



European Network of
Transmission System Operators
for Electricity

MONITORING R&D ROADMAP

7 JUNE 2012

FINAL VERSION

EXECUTIVE SUMMARY

The Research & Development Plan was issued by ENTSO-E to define priority areas of research, development, and demonstration for its member Transmission System Operators (TSO) so to provide tangible anticipated benefits in line with the EU energy policy targets. These targets are laid out in the European Commission's Strategic Energy Technology (SET) Plan, which is a strategic plan to accelerate the development and deployment of cost-effective low carbon technologies.

The Working Group Monitoring and Knowledge Sharing (WG MKS) has been tasked with developing a framework to monitor the research effort within the ENTSO-E member TSO's in meeting the objectives of the R&D plan. In this Road Map, the WG MKS are proposing a methodology for monitoring and evaluating research projects through which ENTSO-E may map plans to achieve the objectives of the R&D plan.

The WG MKS initially set about Identifying the information necessary to provide relevant and accurate tracking of all the R&D projects within ENTSO-E member TSO's. The data required was found to be project centric and is divided into six sections. The first three of which comprise the general information such as name and brief description, the completion criterion on how the project contributes to the objectives in the functional areas of the R&D plan and thirdly the coordination criteria to show synergies and coordination between projects, The latter three sections include the dissemination criteria to outline plans for information sharing, the budget criteria to track the project's budget and finally the timing criteria to track the projects timelines. These requirements were then put together in the form a questionnaire. This sampling depends on a fair analysis by the project coordinators of their individual projects.

The questionnaire was sent to R&D research coordinators of all National and European level projects within the ENTSO-E member TSO's. The survey was restricted to ongoing projects or projects that had completed since 2010. Of the 45 TSO projects identified 36 or around 80% responded. This survey is to be conducted annually.

We would like to acknowledge the contribution of project coordinators to the survey.

The WG MKS adopted both a qualitative and quantitative approach in the analysis of the information collected through the survey. The qualitative approach based on the traffic light model highlights how a project is performing against key indicators such as contribution to the R&D Plan, budget and timing. In the colour scheme selected Green indicates very thing on target, yellow indicates problems but unlikely to impact expected results and red indicates problems with likely impact on expected results.

The quantitative approach is based on the contribution of each R&D project on the functional projects in the clusters of the R&D plan. Once the total contribution of the all the applicable R&D projects to a functional project has been calculated it is possible to show how much of the functional project is complete, ongoing, under proposal or not started. These results are displayed by the use of bar charts. By adding a weighting to

each functional project based equally on its budget and priority as assigned in the ENTSO-E R&D Plan, it is then possible to calculate the Plan-level indicators of progress for the entire ENTSO-E R&D Plan.

The objective of this monitoring roadmap is provide an idea what percentage of the R&D Plan is complete, ongoing and not yet been addressed. The results can be used to perform a gap analysis for further prioritization of specific Clusters and Functional Projects.

The results show that around 75% of the ENTSO-E R&D plan activities have not started, ca 19% of the work is ongoing and around 6% of the R&D plan is achieved. The clusters with most R&D work already achieved are cluster 1 (around 12%) and cluster 3 (around 11%). Clusters 2, 4 and 5 are below the average of the whole R&D Plan in terms of work complete. Overall this study shows that the R&D Plan is on target since it covers the period 2010-2018 and there is reasonable amount of time left to achieve the remaining objectives.

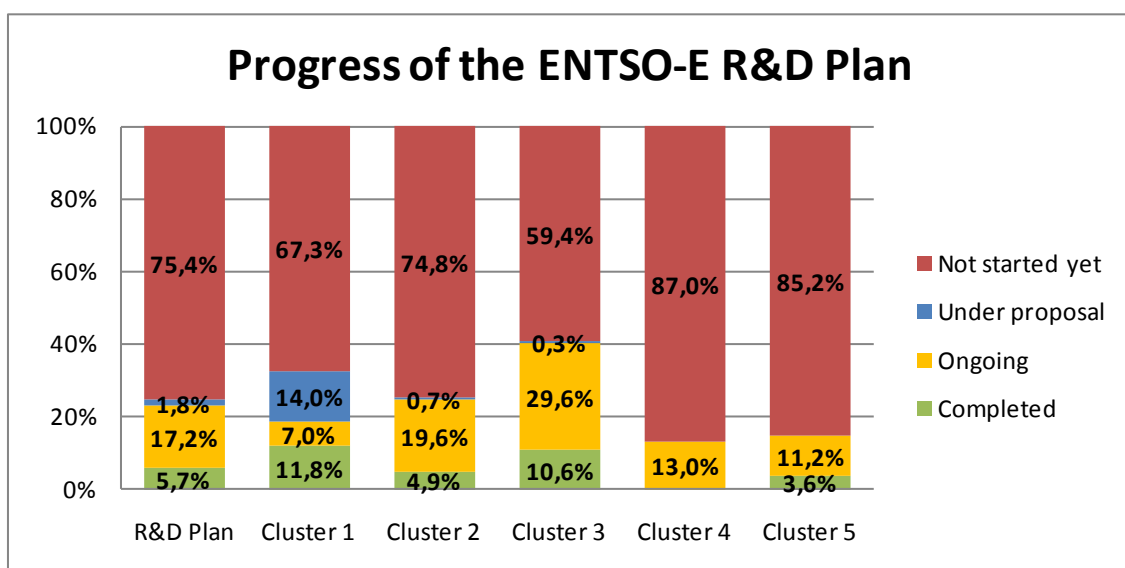


TABLE OF CONTENT

Executive Summary	2
1 Introduction	5
1.1 Background	5
1.2 Objectives	5
1.3 Scopes	6
2 Methodology of Monitoring	7
2.1 Approach	7
2.2 Content of Template	8
2.3 Selecting Projects for Monitoring	8
2.4 Datasheets	10
2.5 Indicators of the Progress of the R&D Plan	10
2.6 Contribution and Weighting	11
2.6.1 Contribution to Functional Project	11
2.6.2 Weighting of Functional Projects and Clusters	12
3 Summary of Results	14
3.1 Map of Project Contribution	14
3.1.1 Research Completion	15
3.1.2 Budget	16
3.1.3 Timing	17
3.2 Plan-Level Indicators of Progress	18
3.2.1 Completion of Functional Projects	18
3.2.2 Completion of Clusters	19
3.2.3 Completion of the R&D Plan	21
4 Summary, Conclusions and Follow-up Steps	22
Annex - Datasheets of Projects	23
Drafting Team	83

1 INTRODUCTION

1.1 BACKGROUND

European TSOs have noticed the need to speed up R&D activities to cope with new challenges imposed on the electricity community by EU energy policy targets for 2020 and beyond. R&D is of utmost importance to achieve the EU energy policy objectives, especially the integration of RES in particular if looking beyond 2020.

ENTSO-E is bound by Art. 8 of Regulation (EC) 714/2009 and Directive EC / 72 / 09 to adopt a document that provides a forward-looking mid- to long-term vision on the association's and its member TSOs' activities with regards to research and development for common network operation. In 2010, the association published proactively its R&D Plan 2010, prior to the Third Package coming into force. In December 2011, ENTSO-E released an updated version of the first edition of ENTSO-E's R&D Plan defined for ten years of R&D activities till 2020.

The plan can be successfully realised with close following-up to know if its defined objectives are reached. From a management perspective, monitoring of progress is needed to know what have been achieved and what the next priorities are.

The R&D is realised at different levels and R&D funding is from different institutions: EU, national or own funding. The plan is defined in Clusters and Functional Projects, but the actual projects may focus on various topics and demonstration, which can cut across several Clusters and Functional Projects.

With a purpose to monitor the progress of the current R&D Plan (version 2011), the WG MKS launched the first survey with a template of questionnaires to the coordinators of the 45 identified TSO projects in February 2012. 36 projects answered the survey (80%). The list of projects contains projects of EU relevance or nations/internal projects that contribute to the R&D Plan.

The monitoring exercise repeats yearly. The results are not only needed for ENTSO-E to know the R&D progress, but also help project coordinators know where their projects contribute to the ENTSO-E R&D Plan, being visible and identify possible gaps for future projects and potential partners.

A methodology and summary of results are provided in section 2 and 3. Conclusions and recommendations are given.

1.2 OBJECTIVES

The main objective is to monitor the implementation of the R&D Plan and provide an overview of all ongoing or finished TSO relevant projects in Europe and their contribution to the R&D Plan. For this, the description, completion, dissemination, budget, timing and coordination information of each project is needed. This data can then be measured against the expected results of each functional project (FP) which is extracted from its description.

Another objective is to identify gaps and define priorities in the research effort around the R&D Plan and to propose corrective actions. These are important inputs for the elaboration of calls for funding and for the development of information, knowledge and experience

exchange among projects. The mapping and gap analysis would benefit from regular updates.

1.3 SCOPES

- TSO relevant projects are only considered. All on-going, proposing or just finishing (2010 onward) projects in Europe are considered.
- The exercise measures the implementation effectiveness of the R&D plan.
- This exercise does not measure how the R&D plan or each project contribute to the EU energy target.

2 METHODOLOGY OF MONITORING

2.1 APPROACH





In order to perform the monitoring process the project information is gathered through a template sent to coordinators of different R&D projects, both European and National levels. The template is elaborated by the WG MKS. It helps collect not only information, timing and budget status of projects, but also the way the projects contribute to the different objectives defined in each functional project of the ENTSO-E R&D Plan, as well as the.

For this the last version (updated R&D plan 2011) of the R&D plan is used. The idea is to later have a specific logic for aggregating the status of all the projects contributing to a given objective in order to see what the current status of the completion of the R&D plan is. The real success of the R&D activities will be decided after the evaluation of the deliverables by technical experts. For this, other KPIs would be necessary and is out of scope of this report.

For the monitoring process, the WG MKS decided to follow a two-step approach.

The first step is a **qualitative approach**, which is based on the traffic light principle, i.e. the status of the project in different fields (contribution to the R&D Plan, budget, timing, etc) is characterised by three colours:

- Green: Going well
- Yellow: Minor problem encountered, but with no impact on expected results
- Red: Problem with possible impact on expected results

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

An explanation is required from the project coordinator to detail the reason of a Yellow or Red status on a given field. The purpose of this step is to have an overview of the progress of the projects. The different fields that were asked to be completed by the project coordinators are detailed in Section 2.2.

The second step is a **quantitative approach**, which is performed to have an idea of what percentage of the R&D Plan is completed, on-going or not yet addressed. Based on the information provided by the project coordinators on how a given project contributes to different objectives of each functional project, a percentage of achievement is assigned by the different members of the WG MKS. It may happen that several projects contribute to the same objectives. The percentage is not a simple sum of all contributions of projects. It is done with some clarification and with a thorough understanding of the R&D Plan. The final results will help to perform a gap analysis for further prioritization of specific Clusters and Functional Projects. More detail is presented in Section 2.4.

2.2 CONTENT OF TEMPLATE

The template is built in an Excel format and contains six sections. The first section intends to gather general project information, while the other five sections aim at providing information about the contribution of the project to the R&D plan, as well as its status in terms of budget and timing.

- **Section 1 – Basic Information:** Information about the project is asked. Such information consists of: JRC reference number, funding scheme, EEGI label (according to the labelling process, which is currently being designed by the GRID+ project), project title and brief description, consortium members (TSOs and others), contact details of the coordinator, project duration and status (proposed, granted/on-going, completed), among others.
- **Section 2 - Completion criteria:** In this section, the project coordinator is asked to answer whether the project contributes to the objective(s) of the different functional projects (FPs) of the ENTSO-E R&D Plan. The objectives are extracted from the 2011 version of the R&D Plan, for each one of the FPs of the five Clusters.
- **Section 3 – Coordination criteria:** The objective of this section is to know whether a particular project has synergies to other projects and if some sort of coordination between these projects is done. In case of an affirmative answer, the project coordinator must detail, in the second worksheet, in which objectives of the different FPs this coordination happens.
- **Section 4 – Dissemination criteria:** In this section, the project coordinator must fill in whether dissemination activities are foreseen or not. If the response is affirmative, then the coordinator must specify in which FPs such dissemination is foreseen or has happened.
- **Section 5 – Budget criteria:** This section aims at knowing whether the project's budget is on track or not.
- **Section 6 – Timing criteria:** This section aims at knowing whether scheduled activities of the project (as a whole) are on track or not.

2.3 SELECTING PROJECTS FOR MONITORING

All R&D projects are considered if they are relevant for TSO and happen in Europe, with a focus on the on-going, proposing or just finishing (2010 onward) ones with EU, national or own funding.

The template (Excel file) was sent to 45 project coordinators, who were invited to fill-in the required information. Answers from 36 projects were received.

Of these 36 projects, 6 have not been included in this ENTSO-E monitoring report since there was no TSO participating or because they finished before 2010, when the first edition of the ENTSO-E R&D Plan was published.

