

# EXTERNAL EVALUATION – SHORT REPORT

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Promotion of Quality Infrastructure with Emphasis on the Energy Sector

Country | Region: Mongolia

Project number: 2014.2132.0  
Project term: 09/2016 – 08/2019

Political partner: Ministry of Energy of Mongolia (MoE)  
Implementing agency/agencies: Mongolian Agency for Standardization and Metrology (MASM)

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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

APLAC	Asia Pacific Laboratory Accreditation Cooperation
APMP	Asia Pacific Metrology Programme
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung / Federal Ministry of Economic Cooperation and Development, Germany
CAB	Conformity Assessment Body
CIPM	Comité International des Poids et Mesures
CMC	Calibration and Measurement Capabilities
CP	Calibration procedure
DAkkS	Deutsche Akkreditierungsstelle GmbH / National Accreditation Body of the Federal Republic of Germany
DeGEval	Gesellschaft für Evaluation e.V. / Evaluation Society
DKE	Deutsche Kommission Elektrotechnik / German Electrotechnical Commission
EUR	Euro
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
ILC	Interlaboratory comparison
iSTE	International short-term expert
ISO	International Standards Organization
MEDEA	Metrology-Enabling Developing Economies in Asia
MoE	Ministry of Energy, Mongolia
NEC	National Electrotechnical Committee, Mongolia
OECD	Organization for Economic Co-operation and Development
PFB	Projektfortschrittsbericht / project progress report
PT	Proficiency Testing
PTB	Physikalisch-Technische Bundesanstalt / National Metrology Institute, Germany
QI	Quality Infrastructure

## 1. Project Description

The object of the evaluation is the project ‘Promotion of Quality Infrastructure with Emphasis on the Energy Sector’ in Mongolia. The project has a budget of up to 600,000 EUR and is planned to operate from 09/2016 until 08/2019. The evaluation covers the time period from 09/2016 until 03/2019 and has been conducted from 11/2018 until 05/2019 applying document study, sample-based checks, semi-structured interviews, focus group discussions and an evaluation workshop.

The project has been mandated by the German Federal Ministry for Economic Cooperation and Development (BMZ) and is jointly implemented by the Physikalisch-Technische Bundesanstalt (PTB) and the governmental partner Ministry of Energy of Mongolia (MoE). The key implementing partner organizations are the Mongolian Agency for Standardization and Metrology (MASM), furthermore the National Electrotechnical Committee (NEC), among other governmental and non-governmental partners that are instrumental for reaching the project objectives.

Lack of quality infrastructure services to explore the potential for improving energy efficiency and securing energy supply for households and the corporate economy has been identified as the core problem the project aims to address. The project is designed to contribute to the Sustainable Development Goals (SDG), specifically SDG 7 – affordable and clean energy for all, as well as SDG 9 – industry, innovation and infrastructure, and SDG 13 – climate action.

On outcome level, the objective of the project (“International requirements for quality assuring services in metrology and for the development of technical regulations and standards in the energy sector are complied with”) is tackled with project activities in the following three output areas:

- (1) The capabilities and services of the metrology system for the energy sector have been enlarged.
- (2) The process and the quality with which international standards in the energy sector are adopted are in accordance with international practice.
- (3) Appropriate legal minimum requirements have been laid down for selected measuring instruments in the energy sector and are being implemented.

The target group consists of private and corporate consumers of electrical energy. Further relevant stakeholders are power plants and grid companies, and their labs, suppliers and service providers.

On impact level, the programme objective aims at contributing to the economic and ecologically more sustainable offer and use of energy as well as to energy security in a German-Mongolian programme on energy efficiency implemented jointly with KfW and GIZ and their respective Mongolian partners.

## 2. Assessment of the project

The analysis based on the OECD-DAC criteria shows that the project achieved positive ratings for relevance and efficiency, whereas some assessment aspects regarding the effectiveness and impact were rated below average. Owing to the average number of points (3), the project is given the overall rating: “satisfactory”.

<b>Criterion</b>	<b>Criterion assessment</b>
1. Relevance	2
2. Effectiveness	3
3. Impact	3
4. Efficiency	2
5. Sustainability	3
<b>Global assessment</b>	<b>3</b>

## 2.1 Status of the change process

### Relevance

The project is in line with the priority area of the Mongolian State Policy on Energy for 2015 – 2030 that covers the aspect of energy efficiency as well as with the focal area of German-Mongolian cooperation of the same topic. Regarding the latter, the PTB module is part of the German-Mongolian programme on energy efficiency, which is implemented jointly with further modules from KfW, GIZ and their respective Mongolian partners. No evidence was found by the evaluators to support a consistent linkage from project activities and quality infrastructure modernization at MASM and NEC to an impactful contribution to the economic and ecologically more sustainable offer and use of energy in Mongolia until 2019.

