



International Energy Agency

Implementing Agreement on Demand-Side Management Technologies and Programmes

2000 Annual Report

International Energy Agency

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

2000 Annual Report

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

January 2001

Foreword

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

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

Stockholm, Sweden, January 2001

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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 collaboration with seventeen IEA Member countries and the European Commission working to clarify and promote opportunities for Demand-Side Management (DSM).

The members are:

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

Eleven 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, EA 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:** Mechanisms for Promoting DSM and Energy Efficiency in Changing Electricity Businesses - Dr. David Crossley, Energy Futures Australia, Pty. Ltd., Australia
- Task VII:** International Collaboration on Market Transformation – Mr. Verney Ryan, BRE, United Kingdom
- Task VIII:** Demand Side Bidding in a Competitive Electricity Market – Ms. Linda Roberts, EA Technology Ltd, United Kingdom
- Task IX:** The Role of Municipalities in a Liberalised System – Mr. Martin Cahn, Energié Cités, France
- Task X:** Performance Contracting Dr. Hans Westling, Promandat AB, Sweden
- Task XI:** New Products and Services in Competitive Electricity Markets. Prof. Seppo Kärkkäinen, VTT Energy, Finland

For more information, visit the Programme's web site on the Internet:
<http://dsm.iea.org>

CHAPTER I

Chairman`s Report

**Jan Moen, Chairman
Executive Committee**

Introduction

The IEA Demand-Side Management Programme is an international collaboration with 17 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, energy efficiency, 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 eight 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

During 2000, a total of 17 countries and the European Commission were official signatories of the Implementing Agreement. The fourteenth Executive Committee meeting was held in Ankara, Turkey in April 2000 and the fifteenth Executive Committee meeting was held in Athens, Greece in October 2000.

Programme Structure

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 2000, the Programme initiated one new Task and one new subtask, and completed work on two Tasks, maintaining the total active Tasks at the end of the year to six. Of the on-going Tasks, the first, Task I, will establish and maintain an international data base on demand-side management programmes. A new subtask of Task I will develop guidelines for the evaluation of the impacts of demand-side management and energy efficiency programmes on green-house gas emission targets. Task II is unchanged. Task VII is addressing a variety of ways to transform the markets for energy efficient products. Tasks VIII and IX are exploring the role of demand-side bidding and of

municipalities, respectively, in competitive electricity markets. The new Task, Task X, addresses performance contracting as a means of providing demand-side management and energy efficiency in competitive energy markets.

Two Tasks were completed in 2000. Task III which used competitive procurement to speed up the market penetration of energy efficient products and Task VI which developed a range of practical mechanisms whereby economically justifiable DSM and energy efficiency can be incorporated into changing electricity businesses environments, such as restructured electricity utilized and competitive electricity markets.

The Programme also decided to initiate the Task Definition Phase for Task XI - New Products and Services in Competitive Electricity Markets.

A brief description of these Tasks and the expected results follows in Chapters II and III.

Participation as of December 2000

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

■ Operating Agent

● Participant

During the ExCo meeting in Athens, the representatives from those countries that appear in the above table as not participating in any of the current Tasks and who were present at that meeting, expressed their willingness to explore the interest in their country to participate in one or more of the current Tasks. It is expected that most will join one or more of these Tasks during 2001.

Achievements of the Programme

The new Task on Performance Contracting and the new Subtask on Impact Evaluation that were initiated this year, as well as the initiation of the Task Definition work on New Products and Services are responsive to the rapid 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 Current Tasks

Achievements of the Programme's work during 2000 are highlighted below. The details of these and many other accomplishments are covered in the individual Task reports in Chapter III.

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

The 220 DSM and EE Programmes that are now included in the INDEEP database have been analysed and reported on. The software developed to access the data base has been finalized. Two new subtasks were proposed; one deals with maintenance of the data base which has been approved and the second one deals with evaluation of energy efficiency programmes related to Kyoto's GHG targets which has been approved for the definition phase.

Task II: Communications Technologies for Demand-Side Management

The customer gateway hardware and software has been completed, documented and distributed to participating countries. The gateway has been demonstrated at a customer premises by the implementation of different services from different service providers. Each service used a different communication medium and protocol.

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

All work on Task III has been completed and all reports are completed and distributed to the participating countries.

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

All work on Task VI has been completed and all reports are completed and distributed to the participating countries.

Task VII: International Collaboration on Market Transformation

With a starting date of January 2000, seven countries are now participating. The Task Work Plan has been refined, a Task web site developed and a coordinated international approach to market transformation started. An IEA Award of Excellence has been presented to an advanced photocopier.

Task VIII: Demand-Side Bidding in a Competitive Electricity Market

Surveys were conducted and reported on the ways in which electricity is traded and opinions of market participants towards demand-side bidding (DSB) in participating countries. A study was launched to gather information on the potential for DSB in the domestic, commercial and industrial sectors. A Task web site was developed.

Task IX: The Role of Municipalities in a Liberalised System

The initial experts meeting was held mid-year. A common framework for studying the roles of municipalities and the impacts of liberalisation in the participating countries was agreed to. One of the two proposed internet sites and a Public Newsletter has been established.

Task X: Performance Contracting

Work on this new Task was approved to begin on 1 December 2000.

New Collaborative Work

A review of the present DSM and Energy Efficiency situation in the participating countries was conducted during the April 1999 Executive Committee meeting. At the conclusion of this review a list of possible areas for future work was developed. At the October 1999 Executive Committee meeting, five proposals for new work, based on that list, were presented to the committee for discussion.

In 2000, Task Definition work was initiated on three of those proposals. One became the new Task X and one became the new Subtask 9 of Task I. The other, dealing with New Products and Services, remains in the Task Definition Phase. This proposed new Task on Products and Services is described below.

There are several driving forces in the energy industry, including privatisation and deregulation, which are having a clear impact on DSM and energy efficiency strategies. As these changes occur, it is necessary to establish an understanding of the particular roles of utilities, government and third parties in promoting customer DSM and energy efficient services. Therefore a proposed new Task will focus on new products and services offered by utilities and the support provided by governments through the development of functioning energy markets and commercial stimulation of energy efficient products.

The main objectives of this Task will be to 1) study what kind of products and services are being offered, 2) what the impact of these products and services are having on energy efficiency and environment, 3) what kind of potential new products are coming into the market, and 4) how government can stimulate the demand for these new products and reduce any barriers.

Programme Visibility

In 2000, the Programme continued to make significant improvements and upgrades to its web site. The address is <<http://dsm.iea.org>>. All Task web sites are linked to the Programme's home page. In addition to publishing and distributing an Annual Report for the Programme, and reports on the results of the ongoing Tasks, the Programme prepared three Spotlight newsletters in 2000. Two were distributed in 2000 and the third will be issued in January 2001.

This year, the Executive Committee unanimously agreed to limit the number of years during which the availability of results from the completed Tasks can be restricted. This was done to conform with that portion of the Programme's mission that states "It is the intent of the Programme to have all Task results available to the widest audience possible". As a result of this decision and a series of votes related to Tasks I – V, the majority of those Task reports are now openly available. Plans are being made to publicize their availability on the web and in the Spotlight Newsletter. Copies will be down-loadable from the web site as well as available in hard copy from the Executive Secretary.

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. Benoit Lebot, the IEA Secretariat, who will provide you with information on how to proceed.

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ACKNOWLEDGEMENTS

The efforts of the following people continue to be essential to the Programme's success. The Operating Agents who are identified in Chapter III, the Executive Secretary – Ms. Anne Bengtson, the Advisor – Dr. Fred Morse, the Newsletter Editor – Ms. Pamela Murphy, and the Webmaster – Ms. Verity Saunders.

CHAPTER II

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

Description

Task I was originally divided into seven subtasks during the period 1994-2000. Two new Subtasks are prepared for 2001 onwards. 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 4 (finalised in 1999). This information is used for analysis and dissemination of the results, Subtask 5. Annual updates have been implemented in Subtask 6, and international promotion has been carried out as part of Subtask 7. Subtask 4 to 7 are interrelated and continue throughout the entire work plan period.

In October 2000, two additional subtasks were proposed. In Subtask 8, Maintenance of the Database, the database information will be kept up to date, expanded to include new programmes from countries around the world and the analyses will be continued. In Subtask 9, Evaluation Guidebook on the Impact of DSM and EE Programmes for Kyoto GHG Targets, a tool will be developed, tested and used to judge the sustainability results of national and regional energy programmes.

Achieved results (from the first seven subtasks)

- Analysis Report for the INDEEP data base.
- Final Report on the INDEEP data base for the years 1994-2000.
- Multi-languages database at the IEA/DSM Website.

Expected results (from the two new subtasks) include

- Updated software for the online INDEEP Database at the IEA DSM Website.
- Additional data collection on EE Programmes.
- Evaluation guidebook on the impact of DSM and EE programmes on Kyoto's GHG targets.