Therefore, 30 projects (Table 1) were considered for the monitoring process, with the following distribution up to the time of data collection (Feb 2012):

- 13 projects are European-level projects and 17 projects are National-level.
- 5 projects are already finished, 23 are ongoing and 2 have been presented to a given funding programme as proposals (eHIGHWAY 2050 and WAMPAC).

TABLE 1: 30 R&D PROJECTS INCLUDED IN THIS MONITORING REPORT FOR THEIR CONTRIBUTION TO THE ACCOMPLISHMENT OF THE ENTSO-E RESEARCH AND DEVELOPMENT PLAN.

No	Projects	Status	Level
1	Active network feasibility assessment on the Belgium East Loop network	Ongoing	National
2	EWIS – European Wind integration Study	Completed	European
3	PEGASE	Ongoing	European
4	UMBRELLA	Ongoing	European
5	Ecogrid EU	Ongoing	European
6	Kriegers Flak	Ongoing	National
7	Cell controller pilot project	Completed	National
8	Development of early warnings systems (PMU/WAMS)	Ongoing	National
9	From wind power to heat pumps	Ongoing	National
10	EVCOM	Ongoing	National
11	Concept for management of the future electricity system	Completed	National
12	TWENTIES	Ongoing	European
13	A complete and normalized 61850 substation	Ongoing	National
14	ALMACENA	Ongoing	National
15	220 kV SSSC device for power flow control	Ongoing	National
16	SAFEWIND	Ongoing	European
17	OPTIMATE	Ongoing	European
18	iTESLA	Ongoing	European
19	eHIGHWAY 2050	Proposal	European
20	AFTER	Ongoing	European
21	DREAM	Ongoing	National
22	SUMO	Ongoing	National
23	WAMPAC	Proposal	National
24	ANEMOS Plus	Completed	European
25	REAL-SMART	Ongoing	European
26	SAMREL	Ongoing	National
27	PoStaWind	Ongoing	National
28	KÄVA2	Ongoing	National
29	29.- Program of improving energy efficiency	Ongoing	National
30	30.- Realisegrid	Completed	European

2.4 DATASHEETS

A data sheet is created to provide a glance capture of essential information of each project. It brings extra means to make the project visible and stimulate knowledge sharing. The datasheet contains:

- Title of the project.
- Basic information about the project:
 - Name of the coordinator, as well as contact information (company, e-mail, phone number and address).
 - The reference of JRC database and EEGI label information (if any).
 - The planned duration (year of starting and ending).
 - Current status (completed, ongoing or under proposal).
 - Budget.
 - Funding scheme.
 - Members of the consortium (TSOs and others).
 - Brief project description.
 - Key words.
 - Website of the project.
- Map of the contribution of the project to the different ENTSO-E R&D Plan Functional Projects and Clusters.
- Status of the research completion of the projects to each Functional Project.
- Status of the overall research completion of the project as well as the budget and the timing (schedule).

A full list of data sheets is given in the annex. There is some missing information which will be able to be filled in the next survey, which should take place by the end of 2012, so the next report is available by the beginning of the year 2013.

2.5 INDICATORS OF THE PROGRESS OF THE R&D PLAN

This qualitative approach is useful to have a quick overview, but it does not provide the accomplishment of the ENTSO-E Plan.

To quantitatively monitor the progress of the ENTSO-E R&D Plan the following indicators are defined:

- **Research completed:** Percentage of the research objectives successfully accomplished in already finalized R&D projects.
- **Research ongoing:** Percentage of the research objectives that are being developed currently in ongoing R&D projects.
- **Research under proposal:** Percentage of the research objectives that will be developed in R&D projects that have been proposed for approval.

- **Research not started yet:** Percentage of the research objectives that are not been considered in any finalized, ongoing or proposed R&D project.

2.6 CONTRIBUTION AND WEIGHTING

2.6.1 CONTRIBUTION TO FUNCTIONAL PROJECT

In the survey, the project coordinators were asked to explain how their projects contribute to the different research objectives of the Plan, and also to estimate the percentage of the Functional Project they cover.

All this information was evaluated in order to quantify the percentage they contribute to accomplish the research objectives of a specific Functional Project, according to the description included in the R&D Plan. This work was performed by the WG MKS members, given the fact that many of such projects (European and National) had the participation of their TSO.

Such a percentage is weighted according to:

- whether the project is of National or European level; due to a scale of impact the weight for a national project is assigned 50% compared to the EU one,
- possible research overlaps among projects.

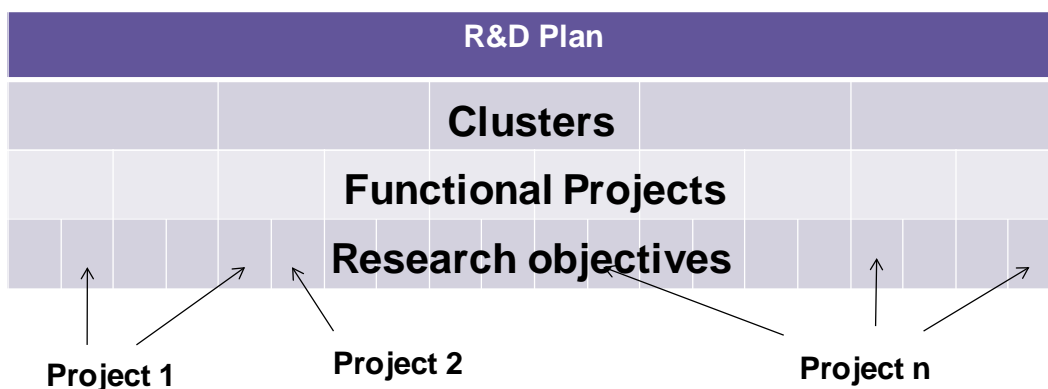


FIGURE 1: A R&D PROJECT CAN CONTRIBUTE TO SEVERAL FPS OR CLUSTERS

As a result, for example for Functional Project T1 (A toolbox allowing new network architecture assessment in the pan-European transmission system) we have:

	Indicators of Progress			
	Completed	Ongoing	Under proposal	Not started
T1.- A toolbox allowing new network architecture assessment in the pan-European transmission system	20,0%	20,0%	15,0%	45,0%

2.6.2 WEIGHTING OF FUNCTIONAL PROJECTS AND CLUSTERS

In order to scale-up the results and provide the value of these KPIs for each Cluster we first must estimate the “weight” of every Functional Project in that cluster. This weight we assume is based on its economic value and research priority on equal basis.

The ENTSO-E R&D Plan establishes the cost of every Functional Project (pg. 31), so its economic value is estimated to be its relative cost. For example, Cluster 1:

Cluster 1	Cost (M€)	Economic value (%)
T1	19	21,1%
T2	21	23,3%
T14	50	55,6%
	90	100,0%

And the ENTSO-E R&D Plan establishes which Functional Projects have high priority (pg. 31), for example, in Cluster 1 the Functional Project T14 has high priority, so the weight of each Functional Project inside Cluster 1 is estimated to be:

Cluster 1	Research priority (%)
T1	30,0%
T2	30,0%
T14	40,0%
	100,0%

Assuming that economic value and research priority have the same weight (50% each) the results for Cluster 1 are

Cluster 1	Cost (M€)	Economic value (%)	Research priority (%)	Total weight (%)
T1	19	21,1%	30,0%	25,6%
T2	21	23,3%	30,0%	26,7%
T14	50	55,6%	40,0%	47,8%
	90	100,0%	100,0%	100,0%

For the other clusters the results are:

Cluster 2	Cost (M€)	Economic value (%)	Research priority (%)	Total weight (%)
T3	80	24,2%	20,0%	22,1%
T4	120	36,4%	40,0%	38,2%
T5	130	39,4%	40,0%	39,7%
	330	100,0%	100,0%	100,0%

Cluster 3	Cost (M€)	Economic value (%)	Research priority (%)	Total weight (%)
T6	12	16,0%	30,0%	23,0%
T7	24	32,0%	20,0%	26,0%
T8	25	33,3%	20,0%	26,7%
T9	14	18,7%	30,0%	24,3%
	75	100,0%	100,0%	100,0%

Cluster 4	Cost (M€)	Economic value (%)	Research priority (%)	Total weight (%)
T10	18	27,7%	20,0%	23,8%
T11	21	32,3%	40,0%	36,2%
T12	14	21,5%	20,0%	20,8%
T13	12	18,5%	20,0%	19,2%
	65	100,0%	100,0%	100,0%

Cluster 5	Cost (M€)	Economic value (%)	Research priority (%)	Total weight (%)
TD1	45	19,6%	20,0%	19,8%
TD2	70	30,4%	20,0%	25,2%
TD3	50	21,7%	20,0%	20,9%
TD4	45	19,6%	20,0%	19,8%
TD5	20	8,7%	20,0%	14,3%
	230	100,0%	100,0%	100,0%

A similar exercise is performed to estimate the weight of every cluster to the ENTSO-E R&D Plan:

R&D Plan	Cost (M€)	Economic value (%)	Research priority (%)	Total weight (%)
C1	90	11,4%	10,0%	10,7%
C2	330	41,8%	30,0%	35,9%
C3	75	9,5%	25,0%	17,2%
C4	65	8,2%	20,0%	14,1%
C5	230	29,1%	15,0%	22,1%
	790	100,0%	100,0%	100,0%

3 SUMMARY OF RESULTS

3.1 MAP OF PROJECT CONTRIBUTION

The following page contains the map of the contribution of every project to the ENTSO-E Research & Development Plan.

It shows how certain Functional Projects have several projects contributing while other Functional Projects have very few, these are “research gaps” that future projects must fill.

MAP OF THE PROJECT CONTRIBUTION TO ENTSO-E R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment 2.- EWIS 8.- Development of early warnings systems (PMU/WAMS) 12.- TWENTIES 19.- eHIGHWAY 2050 25.- REAL-SMART 27.- PoStaWind 28.- KÄVA2 30.- Realisegrid	T2: Tools to analyze pan-European network expansion options 2.- EWIS 6.- Kriegers Flak 14.- ALMACENA 19.- eHIGHWAY 2050 25.- REAL-SMART 26.- SAMREL 30.- Realisegrid	T14: Innovative approaches to improve the public acceptance of overhead lines 19.- eHIGHWAY 2050	
	T3: Demonstration of power technologies for increased network flexibility 2.- EWIS 6.- Kriegers Flak 7.- Cell controller pilot project 12.- TWENTIES 15.- 220 kV SSSC device for power flow control 22.- SUMO	T4: Demonstration of power technologies for novel architecture 6.- Kriegers Flak 12.- TWENTIES	T5: Demonstration of renewable integration 2.- EWIS 7.- Cell controller pilot project 8.- Development of early warnings systems (PMU/WAMS) 12.- TWENTIES 23.- WAMPAC 24.- ANEMOS Plus 25.- REAL-SMART	
Cluster 3: Network management and control	T6: Tools for pan-European network observability 3.- PEGASE 7.- Cell controller pilot project 8.- Development of early warnings systems (PMU/WAMS) 12.- TWENTIES 13.- A complete and normalized 61850 substation 16.- SAFEWIND 23.- WAMPAC 24.- ANEMOS Plus 25.- REAL-SMART	T7: Tools for coordinated operations with stability margin evaluation 2.- EWIS 3.- PEGASE 4.- UMBRELLA 8.- Development of early warnings systems (PMU/WAMS) 18.- iTESLA 20.- AFTER 24.- ANEMOS Plus	T8: Improved training tools for improved coordination 3.- PEGASE	T9: Tools for pan-European network reliability assessment 2.- EWIS 4.- UMBRELLA 8.- Development of early warnings systems (PMU/WAMS) 20.- AFTER 25.- REAL-SMART 26.- SAMREL
	T10: Advanced tools for pan-European balancing markets 17.- OPTIMATE 27.- PoStaWind	T11: Advanced tools for capacity allocation and congestion management 5.- EcoGRID EU 17.- OPTIMATE	T12: Tools for renewable market integration 1.- Belgium East Loop network 5.- EcoGRID EU 6.- Kriegers Flak 17.- OPTIMATE 25.- REAL-SMART	T13: Tools for the integration of active demand in electrical system operations 5.- EcoGRID EU
Cluster 4: Market rules				

Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control 1.- Belgium East Loop network 11.- Concept of management of the future electricity system 16.- SAFEWIND 24.- ANEMOS Plus	TD2: The integration of demand-side management into TSO operations 5.- EcoGRID EU 10.- EVCOM 9.- From wind power to heat pumps 11.- Concept of management of the future electricity system	TD3: Ancillary services provided by DSOs 5.- EcoGRID EU 7.- Cell controller pilot project 9.- From wind power to heat pumps 11.- Concept of management of the future electricity system 25.- REAL-SMART	TD4: Improved defense and restoration plans 11.- Concept of management of the future electricity system	TD5: Joint task force on IT system protocols and standards 9.- From wind power to heat pumps 10.- EVCOM 11.- Concept of management of the future electricity system
---	--	---	---	---	---

