

# INFORMATION EXCHANGE PROJECT

## *Annex 2*

to the Implementing Agreement of the International Energy Agency  
for a PROGRAMME OF ENERGY TECHNOLOGY SYSTEMS ANALYSIS

### **1. Objective**

The objective of this Task is for Participants to carry out a continuous exchange of information related to energy modelling, energy systems analysis and energy technology assessment in order to share experiences stimulate co-operative studies and benefit from common analysis.

### **2. Means**

The objectives shall be achieved by:

- (a) The exchange of work reports, memoranda and documents in the English language containing descriptions of methods, data inputs and results of energy systems studies;
- (b) Periodic workshops or seminar meetings (approximately 2 per year) for the project Participants and invited visitors dealing with national, regional and/or inter-regional aspects of:
  - (i) Energy supply and pricing;
  - (ii) Energy demand;
  - (iii) Energy modelling methods;
  - (iv) Energy technology characteristics;
  - (v) Energy systems characteristics;
- (c) The maintenance of the computer model MARKAL including the corresponding computer programmes and the consultative services of the support centre at KFA Juelich for MARKAL applications;
- (d) Preparation and distribution of a periodic newsletter (up to 3 per year) summarizing information resulting from the activities mentioned under paragraphs (a), (b) and (c) above.

### **3. Specific Responsibilities of the Operating Agent**

- (a) Project Staff. For the purpose of carrying out the above objective, the Operating Agent shall establish within ninety days after the Annex has entered into force a Project Staff composed of a full-time project head, a part-time secretary and a student.
- (b) Co-ordination. The Operating Agent shall be responsible for overall co-ordination of the Task.
- (c) Access to Support Centre at KFA Juelich. The Operating Agent shall accept visits by persons from each of the other Participants at KFA Juelich subject to prior notification and agreement between the Participants concerned and the Operating Agent on timing and duration of the visit.

(d) Additional Services of the Operating Agent. Services of the Operating Agent concerning MARKAL development, application and training may be provided in a bilateral agreement between the Operating Agent and any interested Participant.

(e) MARKAL Availability. The versions of the Matrix Generator developed at KFA Juelich and Brookhaven National Laboratory during the period of Annex I, Program of Equations and Report Generating Systems, current at the time of this Annex entering into force, shall continue to be made available by the Operating Agent in tape form to any IEA country and to the Commission of the European Communities without fee but upon payment of a charge covering tape costs and shipment. The Optimisation Routine and the Matrix Generator language to be used in this Task are proprietary and are only available by arrangement with the commercial supplier.

(f) Preparation of Draft Programme of Work and Reports. The Operating Agent will prepare and submit to the Executive Committee prior to its first meeting a draft programme of work for the three year period of the Task. The Operating Agent will prepare, and submit to the Executive Committee for approval, at the termination of this Annex, a draft final report on the activities carried out during the period of this Annex. Following approval, the Operating Agent will transmit the report to the Agency and to the members of the IEA Committee on Energy Research and Development.

The Committee on Energy Research and Development may, during this Task, propose additions to the Programme of Work. The Executive Committee shall, acting by unanimity, decide whether these proposals will be added to the Programme.

#### **4. Funding**

(a) Common Financial Obligations. Based upon a Project Staff as described in paragraph 3 above, the Operating Agent estimates the annual costs of the Support Centre in 1983 prices at DM 207,000. The actual costs of maintaining and operating the Support Centre will be divided equally among all Participants. If the number of the Participants changes, the shares of contribution to the costs will be adjusted proportionally. New Participants will pay the full share of the costs beginning with the project year in which they become Participants.

(b) Individual Financial Obligations. Aside from the contributions described in sub-paragraph (a) above each Participant shall bear all the costs it incurs in carrying out this Task.

#### **5. Time Schedule**

This Annex will enter into force on 1st July, 1983 and will remain in force for a period of three years. It may be extended by agreement of two or more Participants acting in the Executive Committee and taking into account any recommendation of the Agency's Committee on Energy Research and Development concerning the term of this Annex which shall thereafter apply only to these Participants. It may be extended by agreement of two or more Participants acting in the Executive Committee and taking into account any recommendation of the Agency's Committee on Energy Research and Development concerning the term of this Annex which shall thereafter apply only to these Participants. The Operating Agent may resign, without giving notice, with effect from the commencement of any period of extension of the Task.

#### **6. Operating Agent**

The Kernforschungsanlage Juelich GmbH (Germany).

#### **7. Information and Intellectual Property**

(a) Executive Committee Powers.

The publication, distribution, handling, protection and ownership of information and intellectual property arising from this Annex shall be determined by the Executive Committee, acting by unanimity, in conformity with this Agreement.

(b) Right to Publish. Subject only to copyright restrictions, the Participants in this Annex (referred to in this Annex as the "Participants") shall have the right to publish all information provided to or arising from this Annex except proprietary information, but they shall not publish it with a view to profit, except as agreed by the Executive Committee, acting by unanimity.

(c) Proprietary Information. The Operating Agent and the Participants shall take all necessary measures in accordance with this Annex, the laws of their respective countries, and international law to protect proprietary information. For the purposes of this Annex proprietary information shall mean information of a confidential nature such as trade secrets and know-how (for example, computer programmes, design procedures and techniques, chemical composition of materials, or manufacturing methods, processes, or treatments) that is appropriately marked, provided such information:

- (1) Is not generally known or publicly available from other sources;
- (2) Has not previously been made available by the owner to others without obligation concerning its confidentiality; and
- (3) Is not already in the possession of the recipient Participant without obligation concerning its confidentiality.

