

INTERNATIONAL ENERGY AGENCY

**IMPLEMENTING AGREEMENT
FOR A PROGRAMME OF RESEARCH
DEVELOPMENT AND DEMONSTRATION ON
ENERGY CONSERVATION
IN THE PULP AND PAPER INDUSTRY**

INTERNATIONAL ENERGY AGENCY

IMPLEMENTING AGREEMENT
FOR A PROGRAMME OF RESEARCH
DEVELOPMENT AND DEMONSTRATION ON
ENERGY CONSERVATION
IN THE PULP AND PAPER INDUSTRY

TABLE OF CONTENTS

PREAMBLE 5

Article 1

OBJECTIVES 6

Article 2

IDENTIFICATION AND INITIATION OF TASKS 6

Article 3

THE EXECUTIVE COMMITTEE 7

Article 4

THE OPERATING AGENTS 9

Article 5

ADMINISTRATION AND STAFF 10

Article 6

FINANCE 10

<i>Article 7</i>	
INFORMATION AND INTELLECTUAL PROPERTY	13
<i>Article 8</i>	
LEGAL RESPONSIBILITY AND INSURANCE	13
<i>Article 9</i>	
LEGISLATIVE PROVISIONS	14
<i>Article 10</i>	
ADMISSION AND WITHDRAWAL OF CONTRACTING PARTIES	15
<i>Article 11</i>	
FINAL PROVISIONS	16
<i>Annex I</i>	
INCREASING THE THERMAL EFFICIENCY OF THE KRAFT	
RECOVERY BOILER	20
<i>Annex II</i>	
DEVELOPING AN ENERGY ACCOUNTING METHOD FOR THE	
PULP AND PAPER INDUSTRY	27
<i>Annex III</i>	
IMPROVING ENERGY CONSERVATION IN MECHANICAL	
DEFIBRATION, BEATING AND WATER REMOVAL	33

INTERNATIONAL ENERGY AGENCY

IMPLEMENTING AGREEMENT FOR A PROGRAMME OF RESEARCH DEVELOPMENT AND DEMONSTRATION ON ENERGY CONSERVATION IN THE PULP AND PAPER INDUSTRY

The Contracting Parties

CONSIDERING that the Contracting Parties, being either governments of International Energy Agency ("Agency") countries, governments of other countries invited by the Governing Board of the Agency to be Contracting Parties, international organizations or parties designated by their respective governments, wish to take part in the establishment and operation of a continued Programme of Research, Development and Demonstration on Energy Conservation in the Pulp and Paper Industry (the "Programme") as provided in this Agreement;

CONSIDERING that the Contracting Parties which are governments of Agency Countries and the governments of Agency Countries which have designated Contracting Parties (referred to collectively as the "Governments") have agreed in Article 41 of the Agreement on an International Energy Program (the "I.E.P. Agreement") to undertake national programmes in the areas set out in Article 42 of the I.E.P. Agreement, including energy research and development;

CONSIDERING that in the Governing Board of the Agency on 15th/16th March 1977, the Governments approved the Programme as a special activity under Article 65 of the I.E.P. Agreement;

CONSIDERING that the Agency has recognized the establishment of the Programme as an important component of international co-operation in the field of energy conservation in the pulp and paper industry;

HAVE AGREED as follows:

Article 1

OBJECTIVES

- (a) *Scope of Activity.* The Programme to be carried out by the Contracting Parties within the framework of this Agreement shall consist of co-operative research, development, demonstrations and exchanges of information regarding energy conservation in the pulp and paper industry.
- (b) *Method of Implementation.* The Contracting Parties shall implement the Programme by undertaking one or more tasks (the "Task" or "Tasks") each of which will be open to participation by two or more Contracting Parties as provided in Article 2 hereof. The Contracting Parties which participate in a particular Task are, for the purposes of that Task, referred to in this Agreement as "Participants".
- (c) *Task Co-ordination and Co-operation.* The Contracting Parties shall co-operate in co-ordinating the work of the various Tasks and shall endeavour, on the basis of an appropriate sharing of burdens and benefits to encourage co-operation among Participants engaged in the various Tasks with the objective of advancing the research and development activities of all Contracting Parties in the field of energy conservation in the pulp and paper industry.