More information about Task I can be found on the web site:

<http://dsm.iea.org/research/project1/project1.htm>

TASK II: Communications Technologies for Demand-Side Management

Description

This Task is to assess the best available options and strategies for applying communications to DSM and customer services programmes in the Participants' countries, develop models to carry out evaluations, and specify and develop the technology 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, automated meter reading and billing, customer alarm services, customer generation management, remote diagnostics and audits. Separate subtasks have been to specify and implement in prototype form, a customer - flexible gateway, through which the identified services can be provided. A business case evaluation is in progress to identify the most likely actors to provide bundles of services and infrastructure and to assess the commercial viability. A field trial of the provision of advanced customer services is being considered. 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.

Achieved results

- Report on communications requirements for utility/customer services.
- Report on an assessment of communications technology for meeting performance criteria in pursuit of demand-side management and customer services.
- Report on an assessment of harmonised standards for communications technology which would allow system compatibility across Participating countries.
- Report on key research development, and demonstration priorities to bring emerging energy management-related communications technologies to the marketplace.
- Report on communications traffic and system costs calculation methodologies and algorithms.
- Communications and costs evaluation model - report and software.
- Report on specification for customer flexible gateway.
- Report on migration strategies from narrow to wideband communications media.
- Development of prototype, customer flexible gateway - hardware and software.

Expected results

- Report on business case assessment for the provision of customer service.

More information about Task II can be found on the web site:

<http://dsm.iea.org/research/project2/project2.htm>

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

Description

The work on this Task was completed in 1999 and the final reports submitted to the Executive Committee in 2000. Eight countries – Denmark, Finland, Korea, The Netherlands, Spain, Sweden, United Kingdom, United States - and the European Commission participated. A process for collaborative procurement actions for introduction of innovative, more energy-efficient products was developed and tested in a number of pilot projects. A clothes drier with the energy use cut by half (the first “Class A” drier on the market), electric motors with losses reduced by 20-40% and “copiers of the future”, where the energy use has been reduced down to 25%, are concrete results of the Task III international procurement collaboration. After evaluation of proposals and prototypes, the suppliers of these products received the “IEA DSM Award of Excellence”, introduced by Task III. The products are now commercially available. Two international workshops were organised during the years – in Paris 1994 and in London 1999 - each with about 80 participants. A list of lessons learned and recommendations have been drawn up. Creation of buyer groups, formulation of performance criteria and creation of mechanisms for recognition are some of the important elements in co-operative procurement efforts.

Achieved results

- Report on Co-operative Procurement - Market Acceptance for Innovative Energy-Efficient Technologies.
- IEA DSM Award of Excellence ceremony.
- IEA Drier Promotion Competition.
- IEA Hi-Motors Competition.
- IEA Copier of the Future Competition.
- Lessons learned summarised in the London Workshop proceedings and in the Final Management Report.

This Task is completed and therefore not included in the chapter on Task Reports. More information about Task III, the pilot projects and lessons learned can be found on the web-sites:

<http://dsm.iea.org/research/project3/project3.htm> and www.stem.se/IEAProcure.

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

Description

This Task reviewed and documented utility structures and integrated planning approaches in IEA-member countries. Participants performed a review and comparative assessment of government and utility power sector planning priorities in IEA-member and non-member countries with a view to their implications for the integration of DSM options into resource planning. They also compiled 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 was developed describing alternative approaches and summarising examples of how these methodologies have been incorporated. Case studies documenting successful applications from several countries were included.

Taking into consideration the factors influencing DSM in participating countries, guidelines were 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 were issues related to differences in market conditions, supply characteristics, utility structure, regulatory environments, pricing and tariff structures and government policies.

Task IV also investigated mechanisms to promote DSM and energy efficiency in new business environments. This included a critical review of mechanisms which have been used, or proposed for use, to incorporate DSM and energy efficiency into restructured electricity industries. The results were presented in three workshops and are available on the Programmes web site.

Achieved results

- Report comparing utility structures and characteristics in different countries.
- Report on 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.
- Report on existing and new mechanisms for promoting DSM and energy efficiency in new electricity business environments.

This Task is completed and therefore not included in the chapter on Task Reports.

More information about Task IV can be found on the web site:

<http://dsm.iea.org/research/project4/project4.htm>

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 modelled 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 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 carried out a pilot project for a particular small customer market. 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.

Achieved results

- Marketing methodology for implementing DSM technologies in small customer markets.
- Tools to analyse, follow-up and evaluate DSM programs in these markets, always from a marketing point of view.
- Analysis of previous DSM programs in the participating countries.
- Real pilot programmes for effective implementation of DSM technologies in such markets and analysis and evaluation of the pilot programme results.
- Reports on all these items.
- A better overall understanding of the actors in the small customer market for DSM technology has evolved.

This Task is completed and therefore not included in the chapter on Task Reports.

More information about Task V can be found on the web site:

<http://dsm.iea.org/research/project5/project5.htm>

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

Description

The objective of Task VI was to develop mechanisms for promoting the implementation of demand-side management (DSM) and energy efficiency in changing electricity businesses, such as in restructured electricity industries and competitive electricity markets.

During the Task, 99 existing mechanisms already in use in the countries participating in Task VI were identified and described. Twenty-five mechanisms were developed in detail and reviewed by practitioners who may be involved in using the mechanisms. The effectiveness of the developed mechanisms was assessed against a range of criteria.

Four types of mechanisms were developed:

Control Mechanisms – these are used to direct energy businesses to change behaviour;

Funding Mechanisms – these provide funding for other mechanisms;

Support Mechanisms – these provide support for behavioural changes by end-users and energy businesses;

Market Mechanisms – these enable the use of market forces to encourage behavioural changes by end-users and electricity businesses.

Task VI also identified the public policy goals and objectives which governments may seek to achieve through the reform and restructuring of the electricity industry. It analysed how the effectiveness of mechanisms in promoting DSM and energy efficiency is influenced by different structural models for the electricity industry. Effectiveness was judged by analysing the effects of different electricity sector structural models on the mechanisms, and by reviewing the barriers to the implementation of DSM and energy efficiency which were addressed by the mechanisms.

The developed mechanisms were subjected to review by a range of relevant practitioners through a series of Practitioners Workshops held in Australia, France and Japan. The purpose of the Practitioners Workshops was to present preliminary summaries of the mechanisms developed in Task VI for comment by a range of practitioners who may be involved in using the mechanisms. The Practitioners Workshops were designed to provide a “reality check” on the practicality of the developed mechanisms.

The products from Task VI constitute a comprehensive catalogue of information on incorporating DSM and energy efficiency into restructured electricity industries. The products will be of immediate practical use to government policy makers, industry regulators, electricity business managers, and analysts and commentators on the electricity industry.

Achieved results

The major products from Task VI comprise:

- three Task VI Research Reports;
- two Task VI Working Papers;
- a database of 99 existing mechanisms for promoting DSM and energy efficiency;
- a database of 25 developed mechanisms for promoting DSM and energy efficiency.

All the Task VI products are available on an internet web site. Access to this site is at present restricted to the Task VI participants. The participants have decided that the products will be publicly available in August 2001. Public access will be made available through the internet web site of the International Energy Agency Demand-Side Management Programme at:

<http://dsm.iea.org/research/project6/project6.htm>.

This Task is completed and therefore not included in the chapter on Task Reports.

More information about Task VI can be found on the web site:

<http://dsm.iea.org/research/project6/project6.htm>

Task VII: International Collaboration on Market Transformation

Description

The need to meet Kyoto targets and to reduce greenhouse gas emission through greater energy efficiency provides the driving force behind the Market Transformation Task. Utilising the forces of the market and transforming those markets to better respond to energy efficient products helps to contribute to a more sustainable path whilst still maintaining a future vision of economic prosperity. In the broadest sense the Task is expected to facilitate a new approach to market transformation in order to bring about the changes that are required in international markets so that new energy efficient technologies penetrate the market and start to achieve their true potential. If successful, the Task will contribute significantly to the accelerated take up of energy efficient technologies in the market place and will assist in the conservation of energy and reduction in the emissions of greenhouses gases.

The Task will:

- Increase the market share of today's energy-saving products and practices
- Accelerate the use of the most efficient new technologies in order to reduce the use of energy and other primary resources, thereby reducing the emission of greenhouse gases and other potentially harmful pollutants.
- Provide an on-line forum for exchange of Market Transformation information

One important aspect will be the deeper involvement of retailers – both in the formulation of key criteria that will accelerate the acceptance of energy efficient products, and intensified targeting of the most appropriate methodology that will lead to an increase in sales. The involvement of multinational chains of distributors and retailers with business in a wide range of participating countries will be key to this process.

Expected results

- Shared knowledge of international approaches to market transformation
- Access to information about best practice and lessons learned in market transformation
- Access to, and contacts with, a wide variety of participating countries from which to draw project partners
- A conference dealing with Market Transformation and sharing international perspectives

More information about Task VII can be found on the web site:

<http://dsm.iea.org/research/project7/project7.htm>

Task VIII: Demand Side Bidding in a Competitive Electricity Market

Description

The objective of Task VIII is to evaluate and promote demand side bidding (DSB) as a means of improving the efficiency operation of the electricity supply chain. DSB is a mechanism that enables the demand side of the electricity market to participate in energy trading. More specifically, DSB allows electricity consumers to offer a specific reduction in demand, at a given time, in return for a specified income.

