ENARD:-
the IEA Implementing Agreement on Electricity Networks Analysis, Research and Development

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Presentation Structure

• ENARD, context, mission, objectives and structure
• Participation
• Annex I
• Workshops
• Information and Data Collation
• Supporting Activities
• Current Status
• Annexes II, III and IV
• Complementarities and Linkages
• Advantages and Benefits
• Further information
• ENARD web-site: www.iea-enard.org
The IEA Implementing Agreement on Electricity Networks Analysis, Research and Development (ENARD)

- ENARD:- an IEA Implementing Agreement addressing a variety of electricity T&D network issues
- Annex I work programme initiated September 2006
Context: The Three Rs of Power Systems Development

Renewal

Renewables  Resilience
Mission:

“To provide a major international forum for information exchange, in-depth research and analysis and collaborative R&D in relation to electricity T&D networks”
Core Objectives

- the collation, exchange and dissemination of information and data
- the in-depth review and analysis of a range of key issues relating to the R&D, design, operation and management of T&D networks
- the complementary review and analysis of prevalent and anticipated regulatory frameworks and their impact on the economic evaluation and optimisation of network asset portfolios
Organisational and Management Structure

- Executive Committee (ExCo)
- Secretariat
  - Annex I: Information Collation & Dissemination
  - Annex II: DG System Integration
  - Annex III: Infrastructure Asset Management
  - Annex IV: Transmission Systems
Participation

Austria  Belgium  Denmark  Finland  France

Italy  Netherlands  Norway  Spain  Sweden

Switzerland  UK  USA
Annex I (Information Collation and Dissemination)

• combination of collation and dissemination of pertinent T&D network related information and data, complemented by organisation and delivery of series of topical workshops

• Operating Agent and National Co-ordinator (expert) roles defined

• further role as the springboard for the development of future (R&D) Annexes
## Annex I Workshops (delivered)

<table>
<thead>
<tr>
<th>Date</th>
<th>Venue</th>
<th>Theme</th>
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<tbody>
<tr>
<td>September 2006</td>
<td>Milan, Italy</td>
<td>Distribution Systems and Associated End User Issues</td>
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<tr>
<td>March 2007</td>
<td>Vienna, Austria</td>
<td>Integration of Distributed Energy Sources and New Business Models</td>
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<tr>
<td>May 2007</td>
<td>CIRED, Vienna</td>
<td>Managing an Ageing Infrastructure</td>
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<tr>
<td>June 2007</td>
<td>Leuven, Belgium</td>
<td>Economic &amp; Regulatory Issues</td>
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<tr>
<td>September 2007</td>
<td>Trondheim, Norway</td>
<td>Transmission Systems Issues</td>
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<tr>
<td>April 2008</td>
<td>Chester, UK</td>
<td>Intelligent Networks</td>
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<tr>
<td>May 2009</td>
<td>Gotland, Sweden</td>
<td>Communications &amp; Control</td>
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## Annex I Workshops (planned)

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<tr>
<th>Date</th>
<th>Venue</th>
<th>Theme</th>
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<tbody>
<tr>
<td>October 2009</td>
<td>Fredericia, Denmark</td>
<td>System Balancing</td>
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</tbody>
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Workshop Objectives

In general terms, workshops aim to identify:
- key challenges
- information requirements
- opportunities for future collaborative R&D
- complementarities with other initiatives and programmes
- associated opportunities to develop structured follow-on (R&D) Annexes
Supporting Information and Data Collation Activities

- addressed on a collaborative basis with the network of National Co-ordinators
- Phase One (Sept 2006 to Sept 2008)
  - addressed via a series of detailed questionnaires
  - collation of national returns allowed for compilation of authoritative digest of T&D developments
  - digest delivered to National Participants, Sept 2008
- Phase Two (Oct 2008 on)
  - further specific topics being addressed via a small series of focussed studies
Annex I Associated Activities

• Information Dissemination
  - Confidential information and data, within context of Annex I and further Annexes
  - Public dissemination via overview reports, outputs and events

• Web-site development and maintenance
Current Status

Annex I: Operational and ongoing activities
Annex II: “DG System Integration”
Annex II: “DG System Integration”

