



European Electricity Grid Initiative Implementation Plan 2014-2016

EXECUTIVE SUMMARY

The present document describes the Implementation Plan for the period 2014-2016 of the Research and Innovation (R&I) Roadmap 2013-2022 prepared by the European Electricity Grid Initiative (EEGI).

The Implementation Plan 2014-2016 results from parallel analyses of:

- the on-going R&I activities performed at European level by transmission and distribution system operators (the work already launched, and sometimes completed, in line with the priorities set within the previous EEGI R&I Roadmap 2010-2018 approved in June 2010),
- the upgrading of the EEGI Roadmap which has led to the already mentioned new version (2013-2022) approved by the EEGI in February 2013,
- the upgraded priorities which have emerged for network operators as of early 2013, in order to remain compliant with European energy policies and orientations, which include the 2050 de carbonisation targets of the European electricity system.

The Transmission System Operator (TSO) priorities for the coming three years encompass the following main targets:

- **to launch the demonstration of technologies** which increase the electricity system flexibility through enhanced network observability and control of the pan European transmission network,
- **to address new ways of operating the pan-European Transmission Network** via cooperation with DSOs and the involvement of demand-side approaches,
- to continue research and development activities on alternative electricity market designs in view of the construction of the Internal Electricity Market,

The Distribution System Operator (DSO) priorities for the coming three years encompass the following main targets:

- **to improve distribution grid performances** involving communications improvements, network operations and asset management,
- **to initiate research and development studies** on new market designs at distribution level



- **to reinforce the cooperation between TSOs and DSOs** through a focused set of joint R&I activities
- **to develop methodologies for the scaling up and replication studies** that are needed to prepare the deployment of promising results obtained from the field demonstration of innovative solutions

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The detailed topics in line with the prioritized functional objectives will be prepared in the first semester of 2013 to feed into the Horizon 2020 early calls for proposal.

The proposed set of new R&I activities will keep improving the whole network capacity and flexibility, a prerequisite for its continuous and affordable decarbonisation. However, both TSOs and DSOs stress the importance of streamlining their own resources needed to carry out the suggested ambitious activities of the Implementation Plan 2014-2016. A resource gap is growing on the network operator side, which, in turn, requires regulatory interventions at national levels: more investments in R&I projects are needed NOW to deliver on-time proven network improvement solutions and their grid deployment.

The Implementation Plan is updated and issued yearly in order to better reflect industry's needs and to take into account results from the on-going projects. The Implementation Plan 2015-2017 is under preparation in 2013 with scheduled release by the end of 2013.



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ANNEXES

ANNEX A. TSO IMPLEMENTATION PLAN 2014-2016

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A.1 Introduction

The Implementation Plan is issued every year and outlines research and development (R&D) activities for the next three years as stipulated by the ENTSO-E R&D Roadmap 2013-2022, which is an upgrade of the ENTSO-E R&D Plan update 2011. While the R&D Roadmap focuses on the R&D strategy that details ten years of R&D activities required to meet twenty-year transmission system targets, the Implementation Plan defines R&D priorities. Since the Implementation Plan covers short-term R&D activities, it serves as a background to develop upcoming Calls for Proposals through the European Energy Research and Innovation program.

In 2012, ENTSO-E releases a set of R&D deliverables consisting of three documents: R&D Roadmap 2013-2022, Implementation Plan 2014-2016 and R&D Activities and Indicative Timetable as a part of the ENTSO-E Annual work program.

The Implementation Plan 2014-2016 summarizes the priorities which projects launched in the period 2014-2016 should focus on. Therefore, ENTSO-E suggests priorities in this document as initial input to European Commission (EC), European Electricity Grid Initiative (EEGI), technology providers and other stakeholders.

The TSO work in the Implementation Plan 2014-2016 is constraint by the limited available resources. Further work is necessary within ENTSO-E and its members to determine specific topics achievable by these resources. Based on this additional work the Implementation Plan will be updated in the beginning of 2013.

A.2 Monitoring of R&D achievement

Based on the ENTSO-E R&D Plan update 2011, a survey has been addressed to project coordinators in February 2012 to monitor the progress and success of the R&D Plan. It measures how on-going R&D projects contribute to the defined objectives of

¹ The 1st R&D Plan was published in 2010.



the R&D Plan. The results are available through a Monitoring Report made available in June 2012².

The analysis provides quantitative information on what %age of the R&D Plan has been completed, identifying which activities are on-going or which ones have not yet been addressed. The results are used as an input to prioritize actions aimed to achieve the clusters and functional objectives defined in the R&D Plan.

The results show that around 75% of activities defined in the ENTSO-E R&D Plan update 2011 have not started, ca. 19% of the work is on-going and about 6% of the R&D Plan is achieved. Cluster 1, related to pan-European grid architecture, is well advanced (approximately 12%) as is Cluster 3, Network operation (around 11%). Cluster 2 (Power technology), Cluster 4 (Market rules) and Cluster 5 (Joint TSO/DSO R&D activities) are below the average of the whole R&D Plan in terms of work completed. Overall, this study shows that the R&D Plan is on target since it covers the period 2010-2018 and there is a reasonable amount of time left to achieve the remaining objectives.