DSB can improve the efficiency of the electricity supply chain by increasing competition in the wholesale energy market and acting as an alternative to conventional generation. For example, DSB can be used to balance electricity supply and demand and also maintain the quality and security of supply. In addition, DSB can have important environmental and energy efficiency benefits in some situations when it is used as an alternative to conventional generation.

The Task will:

- Evaluate and promote DSB as a means of improving the efficiency of the electricity supply chain and global environment
- Examine current DSB mechanisms and assess their strengths and weaknesses
- Identify the main barriers to DSB and assist in their removal through the provision of practical guidelines for the development of new schemes and enhancements to existing ones.

Expected results

- Characteristics and role of DSB in the electricity industry in each country participating in the Task
- Potential market for DSB in each participating country
- Guidelines on the ability of specific customer types to participate in DSB and their opinions on participation
- Report aimed at potential demand side bidders on the different types of DSB and the necessary control and monitoring technology for participation
- Practical guidelines on the technical rules for DSB
- A best practice report for the development or improvement of DSB schemes.

More information about Task VIII can be found on the web site:

<http://dsm.iea.org/research/project8/project8.htm>

Task IX: The Role of Municipalities in a Liberalised System

Description

This Task will investigate how the roles of local authorities in demand side management are affected by a liberalised market and in the light of these changes and examples of good practice, to prepare guidelines for improving the local authorities' service delivery in this field. Demand side management includes action to improve energy efficiency, load management and action to reduce CO₂ emissions by energy substitution. Local authority activities in this field will be assessed for replicability, choice of targets, its effectiveness in producing long term results, response to social and political needs, response to conditions of the liberalised market and the likelihood of resources and financing being found on a long term basis. The Task will provide an up to date view of municipal action in the participating countries and the likely results that can be expected from such action.

The Task will:

- Identify municipal roles and practices in DSM activity within the context of their national energy scene and evaluate their effectiveness
- Evaluate the impact of liberalisation of energy markets and identify how municipalities can respond to this
- Define priorities for municipal action on DSM
- Make recommendations how municipalities can improve their service delivery on DSM both in-house and to third-parties
- Propose an action guide relating to DSM at municipal level, presenting common factors and specific features and to illustrate this with examples.

Expected results

- Report on the roles and responsibilities of municipalities in the energy field and the participating countries role in promoting energy efficiency
- Report on different approaches to liberalisation and their impact on energy efficiency activity in participant country, which will form the basis of an assessment of the situation faced by municipalities
- Report on best practice projects to promote energy efficiency which have been introduced by municipalities and action introduced in response to liberalisation
- Recommendations for guidelines at national and local levels regarding the role of municipalities in DSM and how the current restructuring process affects the role that they can play
- Publication of an action guide on local authority practice on energy efficiency including specific guidelines and recommendations and illustrated by practical examples

More information about Task IX can be found on the web site:

<http://dsm.iea.org/research/project9/project9.htm>

Task X: Performance Contracting

Description

The objective of this new work is to facilitate the use of performance contracts and other energy service company (ESCO) contracts. Performance contracting is a well-established mechanism for promoting the installation of energy efficient building equipment and systems. For example, facility owners and energy service contractors use this method to retrofit equipment to save money on building operations. The savings in energy bills due to the installation of this more energy efficient equipment is then shared between the facility owner and the ESCO under the terms of the agreement they entered. In this scenario, the ESCO has taken on the project's performance risk by guaranteeing a specified level of energy savings. Its compensation for this risk is directly tied to achieving savings. The financing for such a project could come from the ESCO, the equipment supplier or a third-party company.

Reasons why a property owner may enter into a performance contract vary. It could be a financial reason – a property owner may lack the money to invest in new equipment. It could be a business strategy – a property owner only wants to pay for the equipment once the value-added functions, such as reduced energy bills, are demonstrated. For an ESCO, the motivation could be that it provides another way to connect with customers and initiate new business relations. For some companies and government organizations, performance contracts can be used to inspire innovations and encourage the use of more energy efficient equipment.

Expected results

By building upon the experiences of those countries familiar with performance contracting, such as Canada, the United States and some European countries, and listening to the needs of countries that are developing such systems, the Task Experts will:

- Provide a better understanding of how performance contracts and other ESCO financial options and services can be used.
- Outline the benefits of performance contracting and their potential to promote energy efficiency and mitigate global climate change.
- Outline the regulatory and legal context for such contracts to function.
- Identify the market potential in countries that lack a mature performance contracting industry.
- Identify and share information on potential barriers and problems associated with implementing these contracts.
- Share success stories and solutions to problems that may arise.
- Formulate definitions of different types of performance contracting.
- Identify solutions and schemes on how to find suitable ESCOs and how to improve the tendering process.

More information about Task X can be found on the web site:

<http://dsm.iea.org/research/project10/project10.htm>

Task XI: New Products and Services in Competitive Electricity Markets

Description

The focus of this new Task is on commercial DSM and energy efficiency products and services that are offered by utilities in competitive electricity markets. The Task will address the situation where utilities are moving to compete for electricity sales with each other and with new entrants like ESCOs. The main emphasis of this Task is on products and services that are primarily related to DSM and energy efficiency, but integrated products where DSM and EE are of secondary consideration will also be addressed.

The Task will:

- Study the kinds of DSM and energy efficiency products and services that are being commercially offered by different businesses in competitive markets.
- Clarify why and how these new products and services are offered (utility strategies);
- Assess their effects on energy efficiency and the environment.
- Study potential new products that will enter the market on the basis of existing pilot projects.
- Study how the government or regulators can stimulate the demand for these products and reduce market barriers.
- Communicate the results.

The work will be divided into two Phases. Phase One will concentrate on the analysis of the existing products and their effects on energy efficiency and the environment. Phase Two will address new products and their entry into the market.

Expected results

From Phase One:

- Summary report of products and services, with selected product descriptions.
- The detailed information on the collected products and services will be included on the secure Internet site of this Task. A short description of these products and services will be available on the public Internet site of this Task
- An analysis report describing what types of existing commercial products and services are most favourable from a DSM and energy efficiency point of view, how products and services are developed and delivered to customers, what the main barriers in product and service development, delivery and acceptance are, and how government is involved in the promotion of commercial products.

The specific results of Phase Two will be defined later.

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.

In the year 2000, the possibility of adding two new subtasks was raised. One new subtask would pertain to maintenance of the data base and the other would be to develop an evaluation guidebook on the impact of DSM and EE programmes related to Kyoto greenhouse gas targets.

Progress

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.

Table 1**Subtasks for Task 1**

Subtasks	Main activities	Main period
1: Programme Identification	Develop survey questionnaire; Implement survey; Identify programmes; conduct workshop	Year 1
2: Design Planning	Determine data to be collected Develop Data Collection instrument and definitions Pre-test and evaluate DCI	Year 2
3: Design Database	Select software package Start software development	Year 3
4: Data Collection and Entry	Collect data using the DCI Quality control on entered data	Year 2 to 6
5: Data Analysis and Report	Analyse the first 100 entries Prepare a report including lessons learned Dissemination of information Analyse the final set of programmes	Year 2 and 3 Year 7
6: Updates to Database	Update existing data Add new data Improve software Finalise software	Year 3 to 6 Year 7
7: Promotion and Marketing	Prepare and distribute information material Present INDEEP at conferences and workshops	Year 1 to 7
8: Maintenance of the database*	Collect new and update data Software update Promote the database and distribute information Analysis the database Prepare a marketing for the period after 2002	Year 8 and 9 Year 9
9: Evaluation guide-book for GHG**	Combine existing knowledge and experiences Finalise and promote a draft guidebook	Year 9 and 10

* under discussion

** in Task Definition Phase

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 and the Internet chosen. The fifth year has seen the development of the Internet software for the INDEEP database, as well as a discussion on the future of the database from 2000 onwards.