3.1.1 RESEARCH COMPLETION

All the coordinators report that the research completion of their project is going well (😊), so a qualitative overview of the situation research completion of the ENTSO-E R&D is:

RESEARCH COMPLETION OF THE ENTSO-E R&D PLAN					
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment 😊	T2: Tools to analyze pan-European network expansion options 😊		T14: Innovative approaches to improve the public acceptance of overhead lines 😊	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility 😊	T4: Demonstration of power technologies for novel architecture 😊		T5: Demonstration of renewable integration 😊	
Cluster 3: Network management and control	T6: Tools for pan-European network observability 😊	T7: Tools for coordinated operations with stability margin evaluation 😊	T8: Improved training tools for improved coordination 😊	T9: Tools for pan-European network reliability assessment 😊	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets 😊	T11: Advanced tools for capacity allocation and congestion management 😊	T12: Tools for renewable market integration 😊	T13: Tools for the integration of active demand in electrical system operations 😊	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control 😊	TD2: The integration of demand-side management into TSO operations 😊	TD3: Ancillary services provided by DSOs 😊	TD4: Improved defense and restoration plans 😊	TD5: Joint task force on IT system protocols and standards 😊

3.1.2 BUDGET

All the coordinators report that the budget situation of their project is going well (😊), so a qualitative overview of the situation of the budget of the ENTSO-E R&D is:

BUDGET SITUATION OF THE ENTSO-E R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment 😊	T2: Tools to analyze pan-European network expansion options 😊	T14: Innovative approaches to improve the public acceptance of overhead lines 😊	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility 😊	T4: Demonstration of power technologies for novel architecture 😊	T5: Demonstration of renewable integration 😊	
Cluster 3: Network management and control	T6: Tools for pan-European network observability 😊	T7: Tools for coordinated operations with stability margin evaluation 😊	T8: Improved training tools for improved coordination 😊	T9: Tools for pan-European network reliability assessment 😊
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets 😊	T11: Advanced tools for capacity allocation and congestion management 😊	T12: Tools for renewable market integration 😊	T13: Tools for the integration of active demand in electrical system operations 😊
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control 😊	TD2: The integration of demand-side management into TSO operations 😊	TD3: Ancillary services provided by DSOs 😊	TD4: Improved defense and restoration plans 😊
				TD5: Joint task force on IT system protocols and standards 😊

3.1.3 TIMING

With only two exceptions, all the coordinators report that the timing of their project is going well (😊). The two exception report a minor delay (😬). Since the other projects that contribute to the same FP are going well, a qualitative overview of the situation of the timing of the ENTSO-E R&D is:

TIMING SITUATION OF THE ENTSO-E R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment 😊		T2: Tools to analyze pan-European network expansion options 😊	
	T14: Innovative approaches to improve the public acceptance of overhead lines 😊			
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility 😊		T4: Demonstration of power technologies for novel architecture 😊	
	T5: Demonstration of renewable integration 😊			
Cluster 3: Network management and control	T6: Tools for pan-European network observability 😊		T7: Tools for coordinated operations with stability margin evaluation 😊	
	T8: Improved training tools for improved coordination 😊		T9: Tools for pan-European network reliability assessment 😊	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets 😊		T11: Advanced tools for capacity allocation and congestion management 😊	
	T12: Tools for renewable market integration 😊		T13: Tools for the integration of active demand in electrical system operations 😊	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control 😊		TD2: The integration of demand-side management into TSO operations 😊	
	TD3: Ancillary services provided by DSOs 😊		TD4: Improved defense and restoration plans 😊	
		TD5: Joint task force on IT system protocols and standards 😊		

3.2 PLAN-LEVEL INDICATORS OF PROGRESS

3.2.1 COMPLETION OF FUNCTIONAL PROJECTS

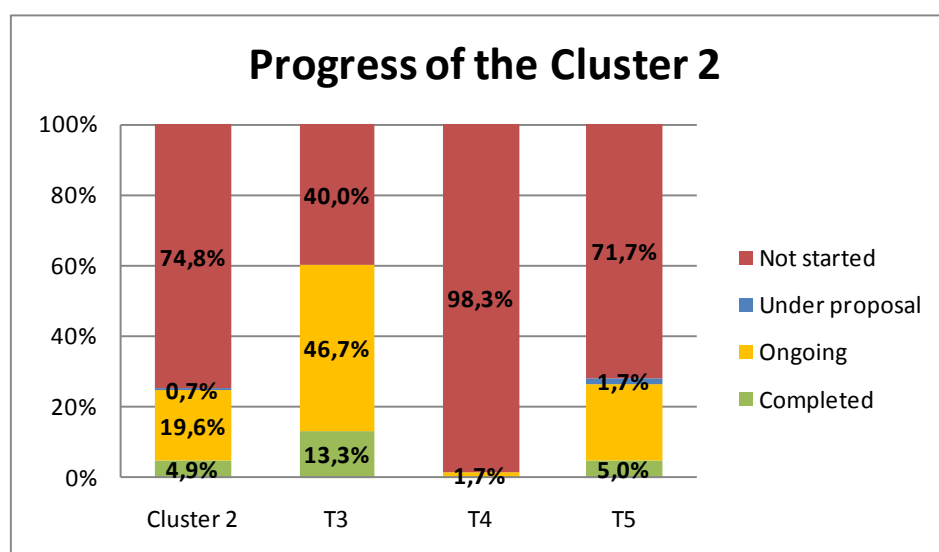
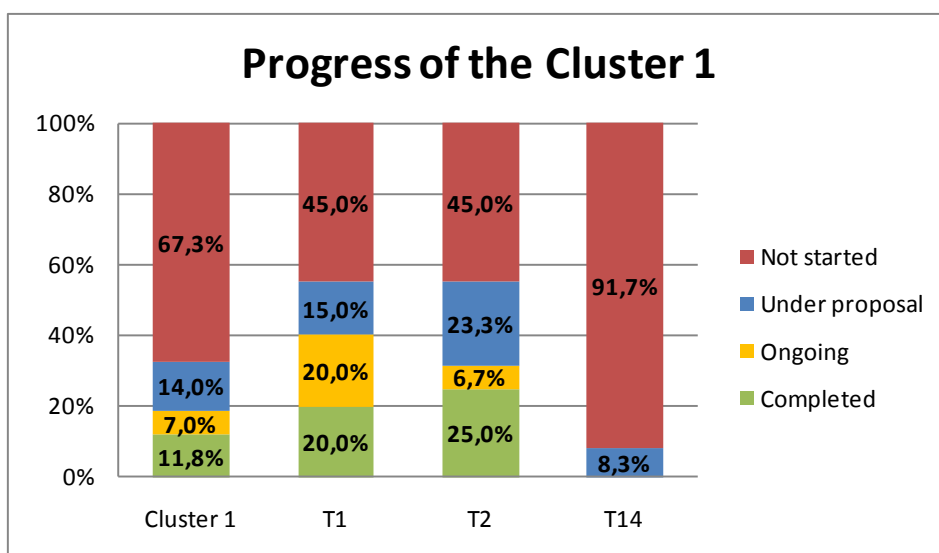
Using the information provided by the project coordinators in the survey (included in the datasheets), WG MKS has estimated the value of these KPIs for the Functional Projects:

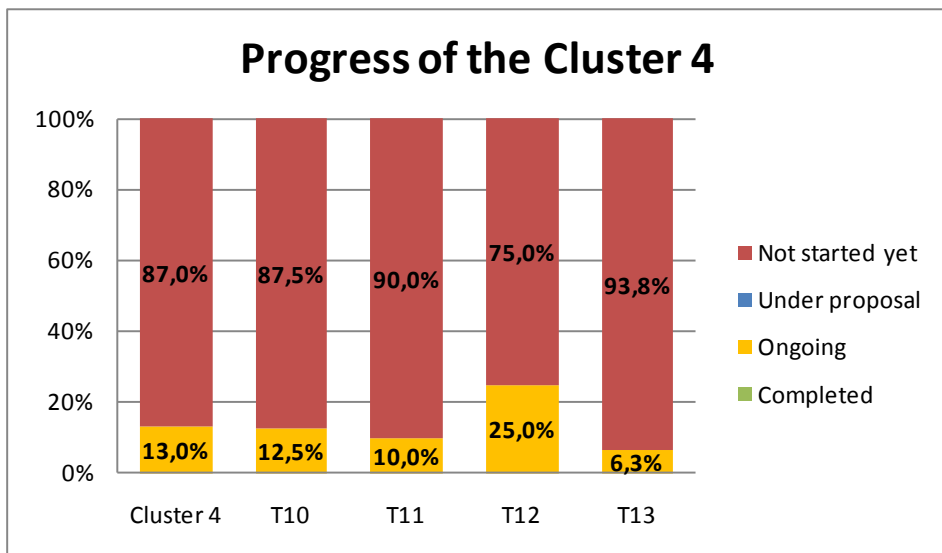
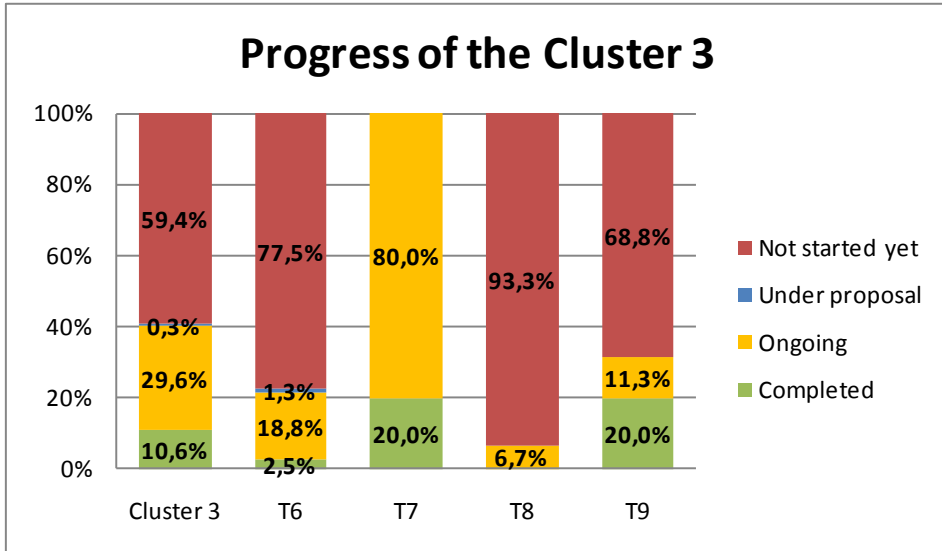
	Indicators of Progress			
	Completed	Ongoing	Under proposal	Not started
T1.- A toolbox allowing new network architecture assessment in the pan-European transmission system	20,0%	20,0%	15,0%	45,0%
T2.- Advanced tools to analyze pan-European network expansion options according to energy scenarios for Europe	25,0%	6,7%	23,3%	45,0%
T14.- Environmental impact and social acceptance of transmission facilities	0,0%	0,0%	8,3%	91,7%
T3.- Demonstration of power technology for increased network flexibility	13,3%	46,7%	0,0%	40,0%
T4.- Demonstration of power technology for novel network architecture	0,0%	1,7%	0,0%	98,3%
T5.- Demonstration of renewable integration	5,0%	21,7%	1,7%	71,7%
T6.- Innovative tools for pan-European network observability	2,5%	18,8%	1,3%	77,5%
T7.- Innovative tools for coordinated operations with stability margin evaluation	20,0%	80,0%	0,0%	0,0%
T8.- Improved training tools to ensure better coordination at the regional and pan-European levels	0,0%	6,7%	0,0%	93,3%
T9.- Innovative tools and approaches for pan-European network reliability assessment	20,0%	11,3%	0,0%	68,8%
T10.- Advanced tools for pan-European balancing markets	0,0%	12,5%	0,0%	87,5%
T11.- Advanced tools for capacity allocation and congestion management	0,0%	10,0%	0,0%	90,0%
T12.- Tools for renewable market integration	0,0%	25,0%	0,0%	75,0%
T13.- Tools for the integration of active demand in electrical system operations	0,0%	6,3%	0,0%	93,8%
TD1.- Increased observability of the electrical system for network management and control	5,0%	13,3%	0,0%	81,7%
TD2.- Integration of demand-side management into TSO operations	2,5%	11,3%	0,0%	86,3%
TD3.- Ancillary services provided by DSOs	5,0%	25,0%	0,0%	70,0%
TD4.- Improved defense and restoration plan	3,8%	0,0%	0,0%	96,3%
TD5.- Joint taskforce on IT system protocols and standards	1,7%	3,3%	0,0%	95,0%