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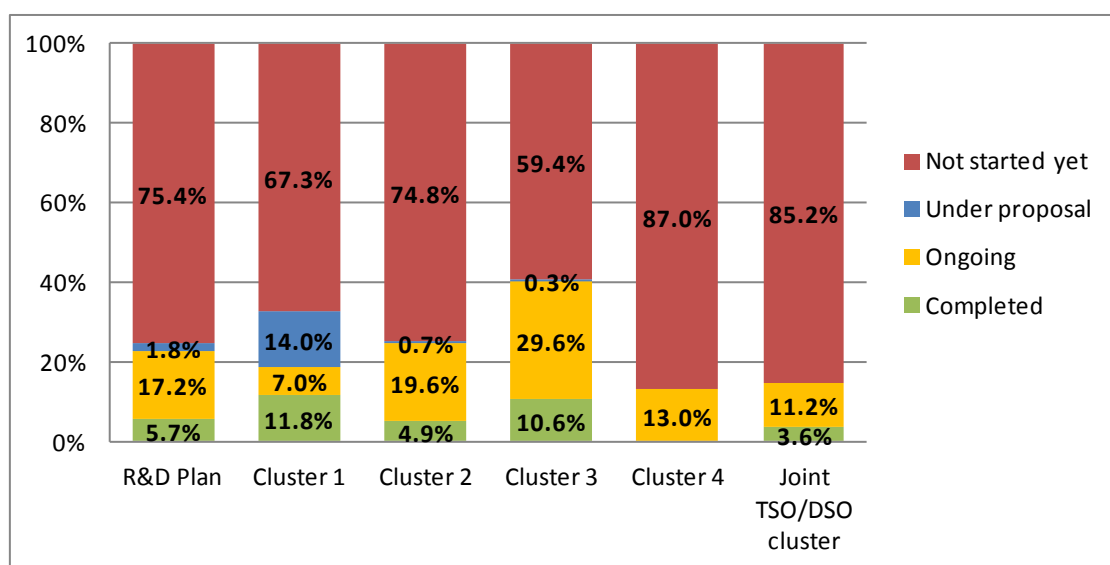


Figure 1: Achievement per Cluster of the R&D Plan update 2011, results of survey launched in February 2012

² Monitoring Report, 7 June 2012 <https://www.entsoe.eu/rd/monitoring-of-the-rd-achievement/>



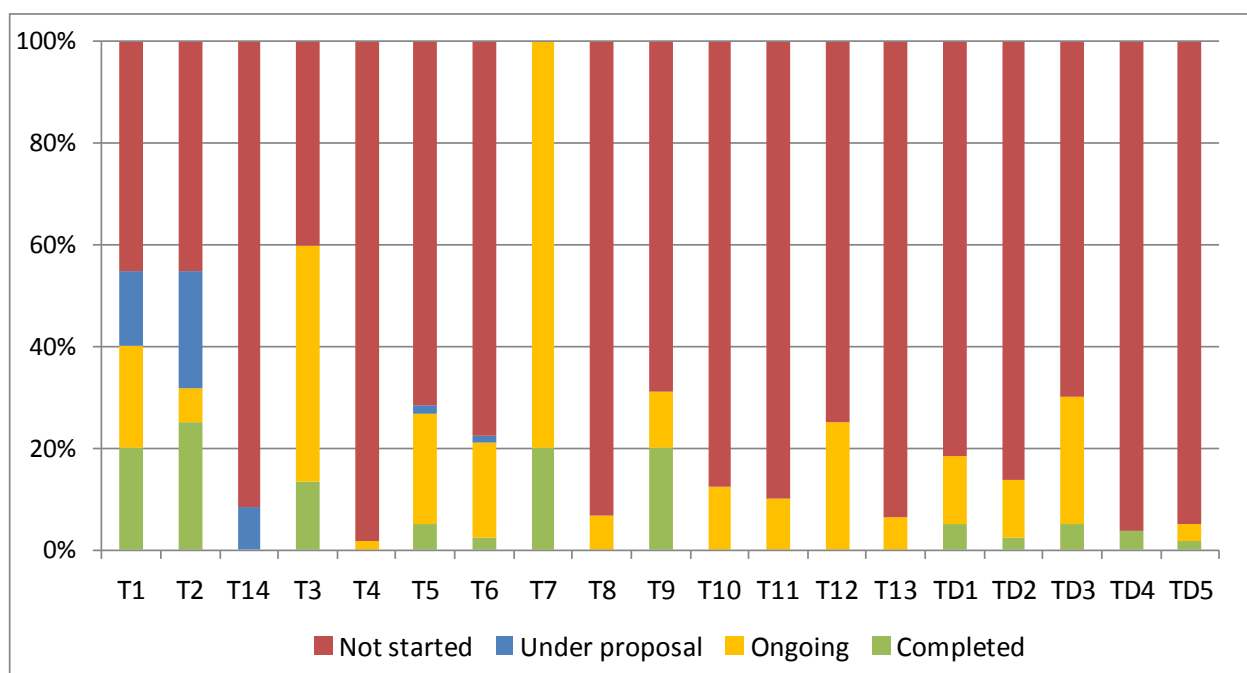


Figure 2: Achievement per Functional Objective of the R&D Plan update 2011, results of survey launched in February 2012

A.3 Tracking the R&D Roadmap

In 2012, ENTSO-E upgraded the R&D Plan update 2011 to the R&D Roadmap 2013-2022. The structure of main chapters of the R&D Roadmap is different but the arrangement of clusters and functional objectives are very similar compared to the R&D Plan update 2011. T13 is merged into T10. T1 and T2 are swapped. A new cluster on Asset Management (three functional objectives T15, T16, T17) is added. The R&D budget for the Roadmap is 1005 M€. An increase of 215 M€ is added compared to the R&D Plan update 2011 (790 M€). An overview of changes is given in the Appendix 2.

Thus far, EC has funded 14 projects related to the TSO R&D activities in the framework of FP7 with a total budget of 166 M€ (Appendix 1), and 120 M€ is expected to be arranged on calls 2013.

