

IGREENGrid



WP7: D7.11

Articles in prestigious
publications to present
IGREENGrid results

"This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 308864".





ID & Title :	D7.11 Articles in prestigious publications to present IGREENGrid results	Number of pages :	21
Short Description (Max. 50 words):			
This report summarizes the articles already published by the IGREENGrid project in relevant magazines and conferences. It presents also the articles that have been planned to be published after the end of the project in order to communicate about the final results.			
Version	Date	Modifications' nature	Author
V1.0	29/04/2016	Deliverable submitted to the approval	Maria Sebastian Viana
Accessibility:			
<input checked="" type="checkbox"/> PU, Public			
<input type="checkbox"/> PP, Restricted to other program participants (including the Commission Services)			
<input type="checkbox"/> RE, Restricted to other a group specified by the consortium (including the Commission Services)			
<input type="checkbox"/> CO, Confidential, only for members of the consortium (including the Commission Services)			
If restricted, please specify here the group:			
Owner / Main responsible:			
ERDF			
Reviewed by:			
ICCS-NTUA			



Authors

Version	Date	Modifications' nature	Author name (s)	Company
V0.0	05/01/2016	Document Initialization	Maria Sebastian Viana	ERDF
V0.1	26/04/2014	First draft submitted to the review	Maria Sebastian Viana	ERDF
V0.2	26/04/2014	Second draft submitted to the review including Iberdrola proposition of article	Maria Sebastian Viana	ERDF
V0.3	27/04/2016	Third draft submitted to the review including RSE propositions of articles	Maria Sebastian Viana	ERDF
V0.4	29/04/2014	Final version including ICCS-NTUA (TOQA) comments	Maria Sebastian Viana	ERDF
V1.0	29/04/2014	Document submitted to the consortium approval	Maria Sebastian Viana	ERDF



Abstract

Dissemination activities include the publication of scientific articles in prestigious magazines and conferences, the presentation of the project to relevant associations, the organization of workshops in different countries and the public reporting of the whole documentation with the project results.

This deliverable summarizes the articles already published in order to communicate about the project and its results and provides the abstract for the upcoming expected publications. In fact, a large amount of interesting results have been produced at the end of the project. The amount of information and the relevancy has created the requirement for the continuation of dissemination activities about the project results after the end of the project.



Table of contents

AUTHORS	3
ABSTRACT	4
TABLE OF CONTENTS	5
LIST OF FIGURES & TABLES	7
1 INTRODUCTION AND SCOPE OF THE DOCUMENT	8
1.1 Scope of the document.....	8
1.2 Notations, abbreviations and acronyms.....	8
2 ARTICLES IN PRESTIGIOUS MAGAZINES	9
2.1 The Proof Is in the Putting: Large-Scale Demonstrations of Renewables Integration Showcase Real-World Solutions.....	9
2.2 The Best of IGREENGrid Practices: A Distribution Network's Contribution to Resiliency	9
3 ARTICLES PUBLISHED IN RELEVANT CONFERENCES	11
3.1 Exploitation of AMR data for DMS functionalities.....	11
3.2 On the Definition and Applicability of Key Performance Indicators for Evaluating the Performance of Smart Grid Concepts	12
3.3 On the DER Hosting Capacity of Distribution Feeders	12
3.4 Probabilistic tools for DMS.....	13
3.5 Potential der Wirkleistungsbegrenzung zur Erhöhung der Erzeugungsaufnahmefähigkeit in Verteilernetzen or (in English) “Potential of active power curtailment to increase the hosting capacity of distribution networks”	13
3.6 Statistical analysis of the deployment potential of Smart Grids solutions to enhance the hosting capacity of LV networks.....	14
3.7 Tatsächliches Potential der Wirkleistungsbegrenzung zur Erhöhung der Aufnahmefähigkeit bei Netzen mit hoher PV-Durchdringung or (in English) “Effective potential of active power curtailment to increase the hosting capacity in distribution networks with a high PV penetration”	15
4 UPCOMING ARTICLES	17
4.1 Increased hosting capacity by means of active power curtailment	17
4.2 A DSO network data analysis platform. An environment for large-scale network analysis and classification	17
4.3 Probabilistic evaluation of the hosting capacity in distribution networks. ...	18
4.4 Assessing Smart Grid Benefits in terms of Renewables integration: an Approach based on Key Performance Indicators.....	18