Article 2

IDENTIFICATION AND INITIATION OF TASKS

- (a) *Identification.* The Tasks undertaken by Participants are identified in the Annexes to this Agreement. At the time of signing this Agreement, each Contracting Party shall confirm its intention to participate in one or more Tasks by giving the Executive Director of the Agency a Notice of Participation in the relevant Annex or Annexes and the Operating Agency for each Task shall give the Executive Director of the Agency a Notice of Acceptance of the Task Annex. Thereafter, each Task shall be carried out in accordance with the procedures set forth in Articles 2 to 11 hereof, unless otherwise specifically provided in the applicable Annex.
- (b) *Initiation of Additional Tasks.* Additional Tasks may be initiated by any Contracting Party according to the following procedure:
- (1) A Contracting Party wishing to initiate a new Task shall present to one or more Contracting Parties for approval a draft Annex, similar in form to the Annexes attached hereto, containing a description of the scope of work and conditions of the Task proposed to be performed;
 - (2) Whenever two or more Contracting Parties agree to undertake a new Task, they shall submit the draft Annex for approval by the Executive Committee pursuant to Article 3(e)(2) hereof; the approved draft Annex shall become

part of this Agreement; Notice of Participation in the Task by Contracting Parties and acceptance by the Operating Agent shall be communicated to the Executive Director in the manner provided in paragraph (a) above;

- (3) In carrying out the various Tasks, Participants shall co-ordinate their activities in order to avoid duplication of activities.

Article 3

THE EXECUTIVE COMMITTEE

(a) *Supervisory Control.* Control of the Programme shall be vested in the Executive Committee constituted under this Article.

(b) *Membership.* The Executive Committee shall consist of one member designated by each Contracting Party; each Contracting Party shall also designate an alternate member to serve on the Executive Committee in the event that its designated member is unable to do so.

(c) *Responsibilities.* The Executive Committee shall:

- (1) Adopt for each year, acting by unanimity, the Programme of Work, and Budget if foreseen, for each Task, together with an indicative Programme of Work and Budget for the following two years; the Executive Committee may, as required, make adjustments within the framework of the Programme of Work and Budget;
- (2) Make such rules and regulations as may be required for the sound management of the Tasks, including financial rules as provided in Article 6 hereof;
- (3) Carry out the other functions conferred upon it by this Agreement and the Annexes hereto; and
- (4) Consider any matters submitted to it by any of the Operating Agents or by any Contracting Party.

(d) *Procedure.* The Executive Committee shall carry out its responsibilities in accordance with the following procedures:

- (1) The Executive Committee shall each year elect a Chairman and one or more Vice-Chairmen;
- (2) The Executive Committee may establish such subsidiary bodies and rules of procedure as are required for its proper functioning. A representative of the Agency and a representative of each Operating Agent (in its capacity as such) may attend meetings of the Executive Committee and its subsidiary bodies in an advisory capacity;

- (3) The Executive Committee shall meet in regular session twice each year; a special meeting shall be convened upon the request of any Contracting Party which can demonstrate the need therefor;
- (4) Meetings of the Executive Committee shall be held at such time and in such office or offices as may be designated by the Committee;
- (5) At least twenty-eight days before each meeting of the Executive Committee, notice of the time, place and purpose of the meeting shall be given to each Contracting Party and to other persons or entities entitled to attend the meeting; notice need not be given to any person or entity otherwise entitled thereto if notice is waived before or after the meeting;
- (6) The quorum for the transaction of business in meetings of the Executive Committee shall be one-half of the members plus one (less any resulting fraction) provided that any action relating to a particular Task shall require a quorum as aforesaid of members or alternate members designated by the Participants in that Task.

(e) *Voting.*

- (1) When the Executive Committee adopts a decision or recommendation for or concerning a particular Task, the Executive Committee shall act:
 - (i) When unanimity is required under this Agreement by agreement of those members or alternate members which were designated by the Participants in the Task and which are present and voting;
 - (ii) When no express voting provision is made in this Agreement by majority vote of those members or alternate members which were designated by the Participants in that Task and which are present and voting.
- (2) In all other cases in which the Agreement expressly requires the Executive Committee to act by unanimity, this shall require the agreement of each member or alternate member present and voting, and in respect of all other decisions and recommendations for which no express voting provision is made in this Agreement, the Executive Committee shall act by a majority vote of the members or alternate members present and voting. If a government has designated more than one Contracting Party to this Agreement, those Contracting Parties may cast only one vote under this paragraph.
- (3) The decisions and recommendations referred to in sub-paragraphs (1) and (2) above may, with the agreement of each member or alternate member entitled to act thereon, be made by mail, telex or cable without the necessity for calling a meeting. Such action shall be taken by unanimity or majority of such members as in a meeting. The Chairman of the Executive Committee shall ensure that all members are informed of each decision or recommendation made pursuant to this sub-paragraph.