The findings from the evaluation support the theory of change and the results model (see annex for graph), in particular with regards to the outputs of the PTB module to support the compliance of Mongolian technical regulations and standards in the energy sector with international requirements for quality assuring services in metrology. All interviewees expressed high demand and appreciation of the project.

Mark: 2 / successful.

### Effectiveness

The project's logic is realistic and plausible for the PTB module. The outputs feed well into the outcome level, namely each output is assigned to contribute to one of the three outcome level indicators.

The achievement of the module objective foresees compliance ("are complied with") of Mongolian technical regulations, standards and metrology services with international requirements, which has been reached as planned. Progress could be made in the provision of metrology services (see indicator #1) and in the processes for technical regulation and standardization. However, the standardization process of the eight (possibly 19 selected) IEC standards under indicator #2 has only been initiated with the translation. The technical regulation for consumption meters under indicator #3 remains in the draft stage.

The actual linkages to the programme's impact level (jointly with KfW and GIZ) are rather weak. However, the comparatively low amount of funding of the PTB project as compared to the budget of KfW and GIZ explains the minor quantitative contribution to the programme indicators to some extent.

Mark: 3 / satisfactory.

The evaluators consider the module indicator #2 adequate for the results-based monitoring and the evaluation (see appraisal "A" in middle column below) and express a slight reservation for module indicators #1 and #3 (see appraisal "B" in middle column below).

<i>Outcome indicator</i>	<i>Degree of fulfilment (in %)</i>	<i>Appraisal (A-C)</i>	<i>Justification</i>
1) The national metrology system ensures international traceability for another three (3) electrical quantities.  Initial value (2016): 2 Target value (2019): 5	100%	B	The measurement procedures and uncertainty budgets are crucial for measurement traceability. During the evaluation this indicator was found not to measure adequately the aspect of the intended change regarding international traceability. Thus, the quality of the indicator is assessed with "B". PTB decided (subject to PTB reporting and BMZ

<p><i>Actually:</i></p> <p><i>The national metrology system ensures international traceability for another three (3) measurement procedures.</i></p> <p><i>Initial value (2016): 3</i></p> <p><i>Target value (2019): 6</i></p> <p><i>Actual value: 8</i></p>			<p>approval) to adjust this indicator in terms of measuring the increase of measurement procedures instead of electrical quantities.</p> <p>The evaluators found in the MASM electricity lab a 2016 initial value of three (3) measurement procedures (for AC voltage and current, DC voltage and current, and DC resistance) traceable to the International System of Units (SI).</p> <p>The evaluators assess the indicator to be fully achieved, because of an expected increase by at least three (3) measurement procedures, actually five (5): resistance standards, resistance decades (two different measurement procedures), power and energy, and DC voltage standards.</p> <p>Both initial and target values deviate from the initial value two (2) and the target value five (5) that were reported to BMZ. This has, however, no effect on objective achievement.</p> <p>The specific electrical quantities or measurement procedures were not subject of project monitoring, which might have been circumstantial for this monitoring deficiency to be identified just during evaluation.</p> <p>All electrical quantities are disseminated to MASM's working standards and then transferred to customer's equipment as shown in traceability charts.</p> <p>Calibration services to customers are at around 500 items/year.</p>
<p>2) At least eight (8) international standards are adopted for their uniform terminology and after involvement of interested parties.</p> <p>Initial value (2016): 0</p> <p>Target value (2019): 8</p> <p>Actual value: 0</p>	<p>0 %</p>	<p>A</p>	<p>At the start of the project, 8 IEC standards were selected for adoption. The scope was expanded by the steering group and at the time of the evaluation, 19 IEC standards were translated from English to Mongolian.</p> <p>The number of eight (8) standards is reported by the project as the target value.</p> <p>In the process of adoption of the IEC standards, the stakeholders are still at the beginning (e.g. stakeholder consultation to follow).</p> <p>Estimates by MoE, MASM and NEC stakeholders about the time needed to adopt the standards range from May 2019 to 2021.</p>

<p>3) A technical regulation for consumption meters in the energy sector has been developed exemplarily according to international practice.</p> <p>Initial value (2016): 0 Target value (2019): 1 Actual value: 1</p>	<p>100%</p>	<p>B</p>	<p>The draft for the technical regulation for consumption meters has been produced and is awaiting approval by government.</p> <p>The quality of the indicator is assessed with “B”. As the indicator reads “developed”, the evaluators assess full achievement, however the status (“regulation developed”, in German even less: “wird ...erarbeitet”) does not contribute sufficiently to the module objective (“requirements are complied with”), and to the programme objective, where programme indicator #4 stipulates approval by the Mongolian partners of the respective norms, or legal and regulatory measures.</p> <p>The “exemplarily” aspect was considered by foreseeing in output indicator 3.1 three (3) trainings on good regulatory practices of which one (1) was conducted in 11/2017. It is not clear to the evaluators what conceptual approach has been taken by the project on how to use and what to learn from this “example” regarding replication and upscaling of this particular process when it will come to other technical regulations. Nevertheless, confidence to repeat the process was expressed by one key stakeholder.</p>
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#### Impact

