

International Energy Agency

**Implementing Agreement on
Demand-Side Management
Technologies and Programmes**

1998 Annual Report

Edited by Anne Bengtson
Executive Secretary
IEA Demand-Side Management Programme

January 1999

Foreword

This report is the fifth Annual Report of the IEA Implementing Agreement on Demand-Side Management Technologies and Programmes, summarising the activities of the fifth year.

The report was published by the Executive Committee and was edited by the Executive Secretary, with contributions from the Operating Agents.

Stockholm, January 1999

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Overview of the IEA and the Demand Side Management Agreement

International Energy Agency

The International Energy Agency, founded in November 1974, is an autonomous body within the framework of the Organisation for Economic Co-operation and Development (OECD) which carries out a comprehensive program of energy co-operation among its 23 member countries. The European Commission also participates in the work of the Agency.

The policy goal of the IEA include diversity, efficiency and flexibility within the energy sector, the ability to respond promptly and flexibly to energy emergencies, the environmentally sustainable provision and use of energy, more environmentally-acceptable energy sources, improved energy efficiency, research, development and market deployment of new and improved energy technologies, and co-operation among all energy market participants.

These goals are addresses in part through a programme of international collaboration in the research, development and demonstration of new energy technologies under the framework of over 40 Implementing Agreements. The IEA's R&D activities are headed by the Committee on Energy Research and Technology (CERT) which is supported by a small Secretariat staff in Paris. In addition, four Working Parties (in Conservation, Fossil Fuels, Renewable Energy and Fusion) are charged with monitoring the various collaborative agreements, identifying new areas for cooperation and advising the CERT on policy matters.

IEA Demand-Side Management Programme

The Demand-Side Management Programme is a new collaboration with fifteen IEA member countries working to clarify and promote opportunities for demand-side management (DSM).

The members are:

Australia	Japan
Austria	Korea
Canada	Netherlands
Denmark	Norway
European Commission	Spain
Finland	Sweden
France	United States
Italy	United Kingdom

Six projects or "Tasks" have been undertaken since the beginning of the Demand-Side Management Programme. The overall program is monitored by an Executive Committee consisting of representatives from each of the member countries. The leadership and management of the individual Tasks are the responsibility of Operating Agents. These Tasks and their respective Operating Agents are:

- Task I:** International Data Base on Demand-Side Management Technologies and Programmes – Mr. Harry Vreuls, NOVEM, The Netherlands
- Task II:** Communications Technologies for Demand-Side Management – Mr. Richard Formby, E.A. Technology, United Kingdom
- Task III:** Co-operative Procurement of Innovative Technologies for Demand-Side Management – Dr. Hans Westling, Promandat AB, Sweden
- Task IV:** Development of Improved Methods for Integrating Demand-Side Management into Resource Planning – Dr. Grayson Heffner, EPRI, United States
- Task V:** Investigation of Techniques for Implementation of Demand-Side Management Technology in the Marketplace – Mr. Juan Comas, FECSA, Spain
- Task VI:** DSM and Energy Efficiency in Changing Electricity Businesses – Dr. David Crossley, Energy Futures Australia, Pty. Ltd., Australia

For more information see our web site on the Internet:

<http://dsm.iea.org>

CHAPTER I

Chairmans Report

Jan Moen, Chairman
Executive Committee

Introduction

The IEA Demand-Side Management Programme is an international collaboration with 15 IEA Member countries and the European Commission, working to clarify and promote opportunities for demand-side management (DSM). For the purposes of this Programme, DSM is defined to include load management, strategic conservation and related activities. Through co-operative activities, participants will collaborate to help DSM technologies to reach their full market potential, thereby allowing energy systems to function more effectively and giving energy system investments enhanced value for gas and electricity customers.

The shaping of the Programme, whose work is summarised in this Annual Report, began over five years ago, following an IEA Conference on Demand-Side Management in Sorrento, Italy. During the first years, experts met to define the work to be undertaken and to draft the Annexes to the Implementing Agreement that described that work and the resources required to accomplish it. In October 1993, the work under this Agreement began when the Executive Committee put five Annexes into force. At that time, the Executive Committee, also approved five Operating Agents to manage the five Tasks (the term Task is used to describe the work to be done under the contractual Annex to the Implementing Agreement).

Status of the Implementing Agreement

As of December 1998, 15 countries and the European Union were official signatories of the Implementing Agreement on Demand-Side Management Technologies and Programmes. A form of participation with countries via the World Bank takes place under a Memorandum of Understanding. The tenth Executive Committee meeting was held in Seoul, Korea in March 1998 and the eleventh in Chester, United Kingdom in October 1998.

Structure of the Co-operation Programme

The Programme is managed by an Executive Committee composed of two representatives from each participating country. The management of each individual Task is the responsibility of the Operating Agent.

In 1998 the Programme had four Tasks. The first will establish an international data base on demand-side management. The second will assess options for applying communications technologies to DSM programmes. By conducting competitive procurement of more efficient DSM technologies, the third Task will speed up the process of market-place penetration. The fourth Task will develop a range of practical mechanisms whereby economically justifiable DSM and energy efficiency can be incorporated into

changing electricity business environments, such as restructured electricity industries and competitive electricity markets. A brief description of the Tasks and of expected results follows in Chapters II and III.

Participation as of December 1998

COUNTRY	TASKS			
	I	II	III	VI
Australia		●		● ■
Austria				
Canada*		●		
Denmark	●		●	●
European Commission	●		●	●
Finland		●	●	●
France				●
Italy				
Japan			●	
Korea			●	●
Netherlands	● ■	●	●	●
Norway		●		●
Spain	●	●	●	●
Sweden	●		● ■	●
United Kingdom		● ■	●	●
United States			●	

■ Operating Agent

*New member

Achievements of the Programme

As the DSM Agreement entered its second five-year period in 1998, the work being undertaken has adapted to the fast changes occurring in the energy industry. From the start of this Programme the Executive Committee and Task experts have recognised the important link between energy and global environmental issues, such as climate change and greenhouse gases. And, it is encouraging to see that the results of this year's political events vigorously underline the importance of our work in energy efficiency. For example, the Kyoto Protocol strongly emphasises the necessity of energy efficiency and acknowledges that it is a demand side issue.

Highlights of the Tasks

This year's Annual Report includes a theme chapter which highlights the results of Tasks IV and V which completed their work this year. Other notable achievements of

the Programme's work during 1998 are highlighted below. The details of these and many other accomplishments are covered in the individual Task reports in Chapter III.

Task I: 162 programmes from 13 countries listed in the INDEEP database were analysed by Task experts. Conclusions drawn from this analysis included: 1) energy efficiency was the primary objective for nearly all the programmes, 2) approximately 70% of the programmes target users (46% residential, 12% commercial and 11% industrial customers), and 3) utility companies implemented about 80% of the programmes. These programmes and a detailed summary of the 10 most cost effective programmes have been published in the report, "International Programme Experience in Providing Energy Efficiency Services Comparing Cost Effectiveness."

Task II: Two new subtasks were started this year. The first subtask, which was completed in September, evaluated customer services provision communication architecture and protocol. This evaluation concluded that a flexible approach to customer gateway design so that different media and protocols could be handled on both sides of the gateway. The second new area of work will evaluate the possible routes for using wideband communication media, developed for entertainment and internet and computing purposes, to implement narrowband utility services.

Task III: IEA Awards of Excellence have been presented in the wet appliances and industrial motors areas. The first award was given to a prototype clothes drier from AEG. This is the first EU Energy Label "Class A" drier on the market with the energy use halved. The second IEA Award goes to ABB Finland for a 75 kW motor and ABB Sweden for a 5.5 kW motor. These motors use 28-50% less energy and have pay-back times of 1-3 years. Procurement activities continue in the areas of lighting, copiers and LED traffic lights.

Task VI: A database of 98 existing mechanisms for incorporating economically justifiable DSM and energy efficiency which can be incorporated into changing electricity business environments was developed. And, work has begun on the detailed development of a select number of these mechanisms.

New Tasks

The Executive Committee has initiated Task definition work for three new Tasks in 1998. The first Task is "The Role of DSM and Energy Efficiency in Least-Cost Energy Long-Term Strategies for Environmental Sustainability." The objective of this work is to assess and demonstrate the role of DSM and energy efficiency in electricity demand in order to provide least-cost energy in long-term strategies. The Task will explore a number of different long-term strategies for the use of efficient electrical technologies, energy conservation and DSM, and then analyse their impacts on global sustainability.

The second new Task is "Demand Side Bidding in a Competitive Electricity Market." The overall objective of this Task is to evaluate and promote Demand Side Bidding (DSB) as a means to improve the global environment. To accomplish this objective, Task experts will evaluate current DSB schemes, analyse generic features, strengths and weaknesses, and provide guidelines for the development of new schemes and enhancements to existing schemes.

The third new Task is "The Role of Municipalities and Energy Efficiency in a Liberalised System." This Task will examine municipal activities and practices, explore how municipalities are involved in energy markets, in particular DSM, and determine their

responsibilities and opportunities. The goals of this new work are to ensure that municipalities play a role in energy markets and to strengthen their capacity to participate in liberalised markets in a positive and dynamic way by providing access to information on the changes occurring and pilot projects that have been carried out. All the Task work will address the overarching question of how to create conditions which encourage DSM and energy efficiency policies that maintain economic competition and help to meet national commitments to the Kyoto Protocol.