(f) *Reports.* The Executive Committee shall, by 31st January each year, provide the Agency with reports containing technically substantive, non-proprietary information on the progress of the Programme and its results.

Article 4

THE OPERATING AGENTS

(a) *Designation.* Participants shall designate in the relevant Annex an Operating Agent for each Task. References in this Agreement to the Operating Agent shall apply to each Operating Agent in respect of the Task for which it is responsible.

(b) *Scope of Authority to Act on Behalf of Participants.* Subject to the provisions of the applicable Annex:

- (1) All legal acts required to carry out each Task shall be performed on behalf of the Participants by the Operating Agent for the Task;
- (2) The Operating Agent shall hold, for the benefit of the Participants, the legal title to all property rights which may accrue to or be acquired for the Task.

The Operating Agent shall operate the Task under its supervision and responsibility, subject to this Agreement, in accordance with the law of the country of the Operating Agent.

(c) *Reimbursement of Costs.* The Executive Committee may provide that expenses and costs incurred by an Operating Agent in acting as such pursuant to this Agreement shall be reimbursed to the Operating Agent from funds made available by the Participants pursuant to Article 6 hereof.

(d) *Replacement.* Should the Executive Committee wish to replace an Operating Agent with another government or entity, the Executive Committee may, acting by unanimity and with the consent of such government or entity, replace the initial Operating Agent. References in this Agreement to the "Operating Agent" shall include any government or entity appointed to replace the original Operating Agent under this paragraph.

(e) *Resignation.* An Operating Agent shall have the right to resign at any time, by giving six months written notice to that effect to the Executive Committee, provided that:

- (1) A Participant, or entity designated by a Participant, is at such time willing to assume the duties and obligations of the Operating Agent and so notifies the Executive Committee and the other Participants to that effect, in writing, not less than three months in advance of the effective date of such resignation; and

- (2) Such Participant or entity is approved in its function of Operating Agent by the Executive Committee, acting by unanimity.

(f) *Accounting.* An Operating Agent which is replaced or which resigns as Operating Agent shall provide the Executive Committee with an accounting of any monies and other assets which it may have collected or acquired for the Task in the course of carrying out its responsibilities as Operating Agent.

(g) *Transfer of Rights.* In the event that another Operating Agent is appointed under paragraph (d) or (e) above, the Operating Agent shall transfer to such replacement Operating Agent any property rights which it may hold on behalf of the Task.

(h) *Information and Report.* Each Operating Agent shall furnish to the Executive Committee such information concerning the Task as the Committee may request and shall each year submit, not later than two months after the end of the financial year, a report on the status of the Task.

Article 5

ADMINISTRATION AND STAFF

(a) *Administration of Tasks.* Each Operating Agent shall be responsible to the Executive Committee for implementing its designated Task in accordance with this Agreement, the applicable Task Annex, and the decisions of the Executive Committee.

(b) *Staff.* It shall be the responsibility of the Operating Agent to retain such staff as may be required to carry out its designated Task in accordance with rules determined by the Executive Committee. The Operating Agent may also, as required, utilize the services of personnel employed by other Participants (or organizations or other entities designated by Contracting Parties) and made available to the Operating Agent by secondment or otherwise. Such personnel shall be remunerated by their respective employers and shall, except as provided in this Article, be subject to their employers' conditions of service. The Contracting Parties shall be entitled to claim the appropriate cost of such remuneration or to receive an appropriate credit for such cost as part of the Budget of the Task, in accordance with Article 6(f)(6) hereof.

Article 6

FINANCE

(a) *Individual Obligations.* Each Contracting Party shall bear the costs it incurs in carrying out this Agreement, including the costs of formulating or transmitting reports and of reimbursing its employees for travel and other per diem expenses incurred in connection with work carried out on the respective Tasks, unless provision is made for such costs to be reimbursed from common funds as provided in paragraph (g) below.

(b) *Common Financial Obligations.* Participants wishing to share the costs of a particular Task shall agree in the appropriate Task Annex to do so. The apportionment of contributions to such costs (whether in the form of cash services rendered, intellectual property or the supply of materials) and the use of such contributions shall be governed by the regulations and decisions made pursuant to this Article by the Executive Committee.