The Table 1 below summarizes the total investments launched by the TSOs and the 719 M€ in new resources needed for the R&D Roadmap.



Table 1: New resources needed for the R&D Roadmap 2013-2022

	Budget (M€)
Budget of the R&D Plan update 2011	790
Cancelled resources for the 2010 roadmap	0
Added budget	+215
Total budget roadmap 2013	1005
Resources already funded (committed)	-166
Resources to be arranged on call 2013	-120
New resources needed for the R&D Roadmap	719

A.4 Short-term R&D resources

In order to define a good implementation plan, available resources must be well estimated. ENTSO-E has launched an internal survey with its TSO members to get an accurate estimate of their contribution in man-year and other expenses in M€ for new R&D projects during 2014-2016.

It is noted that TSOs will lead the consortiums and other partners (stakeholders) will contribute their part to the R&D projects as well. Therefore, TSOs share a portion of the total budget of R&D projects.

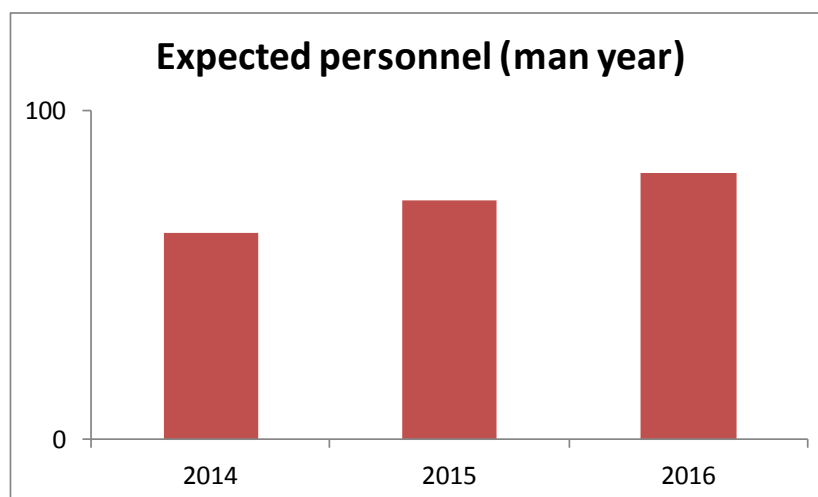


Figure 3: Estimated personnel resources of TSOs arranged for R&D activities



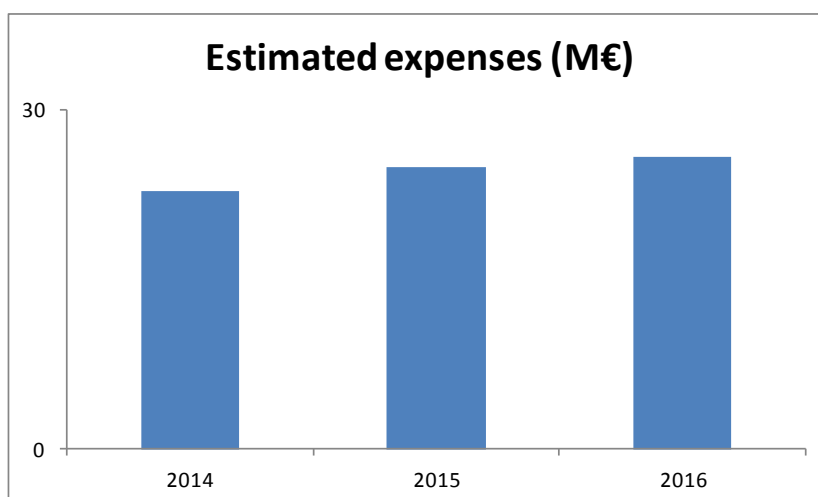


Figure 4: Estimated expenses of TSOs arranged for R&D activities

A.5 R&D priorities for 2014-2016

A.5.1 Topics addressed in FP7-ENERGY-2013

Following the recommendations by the EEGI and Member States, the FP7-ENERGY-2013 program addresses topics that are part of the ENTSO-E R&D Plan update 2011. The mapping between calls addressed in FP7 and the functional objectives defined by ENTSO-E is presented in the Table 2.

Table 2: Mapping FP7 calls vs. functional objectives

FP7-ENERGY-2013 Call	ENTSO-E R&D Plan update 2011
7.2.1. Advanced concepts for reliability assessment of the pan-European transmission network	T9: Tools for pan-European network reliability assessment
7.2.2. Advanced tools and mechanisms for capacity calculation and congestion management	T11: Advanced tools for congestion management
7.2.3. Large-scale demonstration of innovative transmission system integration and operation solutions for (inter)connecting renewable electricity production	T4: Demonstrations of power technologies for new architectures T5: Demonstrations of renewable integration
7.2.4. Ensuring stakeholder support for future grid infrastructures	T14: Innovative approaches to improve public acceptance of overhead lines

A.5.2 Rationale for defining priority

The R&D priorities for 2014-2016 have been set based on objectives established in the ENTSO-E R&D Roadmap 2013-2022, the monitoring analysis of the R&D Plan update

2011, the FP7 calls launched by the European Commission and taking into account the TSOs' resources available for this Implementation Plan.

Resources are already allocated for on-going R&D projects. Difficulties to expand R&D activities due to lack of appropriate regulatory mechanisms for TSO R&D help explain the amount of available resources. It is believed that TSOs' resources would not allow for more than two oriented calls to be answered by TSO driven consortia.

