Swiss University of Applied Sciences (SUPSI).

PTB provided all key project documents to the lead evaluator. The financial monitoring data was only available in an aggregated form. The evaluator took into consideration additional studies and information material developed by institutions such as GIZ or the German Chamber for Foreign Trade. The most valuable source of information were telephone interviews conducted in March -- April 2019 and in-person meetings that took place in Tunis in the timeframe 25-29 April 2019. Partly together with the technical expert, the lead evaluator held a total of 31 interviews with representatives of institutions that participate in the project's steering structures, STEs as well as representatives of other relevant QI institutions and projects. In Tunis, the evaluation team presented the preliminary evaluation results to partners on 29 April 2019. Findings regarding the impact of the project were validated and deepened in discussions and role-plays.
The documents, interviews and observations provided sufficient information, clarifications and individual perspectives to obtain a well-rounded view of a variety of perceptions of the project.

2.1 Status of the change process

Relevance
The expansion of renewable energies and the PV sector became a clear objective of Tunisia, anchored in the Tunisian National Agenda 2030 and the Tunisian Solar Plan. Since project start, the country has significantly increased its use of PV. As a consequence, there is a growing need to strengthen the QI for PV, especially QI services in standardisation, certification and conformity assessment, to improve the quality of the equipment and the installation services. The need to strengthen quality is seen by all interviewed stakeholders in Tunisia, hence the partners do not always perceive the added value of QI institutions and their QI services for their concrete work.
Energy is one of the focus areas of BMZ's cooperation with Tunisia. With its specific approach on QI services for quality assurance, the PV QI project has a unique standing in the donor landscape in Tunisia.
The relevance of the project is rated with good (2,0).

Effectiveness

The most obvious achievement of the PV QI project is the setup of test facilities for PV modules: CETIME and CTMCCV are now able to perform nine new tests in accordance with relevant international standards. This is sufficient to cover the most urgent needs in Tunisia. The project chose inverters after project start in 2016 as the second PV component to focus on. Hence, regarding inverters, no significant progress could be achieved, and the targeted number of eight new tests will not be attained by the end of the project.
Indicator 3, the establishment of at least two additional mechanisms for improving or ensuring the quality of the installed systems, will probably not be entirely met either. Only one mechanism, an installation guide for PV installation workers, which is highly appreciated, has been developed so far. Two other activities, the development of a quality label for installation companies and a national standard for inverters, were initiated but are currently on hold with unclear outcome.
As formulated, the objective of the PV QI project is situated on impact level rather than on outcome level. Therefore, it is realistic to expect that the setup of a functioning and coherent QI for PV is to be reached in more than a decade rather than in four years, and the trust of users depends on various factors beyond the scope of the project. Nevertheless, with support of the PV QI Project the partners achieved valuable progress in this direction.
The effectiveness of the project is rated with satisfactory (3,0).

Impact

The PV QI Project activities on the professionalization of installers and information for the broad public have a direct positive impact on PV clients and for consumer protection. As the PV QI Project contributed to set up functioning testing laboratories, systematic technical controls of imported PV modules could now be introduced. This is exemplary for other renewable energies.
PTB did not fully use its own added value as well situated QI institution to strengthen the link of partners to international QI networks and their products.
Increased capacities of installers, laboratories, inspectors, engineers and other technical staff are a necessary precondition to satisfy the growing PV market and to create local job opportunities in the PV sector. The PV QI Project contributes to the goal of ensuring access to sustainable energy for all. Human rights issues were taken into consideration by addressing smaller installation companies and clients in rural areas, especially in the South of Tunisia and by considering affordability of QI services.
The impact of the project is rated with good (1,7).

Efficiency

Until March 2019, the PV QI Project spent around 60% of its total budget of 1.5 mln EUR, with most of the remaining funds already allocated to planned activities. Various reasons (see Capacity Works criteria) contributed to the rather slow pace of implementation of activities. The purchase of equipment for partners has been highly appreciated but the excessively long procurement process delayed training activities. Additional delay was caused by the difficulty to find available French-speaking PV experts as well as challenges with the coordination of activities. The absorption capacity for technical support was in most cases good. The support for intra- and inter-institutional cooperation process was less accepted. Extended local PTB representation may positively effect cooperation within the project team and coordination with other donors and projects.
There is no common programme for the numerous German development cooperation projects on renewable energy. There are clear overlaps with one of the GIZ projects. Considerable

efforts from both PTB and GIZ management teams were needed to coordinate these two projects and to create synergies.
The efficiency of the project is rated with satisfactory (3,0).

Sustainability
Growing political interest and pressure to increase quality in the PV sector create favourable framework conditions. The PV QI Project's comprehensive and consensus-oriented way of implementation with comprehensive awareness-raising activities are positive factors for the sustainability of the project achievements. The facilitation of the setup of functioning networks between service providers and future users as well as between the energy and the QI sector creates the pillars of a sustainable PV QI system in the future.
A serious risk is the availability of human resources in Tunisia. At the management level, there has been a significant turnover of staff in almost all institutions since project start. This has not occurred so far at the operational level but could likely happen in the future.
The sustainability of the project is rated with good (2,0).