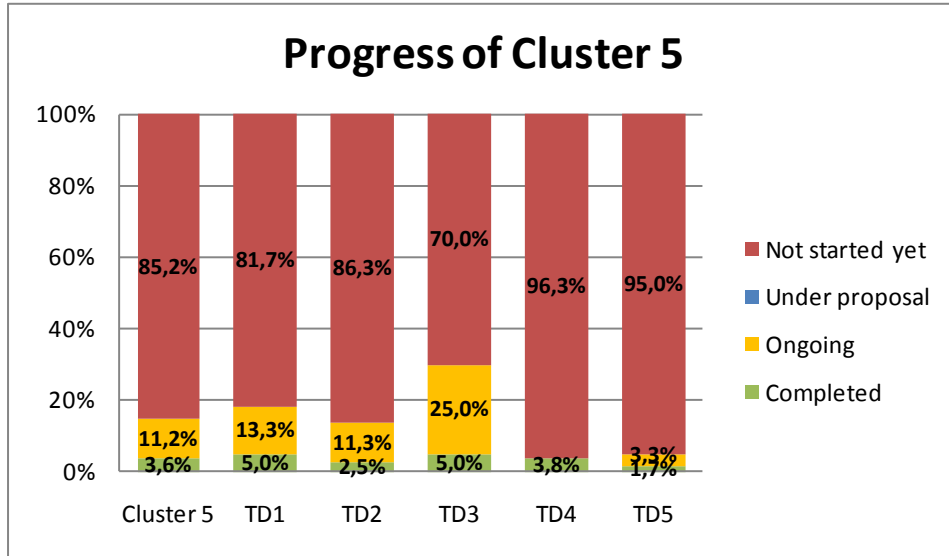
3.2.2 COMPLETION OF CLUSTERS

Using the calculated weight of the Functional Projects inside each Cluster, the Plan-level indicators of progress for the Clusters are:

	Indicators of Progress			
	Completed	Ongoing	Under proposal	Not started
Cluster 1: Pan-European grid architecture	11,8%	6,9%	14,0%	67,3%
Cluster 2: Power technology for a more flexible,	4,9%	19,6%	0,7%	74,8%
Cluster 3: Network management and control	10,6%	29,6%	0,3%	59,4%
Cluster 4: Market rules	0,0%	13,0%	0,0%	87,0%
Cluster 5: Joint TSO/DSO R&D activities	3,6%	11,2%	0,0%	85,2%



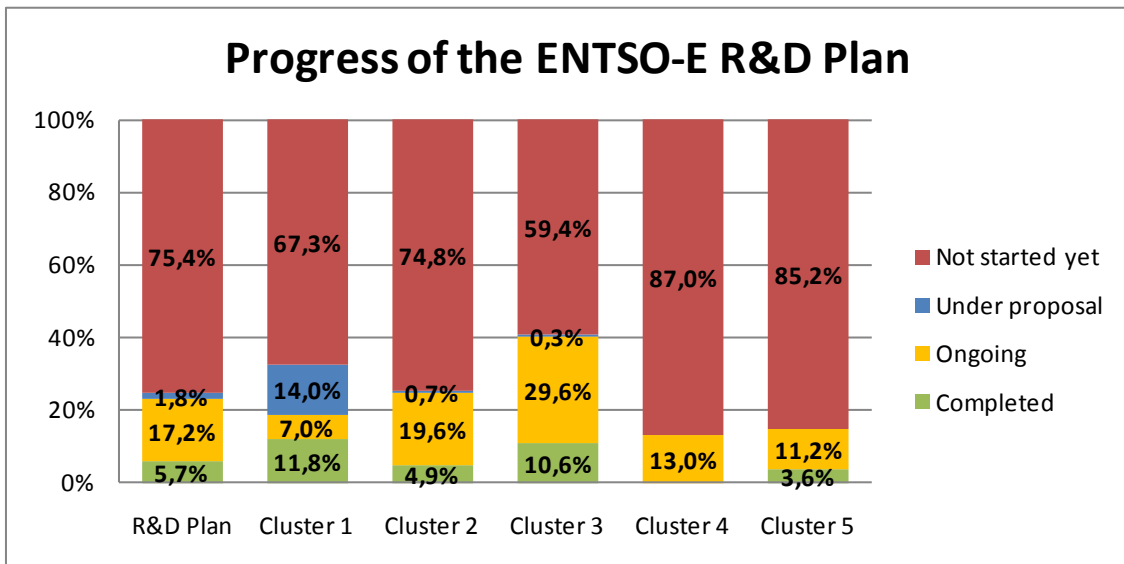




3.2.3 COMPLETION OF THE R&D PLAN

And, finally, using the calculated weight of the Clusters, the Plan-level indicators of progress for the entire ENTSO-E R&D Plan are:

	Indicators of Progress			
	Completed	Ongoing	Under proposal	Not started
ENTSO-E Research and Development Plan	5,7%	17,2%	1,8%	75,4%



These percentages are in line with the time horizon the the Plan, since it covers the period 2010-2018.

4 SUMMARY, CONCLUSIONS AND FOLLOW-UP STEPS

In order to perform the monitoring process WG MKS sent a request to all project coordinators of National or European projects. All relevant information was gathered about the projects in relation to the various objectives of the ENTSO-E R&D plan as well as their timing and budget statuses in order to get an overview about the status of the R&D road map. The monitoring will also highlight areas of future R&D work and possible gaps or topics not yet sufficiently elaborated in the R&D roadmap. The monitoring of the projects in WG MKS is focussed on the contribution of the individual projects to the R&D plan and the different tasks in the clusters.

For this WG MKS achieved a methodology with a two-step approach. The first step is a qualitative approach, which is based on the traffic light principle. In such an approach, the status of the project in different fields (contribution to the R&D Plan, budget, timing, etc) is characterised by one of three colours (green - going well, yellow - minor problems, red – problem with possible impact on R&D plan). The second step is a quantitative approach and was performed by the members of the WG MKS. The objective was to quantify the contribution of a given project to the different objectives of the R&D Plan. The final aim is to have an idea of what percentage of the R&D Plan is completed, ongoing and not yet addressed. The purpose of this is to perform a gap analysis for further prioritization of specific Clusters and Functional Projects.

Among the 45 projects, 13 projects are European-level projects and 17 projects have a national-level; 5 projects are already finished, 23 are ongoing and 2 are under proposal. Using the information provided by the project coordinators in the survey WG MKS has calculated the progress metrics of the various Functional Projects.

The results show that around 75% of the ENTSO-E R&D plan activities are not started yet, ca 19% of the work is ongoing and only around 6% of the R&D plan is achieved. The break down to different clusters shows similar results. The most R&D work is already achieved in cluster 1 (around 12%) and in cluster 3 (around 11%) whereas the work completed in cluster 2, 4 and cluster 5 is less than the average of the whole R&D Plan.

Overall, the percentage of work already completed, ongoing, under proposal or not yet started are in line with the time horizon of the Plan, since it covers the period 2010-2018.

As a conclusion R&D work must continue and more resources must progressively be spent on R&D work in the future in order to achieve the R&D roadmap within the specified timelines. This comprises the work in all clusters. Following the ongoing work in the Grid+ project, WG MKS will continue to optimize the methodology for monitoring and will develop a database for knowledge sharing in order to support the future work of the R&D projects. It is recommended that all completed, ongoing and future projects that have a positive impact on the R&D roadmap contribute to this knowledge database..

Also, to more accurately monitor the implementation effectiveness (completion) of each Functional Project, it is recommended a more specific description of its desired results be given.

This monitoring exercise will be repeated by the end of 2012, so the next report is available by the beginning of the year 2013.

ANNEX - DATASHEETS OF PROJECTS

ACTIVE NETWORK FEASIBILITY ASSESSMENT ON THE BELGIUM EAST LOOP NETWORK

BASIC INFORMATION	
Project Coordinator: Vanessa De Wilde	Company: Elia (Belgium)
e-mail: vanessa.dewilde@elia.be	Phone: +32-22-49-55-71
Address: Culliganlaan,1G - 1831 Diegem (Belgium)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Oct-2010 / Dic-2012	Current status: Ongoing
Budget: ¿?	Funding scheme: Funded 100% by Elia
Members of the consortium: - TSOs: Elia (BE). - Others: ORES (BE), Smarter Grid Solutions (UK).	
Brief project description: The study aims at designing an active network solution based on the power systems analysis. It will define principles of access for generators to perform a curtailment assessment that will help to give estimates of annual energy production and constraint volumes for each concerned generator. The project will provide guidelines for the active network solution deployment and a cost estimation as well.	
Key words: Active network management, Distributed generators, Curtailment assessment.	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)

Impacted Functional Project	Status of research completion	Observations
T12: Tools for renewable market integration		The study highlights the impact of different principles of access on the curtailment needs for each generator on the east loop network.
TD1: Increased observability of the electrical system for network management and control		The study estimates the theoretical maximum feasible capacity of new generation and the theoretical maximum produced energy on the east loop network thanks to a specific active network management scheme.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

EWIS

European Wind Integration Study

BASIC INFORMATION	
Project Coordinator: Hubert Lemmens	Company: Elia (Belgium)
e-mail: hubert.lemmens@elia.be	Phone: +32-25-46-71-01
Address: Keizerslaan, 20 - 1000 Brussel (Belgium)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2007 / 2010	Current status: Completed
Budget: 4 million EUR	Funding scheme: Granted by 6 th Framework Programme
Members of the consortium:	
<p>- TSOs: Elia (BE), Transpower GmbH (DE), 50Hertz Transmission (DE), Amprion GmbH (DE), CEPS (CZ), Eirgrid (IE), Energinet.dk (DK), HTSO (GR), National Grid (UK), PSE (PL), REE (ES), REN (PT), RTE (FR), Tennet TSO B.V. (NL), Verbund (AT).</p> <p>- Others: EC, EWEA, Eurelectric, EFET, IEA, Tradewind...</p>	
<p>Brief project description: EWIS has focused on the immediate network related challenges by analysing detailed representations of the existing electricity markets, network operations, and the physical power flows and other system behaviours that result. The starting point was the actual conditions in 2008 with future challenges assessed against realistic representations of network extensions and reinforcements taken from national development plans. In general, detailed information on user and network developments are only available for a limited number of future years and so 2015 was chosen as a suitable horizon for assessing how current plans will address future challenges. Given the importance of the 2020 targets, however, the study examined the prospects for further developments beyond 2015. Provided important input for TYNDP 2010, the system needs for Network Pilot Code and system security aspects for the future coordinated and stable operation of the Pan European transmission system.</p>	
Key words: ¿?	
Website of the project: http://www.wind-integration.eu/	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans
				TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project;	Status of research completion:	Observations:
T1. A toolbox for new network architecture assessment		Coupling of Pan European Network and Market model analysis. The results are relevant to prioritizing the reinforcement of network pinch-points and identifying beneficial additional measures to those already identified in National plans.
T2: Tools to analyze pan-European network expansion options		<p>Analysis of pan European grid expansion until 2020, especially with RES integration as a necessary basis for further investigations.</p> <p>Enhance capability and flexibility of the existing transmission grid by using dynamic line rating management and enhancing power flow control through operational switching and by use of phase shifters.</p> <p>First time combination of market model with grid model to assess added value of grid infrastructure.</p> <p>Approach to achieve a coordinated economic development of the European transmission system in the presence of wind, European market modeling (such as undertaken in EWIS).The development of suitable tools for making final investment decisions is a challenging task and a suitable development programme will need to be established..</p>
T3. Demonstration of power technologies for increased network flexibility		Results of WG3 to WG4 including control of phase shift controllers and a pilot for Flexible Line Management (TenneT North South Corridor, Germany) has been in operation in 2010.
T5. Demonstration of renewable integration		Need for such tools has been demonstrated trough grid calculations and power system simulations.
T7: Tools for coordinated operations with stability margin evaluation		Analysis of operational tools and procedures that will permit shared wind forecasting, coordinated operation of power flow control devices, coordinated voltage control, and reserve monitoring and management actions across the European network.
T9: Tools for pan-European network reliability assessment		<p>Combined grid-market modeling enabling cost benefit analysis by planners.</p> <p>EWIS analysed an approach to increase transission capability including a dynamic (n-1) approach in combination with FLM.</p>

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator:	Status:	Observations:
Research completion		Project successfully completed.
Budget		Project successfully completed.
Timing		Project completed, but additional 6 months time was needed to finalize it.

