IEA DSM Agreement Task XVII extension
First expert meeting in Madrid 29–30th March 2010,

Minutes of meeting

Present:

Person	Background
Rene Kamphuis, ECN	Dutch country expert. Has worked in several projects with embedded generation and renewable energy sources and in related ICT questions. Works in the group of intelligent energy management.
Axel Collett, Elektroforum Norway	Director of the Elektroforum foundation, Norway.
Miguel Ordiales, Red Electrica España	Spanish country expert, works in the DSM group of Red Electrica
Dominique Fourtune, ADEME	French country expert. At Ademe for 26 years.
Matthias Stifter, Austrian institute of technology	Researcher, M.Sc. (DI) in Technical Cybernetics (2003) at the Vienna University of Technology. Since 2007 with arsenal research - business field Renewable Energy Technologies - working with the expert group for decentralized generation and smart grids.
Seppo Kärkkäinen, Elektraflex, Finland	Operating agent of the task. Has worked a long time with DSM and EU projects at VTT, IEA DSM agreement executive committee for 15 years. Has retired from VTT and works as consultant.
Samuli Honkapuro, Lappeenranta University of Technology, Finland	Works as the Finnish country expert together with prof. Jarmo Partanen. Has worked with economic regulation of electricity sector, and more recently with smart grids.
Jussi Ikäheimo, VTT	Has worked with electricity trade, energy markets, district heating, DSM and wind power for 10 years. Operating agent together with Seppo.

Abbreviations and notations:

DER	Distributed Energy Resource (generation, storage and loads)
EV	Electric vehicle
DSO	Distribution System Operator
EE	Energy efficiency
DR	Demand response
PV	photovoltaic
DS	Distributed storage
OA	Operating agent

1. Monday 29th March

Introductions

Seppo opened the meeting at 10:15. He introduced himself. He has retired from VTT last fall. Has been involved in IEA DSM agreement since 1993.

Rene has been at ECN for 27 years, 15 years with ICT for scientific applications, later with connection between energy and ICT, also in many IEA tasks. He is working in ECN program "intelligent energy grids", efficiency and infrastructure unit. ECN employs about 800 people and is an intermediate between academia and industry. He is trying to increase the number of Dutch participants, such as DSO's, in this task. He was also a country expert in the first phase of DSM task 17.

Dominique Fourtune, from ADEME urban management unit, acts as coordinator, and represents ADEME in this task. At ADEME for 26 years, has worked with DSM from the point of view of local community and distribution network. He said this was a difficult task and not many results were achieved. Regional offices of ADEME work with industrial partners, e.g. support them with subsidies. Dominique works in a regional office although officially he is employed by the central office in Sophia Antipolis. ADEME is under control of two ministries, and with 1000 employees. ADEME has participated in several completed and on-going IEA DSM tasks.

Matthias Stifter from Austrian Institute of Technology, former Arsenal research. Works in the field of DG and integration of renewables. Also focuses on energy storages. Their energy department has about 120 people.

Miguel Ordiales works at DSM dept of Red Eléctrica. DSM department manages the interrubtibility service (demand response contracts) and participates in R&D projects related to DSM. Interrubtibility DR service is provided by large customers. Also works on integration of EV's. Susaña Banares and Carmen Rodriques from Red Eléctrica are members in IEA executive committee.

Axel Collet is the director of Elektroforum cluster in Norway. Members are industrial organisations EnergiNorge (owns 30 % of Sintef research centre), and other organisations, which also support many research projects. Elektroforum is looking for new business opportunities. It is also a lobby organisation. In Norway energy is rather cheap and energy efficiency in building sector is not very high. He also told us about Enova. Enova is an office similar to ADEME in Norway and they provide subsidies to EE for large customers. 90 % of customers are not eligible to the support scheme for Enova.

Samuli Honkapuro comes from Lappeenranta university of technology, Finland. He has worked there since 2002: with economic regulation of electricity sector, and later with smart grids. Close cooperation with Russian universities. Energy markets and EE is one of the focus points of the university. There are 180 people working at the energy department. Power electronics, electric drives are some of their research areas. For example they are thinking about future electricity market models, what they could be and what could work. We also discussed the 1000 VDC distribution system and its benefits.