There are key projects to be finalized in 2012-2013 and some others to be triggered on the basis of FP7 calls announced in 2012. The results of these projects are important to shape follow up activities in specific R&D areas.

By addressing the priorities proposed within the ENTSO-E Implementation Plan 2014-2016, TSOs will be able to maintain electricity grid reliability while helping to achieve European climate and energy goals. It should be pointed out that it is necessary to follow the right timing of call for proposal announcements in order to fulfil the functional objectives of the R&D Roadmap. Therefore, the task of defining priorities lies in an analysis of the results from monitoring the R&D achievements of the last years and the expected needs for the coming years. The procedures for granting projects as well as the duration of projects are among the important issues taken into account when defining priorities. The goal is to perform the right R&D at the right time to ensure efficiency and reach the R&D objectives.

A.5.3 Suggested topics 2014-2016

Priorities identified by ENTSO-E have been converted into specific topics that should be performed starting in 2014. Preferably, the topics should be funded under the framework of EC Calls (which are normally launched at least one year in advance).

The suggested sets of topics for 2014-2016 are focused on three main objectives: The first set is suggested to demonstrate technologies to foster network flexibility and enhance the observability and control of the pan-European network. The second set deals with topics that contribute to the construction of the Internal Electricity Market through the development of new tools and research on alternative market designs. The third set covers the research and development of new resources for operation delivered not only by the relation with DSOs but also the resources coming from the demand side.

In the Implementation Plan 2014-2016 the topics refer to functional objectives defined by the ENTSO-E R&D Roadmap 2013-2022. The R&D activities for 2014 will be specified in detail in close cooperation with EEGI at the beginning of 2013. The priorities and R&D activities for 2015-2016 can only be given on the basis of functional



objectives because either the necessary R&D is not well identified or the results from on-going projects are needed to outline the R&D activities required. When this is accomplished, the priorities can be packaged in a concrete proposal. The next Implementation Plan 2015-2017 issued in 2013 will provide additional details.

Table 3 summarizes the topics that should be addressed in the period 2014-2016.

Table 3: Topics for the Implementation Plan 2014-2016

Year	Topics for the Implementation Plan 2014-2016
2014	<ul style="list-style-type: none"> ▪ T3: Demonstration of power technology to increase network flexibility and operation means ▪ T6: Innovative tools and methods to observe and control the pan-European network
2015	<ul style="list-style-type: none"> ▪ T6: Innovative tools and methods to observe and control the pan-European network ▪ T10: Advanced pan-European market tools for ancillary services and balancing, including active demand management ▪ T12: Tools and market mechanisms for ensuring system adequacy and efficiency in electric systems integrating very large amounts of RES generation ▪ T17: Demonstrations of potential at EU level for new approaches to asset management ▪ T16: Development and validation of tools which optimize asset maintenance at the system level, based on quantitative cost/benefit analysis
2016	R&D activities related to defence plan and restoration plan including active distribution system. <ul style="list-style-type: none"> ▪ TD2: The integration of demand side management at DSO level into TSO operations ▪ TD3: Ancillary services provided through DSOs

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A.6 Conclusions

Identifying priorities and available resources are necessary steps to structure the R&D activities for the following years. The Implementation Plan defines the right R&D at the right time to ensure efficiency and reach the R&D objectives. The current available R&D resources at TSO side are insufficient to reach the R&D objectives in a reasonable time. TSO and regulatory commitment must be arranged to provide timely cost-effective and innovative solutions for future grids.

In 2013, ENTSO-E will follow the results of the on-going projects and estimate the completion of the R&D Roadmap. Based on this monitoring activity and analysis of R&D gaps and need the next Implementation plan issued in 2013 will define priorities for the period 2015-2017.

Detailed R&D topics will be proposed in the beginning of 2013 as inputs to EEGI and EC to be considered for the Horizon 2020.



Appendix

Appendix 1: The table below summarizes past and on-going R&D activities with the budget and EC grant (status February 2012).

<i>No</i>	<i>Project</i>	<i>Budget (M€)</i>	<i>EC funding (M€)</i>	<i>Start date</i>	<i>End date</i>
1	iCoeur	4.79	1.92	January 2009	May 2012
2	Pegase	13.59	8.62	July 2008	June 2012
3	Twenties	56.81	31.77	April 2010	March 2013
4	Realisegrid	4.21	2.72	September 2008	February 2011
5	Susplan	4.79	3.42	September 2008	August 2011
6	Optimate	4.26	2.62	October 2009	September 2012
7	After	5.05	3.47	September 2011	August 2014
8	Safewind	5.62	3.99	May 2008	April 2012
9	EWIS	4.04	4.04	June 2007	October 2009
10	iTesla	19.43	13.23	January 2012	December 2015
11	Umbrella	5.25	3.86	January 2012	December 2015
12	eHighway2050	13.05	8.99	September 2012	January 2016
13	Grid+	3.96	2.99	October 2011	September 2014
14	Ecogrid.eu	20.68	10.33	March 2011	February 2015
	Total	166	102		