(c) *Financial Rules, Expenditure.* The Executive Committee, acting by unanimity, may make such regulations as are required for the sound financial management of each Task including, where necessary:

- (1) Establishment of budgetary and procurement procedures to be used by the Operating Agent in making payments from any common funds which may be maintained by Participants for the account of the Task or in making contracts on behalf of the Participants;
- (2) Establishment of minimum levels of expenditure for which Executive Committee approval shall be required, including expenditure involving payment of monies to the Operating Agent for other than routine salary and administrative expenses previously approved by the Executive Committee in the budget process.

In the expenditure of common funds the Operating Agent shall take into account the necessity of ensuring a fair distribution of such expenditure in the Participants' countries, where this is fully compatible with the most efficient technical and financial management of the Task.

(d) *Crediting of Income to Budget.* Any income which accrues from a Task shall be credited to the Budget of the Task.

(e) *Accounting.* The system of accounts employed by the Operating Agent shall be in accordance with accounting principles generally accepted in the country of the Operating Agent and consistently applied.

(f) *Programme of Work and Budget, Keeping of Accounts.* Should Participants agree to maintain common funds for the payment of obligations under a Programme of Work and Budget of the Task, the following provisions shall be applicable unless the Executive Committee, acting by unanimity, decides otherwise:

- (1) The financial year of the Task shall correspond to the financial year of the Operating Agent;
- (2) The Operating Agent shall each year prepare and submit to the Executive Committee for approval a draft Programme of Work and Budget, together with an indicative programme of work and budget for the following two years, not later than three months before the beginning of each financial year;
- (3) The Operating Agent shall maintain complete, separate financial records which shall clearly account for all funds and property coming into the custody or possession of the Operating Agent in connection with the Task;

- (4) Not later than three months after the close of each financial year the Operating Agent shall submit to auditors selected by the Executive Committee for audit the annual accounts maintained for the Task; upon completion of the annual audit, the Operating Agent shall present the accounts together with the auditors' report to the Executive Committee for approval;
- (5) All books of account and records maintained by the Operating Agent shall be preserved for at least three years from the date of termination of the Task;
- (6) Where provided in the relevant Annex, a Participant supplying services, materials or intellectual property to the Task shall be entitled to a credit, determined by the Executive Committee, acting by unanimity, against its contribution (or to compensation, if the value of such services, materials or intellectual property exceeds the amount of the Participant's contribution); such credits for services of staff shall be calculated on an agreed scale approved by the Executive Committee and include all payroll-related costs.

(g) *Contribution to Common Funds.* Should Participants agree to establish common funds under the annual Programme of Work and Budget for a Task, any financial contributions due from Participants in a Task shall be paid to the Operating Agent in the currency of the country of the Operating Agent at such times and upon such other conditions as the Executive Committee, acting by unanimity, shall determine, provided however that:

- (1) Contributions received by the Operating Agent shall be used solely in accordance with the Programme of Work and Budget for the Task;
- (2) The Operating Agent shall be under no obligation to carry out any work on the Task until contributions amounting to at least fifty per cent (in cash terms) of the total due at any one time have been received.

(h) *Ancillary Services.* Ancillary services may, as agreed between the Executive Committee and the Operating Agent, be provided by that Operating Agent for the operation of a Task and the cost of such services, including overheads connected therewith, may be met from budgeted funds of that Task.

(i) *Taxes.* The Operating Agent shall pay all taxes and similar impositions (other than taxes on income) imposed by national or local governments and incurred by it in connection with a Task, as expenditure incurred in the operation of that Task under the Budget; the Operating Agent shall, however, endeavour to obtain all possible exemptions from such taxes.

(j) *Audit.* Each Participant shall have the right, at its sole cost, to audit the accounts of any work in a Task for which common funds are maintained, on the following terms:

- (1) The Operating Agent shall provide the other Participants with an opportunity to participate in such audits on a cost-shared basis;

- (2) Accounts and records relating to activities of the Operating Agent other than those conducted for the Task shall be excluded from such audit, but if the Participant concerned requires verification of charges to the Budget representing services rendered to the Task by the Operating Agent, it may at its own cost request and obtain an audit certificate in this respect from the auditors of the Operating Agent;
- (3) Not more than one such audit shall be required in any financial year;
- (4) Any such audit shall be carried out by not more than three representatives of the Participants.

Article 7

INFORMATION AND INTELLECTUAL PROPERTY

It is expected that for each Task agreed to pursuant to this Agreement, the applicable Annex will contain information and intellectual property provisions. The General Guidelines Concerning Information and Intellectual Property, approved by the Governing Board of the Agency on 21st November, 1975, shall be taken into account in developing such provisions.