Jussi introduced VTT. It is a Finnish multi-disciplinary research centre with 400 people doing applied research in different fields of energy such as demand response, wind power integration, nuclear power safety, district heating, energy policy, etc.

IEA DSM agreement and related work

Seppo introduced the IEA DSM agreement. It was started in 1993 and has five-year periods, now the fourth one is on-going. 19 countries are involved and 21 tasks have been started (with some of them ended). Program is organized into two clusters: load level (EE) and load shape. The on-going tasks in load-shape cluster are: 17 extension (our task) and 19 (will be finished next summer). Normally the results of the tasks will be public after one year. The program has website (http://www.ieadsm.org) including its password-protected part with reports, presentations and other content. In task 17 we still have some closed content on the website. Seppo can arrange passwords to the organizations who are officially participating the task. People can then view the materials of the task 17 (not other tasks but including the content of the first phase of task 17).

In the first phase of IEA DSM task 17 was already finished in 2008 and a decision of a second part in this task was made. In the first phase we did a scope study about the status of integration of DG and DR. Seppo presented some results from the first phase. We had two workshops whose material is public. The reports (two volumes) are also public. Case studies which we collected from different countries are not public. We have also mentioned aggregators of demand response and generation. Rene mentioned the example of greenhouse aggregation in Netherlands. We won't go very deeply into network-specific questions in this task or IEA DSM agreement in general. ENARD agreement deals more with specific network questions.

Axel asked if market forces are enough to introduce DR and DG themselves or if regulation and public incentives are needed. The question is a bit difficult to answer because it depends on e.g. the country in question, size of installation, technology, energy prices, etc.

Australia will probably not join the task (Obs! they are still trying to participate with a national consortium, final decision is still open). *Austria's* funding has been shortened and the funding contract is currently stuck in their national bureaucracy. However, Matthias was confident that they will get the funding contract soon. Norway is interested in joining the task. Axel asked about Swedish participation. They have had difficulties about finding the responsible party who has enough time. One possibility could be Göteborg energi.

IEA also has some other work which is related to our job. There are other tasks in DSM agreement. ENARD, which is a bit similar arrangement to DSM agreement, deals with network issues. Matthias's colleague is the operating agent of Enard annex 2. IEA has also agreements about technologies about fuel cells, heat pumps, etc., so it is not necessary for us to go into the details of specific technologies. Our aim is more system-oriented.

IEA does internally in their Paris office some work about smart grid roadmap. This will be finished in November 2010. Seppo can check if he can send draft documents. They are also carrying out "GIVAR (Grid Integration of Variable Renewables) project" by December 2010. Seppo has been in a couple of their meetings. Seppo mentioned also a CIGRE publication of a specific Task Force, which probably will be available in the near future as a CIGRE report.

IRED conference was mentioned, it will be on 6–10 December in Albuquerque USA. Rene mentioned that in that context it would be possible to present our task. Of course, USA has not an expert in this task extension.

Monday's country presentations

Rene: Large-scale DR potential has been estimated in Holland. Interest in DR is increasing. One driver for smart grids is µ-CHP (in Holland they have mostly considered stirling engine combined with heating system, 1:8 power-to-heat ratio). However, this is a transition stage. Electricity may replace natural gas as energy carrier. Another driver is EV. Rene mentioned a German project which also deals with DR, E-Energy (http://www.e-energy.de/en/). Rene listed some stakeholder concerns. He mentioned local balancing of DR and PV which could be important for our task. He also explained about the Integral project. There are three field tests in NL, Spain and Grenoble. In field tests they don't use IEC 61850 but some other communication standard.

Dominique: In France situation is less advanced. Splitting of EdF has caused delays. In France distribution networks are owned by local communities, and reinforcements are also partly financed by them. They are not very knowledgeable about smart grids and don't understand the needs for investments. There are also local public distributors but ErDF (Électricité Réseau Distribution France) is the main distributor. It is launching a research program about smart meters. ErDF is preparing new smart meters, their own brand called Linky. In principle they have been made as open meters.