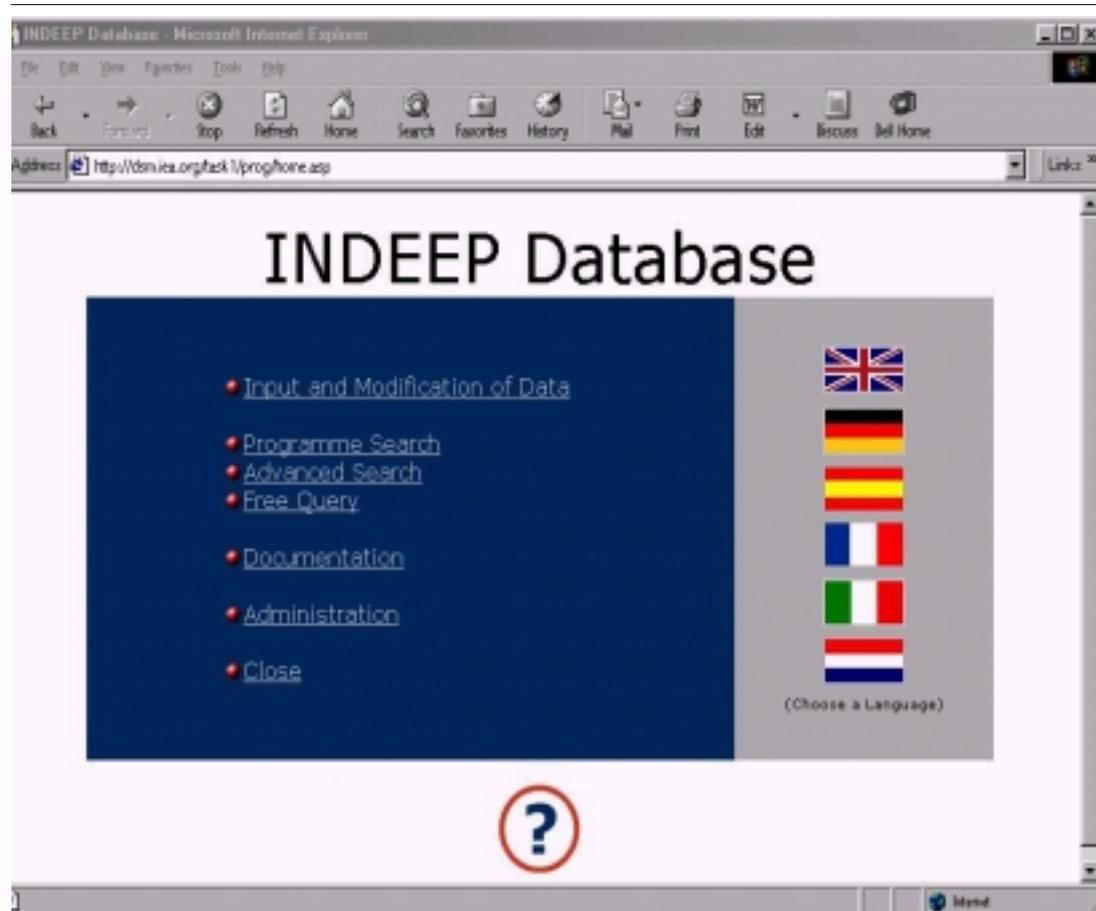
In the year 2000 the development of this international database was finalised and a project management report as well as an analysis report were presented to the Executive Committee.

Table 1 shows the seven Subtasks for the development phase of the INDEEP project, their main activities and periods. This table includes the two new Subtasks that are under discussion.

Activities completed in 2000

- Finalising the INDEEP software
- Additional data collection and quality improvement
- Analysis of the data.

Figure 1: Opening screen INDEEP database on Internet



INDEEP software

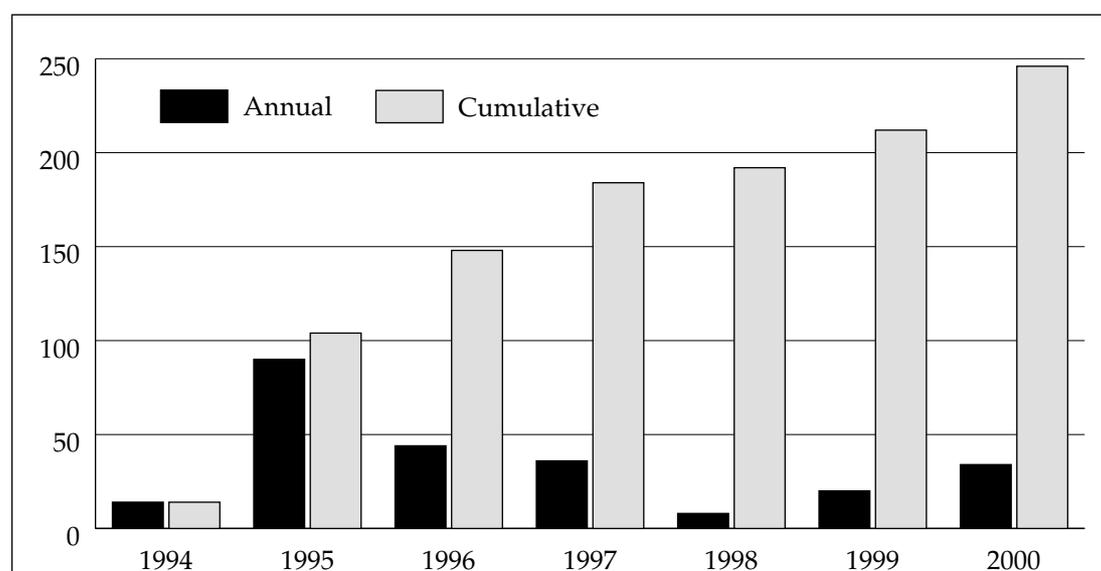
The software development for the INDEEP database on the Internet was finalised. The database is accessible on the IEA DSM Website and it starts with a menu (see figure 1) and on the right side of it country flags. The default language is English. If another flag is selected, the screens show up in that language (Spanish, Italian, German, French and Dutch).

The option '**Advanced search**' gives the possibility to use all field (excluding fields summary and lessons learned; for these the option 'free query' is available) that are on the DCI to search the database. We organised the fields in four groups:

- general: country, implementing agent, contact name, programme status, and evaluation status;
- energy related: energy objective, energy source affected, energy goals, and energy savings
- marketing related: participants; customer group, non-customer group, marketing instruments, marketing methods, and reason for selecting the programme;
- others: programme type; appliance sales, technology, cost, and period or year.

The INDEEP database holds information in the fields summary and lessons learned that are in text. These fields can be searched using the '**free query**' option. After typing in text, the top 20 answers show up with the number of hits, and for each programme the DCI-number, country, programme name, and the summary of that programme. After selecting one of the programmes one can choose a presentation form.

Figure 2: Collected INDEEP programme data 1994–2000

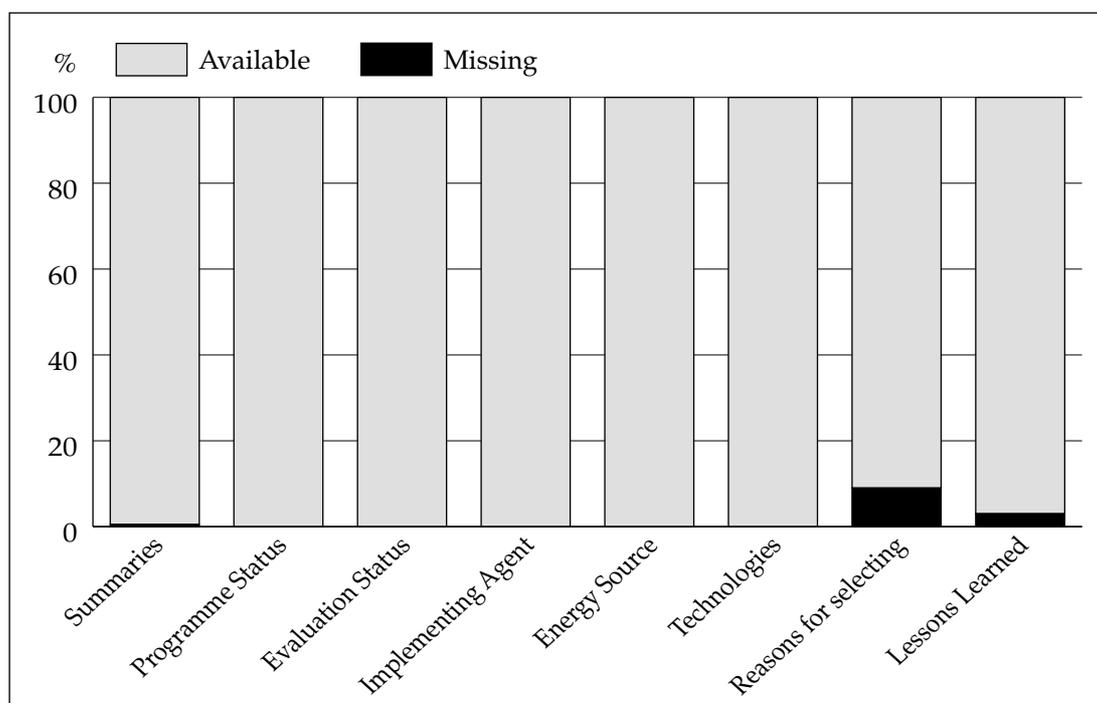


Data collection and quality improvement

In 1994 the data collecting process started by compiling information from 14 programmes. During the period 1995-2000, the country experts and the Operating Agent supplied data on additional programmes, each recorded in the standard four-page DCI form. Early in the year 2000, the data collection was finalised with 11 programmes from Denmark, 9 from the Netherlands, 3 from Brazil and 11 from Germany. The data collecting process resulted in 246 programmes. For some of the programmes, the data supplied was too minimal to be included in the database, and some of the programmes from the second year had to be deleted, due to the raised level of minimum quality. By September 2000, the INDEEP database included 220 programmes. Figure 2 shows the programmes added to the data base each year between 1994 and 2000 (light shade) and the cumulative total (dark shade).