Appendix 2: Comparison of the R&D Roadmap 2013-2022 to the R&D Plan update 2011

M€	R&D Plan update 2011		Clusters	R&D Roadmap 2013-2022		M€
19	A toolbox for new network architecture assessment	T1 ³	C1 Grid Architecture	T1	Definition of scenarios for pan-European network expansion	20
21	Tools to analyze the pan-European network expansion options	T2		T2	Planning methodology for future pan-European transmission system	20
50	Environmental impact and social acceptance of transmission facilities	T14		T14	Towards increasing public acceptance of transmission infrastructure	30
80	Demonstrations of power technologies for more network flexibility	T3	C2 Power Technologies	T3	Demonstration of power technology to increase network flexibility and operation means	100
120	Demonstrations of power technologies for new architectures	T4		T4	Demonstration of novel network architectures	120
130	Demonstrations of renewable integration	T5		T5	Interfaces for large-scale demonstration of renewable integration	130
12	Innovative tools for pan-European network observability	T6	C3 Network Operation	T6	Innovative tools and methods to observe and control the pan-European network	50
24	Innovative tools for coordinated operations with stability margin evaluation	T7		T7	Innovative tools and methods for coordinated operation with stability margin evaluation	30
25	Improved training tools to ensure better coordination at the regional & pan-European levels	T8		T8	Improved training tools and methods to ensure better coordination at the regional and pan-European levels	25
14	Innovative tools and approaches for pan-European network reliability assessment	T9		T9	Innovative tools and approaches for pan-European network reliability assessment	20

³ T1 and T2 are swapped in the R&D Roadmap 2013-2022



M€	R&D Plan update 2011		Clusters	R&D Roadmap 2013-2022		M€
18	Advance tools for pan-European balancing markets	T10	C4 Market Designs	T10	Advanced pan-European market tools for ancillary services and balancing, including active demand management	30
21	Advanced tools for capacity allocation congestion management	T11		T11	Advanced tools for capacity allocation and congestion management	25
14	Tools for renewable market integration	T12		T12	Tools and market mechanisms for ensuring system adequacy and efficiency in electric systems integrating very large amounts of RES generation	20
12	Tools for the integration of active demand into electrical system operations	T13 ⁴				
			C5 Asset Management	T15	Developing approaches to determine and to maximize the lifetime of critical power components for existing and future networks	30
				T16	Development and validation of tools which optimize asset maintenance at the system level, based on quantitative cost/benefit analysis	30
				T17	Demonstrations of new asset management approaches at EU level	75
45	Increased observability of the electrical system for network management and control	TD1	C6 Joint TSO/DSO R&D activities	TD1	Increased observability of the distribution system for transmission network management and control	45
70	The integration of demand side management into TSO operations	TD2		TD2	The integration of demand side management at DSO level into TSO operations	70
50	Ancillary services provided by DSOs	TD3		TD3	Ancillary services provided through DSOs	50
45	Improved defense and restoration plans	TD4		TD4	Improved defense and restoration plan	45
20	Joint taskforce on IT system protocols and standards	TD5		TD5	Methodologies for scaling-up and replicating	40
790	Total			Total	1005	

⁴ T13 is merged in T10 in the new Roadmap



ANNEX B. DSO IMPLEMENTATION PLAN 2014-2016

B.1 Introduction

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This document is an update of the DSO **EEGI Implementation Plan 2010-12**, originally prepared by EDSO for Smart Grids (EDSO), the European Network of Transmission System Operators for Electricity (ENTSO-E) and in close collaboration with the European Commission, the European Regulators' Group for Electricity and Gas (ERGEG) and other relevant stakeholders. The original plan was formally endorsed at the SET-PLAN conference in Madrid on 3rd of June 2010.

This DSO implementation plan outlines research and development (R&D) activities to be developed in the 2014-2016 time frame. The R&D Roadmap focuses on the strategy and R&D activities for the 2013-2022 time frame required to meet the 20-20-20 distribution system targets. The DSO Implementation Plan defines the R&D priorities for the first three years of this period and covers short-term R&D activities, serving as background for developing upcoming Calls for Proposals through the European Energy Research and Innovation programme.

In this document, EDSO suggests priorities as initial input to European Commission (EC), European Electricity Grid Initiative (EEGI), technology providers and other stakeholders.

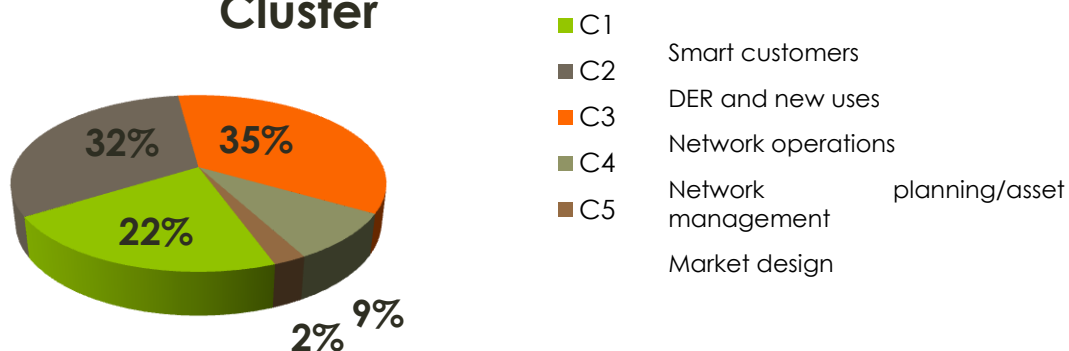
B.2 Monitoring of R&D achievement

This chapter highlights how on-going R&D projects contribute to the defined objectives of the R&D Plan and provides quantitative information on how much of the Plan that has been completed, identifying on-going activities as well as activities not yet addressed. The results are used as input to prioritise the activities in the new clusters and functional objectives defined in the 2013 R&D Plan.

To better understand what has been achieved so far, presented in figure 3 below, it is important to keep in mind that the budgets for the five roadmap clusters are differing significantly.