Matthias mentioned different projects being carried out in Austria. DG Demonetz project: they implemented voltage regulation for distributed generation and studied different control strategies. MetaPV project about solar power control. Sunpowercity project about calculations of PV integration.

Miguel explained the Spanish situation. Red Eléctrica is a private company but government owns 20 %. Its shares are traded in stock exchange. In Spain evening load peak is growing faster than morning peak. Winter peak is still higher than summer peak. However, in July there is less wind power. EV integration is an important subject. It is hoped that smart charging can fill the night valleys. GAD project deals with DR. Scalability can be a problem in DR. Communication has to be considered. Red Eléctrica's interruptibility service has suffered probably because of the economic crisis.

We finished at 18:20.

2. Tuesday

We continued with country presentations. Samuli Honkapuro introduced some Finnish national projects. "CLEEN" is a new Finnish research organization for energy and environment research with shareholders from industry and research organisations. It is coordinating the project "Smart grids and energy markets", which began last autumn. Industrial partners also do some research within this project. The project interactive customer interface (INCA) includes some simulations about impacts of EV on MV feeders. Basic input is detailed statistics about driving habits and traffic. Different

charging tactics were taken into account. In some cases network tariffs could even go down because of the more even load. Also heat pump effects were studied.

Axel Collett mentioned a possible common green certificate market with Sweden and Norway. Problem is that all investments could go to Norway. This arrangement could mean a totally different ballgame with respect to wind power. At the moment there is very little wind power in Norway. In Norway a lot of scientific work is being done with PV and Norway is also in the forefront of CCS technology. A 3-billion-euro full-scale pilot plant is being planned but the timing is not known. There are about 400,000 heat pumps installed.

Axel will talk to Enova about Norwegian participation. His own organisation has limited chances to fund projects. They can possibly contribute to a funding package. However, other Norwegian organizations should be wealthy enough to join. We decided that deadline for new participants joining could be the end of this year.

Jussi introduced briefly the SEESGEN-ICT the project. This is synthesis work about existing research about ICT used for integrating DER. VTT is leading one of the work packages.

Planning of our work

Seppo suggested that we should continue collecting case studies and a new subtask (new subtask 6) could be added for that. Collecting case studies would last until February 2012. The Task includes the following subtasks

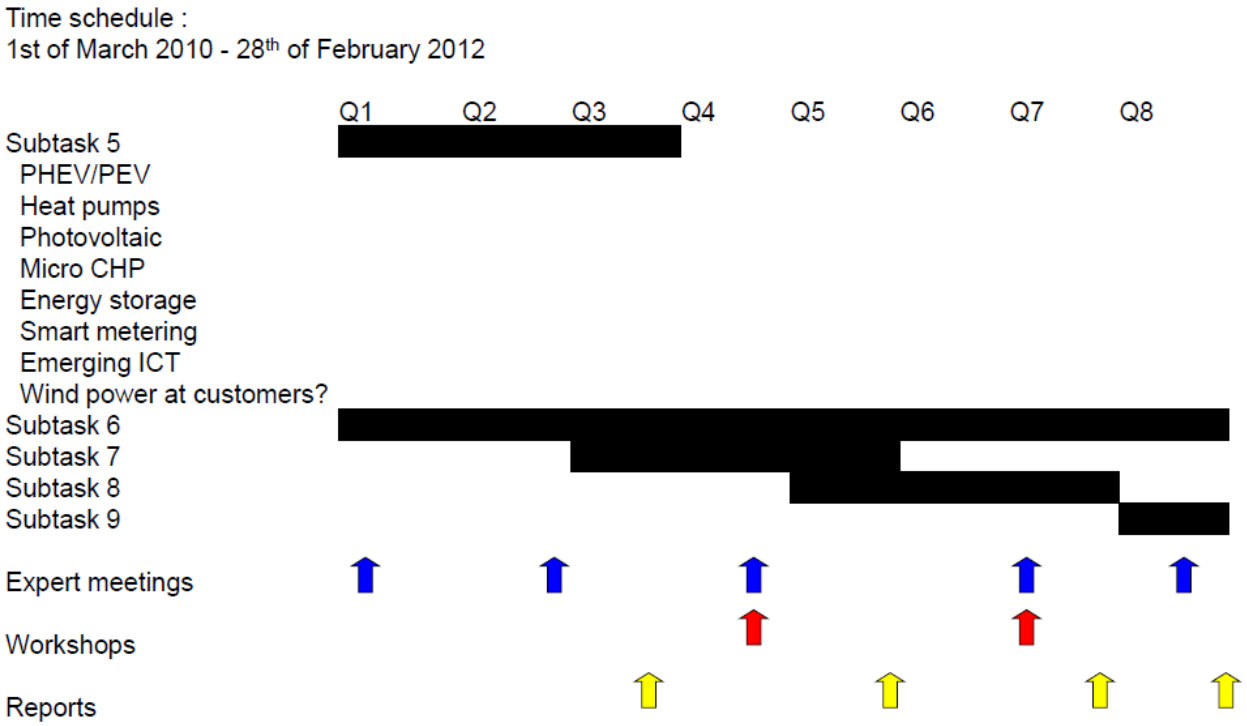
Subtask 5: Assessment of technologies and their penetration in participating countries
Subtask 6: Pilots and case studies
Subtask 7: Stakeholders involved in the penetration and effects on the stakeholders
Subtask 8: Assessment of the quantitative effects on the power systems and stakeholders
Subtask 9: Conclusions and recommendations

