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## PARALLEL SOLAR THERMAL AND PHOTOVOLTAIC SYSTEMS FIELD EXPERIMENT TOTALING 40 KWe

### I. OBJECTIVES

The objectives of this Project are threefold:

- To evaluate the performance of two advanced solar energy conversion systems (thermal and photovoltaic), each providing an equal nominal electrical peak output of 20 kW under the same conditions of climate and electric load demand;
- -- To compare the ability of each system to supply electricity to a selected rural community; and

- To evaluate the performance of the components included in each system.

### II. WORK SCOPE, SCHEDULE, AND MILESTONES

To accomplish these objectives, a three-year collaborative Project will be undertaken by the Department of Energy of the United States of America (DOE), by the Ministry of Industry, Commerce and Handicraft of Italy (MOI), and by Ente Nazionale per l'Energia Elettrica of Italy (ENEL) (hereinafter referred to as the Parties), with an optional follow-on period for monitoring purposes of an additional three years, in which case this Annex shall be extended in writing. ENEL has been designated by MOI to perform certain responsibilities as set forth in this Annex and in accordance with all the terms and conditions of a Party to the Memorandum of Understanding Between the Government of the United States and the Government of the Italian Republic Concerning Energy Cooperation signed 17 October 1979 and the Addendum signed 4 June 1980.

The advanced systems will be constructed and operated in Italy in an experimental installation with the following characteristics: - The site will be a remote rural community which is neither connected to a utility grid nor provided with a central electric power source.

- The complete experimental installation will comprise a concentrating solar thermal energy conversion system with heat engine and A.C. electric generator; a concentrating solar photovoltaic energy conversion system; a fossil-fuel-fired back-up engine with A.C. electric generator; appropriate amounts of thermal and electrochemical energy storage; and power conditioning, instrumentation, and controls.

-- The parallel systems will be designed so that the installation can be connected into the utility grid at some later date.

- The electricity uses will include but not be limited to irrigation water pumping, lighting, and refrigeration. (Uses for heating will be strictly avoided through a separate program of user education, and by the provision of independent solar domestic water heaters by ENEL, if necessary.)

The Project will be broken down into five (5) phases as follows: Phase 1 -- Site selection and collection of environmental data. Phase 2 -- Conceptual design and preparation of draft and final Request

for Proposal (RFP).

Phase 3 -- Procurement period and contract award.

Phase 4 (a) -- Detail design, component qualification, and systems fabrication.

Phase 4 (b) -- Systems installation, and acceptance by Operating Agent. Phase 5 - Operation, evaluation, and maintenance of systems.

Milestones for the Project are set forth in Table A-1.

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TAB	LE	A-1	

## Milestones for Project "A"

(Milestone)	(Date)
(1) Approval of Completed RFP	July, 1980
(2) Issue of Approved RFP by Operating Agent (ENEL)	September, 1980
<pre>(3) Selection of Contractor(s)</pre>	November, 1980
(4) Approval of Contract Award(s)	December, 1980
(5) Approval of Detail Design(s)	March, 1981
(6) Installation Complete and Checked Out	June, 1982
(7) Installation Performance Review	October, 1982
(8) Final Report	December, 1982

# III. MANAGEMENT AND REPORTING REQUIREMENTS

A. The Executive Committee and the Project Committee for this Annex will implement this Project in accordance with the Addendum to the Memorandum of Understanding signed June 4, 1980.

B. This Project will be managed and implemented by ENEL as the Operating Agent on a day-to-day basis as set forth in paragraph II above and in accordance with the Addendum signed June 4, 1980.

### IV. FUNDING

The total estimated cost of the project is \$2,710,000. The yearly budget breakdown is as follows: 1980 - \$200,000, 1981 - \$2,100,000, 1982 -\$410,000. ENEL will expend approximately \$1,625,000 in Italy. DOE will expend approximately \$185,000 in the United States in accordance with its normal procedures, and DOE will transfer approximately \$900,000 to the Operating Agent. Detailed procedures and schedule for transferring these funds by DOE to the Operating Agent will be agreed upon in writing prior to the time of the initial transfer.

