

IEA DSM Programme Task XV: Network-Driven DSM

Dr David Crossley
Task XV Operating Agent
and
Managing Director
Energy Futures Australia Pty Ltd



International Energy Agency

- The International Energy Agency (IEA) is an intergovernmental body committed to advancing security of energy supply, economic growth and environmental sustainability through energy policy co-operation
- The IEA provides a framework for international collaborative energy research, development and demonstration under more than 40 Implementing Agreements
- These Agreements enable experts from different countries to work collectively and share results, which are usually published



IEA DSM Programme

- One of the Implementing Agreement is known as the International Energy Agency Demand Side Management Programme
- The 17 member countries of the IEA DSM Programme undertake collaborative research and development (R&D) on demand side management (DSM) and energy efficiency
- Participation in this work is a very effective way of gaining valuable information about international experience in implementing DSM and energy efficiency programs

IEA R&D Projects

- In IEA terminology, multi-national R&D projects are called 'Tasks'
- Tasks are undertaken collaboratively under the management of an 'Operating Agent' (Project Director)
- The Operating Agent is responsible for overall management of the Task, including deliverables, milestones, schedule, budget and communications
- The actual research work for a Task is carried out by a combination of the Operating Agent and a group of country Experts, depending on the nature of the work to be carried out
- Each country which is participating in a Task nominates one person as its country Expert

IEA DSM Task XV

- Task XV of the IEA DSM Programme is called “Network-Driven DSM”
- The focus of Task XV is on identifying and developing the most appropriate and cost-effective demand side management measures:
 - to relieve electricity network constraints and/or
 - to provide network operational services

Motivation for Task XV (1)

- To date, the IEA DSM Programme has not undertaken any work on the potential for DSM to cost-effectively relieve electricity network constraints
- Such constraints are becoming a significant problem in countries where electricity demand is increasing and network infrastructure ('poles and wires') is ageing

Motivation for Task XV (2)

- As loads grow and infrastructure reaches the end of its economic life, the potential cost of augmenting electricity networks is increasing exponentially
- In many situations, network-driven DSM can delay the need for network augmentation
- In some limited situations, mainly at the distribution level, network-driven DSM may be able to cost-effectively eliminate the requirement to build a 'poles and wires' solution

Motivation for Task XV (3)

- In addition to relieving network constraints, DSM can also provide services for electricity network system operators
- DSM can deliver peak load reductions with various response times for network operational support

Network Constraints (1)

- All types of electricity network constraint will be addressed by Task XV, including capacity limitations, voltage fluctuations, reliability issues, etc
- Network constraints have a **time-related dimension** because they may be:
 - **peak related** – occurring strongly at the system peak and lasting seconds, minutes or a couple of hours; or
 - **non-peak related** – less strongly related to the system peak, occurring generally across the electrical load curve and lasting several hours, days, months, years or indefinitely

Network Constraints (2)

- Network constraints also have a **geographically-related dimension** because they can occur:
 - generally across the network in a particular geographical area; or
 - specifically associated with particular network elements such as certain lines or substations
- To be effective in relieving network constraints, DSM activities must address both:
 - time-related and
 - geographically-relateddimensions of network constraints

Network-driven DSM

Network-driven DSM measures include:

- Distributed generation, including standby generation and cogeneration
- Energy efficiency
- Fuel substitution
- Load management, including interruptible loads, direct load control, and demand response
- Power factor correction
- Pricing initiatives, including time of use and demand-based tariffs

Benefits of Participating in Task XV (1)

- Understand the advantages and disadvantages of network-driven DSM measures as alternatives to network augmentation and for providing network operational services
- Gain information about network-driven DSM measures currently in use in other countries and the effectiveness of these measures
- Understand the factors which lead to a network-driven DSM measure being effective at the transmission and/or distribution levels
- Participate in further developing the identified network-driven DSM measures so that they will be successful in cost-effectively achieving network-related objectives

Benefits of Participating in Task XV (2)

- Understand the interaction between network-driven DSM and the operation of liberalised electricity markets
- Identify modifications which can be made to existing network planning processes to incorporate network-driven DSM measures as alternatives to network augmentation
- Participate in developing 'best practice' principles, procedures and methodologies for the evaluation and acquisition of network-driven DSM resources