2.2 Success factors for the observed results and change processes

Strategy
The participatory and agile process of project identification caused some confusion among stakeholders. The vagueness of the project proposal provided necessary flexibility in a new cooperation setting, but at the same time created obstacles for its smooth implementation. The lack of strategic clarity is both a reason and a consequence of inter-institutional friction, e.g. between the two testing laboratories or between PTB and GIZ.
For instance, perceptions varied regarding whether the PV QI Project should support the setup of fully IEC-scheme accredited test services or only the most urgent tests. Another question that caused divergencies was how to emphasise the unique selling point of QI for quality assurance.
It is clear that a joint strategy cannot exist from the beginning of a new cooperation. However, a common understanding should be developed and strategic questions decided over time within the project team, which is still an ongoing process in the PV QI Project to be continued.
Currently achieved: 60%, potentially achievable: 80%

Cooperation
The project team has made substantial and continuous efforts in identifying relevant institutions from the private, public and non-governmental sectors and in assessing their potential interest and role in the PV QI Project. Bringing these stakeholders together and establishing an effective cooperation is a considerable achievement of the PV QI Project. The actual PV QI partnership can be considered as innovative and comprehensive. Additional stakeholders might be considered future activities.
The distribution of roles in the project is a constant point of discussion and even conflict among partners in this project, even though the PV QI Project provided considerable

facilitation. Processes for trouble-shooting need further acceleration.
Currently achieved: 80%, potentially achievable: 90%

Steering structure
On strategic level, the PV QI Project has set up a steering committee (CoPil) with high-ranking members of core partner organisations. On operational level, three Technical Committees (CT), aligned with the three project components, have been set up, with members deeply involved in project activities. Meetings with external professional facilitation as well as the elaboration of written Terms of Reference (ToR) have been used to clarify roles and to facilitate the flow of information and cooperation.
The PV QI Project, nevertheless, has shown clear deficiencies in its steering processes and to a certain extent a lack of ownership. Strategic and operational steering need to be linked more strongly and activities monitored more closely than it was the case so far.
Currently achieved: 80%, potentially achievable: 100%

Processes
The PV QI project has provided a broad range of well tailored capacity-building measures to the partners. The support shifted from online presence to remote targeted consultancy. The common study visit would been more beneficial and impactful if it were organised at an earlier stage of the PV QI Project. Tangible project outputs such as the installation guide were helpful to increase ownership of the project. Apart from comprehensive technical consulting and procurement, the PV QI Project has also supported the partners with facilitating their cooperation processes.
The flow of information needs to be further improved. The PV QI team encourages initiative taking and ownership, but a lack of leadership and unclear decision making processes have negative effects, for instance in case of problems and conflicts.
Currently achieved: 70%, potentially achievable: 90%

Learning and innovation
Disseminating project results and informing external stakeholders about the project topic through tailored messages is the objective of a special project component. The approach to combine the awareness raising on the somewhat abstract issue of quality assurance via QI with the promotion of the project outputs proved to be successful. In the future, appropriate ways of communicating the added value of QI services in the PV sector to the broad public and the policy level have to be found.
A proper retrospective and follow up of project activities is important. This goes in line with the wish for more transparency and information expressed by partners as well as the need to ensure continuity in case of staff turnover. The PV QI Project might benefit from the use of more e-cooperation tools, such as an online data storage system or online exchange forums.
Despite communication gaps between stakeholders, the PV QI Project made considerable efforts to establish a thorough, open and agile culture of learning on various project levels.
Currently achieved: 90%, potentially achievable: 100%

3. Learning processes and learning experience

Learning processes

- The PV QI Project identified relevant stakeholders from the QI and PV sector and facilitated their inter-institutional cooperation. This is an ongoing process, in which both written agreements and facilitated personal exchange were helpful in the past and necessary in the future.
- The most relevant tests for PV modules have been set up, so that the control of imported products is possible in the future. Spillover effects like import controls are possible after having established building blocks in a QI system for PV, although a complete uninterrupted QI line is far away in the PV sector. The main reasons for success were the comprehensive support of new services in testing laboratories, the good absorption capacities of partners and favourable political framework conditions.
- The PV QI Project has produced some tangible results, which is important to increase the ownership among project partners. Developing and disseminating a PV installation guide has raised the awareness of installers and costumers for quality of PV installations. The Label Confiance will be a next step in the same direction. The main reason for success was the participatory synergetic elaboration process with commitment from all partners.

Experiences

- The development of a common understanding of the project is necessary for its smooth implementation. Diverging expectations and an unclear path for realisation of the project goals hindered progress and are both a reason for and a consequence of blockades.
- There is a gap between theory and practice when observing the comprehensive setup of the steering structures on paper versus the actual steering processes and ownership, so revising the functionality of established project processes and structure is necessary.
- The PTB approach of managing cooperation projects remotely reaches its limit when a project requires facilitation of inter-institutional processes, closer interpersonal relationships and exchange of information, reaching target groups beyond peer institutions and thorough donor coordination.
- As GIZ and PTB both work on PV quality issues, greater coordination beyond the working level is necessary in the project identification phase in order to avoid overlaps. The efforts invested by both project teams to minimize the existing overlaps are a good practice example for using synergies in various ways but cannot compensate for inefficiencies.

4. Recommendations

The recommendations below group the detailed recommendations of the evaluation report.

Technical recommendations to the project team

1. To further broaden the setup of testing capacities
2. To finalise the development of the quality assurance mechanisms including market surveillance
3. To stimulate Tunisian participation in international QI activities

Management recommendations to the project team

4. To focus on QI for quality of PV installations and nevertheless produce tangible results
5. To further develop the result-based monitoring system based on a clear project strategy
6. To accelerate project activities without losing the search for consensus
7. To adapt the coordination and cooperation without losing the participatory approach
8. To improve the project processes such as decision-making and exchange of information

Management recommendations to the "International Cooperation" department

9. To improve internal processes on procurement and e-cooperation
10. To use PV QI lessons learned for future projects
11. To improve external collaboration and coordination