The final content of subtask 7 depends on the participation of Australia.

The deliverables of the Task are

- 4 subtask reports
  - Technologies including state-of the art in participating countries (present situation) and future penetration scenarios
  - Stakeholder involvement and effects (including regulation, business opportunities etc.),
  - Assessment of the effects on the system and stakeholders including methodologies and cost-benefit analysis
  - Summary, conclusions and recommendations
- 2 workshops
- Case studies and pilots data base + summary report
- Country descriptions ?
- Conference presentations
- 2 updated Task flyers (in the beginning and end of the Task extension)

The general scheme of the Task with time schedule is as follows:



Subtask 5, assessment of DG and DS technologies, is the first subtask in the task extension because subtasks 1–4 are part of the first phase of this task. Question is what technologies are included. From what technologies should we start? Seppo suggested to start from heat pumps and EV. Matthias mentioned small-scale wind power. It will be discussed further later. Intelligent metering is an enabling technology for smart grids. Country-specific aspects of smart metering could be included. A lot of results about this are already available from e.g. ESMA project. Rene suggested a general view of the enabling ICT technologies. We could also get some information about these from our workshops. The enabling ICT aspect will be included somehow. The general idea in the work is that OA will make summaries and general conclusions, and country experts produce country-specific information.

Country experts find out future scenarios and current situation of their penetration. OA will try to produce a template for the scenarios in July, as well as a first description of EV and heat pumps. Experts will add the country specific descriptions of technologies as well as fill the template from September to October. Subtask 5 should finish in the end of this year.

We have to decide the publicity of our results, e.g. subtask reports. We decided to propose to the IEA DSM EXCO that subtask reports could be public immediately (Obs. EXCO decided that a common procedure should be applied meaning that the reports are public after one year from the release inside the Task). As mentioned, a new subtask will be added for collecting case studies. The case studies cards will not be public but a small synthesis report will be.

Subtask 7 will start only after our next expert meeting. We already reserved days for the next meetings. They are shown in the table below.

Subject	time	place
Second expert meeting	30th September to 1st October was suggested. Second alternative is 23rd to 24th September.	Location would be Wien at AIT.

First workshop & expert meeting	Could be one year from now. 24th – 25th February was suggested	Place could be France. Dominique will ask about it
Second workshop & expert meeting	29–30th September was suggested	In Finland together with a Finnish stakeholder group; could also be organized in context of an Enard meeting
Final expert meeting	Suggested in the end of January 2012. 26–27th Jan was suggested.	Petten