From the beginning a quality check was included in the process of collecting data, but no automatic control was included in the software. National experts did data consistency control; this refers to the logical relation between values, as a participation ratio cannot exceed 100 %. The minimum information on a programme to be included in the database is: Implementing Agent; Programme name; Programme summary; Energy sources and Programme status. Figure 3 shows that almost all programmes in the database meet this minimum.

Figure 3: Available data for programmes in the INDEEP database, related to minimum quality level

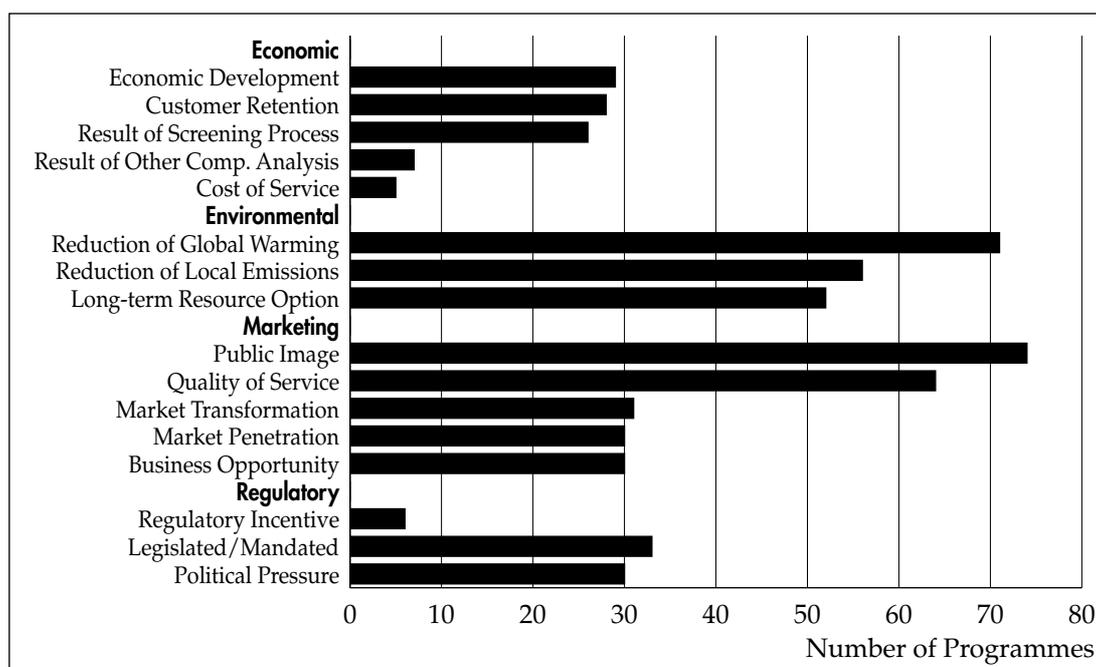


Data analysis

The analysis on INDEEP 2000 is not yet a publically available report, but is available to the countries participating in the Task. Some highlights from the analysis are :

- The main objective for nearly all programmes is energy efficiency and electricity consumption is affected by 90% of the programmes.
- The programmes are spread over a wide variety of programme types and in average a programme is placed in two programme types. The majority of programmes are characterised as general information, site-specific and installation of conservation.
- The programmes are also implemented for a wide range of reasons. In general image/service and environmental concerns are the main reasons that agents such as governments and utilities implement DSM programmes. In figure 4 the reasons for selecting a programme are presented. It should be kept in mind that each programme can have up to five reasons.

Figure 4: Reason for selecting DSM programme; INDEEP database September 2000



Activities planned for 2001

At their meeting in October 2000, the Executive Committee discussed the two new Subtasks. Only a small number of countries were at that moment willing to participate in the Subtask on maintenance. A majority of the Executive Committee members agreed to consider participation even if they were not involved in the earlier Subtasks. Early in 2001 it will be clear how many countries will participate in the maintenance subtask.

At that meeting, enough countries stated their interest in the Subtask dealing with evaluation for the Executive Committee to approve the start of the Definition Phase. An Experts meeting to prepare the subtask work plan will be held in February 2001 with Executive Committee approval anticipated in May 2001.

Involvement of industry and other organisations

Each national expert is responsible for contacting utilities and governmental agencies within their country, to assess general DSM information needs and the specific need for (and usefulness of) an international database on energy efficiency programmes. The experiences from the project were used as input for an European Union SAVE programme (related to evaluation) and presented as an interesting future tool for DSM strategy and policy in Slovenia.

Reports produced in 2000:

1. INDEEP database, multi languages
2. How to use the INDEEP database
3. INDEEP database technical documentation
4. INDEEP second analysis report "INDEEP Analysis Report 2000"
5. INDEEP final report on developing an international database
6. "Final report developing INDEEP 1994–2000"

Meeting schedule

Meetings in 2000:

11 and 12 September 2000, Lund, Sweden

Meetings planned in 2001:

February 2001 (Subtask 9 Experts), the Netherlands.

June 2001 (Subtask 8 Experts), France

Activity time schedule

Task I came into force on 1 May 1994 and will continue until 1 May 2003.

Activity	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1. Programme Identification (participating countries)	■	■	■							
Additional programmes (including non-participating countries)		■	■	■	■	■				
2. INDEEP design planning Data Collection Instrument		■	■	■	■					
3. Design Database		■	■							
4. INDEEP data collection & entry		■	■	■	■	■	■			
5. INDEEP data analysis and report preparation				■	■	■	■			
6. Updates to the Database			■	■	■	■	■			
7. Promotion and Marketing		■	■	■	■	■	■			
8. Maintenance and update								■	■	■
9. Evaluation Guidebook for GHG								■	■	■

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Task II: Communications Technologies for Demand-Side Management

Operating Agent: Richard Formby, EA Technology, United Kingdom

Objectives

This Task is to assess the best available options and strategies for applying communications to DSM and customer services programmes in the Participants' countries, develop models to carry out evaluations, and specify and develop the technology 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, automated meter reading and billing, customer alarm services, customer generation management, remote diagnostics and audits. Separate Subtasks have been to specify and implement in prototype form a customer, flexible gateway through which the identified services can be provided. A business case evaluation is in progress to identify the most likely actors to provide bundles of services and infrastructure and to assess the commercial viability. A field trial of the provision of advanced customer services is being considered.

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.

Progress

Different countries and different parts of a country have different requirements, different criteria and different stages of development in the application of energy related services and competitive markets. The level of sophistication of the available and developing communications technologies is also important in these differences. This Task has examined available standards and codes of practice for software, hardware, communication protocols and interfaces, as well as relevant international standards. The intention is to develop and promote best practice in meeting different national needs and to derive value judgements on communications systems and technologies that offer cost effective solutions to energy management and services deployment.

The Task has defined the climate for the application of energy management and services which could use Customer/Service Provider communications within each participating country. It has also defined Customer services 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, Utilities, and Services Providers. The study has collected information from each participating country and defined 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 supplying a developing services market. A schematic diagram illustrating some of the more advanced energy related services and one of the communication buses in customer premises is shown in Figure 1.

The Task has developed methodologies and models to link the data exchange need in order to implement bundles of services to the communications media capabilities to transfer the information for a population of customers. This has enabled multiple media communications hierarchies such as telephone, power line and radio communication to be constructed which utilise the potential of each medium in the most efficient and effective way from the point of view of complexity, reliability and security. The models have also enabled the costs of technically viable communication solutions to be quantified. Field trial evaluations using the models have been carried out by four participating countries.

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

An important requirement in order to assist in the development of a dynamic market for the provision of customer services is a multi media and multi protocol communication gateway. This will future proof investment in communications at customer premises. A Subtask to specify the flexible gateway through which to provide identified customer DSM and other services has been completed with the participation of six countries. The design allows different media and protocols to be handled on both sides of the gateway in order to accommodate future expansion of media and services.

A Subtask to evaluate possible routes for using wideband communication media, developed for entertainment, internet and computing purposes, to implement narrowband utility services has been completed and reported. The project is a collaboration among six countries.

A new Subtask to implement the flexible gateway in prototype form to the agreed specification has been completed and the gateway demonstrated using two applications. The demonstration prototype uses the telephone network as the external to the premises communication medium. The media used inside the customer premises are power line and twisted pair which use LON and Mbus protocols. Expansion to other media and protocols both inside and outside customer premises can be readily accommodated.