Budget weight of each Cluster



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Figure 5: Budget weight of each cluster

Activities in cluster C1, on “Smart Customers”, are covering approximately 22% of the total budget for the roadmap 2013. “Integration of DER and New Users”, and the “Network Operation”, cover together 67% of the total budget, while the clusters on “Network Planning and Asset Management” and Market Design only cover 11% of the total budget.

The total budgets and the achievements so far is highlighted in figure 2; the two latter clusters have not yet been started and the achievements (completed, on-going or under proposal) so far in the three first clusters represent less than 20% of the total budgets.



Budget (M€) per Cluster

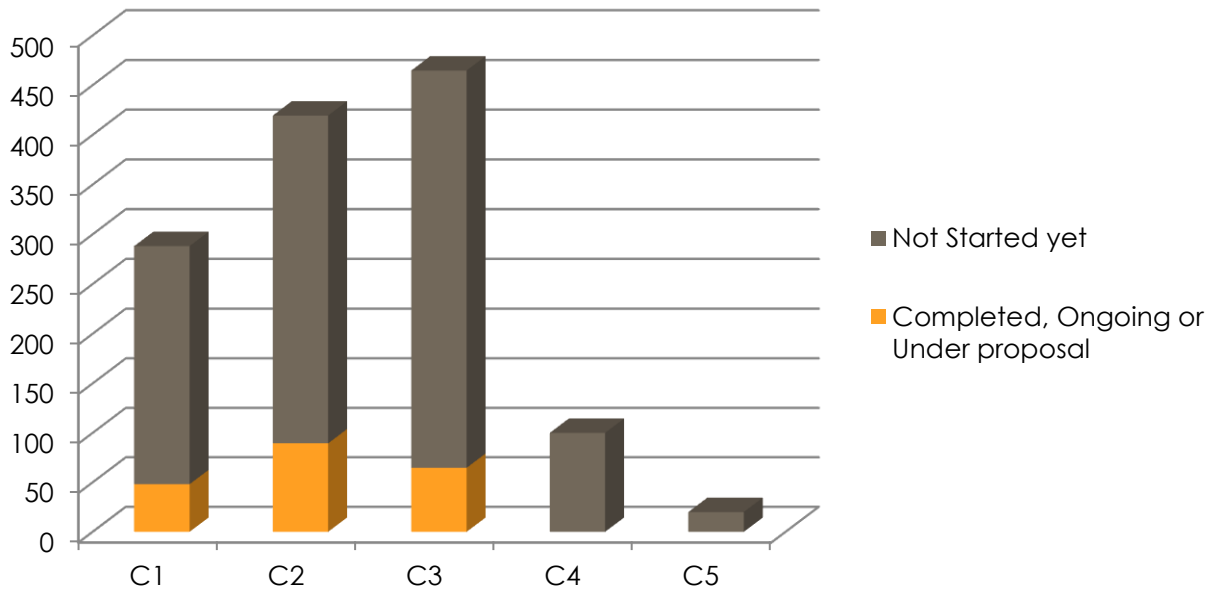


Figure 6: Budget (M€) per cluster

As can be observed in Figure 3, below, activities have started in the three main clusters but only a smaller part of the projects have been completed so far. The on-going projects represent some 10 to 15 per cent of the total budget.

R&D Achievement

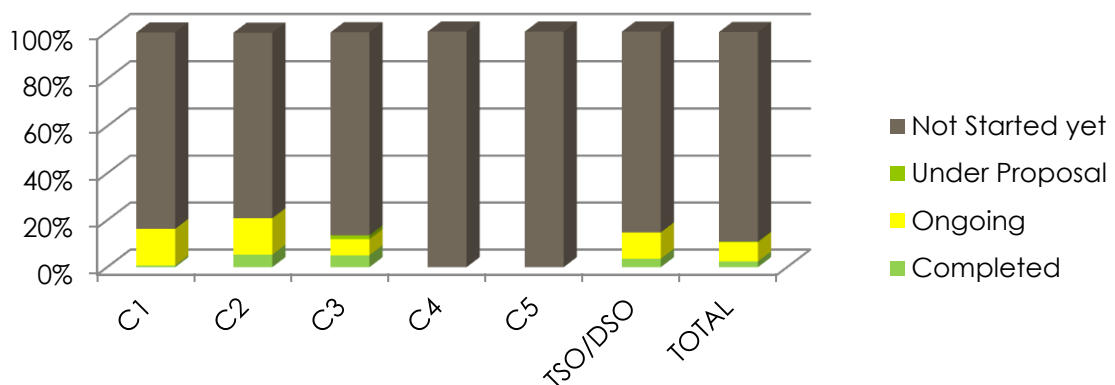


Figure 7: R&D Achievement



The results show that more than 80% of the budget allocated for Functional Objectives in the 2013 Roadmap, represent projects not started yet, less than the 15% of the work is on-going and approximately 3% of the R&D Plan for 2010-2022 is so far achieved. This is more or less proportional to the time consumed so far by the Roadmap. It is also important to clarify that the figures mentioned in the Roadmap & Implementation plan are related to European common efforts and do not include National projects.

B.3 Tracking the R&D Roadmap

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In 2012, the EEGI Roadmap was updated. The structure of the main chapters of the R&D Roadmap is different but the arrangement of clusters and functional objectives are very similar compared to the previous plan. Figure 4 shows the relation between the clusters and functional objectives of the old and updated Roadmaps.