PEGASE

BASIC INFORMATION	
Project Coordinator: Stephane Rapoport	Company: Tractebel engineering (Belgium)
e-mail: stephane.rapoport@gdfsuez.com	Phone: +32-27-73-78-99
Address: Avenue Ariane 7 - 1200 Brussels (Belgium)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Jun-2008 / Jun-2012	Current status: Ongoing
Budget: 13.6 million EUR	Funding scheme: Granted by 7 th Framework Programme
Members of the consortium:	
- TSOs: RTE (FR), REE (ES), Litgrid (LT), Transelectrica (RO), REN (PT), SO UPS (RUS), HEP (HR), TEIAS (TU) and Elia (BE).	
- Others: TRACTEBEL (BE), DELING DOO (BA), DIGITEO (FR), CRSA-ECP (FR), AICIA (ES), FGH (DE), Uni. Of Liege (BE), Uni. Of Dusiburg (DE), Uni. Of Manchester (UK), Uni. Eindhoven (NL) RTU (LT), Energosetproject (RUS) and NUCLEO (ES).	
Brief project description: Define the most appropriate state estimation, optimization and simulation frameworks, their performances and the requested data flows. Relieve the technical barriers that prevent European-wide real-time state estimation and off-line and on-line simulations to be run. Develop methodologies for building and validating static and dynamic models (including renewable energy sources, power electronics, etc.). Study the architecture of a pan-European real-time state estimation, simulation and training.	
Key words: State Estimation, Optimal Power Flow, Dynamic Simulation, Model, Dispatcher Training Simulator, Pan-European.	
Website of the project: http://fp7-pegase.eu/	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T6: Tools for pan-European network observability		Deliverables of WP1 "Specification and Architecture" and WP2 "State Estimation", and more especially task 2.1 "Algorithms for State Estimation of the European system" and task 2.2 "Improvements of State Estimation performances by PMUs and IEDs".
T7: Tools for coordinated operations with stability margin evaluation		Deliverables of WP3 "Steady State Optimization", WP4 "Time Domain Simulation" and WP5 "Modeling issues".
T8: Improved training tools for improved coordination		Deliverables of WP4 "Time Domain Simulation" and more especially task 4.5 "Dispatcher Training Simulator Engine" and task 4.7 "Dispatcher Training Simulator Architecture".

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

UMBRELLA

BASIC INFORMATION

Project Coordinator: Wilhelm Winter	Company: TenneT (Germany)
e-mail: wilhelm.winter@tennet.eu	Phone: +49-0-921-50740-4165
Address: TenneT TSO GmbH, Bernecker Straße 70 - 95448 Bayreuth (Germany)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2012 / 2016	Current status: Ongoing
Budget: 5 million EUR (3.8 granted)	Funding scheme: Granted by 7 th Framework Programme
Members of the consortium: - TSOs: TenneT TSO GmbH (DE), Amprion GmbH (DE), ČEPS, a.s.(CZ), Elektro-Slovenija, d.o.o (SI), EnBW Transportnetze AG (D), PSE Operator S.A.(PL), swissgrid ag (CH), TenneT TSO B.V. (NL), Austrian Power Grid AG (AT). - Others: ABB Delft University of Technology (NL), ETH Zurich (CH), Graz University of Technology (A), RWTH Aachen (D), University Duisburg-Essen (D), FGH e.V. (D).	
Brief project description: To develop a dedicated innovative toolbox to support a coordinated decentralized grid security approach for TSOs. To demonstrate the enhancement of existing and current procedures by the utilization of the developed toolbox. To provide a scientifically sound basis to support common TSO decisions. Cooperation with iTesla in order to achieve a common use case at the beginning of both of the projects and recommendations to converging operational rules to ENTSO-E at the end of both of the projects.	
Key words: Operational system security, Risk assessment, Enhanced optimal power flow, Forecasting, optimization tools, Integration of renewables, Innovative operational tools, Corrective actions, Grid flexibility, Transmission capacity.	
Website of the project: http://www.e-umbrella.eu/	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T7: Tools for coordinated operations with stability margin evaluation		D2, D3, D4 Risk Based Assessment concepts for system security, Methods on optimizing power transits D5 Toolbox prototype for coordinated cross border actions. D2, D6 Recommendations, uncertainty modeling and system state forecasting for coordinated defense plan actions to ENTSO-E regarding operating rules
T9: Tools for pan-European network reliability assessment		D2, D3, D4 Risk Based Assessment concepts for system security, Methods on optimizing power transits D5 Toolbox prototype for coordinated cross border actions.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

ECOGRID EU

BASIC INFORMATION

Project Coordinator:	Company: Sintef ER (Norway)
e-mail: kbe@energinet.dk	Phone:
Address:	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Mar-2011 / Feb-2015	Current status: Ongoing
Budget: 21 million EUR	Funding scheme: Granted by 7 th Framework Programme
Members of the consortium:	
<ul style="list-style-type: none"> - TSOs: Energinet.dk (DK), Elia (BE). - Others: Østkraft (DK), Siemens (DK, DE), ECN (NL), IBM (DK, CH), EANDIS (BE), EnCT (DE), Tecnalía (ES), DTU-CET (DK), AIT (AU), TUT (EST), Landis + Gyr (DK). 	
Brief project description: To build and demonstrate a complete prototype of the future power system with more than 50% renewable energy. The primary focus is on market integration and inclusion of electricity customers in the building of tomorrow's SmartGrid. From the DoW: "To develop and demonstrate in large-scale a generally applicable real-time market concept for smart electricity distribution networks with high penetration of renewable energy sources and active user participation. The concept is based on small and medium-size distributed energy resources (DER) and flexible demand response to real-time price signals. Market-based, cost efficient and standardized solutions will be aimed for".	
Key words: ¿?	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T11: Advanced tools for capacity allocation and congestion management		Prototype tool for DSO control room regarding optimal grid operation.
T12: Tools for renewable market integration		<ul style="list-style-type: none"> - Report with review of existing and suggested future market solutions for real-time balancing using DERs. - Report describing the full real-time market concept architecture and model-based analysis of the market balancing performance in Bornholm system under different scenarios. - Complete and operational model for forecasting of aggregated DER response based on price signals
T13: Tools for the integration of active demand in electrical system operations		<ul style="list-style-type: none"> - Report with novel EcoGrid EU business models, functional systems architecture specifications and recommendations for future grid codes. - Information and communication plan for involvement of participants of the demonstration. - Report of evaluation of concept and market place - Report of evaluation of customer participation and acceptance. - Report of overall evaluation of the demonstration.
TD2: The integration of demand-side management into TSO operations		<ul style="list-style-type: none"> - Report on customer segments on Bornholm. - Report on developed products and services for private and commercial customers and power producers. - Report on DER models and control algorithms
TD3: Ancillary services provided by DSOs		<ul style="list-style-type: none"> - Recommendations for policy makers. These recommendations inform policy makers on how to address various constraints that have been identified. Next it addresses the options for harmonizing policy and legal framework conditions for the successful deployment of Smart Grids in the European Union. - Report with analysis and design of interoperability between real-time market and direct control by distributed cell controller and system level operational procedures

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

KRIEGERS FLAK COMBINED GRID SOLUTION

BASIC INFORMATION	
Project Coordinator: Peter Jørgensen	Company: Energinet.dk (Denmark)
e-mail: pej@energinet.dk	Phone: +45-7622-4420
Address: Tonne Kjaersvej 65, 7000 Fredericia (Denmark)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Nov-2009 / Nov-2017	Current status: Ongoing
Budget: ¿?	Funding scheme: EEPR
Members of the consortium: - TSOs: Energinet.dk (DK), 50Hertz Transmission (DE). - Others:	
Brief project description: To design the first offshore interconnected multi-terminal HVDC-HVAC and connect up to 1.800 MW offshore wind turbines.	
Key words: ¿?	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans
				TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T2: Tools to analyze pan-European network expansion options		When finding the optimum solution for the construction of Kriegers Flak. The project will analyze and find the best cost/benefit ratio based on existing scenarios for the pan-EU grid expansion.
T3. Demonstration of power technologies for increased network flexibility		The project will combine the task of bringing the energy from the OWF to shore with the characteristic of an interconnector When finding the optimum solution for the construction of Kriegers Flak. The project will analyze and find the best cost/benefit ratio based on existing scenarios for the pan-EU grid expansion.
T4. Demonstration of power technologies for novel architecture		Demonstration of two HVDC links.
T12: Tools for renewable market integration		Energinet.dk and 50HzT will need to develop mechanisms for handling several OFW connected into different regulatory regimes. Under consideration the development of tools for obtaining ancillary services and balancing energy from RES.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		Behind schedule do to political issues.

THE CELL CONTROLLER PILOT PROJECT

BASIC INFORMATION	
Project Coordinator: Stig Holm Sorensen	Company: Energinet.dk (Denmark)
e-mail: shs@energinet.dk	Phone: +45-23-33-89-54
Address: Tonne Kjaersvej 65, 7000 Fredericia (Denmark)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Nov-2004 / Apr-2011	Current status: Completed
Budget: 13.4 million EUR	Funding scheme: Funded 100% by Energinet.dk
Members of the consortium: - TSOs: Energinet.dk (DK). - Others: SydEnergi Net (DK), Spirae Inc (USA), Energynautics GmbH (DE), Kalki Tech (India), Tjæreborg Industri (DK), PonPower (DK).	
Brief project description: The project is to help adapt the Danish power system to future requirements in a RE-based power system by increasing the extent of system control and monitoring to intelligently activate distributed power generation in virtual power plants and ultimately balance generation and consumption in emergency island situation.	
Key words: Virtual power plant, ancillary services, reliability	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture	T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans
				TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Remarks
T3. Demonstration of power technologies for increased network flexibility		The cell controller has been implemented in a pilot area. Automated import/export control of active power and reactive power in and out of a pilot area have been demonstrated.
T5. Demonstration of renewable integration		The cell controller has been implemented in a pilot area. Coordinated power balancing in an islanded emergency situation has been demonstrated.
T6: Tools for pan-European network observability		The cell controller has been implemented in a pilot area. Online load flow calculation and state estimation have been demonstrated.
TD3: Ancillary services provided by DSOs		The cell controller has been implemented in a pilot area. Coordinated voltage control and reactive power import/export have been demonstrated.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		Project successfully completed
Budget		Project successfully completed
Timing		Project successfully completed

DEVELOPMENT OF EARLY WARNINGS SYSTEMS (PMU/WAMS)

BASIC INFORMATION	
Project Coordinator: Carsten Strunge	Company: Energinet.dk (Denmark)
e-mail: cas@energinet.dk	Phone: +45-76-22-45-35
Address: Tonne Kjaersvej 65, 7000 Fredericia (Denmark)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2006 / 2015	Current status: Ongoing
Budget: ¿?	Funding scheme: Financed 100% by Energinet.dk
Members of the consortium:	
- TSOs: Energinet.dk (DK).	
- Others: CET, DTU (DK), Universitetet of Kassel (DE).	
Brief project description: The purpose is to develop systems that can monitor the overall power system state and alert system operators and other protection systems for critical situations in the power system.	
Key words: ¿?	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture	T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans
				TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T1. A toolbox for new network architecture assessment		New algorithms are developed to foresee and decide control actions to avoid power system stability and security risks.
T5. Demonstration of renewable integration		Indirectly.
T6: Tools for pan-European network observability		Indirectly.
T7: Tools for coordinated operations with stability margin evaluation		Indirectly.
T9: Tools for pan-European network reliability assessment		Indirectly.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

FROM WIND POWER TO HEAT PUMPS

BASIC INFORMATION	
Project Coordinator: Steen Kramer Jensen	Company: Energinet.dk (Denmark)
e-mail: skr@energinet.dk	Phone: +45-76-22-44-06
Address: Tonne Kjaersvej 65, 7000 Fredericia (Denmark)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2010 / 2012	Current status: Ongoing
Budget: 1 million EUR	Funding scheme: Financed 100% by Energinet.dk
Members of the consortium: - TSOs: Energinet.dk (DK). - Others: Danish Energy Authority (DK), GoEnergi (DK).	
Brief project description: To control 300 intelligent heat pumps as if they were one big energy storage facility capable of storing electricity as heat.	
Key words: ¿?	
Website of the project: www.styrdinvarmepumpe.dk	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN					
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
TD2: The integration of demand-side management into TSO operations	¿?	
TD3: Ancillary services provided by DSOs	¿?	
TD5: Joint task force on IT system protocols and standards	¿?	

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion	¿?	
Budget	¿?	
Timing	¿?	

EVCOM

BASIC INFORMATION

Project Coordinator: Carsten Strunge	Company: Energinet.dk (Denmark)
e-mail: cas@energinet.dk	Phone: +45-76-22-45-35
Address: Tonne Kjaersvej 65, 7000 Fredericia (Denmark)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Ene-2008 / Dic-2012	Current status: Ongoing
Budget: ¿?	Funding scheme: Financed 100% by Energinet.dk
Members of the consortium:	
- TSOs: Energinet.dk (DK).	
- Others: Danish Energy Association (DK), a number of Danish DSO's (DK).	
Brief project description: The primary purpose is to establish a concept for electric vehicles and their communication with the power system. The concept disseminated to the standardization work and to relevant stakeholders.	
Key words: ¿?	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture	T5: Demonstration of renewable integration		
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
TD2: The integration of demand-side management into TSO operations	¿?	Coordination of data exchange and control needs between for DSO and TSO and for stakeholders of Electric Vehicles.
TD5: Joint task force on IT system protocols and standards	¿?	Coordination of Danish EV communication projects with EU M/468 E-mobility and ISO/IEC JWG V2G CI.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion	¿?	
Budget	¿?	
Timing	¿?	