Benefits of Participation

The benefits of international collaboration and co-operative activities of this Programme will be of value in a number of additional important ways. The term Programme is used to describe the work to be done under the legal contract, the Implementing Agreement, and this Programme deals with data, software, analysis, strategy development and studies. A significant benefit for the participating countries is participation itself – the learning process.

- **Saves money.** Many types of activities can be carried out more economically in a collaborative mode than if conducted within one national program. Each country funds only a portion of the work, but has access to the entire results of the project.
- **Saves time.** Work can often be completed more quickly through task sharing and data sharing, accelerating the pace of technological development and application.
- **Increases the size of the technology data base.** The large number of countries included in a collaborative project enlarges the general pool of information available beyond what any one country could manage to assemble by itself.
- **Permits national specialisation.** As part of a collaborative effort, countries can specialise in certain aspects of a technology development or deployment while maintaining access to the larger pool of information from the entire project.
- **Enables complex and/or expensive projects to be undertaken.** Many countries do not have the expertise or resources to undertake every desirable research project. A collaborative project enables the strength and contribution of many countries to undertake collectively what individually would be prohibitive.
- **Enhances national R & D programmes.** National researchers involved in international projects are exposed to a multiplicity of ideas and approaches.
- **Promotes standardisation.** Collaborative work encourages the use of standard terminology, notation, units of measurement, while also encouraging the portability of computer programmes, and common methodology, procedures and reporting formats make interpretation and comparison easier.
- **Accelerates the pace of technology development.** Interaction among project participants allows cross-fertilisation of new ideas, helping to spread innovative developments rapidly, while increasing the range of technologies and approaches employed.
- **Promotes international understanding.** Collaboration promotes international goodwill, and helps participants broaden their views beyond their national perspective.

How to Participate

If your country has signed the Implementing Agreement, contact the Operating Agent of the Task(s) you are interested in, or the Executive Committee member from your country.

If your country has not signed the Implementing Agreement, and is an IEA-member country, contact the Executive Committee member from your country, or the Executive Secretary, Ms Anne Bengtson, who will provide you with the name of your country's representative to the IEA/CERT. If your country has not signed the Implementing Agreement or is not an IEA-member country, contact Mr. John Newman, the IEA Secretariat, who will provide you with information on how to proceed.

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THEME CHAPTER – Accomplishments of Recently Completed Tasks

Introduction

The IEA DSM Programme recently completed two of the five original Tasks initiated by the Executive Committee. Through the collaborative work of international teams of experts, critical issues confronting the implementation of DSM strategies in the changing marketplace were addressed, and the results from these Tasks continue to be a valuable resource for people working in the area of DSM and energy efficiency. The following is a summary of each Task and the significant accomplishments achieved by the experts.

Implementing DSM Technologies in the Marketplace

Task V, *Investigation of Techniques for Implementation of Demand Side Management Technology in the Marketplace*, took on the challenge of how to improve marketing strategies for DSM programmes in residential, small commercial and small industrial sectors of the market. For the past four years, Task experts from Finland, Netherlands, Norway, Spain, Sweden and Tanzania have worked on developing a set of analysis tools to identify effective marketing components of DSM programmes. The international collaborative nature of this Task provided a richness and depth to the Task work, and to capitalise on this, 32 national DSM programmes were documented and 9 pilot programmes were initiated.

Task Activities

Over the course of the Task, participants carried out a series of DSM marketing activities. First, the experts identified a common methodology for developing DSM programmes. Then a questionnaire was created to determine the effectiveness of, and similarities and differences of existing DSM programmes in the participating countries. The results from this questionnaire were analysed and grouped according to three basic promotional concepts—marketing of energy efficient products, behavioural change and utility image. In addition, 32 existing programmes were documented and an Action Plan was designed to cover, in detail, the steps required to develop DSM activities. The Task concluded with an evaluation of each of the pilot programmes.

Pilot Programmes

The pilot programmes proved to be a valuable activity as Task experts were involved in the design as well as evaluation of these programmes. A total of nine pilot programmes, one or more projects in each of the participating countries, were initiated to test DSM marketing strategies. To manage these programmes, target groups were selected using a “micro-marketing approach,” that is a geographical categorising of customers into Basic Market Units that are homogeneous in customer characteristics, such as equipment level, network development costs, income, values, etc. By creating these subgroups based on similar characteristics and interests, the customers’ needs and concerns could be more readily addressed.

At the conclusion of each pilot programme, an evaluation was conducted using a common evaluation framework developed by the Task participants. The evaluation was divided into the following four main areas 1) background and documentation of

programme, 2) customer attitudes of programme participants and non-participants, 3) trade ally attitudes (intermediaries used to carry out the programme), and 4) utility's evaluation. This evaluation framework not only provided a means for evaluating a specific programme, but also to analyse and compare results among the programmes.

Pilot Programmes Implemented under Task V

Country	Entity	Programme Objective
Finland	Hämeen Sähkö Savon Voima Vatajankosken Sähkö	Market a time of use tariff Determine how to avoid network investments Develop a service chain
Netherlands	NUON	Promote purchase of high efficiency appliances
Norway	NVE & Stavanger	Develop user-friendly energy bills
Spain	ENDESA	Promote efficient lighting
Sweden	Halmstad NUTEK & utilities	Develop "definitive" invoices (based on meter reading) Determine how marketing of electrically efficient goods can be stimulated
Tanzania	TANESCO	Promote power factor correction

Results from each pilot programme are included in "Techniques for Implementation of Demand Side Management Technology in the Marketplace."

Lessons Learned

Highlights of the lessons learned from the Task V evaluation of existing DSM programmes and the nine pilot programmes are:

- Customer attitudes concerning energy use were similar in all the participating countries.
- Problems associated with marketing residential DSM programmes were the same for all utilities, regardless of size.
- The performance of DSM marketing strategies are impacted by the low cost of electricity and many customers' lack of understanding the benefits of energy efficiency.
- The public sector is always, in some way, connected with DSM programmes.
- DSM campaigns produce a cumulative effect on customers which implies that less effort will be required when implementing future DSM actions.

Conclusions

The primary conclusion of the Task's work is that "micro-marketing" is valuable when applied to the residential sector. Other conclusions drawn from the Task work are:

- It is possible and beneficial to transfer marketing experiences among countries.

- The “workshop system” was a valuable process in the development of the pilot programmes. Special workshops were held during Task meetings to provide a forum for the ongoing design and evaluation of specific pilot programmes.
- DSM actions should be carried out even in deregulated markets. And, governments and institutions should support DSM actions by acknowledging DSM’s contribution to social benefits.
- In a deregulated market, utilities can become more competitive if DSM is part of their marketing activities.

Integrating DSM and Energy Efficiency in Changing Electricity Businesses

The IEADSM Programme recently completed phase one of its work on DSM and energy efficiency in changing electricity businesses. Over a period of three years, DSM experts from 12 IEA Member countries worked with utilities and governments to consider demand-side options, on an equal basis, as alternatives or additions to conventional and non-conventional supply-side resources.

Early Task Activities

Early activities in this Task focused on developing improved methodologies for integrating demand-side management options into utility resource planning and related government policies. The first job for the experts in Task IV, *Improved Methods for Integrating Demand-Side Options into Resource Planning*, was to review and document the utility structures and the characteristics of conducting DSM in countries participating in the Task. Once this review was completed, an inventory was performed of the available methods for assessing the benefits and costs of DSM options and how to integrate these benefits and costs into the resource plans of utilities. Using the inventory as a basis, the experts then wrote a guidebook, “Guidebook on Analytical Methods and Processes for Integrated Planning”, designed to be used as a one-stop reference on applying analytical methodologies to evaluate DSM. To write this guidebook, the experts first had to determine what was missing in the existing inventory of DSM planning and evaluation methods and then develop recommendations on how to improve the methodologies and to build better models. Experts then examined the transferability of evaluation methods and analytical approaches from one utility to another. Six case studies on the successful transfer of methods and processes were reported on and are described in the report, “Guidelines for Transferring Methods and Processes for Integrated Planning.”

As the Task was drawing to a close, the restructuring of electricity industries was getting underway or being considered by many of the participating countries and so the experts recommended that the Task be extended in order to stay abreast of these changes. The new work undertaken investigated the available and new mechanisms to promote DSM and energy efficiency in the new business environments. The results of this work are reported on in two documents, “Review of Existing Mechanisms for Promoting DSM and Energy Efficiency in New Electricity Business Environments” and “Preliminary Concepts for New Electricity Business Environments.”

Although this Task has ended, a new DSM Task has picked up where Task IV left off. This work is being conducted under Task VI, *Mechanisms for Promoting Demand-Side Management and Energy Efficiency in Changing Electricity Businesses*.

Task Results

Through the exchange of experiences and the development of practical mechanisms for incorporating DSM and energy efficiency into the changing environment of electricity businesses, many results were achieved in this Task.

Categorisation of Strategies

The introduction of a competitive electricity market has realigned the roles of the industry players (generators, transmission businesses, distribution 'wires' businesses and retail suppliers) relative to customers, and this competitive market has created a stronger need for defining *why* DSM and energy efficiency programs should be carried out by the different players. To categorise these strategies, the Task experts divided the DSM strategies into two categories – those pursued by or at the direction of government and those pursued as part of a business. The government strategies are carried out to achieve public policy goals, such as to reduce environmental damage, to increase overall energy system efficiency and to create jobs. The business strategies are carried out by energy businesses or their partners to achieve commercial goals, such as to improve the profitability of existing business areas, to improve market positioning, to retain customers, to improve customer relations and to increase profitability from new business areas (e.g., new products and services).