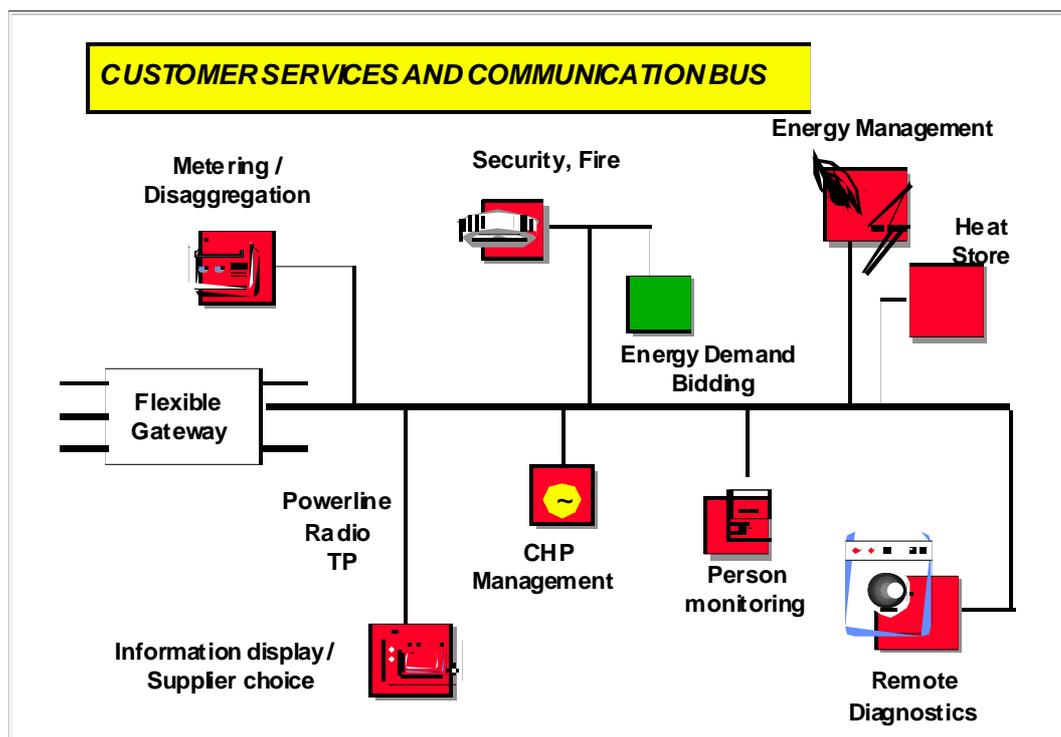
Before any wide scale implementation and roll-out of customer services and communication infrastructure can be considered, the business case must be positive. An evaluation of the business case for providing services is in progress. This is being carried out by estimating the costs of implementing bundles of specific services using different technologies, identifying who the beneficiaries of the services are and the income which may be generated from the provision of the services. This project will be completed in March 2001.

In order to prime the market and develop routes for providing customer services, a field trial of services and technology is needed. This requires involvement of manufacturers, infrastructure providers, services providers and technology providers. The DSM Agreement Executive Committee have approved the concept of a field trial project to

achieve these objectives and promote routes to the exploitation and achievement of energy related services in the market place. The results of the business case evaluation will be used to influence the implementation strategy for field trials in partner countries proposed for 2001.

All customers are potential participants in energy and related services using communication. Bundles of services will be targeted at specific customer groups using the most appropriate communication infrastructure and managed by a service provider company.

Figure 1



Activities completed in 2000

- Gateway Hardware and Software: Subtask 9, hardware and software design and development have been completed and a Prototype Gateway produced.
- Gateway Documentation: Subtask 9 deliverables of full documentation of the Gateway electronics and software and an actual Flex Gate delivered to each participating country.
- Exploitation Agreement: A draft licence agreement has been agreed by Experts and participating ExCo members which transfers FlexGate exploitation rights to participating countries.
- Gateway Demonstration: A witnessed demonstration of the Gateway dealing with LON and Mbus Protocol applications using powerline and twisted pair and being linked to separate service providers via the telephone network, was carried out on 4 and 5 September at the Experts meeting.
- Commencement of Project: To carry out an overview business case evaluation of the costs and benefits of the provision of energy and other services to customers.

Activities planned for 2001

- The Business Evaluation Project: The Business Evaluation project is started in December 2000 and will be completed by March 2001.
- Obtain Support for Field Trial Definition Project which will: Define the benefits, objectives and scope of the trials in each country and estimate the costs.

Involvement of industry and other organisations

The collection of information about Customer 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. The Gateway implementation project directly involves manufacturers from several countries. Exploitation of the technology and implementation and development of services will involve many industrial and service provider partners.

Reports

Reports produced in 2000:

Report on Gateway Detailed Specification and Application Note

Reports planned for 2001:

Report on Business Evaluation of Services

Meeting schedule

Meetings in 2000:

5–6 March, Tweed Heads, Australia

4–5 September, Chester, UK

Meetings planned in 2001:

5–6 March, Chester, UK

Activity time schedule

Task II was entered into force on 1 October 1993, and was extended by the addition of two new Subtasks to a total duration of three and a half years i.e. 31 March 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 using wideband communication channels for Customer services commenced in March 1998. A Subtask to implement the design of a flexible customer gateway, specified earlier, started in July 1999. A business evaluation of the provision of customer services commenced in December 2000 with completion planned for March 2001. A field trial of customer services provision is being considered for commencement in 2001.

Activity time schedule

Activity	1993	1994	1995	1996	1997	1998	1999	2000	2001
Customer/Utility needs		—							
Communications Technologies		—							
Relate needs and Communications			—						
International Standards			—	—					
R&D Priorities				—	—	—			
Costing Model				—	—				
Communications Model						—	—		
Customer Gateway Specification						—			
Wideband Communication Strategy						—			
Customer Gateway Implementation							—	—	
Business Evaluation of Services									—

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Task VII: International Collaboration on Market Transformation

Operating Agent, Verney Ryan, BRE, United Kingdom

Objectives

The need to meet Kyoto targets and to reduce greenhouse gas emissions through greater energy efficiency provides the driving force behind the new Market Transformation Task. Utilising the forces of the market and transforming those markets to better respond to energy efficient products helps to contribute to a more sustainable path whilst still maintaining a future vision of economic prosperity.

Specific objectives of this Task are to:

- Increase the market share of today's energy-saving products and practices.
- Accelerate the use of the most efficient new technologies in order to reduce the use of energy and other primary resources, thereby reducing the emission of greenhouse gases and other potentially harmful pollutants.

One important aspect is the deeper involvement of retailers and marketing – both in the accelerated acceptance of energy efficient products, and intensified targeting of the most appropriate methodology that will lead to an increase in sales.

The Market Transformation Task has three main areas of work:

1. Market Transformation integrated Policy and Programmes development - developing a co-ordinated international approach to Market Transformation
2. Market Transformation Marketing - developing marketing based actions to deliver Market Transformation
3. Promoting Advanced Products Approach - using procurement, requirements, specifications and other tools in a targeted way to deliver Market Transformation.

Progress

Most work to date within Task VII on Market Transformation has concentrated on developing the programme of work and co-ordinating participating country interests in order to deliver effective action projects. Six experts meetings have been held over the last year resulting in several Subtask proposals and a refined programme of work. The original 6 interested countries have now been joined by Korea, taking the total number of countries involved in the Task to seven. The greater involvement of marketing experts within the Task is resulting in some exciting prospects for increasing the role of marketing within the set of tools required for effective Market Transformation. Three of the five Subtasks are underway with commencement of the additional two Subtasks on market research and the Market Transformation Forum expected shortly.

A brief synopsis of important areas of work is outlined below:

Subtask A: Defining the Market Transformation programme

This part of the programme is concerned with the development of an internationally coordinated Market Transformation model that would help to inform policy, engage with the marketplace and deliver actions. The aim is to develop a robust and transparent approach to Market Transformation activities, and to provide the first international coordination on a policy approach to Market Transformation. An initiative led by the UK and the Netherlands hopes to align individual Market Transformation approaches in each country and collaborate on a unified Market Transformation approach to be used as a model for other interested countries.

Subtask B: International Market Research on Energy Efficiency – Market Transformation through Branding Energy Efficiency as A Positive Lifestyle Choice

Energy efficiency is low or non-existent in the consumer's hierarchy of needs when deciding between competing consumer products. The work undertaken by the Task suggests that energy efficiency is not dominant in purchasing decisions because few consumers, if any, have ever been professionally exposed to marketing and branding of energy efficiency as a positive consumer choice.

A common market research study will allow the Task to identify the differences of value patterns in participating countries and will develop a common means of communication. The research will provide invaluable information needed for talking to the market actors about 'selling' energy efficiency as a concept. The Task aims to produce a definitive set of international target audience values and aspirations regarding energy efficiency branding. This information will be of benefit to energy efficiency promoters as well as valuable to the multinational producers and marketers of energy efficient products.

Subtask C: Market Transformation Workshop and Forum

The Synergy Workshop

A series of brainstorming sessions on Market Transformation will be held in each participating country aimed at informing and invigorating the debate about the promotion of energy efficiency. The results of these facilitated meetings will be brought together in a one-day synergy symposium planned in 2001. This is intended as a showcase for best practice and lessons learned in Market Transformation and provides an opportunity for targeting a way forward for the future of Market Transformation activities – an answer to the challenging questions facing the energy efficiency community in today's marketplace.