- 4.5 Optimal operation in insular and continental distribution systems: how power curtailment of renewables can be minimized 19
- 4.6 The role of Storage in distribution grids: Practical Experience of European Network Operators..... 19
- 4.7 Calculation Approach for Distribution Networks Hosting Capacity: Evaluation of the Benefits introduced by Smart Grid technology 20
- 5 REFERENCES** 21
- 5.1 Project Documents 21



List of figures & tables

Table 1 Acronyms 8



1 Introduction and scope of the document

Dissemination activities include the publication of articles in prestigious magazines and conferences, the presentation of the project to relevant associations, the organization of workshops in different countries and the report of the whole documentation with the project results. This deliverable summarizes the articles already published in order to communicate about the project and its results and provides the abstract for the upcoming expected publications. In fact, a large amount of relevant results have been produced at the end of the project. The amount of information and the relevancy has created the requirement for the continuation of dissemination activities about the project results after the end of the project.

1.1 Scope of the document

This document is organized as follows:

- Chapter 2 presents the IGREENGrid articles already published in prestigious magazines.
- Chapter 3 presents the IGREENGrid articles already submitted and presented in relevant international conferences.
- Chapter 4 introduces the next proposition of articles submitted or to be submitted in prestigious magazines or relevant conferences presenting the most relevant final results of the IGREENGrid project.

1.2 Notations, abbreviations and acronyms

AMR	Automatic Meter Reading
CIGRE	Council on Large Electric Systems
CIREN	International Conference on Electricity Distribution
DER	Distributed Energy Resources
DRES	Distributed Renewable Energy Sources
DMS	Distribution Management System
DSO	Distribution System Operator
EEGI	European Electricity Grid Initiative
EU	European Union
HV	High Voltage
IEEE	Institute of Electrical and Electronics Engineers
KPI	Key Performance Indicators
LV	Low Voltage
MV	Medium Voltage
PV	PhotoVoltaic
RES	Renewable Energy Sources
SCADA	Supervisory Control And Data Acquisition
STATCOM	STATic var COMPensator

Table 1 Acronyms



2 Articles in prestigious magazines

2.1 The Proof Is in the Putting: Large-Scale Demonstrations of Renewables Integration Showcase Real-World Solutions

Published in: IEEE Power and Energy Magazine (Volume:13 , Issue: 1).

Date of Publication: Jan.-Feb. 2015.

Page(s): 75 – 83.

ISSN: 1540-7977.

Sponsored by: IEEE Power & Energy Society.

Publisher: IEEE.

Abstract:

“The safe and reliable integration of the levels of Renewable Energy Sources (RES) penetration expected in the European Union (EU) by 2020 requires the implementation of new technologies to demonstrate the effectiveness of new practices for managing the system and the assessment of the economic impact and replicability potential of the proposed solutions.”

Metrics: The article has been accessed 309 times.

Available on: <http://ieeexplore.ieee.org/xpl/abstractAuthors.jsp?reload=true&arnumber=6999001>.

2.2 The Best of IGREENGrid Practices: A Distribution Network's Contribution to Resiliency

Published in: IEEE Power and Energy Magazine (Volume:13 , Issue: 1).

Date of Publication: May-June 2015.

Page(s): 81 – 89.

ISSN: 1540-7977.

Sponsored by: IEEE Power & Energy Society.

Publisher: IEEE.