CONCEPT FOR MANAGEMENT OF THE FUTURE ELECTRICITY SYSTEM

BASIC INFORMATION	
Project Coordinator: Carsten Strunge	Company: Energinet.dk (Denmark)
e-mail: cas@energinet.dk	Phone: +45-76-22-45-35
Address: Tonne Kjaersvej 65, 7000 Fredericia (Denmark)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Ene-2009 / Dic-2011	Current status: Completed
Budget: ¿?	Funding scheme: Financed 100% by Energinet.dk
Members of the consortium:	
- TSOs: Energinet.dk (DK).	
- Others: Danish Energy Association (DK), a number of Danish DSO's (DK).	
Brief project description: To develop and describe a concept for the necessary and sufficient management of the future power system in 2025. The concept description should be at a level that allows a subsequent breakdown in specific projects to an early-stage phased rollout.	
Key words: ¿?	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans
				TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
TD1: Increased observability of the electrical system for network management and control	?	Concept for how to integrate, scale and manage large quantities of DER through aggregation and distributed control hierarchies.
TD2: The integration of demand-side management into TSO operations	?	Specification of the data needed by TSOs for a pan-EU tool in order to integrate DSM: indirectly by utilizing assets through aggregation at DSO level.
TD3: Ancillary services provided by DSOs	?	Concept for how to integrate, scale and manage large quantities of DER through aggregation and distributed control hierarchies.
TD4: Improved defense and restoration plans	?	Regulatory and technical challenges to implement restoration plans at pan-EU level: indirectly by utilizing assets through aggregation at DSO level.
TD5: Joint task force on IT system protocols and standards	?	Information models for the EU Smart Grids security, taking into account business interactions and the physical processes of delivering electricity, and also the disruption of business communications, or of the delivery of electricity: partially, on concept level.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion	?	Project completed
Budget	?	Project completed
Timing	?	Project completed

TWENTIES

BASIC INFORMATION

Project Coordinator: Vicente González	Company: Red Eléctrica de España (Spain)
e-mail: vgonzalez@ree.es	Phone: +34-91-650-20-12
Address: Conde de los Gaitanes, 177 – 28109 Alcobendas (Madrid, Spain)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Apr-2010 / Apr-2013	Current status: Ongoing
Budget: 56.8 million EUR	Funding scheme: Granted by 7 th Framework Programme
Members of the consortium:	
<ul style="list-style-type: none"> - TSOs: REE (ES), Elia (BE), Energinet.dk (DK), RTE (FR), 50Hertz Transmission GmbH (DE), Tennet TSO (NL). - Others: DONG (DK), IBR (ES), RISØ.DTU (DK), EDF (FR), ALSTOM (UK), Comillas-IIT (ES), Fraunhofer IWES (DE), SINTEF (NO), GAMESA (ES), SIEMENS (DE), EWEA (BE), CORESO (BE), ABB (ES), INESC-PORTO (PO), UCD (EI), RSE (IT), STRATHCLYDE (UK), ULG (BE), KUL (BE), ULB (BE). 	
Brief project description: Project aims to demonstrate through real-life, large-scale demonstrations, the benefits and impact of several critical types of technology required to improve the European transmission network, thus giving Europe the ability to increase the share of renewable in its energy mix by 2020 and beyond, while keeping its present reliability.	
Key words: Wind power integration, DC grid management, AC grid flexibility, WAMS, DLR, FACTS, VPP, Wind farms services provider.	
Website of the project: http://www.twenties-project.eu	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T1. A toolbox for new network architecture assessment		Replicability and scalability assessment in WP15 and WP16. Demo 3: study of optimal topology of future DC grid in North Sea.
T3. Demonstration of power technologies for increased network flexibility		Demo 5 and 6, Dynamic line ratings, coordination of power technology devices and new power flow management system
T4. Demonstration of power technologies for novel architecture		Demo 3 DC Grid
T5. Demonstration of renewable integration		Demo 1 System services provided by wind farms. Demo 4 Balancing wind fast reduction in storm situation. Demo 2 balancing wind with VPPs (load & gen)
T6: Tools for pan-European network observability		Demo 5 Implementation of WAMS for dynamic security assessment

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

A COMPLETE AND NORMALIZED 61850 SUBSTATION

BASIC INFORMATION	
Project Coordinator: Carlos Rodríguez del Castillo	Company: Red Eléctrica de España (Spain)
e-mail: calrodriguez@ree.es	Phone: +34-91-650-20-12
Address: Conde de los Gaitanes, 177 – 28109 Alcobendas (Madrid, Spain)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2009 / 2015	Current status: Ongoing
Budget: 4.2 million EUR	Funding scheme: Financed 100% by Red Eléctrica de España
Members of the consortium: - TSOs: REE (ES). - Others: Several protection and control system suppliers.	
Brief project description: Use the standard IEC61850 as a means to improve the design, maintenance and operation of the substation automation systems. Design a standard substation considering the existing and new solutions developed by the vendors collaborating in the project. Build and set-up in operation a IEC61850 HV substation.	
Key words: 61850 standardization, Digital substation, Process bus.	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN					
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration		T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T6: Tools for pan-European network observability		Test bed for different manufactures under a common process and substation bus.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		The commitment and involvement of industrial partners is being larger than initially expected.
Timing		The lab test process is being longer than expected due to the complex validation of interoperability. Estimated delay: 12 months.

ALMACENA

BASIC INFORMATION

Project Coordinator: Belén Díaz-Guerra	Company: Red Eléctrica de España (Spain)
e-mail: bdguerra@ree.es	Phone: +34-91-650-20-12
Address: Conde de los Gaitanes, 177 – 28109 Alcobendas (Madrid, Spain)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2009 / 2013	Current status: Ongoing
Budget: 4 million EUR	Funding scheme: Presented to EU FEDER
Members of the consortium: - TSOs: REE (ES). - Others: A123 (USA).	
Brief project description: Installation and testing of 1 MW electrochemical battery in a substation of the transmission grid.	
Key words: Energy Storage, Load shift, RES integration.	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T2: Tools to analyze pan-European network expansion options		Development of a pilot test facility to assess the potential capabilities of electrochemical devices supporting grid applications.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		FAT schedule in summer 2012 and commissioning by fall 2012.

220 kV SSSC DEVICE FOR POWER FLOW CONTROL

BASIC INFORMATION	
Project Coordinator: Juan Carlos Sánchez	Company: Red Eléctrica de España (Spain)
e-mail: jcsanchez@ree.es	Phone: +34-91-650-20-12
Address: Conde de los Gaitanes, 177 – 28109 Alcobendas (Madrid, Spain)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2009 / 2014	Current status: Ongoing
Budget: 5.5 million EUR	Funding scheme: Granted by PSE during 2009-2010 and INNFACTO during 2011-2014 (Spanish R&D Programs)
Members of the consortium: - TSOs: REE (ES). - Others: INGETEAM (ES), INCOESA (ES).	
Brief project description: Design, construct, set up in operation and test a FACTS (SSSC) to prevent overload situations in the 220 kV transmission grid and reduce the measures that the System Operator has to make for solving overloads, like reduce the meshing of the network or curtail wind production.	
Key words: FACTS, SSSC, Power flow control, Power electronics	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T3. Demonstration of power technologies for increased network flexibility		Full scale 220kV SSSC demonstrator in operation. The major identified risk is the performance of the Serial coupling transformer.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

SAFEWIND

BASIC INFORMATION

Project Coordinator: Dr. George Kariniotakis	Company: ARMINES/MINES ParisTech (France)
e-mail: georges.kariniotakis@mines-paristech.fr	Phone: +33-(0)4-93-95-75-01 (ext. 7599)
Address: MINES-ParisTech / ARMINES. Centre for Energy & Processes (CEP), P.O. Box N° 207, 06904 Sophia Antipolis Cedex (France)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Sep-2008 / Ago-2012	Current status: Ongoing
Budget: 5.6 million EUR	Funding scheme: Granted by 7 th Framework Programme
Members of the consortium: - TSOs: RTE (FR), Energinet.dk (DK), SONI - SYSTEM OPERATOR FOR NORTHERN IRELAND (GB), EIRGRID PLC (IE). - Others: PPC – PUBLIC POWER CORPORATION (GR), ACCIONA ENERGIA S.A. (ES), EdF - ELECTRICITE DE FRANCE S.A. (FR), ECMWF - EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTS (INT), METEO-FRANCE (FR), OVERSPEED GMBH & CO. KG (DE), ENERGY & METEO SYSTEMS GMBH (DE), CENER (ES), NATIONAL TECHNICAL UNIVERSITY OF ATHENS - ICCS/NTUA (GR), UNIVERSITY OF OLDENBURG - FORWIND (DE), UNIVERSIDAD CARLOS III DE MADRID (ES), TERI - THE ENERGY AND RESOURCES INSTITUTE INDIA (IN), DANISH TECHNICAL UNIVERSITY (DK), THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD (GB), UNIVERSIDAD COMPLUTENSE DE MADRID (ES).	
Brief project description: The project will develop: New short-term forecasting methods for wind generation focusing on uncertainty and challenging situations/extremes at various temporal and spatial scales. - Models for "alarming": providing information for the level of predictability in the very short-term. - Models for "warning": providing information for the level of predictability in the medium-term (next day(s)). Analysis of predictability as decision factor in the resource assessment phase. Develop a "European vision" for wind power forecasting.	
Key words: Renewable energy, Short-term forecasting, Uncertainty, Ramps forecasting, Alarming, Warning, Weather forecasts, Remote sensing, Weather extremes, Meteorology.	
Website of the project: www.safewind.eu	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture	T5: Demonstration of renewable integration		
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T6: Tools for pan-European network observability		The project develops advanced tools for short-term wind power forecasting with focus on challenging situations and extremes. In order to improve predictability at local/regional or continental level, a large network of more than 2000 meteorological stations all over Europe have been considered together with measurements from numerous wind farms.
TD1: Increased observability of the electrical system for network management and control		The project develops advanced tools for wind power forecasting with focus on difficult weather situations and extremes which have a high impact for the power system. It develops solutions for probabilistic forecasting, uncertainty estimation, ramps forecasting, alarming for large forecast errors, warning for low wind power predictability, risk indices, new weather forecast products adapted to the renewables industry, use of distributed measurements to improve wind power forecasts at local/regional/national level adapted for DSO and TSO application etc. Demonstration of the developed approaches at real conditions.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

OPTIMATE

BASIC INFORMATION

Project Coordinator: Serge Galant	Company: Technofi (France)
e-mail: sgalant@symple.eu	Phone: +33-4-93-65-34-44
Address: ATLANTIS 2. 55 allée Pierre ZILLER - BP 22. 06901 Sophia Antipolis Cedex (France)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Oct-2009 / Sep-2012	Current status: Ongoing
Budget: 4.2 million EUR	Funding scheme: Granted by 7 th Framework Programme
Members of the consortium: - TSOs: RTE (FR), EnBW Transportnetze AG (DE), REE (ES), ELIA (BE), 50 Hertz Transmission (DE). - Others: Katholik University of Leuven (BE), Association pour la Recherche et le Développement des Méthodes et Processus Industriels, ARMINES (FR), University Comillas (ES), RISOE-DTU (DK), European University Institute (IT), University of Manchester (UK)..	
Brief project description: The project aims at developing a numerical test platform to analyze and to validate new market designs which may allow integrating massive flexible generation dispersed in several regional power markets.	
Key words: Market design, Simulation platform, Agent based, DA market, ID market, Balancing mechanism, Flow based market coupling, Intermittent generation.	
Website of the project: www.optimate-platform.eu	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture	T5: Demonstration of renewable integration		
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T10: Advanced tools for pan-European balancing markets		OPTIMATE simulator.
T11: Advanced tools for capacity allocation and congestion management		OPTIMATE simulator
T12: Tools for renewable market integration		OPTIMATE simulator

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

iTESLA

BASIC INFORMATION

Project Coordinator: Christian Lemaitre	Company: RTE (France)
e-mail: christian.lemaitre@rte-france.com	Phone: +33-1-39-24-40-78
Address: RTE/DES. 9 RUE DE LA PORTE DE BUC. BP561. 78005 VERSAILLES CEDEX (France)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Ene-2012 / Dic-2015	Current status: Ongoing
Budget: 19.4 million EUR	Funding scheme: Granted by 7 th Framework Programme
Members of the consortium:	
<ul style="list-style-type: none"> - TSOs: RTE (FR), ELIA (BE), NGC (UK), REN (PT), Statnett (NW), HTSO (GR), CORESO(BE). - Others: AIA (SP), Artelys (FR), BULL (FR), PEPITE (BE), Quinary (IT), Tractebel (BE), Technofi (FR). Imperial College (UK), INESC Porto (PT), KTH (SE), K.U.Leuven (BE), RSE (IT), RISOE (DK). 	
Brief project description: The goal of this 4 year R&D project is to develop and validate an open interoperable toolbox which will bring support, by 2015, to future operations of the pan-European electricity transmission network, thus favouring increased coordination and harmonisation of operating procedures among network operators. New concepts, methods and tools are developed to define security limits of the pan European system and to quantify the distance between an operating point and its nearest security boundary: this requires building its most likely description and developing a risk based security assessment accounting for its dynamic behaviour. The chain of resulting tools meets 3 overarching functional goals: i) to provide a risk based security assessment accounting for uncertainties around the most likely state, for probabilities of contingencies and for corresponding preventive and corrective actions. ii) to construct more realistic states of any system (taking into account its dynamics) over different time frames (real-time, intraday, day ahead, etc.). iii) to assess system security using time domain simulations (with less approximation than when implementing current standard methods/tools)..	
Key words: Pan European coordination, Security assessment, Risk-based security analysis, System dynamic behavior, Large non convex optimization techniques.	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans
				TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T7: Tools for coordinated operations with stability margin evaluation		<p>The overarching goal is to develop and validate a toolbox able to support the future operation of the pan-European grid and to increase coordination among TSOs. This toolbox will allow to perform an accurate security assessment taking into account system dynamics, possible corrective actions and the increasing amount of uncertainties affecting the system. All project deliverables will contribute to this goal. The final deliverable consists of the toolbox prototype itself.</p> <p>The objective of WP6 is to assess the effectiveness of existing defense and to propose improvements (integration of renewables, increased coordination, use of PMU information, role of distributed energy resources, etc.). This WP will also provide recommendations regarding restoration procedures (coordination, role of renewable energy sources).</p>