Analysis of Traditional & Restructured Markets

The primary differences in DSM and energy efficiency mechanisms suitable for implementation in traditional regulated markets and those applicable to restructured electricity markets are listed in the following table.

	Traditional Regulated Market	Restructured Competitive Market
Motivation	Regulators	Marketplace
Driven By	Load shape objectives	Customer needs
Targeted At	Resource value	Customer value
Paid By	All customers (ratepayers)	Beneficiaries only
Focused On	Electricity only	All energy sources

Identification of New Mechanisms

The uncertainty of the market structure of new electricity business environments lends itself to a number of possible opportunities to ensure the advancement of DSM and energy efficiency. Task experts joined with other interested parties to discuss and solicit insights regarding the shape of new mechanisms to be considered. While many of the mechanisms identified were not entirely new, the discussions confirmed that it is possible to develop new combinations in the type of activity, implementing organisation and funding source to create new mechanisms for promoting DSM in restructured markets. Some of the mechanisms identified in the Task include:

New combinations of existing mechanisms

- Customer audits tied to the Internet or to home automation, provided by the private sector or the distribution utility, and funded by the customer or the government.
- Partnerships for technology improvement implemented by government and manufacturers, and funded by tax revenues.

New mechanisms

- Certification of energy service companies (ESCOs) by governments using funds from tax revenues or from ESCOs.
- Development of state-of-the-art energy-efficient construction techniques in collaboration with architects and engineers, and implemented by governments using tax revenues or distribution charges.
- Provision of “frequent user credits” for large electricity users, with credits to be redeemable for energy-efficient appliances or equipment.
- Information campaigns implemented through by government-utility partnerships.
- Pricing options (such as real-time pricing, progressive use rates, “green pricing,” etc.)
- Consortia of governments, manufacturers, and regional distribution utilities to offer energy-efficient products and equipment.
- Performance contracting for energy efficiency offered by utility or private-sector ESCOs or by government.
- Utility end-use service rates.

When reviewing the new types of mechanisms identified during the Task, a number of important implications were identified by the experts. For example, there appears to be a need for shared-risks and responsibilities across all stakeholders as a requisite for assuring DSM in re-regulated markets. This “shared risk” approach means a higher level of intervention by government, manufacturers, consortia of trade groups or utilities in order to obtain the benefits of economies of scale in the marketplace. Another implication is the need to rely on government intervention to ensure top-level involvement in advancing DSM and energy efficiency opportunities. Also, a key ingredient to ensuring energy efficiency in restructured markets is customer education. Customers must be informed of the benefits and costs of energy efficiency. And, finally, the experts concluded that no single mechanism will adequately assure energy efficiency in restructured markets, but rather a strategy is needed which combines complementary mechanisms.

Task Conclusions

This work provides framework for thinking logically about what type of DSM mechanism would be appropriate for a specific situation given all the specifics of the energy sector, energy policies and government objectives in a given economy. The Task work shows that basic planning fundamentals can be used as a means to look at both the generation and the DSM options.

Many countries recognise the importance of DSM and energy efficiency in reducing greenhouse gas reductions and sustainable development goals, and so what has been started in this Task and is being continued in Task VI will help countries promote DSM

while sorting through the challenges of restructuring, competition and privatisation. The key challenge for many countries will be to create a close working relationship between utilities, government agencies and the private sector.

More information on these Tasks can be found on the IEA DSM web site (<http://dsm.iea.org>).

CHAPTER II

TASK I: International Database on Demand-Side Management Technologies and Programmes

Description

The Task is divided into seven Subtasks over a five-year period (1994-1999). The first Subtask was a pilot project to explore the feasibility and nature of an international database on DSM programmes. Participants assessed the transferability of DSM programme results, the usefulness of existing data collection instruments for databases on DSM programmes, and the level of interest among potential users of an international database on DSM programmes.

The second Subtask built on the results of the first, to identify DSM programmes for an international database. Participants distributed a questionnaire - known as a data collection instrument (DCI) - to collect information on DSM programmes and analyse the responses.

The outcome of the first two Subtasks resulted in the design of an international database, the third Subtask, which produced a database that is accessible to all participating countries.

The programme information is entered into the database and the quality of the data is improved under Subtask four (ongoing). This information is used for analysis and dissemination of the results, Subtask five. Annual updates will be implemented in Subtask six, and international promotion will be carried out as part of Subtask seven. Subtasks four to seven are interrelated and continue throughout the entire work plan period.

Expected results include

- a design for data collection and development of an international database on DSM programmes;
- creation and maintenance of an international DSM programme database on the Internet;
- reports on successful DSM programme approaches and results.

TASK II: Communications Technologies for Demand-Side Management

Description

The Task will assess the best available options for applying communications technologies to DSM and customer services programmes in Participants' countries, develop models to carry out evaluations and specify the R&D and demonstration efforts which are required to bring these options to fruition. A new activity within the project is to specify a customer gateway through which the identified services can be provided. Also being considered is the migration of services from narrowband to wideband communication media.

The main criteria for evaluating these technologies is their potential to improve the efficiency of energy resource use and to provide customers with better services at lower cost. Examination of available standards and codes of practice for software, hardware, communication protocols and interfaces, as well as relevant international standards where they apply will also be carried out.

The assessment has covered communications technologies for load control, data transmission, data processing, load management, advanced metering, automated meter reading and billings, customer interface services, and automation for improving distribution quality and system security. The study has categorised and described the Customer/Utility communications environment and technological development taking place and planned for usable communications media. These media particularly include radio, telephone and power line communications.

The Task has developed methodologies and models to link the data exchanges relating to Customer/Utility requirements and information flows to the communications media capabilities to transfer the information. The models enable the costs of technically viable solutions to be quantified. Field trial evaluations using the models have been carried out by four participating countries.

Expected results include

Eight substantive reports:

- description of communications requirements for utilities
- assessment of the best types of communications technology for meeting different performance criteria in pursuit of demand-side management goals
- progress towards harmonised standards for communications technology which would allow system compatibility across Participating countries
- identification of key priorities for research development, and demonstration to bring emerging DSM-related communications technologies to the marketplace
- communications traffic and system costs calculation methodologies and algorithms
- communications evaluation model
- standard customer gateway specification
- migration strategies from narrowband communications to wideband media

TASK III: Co-operative Procurement of Innovative Technologies for Demand-Side Management

Description

This Task is divided into six Subtasks, of which the first aims to define a process for international procurement of innovative DSM technologies by purchasing parties from several countries. Expected outcomes include specifications and procedures to coordinate interest in DSM technologies and yet allow for differences in equipment performance characteristics between countries.

Also expected to emerge are guidelines for selecting among competing manufacturers in co-operative international procurement processes, guidelines for adhering to differing legal codes and advice suitable support mechanisms in order to maintain the demand pull.

Subtask two involves selecting and describing innovative DSM technologies which would be suitable for international collaborative efforts and contribute energy savings if an international competitive procurement process were carried out to bring them to the marketplace. Building on this foundation the third subtask will draft pilot specifications for a pilot competitive procurement of a selected innovative DSM technology while the fourth will contact key market actors to promote specifications and their applications.

The fifth subtask will finalise detailed specifications for the procurement process, and the Task will then conclude with lessons learned from the Procurement Process developed.

Expected results include

A series of workshops and reports that will detail and describe the activities described in the first three Subtasks above. One outcome of all these events will be competitive international procurement procedures, improved understanding of markets, and an evaluation of international procurement of innovative DSM technologies.

TASK IV: Development of Improved Methods for Integrating Demand-Side Options into Resource Planning

Description

This Task will undertake an in-depth review and documentation of utility structures and integrated planning approaches in agency member countries. Participants will join in a review and comparative assessment of government and utility power sector planning priorities in member and non-member countries with a view to their implications for the integration of DSM options into resource planning. They will also compile information on the methods, techniques, and models for demand forecasting and integrated planning being used in their respective countries by utilities and government.

Based on this review, a guidebook will be developed describing alternative approaches and summarising examples of how these methodologies have been incorporated. Case studies documenting successful applications will be included from several countries.

Taking into consideration the factors influencing DSM in participating countries, guidelines are developed on how to transfer processes, methods, techniques, and models for incorporating DSM in resource planning from one country to another. Included in this book will be issues related to differences in market conditions, supply characteristics, utility structure, regulatory environments, pricing and tariff structures and government policies.

Task IV will also undertake work to investigate mechanisms to promote DSM and energy efficiency in new business environments. This includes to present and critically review mechanisms which have been used, or proposed for use, as well as develop the concepts for potential new and improved mechanisms, to incorporate DSM and energy efficiency into restructured electricity industries.

Expected results include

- comparison of utility structures and characteristics in different countries
- inventory of existing processes, models, methods, and techniques in various electric resource planning applications
- recommendations for development of improved methodologies
- guidelines on transfer methods, techniques and models
- guidebook approaches and methodologies for analysis and planning of demand-side programs and
integration of DSM options in utility resource planning
- comprehensive reports which reviews existing mechanisms for promoting DSM and energy efficiency in new electricity business environments and provides the concepts for new and improved mechanisms
- communication of the results through 3 regional workshops and on the world-wide-web

TASK V: Investigation of Techniques for Implementation of Demand-Side Management Technology in the Marketplace

Description

Participants developed a common methodology for implementing DSM technology with residential small commercial and small industrial customers. This methodology models small customer markets in basic units with objective characteristics such as kinds of end-use equipment, cost of network equipment, family or business types, and socio-cultural values. Participants have also conducted a survey in their countries of the methods that utilities and governments have successfully used to market DSM technologies in residential, small commercial and small industrial markets.