Senior-level International Forum

The first of its kind ever held for energy efficiency, the Forum will involve senior industry players, marketing specialists and government policy makers in a two day discussion highlighting the critical success factors required for a step change in energy efficiency promotion and popular culture. This Forum is aimed at the top influential marketers and politicians in a unique meeting that will highlight the importance of a radical new approach in energy efficiency policy, marketing and delivery. Chaired by a prominent personality, this Forum promises to engage industry, the media and the public on a scale not yet achieved in energy efficiency circles.

Subtask D: Website and Communication

A series of brief Market Transformation case studies has been placed on the IEA DSM site. These incorporate a short outline of the project and link to the case-study website. Additional work has been undertaken setting up a Task information sharing system and email group.

Subtask E: Promoting Advanced Products

Importantly in this Subtask work continues on the copier of the future competition with a winner announced in the last round. The high profile award ceremony, attended by the president of the winning company and the IEA, resulted in press coverage which dubbed the IEA DSM award the 'Nobel Prize' for energy efficiency. Further work continues on the LED procurement project following a seminar in Amsterdam. A Subtask proposal plan has been finalised and work is underway in assessing new projects under this Subtask.

Activities completed in 2000

- Developed a co-ordinated international approach to Market Transformation
- Realized greater involvement of marketing experts in the Task
- Developed a refined Task Work Plan and several subtask proposals
- Presented the IEA DSM Award of Excellence for an advanced photocopier procured in Subtask E
- Completed the design of the Task website and group information sharing approach
- Produced several country specific Market Transformation case studies
- Presented a paper on the Task at the IEA and World Energy Council Congress in Ankara, Turkey
- Held six experts meetings where shared knowledge of international approaches to market transformation.

Activities planned for 2001

- Development of a revolutionary approach to marketing energy efficiency based on new research and action projects.
- An international Forum yielding the latest market transformation approaches and sharing international perspectives.
- A co-ordinated and co-operative international approach to market transformation that yields effective market changing results.
- Regular briefings on current practices and latest knowledge of Market Transformation practice.
- A possible new subtask on market transformation for standby power in various devices
- A wider involvement of industry in the task including multinational manufacturer and retailer chains

Reports

Reports produced in 2000:

Development of a dedicated area of the website for exchanging case studies

Reports planned for 2001:

A report on Market Research

Meeting schedule

Meetings in 2000:

26–27 January, Watford, UK

13–14 April, Utrecht, Netherlands

19 June, Oslo, Norway

26 September, Naples, Italy

11 December, Copenhagen, Denmark

Meetings planned in 2001:

March, London, UK

May, Finland

Activity time schedule

Task VII came into force in January 2000 and shall remain active until January 2002 unless an extension to the Task Activities is required

Subtask	1999	2000	2001
Subtask A: Defining the Market Transformation Programme and detailed project planning	■	■	■
Subtask B: Market Transformation Market Research		■	■
Subtask C: Market Transformation Workshop and Forum		■	■
Subtask D: Market Transformation Website and E-mail list server		■	■
Subtask E: Promoting Advanced Products	■	■	■
Subtask F: Standby Power			■
Subtasks G – [...X,Y,Z]: Additional Subtasks			■

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TASK VIII: Demand Side Bidding in a Competitive Electricity Market

Operating Agent: Linda Roberts, EA Technology, United Kingdom

Objectives

The objective of Task VIII is to evaluate and promote Demand Side Bidding (DSB) as a means of improving the efficiency operation of the electricity supply chain. This aim will be fulfilled by evaluating the characteristics, strengths and weakness of existing DSB schemes and creating guidelines for the development and enhancement of new schemes.

Progress

The initial work programme for Task VIII involved identifying the characteristics and function of all the different types of DSB products that could be traded, irrespective of whether they are traded in practice. This work revealed that there are four main categories of DSB products:

- DSB for electricity balancing
- DSB to maintain quality of supply
- DSB to solve network constraints
- DSB for price setting in wholesale markets

The main difference between each of these products is the time at which the bids are scheduled, which refers to the length of notice a demand side bidder is given before they must execute their bid. The scheduling time frame also affects the type of control and monitoring mechanisms that are required by a bidder of each product. There are three main scheduling time frames, which relate to 'months ahead of trading', 'day ahead of trading' and 'within day trading'.

Surveys have been conducted in each participating country to obtain an overview of the way in which electricity is traded together with the opinions of market participants towards DSB. In particular, information was gathered from the market operator, the system operator, the transmission network company, the regulator and a supplier in each country. The results of the survey, which are included in the report 'Market participants' views towards and experiences with demand side bidding', showed that although many different DSB products are currently available, only a few schemes can be considered to be operating successfully. DSB for the provision of ancillary services to the System Operator is the area where DSB is most successful. However, few products are operating in electricity spot or balancing markets.

The surveys show most market participants view DSB favourably, mainly due to the fact that it increases the number of available products in the market and improves market liquidity. In addition, the results highlighted that there are several critical barriers to DSB, which range from technical issues to ignorance.

Having identified the current state of play regarding DSB in each participating country, the work programme has turned towards an analysis of the potential scope for DSB in

each country. In particular, a market survey is being completed to gather information on the potential for DSB in the domestic, commercial and industrial sectors. This survey will include data on the electrical loads available for DSB in the different sectors, the potential level of load reductions that might be feasible and the approximate financial value associated with DSB. This work is complemented by a consumer survey, which is aimed at providing information from individual consumers on their ability to participate in DSB and their perception of DSB.

From the work that has been completed, it is evident that there are still several major barriers preventing the demand side of the electricity market from actively participating in the balancing of electricity supply and demand and the maintenance of quality and security of supply. Therefore, it is apparent that there is still further work to be completed in promoting and developing DSB as a means of creating an efficient electricity supply chain. Initial discussions with the participants in this Task has revealed a desire to move the work programme forward by identifying the necessary technical rules for different DSB products in order to develop guidelines for developing and enhancing DSB schemes. In addition, it is evident that further work is required on the necessary monitoring and verification of bid delivery and the specification of control strategies for different types of customers and electrical processes.

Reports

Reports produced in 2000:

- Market Participants' Views Towards, and Experiences with, Demand-Side Bidding.

Reports planned for 2001:

- Summary report on the market for DSB and its potential participants in each country involved in Task VIII
- Detailed report documenting the results of the market and customer surveys completed by each Expert from the countries participating in Task VIII
- Report providing practical guidance to potential DSB participants

Meeting schedule

Meetings in 2000:

16–17 March, Madrid, Spain

19–20 June, Trondheim, Norway

2–3 November, Chester, UK

Meetings planned in 2001:

8–9 March, Chester, UK

Activity time schedule

Task VIII came into force in January 1999 and shall continue until April 2001. At the Task VIII Experts meeting held in November 2000 it was agreed that a third stage to the project should be proposed to the Executive Committee to address the need for further work. This proposal will be made in April 2001.

Activity	1999	2000	2001
Stage 1 Survey of organisations to find the current practice of DSB and opportunities for DSB			
<i>Subtask 1 General definitions and project commencement</i>	—		
<i>Subtask 2 Survey of DSB participants (except for consumers)</i>	—		
Stage 2 Survey of customers and technologies			
<i>Subtask 3 Market and customer surveys</i>		—	
<i>Subtask 4 Survey of technologies</i>		—	
<i>Subtask 5 Stage 2 final report</i>			—

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Task IX: Municipalities and Energy Efficiency in a Liberalised System

Operating Agent: Martin Cahn, Energie-Cités, France.

Objectives

Energy efficiency activity has been identified as one of the main potential casualties of market liberalisation and this is felt to be a key problem by local authorities and others. There is a tendency for energy producers, traders and distributors to concentrate into large conglomerates which compete with traditional local authority utilities. While profitable energy efficiency activity is integrated into the services offered, there is a retreat from promoting energy efficiency to the small consumer which is less profitable in the short term. This makes the public service roles, including energy efficiency activity, more difficult to maintain.

Local authorities have a key role in promoting energy efficiency. This applies in their own stock of buildings and equipment which provides approximately 2-4% of energy demand, depending on the country. Certain activities, for instance street lighting (which involves approx. 1% of total electricity consumption), have a significant demand and at the same time provide major opportunities for improved efficiency even in traditionally energy conscious countries like Finland.

The Task's main role is to investigate energy efficiency activity by local authorities in markets affected by liberalisation.

The objectives of this investigation are therefore to:

- discover how those impacts of liberalisation discouraging energy efficiency activity can be circumvented,
- recommend how the action of local authorities in this field can be made more effective and
- disseminate this information to local authorities and those arms of government responsible for supervising municipal activity in this field.

The Task will proceed through seven Subtasks. These include:

1. Development of the framework of the Task
2. Studies of the roles of municipalities in the participating countries
3. Impacts of liberalisation on those roles
4. Detailed case studies of best practice in the participating countries
5. Evaluation of these case studies to prepare recommendations for municipal Governments
6. Preparation of an Action Guide and Web Site
7. A dissemination phase to ensure that the conclusions reach their intended targets.