Task XV Objectives

- To identify a wide range of DSM measures which can be used to relieve electricity network constraints and/or provide network operational services
- To further develop the identified network-driven DSM measures so that they will be successful in cost-effectively achieving network-related objectives
- To investigate how existing network planning processes can be modified to incorporate the development and operation of DSM measures over the medium and long term
- To develop 'best practice' principles, procedures and methodologies for the evaluation and acquisition of network-driven DSM resources
- To communicate and disseminate information about network-driven DSM to relevant audiences

Task XV Work Plan

- **Subtask 1:** Worldwide Survey of Network-Driven DSM Projects
- **Subtask 2:** Assessment and Development of Network-Driven DSM Measures
- **Subtask 3:** Incorporation of DSM Measures into Network Planning
- **Subtask 4:** Evaluation and Acquisition of Network-Driven DSM Resources
- **Subtask 5:** Communication of Information About Network-Driven DSM

Subtask 1 Survey of DSM Projects

Objective

- To identify a wide range of DSM measures which can be used to relieve electricity network constraints and/or provide network operational services

Deliverable

- A report listing and summarising network-driven DSM projects implemented around the world

Subtask 1 Survey of DSM Projects

- **Activity 1-1:** Network-Driven DSM Projects in Participating Countries
- **Activity 1-2:** Network-Driven DSM Projects in Other Countries
- **Activity 1-3:** Identification of Network-Driven DSM Measures

Subtask 2 Network-Driven DSM Measures

Objective

- To further develop the identified network-driven DSM measures so that they will be successful in cost-effectively achieving network-related objectives

Deliverable

- A report listing and summarising successful network-driven DSM measures and the specific network problems they address

Subtask 2 Network-Driven DSM Measures

- **Activity 2-1:** Value Proposition for Network-Driven DSM
- **Activity 2-2:** Effectiveness of Network-Driven DSM Measures
- **Activity 2-3:** Further Development of Network-Driven DSM Measures

Subtask 3 DSM and Network Planning

Objective

- To investigate how existing network planning processes can be modified to incorporate the development and operation of DSM measures over the medium and long term

Deliverable

- A report on ways in which network planning processes can be modified to incorporate DSM measures as alternatives to network augmentation

Subtask 3 DSM and Network Planning

- **Activity 3-1:** Interaction between Network-Driven DSM, Electricity Markets and Regulatory Regimes
- **Activity 3-2:** Identification of Network Planning Processes
- **Activity 3-3:** Options for Modifying Network Planning Processes

Subtask 4 Evaluation & Acquisition of DSM Resources

Objective

- To develop ‘best practice’ principles, procedures and methodologies for the evaluation and acquisition of network-driven DSM resources

Deliverable

- A report on ‘best practice’ principles, procedures and methodologies for the evaluation and acquisition of network-driven DSM resources

Subtask 4 Evaluation & Acquisition of DSM Resources

- **Activity 4-1:** Survey of Evaluation and Acquisition Procedures for DSM Resources
- **Activity 4-2:** Development of 'Best Practice' Procedures

Subtask 5 Communication of Information

Objective

- To communicate and disseminate information about network-driven DSM to relevant audiences, including representatives of electricity network businesses, government agencies and electricity end-users