Based upon the methodology developed above, each participant has carried out a pilot project for a particular small customer market. Later, the results of the pilot programmes were measured and their success evaluated. Results in different countries were compared, and their similarities and differences were explained. Within each country, results of the pilot programme were compared with results of previous programmes in order to document improvements realised in programme effectiveness.

Expected results include

A methodology for implementing DSM technologies in small customer markets; pilot programmes for effective implementation of DSM technologies in such markets; reports comparing and evaluating pilot programme results. At the conclusion of this Task, a better overall understanding of the actors in the small customer market for DSM technology has evolved.

Task VI: DSM and Energy Efficiency in Changing Electricity Businesses

Description

This Task is designed to develop in detail a range of practical mechanisms for promoting the implementation of economically justifiable demand-side management (DSM) and energy efficiency by changing electricity businesses, such as in restructured electricity industries and competitive electricity markets.

To meet the needs of the participating countries, Task VI is studying and developing mechanisms suitable for traditional monopoly structures as well as for restructured electricity industries and competitive electricity markets.

Task VI will:

- develop a range of practical mechanisms;
- identify the public policy implications of these mechanisms;
- communicate a range of information about the mechanisms.

Task VI is not aiming to tell governments and industry regulators what they should do. Neither will it make comparisons between countries in relation to their relative success or otherwise in promoting DSM and energy efficiency. Rather Task VI will make available to responsible authorities objective factual information about the mechanisms they could use to promote DSM and energy efficiency in changing electricity business environments. The decision on whether to implement any of the mechanisms clearly lies with the responsible authorities in each sovereign country. The information provided by Task VI is intended to assist and inform this decision.

Expected results include

- Report on mechanisms for promoting the implementation of DSM and energy efficiency by changing electricity businesses
- Regular Task VI newsletter
- Regional workshops in Europe and Asia Pacific
- Series of technical reports, articles in international publications and less detailed publicity material for targeted audiences
- Internet site with summaries of results and details on specific mechanisms
- Report on the public policy implications of new mechanisms for DSM and energy efficiency in changing electricity businesses

CHAPTER III

Task I: International Database on Demand-Side Management Technologies and Programmes

Operating Agent: Mr Harry Vreuls, Netherlands agency for energy and the environment (Novem), the Netherlands

Objectives

The objectives of Task I are to establish and maintain an international database on demand-side management programmes, analyse the data collected, and disseminate the information resulting from the analysis. These activities should help utilities and governments in participating countries to design demand-side management (DSM) programmes which reach more customers and save more energy at lower cost.

Task description

The international database on energy efficiency programmes (INDEEP) has made information available on electric and gas utility DSM programmes as well as those carried out by others (e.g. government agencies and energy service companies). The database consists of programmes implemented by the countries participating in this Task, plus as many other countries as possible. INDEEP focuses on programme descriptions and key summary data on programme costs, participation rates, energy and demand savings, market delivery designs, and evaluation methodologies.

Practical information, such as programme contacts, are also included in the database. In addition, summaries of pertinent data are provided periodically in order to present the lessons learned in particular types of programmes (e.g. lighting programmes in commercial buildings, or appliance rebate programmes for energy-efficient refrigerators). General analysis is disseminated and the use of a uniformed programme information data framework is being promoted.

Two advisory groups provide guidance to INDEEP activities. The IEA DSM Executive Committee provides management oversight to the Task and advises at critical junctures during the process of designing, implementing and maintaining the database, or with dissemination strategies. The Task I Experts group includes government and utility representatives, database specialists, and DSM professionals who provide advice regarding the database design, data collection, data analysis activities, and guiding the direction of the Task.

Task I officially began May 1, 1994. The first year was a pilot project to explore the feasibility and nature of an international database on DSM programmes. During the second year participants collected DSM programme data and started to compare DSM programmes among participating countries. Data analysis began during the third year, as well as software development (a prototype) and information products were published and disseminated. During the fourth year a first analysis report was produced

and the platform for the database software was discussed. The (ongoing) fifth year has seen the initial development of the Internet software for the INDEEP database, as well as a discussion on the future of the database from mid-1999 onwards.

Table 1 shows the seven Subtasks, their main activities and periods for the five-year period.

Table 1

Subtask for Task

Subtasks	Main activities	Main period
1: Programme identification	develop surey questionnaire implement surey questionnaire identify programmes, workshop	year 1
2: Design planning	determine data to be collected develop DCI and definitions pre-test DCI, evaluate DCI	year 1 and 2
3: Design database	select software package start software development	year 2
4: Data collection and entry	data collection using the DCI quality control on data data entry	year 2 up to 5
5: Data analysis and report preparation	analyse the first 100 entries prepare a report including lessons learned, dissemination of information	year 2 and 3
6: Updates to database	update existing data add new data improve software	year 3 up to 5
7: Promoting and marketing	prepare and distribute information material present INDEEP at conferences and workshops develop a marketing strategy to transfer INDEEP	ongoing year 4 and 5

Activities completed in 1998

During 1998 the activities in Task 1 concentrated on software development, analysis and data collection.

INDEEP software development on Internet

Early 1998 the experts discussed several option for the software for the INDEEP database. This discussion was based on discussion papers on the pro's and contra's for the platform (pc-stand alone with floppies or files to be downloaded), dos-, windows

(3.11, 95, 98) and/or Mac, and the Internet, as well as on a prototype for menus and screens using the ACCES prototype database. It was agreed by the experts, and approved by the EXCO, that the software should be developed optimal for the Internet and to stop, and not to upgrade the programmes developed for the prototypes (using the ACCESS software). In the second half of the year 1998 the software development and testing started, based on the report "Definition of Requirements for INDEEP Internet software". The Internet version will have an option to choose for other languages than English at the opening screen (see figure 1.). There will be two options to search for information : a quick search, using a selected number of key fields, and a free query programme search for all field and value ranges. From early 1999 is should be possible to input new data directly via the Internet site.

Figure 1: Internet Opening screen INDEEP database (test version)

Analysis on the data in the INDEEP database

In 1998 the first in depth analysis on 162 quality-controlled the programmes from 13 countries in INDEEP was published : *"International programme experience in providing energy efficiency services comparing cost effectiveness"*. Several conclusions are given below.

The primary objective for nearly all programmes is energy efficiency. The programmes target about 70% to the energy users (46%, 12% and 11% of the residential, commercial and industrial customers respectively) and circa 30% target primary non-residential customers. Electricity consumption is affected by 90% of the programmes. Utility companies implemented around 80% of the programmes.

A top 10 most cost-effective programmes is selected and presented in the analysis report. This list gives individual descriptions of the programmes and reasons for their success including very different programmes on low-flow showerheads, energy-

saving lamps, commercial lighting retrofit, different types of energy management, occupancy sensors in schools, and gas for more efficient heating and ovens.

Data collection and quality improvement

To improve the quality of the content of the database, in 1997 Three groups of quality levels were set. The first group refers to the minimum level: data that should be available if a programme is included in the INDEEP database. The second group is the threshold to include a programme for analysis. The third group refers to the data fields that have been filled if the information for a programme is published by an one page summaries. An example one page summary is presented below. These three groups are:

- Group 1: data on implementing agent, summary, energy sources and programme status must be completed for all cases;
- Group 2: data on evaluation status, reasons for selecting DSM programmes and technologies should be included.
- Group 3: programme summary text should be sufficiently long for understanding the programme action; if similar names are used within a country, differences between these programmes are stressed in the summary; consistence for all data meets the standard good (judged by the team of experts).

For about 35 programmes the experts improved the data to met both levels. For the Korean programmes it was concluded that it was not possible to improve the data and the programmes should be excluded. For two Korean programmes new data were provided.

The expert also continue the data collection for new programmes. The process of collection, quality control and improvement is was at the end of the year 1998 still ongoing. By January 1999 it should be possible to have information for about 220 programmes in the database that meet all the three groups of quality levels mentioned ahead.

One page summaries

For all programmes the most relevant quantitative and qualitative information is summarised.

Each programme results in a one-page summary, which includes :



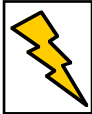


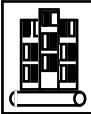
- general information: country, programme name, implementing organisation, market sectors, technologies and energy sources;
- complete text of programme summary and lessons learned;
- key target figures for the most recent year and cumulative figures on energy savings, appliance sales, participation and costs.

To make the use of this summaries more easy, pictures are presented at the top of these summaries, indicating the technology group, market sector, country etc. An example is presented in figure 2.

Figure 2: an example for an INDEEP one page summary

INDEEP Energy Efficiency Programme Summary Indeep: DK-13

International Database on Energy Efficiency Programmes: <http://dsm.iea.org/task1>, email h.vreuls@novem.nl

Programme Name	Country	Implementing Organisation
Energy Management in the Public Sector Status: Phase Out/In-Progress	Denmark	Danish Energy Agency
Sector	Energy Source	Technologies
Residential Commercial	Electricity Gas Fuel Oil District Heating	104.1
 	   	

Summary

By the end of 1992, a directive for public institutions stated that they had to appoint an energy manager, monitor the consumption and make energy-efficient purchasing and building construction. A campaign over 3 years supported the directive.

Individual information was provided to the top management, the energy manager, the operational staff and the 100,000 employees. 3 SAVE seminars have been held, and a network among the energy managers has been formed.

During the campaign period, 1992–1995, energy consumption dropped 6%. Electricity savings are approximately 34,000 MWh. Heating savings are approximately 73,000 MWh. Maybe a part of the savings results from the campaign activity.