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

E-HIGHWAY 2050

BASIC INFORMATION

Project Coordinator: Gérald Sanchis	Company: RTE (France)
e-mail: gerald.sanchis@rte-France.com	Phone: +33-1-41-02-12-80
Address: RTE – Tour Initiale - 1 Terrasse Bellini - 92800 – PUTEAUX (France)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Apr-2012 / Dic-2014	Current status: Proposal
Budget: 14.6 million EUR	Funding scheme: Presented to 7 th Framework Programme
Members of the consortium:	
- TSOs: RTE (FR), Amprion (DE), REN (PT), ELIA (BE), APG (AT), Energinet (DK), EKC (YU), PSE (PL), HTSO (GR), REE (ES), Svenska (SE), Transelectrica (RO), CEPS (CZ), Swissgrid (CH), TERNNA (IT).	
- Others: Sintef (NO), ECN (NL), Technofi (FR), RSE (IT) DENA (DE), ENTSO-E (BE), Brunel (UK), Comillas (ES), IST (PT), Leuven (BE), Ensiel (IT), Tu Berlin (DE), IPE (PL), Eurelectric (BE), Europacable (BE), EWEA (BE), T&D Europe (BE), Poyry (IK), E3G (BE).	
Brief project description: The overarching goal of the e-Highway2050 project is to develop the foundations of a modular and robust expansion of the pan-European network from 2020 to 2050 which will be required to be on line with the three european energy policy pillars.	
Key words: ¿?	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment		T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility		T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability		T7: Tools for coordinated operations with stability margin evaluation		T8: Improved training tools for improved coordination	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets		T11: Advanced tools for capacity allocation and congestion management		T12: Tools for renewable market integration	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control		TD2: The integration of demand-side management into TSO operations		TD3: Ancillary services provided by DSOs	
					TD4: Improved defense and restoration plans	
					TD5: Joint task force on IT system protocols and standards	

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T1: A toolbox for new network architecture assessment	[Not started yet]	Method and tool to support the planning of electricity highways based on various future power system scenarios, taking into account benefits, costs and risks for each.
T2: Tools to analyze pan-European network expansion options	[Not started yet]	Options for a pan-European grid architecture under different scenarios, including transition planning between 2020, 2030, 2040 and 2050.
T14: Innovative approaches to improve the public acceptance of overhead lines	[Not started yet]	Environmental and public acceptance of electricity highways.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion	[Not started yet]	
Budget	[Not started yet]	
Timing	[Not started yet]	

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

AFTER

A Framework for electrical power systems vulnerability identification, defense and Restoration

BASIC INFORMATION	
Project Coordinator: Emanuele Ciapessoni	Company: RSE – Ricerca sul Sistema Energetico (Italy)
e-mail: Emanuele.Ciapessoni@rse-web.it	Phone: +39-02-39-92-57-66
Address: RSE - Via Rubattino 54, 20134 Milan (Italy)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Oct-2011 / Sep-2014	Current status: Ongoing
Budget: 5 million EUR (3.5 granted)	Funding scheme: Granted by 7 th Framework Programme (Call FP7-SEC-2010-1)
Members of the consortium:	
- TSOs: ELIA (BE), Terna (IT), ČEPS, a.s. (CZ).	
- Others: ENEA (IT), SINTEF EN (NO), SINTEF ICT (NO), Genoa University (IT), UCD University (IE), City University (UK), ALSTOM Power (FR), SIEMENS (DE), JRC (BE).	
Brief project description: AFTER addresses vulnerability evaluation and contingency planning of the energy grids and energy plants considering also the ICT systems used in protection and control. Main addressed problems concern high impact, wide spread, multiple contingencies and cascading.	
Key words: Security, Risk assessment, Emergency control, Defense, Restoration.	
Website of the project: http://www.after-project.eu	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans
				TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T7: Tools for coordinated operations with stability margin evaluation		AFTER main objectives (in WP2, WP4 and WP5), is to define methodologies for vulnerability: identification, global risk assessment and contingency planning (relevant deliverable D4.1-4). The methodology will be supported by prototype tools developed in WP5 "Tools for global risk assessment of the Electrical Power Systems". AFTER will develop risk based methods for the definition and assessment of defense plan. Moreover AFTER will analyze the restoration phase
T9: Tools for pan-European network reliability assessment		AFTER objectives (in WP2, WP4 and WP5), is to define approaches for risk analysis in operation (relevant deliverable D4.1-4). AFTER will study a risk based approach for the analysis of large disturbances and for the management of emergencies. The definition of new security criteria, replacing N-1) is not directly addressed.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

DREAM

Danish Renewable Energy Alligned Markets - phase 1

BASIC INFORMATION	
Project Coordinator: Frank Elefsen	Company: Danish Technological Institute (Denmark)
e-mail: fre@dti.dk	Phone: +45-72-20-12-50
Address: ¿?	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Feb-2012 / Ago-2013	Current status: Ongoing
Budget: 1.1 million EUR	Funding scheme: ForskEL-programme (Energinet.dk)
Members of the consortium:	
- TSOs: Energinet.dk (DK).	
- Others: Danish Energy Association, SE (DK), Billund CHP (DK), LEGO (DK), Municipality of Billund (DK), Vestas (DK), Danfoss Power Electronics (DK).	
Brief project description: The DREAM projects will bring smart grids to the next level and demonstrate that full deployment of technologies, fiscal accountable models and user acceptance is possible in a well-defined delimited region. The DREAM project combines technical expertise with thorough financial insight bringing full deployment of smart grid technologies closer to the market. This ForskEL project is the first out of a number of future DREAM projects and provides the necessary analysis and design of end-user solutions to make reliable and financial accountable full-scale demonstration in the succeeding projects. The results of this project will be a ready-to implement layout for the demonstration in the selected area. The main idea of the DREAM project is to let all consumers, living in a defined area with a high density of electric vehicles and heat pumps, be subject to the fluctuations of the electricity production. The project will take advantage of the "Cell Controller" project which provides smart grid measuring and control equipment at macro level in the area of Holsted in the Municipality of Billund. The equipment can deliver the necessary grid information to the consumers and the consumption can be monitored simultaneous.	
Key words: ¿?	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

SUMO

BASIC INFORMATION

Project Coordinator: Jan Kostevc	Company: ELES (Slovenia)
e-mail: jan.kostevc@eles.si	Phone: +386-1-474-2105
Address: ELES, d.o.o. Hajdrihova 2 1000 Ljubljana (Slovenia)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2011 / 2014	Current status: Ongoing
Budget: 2 million EUR	Funding scheme: Financed 100% by ELES
Members of the consortium: - TSOs: ELES (SI). - Others: EIMV (Milan Vidmar Electric Power Research Institute).	
Brief project description: Dynamic thermal rating will be incorporated in SCADA/EMS environment. Network analyses will use near real time system capabilities. Calculation of element ratings will use ambient parameters from relevant geographical areas.	
Key words: Dynamic thermal rating	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T3. Demonstration of power technologies for increased network flexibility		SUMO project is aimed at implementing DTR technology which can increase transfer capacities of existing infrastructure.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

WAMPAC

BASIC INFORMATION

Project Coordinator: Jan Kostevc	Company: ELES (Slovenia)
e-mail: jan.kostevc@eles.si	Phone: +386-1-474-2105
Address: ELES, d.o.o. Hajdrihova 2 1000 Ljubljana (Slovenia)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2012 / 2014	Current status: Proposed
Budget: 1 million EUR	Funding scheme: Financed 100% by ELES
Members of the consortium:	
<ul style="list-style-type: none"> - TSOs: ELES (SI). - Others: ABB (ES), ALSTOM (UK), Comillas-IIT (ES), CORESO (BE), DONG (DK), EDF (FR), EWEA (BE), Fraunhofer IWES (DE), GAMESA (ES), IBR (ES), INESC-PORTO (PO), KUL (BE), RISØ.DTU (DK), RSE (IT), SIEMENS (DE), SINTEF (NO), STRATHCLYDE (UK), UCD (EI), ULB (BE), ULG (BE). 	
Brief project description: Existing wide area measurement system will be upgraded with protection and control functions. Relevant critical operation scenarios will be investigated in due course.	
Key words: WAMS, WAMPAC, Protection, Control functions.	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility		T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration		T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T5. Demonstration of renewable integration		WAMPAC shall use PMU measurements implemented in a smart management system, cooperating directly with the existing SCADA system. In case of oscillations, threatening the secure operation of the grid, WAMPAC will provide topological measures intended to dampen the oscillations or reduce their impact on the grid.
T6: Tools for pan-European network observability		Wide area monitoring system (WAMS), which creates the basis for the development of WAMPAC, is currently the best tool for increasing observability of the system. WAMPAC will still implement all the benefits of WAMS, plus more.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

ANEMOS Plus









BASIC INFORMATION







Project Coordinator: Dr. George Kariniotakis	Company: ARMINES/MINES ParisTech (France)
e-mail: georges.kariniotakis@mines-paristech.fr	Phone: +33-0-4-93-95-75-01 (ext. 7599)
Address: MINES-ParisTech / ARMINES. Centre for Energy & Processes (CEP). P.O. Box N° 207. 06904 Sophia Antipolis Cedex (France)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Ene-2008 / Jun-2011	Current status: Completed
Budget: 5.7 million EUR	Funding scheme: Granted by 6 th Framework Programme
Members of the consortium:	
<ul style="list-style-type: none"> - TSOs: REN (PT), REE (ES), EIRGRID (IE), SONI (GB), PPC (System Operator of Crete Island, GR), EDF-Guadeloupe (System Operator of Guadeloupe Island, FR). - Others: EWE (DE), Acciona Energia (ES), DONG Energy Generation (DK), Danish Technical University (DK), OVERSPEED GmbH (DE), Energy & Meteo Systems GmbH (DE), ENFOR (DK), University Carlos III Madrid (ES), INESC Porto (PT), CENER (ES), University College of Dublin (IE), University of Antilles & Guyane (FR), National Technical University of Athens-ICCS (GR..) 	
Brief project description: Advanced tools for the management of electricity grids with large-scale wind generation, demonstration.	
Key words: Wind energy, Wind power forecasting, Decision making under uncertainty, Reserves estimation, Congestion management, Scheduling, Wind/storage coordination, Optimal trading, Uncertainties management, Demonstration.	
Website of the project: http://www.anemos-plus.eu/	





MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T5. Demonstration of renewable integration	 	Advanced software modules based on stochastic approaches have been developed and demonstrated/evaluated under real conditions for various functions like optimal reserves estimation for a system with high wind penetration, Optimal scheduling of a power system based on stochastic approaches to account for high wind penetration, Congestion management using localized wind power forecasts, optimal coordination of hydro storage with wind farms, optimal trading of a wind farms portfolio at an electricity market.
T6: Tools for pan-European network observability	 	Advanced tools have been developed for wind power forecasting (probabilistic models, risk indices, scenarios, local, regional, national wind power forecasting). They have been integrated into a prediction platform (ANEMOS) and demonstrated/evaluated under real conditions.
T7: Tools for coordinated operations with stability margin evaluation	 	The project developed wind power forecasting tools and stochastic approaches for various power system management functions (see above). These contribute to the following scopes of T7: "to implement stochastic approaches to critical optimization variables in order to cope adequately with uncertainties" and "to facilitate the converging of policies for operational planning and to support the harmonization of operation rules at the ENTSOE-e level".
TD1: Increased observability of the electrical system for network management and control	 	The project developed advanced tools for wind power forecasting (probabilistic models, ensembles, risk indices, forecast scenarios, local/regional/national wind power forecasting a.o.). They have been integrated into a prediction platform (ANEMOS) and demonstrated/evaluated under real conditions at TSO and DSO cases. The project also developed stochastic methods for the optimal use of such forecasts for decision making related to wind integration (functions like reserves estimations for TSOs, congestion management for DSOs etc).