- formally adopted by ENARD ExCo, September 2007
- Operating Agent: Arsenal Research, Austria
- 24 month initial work programme, May 2008 on
- 11 countries participating
Annex II – Overall Objectives

- to build up and **exchange knowledge** on DG system integration aspects and existing active network approaches **amongst the global players** in distribution networks
- to **promote implementation possibilities** for active distribution networks as an overall goal of Annex II
- to develop **guideline(s)** for network operators and political decision makers on how to manage and implement the **transition from passive to active distribution networks**
Annex II: Deliverables and Outputs

The Annex II deliverables will include:-

• Detailed in-country surveys of current state-of-the-art, lessons learnt, limitations, future developments
• Complementary foresighting activities and abstraction of visions/goals for the future (eg growth of future fully integrated active networks)
• Compilation of an international overview report drawing out key messages
• Formulation of guidelines document to assist DNOs and Governments to progress from passive to active networks
• Identification of requirements and needs for future work
Annex III: “Infrastructure Asset Management”
Annex III: “Infrastructure Asset Management”

- formally adopted by ENARD ExCo, September 2007
- Operating Agent: EA Technology, United Kingdom
- 21 month Phase One work programme, addressing the distribution asset base, April 2008 on
- 6 countries participating
Annex III “Infrastructure Asset Management”

**Aim:** To address the challenges associated with the management of increasingly ageing T&D asset bases within the participating countries and beyond, via the exchange of information and data in relation to the ageing, degradation, failure and end-of-life characteristics of the T&D asset base and the complementary development of new asset management techniques and methodologies.
Annex III “Infrastructure Asset Management”

Objectives (Phase 1; related to the distribution asset base)

• development of a robust international information base
• development of detailed understanding of risk based definitions and methodologies
• to source, collate and analyse relevant case study material
• to cross-reference above with that for transmission systems
• to compile a comprehensive information base and digest
Annex III: Principal Deliverables and Outputs

The principal deliverables and outputs associated with Annex III will include information/data bases, experts’ meetings and reports addressing:

• ageing, degradation, failure and EoL characteristics
• existing and proposed methods of quantifying asset related risk
• international case study experience
• lessons learnt and implications/recommendations for successful asset management
Annex IV “Transmission Systems”
Annex IV “Transmission Systems”

- formally adopted by ENARD ExCo, September 2008
- Operating Agent: SINTEF Energy Research (Norway) and ERSE SpA (Italy)
- 24 month initial work programme
- start-of-work, via Inaugural Experts meeting, Milano, Italy, 28th-29th April 2009
- 7 countries participating
Annex IV “Transmission Systems”

Aim:

– To develop a long term vision for transmission systems, beyond 2020

Objectives:

– To address the main barriers towards the development of transmission capacity

– To identify the most promising solutions and challenges in terms of expansion planning and market analysis, and secure operation of transmission networks

– To identify the need for new transmission technologies
Annex IV: “Principal Deliverables and Outputs”

The principal deliverables and outputs associated with Annex IV will comprise a small series of experts’ meetings and workshops and two detailed reports, addressing, respectively:

- Availability and application of planning tools, market and network models and the identification of the need for new tools
- Availability and application of advanced operational tools and on the need for new operational monitoring and control tools
Complementarities and Linkages and Other Work Programmes

• current IEA framework addresses discrete aspects of electricity networks, DG, renewables, communications, DSM, network technologies

• ENARD actively pursuing the development of exchange mechanisms within the above framework and with other international programme activities, including:-
  - CIRED
  - Eurelectric
  - CIGRE
  - European Commission
Key Advantages and Benefits of Participation in ENARD:-

- timely ability to address a series of inter-related technological and policy related issues
- highly cost effective platform for international collaboration and peer group information exchange
- provision of high level advice to Governments, G8 and associated policy makers
- essential role in stimulating new initiatives and actions
- common challenges/shared solution mechanisms!
For further information....

Further information on ENARD, including participation in the Implementing Agreement and its activities, may be obtained from the ENARD web-site, at www.iea-enard.org or from the ENARD Secretariat at EA Technology:-

e:mail: enquiries@iea-enard.org

or

Tel. +44-(0)151-347-2425
ENARD Web-site

www.iea-enard.org