Lessons Learned

Appointment of an energy manager in public institutions and directives on energy management is no guarantee for reaching the program goal.

Consumption has been stabilised during the program period but it is unsure if it is a result of the program.

Key Figures

	Units	Goals	Most Recent Year 1995	Cumulative 1993–1995
Participants		700	200	700
Eligible Participants			700	700
Participation Rate			29	100
Total Cost Agent	ECU			
Total Cost Others	ECU		426,420	2,069,000
Total Cost	ECU		426,420	2,069,000
Market Incentive Cost	%			
Non-Incentive Costs	%			
Energy/Electricity Savings	MWh	10–15%	11,300	34,000
Peak Demand Savings	MWh			
Fuel Savings	TJ		42	122
Appliance Sales				
Total Resources Cost	ECUs/kWh		0.020	
Utility Resources Cost	ECUs/kWh			

Activities planned for 1999; Future for the INDEEP database

In March 1998, the EXCO approved an information package and prices for INDEEP products in order to make information general available. All information is available, if an organisation is willing to pay the fee for it. Another option is to use credits in stead of money: if an organisations contributes to the content of the database by input new programmes, it gains credits (see figure 3).

The experts discussed a marketing strategy for 1999 onwards and arrived upon two options. One is that of an unofficial group within the IEA organisation. In doing this the transformation process could take a two year period. Another option that was dis-

cussed was related to the changing environment for energy efficiency services. If the database would be enlarged with a module for more specific information for non-utility programmes, the work to do this could be organised in a new Annex. Both items are still in discussion and will be present in 1999 to the EXCO to decide on the future of the INDEEP database.

Figure 3: Information package and prices for INDEEP products

<p>1. A package of free information on the Web site, or by mail by the Operating Agent</p> <ul style="list-style-type: none"> • General Information on IEA Task 1 and INDEEP • A small number (10) of one-page summaries and complete programs access • The list of all the programs and countries • The list of all the technologies • DCI template display • Summary of the content of the Analysis Report 									
<p>2. A price system for information for the not in INDEEP participating countries:</p> <table border="0"> <tr> <td>• Access to all 1-page summaries for 1 year</td> <td>85 US \$/organisation /year</td> </tr> <tr> <td>• Analysis Report</td> <td>100 US \$</td> </tr> <tr> <td>• Full Access to INDEEP + Analysis Report</td> <td>3000 US \$/ organisation/years</td> </tr> <tr> <td>• Supply of 1-page summary printouts</td> <td>20 US \$/printout</td> </tr> </table>		• Access to all 1-page summaries for 1 year	85 US \$/organisation /year	• Analysis Report	100 US \$	• Full Access to INDEEP + Analysis Report	3000 US \$/ organisation/years	• Supply of 1-page summary printouts	20 US \$/printout
• Access to all 1-page summaries for 1 year	85 US \$/organisation /year								
• Analysis Report	100 US \$								
• Full Access to INDEEP + Analysis Report	3000 US \$/ organisation/years								
• Supply of 1-page summary printouts	20 US \$/printout								
<p>3. A credit for qualified program information for the not in INDEEP participating countries</p> <p>To all program data supplier a 100 US\$ credit will be acknowledged per each program data supplied. This credit can be used for getting Analysis Reports, or 1-page summary printouts, or other products of 100 US \$ worth.</p>									

Involvement of industry and other organisations

Each expert is responsible for contacting utilities and governmental agencies within his country to assess general DSM information needs and the specific need for and usefulness of an international database on energy efficiency programmes.

The information on the Internet site seems to be well used, and the Operating Agent was only contacted for additional information in a small number. One was for the use of the INDEEP system by a consultant in the development of a DSM strategy by a utility in Japan and the development of a system of energy efficiency programmes in Hungary.

Reports

The following reports, articles and information products were finalised in 1998:

1. First INDEEP Analysis Report "International programme experience in providing energy efficiency services comparing cost effectiveness", February 1998
2. Progress report INDEEP 1996-1997, October 1998

3. Definition of Requirement for INDEEP Internet, September 1998
4. System on INDEEP reports and reference numbers, 1996 onwards, June 1998
5. INDEEP codes for Energy Efficiency Technologies & Immaterial Techniques, March 1998
6. INDEEP (Provisional) multi languages products, September 1998
7. List of INDEEP programme names, May 1998
8. Information strategy for INDEEP, April 1998
9. The Global DSM MAP: a tool for DSM strategy and planning, paper presented at the CEPSI conference, November 1998

For 1999 the following products are planned:

1. INDEEP database, on Internet
2. INDEEP database software manual
3. INDEEP second analysis report
4. INDEEP progress report 1998-1999
5. Marketing strategy INDEEP database 1999 onwards

Meeting Schedule

Meetings held in 1998:

16 and 17 March, Barcelona, Spain;
 27 and 28 May, Copenhagen, Denmark;
 31 August and 1 September, Lund Sweden.

Planned meetings for 1999

28 and 29 January, Paris, France
 March, Denmark
 June, The Netherlands

Task I came into force on October 28, 1993 and shall remain so at least until December 31, 1999.

Activity Time Schedule

Activity	Start Date	Completion	1994	1995	1996	1997	1998	1999	
1. Programme Identification (participating countries)	94 05 01	96 05 01	██████████						
Additional programmes (including non-participating countries)	94 12 01	98 09 01		████████████████████					
2. INDEEP design planning Data Collection Instrument	94 12 01	98 05 01		████████████████					
3. Design Database	95 05 01	96 05 01		██████					
4. INDEEP data collection & entry	95 05 01	99 03 01		████████████████████					
5. INDEEP data analysis and report preparation	97 01 01	99 08 01				████████████████			
6. Updates to the database	96 05 01	99 03 01			████████████████				
7. Promotion and marketing	94 10 01	99 11 30	████████████████████						

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Task II: Communications Technologies for Demand Side Management

Operating Agent: Mr J R Formby, EA Technology, United Kingdom

Objectives

This Task is to assess the best available options for applying communications technologies to DSM and customer services programmes in the Participants' countries, develop models to carry out evaluations and specify the R&D and demonstration efforts which are required to bring these options to fruition. To date the assessment has covered communications technologies for load control, data transmission, data processing, load management, advanced metering, automated meter reading and billing, customer interface services, and automation for improving distribution quality and system security. A separate activity within the project is to specify a customer gateway through which the identified services can be provided.

The main criteria for evaluating these technologies is their potential to improve the efficiency of energy resource use and to provide customers with better services at lower cost.

Different countries and different parts of a country have different requirements, different criteria and different stages of development in the application of DSM. The level of sophistication of the relevant communications technologies is reflected in these differences. This Annex is examining available standards and codes of practice for software, hardware, communication protocols and interfaces, as well as relevant international standards where they apply. The intention is to be guided by the best practice presently employed in meeting different national needs and to derive value judgements on communications systems and technologies that offer cost effective solutions at various stages of DSM development.

The Task will also define the climate for the application of DSM and other functions which could use Customer/Utility communications within each participating country. It has already defined Customer/Utility functions which are seen as being the most attractive and necessary in each country and converted them into information flows and data rates for communication between Customers and Utilities. The study has collected information from each participating country to categorise and describe the Utility/Customer communications environment and technological developments which are taking place and planned for all the potentially usable communications media. The media particularly include radio, telephone and power line communications, as well as wideband media. Descriptions of performance of trials and field trials have also been included and channel capacity, error performance and overall suitability of the different media quantified in developing circumstances.

The Task has developed methodologies and models to link the data exchanges relating to Utility/Customer requirements and information flows to the communications media capabilities to transfer the information. This has enabled multiple media communications hierarchies such as telephone and DLC to be constructed which utilise

the potential of each medium to achieve given functional requirement in the most efficient and effective way from the point of view of complexity, reliability and security. The models also enable the costs of technically viable solutions to be quantified. Field trial evaluations using the models have been carried out by four participating countries.

The results of these studies are being used as inputs to standards forming organisations to assist with the tasks of defining protocols, signalling and interfacing standards for customer/Utility communications systems on an international basis.

A project to specify a standard customer gateway through which to provide identified customer DSM and Value Added Services was agreed and commenced with participation by six countries.

Evaluation of customer services provision communication and protocols, both inside and outside customer premises, was carried out. The results of the evaluation were used to inform the implementation of an agreed range of services and the most appropriate media for each. The results of the evaluation were used to inform the approach to the customer gateway design so that different media and protocols are handled on both sides of the gateway. A final report has been produced.

A second project was also started to evaluate possible radio communication media, developed for entertainment, internet and other purposes, to implement narrowband utility services. The project involved six countries. Information has been collected from participating countries on the status of wideband infrastructure development. The technical requirements for a utility services gateway into customer, set top boxes and field devices is being evaluated and the costs of various strategies quantified.

A project has been proposed to design and implement the flexible gateway. The completed specification and is being considered for support in the field. An overview schematic of the proposed gateway is shown in Figure 1.