Progress

The proposed area of action will look at responsibilities under all local authority roles, as an energy consumer, as an energy producer or distributor, as a regulator and planner and as an awareness raiser. It will identify how local authority action to fulfil them can promote energy efficiency and propose management and administrative mechanisms to improve the response to the challenge of liberalisation. This detailed investigation of the roles and the responsibilities of municipalities (and where relevant municipal energy companies) will proceed by looking at the impact of local authority activity in each of their main roles on energy efficiency. The following key issues have been identified as the basic framework of the investigations:

- What is the best structure to promote energy saving among the general public in a situation where the utility abandons such activity among small consumers.
- How can local authorities maintain and increase energy efficiency activity in their own stock of buildings and equipment in a competitive world of unstable and/or falling prices?
- Has the municipal distributor a long term role to play in energy efficiency or should this be passed elsewhere? If so, who pays for energy efficiency activities
- Can municipalities still play a role in reducing demand on primary resources by promoting combined heat and power systems?
- Can local authority regulation be used to counteract the disincentive to energy efficiency caused by falling energy prices, for instance via the planning and building regulation system or via energy labelling and standards for energy using equipment?
- Can local authorities still plan networks to avoid duplication
- How can government action promote better delivery of energy efficiency by local authorities?

Activities completed in 2000

Defined, in principle, the common framework for proceeding with the first two Subtasks.

Activities planned for 2001

Completion of studies of the roles of local authorities in the participant countries and the impacts of liberalisation.

Hold a workshop to evaluate these roles.

Commencement and completion of the work on detailed case studies of good practice.

Involvement of industry and other organisations

The main organisations that are participating in this project are local authorities in the participant countries. To date two French local authorities and one French association of local authorities, two Dutch local authorities and one Swedish local authority are participating. In Spain it is planned that one local authority promoted energy agency and one other local authority participate. The Catalan Institute for Energy will provide funding for the participation. Both French and Dutch local authorities were present at the launch meeting.

Reports

Reports produced in 2000:

The first Task newsletter was published electronically in October 2000 and in hard copy was distributed in November 2000.

Reports planned for 2001:

Report on the Roles of Municipalities in the participant countries and the impacts of liberalisation on them.

Report on best practice examples in municipalities in the participant countries.

Report on the evaluation of best practices and recommendations.

Meeting schedule

Meetings in 2000:

June 2000, Lille, France

Meetings planned in 2001:

Workshop to review draft reports and prepare the framework for best practice studies.

April 2001, Utrecht, The Netherlands.

Workshop to evaluate the best practice studies and prepare recommendations.

December 2001, Spain or Sweden.

Activity time schedule

The Task began on 1 January 2000 and will be completed on 31 December 2002.

Activity	2000	2001	2002
1 A Launch Seminar	—		
B Survey of municipal roles	—		
C Survey of context of Liberalisation	—		
2 D Best Practice Studies		—	
3 E Evaluation Analysis of Municipal Roles and Projects Prepare Recommendations			—
4 F Prepare Action Guide			—
G Final Seminar Disseminate reports			—

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Task X: Performance Contracting

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

Objectives

The overall objective of Task X is to facilitate the greater use of performance contracts (PC) and other Energy Service Company (ESCO) financial options and services (PC/ESCO) in the participating countries.

The Task will:

- Provide all the participants with a better understanding of how performance contracts and other ESCO financial options and services can be used.
- Promote an understanding of the benefits of performance contracting and other ESCO financial options and services and the potential contribution of these financial options and services to promoting energy efficiency and mitigating global climate change.
- Promote an understanding of the necessary regulatory and legal context under which the performance contracting industry may function.
- Identify the market potential in countries for which no mature performance contracting industry currently exists.
- Identify and share information concerning potential barriers and problems associated with implementing performance contracting and other ESCO financial options and services.
- Identify and share information concerning solutions to problems and success stories involving performance contracting and other ESCO financial options and services.

Description

Energy service contracting, or performance contracting, is an established mechanism for promoting the installation of energy efficient building equipment and systems. Energy service contractors, or ESCOs, enter into agreements with facility owners to perform retrofit installations of equipment that can save money on building operations. The savings in energy bills due to the more efficient equipment are shared between the facility owner and the ESCO under terms of the agreement. Most importantly, the ESCO takes on the project's performance risk by guaranteeing a specified level of energy savings. The ESCO's compensation is directly tied to achieving these savings. The financing can either be by the ESCO, by the suppliers of the system or components, or by an outside third-party company – or a combination. ESCOs can also employ other financial options and services in support of their clients.

The performance contracting industry (an industry employing performance contracts and other financial options and services) is well established in the U.S. and Canada, and some European countries. The success of an ESCO industry depends on energy sector regulations, contracting law, and an awareness of building owners of the benefits of performance contracting.

Motivating factors for the establishment and growth of the performance contracting industry include:

- Operation and maintenance of energy systems in aging building stocks costs more as the systems grow older and less efficient.
- Increased environmental awareness.
- Changes in legislation and rules concerning energy matters.
- Energy systems and indoor environment issues.
- Increased competition and cost-consciousness.
- Need to improve facility infrastructure.
- The joint multinational IEA Task contributes to an expanding international market for Performance Contracting.

Planned work

Task X is divided into 4 Subtasks.

Subtask A – Initial Workshop

This Workshop will be used to complete the work on the legal documents and on definitions of the concept. Possible demonstration projects will be identified, and finalised or ongoing projects will be presented as a basis for case studies.

Subtask B – Country Reports

The participating countries will prepare reports on the establishment and utilisation of the performance contracting industry. Countries with mature performance contracting industries will provide information on model contracts, problems/hindrances, case studies and market size.

Subtask C – Interactive Workshop comparing Country Reports and Ideas

This Workshop will be used as a forum for each participating country to share the results of their research on the performance contracting industry and the conclusions in their country reports with each other and with other interested parties.

Subtask D – Country Plans and Lessons Learned

Each participating country will develop individual implementation plans for increasing the viability of performance contracting in their countries. These should be initiated during the Interactive Workshop (Subtask C). The plans will be followed up, identified cases and demonstration projects analysed to form a background for formulation of lessons learned and the draft for the Final Management Report.

Activities completed in 2000

During most of the year, the Task has been in the Task definition and preparation phase. A draft Concept Paper was drawn up and presented by the Task Organiser/Operating Agent at the Executive Committee Meeting in Ankara, Turkey, in April. The Executive

Committee decided that the work during the next six months would, among other things, include preparation for a preparatory workshop and drawing up of draft Annex Text and draft Work Plan. The workshop was held in September in Stockholm, Sweden, with representatives of eight countries present. Drafts of the Concept Paper, Annex Text, Work Plan and Information Plan were presented by the Task Organiser and revised versions were prepared. These documents were then presented to the Executive Committee Meeting in Athens, Greece, in October, where it was officially decided to start the Performance Contracting Task on the 1st of December 2000 with Sweden acting as Operating Agent.

Activities planned for 2001

- Finalise the Task Definitions, Concept Paper, Annex Text, Work Plan and Information Plan.
- Formulate draft guidelines for Country Reports for discussion and revision.
- Identify possible case studies and demonstration projects from which valuable experience can be drawn.
- Prepare the Country Reports.
- Exchange comments about individual Country Reports from other participants.
- Finalise the Country Reports
- Interactive Workshop comparing the final Country Reports and ideas presented about different use of performance contracting.
- Start formulation of Country Plans for expanded use of performance contracting and preparation of analysis of ongoing cases and planned demonstration projects.
- Involvement of additional specialists in legal issues, model contracts, financing and verification methods.

Meeting schedule

Meetings in 2000:

None

Meetings planned in 2001:

- February 1–2, Valbonne, France
- June, Finland
- November, United States

Expected results

- Documentation from two Workshops as web Reports.
- A Final Management Report including lessons learned, models for process and contracts.
- Shared knowledge of different models of performance contracting.
- A collaborative international approach which can accelerate the wider acceptance and use of performance contracting concepts.

Each participating country will:

- Learn how to use performance contracting and other ESCO financial options and services to a larger extent in different areas, types of buildings and different ownership.
- Get a background for the development of an even better process for partnering work between owners, suppliers/installers, and financing institutions.
- Contribute to better dissemination of working models for performance contracting and other ESCO financial options and services and identify which stake-holders have the most interest in using these forms.
- See the use of performance contracting and other ESCO financial options and services increase in their country, see new international markets open up and see the benefits of the resulting energy-efficiency improvements.

Activity time schedule

Task X came into force on 1 December 2000 and will continue until 31 December 2002.

Activity Time Schedule	2000	2001	2002	2003
Subtask A: Initial Workshop		—		
Subtask B: Country Reports		—		
Subtask C: Interactive Workshop comparing Country Reports and Ideas			—	
Subtask D: Country Plans			—	

Participants

At the printing of this report, the country participants had not yet been decided. Interested countries include Austria, Finland, France, Greece, Ireland, Italy, Japan, The Netherlands, Norway, Spain, Sweden, United Kingdom and United States.

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DSM and Energy Efficiency in Changing Electricity Businesses

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