The results of the project could eventually have an effect on a more sustainable offer and use of energy in Mongolia – in combination with further efforts by Mongolian stakeholders, German implementing agencies KfW and GIZ, among others. The evaluators did not find any measurable effects of the project (within the context of the programme) on energy efficiency, e.g. at the point of power or heat generation, transmission, distribution and consumption. However, on the outcome level the calibration of equipment for electrical quantities and international traceability contributes to measurable effects on the increase of compliance of MASM quality assuring services in metrology with international requirements. Furthermore, several interviewees emphasized that the project had an effect on improving processes in MASM-NMI, MASM Darkhan and South Gobi offices and secondary labs of power companies, as well as initiating and fostering participation and empowerment of the NEC.

Mark: 3 / satisfactory.

#### Efficiency

The relation between resources allocated and project performance is in balance, however after 26 of the total 36 months term (as at 11/2018), just about 50 % of the budget of 600,000 EUR were spent, and one project indicator (indicator #2 as mentioned above) might eventually not be reached. Thus, there is a certain imbalance of available budget in relation to planned and actual progress. The resources used were perceived as adequate by interviewees.

Mark: 2 / successful.

#### Sustainability

The increase of staff qualification, ensuring of electrical quantities, translating the IEC international terminology standards and introduction of a technical regulation for consumption meters are the palpable effects on output and outcome level, and are likely to endure after the end of the project. However, for output area #1, the enlarged capabilities in the electricity laboratory of MASM are in a fragile transition phase due to the retirement of the trained, knowledgeable head of laboratory and further resource persons at the end of 2018.

The introduction of the IEC international terminology standards (translated, to be processed for consultation and approval) and the technical regulation for electricity meters (draft, pending approval) are considered by the evaluators as important, however, preliminary steps, whereas impact and sustainability will need to be assessed once the standards and the regulation will have been implemented subsequently. These steps are an important advancement towards international practice.

Several stakeholders on management and technical level at MoE, MASM and NEC state a change of culture regarding control/service, e.g. revenue generation through services, draft metrology strategy and law for institutional and sectoral transformation, and an improved self-awareness of handling the lab equipment for calibration procedures and uncertainty measurement.

Several important risks to sustainability, mostly related to insufficient or slow institutional and sectoral change and transformation processes, cannot be addressed by the current design of the PTB module alone. The German-Mongolian energy efficiency programme was not used to the extent possible for the stock-taking and management of those risks.

Mark: 3 / satisfactory.

## 2.2 Success factors for the observed results and change processes

### Strategy

For strategy development (and all other CapacityWorks factors) no tools of the CapacityWorks (CW) management model have been applied by the project. In hindsight, despite the obvious demand for systematic and thorough application of those management tools, the evaluators did not come across any explanations why the management model was ignored.

All key stakeholders interviewed expressed high satisfaction of the joint character of the strategy development and of the progress of the implementation. The evaluators assess that the relevant and “right” partners have been on board for the planned activities. However, it appears that the steering and implementation of the project did not provide sufficient leverage, to make a meaningful contribution to the objective on programme level (“economic and ecologically more sustainable offer and use of energy as well as to energy security”) and only partially to the module objective (“international requirements... are complied with”).

The project took a demand-oriented approach, with regular, at least twice per year consultations, to agree on activities and pursued activities that are reasonable and sustainable with and without the new metrology law and with and without the metrology strategy. The relevant circumstances were taken into account, for instance by focusing on human resource measures (e.g. on-the-job training), introducing international requirements for quality assurance and calibration procedures for quantities that are regularly in demand of an economy such as Mongolia.

Level of achievement: 80 %

## Cooperation

The project involved the right stakeholders for the planned activities, and in principle for the achievement of the module objective and intended higher-level results. The main project partners were defined for the implementation of the activities, and responsibilities were agreed upon in the frame of the steering group meetings. Possible lines of conflict appear to have been taken into consideration but were not explicitly identified. The involvement of private sector has been emerging. The roles within the project as well as the limits of the project are clearly defined in practice.

The project did not have sufficient leverage in terms of project partners and stakeholders to explore a more meaningful contribution to the module and programme objective.

The project did not maintain an up-to date stakeholder mapping or a mapping of other donor activities.