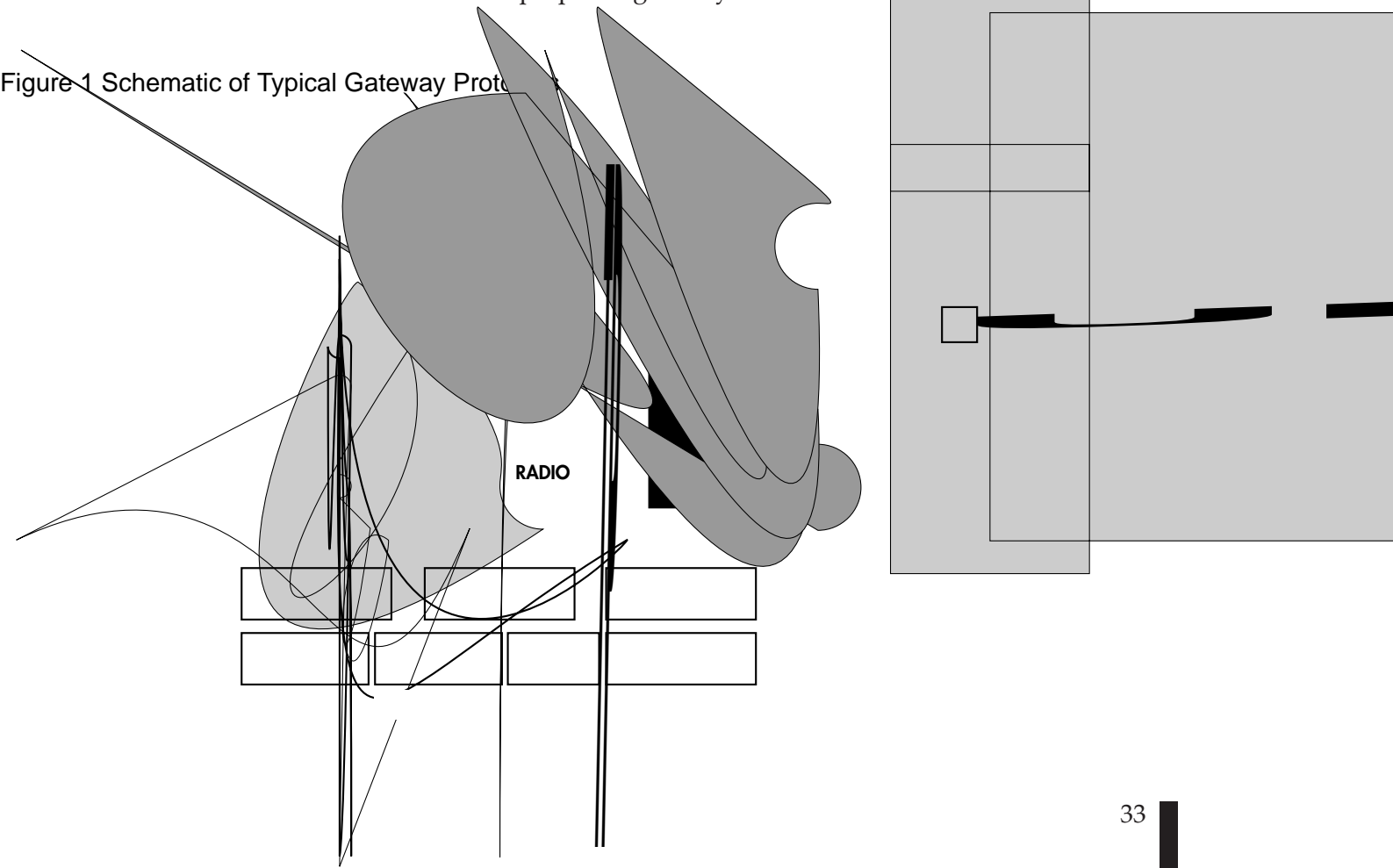


Figure 1 Schematic of Typical Gateway Protocol

Activities completed in 1998

January 1998 Commencement of Customer Gateway Specification project

July 1998 Commencement of Wideband Media project

September 1998 Completion of Customer Gateway Specification project

October 1998 Flexible Gateway Implementation project proposal

Activities planned for 1999

Report on Wideband Media project

Decision on support for Flexible Gateway Implementation project

Involvement of industry and other organisations

The collection of information about Customer/Utility Value Added Services and the communications technologies and protocols in participating countries has involved a great deal of interaction with organisations in each country. Much of the work has been carried out through detailed dialogue with utilities and hardware manufacturers. Customer groups and Government organisations have also been involved in consultations to assess national needs and Customer/Utility service motivators.

Reports

Reports produced in 1998

September 1998 Definition and Specification of Residential Customer Gateway for DSM and Related Services

Reports planned for 1999

Report detailing Wideband Media project

Meeting Schedule

Meetings during 1998

12 February 1998, Chester, United Kingdom

29 April 1998, Rotterdam, Netherlands

13 August 1998, Trondheim, Norway

5 October 1998, Chester, United Kingdom

Planned meetings 1999

18–19 January 1999, Barcelona, Spain

Task II was entered into force on October 1, 1993 and was extended by the addition of two new Subtasks to a total duration of three and a half years i.e. March 31, 1997. A new Subtask commenced in January 1998, to specify a Customer Gateway for delivering value added services. An additional Subtask to define strategies for wideband communication channels for Customer/Utility services commenced in March 1998.

Activity Time Schedule

Activity			1993	1994	1995	1996	1997	1998	1999
Customer/Utility needs	93 10 01	94 09 30	■	■					
Communications Technologies	93 10 01	94 09 30	■	■					
Relate needs and Communications	94 10 01	95 09 30		■	■				
International Standards	94 10 91	96 09 30		■	■	■			
R&D Priorities	94 10 01	96 09 30		■	■	■			
Costing Model	96 01 01	97 03 31				■	■		
Communications Model	96 01 01	97 03 31				■	■		
Customer Gateway Specification	98 01 01	98 06 30						■	
Wideband Communication Strategy	98 01 01	98 06 30						■	
Customer Gateway Implementation	99 04 01	99 12 31							■

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Task III: Co-operative Procurement of Innovative Technologies for Demand-Side Management

Operating Agent: Dr. Hans Westling, Promandat AB, Sweden

Objective

The objective of Task III is to establish a co-operative demand-pull procedure to bring more energy-efficient and environmentally-adapted demand-side management technologies to the marketplace, to rank innovative candidate technologies for competitive procurement activities, and to procure key DSM technology options that have not yet reached the marketplace in order to demonstrate and test the procedure developed.

Task Description

Task III is divided into a number of subtasks. The first subtask aims at defining a process for international co-operative procurement of innovative DSM technologies. Subtask two concerns the technology screening process to select the technologies which are most suitable for co-operative, innovative and diffusion activities. The third subtask concerns formulation of pilot specifications and pilot procurement of a selected innovative DSM technology. Subtask four concerns the organisation of contacts with the market, including buyers, users, authorities, etc. Finally, the fifth subtask includes evaluation of the procurement process developed, after the pilot projects and other gained experience.

The expected benefits of Task III work are that combined efforts of participating countries can create a larger impact than activities conducted by a single country. Procurement activities (carried out concurrently for the same technological area), and especially in combination with supporting mechanisms (economic incentives, information, labelling, etc.) can strengthen interest and accelerate market introduction. Gradually tougher requirements may contribute to innovation and may from time to time be adopted for:

- technology procurement for technological solutions not yet existing on the market,
- procurement activities by leading or anchor buyers restricted to the 25% best products on the market,
- standards (minimum requirements).

In some areas, it is evident that only through *combined efforts* is it possible to create such an impact and interest among manufacturers that they are willing to run the risk of investing further capital in research and development for manufacturing processes. The existence of a full set of requirements from important buyers may also reduce the risks for the manufacturers. Using combined efforts from a number of countries contributing fairly limited economic means may also result in an impact of the same magnitude as that achieved by using large, very costly rebate programmes directed to consumers.

Activities Completed in 1998

Market Acceptance Process and Technology Screening

The participants of Task III – Denmark, Finland, Korea, The Netherlands, Spain, Sweden, United Kingdom, United States and the European Commission through DG XVII – see participation in this Task as *taking part in a learning process*. Experience from work on the process, exchange of information and learning from the preparations for procurements during and between Experts meetings are important elements of the work. Seven technological areas have been investigated in depth: *lighting, wet appliances* (clothes washers and driers), *copiers, vending machines, consumer electronics, LED traffic lights and industrial motors*. Work is proceeding in all the areas except in *vending machines and consumer electronics*, which are kept on a low-profile basis for the time being. Procurements have started in some of the areas, see further below.

The report on the Market Acceptance Process "Co-operative Procurement – Market Acceptance for Innovative Energy-Efficient Technologies" and "The Challenge" information brochure are still widely distributed with the purpose of attracting interest in international, as well as national DSM activities. The Market Acceptance Process, Task III, its technological areas and ongoing pilot procurements are also presented on the Internet (on homepages, and with links to the IEA DSM, the Swedish National Energy Administration, Motiva and other web sites).

Pilot Procurements

The suitable number of pilot procurement projects to concentrate on has been thoroughly discussed by the Experts. The Experts decided initially that *at least three projects are needed* and should be fulfilled, if possible, in order to gather *sufficient background experience*. During the evaluation of the DSM Agreement, one suggested action was that the number of pilot projects should be increased to five in order to get enough experience. The purpose of the projects is to show how *a collaborative procedure at an international level can function and to draw conclusions* from this work. A general consensus was obtained to strive to increase the number of pilot projects and to continue with the Task for one additional year (1999).

In three of the Task III technological areas – *wet appliances, lighting and industrial motors* – with procurements launched last year, there were ongoing procurements in 1998. In September the procurement in *Copiers* was launched, and procurement in *LED traffic lights* is planned for 1999.