Article 8

LEGAL RESPONSIBILITY AND INSURANCE

(a) *Liability of Operating Agent.* The Operating Agent shall use all reasonable skill and care in carrying out its duties under this Agreement in accordance with all applicable laws and regulations. Except as otherwise provided in this Article, the cost of all damage to property, and all expenses associated with claims, actions and other costs arising from work undertaken with common funds for a Task shall be charged to the Budget of that Task; such costs and expenses arising from other work undertaken for a Task shall be charged to the Budget of that Task if the Task Annex so provides or the Executive Committee, acting by unanimity, so decides.

(b) *Insurance.* The Operating Agent shall propose to the Executive Committee all necessary liability, fire and other insurance, and shall carry such insurance as the Executive Committee may direct. The cost of obtaining and maintaining insurance shall be charged to the Budget of the Task.

(c) *Indemnification of Contracting Parties.* The Operating Agent shall be liable, in its capacity as such, to indemnify Participants against the cost of any damage to property and all legal liabilities, actions, claims, costs and expenses connected therewith to the extent that they:

- (1) Result from the failure of the Operating Agent to maintain such insurance as it may be required to maintain under paragraph (b) above; or
- (2) Result from the gross negligence or wilful misconduct of any officers or employees of the Operating Agent in carrying out their duties under this Agreement.

Article 9

LEGISLATIVE PROVISIONS

(a) *Accomplishment of Formalities.* Each Participant shall request the appropriate authorities of its country (or its Member States in the case of an international organization) to use their best endeavours, within the framework of applicable legislation, to facilitate the accomplishment of formalities involved in the movement of persons, the importation of materials and equipment and the transfer of currency which shall be required to conduct the Task in which it is engaged.

(b) *Applicable Laws.* In carrying out this Agreement and its Annexes, the Contracting Parties shall be subject to the appropriation of funds by the appropriate governmental authority, where necessary, and to the constitution, laws and regulations applicable to the respective Contracting Parties, including, but not limited to, laws establishing prohibitions upon the payment of commissions, percentages, brokerage or contingent fees to persons retained to solicit governmental contracts and upon any share of such contracts accruing to governmental officials.

(c) *Decisions of Agency Governing Board.* Participants in the various Tasks shall take account, as appropriate, of the Guiding Principles for Co-operation in the Field of Energy Research and Development, and any modification thereof, as well as other decisions of the Governing Board of the Agency in that field. The termination of the Guiding Principles shall not affect this Agreement, which shall remain in force in accordance with the terms hereof.

(d) *Settlement of Disputes.* Any dispute among the Contracting Parties concerning the interpretation or the application of this Agreement which is not settled by negotiation or other agreed mode of settlement shall be referred to a tribunal of three arbitrators to be chosen by the Contracting Parties concerned who shall also choose the Chairman of the tribunal. Should the Contracting Parties concerned fail to agree upon the composition of the tribunal or the selection of its Chairman, the President of the International Court of Justice shall, at the request of any of the Contracting Parties concerned, exercise those responsibilities. The tribunal shall decide any such dispute by reference to the terms of this Agreement and any applicable laws and regulations, and its decision on a question of fact shall be final and binding on the Contracting Parties concerned. Operating Agents which are not Contracting Parties shall be regarded as Contracting Parties for the purpose of this paragraph.