Abstract:

“The term “resilience” means the ability to prepare for and adapt to changing conditions and to withstand and recover rapidly from disruptions. Active distribution grids can provide support to system resilience in both aspects, more specifically to help system recovery and provide the necessary flexibility to adapt to changing conditions.”

Metrics: The article has been accessed 264 times.

Available on: <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&arnumber=7091082>.



3 Articles published in relevant conferences

3.1 Exploitation of AMR data for DMS functionalities

Conference: CIGRE 2014 – SC6 session.

Date: 28/08/2014.

Place: Paris (France).

Authors: D. Koukoura, G. Sideratos, A. Anastasiadis, D. Trakas, A. Dimeas, N. Hatzargyriou from NTUA and M. Kouveletsou, K. Andreadis, E. Leonidaki, I. Vitellas from HEDNO.

Abstract:

“The EU funded on-going IGREENGrid project [1] aims at increasing the hosting capacity of Distributed Renewable Energy Sources (DRES) in power distribution grids without compromising the reliability or jeopardizing the quality of electricity supply. Based on the experience of six world class DRES integration Demo Projects in low & medium voltage grids, the main final result will be a set of guidelines, including most promising solutions, recommendations for appropriate integration of small & medium size variable DRES in distribution grids, methodologies and tools, criteria to establish hosting capacity and to manage curtailment procedures, and technical requirement to DRES, equipment manufacturers & technology providers. The assessment will include an evaluation framework defined according to European Electricity Grid Initiative (EEGI) Key Performance Indicators (KPIs).

The objectives of the Greek Demo project within the IGREENGrid project include testing, demonstration and evaluation of advanced management tools and monitoring applications concerning the RES installations at Medium Voltage Distribution networks that use the electronic metering infrastructure with AMR connected to the Telemetry Centre of HEDNO. The Greek Demo project exploits data collected from electronic meters installed at MV customers and RES (PVs) connected to two MV feeders located at Sperchiada, in Central Greece. The MV lines are fed by HV/MV substations and they are feeding MV/LV substations, MV loads (mainly industrial/commercial customers) and RES installations.”



3.2 On the Definition and Applicability of Key Performance Indicators for Evaluating the Performance of Smart Grid Concepts

Conference: CIRED 2015 Paper 1281.

Date: 16/06/2015.

Place: Lyon (France).

Authors: Marco Rossi from RSE, Benoît Bletterie from AIT, Maria Sebastian Viana from ERDF Jesús Varela Sanz from Iberdrola.

Abstract:

“Distributed Renewable Energy Resources (DRES) are having a growing presence in the electrical distribution system and they are one of the fundamental pillars for the achievement of the 2020 energy and climate change targets. The integration of renewables, however, entails several technical issues which could be often solved in a more efficient way than the traditional grid reinforcement strategies: in particular, the field experience has demonstrated that new technologies can be implemented in order to obtain acceptable levels of grid capacity. IGREENGrid collects the field experience in DRES integration from six large scale demonstrators located in different European countries. Their heterogeneous nature defines an environment in which a complete analysis of the benefits introduced by the smart grid solutions can be exhaustively evaluated. The role of this evaluation is assigned to the so-called Key Performance Indicators (KPIs) which represent a new recognized standard in the research and innovation field of electrical networks.

The document proposes an overview of the KPIs adopted by IGREENGrid for the evaluation and selection of the most promising solutions dedicated to the integration of DRES in distribution networks. Details about the adopted calculation procedures, numerical examples and applicability issues have been highlighted and discussed.”

Available on: <http://www.igreengrid-fp7.eu/conferences-events>.

3.3 On the DER Hosting Capacity of Distribution Feeders

Conference: CIRED 2015 Paper 1320.

Date: 16/06/2015.

Place: Lyon (France).

Authors: Nikos Hatziargyriou, Evangelos Karfopoulos, Achilleas Tsitsimelis and Despina Koukoura from NTUA and Marco Rossi and Viganò Giacomo from RSE.