It shall be the responsibility of each Participant supplying proprietary information to identify the information as such and to ensure that it is appropriately marked.

(d) Production of Relevant Information by Governments. The Operating Agent should encourage the governments of all Agency Participating Countries to make available or to identify to the Operating Agent all published or otherwise freely available information known to them that is relevant to the Task. The Participants should notify the Operating Agent of all pre-existing information, and information developed independently of the Task known to them which is relevant to the Task and which can be made available to the Task without contractual or legal limitations.

(e) Production of Available Information by Participants. Each Participant agrees to provide to the Operating Agent all previously existing information and information developed independently of the Annex, which is needed by the Operating Agent to carry out its function in this Task and which is freely at the disposal of the Participant and the transmission of which is not subject to any contractual and/or legal limitations:

- (1) If no substantial cost is incurred by the Participant in making such information available, at no charge to the Task;
- (2) If substantial costs must be incurred by the Participant to make such information available, at such charges to the Task as shall be agreed between the Operating Agent and the Participant with the approval of the Executive Committee.

(f) Use of Confidential Information. If a Participant has access to confidential information which would be useful to the Operating Agent in conducting studies, assessments, analyses, or evaluations, such information may be communicated to the Operating Agent but shall not become part of reports, handbooks, or other documentation nor be communicated to the other Participants except as may be agreed between the Operating Agent and the Participant which supplies such information.

(g) Acquisition of Information for the Task. Each Participant shall inform the Operating Agent of the existence of information known to the Participant that can be of value to the Task, but which is not freely available, and the Participant shall endeavour to make the information available to the Task under reasonable conditions, in which event the Executive Committee may, acting unanimously, decide to acquire such information.

(h) Reports on Work Performed under the Task. The Operating Agent shall provide reports on all work performed under the Task and the results thereof, including studies, assessments, analyses, evaluations and other documentation, but excluding proprietary information, to the Participants.

(i) Copyright. The Operating Agent may take appropriate measures necessary to protect copyrightable materials generated under this Task. Copyrights obtained shall be the property of the Operating Agent for the benefit of the Participants, provided, however, that Participants may reproduce and distribute such material, but shall not publish it with a view to profit, except as otherwise directed by the Executive Committee.

(j) Authors. Each Participant shall, without prejudice to any rights of authors under its national laws, take necessary steps to provide the co-operation with its authors required to carry out the provisions of this paragraph. Each Participant will assume the responsibility to pay awards or compensation required to be paid to its employees according to the laws of its country.

## **8. Results**

The results of this Task shall be:

- (a) Maintenance and improvement of an international capability for the analysis of new energy technologies and their future prospects; and
- (b) Periodic reports on workshops or seminar meetings and on analytical studies undertaken in connection with the Task.

## **9. Participants**

## INFORMATION EXCHANGE PROJECT:

### WORK PROPOSAL

The main subjects for the User's Club program are:

1. Post-optimal Analysis
2. Energy Supply Modelling
3. Energy Demand Modelling
4. Technology Characterization

#### 1. *Post-optimal Analysis*

The topic "Post-optimal Analysis" will be subdivided in three points:

- a) **Flow Analysis**  
The detailed analysis of energy and cost flow in the model (see J. Gundermann, G.C. Tosato, KFA Memo No. 360, Sept. 1981 and M. Finnis, Juel.-Spez-92, October 1980) will allow the participants to get a better understanding of the results of the MARKAL model. The study of the dual solution enables the analyst to find inconsistencies in the model. In this frame the question of demand-price consistency will be handled.
- b) **Range Analysis**  
The analysis of the range output, which can be provided by the optimization software allows the energy system analyst to check the stability of the solution.
- c) **Parametric Studies**  
The topic "Parametric Studies" includes software activities (Question: How to use the parametrisation capabilities of the optimising software?) and the study of effects caused by continuously introduced changes of model elements (e.g. changing investment cost for an advanced power plant starting from the most optimistic view and going stepwise in the direction of the most pessimistic investment cost assumption).

#### 2. *Energy Supply Modelling*

The task "Energy Supply Modelling" will provide the participants with a comparison of the MARKAL model with two of the main competitors in the field of energy supply system modelling: EFOM and MESSAGE. Further investigations of other energy supply models and sub-models (e.g. for electricity generation, refineries) would be desirable. As a result of that information exchange activity a concept for future changes of the MARKAL model can be discussed.

#### 3. *Energy Demand Modelling*

**Due to the fact that nearly each country is using its own method/model to estimate the energy demands given to the energy supply models an exchange of know-how and experience would be valuable. In this context the possibility of coupling economy-energy models can be discussed.**

#### 4. Technology Characterization

In phase III of the ETSAP project the data management system MINERVA has been developed and implemented on the computer system at KFA Jülich. At the moment the data management system includes all the technology data collected during phase III of the project. The MINERVA system allows the printing of the available technology data. Future updates which might be desired by single participants or by a future common technology characterization workshop are possible. In order to facilitate the construction of MARKAL input data sets the MINERVA system has to be expanded to bring the data in a format which can be processed by the matrix and report generators in use in the ETSAP project. This task could be combined with an extended data validator based on cross country comparison of the related data.