Article 10

ADMISSION AND WITHDRAWAL OF CONTRACTING PARTIES

- (a) *Admission of New Contracting Parties: Agency Countries.* Upon the invitation of the Executive Committee, acting by unanimity, admission to this Agreement shall be open to the government of any Agency Participating Country (or a national agency, public organization, private corporation, company or other entity designated by such government), which signs or accedes to this Agreement, accepts the rights and obligations of a Contracting Party, and is accepted for participation in at least one Task by the Participants in that Task, acting by unanimity. Such admission of a Contracting Party shall become effective upon the signature of this Agreement by the new Contracting Party or its accession thereto and its giving Notice of Participation in one or more Annexes and the adoption of any consequential amendments thereto.
- (b) *Admission of New Contracting Parties: Other OECD Countries.* The government of any Member of the Organisation for Economic Co-operation and Development which does not participate in the Agency may, on the proposal of the Executive Committee, acting by unanimity, be invited by the Governing Board of the Agency to become a Contracting Party to this Agreement (or to designate a national agency, public organization, private corporation, company or other entity to do so), under the conditions stated in paragraph (a) above.
- (c) *Participation by the European Communities.* The European Communities may participate in this Agreement in accordance with arrangements to be made by the Executive Committee, acting by unanimity.
- (d) *Admission of New Participants in Tasks.* Any Contracting Party may, with the agreement of the Participants in a Task, acting by unanimity, become a Participant in that Task. Such participation shall become effective upon the Contracting Party's giving the Executive Director of the Agency a Notice of Participation in the appropriate Task Annex and the adoption of consequential amendments thereto.
- (e) *Contributions.* The Executive Committee may require, as a condition to admission to participation, that the new Contracting Party or new Participant shall contribute (in the form of cash, services or materials) an appropriate proportion of the prior budget expenditure of any Task in which it participates.
- (f) *Replacement of Contracting Parties.* With the agreement of the Executive Committee, acting by unanimity, and upon the request of a government, a Contracting Party designated by that government may be replaced by another party. In the event of such replacement, the replacement party shall assume the rights and obligations of a Contracting Party as provided in paragraph (a) above and in accordance with the procedure provided therein.
- (g) *Withdrawal.* Any Contracting Party may withdraw from this Agreement or from any Task either with the agreement of the Executive Committee, acting by unanimity, or by giving twelve months written Notice of Withdrawal to the Executive Director of the Agency, such Notice to be given not less than one year after the date hereof. The withdrawal

of a Contracting Party under this paragraph shall not affect the rights and obligations of the other Contracting Parties; except that, where the other Contracting Parties have contributed to common funds for a Task, their proportionate shares in the Task Budget shall be adjusted to take account of such withdrawal.

(h) *Changes of Status of Contracting Party.* A Contracting Party other than a government or an international organization shall forthwith notify the Executive Committee of any significant change in its status or ownership, or of its becoming bankrupt or entering into liquidation. The Executive Committee shall determine whether any such change in status of a Contracting Party significantly affects the interests of the other Contracting Parties; if the Executive Committee so determines, then, unless the Executive Committee, acting upon the unanimous decision of the other Contracting Parties, otherwise agrees:

- (1) That Contracting Party shall be deemed to have withdrawn from the Agreement under paragraph (g) above on a date to be fixed by the Executive Committee; and
- (2) The Executive Committee shall invite the government which designated that Contracting Party to designate, within a period of three months of the withdrawal of that Contracting Party, a different entity to become a Contracting Party; if approved by the Executive Committee, acting by unanimity, such entity shall become a Contracting Party with effect from the date on which it signs or accedes to this Agreement and gives the Executive Director of the Agency a Notice of Participation in one or more Annexes.

(i) *Failure to Fulfil Contractual Obligations.* Any Contracting Party which fails to fulfil its obligations under this Agreement within sixty days after its receipt of notice specifying the nature of such failure and invoking this paragraph, may be deemed by the Executive Committee, acting by unanimity, to have withdrawn from this Agreement.

Article 11

FINAL PROVISIONS

(a) *Term of Agreement.* This Agreement shall remain in force for an initial period of three years from the date hereof, and shall continue in force thereafter unless and until the Executive Committee, acting by unanimity, decides on its termination.

(b) *Legal Relationship of Contracting Parties and Participants.* Nothing in this Agreement shall be regarded as constituting a partnership between any of the Contracting Parties or Participants.

(c) *Termination.* Upon termination of this Agreement, or any Annex to this Agreement, the Executive Committee, acting by unanimity, shall arrange for the liquidation of the assets of the Task or Tasks. In the event of such liquidation, the Executive Committee shall, so far as practicable, distribute the assets of the Task, or the proceeds therefrom, in

proportion to the contributions which the Participants have made from the beginning of the operation of the Task, and for that purpose shall take into account the contributions and any outstanding obligations of former Contracting Parties. Disputes with a former Contracting Party about the proportion allocated to it under this paragraph shall be settled under Article 9(d) hereof, for which purpose a former Contracting Party shall be regarded as a Contracting Party.

(d) *Amendment.* This Agreement may be amended at any time by the Executive Committee, acting by unanimity, and any Annex to this Agreement may be amended at any time by the Executive Committee, acting by unanimity of the Participants in the Task to which the Annex refers. Such amendments shall come into force in a manner determined by the Executive Committee, acting under the voting rule applicable to the decision to adopt the amendment.

(e) *Deposit.* The original of this Agreement shall be deposited with the Executive Director of the Agency and a certified copy thereof shall be furnished to each Contracting Party. A copy of this Agreement shall be furnished to each Agency Participating Country, to each Member country of the Organisation for Economic Co-operation and Development and to the European Communities.