Abstract:



“In the last two decades, there is significant increase in the grid connected Distributed Energy Resources (DER) worldwide. At the distribution level, a high DER penetration provides a number of challenges for the Distribution System Operators (DSOs) concerning the operation and planning of their electricity networks.

Despite these operational problems, DSOs are often faced with high political pressures to increase DER installations by investors driven by significant economic incentives. There is a clear need to adopt an objective metric that can define, at the planning stage, the limits of electricity grids for hosting DER without violating operational constraints. This paper reviews the methods and regulations currently used in several countries, it proves analytically the maximum allowable capacity for DER hosting in the worst case scenario and examines its possible increase by applying smart control solutions.”

Available on: <http://www.igreengrid-fp7.eu/conferences-events>.

3.4 Probabilistic tools for DMS

Conference: Smart Electric Distribution Systems and Technologies (EDST), 2015 International Symposium.

Date: 8-11/09/2015.

Place: Vienna (Austria).

Authors: O. Vlachokyriakou, K. Mavrogenou, D. Trakas, D. Koukoula, G. Sideratos and A. Dimieas from NTUA and N. Hatziargyroui, M. Kouveletsou, E. Leonidaki and K. Andreadis from HEDNO.

Abstract:

“The paper presents a set of probabilistic functions based on stochastic RES (PV and Wind) forecasting and probabilistic load flow, which use the AMR (Automatic Meter Reading) infrastructure for data acquisition at MV Networks and the SCADA measurements at the MV bus. More specifically, probabilistic functions are implemented, in order to provide improved monitoring of the system state, identification in advance and management of operational limits notations (e.g. over voltages), etc. Moreover, probabilistic tools are used for RES Hosting Capacity Evaluation and the Assessment of the impact of P/Q control strategies of Distributed Energy Resources (DER). Results from the application and evaluation of the probabilistic functions in actual, rural MV feeders with high PV penetration are presented and evaluated.”

Available on: <http://www.igreengrid-fp7.eu/conferences-events>.

3.5 Potential der Wirkleistungsbegrenzung zur Erhöhung der



Erzeugungsaufnahmefähigkeit in Verteilernetzen or (in English) "Potential of active power curtailment to increase the hosting capacity of distribution networks"

Conference: 14. Symposium Energieinnovation.

Date: 10-12/02/2016.

Place: Graz (Austria).

Authors: Benoît Bletterie and Serdar Kadam from AIT, Werner Friedl and, Roland Bründlinger.

Abstract: (in German, translation in English below)

"Kurzfassung – Ziel dieses Papers ist es, die Umsetzbarkeit einer Wirkleistungsregelung zur Erhöhung der Netzaufnahmefähigkeit, zu diskutieren. Da netzdienlicher Betrieb von erneuerbaren Einspeisern den Weg in regulatorische Rahmenbedingungen findet, benötigen Anlagenbetreiber einerseits Investitionssicherheit und andererseits einen nicht diskriminierenden Zugang zum Stromnetz. Um die möglichen Auswirkungen einer Wirkleistungsbegrenzung zu untersuchen, wurden für einen Niederspannungsnetzabschnitt 30 einphasige 3kWp PV-Anlagen angenommen und ein Vergleich zwischen Referenzfall (ohne Regelung) und einer Wirk- und Blindleistungsregelung durchgeführt. Die Ergebnisse zeigen, dass für diesen Netzabschnitt mit einer spannungsgeführten Wirkleistungsabregelung weniger als 1% der Jahreserzeugung reduziert werden musste um die vorgegebenen Spannungsgrenzen einzuhalten. Obwohl Anlagen unterschiedlich stark betroffen sind (0-8% der Jahreserzeugung), ist dies deutlich weniger als bei einer Wirkleistungsbegrenzung auf 70% bei der etwa 6% der Jahreserzeugung abgeregelt wurden."