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion	 	Project successfully completed.
Budget	 	Project successfully completed. Entire budget justified.
Timing	 	Project successfully completed in the foreseen timing.

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

REAL-SMART

BASIC INFORMATION

Project Coordinator: Nina Thornhill	Company: Imperial College of Science, Technology and Medicine (United Kingdom)
e-mail: n.thornhill@imperial.ac.uk	Phone: + 44-0-20-7594-6622
Address: Conde de los Gaitanes, 177 – 28109 Alcobendas (Madrid, Spain)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Sep-2010 / Ago-2014	Current status: Ongoing
Budget: 1.1 million EUR	Funding scheme: FP7-PEOPLE-2009, Marie Curie IAPP transfer of knowledge programme
Members of the consortium:	
- TSOs: Statnett (NO), Fingrid (FIN).	
- Others: ABB (NO, CH, PL), General Electric (GER), AALTO-KORKEAKOULUSAATIO (FI), TECHNISCHE UNIVERSITAET GRAZ (AUT), Imperial College of Science, Technology and Medicine (UK), NATIONAL GRID (UK).	
Brief project description: Power transmission in Europe is entering a period of significant renewal and technological change because the electrical transmission grids face increases in new and variable energy sources, especially from large scale wind power generators. They therefore face future challenges of operation and control. Changes happening in the process industries will also have an impact on electrical supply because electric motors are taking over from traditional gas turbine drivers for large-scale process equipment such as compressors. On the other hand, new measurement and data acquisition methods such as phasor measurement units are allowing greatly improved observation of the transmission grid. The REAL-SMART proposal presents a balanced programme of applied R&D to address measurement-based monitoring and management of the high voltage transmission grid. The REAL-SMART consortium is interdisciplinary with experts in electrical power systems, modelling, instrumentation, signal analysis, equipment condition monitoring, and automation of oil & gas processes. The consortium will conduct research and undertake secondments to transfer experience and knowledge both ways between academia and industry. The project integrates in-depth understanding of the power system operational issues with analysis of state-of-the-art measurements and first-principles physical knowledge. It will invent and develop state-of-the-art tools that will be deployed by the transmission system operators, and will produce trained and experienced personnel. We aim to take a pivotal role in the creation of technology for intelligent operation of the wide-area transmission grids of the future.	
Key words: Smart Grid, wind power, WAMS	
Website of the project: http://www3.imperial.ac.uk/realsmart	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T1. A toolbox for new network architecture assessment		Workpacket called "Network modelling and control for enhanced power system security" is complete.
T2: Tools to analyze pan-European network expansion options		Work packet called "New methods for converting WAMS data into information about performance and operation in real-time" is underway.
T5. Demonstration of renewable integration		A work packet called "Quantifying the dynamic impact of wind generation on the grid." is underway.
T6: Tools for pan-European network observability		Work packet called "New methods for converting WAMS data into information about performance and operation in real-time" is underway. Work packet called "Methods for converting historical WAMS data into information about performance and operation." is underway.
T9: Tools for pan-European network reliability assessment		Secondment of PhD student to TSO: Report on applying probabilistic approaches in wind integration for system planning. It is completed.
T12: Tools for renewable market integration		Work packet called "Modifying grid planning methods to take into account installed large-scale wind power" is underway.
TD3: Ancillary services provided by DSOs		Work packet called "Interactions between heavy industrial loads and the grid" is underway. It may be relevant.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

SAMREL

BASIC INFORMATION

Project Coordinator: Gjerde Oddbjörn	Company: Sintef Energy Research AS (Norway)
e-mail: Oddbjorn.Gjerde@sintef.no	Phone: +47-73-59-72-00
Address: ostboks 4761 Sluppen, NO-7465 Trondheim (Norway)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Ene-2010 / Dic-2013	Current status: Ongoing
Budget: 1.9 million EUR	Funding scheme: Granted by Research Council of Norway
Members of the consortium:	
<ul style="list-style-type: none"> - TSOs: Energinet.dk (DK), Fingrid (FI), Statnett (NO). - Others: Det Norske Veritas AS (NO), Norwegian University of Science and Technology (NO), Norwegian Water Resource and Energy Directorate (NO). 	
Brief project description: Integration of methods and tools for security of electricity supply analysis. The primary goal is to establish a comprehensive methodology for security of electricity supply analysis, by the integration of power system reliability analysis with the electricity market analysis.	
Key words: Simulation tool, System security, Reliability.	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture	T5: Demonstration of renewable integration		
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T2: Tools to analyze pan-European network expansion options		The SAMREL methodology, integrating power market, contingency and reliability analyses, will enable coordinated planning including network investment. Ref. Kjølle, G.H., Gjerde, O., "Integrated approach for security of electricity supply analysis", International Journal of Systems Assurance Engineering and Management, pp. 1-7, 2010.
T9: Tools for pan-European network reliability assessment		The SAMREL methodology can be used for testing different security criteria and see how system performance and reliability of supply is affected (on a power system planning horizon).

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

PoStaWind

BASIC INFORMATION

Project Coordinator: Nayeem Ullah	Company: STRI AB (Sweden)
e-mail: nayeem.ullah@stri.se	Phone: + 46-0-2-40-79-575
Address: Regnbagsgatan 8B SE-41755 Gothenburg (Sweden)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Jul-2011 / Oct-2012	Current status: Ongoing
Budget: 0.2 million EUR	Funding scheme: Vindforsk III
Members of the consortium:	
- TSOs: Svenska Kraftnät (SE), Fingrid (FIN), Statnett (NO).	
- Others: STRI AB (SE), Statkraft (SE), Vattenfall (SE), E.ON Elnät Sverige AB (SE).	
Brief project description: Effects of large scale wind power integration on power system stability: angle, voltage and frequency stability.	
Key words: Wind power, Small-signal stability, Inertia, Voltage stability, Frequency stability, Grid code.	
Website of the project: http://www.elforsk.se/Programomraden/EI--Varme/Vindforsk/projekt/projects_area_4/V-369-PoStaWind/	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture	T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans
				TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T1. A toolbox for new network architecture assessment		The project investigates how large scale RES integration in an example Nordic grid will influence the angle, voltage and frequency stability. The results will lead to recommendations on relevant grid codes (voltage controller requirements, 'synthetic inertia' requirement) for a secure and reliable operation of the Nordic grid with large scale RES integration.
T10: Advanced tools for pan-European balancing markets		One part of the project investigates how large scale RES integration will affect the inertia within the system and hence the frequency nadir following a contingency and how a 'synthetic inertia' control scheme from RES units can help it. The project also investigates how 'synthetic inertia' control will affect the existing speed governor systems.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

KÄVA2

BASIC INFORMATION	
Project Coordinator: Jarno Lamponen	Company: Fingrid (Finland)
e-mail: jarno.lamponen@aalto.fi	Phone: +34-91-650-20-12
Address: ¿?	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2007 / 2013	Current status: Ongoing
Budget: ¿?	Funding scheme: ¿?
Members of the consortium: - TSOs: Fingrid (FI). - Others: Aalto University (FI).	
Brief project description: Doctoral thesis project on power system security. The purpose is to develop probability based methods to supplement the n-1 criterion.	
Key words: Reliability, N-1.	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options		T14: Innovative approaches to improve the public acceptance of overhead lines
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T1. A toolbox for new network architecture assessment		Security assessment studies on test model and real grid model.

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

PROGRAM OF IMPROVING ENERGY EFFICIENCY

BASIC INFORMATION	
Project Coordinator: Witold Smolik	Company: PSE Operator S.A.(Poland)
e-mail: witold.smolik@pse-operator.pl	Phone: +34-91-650-20-12
Address: Conde de los Gaitanes, 177 – 28109 Alcobendas (Madrid, Spain)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: 2011 / 2013	Current status: Ongoing
Budget: ¿?	Funding scheme: Financed 100% by PSE Operator SA
Members of the consortium: - TSOs: PSE Operator S.A. (PL). - Others: None.	
Brief project description: The primary aim of the project is to gain financial savings on energy consumption of TSO's basic activity. Main areas of interest are: buildings, transmission equipment, auxiliary consumption, losses, Var Management.	
Key words: ¿?	
Website of the project: None	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN				
Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines	
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans
				TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T1. A toolbox for new network architecture assessment		

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		
Budget		
Timing		

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

REALISEGRID

BASIC INFORMATION

Project Coordinator: Gianluigi Migliavacca	Company: RSE (Italy)
e-mail: Gianluigi.Migliavacca@rse-web.it	Phone: +39-02-3992-5489
Address: Via Rubattino 54 20134 Milano (Italy)	
JRC reference: ¿?	EEGI label: ¿?
Start/End: Sep-2008 / May-2011	Current status: Completed
Budget: 4.2 million EUR	Funding scheme: Granted by 7 th Framework Programme (FP7 ENERGY.2007.7.3.4)
Members of the consortium:	
<ul style="list-style-type: none"> - TSOs: APG (AT), RTE International (FR), TenneT (NL), TERNA (IT). - Others: RSE (IT), EC JRC (BE), OME (FR), EEG TU Wien (AT), TU Delft (NL), TU Dortmund (DE), Politecnico di Torino (IT), TECHNOFI S.A. (FR), R&D Center for Power Engineering (RU), PRYSMIAN POWERLINK S.r.l. (IT), KANLO CONSULTANTS SARL (FR), RIECADO GmbH (AT), TU Dresden (DE), Univerza v Ljubljani (SI), ASATREM (IT), The University of Manchester (UK). 	
Brief project description: The REALISEGRID project aims at developing a set of criteria, metrics, methodologies and tools to assess how the transmission infrastructure should be optimally developed to support the achievement of a reliable, competitive and sustainable electricity supply in the European Union (EU). REALISEGRID includes three main areas of activities: 1) identification of performances and costs of new grid technologies aimed at increasing capacity, reliability and flexibility of the transmission infrastructure; 2) definition of long term scenarios for the EU power sector, characterized by different evolutions of demand and supply; 3) implementation of methods and tools to assess the different benefits of transmission expansion investments. Main outputs of REALISEGRID activities are: • roadmap for the incorporation of new transmission technologies (including WAMS, FACTS, HVDC) into the electricity networks; • analysis of the impact of different scenarios on the future electricity exchanges between European countries; • evaluation of the benefits provided to the pan-European power system by the development of transmission infrastructure; • testing of such cost-benefit analysis to specific transmission projects, namely, nine electricity projects of European interest concerning the Trans European Network priority axis EL.2.	
Key words: Transmission planning, RES integration, Cost-benefit analysis, Infrastructure package, Innovative technologies.	
Website of the project: http://realisegrid.rse-web.it	

MAP OF PROJECT CONTRIBUTION TO R&D PLAN

Cluster 1: Pan-European grid architecture	T1: A toolbox for new network architecture assessment	T2: Tools to analyze pan-European network expansion options	T14: Innovative approaches to improve the public acceptance of overhead lines		
Cluster 2: Power technology	T3: Demonstration of power technologies for increased network flexibility	T4: Demonstration of power technologies for novel architecture		T5: Demonstration of renewable integration	
Cluster 3: Network management and control	T6: Tools for pan-European network observability	T7: Tools for coordinated operations with stability margin evaluation	T8: Improved training tools for improved coordination	T9: Tools for pan-European network reliability assessment	
Cluster 4: Market rules	T10: Advanced tools for pan-European balancing markets	T11: Advanced tools for capacity allocation and congestion management	T12: Tools for renewable market integration	T13: Tools for the integration of active demand in electrical system operations	
Cluster 5: Enhanced link between transmission and distribution	TD1: Increased observability of the electrical system for network management and control	TD2: The integration of demand-side management into TSO operations	TD3: Ancillary services provided by DSOs	TD4: Improved defense and restoration plans	TD5: Joint task force on IT system protocols and standards

The project contributes to this FP

RESEARCH COMPLETION OF THE PROJECT (APRIL 2012)		
Impacted Functional Project	Status of research completion	Observations
T1. A toolbox for new network architecture assessment		D3.3.1 / D3.5.1 Successfully completed
T2: Tools to analyze pan-European network expansion options		D1.2.1 / D1.4.2 / D3.1.1 / D3.2.3 / D3.3.1 / D3.5.1 Successfully completed

OVERALL PROJECT PERFORMANCE (APRIL 2012)		
Indicator	Status	Observations
Research completion		Project successfully completed
Budget		Project successfully completed
Timing		Project successfully completed

LEGEND	
	Going well
	A minor problem, but with no impact on expected results
	A problem with possible impact on expected results
	Completed

DRAFTING TEAM

Convenor:

Carlos Llanos Lecumberri (REE)

Coordinators:

Thong Vu Van, Chavdar Ivanov (ENTSO-E)

Drafting Experts:

Carlos Llanos Lecumberri (REE), Giao Do (RTE), Manuel Galvez (Elia),
Thong Vu Van (ENTSO-E), Tommy Kalayil (Eirgrid), Wilhelm Winter (TenneT)