An implementation agreement for the project was signed in January 2017 between MoE, MASM and PTB. MoE and MASM represent the key project partners and are directly affected by and involved in the achievement of the project objective and indicators. Representatives of both institutions take part in the steering group of the project

Level of achievement: 70 %

## Steering structure

The approach to the steering of the project involves an activity-related structure of management meetings during PTB coordinator missions twice per year and e-mail and telephone exchange centering on an excel-sheet monitoring document. There are no terms of reference for the steering group. Responsibilities for concrete activities are assigned during the meetings of the project steering group. The implementation status and possible issues are regularly presented by the person in charge and the steering group defines the next steps. The monitoring is done jointly, and the monitoring document is "managed" by PTB, however, it is too minimalistic to inform steering decisions, and it contains (unintentional) information asymmetries and inaccuracies. The interviewees highlighted a strong cooperation between the PTB project team and partners MoE and MASM and indicated some interfaces to be improved.

Overall, PTB has set-up a standalone project-related steering structure (in addition to KfW, GIZ and others) for a comparatively small module (EUR 200,000 funds to be allocated per year, actual spending EUR 100,000 per year). This approach did not help to increase the leverage of the project to consolidate results and to reach broader QI change for an increase of energy efficiency.

Level of achievement: 70 %

## Processes

Processes have been neither explicitly defined nor analyzed by the project team. The evaluators note target-relevant evidence that steering processes have not been based on a comprehensive grasp of core and support processes. The lack of definition or management of interfaces of core processes to be supported by procurement have led to delays.

Partially, output and outcome monitoring has been done for two years in contrast to project realities.

The instrument of mission reports was not applied thoroughly and was often rather mission day oriented than results-framework oriented. Several key expert reports throughout large parts of the implementation period applied for essential parts of their content the same wording, without highlighting that this was possibly due to lack of progress, and without proposing action points. This has possibly contributed to a lack of comprehensive management information on processes and progress.



The generic character of the results and action points of such mission reports and the deficiencies of the excel monitoring document as well as the lack of mapping processes are found by the evaluators not to be conducive towards clear-cut, targeted processes.

Level of achievement: 40 %

#### Learning and innovation

Learning objectives have not been defined, and there is little evidence for lessons learned to be processed or documented. The evaluators got the impression that learning took place implicitly and in mutual understanding in the setting of the steering group, when the situation of a specific measure, its challenges and opportunities were discussed. Furthermore, learning from project activities has been done in form of reflective practice by the PTB project assistant in Ulaanbataar before, during and after expert missions, and in telephone calls with the project coordination in Braunschweig.

Key stakeholders like the MASM Chairman are well aware of the challenge of safeguarding the transfer of knowledge from (trained) senior to junior staff and from MASM to MASM local offices and secondary labs. The project – despite its human resource centered approach – did not yet provide a concept to this challenge.

Neither did the key stakeholders and the local assistant receive training for the CW management model nor the current PTB project coordinator. The latter reported to have been registered for a training.

All stakeholders interviewed have been open to share relevant project related information, e.g. calibration certificates and documentation by MASM upon request during evaluation.

Level of achievement: 60 %

### 3. Learning processes and learning experience

#### **Learning processes and experiences**

##### Learning Processes

- (1) The steering group set up for the project created a space for exchange, joint reflection and learning on activity level, which was appreciated by the project partners. The clear responsibility of partner representatives for the implementation of project activities supported by PTB expert advice was highlighted by the steering group members as an empowering approach.
- (2) The project was able to deliver much appreciated staff training and no less appreciated introduction of international requirements. However, the project was planned and operated in a rather stand-alone way that did not yield enough leverage for necessary change and transformation processes.
- (3) Steering processes have not been based on a comprehensive grasp of core and support processes. The lack of definition or management of interfaces of core processes to be supported by procurement have led to delays, and a possible underachievement of one outcome indicator.

##### Experience

- (1) Several important risks to sustainability cannot be addressed by the current design of the PTB module alone. The German-Mongolian energy efficiency programme was not used to the extent possible for the stock-taking and management of those risks. Instead, KfW, GIZ and PTB selected different sub-sector foci and PTB set-up a separate steering structure for its comparatively small module (EUR 200,000 funds to be allocated per year, actual spending EUR 100,000 per year).
- (2) Effective monitoring process should be implemented for all relevant stakeholders, and monitoring data documented comprehensively (e.g. not just document the counting 1, 2, 3 etc. but counting

units and respective items, too). It is essential to make knowledge accessible and minimize information and efficiency loss when project staff changes.

#### 4. Recommendations

The evaluators issue 14 recommendations. Key recommendation is to continue the approach in the focal area “energy efficiency” of Mongolian-German cooperation, focusing on QI stakeholders like MASM and its provincial centers, NEC and designated institutes to take next steps in systemic change of the NQI system (e.g. strengthen independency, smart specialization, designation).