"The objective of this paper is to discuss the implementation of active power curtailment to increase the network hosting capacity. While supporting the network operation, investment security and non-discriminatory access must be guaranteed."

In order to investigate the issue of active power curtailment, a LV feeder with 30 PV generators of 3 kWp has been considered and a comparison has been made between the reference case (without control) and the use of reactive and active power management. The results show that it is possible to meet the network operation limits with a reduction of the annual yield of less than 1 %. Even if installations are curtailed to different extent, depending on their position along the feeder, this overall yield reduction is significantly less than the yield reduction obtained from a fix curtailment (reduction of about 6 % of the annual yield for a fix curtailment to 70 % of the nominal power)."

3.6 Statistical analysis of the deployment potential of Smart Grids solutions to



enhance the hosting capacity of LV networks

Conference: 14. Symposium Energieinnovation.

Date: 10-12/02/2016.

Place: Graz (Austria).

Authors: Benoît Bletterie and Serdar Kadam from AIT, Andreas Abart from Netzoo and Robert Priewasser from SAG.

Abstract:

“Several smart grids solutions to enhance the hosting capacity of LV networks have been proposed, investigated and successfully demonstrated. However, the real deployment potential remains unknown, which is a barrier to a systematic use of them by distribution network operators. This paper presents the results of the work done in the project IGREENGrid on the quantification of the potential of smart grids solutions in LV networks on the basis of a comprehensive statistical analysis of real datasets from two network operators. This work shows a moderate potential for reactive power-based voltage control and a significant potential for voltage regulated distribution transformer in the considered areas.”

3.7 Tatsächliches Potential der Wirkleistungsbegrenzung zur Erhöhung der Aufnahmefähigkeit bei Netzen mit hoher PV-Durchdringung or (in English) “Effective potential of active power curtailment to increase the hosting capacity in distribution networks with a high PV penetration”

Conference: 3. Konferenz Zukünftige Stromnetze für Erneuerbare Energien.

Date: 26-27/01/2016.

Place: Berlin (Germany).

Authors: Benoît Bletterie and Serdar Kadam from AIT and Werner Friedl.

Abstract: (in German, translation in English below)

“Der stetige Zubau von Erzeugungsanlagen auf Basis erneuerbarer Energieträger, vor allem in



Niederspannungsnetzen führt zu steigenden Herausforderungen wie diese Anlagen möglichst effizient in die Netze integriert werden können und lässt auf erhöhte Aufwände und somit steigende Netzintegrationskosten schließen. Die mögliche hohe Gleichzeitigkeit der Einspeisung in Verteilernetzen verursacht neben möglichen Netzengpässen zudem zunehmende Herausforderungen in der Haltung und Regelung der Spannung. Um die zu erwartenden hohen Mengen an elektrischer Energie aus Photovoltaik in strukturell schwächeren Netzen, wie sie in ländlichen Gegenden häufig zu erwarten sind, tatsächlich integrieren zu können, müssen entweder die Netze verstärkt werden oder Maßnahmen getroffen werden, die keine volle und uneingeschränkte Einspeisung zulassen. Netzausbau und -verstärkungen sind im Allgemeinen sehr kostenintensive Lösungen und sind bei fluktuierenden Erzeugungsanlagen mit einer niedrigen Anzahl von Vollaststunden (wie z.B. bei Photovoltaik) besonders genau zu betrachten, da netztechnische Lösungen oftmals nur für wenige Stunden oder wenig Energie pro Jahr benötigt würden.“

“The steadily increase of renewable generation in distribution networks and in particular in LV networks pose challenges in terms of efficient network integration. The high coincidence factors of renewables in distribution networks might lead to congestions or over-voltage situations. In order to be able to integrate large amounts of PV generation in rural networks which were designed for a low load density, reinforcement or alternative measures are necessary. Considering that reinforcement might lead to large costs for only a very limited time of the year, alternatives might be attractive.”



4 Upcoming articles

4.1 Increased hosting capacity by means of active power curtailment

Conference: CIRED Workshop.