Done in Paris, this 18th day of February, 1981.

For the GOVERNMENT OF BELGIUM:

For the PULP AND PAPER RESEARCH INSTITUTE OF CANADA
(designated by the Government of Canada):

For the JAPAN PAPER ASSOCIATION
(designated by the Government of Japan):

For the NIJVERHEIDSORGANISATIE T.N.O.
(NETHERLANDS)
(designated by the Government of the Netherlands):

For the NORWEGIAN PULP AND PAPER RESEARCH INSTITUTE
(designated by the Government of Norway):

For the CENTRO DE ESTUDIOS
DE LA ENERGÍA (designated
by the Government of Spain):

For the NATIONAL SWEDISH BOARD FOR
TECHNICAL DEVELOPMENT (STU)
(designated by the Government of Sweden):

For the BRITISH PAPER AND BOARD INDUSTRY FEDERATION
(designated by the Government of the United Kingdom
of Great Britain and Northern Ireland):

For the DEPARTMENT OF ENERGY
for and on behalf of the Government of
the United States of America:

ANNEX I

INCREASING THE THERMAL EFFICIENCY OF THE KRAFT RECOVERY BOILER

1. *Background*

For economic and environmental reasons, burning concentrated spent liquor from kraft production in a recovery boiler in order to produce steam, and sometimes electricity, is a normal practice in kraft pulp mills. At present, however, the dry-solids content of spent liquor burned in recovery boilers is no higher than approximately 65 per cent. There appear to be two factors that limit concentrations to this level: (a) using present methods, considerably larger expenditures of energy would be required to produce concentrations over about 65 per cent; (b) because concentrations of liquor higher than about 65 per cent have not been available, recovery boilers to deal with the potential problems resulting from high viscosity have not been developed.

This limitation of dry-solids content results in a decrease in the energy available for steam generation, since part of the energy produced is used to vaporize the water. Burning higher concentrations of kraft liquor will, therefore, result in an increase of energy available for productive use and, hence, contribute to energy conservation.

2. *Objectives*

The objective of this Task is to increase the thermal efficiency of the overall spent liquor recovery system in demonstration projects.

3. *Means*

The Participants will carry out a task-sharing project by investigating methods of obtaining concentrated waste liquors that have a dry-solids content above about 65 per cent and are suitable for burning in a recovery boiler.

4. *Work Distribution and Responsibilities of Participant*

Subtask 1: Investigating methods of obtaining high-concentration spent liquor

Contribution from Sweden.

- (a) *Objective.* The objective of this Subtask is to investigate and prepare an industrial process to produce high concentration spent kraft liquor for use in recovery boilers.

(b) *Means.* The scope of the work to be accomplished will include several theoretical and experimental investigations. It is set out in the following steps:

STEP 1: Identify technical processes for evaporating kraft black liquor to a solids content higher than 65 per cent;

STEP 2: - Conduct technical evaluations of processes selected in Step 1;
- Investigate processing problems and evaluate possible technical problems in handling and burning such concentrated liquor;
- Investigate material balance of the evaporation processes and of the complete mill;
- Investigate energy balance of the evaporation processes and of the complete mill;

STEP 3: Conduct economic evaluation of processes selected in Step 1;

STEP 4: Select the one or two most technically and economically feasible evaporation processes; prepare preliminary designs and estimate the cost of building appropriate pilot plants.

(c) *Expected Results.* The result of Subtask 1 will be a comprehensive report of the work carried out under the four steps above, covering

- Review of the technical process for evaporating kraft black liquor to a dry-solids content higher than 65 per cent;
- Technical and economic evaluations of all the processes;
- Descriptions of the criteria used to select processes for pilot-plant testing;
- Preliminary description and design of the pilot plant.

(d) *Time Schedule.* The duration of the Subtask shall be 24 months. It may be extended by the Executive Committee, acting by unanimity.

(e) *Funding.* The Swedish Participant will bear all costs it incurs in carrying out this Subtask, including costs of materials, testing, transport, reporting and travel expenses of representatives. The Subtask is expected to cost 600,000 Swedish Kroner, at July, 1979 price levels.

(f) *Follow up.* When the results of the first four steps have been reported, the Participants will decide whether experiments on a pilot plant scale will be undertaken as described below. The possibility of jointly funding this second phase will also be considered at this time. Any such activities shall take the form of additional Task Annexes to this Agreement.