The Operating Agent will maintain financial records for all expenses. The Operating Agent will annually, using the United States fiscal year, provide a certification to DOE of the amount of all funds utilized; such certification will be transmitted by the Operating Agent to DOE within three months following the end of each fiscal year and bearing a certification common to the Operating Agent.

### V. INCORPORATION BY REFERENCE

Paragraphs 4 and 5 of the Memorandum of Understanding Between the Government of the United States and the Government of the Italian Republic Concerning Energy Cooperation signed 17 October 1979 and Articles 3, 5, and 9 of Annex I thereto and the Addendum to the Memorandum of Understanding signed June 4, 1980, are hereby incorporated by reference.

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### VI. INFORMATION AND INTELLECTUAL PROPERTY

(a) Subject only to the restrictions applying to patents and copyrights, the Parties will have the right to publish all information developed prior to or outside the Project and provided to the Project, except proprietary information, and all information arising from this Project. For the purposes of this paragraph, proprietary information will mean information which contains trade secrets or commercial or financial information which is privileged or confidential, and may only include such information which;

- a) has been held in confidence by its owners;
- b) is of a type which is customarily held in confidence by its owner;
- c) has not been transmitted by the transmitting Party to other entities (including the receiving Party) except on the basis that it be held in confidence; and
- d) is not otherwise available to the receiving Party from another source without restriction on its further dissemination.

(b) It will be the responsibility of the Party providing information pursuant to paragraph (a) to the Project to identify information it furnishes which qualifies as proprietary information under paragraph (a) and ensure it is appropriately marked. The Parties will take all necessary measures in accordance with this paragraph, the laws of their respective countries and international law to protect proprietary information.

(c) Information developed prior to or outside the Project owned or controlled by the Party which is necessary for or utilized in the Project and information arising in the course of or under the Project ("arising information") will be freely available to both Parties for use and dissemination.

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(d) Proprietary information developed prior to or outside the Project and inventions made or conceived prior to or outside the Project owned or controlled by third parties will be utilized in the Project only if such information or inventions will be licensed on reasonable terms and conditions to the Parties, their Governments, and their nationals designated by them. If such licensing rights can not be obtained, such inventions or information will not be accepted for or utilized in the Project without the express unanimous approval of the Parties as set forth in an agreement between the Parties stating the terms and conditions for such acceptance.

(e) Reports containing arising information and information developed prior to or outside the Project necessary for and used in the Project, including proprietary information, will be provided to the Parties by the Operating Agent and will cover the work performed by the Operating Agent under this Project.

(f) Inventions made or conceived in the course of or under this Project ("arising inventions") will be owned by ENEL in Italy and third countries and by DOE in the United States. Each Party will license such arising inventions to the other Party, its Government and its nationals designated by it royaltyfree.

(g) The Operating Agent or either Party may take appropriate measures necessary to protect copyrightable material generated by it under this Project. Copyrights obtained will by the property of the Party or the Operating Agent, for the benefit of the Parties; provided, however, that both Parties may reproduce and distribute such material, but will not publish it with a view to profit.

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(h) Each Party will, without prejudice to any rights of inventors or authors under its national laws, take all necessary steps to provide the cooperation from its authors and inventors required to carry out the provisions of paragraph VI. Each Party will assume the responsibility to pay awards or compensation required to be paid to its employees according to the laws of its country.

### VII. TERM

The term of this Project shall be three years from the date of signature, unless extended or amended in writing by the Parties.

Done at Washington, D.C. this 4th day of June, 1980.

Italian Ministry of Industry, Commerce and Handicraft

5 Department of Energy of the

Department of Energy of the United States of America

Ente Nazionale per l'Energia Elettrica of Italy