In the *wet appliances* area, where The Netherlands has the Project Management role, the "IEA-DSM Drier Promotion Competition" has been going on in 1998 with its Second and Final Round, and with 1 January 1999 as the closing date for entries. The Award Ceremony for the winner of the First Round took place in The Hague on 27 April. The Award Winner, a prototype from AEG, fulfilled all the mandatory requirements and the drier is the first EU Energy Label "Class A" drier on the market with the energy use halved. The first, partly manually produced, driers were marketed in Germany and will be launched in other European countries. Work is under way to inspire the process towards industrialisation in order to lower the price and increase the number of driers sold.

In *lighting*, with United Kingdom as Project Manager, the "Replacement Incandescent Lamp – Future Bulb – Technology Procurement Competition" was launched in 1997.

None of the tenders met all the requirements – the lamp should be at least 30 per cent more efficient than standard GSL lamps and last three times as long – when the competition closed last year. It was therefore decided to have a Reissue and Second Round with 15 December as closing date. Work has also been going on to increase the number of interested buyers of the new bulb.

In the *industrial motors area*, which is supported by Task III and which has Finland as project-managing country, the Opening Round of the "IEA Hi-Motors Competition" was launched in June last year and the closing date for the Round was 15 August 1998. The specification of requirements was drawn up for three-phase squirrel cage induction motors for general continuous operation uses in the range of 0.18–110 kW. The jury has decided to give the IEA Award of Excellence to ABB Finland for a 75 kW motor and ABB Sweden for a 5.5 kW motor. Both of them fulfilled all the mandatory requirements in prototype testing. These new energy-efficient motors use 28–50% less energy and have pay-back times of 1–3 years. The Award Ceremony is planned to take place in February 1999 in London.

In *copiers*, Switzerland acted as Project Manager during the preparatory stage, after which the United States took on the Project Management role from the autumn of 1997. The main goal of the copier efforts is an accelerated market introduction of an innovative copier in the medium-speed range (30–60 copies/minute) with low energy standby mode, fast recovery time, improved duplicating performance and other characteristics. Electricity saving of 60 per cent is the target. The launching of the "Copier of the Future" competition took place on 22 September during the conference "Improving Electricity Efficiency in Commercial Buildings" in The Netherlands.

In *LED traffic lights*, Sweden took on the project management role. A draft background report was updated and specifications prepared. A preparatory meeting with interested countries is planned to take place in the beginning of 1999.

In *consumer electronics*, two areas for possible procurement and promotion activities – power supplies and cable TV decoders – were identified in an EU SAVE project. There was a meeting in 1998 with the European Commission, The Netherlands, Denmark and Sweden concerning a possible joint proposal.

The *vending machines* project has been kept on a low-profile basis for some time. An interested project management country has to be identified

Activities Planned for 1999

Activities in the different technological areas will proceed according to plan. In the *wet appliances* area, the entries in the Second and Final Round of the "Drier Promotion Competition" will be evaluated by the international jury for a possible appointment of the IEA Award of Excellence. The launching of the drier winning the First Round will continue on further markets.

In *lighting*, eventually the entries in the "Future Bulb" competition will be evaluated during the first months of the year, prototypes will be tested and the winner(s) will be announced in December.

In *industrial motors*, the Award Ceremony will be early 1999 in connection with the Task III Workshop in London in February (see further below).

After the "*Copiers of the Future*" procurement was launched in September 1998, tenders will be accepted every six months from 31 March 1999 until 30 September 2000. Three different rounds are planned. Prototypes from manufacturers will be accepted and a report from selected leading buyers will be released in March. The First Round winner/s will be presented in June 1999.

In *LED traffic lights*, the specifications are expected to be finalised during the spring of 1999. A large kick-off meeting is planned to be held in April/May in Stockholm and the launching of the procurement will take place during the winter of 1999. Delivery of the first units is expected in the winter of 2000.

In *consumer electronics*, buyer-group work may result in procurements and promotion activities for cable TV decoders and/or power supplies, possibly as a joint EU SAVE/Task III project.

The IEA DSM Co-operative Procurement activity has inspired to plans for activities through the *European Commission DG XVII* as well as the *InterAmerican Development Bank*. Contacts will be followed up during the year.

The main Task III event to take place in 1999 is the *Workshop on Lessons Learned and Future Actions*, which will be held in London, United Kingdom, on 24–25 February 1999. Lessons learned from the Task III pilot procurements and other similar projects will be presented and examined by the project managers, IEA DSM Programme people and outside experts. The need for efficient use of different instruments to accelerate innovation and market transformation, and how to facilitate future interaction between buyers and suppliers are other items that will be discussed. After the Workshop, recommendations will be formulated for a possible presentation at the IEA Ministerial Conference in May 1999.

Involvement of Industry and Other Organisations

There have been extensive contacts and several meetings with manufacturers and buyers, especially in the areas *wet appliances, lighting, copiers and industrial motors*, in connection with the pilot procurement projects.

At the *Drier Award Ceremony* and press conference in The Hague in April 1998, a number of interested manufacturers were present. Some twenty articles were published afterwards in different magazines and in the globally distributed *Electrolux Environmental Report*. The awareness of the consumers and the retail and utility sectors has also increased as a result of this event.

Contacts with manufacturers in all the areas have been established at several national meetings and international conferences, where the Operating Agent and the Experts have presented Task III work and co-operative and procurement efforts. Examples of such conferences are the "*World Energy Day*" in Austria in March, the *EC Lighting Meeting* in April, the *CIB World Building Congress* in Sweden in June, the *ACEEE Conference* in the United States in August and the *Green Building Challenge '98* in Canada in October.

The participating countries have, to a varying degree, carried out systematic identification of interested buyers in the chosen technological areas. In several of the countries, national buyer groups have been established for specific products, in which the countries have an interest.

Reports

Reports produced in 1998

Examples of reports, working documents, competition documents and information products prepared by/for the Experts in 1998:

- Presentations on the Internet (<http://stem/IEAprocure/>), continuously updated, including:
 - Task III Co-operative Technology Procurement
 - Co-operative Procurement. Market Acceptance for Innovative Energy-Efficient Technologies
 - The Challenge and The Market Acceptance Process
 - Replacement Incandescent Lamp
 - Wet Appliances and Drier Promotion Competition
 - Efficient Copiers
 - High Efficient Induction Motors
- Presentation on the Internet (<http://www.epa.gov/appdstar/esoe/techpro.html>) of the Copiers of the Future procurement.
- Presentation on the Internet (<http://info.lut.fi/ente/sahko/Hi.Motors/Intro.htm>) of IEA Hi-Motors Competition.
- "Report of the Jury – IEA-DSM Drier Promotion Competition 1997/1998, issued by the Netherlands Agency for Energy and the Environment NOVEM, April 1998.
- "Drier Award Ceremony – Press Conference Material, NOVEM, The Netherlands, April 1998.
- "Improving Three-Phase Induction Motor Efficiency in Europe – The Challenge for Manufacturers", article in the "Power Engineering Journal by J. Haataja and J. Pyrhönen, Finland, April 1998.
- IEA Hi-Motors Competition - Project Report Summary", Heikki Härkönen, Motiva, Finland, May 1998.
- "Internationally Coordinated Procurement of Innovative Copiers. Project Management October 1995-September 1997", Bernard Aebischer, ETH, Switzerland, May 1998.
- "Collaborative Performance-Based Purchasing for Sustainable Innovation, paper by Hans Westling, Promandat AB, Sweden, for the CIB World Building Congress in Gävle, Sweden, June 1998.
- "Annex III LED Traffic Light Proposal", background report, Nils Borg, Borg & Co, Sweden, August 1998.
- "Copier of the Future Technology Procurement Project – Procurement Documentation", Alison ten Cate, EPA, United States, September 1998.

Reports Planned for 1999

- Final jury report of the "IEA Hi-Motors Competition".
- Jury report of the entries in the Second Round of the "IEA Drier Promotion Competition".
- Background report in "LED traffic lights".
- "Lessons learned". External and Internal evaluation of experience in Task III Co-operative Procurement.

Meetings Schedule

Experts meetings held in 1998

February 19–20, Utrecht, The Netherlands.

June 24–26, Washington D.C., United States.

September 22, Amsterdam, The Netherlands (informal meeting).

November 18-20, Vienna, Austria.

Experts meetings planned for 1999

Workshop "Lessons Learned", 24–25 February, London, United Kingdom. There will be an Experts Meeting 26 February in connection with the Workshop.

June 21–22, Brussels, Belgium.

November/December, Stockholm, Sweden (which may be the final Experts meeting unless there is a continuation of Task III).

Task III was entered into force on October 28, 1993, and has been extended until December 31, 1999.

Activity Time Schedule

Activity	Start Date	Completion Date	1993	1994	1995	1996	1997	1998	1999
Subtask III:1 Market Acceptance Process	93 11 15	95 10 01		█	█				
Subtask III:2 Technology Screening: Step 1 (3 areas)	93 11 15	94 11 30		█					
Step 2 (2 more areas)	94 11 04	95 03 04			█				
Step 3 (further areas)	95 01 30	98 06 30			█	█	█		
Subtask III:3 Specification Pilot Project(s) (different areas)	95 03 01	99 12 31			█	█	█	█	█
Subtask III:4 Market Contact: (first pilot(s)) further pilots	95 06 15 96 06 15	97 02 28 99 12 31			█	█	█	█	█
Subtask III:5 Further Procurement	96 04 01	99 12 31				█	█	█	█
Subtask III:6 Lessons learned Lessons Learned-preliminary Lessons Learned-final	97 10 01 99 01 01	98 12 31 99 12 31					█	█	█

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Names of Project Managers and Specialists for the different technological areas can be obtained from the Operating Agent or the Experts.