Date: 14-15/06/2016.

Place: Helsinki (Finland).

Authors: Benoît Bletterie, Serdar Kadam and Julien Le Baut from AIT.

Abstract:

“Active power curtailment is already in use and is also finding its path into national regulatory frameworks. One of the advantages of active power curtailment of fluctuating distributed energy resources, e.g. photovoltaics, is to increase the hosting capacity avoiding or postponing network reinforcement, or to avoid the disconnection of inverters due to overvoltage tripping. Active power can be limited to a fixed percentage of the nominal power (e.g. 70 %) or voltage-dependent (Volt-Watt control). In this paper the fixed curtailment is compared to Volt-Watt-control. First, an approach to compare the curtailed energy for the two approaches is presented followed by an evaluation of their effectiveness and impact on the yield for installations in six different countries. Finally, a high PV penetration scenario is simulated on a sample LV feeder and main conclusions

4.2 A DSO network data analysis platform. An environment for large-scale network analysis and classification

Conference: Energy Informatics Conference 2016

Date: 29-30/09/2016.

Place: Klagenfurt (Austria).

Authors: Serdar Kadam and Benoît Bletterie from AIT and Wolfgang Gawlik from ESEA.

Abstract:

“The increasing number of Distributed Energy Resources (DER) in distribution networks with integrated smart grid functionalities offers new flexibilities to Distribution System Operators (DSO). Nevertheless, since there is little knowledge about low-voltage networks, the connection assessment for every installed DER necessary relies on conservative assumptions. This paper presents a methodology to analyze all networks of a DSO and estimate a theoretical hosting capacity for each feeder. A large number of parameters can be assessed to provide an overview of the potential deployment of smart grid solutions.”



4.3 Probabilistic evaluation of the hosting capacity in distribution networks.

Conference: IEEE ISGT Europe 2016.

Date: 9-12/10/2016.

Place: Ljubljana (Slovenia).

Authors: Julien Le Baut, Paul Zehetbauer, Serdar Kadam and Benoît Bletterie from AIT, Nikos Hatziaargyriou from HEDNO, Jeff Smith and Matt Rylander.

Abstract:

“To correctly estimate the hosting capacity, the proposed approach has been designed as the basis of a tool to analyze the scalability and replicability potential of smart grids solution. The paper is devoted to the hosting capacity evaluation of distribution feeders with the three step probabilistic approach. The proposed method is presented and applied to a medium voltage network with 8 feeders.”

4.4 Assessing Smart Grid Benefits in terms of Renewables integration: an Approach based on Key Performance Indicators

Magazine: Power & Energy Magazine / Sustainable Energy, Grids and Networks Journal.

Date: 2016/2017.

Authors: Marco Rossi (RSE-Italy), Giacomo Viganò (RSE-Italy), Diana Moneta (RSE-Italy), Jesús Varela (IBERDROLA–Spain) and others.

Abstract:

“Currently, the electrical system is subjected to an innovation process that sees the integration of new technologies within the traditional network asset. In particular, this evolution is mainly due to the increasing energy contribution from renewable resources and it can be already perceived in many countries. Focusing on Europe, several practical applications of Smart Grid technology in the real field are currently under investigation for different purposes. In particular, IGREENGrid project evaluates six large demonstrators in which innovative solutions have been applied in order to increase the share of renewable energy within distribution networks. The document will describe the experience of IGREENGrid in assessing the considered Smart Grid solutions, mainly focusing on dedicated Key Performance Indicators (KPIs) used for the identification of the most promising strategies. The discussion will be centred on the practical aspects, advantages and limitations



related to the use of KPIs for the evaluation of the Smart Grid potential in distribution networks.”

4.5 Optimal operation in insular and continental distribution systems: how power curtailment of renewables can be minimized

Magazine: Power & Energy Magazine / Sustainable Energy, Grids and Networks Journal.