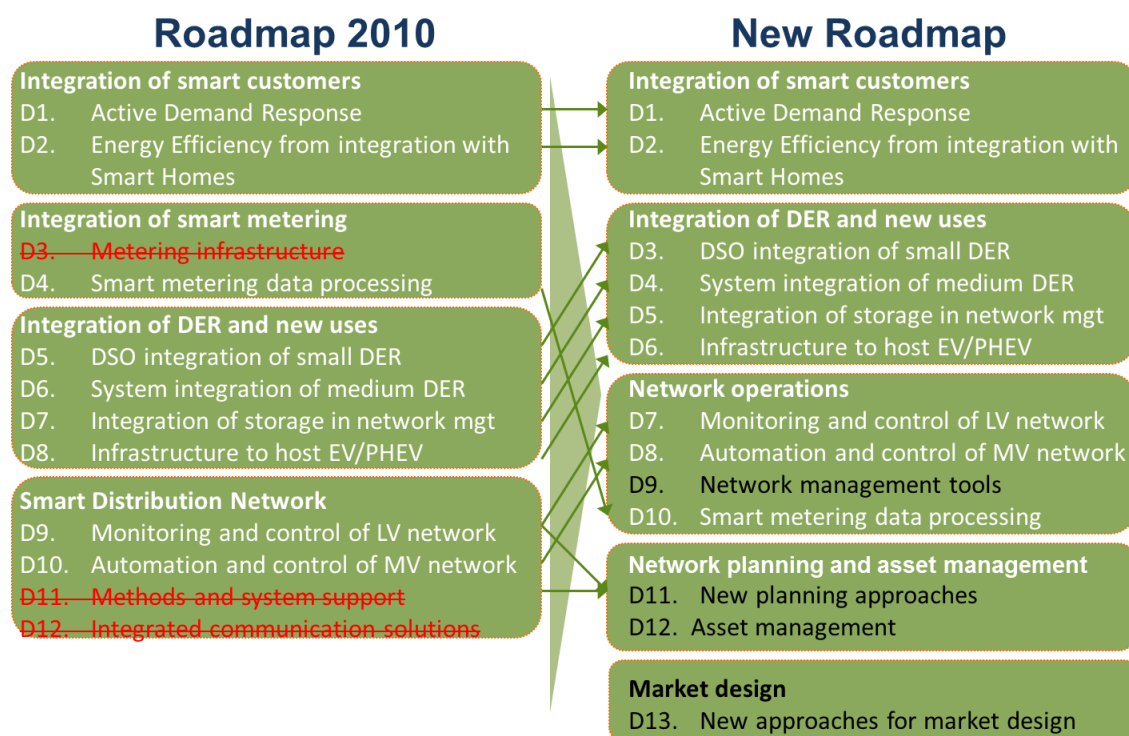


Figure 8: Road Map 2010 and New Roadmap

The functional objective D3, "Metering Infrastructure", has been eliminated in the new roadmap. This is because the issue of metering infrastructure matured, since a big number of pilot-tests have been completed and commercial products already



have been developed. There are also Member States that have already started or even completed mass deployment. The functional objectives D11, "Methods and system support", and D12, "Integrated communications solutions", of the old roadmap have been redistributed between other functional objectives.

There are also new functional objectives introduced in the roadmap; "Network management tools", "New planning approaches", "Asset management" and "Market design", and some transversal topics, being addressed in many of the Functional Objectives. "Integrated Communication solutions", is important due to the need of support from national telecommunications companies that are not yet ready to provide the services that electric utilities need, and "Cyber-security and telecommunication impact on the network security", as the ability of an electric power system to operate in such a way that credible events do not give rise to loss of load, stresses of system components beyond their ratings, bus voltages or system frequency outside tolerances, instability, voltage collapse, or cascading.

The R&D budget for the Roadmap adds up to 1090 MEUR, i.e. less than the original 1200 MEUR. An overview of the new budget and the changes compared to the old version can be viewed in table 1, below.

Functional Objective		Costs (M€)	Functional Objective		Costs (M€)
D1	Active Demand Response	190	D1	Active Demand Response	140
D2	Energy Efficiency from integration with Smart Homes	120	D2	Energy Efficiency from integration with Smart Homes	100
D3	Metering infrastructure	150	D3	DSO integration of DER into LV	80
D4	Smart metering data processing	20	D4	System integration of DER into MV	90
D5	DSO integration of small DER	90	D5	Integration of storage in network mgt	100
D6	System integration of medium DER	150	D6	Infrastructure to host EV/PHEV	60
D7	Integration of storage in network mgt	60	D7	Monitoring and control of LV network	150
D8	Infrastructure to host EV/PHEV	100	D8	Automation and control of MV network	100
D9	Monitoring and control of LV network	100	D9	Network management tools	50
D10	Automation and control of MV network	90	D10	Smart metering data processing	100
D11	Methods and system support	80	D11	New planning approaches	50
D12	Integrated communications solutions	50	D12	Asset management	50
			D13	New approaches for market design	20
TOTAL		1200			1090

Table 4: Functional objectives

Eleven projects were launched before 2010 with a combined budget of 64 million EUR. Nine additional projects have been launched after the 2010 roadmap with a combined budget of 138 million EUR (further details in Appendix 1). Furthermore, it is expected that projects with a combined budget of some 72 MEUR will be related to the calls of proposals for 2013.

Table 5, below, summarises the differences between the budget of the original roadmap and the budget of the new roadmap for 2013-2022. The total investments launched by the DSOs have changed due to the resources cancelled and new functional objectives included. It should also be considered that the new horizon for the 2013 roadmap is 2022 and not 2020. The final result is 1090 MEUR of new resources needed for the 2013 R&D Roadmap.