Task VI: Mechanisms for Promoting DSM and Energy Efficiency in Changing Electricity Businesses

Operating Agent: Dr David J Crossley, Energy Futures Australia Pty Ltd

Objectives

The objectives of Task VI, as approved at the March 1996 Executive Committee meeting, are as follows:

- to develop in detail a range of practical mechanisms whereby economically justifiable DSM and energy efficiency can be incorporated into changing electricity business environments;
- to identify the public policy implications which would follow a decision by the responsible authorities to implement each of the various mechanisms, including:
 - actions which would be required by, and changes to the responsibilities of, privately- and publicly-owned utilities, governments, and industry regulators;
 - impacts of the mechanism on market structures and oversight;
 - effects of the mechanism on trading and financial arrangements;
 - consequences of the mechanism for new industry structures, rules of conduct, consumer interests, legislation and regulation;
- to identify and discuss the transitional issues for existing DSM programs arising from changing electricity business environments;
- to communicate and disseminate a range of information about the mechanisms.

Definitions

The mechanisms which will be considered in Task VI are not DSM and energy efficiency programmes. Rather they assist the implementation of such programmes. *Mechanisms* are targeted at organisations which develop and implement DSM and energy efficiency programmes and are intended to make it easier for these programmes to be implemented. In contrast, DSM and energy efficiency *programmes* are targeted at energy end-users and are intended to change the way in which energy is used and therefore achieve commercial outcomes for the programme implementer.

The following examples are provided to illustrate the distinction between mechanisms and programs.

Mechanism	Program
A regulator allowing electricity businesses to increase their electricity prices to cover the cost of providing cash rebates to customers who purchase energy efficient appliances	An electricity business providing cash rebates to customers who purchase energy efficient appliances
A Government establishing an energy efficiency funding agency such as the United Kingdom's Energy Saving Trust	An electricity business participating in the funding agency's programs directed at customers
A wholesale electricity pool establishing a protocol for demand bidding into the pool	An electricity business offering low-priced interruptible electricity supply to customers and then bidding demand reductions into the pool
An electricity business implementing performance contracting where the cost of services provided by the business is only paid for by customers if specified results are achieved	An electricity business offering to provide customers with energy efficiency improvements through performance contracting where the cost of the improvements is paid for from reductions in the customer's electricity bill

Activities Completed in 1998

During 1998, work continued on all three subtasks within Task VI:

Subtask VI/1: Detailed Development of New Mechanisms and Evaluation Criteria;

Subtask VI/2: Communication of Information About the Mechanisms;

Subtask VI/3: Public Policy Implications.

From late 1997, work in all the Task VI Subtasks has been proceeding simultaneously. Subtasks in Task VI are each concerned with a different aspect of the topic which Task VI is addressing rather than sequential stages in completing the work. Sequential staging of the work on each different aspect occurs within each Subtask rather than between Subtasks.

Subtask VI/1: Detailed Development of Mechanisms and Assessment Criteria

Existing Mechanisms Database

The contractor As/Tech completed the technical development of the existing mechanisms database. The database is now fully available through the Task VI Internet secure site. Access to this site is restricted to the Task VI Operating Agent, Experts and contractors.

All country Experts entered details about the mechanisms in use in their countries. At the time of writing, details of 98 mechanisms have been entered into the database. The intention is that Experts will progressively update this information.

Existing Mechanisms in Participating Countries

The Operating Agent completed the analysis of the mechanisms in the database. This analysis has been included in the first official report from Task VI: Task VI Research Report No 1: *Existing Mechanisms for Promoting DSM and Energy Efficiency in Selected*

Countries. This report has been approved for distribution by the Executive Committee members representing Task VI participants.

Mechanisms in Developing Countries

The contractor EPRI completed work on this project and a final report: Task VI Working Paper No 1: *Activities in the Development of Mechanisms for Promoting DSM and Energy Efficiency in Non-IEA Countries* has been circulated to Task VI Experts. It is not intended to circulate this Working Paper more widely.

Commercial Return Mechanisms in North America

The contractor EPRI completed work on this project and a final report: Task VI Working Paper No 2: *Status of Commercial Mechanisms for Energy Efficiency in Use or Contemplated by US Utilities* has been circulated to Task VI Experts. It is not intended to circulate this Working Paper more widely.

Classification of Mechanisms

Several systems for classifying mechanisms were developed by the Operating Agent and various Experts. Descriptions of these systems were circulated to all the Experts for discussion. At the October Experts meeting, the Experts agreed on the classification system for use in Task VI.

Development of Mechanisms

The Operating Agent prepared a preliminary list of mechanisms proposed for further development and this was circulated to the Task VI Experts for comment. The Operating Agent also prepared draft outline descriptions of three developed mechanisms and these were circulated to the Experts as examples of how mechanism development might be carried out. At the October Experts meeting, the Experts agreed on a list of mechanisms to be developed further and approved the draft mechanism description.

Detailed development of mechanisms was commenced by the Operating Agent following the October Experts meeting.

Development of Assessment Criteria

The Operating Agent prepared a preliminary list of criteria to be used in assessing the likely effectiveness of the developed mechanisms. At the October Experts meeting, the Experts agreed to this list.

Subtask VI/2: Communication of Information About the Mechanisms

Information Dissemination

The Operating Agent prepared and distributed six editions of the *Task VI Experts Newsletter*.

The contractor Verity Saunders Strategic Communication completed the following:

- revision of the Task VI publicity brochure;
- development of the Task VI Information Pack;
- updating of various elements of the Task VI public Internet web site and the Task VI Experts Internet secure site.

Internet Secure Site

The contractor As/Tech completed the technical development of the Task VI Experts Internet secure site, which now comprises:

- existing mechanisms database;
- external contacts database;
- IEA DSM Programme contacts database;
- Task VI discussion group;
- Task VI Experts Newsletter downloadable files;
- Task VI Status Reports downloadable files;
- Task VI Working Papers downloadable files;
- Task VI Research Reports downloadable files;
- sources of further information;
- software downloads links page.

Practitioners Workshops

The Operating Agent, the contractors Ressurskonsult and Verity Saunders Strategic Communication, plus various Experts commenced planning for Practitioners Workshops to be held in Europe and the Asia-Pacific in mid-1999. At these workshops the draft developed mechanisms will be presented for comment to a range of practitioners who may eventually be involved in using the mechanisms. The practitioners' comments will comprise a form of "reality check" on the practicality of the developed mechanisms.

Subtask VI/3: Public Policy Implications

The contractor Center for Resource Solutions completed Task VI Research Report No 2: *Public Policy Implications of Mechanisms for Promoting DSM and Energy Efficiency*. This report will be sent for balloting to the Executive Committee members representing Task VI participants.

The preparation of this report involved the contractor:

- categorising the different types of electricity industry structure;
- identifying the primary goals and mechanisms for promoting energy efficiency;
- identifying the barriers preventing the promotion of energy efficiency;
- assessing how mechanisms for promoting energy efficiency address barriers; and
- analysing the special role of mechanisms during the transition from one electricity industry structure to another.

Activities During 1999

Subtask VI/1: Detailed Development of New Mechanisms and Assessment Criteria

During 1999, the following work will be carried out in Subtask VI/1:

- development of mechanisms and circulation of draft descriptions of developed mechanisms to Experts for comments;
- assessment of the developed mechanisms using the assessment criteria;
- revision of the mechanism descriptions following receipt of comments from the Experts and from participants in the Practitioners Workshops;
- preparation of the final report.

Subtask VI/2: Communication of Information About the Mechanisms

During 1999, the following work will be carried out in Subtask VI/2:

- holding of the Practitioners Workshops;
- creation of a developed mechanisms database for inclusion in the Task VI Experts Internet secure site.

Subtask VI/3: Public Policy Implications

During 1999, the following work will be carried out in Subtask VI/3:

- assessment of the public policy implications of the mechanisms developed in Subtask VI/1.

Reports Produced During 1998

1. Research Report No 1: *Existing Mechanisms for Promoting DSM and Energy Efficiency in Selected Countries*
2. Research Report No 2: *Public Policy Implications of Mechanisms for Promoting DSM and Energy Efficiency*
3. Working Paper No 1: *Activities in the Development of Mechanisms for Promoting DSM and Energy Efficiency in Non-IEA Countries*
4. Working Paper No 2: *Status of Commercial Mechanisms for Energy Efficiency in Use or Contemplated by US Utilities*
5. Six editions of the *Task VI Experts Newsletter* were produced during 1998. These were circulated to all Task VI Experts and contractors plus Executive Committee members from countries participating in Task VI.

Electronic files of all these publications are posted on the Task VI Experts Secure Site on the Internet.

Reports Planned for 1999

1. Research Report No 3 on developed mechanisms and their public policy implications

Meeting Schedule

Meetings held in 1998

The following Experts meetings were held during 1998:

23rd and 24th March, Seoul, Korea

25th and 26th June, Vouliagmeni, Athens, Greece

5th and 6th October, Capenhurst, Chester, United Kingdom

Meetings Planned for 1999

12th and 13th April, Copenhagen, Denmark

27th May, South of France, Practitioners Workshop

June, Japan, Practitioners Workshop

June, Australia, Practitioners Workshop

Activity Time Schedule

Task VI was entered into force in January 1997 and shall remain so for three years.

Subtask	1997	1998	1999
VI/1 Detailed Development of New Mechanisms and Evaluation Criteria	██████████	██████████	██████████
VI/2 Communication of Information About the Mechanisms	██████████	██████████	██████████
VI/3 Public Policy Implications	██████████	██████████	██████████

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