

Bundesamt für Energie BFE

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ISGAN Annex 3: Kosten-Nutzen-Analyse

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Für den Inhalt und die Schlussfolgerungen sind ausschliesslich die Autoren dieses Berichts verantwortlich.

Project Objectives

The scope of the Annex III is the development of methods and tools for the evaluation of the costs and benefits of smart grids projects, and for the preliminary assessment of the level of smartness of present electricity systems. Some requirements for the methods and tools developed by this Annex are:

- Results of application of these tools could be used to develop specific business cases, taking into account regulatory and market structures, as well as current system status, available generation assets and resources and demand profiles.
- Regulators, utilities and other electricity system stakeholders could use these toolkits to define and decide on system needs and priorities for smart grid system investment and regulatory changes
- Leverages existing knowledge and experience (e.g. in the DOE-EPRI methodology and computational tool, the EU KPI etc).

The objective of this Annex is to develop a global framework and related analyses that can identify, define, and quantify in a standardized way the benefits that can be realized from the demonstration and deployment of smart grids technologies and related practices in electricity systems. The Annex will leverage existing knowledge and experience gained in different participating countries (e.g. in the U.S. through the DOE-EPRI methodology and computational tool, the EU through its approach based on Key Performances Indicators, etc.), as well as in current international efforts underway and through cooperation among major smart grids stakeholders globally.

The program of work consists of the following three Tasks.

Task 1: Assess Current Network Maturity Models and Tools available

Subtask 1.1: Collecting and comparing maturity frameworks and tools

Subtask 1.2: Trial application of two network maturity analysis tool and results discussion

Subtask 1.3: Guidelines for the development of a new ISGAN simplified maturity analysis tool

Task 2: Assess Current Benefit-Cost Analytical Methodologies and Tools

Subtask 2.1: Collecting and comparing benefit-costs frameworks and tools Subtask 2.2: Assessing policy and regulatory considerations for smart grid Task 3: Develop Toolkits to Evaluate Benefit-Costs at the Technology or Subsystem Level

Subtask 3.1: Trial application of the DOE benefit-cost analysis computational tool and results discussion

Subtask 3.2: Guidelines for the development of a new ISGAN benefit-cost analysis tool

Work Performed and Achieved Results

The Tasks and Subtasks within the ISGAN Annex III are carried out on a task-sharing basis, as directed by the ISGAN ExCo. The following summary of activities includes contributions of all participating countries to the tasks.

In 2015 the main activities in Annex 3 were devoted to Task 3: Develop Toolkits to Evaluate Benefit-Costs at the Technology or Sub-system Level.

The simplified/practical approach, based on simple excel spreadsheets developed in the previous years, was applied to a real case of CBA performed/validated by the Italian/French NRA (AEEG-SI / CRE) to quantify the network related benefits. The smart grid project taken under investigation was "Grid integration of REnewables Energy sources in the North-MEditerranean". The results of these activity where of ISGAN Annex 3 experts were involved have been presented in 23rd International Conference on Electricity Distribution CIRED 2015. The application of the methodology showed also some advantages and disadvantages of the approach.

The main advantage of the method are:

- it is easy to implement and to use.
- captures the network related benefits of a project.

the main disadvantage of the method is:

• it does not capture the dispatch related benefits.

The results of the GreenMe study showed for the dispatch related costs made up to 50% of the overall benefits. The developed toolkit currently quantifies only the network related benefits.

National Collaboration

The ongoing activities in Annex I (Global Smart Grid Inventory) and Annex III (Benefit & Cost Analyses And Toolkits) were regularly communicated with Dr. Rainer Bacher from BACHER ENERGY LTD, who is the Annex I swiss representative.

International Collaboration

The Tasks and Subtasks within the ISGAN Annex III are carried out on a task-sharing basis. The task-sharing basis allows close collaboration with participating countries (Austria, Canada, France, India, Italy, South Korea, Mexico, Russia, Spain, Sweden, Switzerland, UK, USA).

Outlook 2016

Finalisation of the developed excel spreadsheets based cost-benefit analysis toolkit and the user's manual.