Deliverables

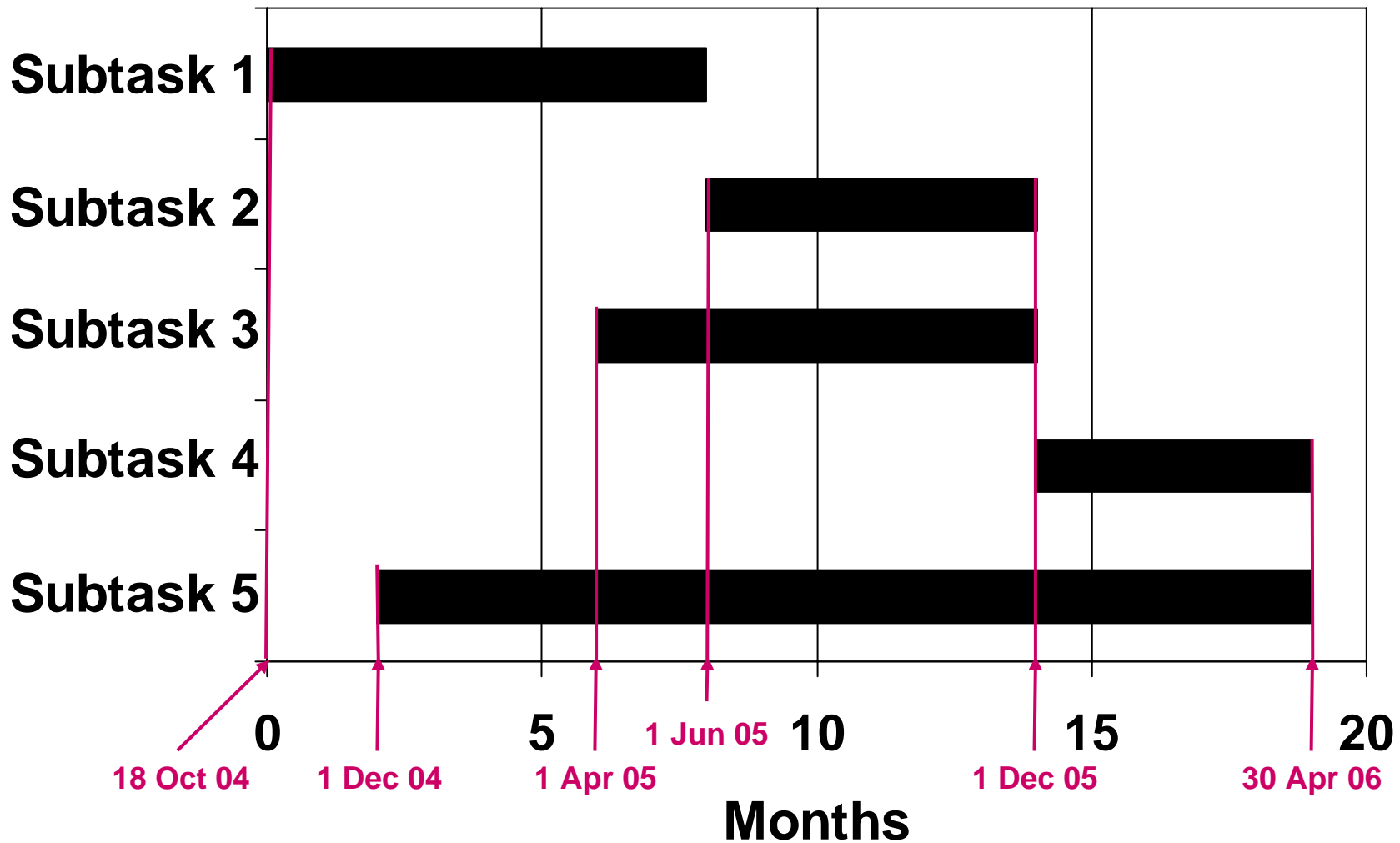
- Task Newsletter
- Information databases about network-driven DSM projects and measures
- Regional workshops about network-driven DSM held in Europe, North America and Asia Pacific



Subtask 5 Communication of Information

- **Activity 5-1:** Prepare and Circulate a Task Newsletter
- **Activity 5-2:** Establish Information Databases about Network-Driven DSM
- **Activity 5-3:** Conduct Regional Workshops

Task XV Timetable



Task XV Budget (1)

Subtask	No days	Cost
Task Definition Phase	8	€11,700
1. Worldwide Survey of Network-Driven DSM Projects	50	€53,000
2. Assessment and Development of Network-Driven DSM Measures	50	€52,000
3. Incorporation of DSM Measures into Network Planning	35	€38,000
4. Evaluation and Acquisition of Network-Driven DSM Resources	40	€37,500
5. Communication of Information About Network-Driven DSM	30	€36,000
	213	€228,200

Task XV Budget (2)

No Countries Participating	Country Contribution per year for two years
Four	€28,525
Five	€22,820
Six	€19,017
Seven	€16,300
Eight	€14,263
Total budget	€228,200

Further Information about Task XV

- Task XV website:

<http://dsm.iea.org/NewDSMWork/Tasks/15/task15.asp>

- Dr David Crossley, Task XV Operating Agent
crossley@efa.com.au