Initial budget of the 2010 roadmap	1 200 MEUR
Cancelled resources for the 2010 roadmap	- 150 MEUR
Additional budget to meet the 2013 roadmap R&I challenges	250 MEUR
Total budget roadmap 2013	1300 MEUR
Resources already funded (committed)	- 138 MEUR
Resources to be committed on call 2013	- 72 MEUR
New resources to be provided during up-coming calls 2014-2022 to meet the defined R&I TSO part of the EEGI roadmap	1 090 MEUR

Table 5: Differences between budgets

B.4 R&D priorities for 2014-2016

The Grid+ project has studied the investments made the last couple of years by different stakeholders and the investments needed for the upcoming ten years in order to achieve the objectives established in the 2013 Roadmap. Based on this result, EDSO has prepared an estimation of necessary investments in R&D projects for the period 2014-2016.



The “prioritised topics” have been proposed between functional objectives, directly related to the three EU objectives for 2020, trying to involve the final client during the whole process and taking into account the less mature technology areas. The functional objectives D3, “DSO integration of small DER” and D6, “Infrastructure to host EV/PHEV”, match all the objectives mentioned.

Collaboration between TSOs and DSOs should be reinforced to reach a larger integration of systems and functions, increasing the possibility for the European Union to reach the 20-20-20 objectives, why three of the common DSO-TSO functional objectives has been included as priorities for the first year, especially those concerning the methodologies for scaling-up and replication (TD2, TD5, TD12).

The rest of topics proposed deals with necessary studies to improve the grid performance – functional objectives D12, D7 and D8 – and others to really benefit from the investigations made, such as D9 and D10.

“New approaches for market design”, D13, is highly important in order to clarify the new situation and the best way to manage the new situations emerging from technology improvements and market evolution.

Table 6, below, summarises the topics to be addressed in the period 2014-2016. The many references to “demonstration” in the table shows the importance of “large demonstration projects” (as in the Grid4EU and the Eco-grid projects) to make real progress in most of the functional objectives possible.

Year	Priority Topics	Comments	Budget (M €)	Budget (M €)
2014	TD2 – The integration of demand side management at DSO level into TSO operation	demonstration	50	145
	D12 – Asset management		20	
	D10 – Smart metering Data Processing	methods & tools	15	
	TD5 – Methodologies for scaling - up and replicating	tools	20	
	D5 – Integration of storage in network management	demonstration	40	
2015	D3 – DSO integration of small DER	demonstration	50	155
	TD4 - Improved defense and restoration plan	methods & tools	15	
	D4 – System integration of medium DER	demonstration	40	
	D7 – Monitoring and control of LV network	demonstration	50	
2016	TD1 - Increased observability of the distribution system for transmission network management and control (includes Forecasting)	demonstration	55	190
	D6 – Infrastructure to host EV/PHEV	demonstration	40	
	D9 – Network Management Tools	tools	20	
	D8 – Automation and Control of MV networks	demonstration	55	
	D13 – New approaches for market design	tools & simulations	20	

Table 6: Topics to be address 2014-2016



B.5 Conclusions

The monitoring of R&D shows that there is yet an important work to do to reach the 2020 objectives. Most of the new clusters are under 20% of budget allocated in on-going projects.

The roadmap has been updated, omitting some Functional objectives like “metering infrastructure” that has been widely studied in Europe and even has passed to “deployment stage” in some countries, and introducing new topics that aim to address emerging difficulties.

Comparing with the last years, the short term scenario shows an increment of investments (150 million Euros per year and growing) on Smart Grids from utilities and other stakeholders to reach the established objectives.

To make that become a reality, it is necessary to develop large scale demonstration projects and to foster collaboration among European Utilities. The priorities for the period 2014-2016 are related to improvements in scaling-up and replication strategies, close collaboration among DSOs and TSOs, involvement of customers and integration of renewable energies, improvements in tools, methodologies and study of new market approaches.

Transversal topics like “Integrated Communication solutions” and “cyber-security and telecommunication impact on the network security” have to be addressed on the selected topics for next calls.



Appendix

Appendix 1: The tables below summarise past and on-going R&D activities (budget & EC grant).

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<i>Projects (before 2010)</i>	<i>Budget</i>	<i>EC funding</i>	<i>Start</i>	<i>Duration</i>
DER LAB	4,1	3,1	nov-05	76
ADDRESS	16,0	9,5	jun-08	48-60
OPEN METER	4,1	2,4	jan-09	30
OPEN NODE	5,3	2,8	dic-09	33
MERGE	4,4	3,0	jan-10	24
W2E	4,7	2,9	jan-10	36
MIRABEL	4,5	3,1	jan-10	36
DLC-VIT4IP	5,1	3,5	jan-10	36
HYPER DNO	6,5	4,4	feb-10	36
INTEGRIS	5,6	3,4	feb-10	30
G4V	3,7	2,5	mar-10	18
	64,0	40,6		

<i>Projects (since 2010)</i>	<i>Budget</i>	<i>EC funding</i>	<i>Start</i>	<i>Duration</i>
GREEN eMotion	42,0	24,2	apr-11	48
GRID4EU	54,0	27,0	nov-11	48
METER - ON	1,8	1,6	jul-12	24
ADVANCED	4,1	2,7	nov-12	24
DISCERN	7,9	4,8	dic-12	36
IGREENGRID	6,7	4,3	jan-13	36
SUSTAINABLE	5,7	3,9	jan-13	36
SINGULAR (budget figure is an estimate)	5,0	2,5	dic-12	
INOVGRID (*)	11,0	5,5		
	138,2	76,5		

(*) If we consider the development of the concept the figures will be different (budget: 7, funding: 3,6). This project refers only to Development the concept, excluding Automated Metering infrastructure installation in Évora and in the next phase of deployment in other locations.





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