cooperação alemã
DEUTSCHE ZUSAMMENARBEIT

Durchgeführt von: giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

In Partnership with: ANEEL Agência Nacional de Energia Elétrica

Measurement & Verification on the Brazilian Energy Efficiency Program

Accurate results for greater energy savings

The Challenge

Brazil is historically known in the field of energy for having a high percentage of hydropower generation in its energy matrix. However, the country´s major reservoirs have suffered from low water levels in the past years, a trend that shows signs of persisting for the next years. In response, thermal power plants have been more often activated, resulting in increasing emissions from electricity generation – **CO_2 emissions peaked up from 29 g/KWh to 96 g/KWh between 2007 and 2013** (Ministério da Ciência, Tecnologia e Inovação - MCTI, 2014).

Energy efficiency (EE) actions are becoming increasingly important tools for Brazil to address these energetic issues while avoiding growth of greenhouse gas emissions. Reducing unnecessary energy demand, they can prevent the commissioning of additional conventional power plants and curb the growth of emissions.

The Energy Efficiency Program (Programa de Eficiência Energética, PEE), a billionaire program conducted by the Brazilian regulatory authority of the electricity sector (Agência Nacional Energia Elétrica, ANEEL) plays an important role towards achieving the target of reducing 10% of the estimated demand by 2030 (Ministério de Minas e Energia - MME, 2007). This program requires approximately 100 electricity providers to employ 0.5% of their net operating revenue in energy efficiency projects. According to ANEEL (2014), this results in an annual investment of about 385 million Brazilian Reais (approx. EUR 120 Mio). The Ministry of Mines and Energy - MME (2014) estimates that between 1998 and March 2014, **PEE has already invested 5.7 billion** Brazilian Reais (approx. EUR 1.85 Bi.).

To ensure that regulatory institutions and project developers are capable of assessing the effectiveness and impacts of PEE resources, ANEEL has been working in the improvement of its Measurement and Verification (M&V) procedures.

Measuring and verifying energy efficiency projects are not easy tasks. Unlike the generation of new energy, the reduction of the energy demand due to energy efficiency actions cannot be directly measured – it is necessary first to estimate how demand would behave in the absence of the project (i.e. establish a baseline scenario), and then to measure the actual demand after the implementation of the project. The difference between these two values – what would have happened without the project, and what actually happened – is the effect of the EE actions of the project.

The 2008 PEE Manual incorporates M&V procedures based on the International Performance Measurement and Verification Protocol (IPMVP). These procedures were enhanced in 2013 by the Procedures of the Energy Efficiency Program" (PROPEE). The M&V Guide was launched in 2014 and **aims to allow the generation of standardized and reliable data on the performance and impacts of the projects and the PEE** (Footnote image).

Expected Results

PEE´s monitoring methods and techniques are improved. Accurate data about the impacts of the program and project´s results facilitate the improvement of the program regulation, leading to greater energy savings.

Timeline of M&V on PEE

Our Approach

On behalf of the Federal Ministry for Economic Cooperation and Development (BMZ), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH supports ANEEL´s efforts to enhance the energy savings incentiviced by PEE.

Project's Name	Renewable Energy and Energy Efficiency (4E)
Financed by	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ)
Region	Federal Level
Executor Organisation	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Duration	01.02.2013 – 31.12.2015

GIZ supported ANEEL in the elaboration of the M&V Guide, which was successfully tested and validated with real data from PEE projects. Three training sessions with ANEEL's staff were held and also contributed to its improvement. After its publication, ANEEL, with support of GIZ, held **seminar trainings** for approximately 50% of the electricity providers implementing PEE projects.

Trainings promoted by the cooperation directly reached 87% of the regulated energy market and are being replicated by main utilities to its subsidiaries. Therefore, considering both direct and replicated trainings, approximately **96% of the regulated market was reached**. ANEEL belives that a wide dissemination of M&V procedures can directly impact the quality of the data provided to them.

GIZ also provided technical support for **e-learning** materials and techniques. Online **training videos** aim to disseminate knowledge about general M&V procedures, as well as specific standards for PEE projects.

Intended impacts

Besides enabling a better assessment of the results and impacts of the projects financed with PEE resources, improved M&V procedures support the **creation of a standardized nationwide database,** providing ANEEL with key indicators **to support the monitoring and improvement of PEE**.

Improvements on M&V procedures are also expected to reduce costs and efforts for future PEE's projects, since the accumulation of data from previous projects will allow project executors to perform sample measurements without compromising the accuracy of results, instead of measuring an exhaustive number of equipments in order to prove its energy savings.

Further Activities

The current challenge is to ensure that M&V knowledge is transferred to ESCOs and other companies that execute PEE projects on behalf of utilities. Therefore, the cooperation increases efforts on e-learning technics. **Several videos of the training sequence on M&V procedures on PEE** are expected to be elaborated in order to ensure dissemination of the knowledge transfer also to other agents on the long term.

Support ANEEL to structure a database to organize the massive M&V data that is going to be provided by electricity providers on the near future. Defining methodologies to assess this data as well as testing them are key activities to ensure a successful implemantation of the nationwide database.

References

ANEEL. (19 de Agosto de 2014). *Aberta chamada para projetos de eficiência energética*. Acesso em 27 de Janeiro de 2015, disponível em http://www.aneel.gov.br/aplicacoes/noticias/Output_Noticias.cfm?Identidade=8070&id_area=90

Ministério da Ciência, Tecnologia e Inovação - MCTI. (2014). *Mudanças Climáticas*. Acesso em 27 de Janeiro de 2015, disponível em Fatores de Emissão de CO2 pela geração de energia elétrica no Sistema Interligado Nacional do Brasil: http://www.mct.gov.br/index.php/content/view/72764.html

Ministério de Minas e Energia - MME. (2007). *Plano Nacional de Energia – PNE 2030.* Acesso em 27 de Janeiro de 2015, disponível em Plano Nacional de Energia – PNE 2030: http://www.epe.gov.br/Estudos/Paginas/Plano%20Nacional%20de%20Energia%20%E2%80%93%20PNE/Estudos_12.aspx?CategoriaID=346

Ministério de Minas e Energia - MME. (Julho de 2014). *11º Congresso Brasileiro de Eficiência Energética.* Acesso em 27 de Janeiro de 2015, disponível em Programa: http://www.cobee.com.br/cobee2014/programa.html

Editor: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Registered offices: Bonn and Eschborn

GIZ – Office in Brasília
SCN Quadra 01 bloco C sala 1501
Ed. Brasília Trade Center
70.711-902 Brasília DF
T + 55-61-2101-2170
F + 55-61-2101-2166
giz-brasilien@giz.de
www.giz.de/brasilien

GIZ is responsible for the contents of this publication

As at: May 2015

On behalf of the: Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ)

Adresse

BMZ Bonn
Dahlmannstraße 4
53113 Bonn, Germany
T +49 (0)228 99 535-0
F +49 (0)228 99 535-3500

BMZ Berlin
Stresemannstraße 94
10963 Berlin, Germany
T +49 (0)30 18 535-0
F +49 (0)30 18 535-2501

poststelle@bmz.bund.de

www.bmz.de