

ENERGY TECHNOLOGY SYSTEMS ANALYSIS PROGRAMME

Annex 1

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

1. Background and Objectives

(a) *Background.* As a result of the decision by the IEA Governing Board in November, 1975 to develop an IEA Strategy for Energy Research, Development and Demonstration, a co-operative energy systems analysis " activity was begun in February, 1976 for the purpose of providing the analytical basis for the Strategy. This activity was carried out on a task-sharing basis and was managed by a Steering Group on Research and Development Systems Analysis under the Committee on Energy Research and Development. Sixteen Participating Countries and the Commission of the European Communities participated in this activity, which was terminated by decision of the Steering Group on 31st December 1979. By that time the co-operative work had developed a computer model, known as MARKAL, and a set of analytical results that have been used to develop an Energy Research, Development and Demonstration Strategy for the IEA.

(b) *Objectives.* The objectives of this Task are to provide for the continuation of a co-operative energy technology systems analysis activity in which the greater part of the analytical work will be carried out by Participants at the national level, with co-ordination and certain types of support being assured by a central support staff. The general objectives of the Task are to:

- (1) Increase the analytical capabilities of Participating Countries in the field of energy technology assessment;
- (2) Maintain a multilateral capability within the IEA for energy technology systems analysis by making use of and improving the data base and modelling techniques developed during Phase II of the IEA Energy Research and Development Systems Analysis Project.

Specific analytical objectives are as follows, with each objective to be pursued in a Subtask:

Subtask 1: Analyse the potential for energy saving through the application of conservation technologies.

Subtask 2: Review and expand the technology characterizations developed for the IEA Energy Research, Development and Demonstration Strategy Project; perform sensitivity analyses, and study the competitiveness of selected technologies.

Subtask 3: Review key assumptions about world-traded fuels and examine the sensitivity of results to variations in these assumptions.

Subtask 4: Review the demand projections, the underlying assumptions for economic growth and other important items, and analyse the robustness of different scenarios.

Subtask 5: Investigate certain environmental questions including the " requirements for labour, land, water and some structural materials, and specify the inventories of selected pollutants.

2. Means

The objectives shall be achieved by:

- (i) the establishment of an IEA Energy Technology Systems Analysis Support Centre comprising a Project Staff with computing facilities;
- (ii) the transfer of the MARKAL model to computing facilities in Participants' Countries;
- (iii) the carrying out of the five Subtasks and such other co-operative analytical tasks as maybe agreed in the annual Programme of Work; and
- (iv) temporary visits of officials from Participants to the Support Centre at KFA Juelich.

3. Specific Responsibilities of the Operating Agent

- (a) *Project Staff.* For the purpose of carrying out the above objectives, the Operating Agent shall establish within ninety days of the signature of the Agreement a Project Staff composed of a Project Head, two scientific members and one clerical. The Project Staff resources shall at all times consist of at least the equivalent of four full-time positions, with the exact disposition of resources to be set by the Operating Agent.
- (b) *Co-ordination.* The Operating Agent shall be responsible for overall co-ordination of the Task.
- (c) *Computing Facilities.* The Operating Agent will maintain computing facilities adequate to carrying out the objectives of the Task.
- (d) *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 of the visit. In addition to making the necessary arrangements to facilitate access of Participants to KFA Juelich, the Operating Agent shall accept one person per Participant up to a maximum of three months each year and shall provide the necessary office space therefor, unless bilateral arrangements are made between the Participant concerned and the Operating Agent for officials to remain at KFA Juelich for extended periods to carry out computer analyses.
- (e) *MARKAL Availability.* The versions of the Matrix Generator developed at KFA Juelich during Phase II, Programme of Equations and Report Generating Systems, current at the time of signature of the Agreement, shall 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 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 two year period of the Task. The Operating Agent will prepare, and submit to the Executive Committee for approval, no less than semi-annually, a draft technical progress report. Following approval, the Operating Agent will transmit these reports 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. Specific Responsibilities of the Other Participants

Each Participant in this Task other than the Operating Agent is required to participate in at least one of the five Subtasks mentioned in paragraph 1 (b).

5. 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 1980 prices at DM. 400,000. These costs include computing costs sufficient to cover aggregation runs and test runs for model improvement. The costs of other runs carried out by the Operating Agent for the Task are to be shared by agreement with the Participant(s) concerned. The costs of maintaining and operating the Support Centre will be divided equally among all 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.

6. Time Schedule

The duration of this Task shall be two years. It may be extended by decision of the Executive Committee, acting by unanimity.

7. Operating Agent

The Kernforschungsanlage Juelich GmbH (KFA Juelich).

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(a) Maintenance and improvement of an international capability for the analysis of new energy technologies and their future prospects; and

(b) Periodic reports on analytical studies undertaken in connection with the Task.

10. Participants

The Contracting Parties which are Participants in the Task are the following:

The Department of National Development and Energy (Australia),
The Government of Belgium,
The Ministry of Energy (Denmark),
The Kernforschungsanlage Juelich GmbH (Germany),
The Ente Nazionale Idrocarburi (Italy),
The Royal Ministry of Petroleum and Energy (Norway),
The Energy Research and Development Commission (Sweden),
The Office Federal de l'Energie (Switzerland),
The Department of Energy (United States of America),
The Commission of the European Communities.