Date: 2016/2017.

Authors: Marco Rossi (RSE-Italy), Giacomo Viganò (RSE-Italy), Diana Moneta (RSE-Italy), Anastasios Bakirtzis (AUTH–Greece), André Neves (EDP-Portugal).

Abstract:

“The operation of electrical networks is becoming more and more challenging, especially because of the growing presence of distributed generation. As a consequence of the usually non programmable nature of renewable energy sources, active power curtailment is often required in order to guarantee adequate stability and quality of supply. Because of their particular situation, small insulated systems (insular networks) are already facing high share of renewables and optimization techniques are currently in place in order to maintain the energy balance and minimize the curtailment of wind and photovoltaic production. Simultaneously, connected distribution grids (subjected to a relevant presence of distributed generation) are facing the problem of congestions and optimization techniques for network operation (similar to the ones adopted for insular systems) seem to have high development potential. The document will describe the experience from the FP7 European projects SINGULAR, SUSTAINABLE and IGREENGrid on the topic of renewables curtailment and optimization techniques devoted to its minimization, looking at the evolving regulatory framework and discussing on the technical challenges for obtaining an optimal network management.”

4.6 The role of Storage in distribution grids: Practical Experience of European Network Operators

Magazine: Power & Energy Magazine / Sustainable Energy, Grids and Networks Journal..

Date: 2016/2017

Authors: Marco Rossi (RSE-Italy), Giacomo Viganò (RSE-Italy), Diana Moneta (RSE-Italy), Kai



Strunz (TU-Germany), and others (SuSTANAIBLE and GRID4EU).

Abstract:

“The electrical system is evolving and the share of renewables is constantly increases. Because of their usual stochastic nature, the integration of distributed energy resources is becoming a challenge and the stability and quality of supply can be guaranteed by innovating the traditional operation of distribution networks (in which renewable generation is expected to be particularly concentrated). One of the solutions that, from a technical point of view, seems to have the highest potential is represented by the installation of electrical storage devices. The document will describe the practical experience of some European Distribution System Operators in introducing and managing storage units, analyzing the technical benefits and the current practices/strategies that have been adopted in order to increase their cost effectiveness.”

4.7 Calculation Approach for Distribution Networks Hosting Capacity: Evaluation of the Benefits introduced by Smart Grid technology

Publication in: IEEE Transaction on Power Systems.

Date: 2017.

Authors: Marco Rossi (RSE-Italy), Giacomo Viganò (RSE-Italy), Diana Moneta (RSE-Italy).

Abstract:

“According to the evolution in which the electricity system is involved, most of the forecasted next future scenarios will be characterized by a high share of renewables. In particular, distribution networks will be particularly affected by innovation processes since the highest contribution in terms of renewable energy is expected from distributed generation. In the last decades, in order to evaluate the ability of a network to accept power injection, the concept of Hosting Capacity has been introduced in several publications. However, most of the proposed techniques lead to results that often are not fully representative of the actual capacity of the network, since they refer to a limited set of situations. In a previous publication, the authors have proposed a method for the probabilistic evaluation of distribution networks Hosting Capacity, which is based on the assumption that the allocation and size of future generation is unknown and several scenarios are theoretically possible. On the basis of the practical experience, matured during its implementation in the European project IGREENGrid, the calculation approach has been improved and adopted for the evaluation of the benefits introduced by Smart Grid solutions. The document will detail the implementation of the new method for the Hosting Capacity calculation, demonstrating the added value of the proposed procedure with respect to the ones traditionally adopted.”



5 References

5.1 Project Documents

List of reference document produced in the project or part of the grant agreement

[DOW] – Description of Work

[GA] – Grant Agreement

[CA] – Consortium Agreement

[D7.10] Final report on dissemination activities and description of exchanged experiences: Report describing and evaluating the dissemination activities carried in IGREENGrid Project

IGREENGrid website: www.igreengrid-fp7.eu