STEP 1: Design and construct the pilot plant(s) for the process(es) selected in Step 4 above;

STEP 2: Operate the pilot plant(s) and evaluate the results from a technical and economic standpoint;

STEP 3: Propose a commercial-sized design for the evaluation process(es) that incorporates the results of the pilot-plant evaluation.

The result of the potentially extended Subtask 1 would be a proposed design for a commercial-sized process, with associated technical and economic support.

Subtask 2: Investigating freeze-crystallization techniques for black liquor

Contribution from the United States.

(a) *Objective.* The objective of this Subtask is to investigate a freezing-concentration process.

(b) *Means.* The scope of the work to be accomplished is set out in the following steps:

STEP 1: Select the freeze-concentration process to be applied in an integrated mill. The process will use low-level waste heat as the energy source;

STEP 2: Develop test data to characterize various black liquors;

STEP 3: Design and fabricate a mini-test system. The system envisioned will have a capacity of 500 to 1,000 gallons per day. It will be operated with various types of black liquors to determine operating characteristics, including tall-oil separation, economics of operation and energy savings;

STEP 4: Test the mini-plant system;

STEP 5: Scale-up preliminary design and cost information for a pulp and paper mill application.

(c) *Expected Results.* The expected result of the Subtask would be a comprehensive report of the first five steps above covering:

- Selection of an optimum process for freeze-concentrating black liquor;
- Determination of the economics and energy conservation associated with freeze concentration, as compared to the present evaporator technology;
- Calculation of preliminary design and costs involved in applying the freeze-concentration process.

(d) *Time Schedule.* The duration of this Task shall be 24 months, but it may be extended by the Executive Committee, acting by unanimity.

- (e) *Funding.* The project is expected to cost \$1 million at July, 1979 price levels. The U.S. Participant will bear all costs it incurs in carrying out this Subtask, including costs of materials, testing, transport, reporting and travel expenses of representatives.
- (f) *Follow up.* When the results of the first five steps have been reported, the Participants will decide whether a pilot plant system shall be developed as described below. The possibility of jointly funding this second phase will also be considered at this time. Any such activities shall take the form of additional Task Annexes to this Agreement.

STEP 1: Design, fabricate and install a freeze-concentration system in a mill application;

STEP 2: Operate and test the system under varying mill conditions;

STEP 3: Prepare a technical report on operation results, including operating cost, energy savings, reliability, economic benefit, etc;

STEP 4: Disseminate results to the industry.

The result of the potentially extended Subtask will be a comprehensive report on a freezing-concentration process, also covering the demonstration of potential for tall-oil and volatiles recovery.

5. *Special Responsibilities of the Operating Agent*

The Operating Agent shall be responsible for the overall administrative management of the work under this Annex and for implementing the decisions of the Executive Committee. To that end, the Operating Agent shall:

- (a) Prepare and submit for approval to the Executive Committee not later than one month after the adoption of this Annex a detailed programme of work and budget.
- (b) Report to the Executive Committee on the results and progress of work under the Annex, at least semi-annually.

6. *Funding*

The cost for the work to be carried out under this Annex will be funded by the Participants as indicated in paragraph 4. In addition, the Operating Agent will bear all costs it incurs in carrying out its responsibilities under this Annex.

7. *Time Schedule*

This Annex shall enter into force on the date of signature of this Agreement and remain in force for an initial period of 24 months from that date. It may be extended by agreement of the Participants in the Executive Committee. Extensions shall apply only to Participants who agree to the extension or notify the IEA Secretariat of their decision to continue to participate.

8. *Operating Agent*

The National Swedish Board for Technical Development (STU).

9. *Information and Intellectual Property*

- (a) *Executive Committee's Powers.* The publication, distribution, handling, protection and ownership of information and intellectual property arising from activities conducted under this Annex shall be determined by the Executive Committee, acting by unanimity, in conformity with this Agreement.
- (b) *Right to Publish.* Subject only to the patents and copyright restrictions of this Annex, 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 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) which 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 Participants 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.* 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) *Reports on Programme Work.* Reports containing arising information and pre-existing information necessary for and used in each Subtask, including proprietary information, shall be provided to each Participant by the Participants performing the Subtask. It shall be the responsibility of each Participant to identify information which qualifies as proprietary information under this Annex and ensure that it is appropriately marked. The Operating Agent shall provide summary reports of work performed under this Annex and results thereof (arising information), excluding proprietary information, to the Executive Committee.
- (f) *Licensing of Proprietary Information.* Each Participant agrees to license all pre-existing proprietary information necessary for and used in its work in the Task and which it owns or controls and arising proprietary information to the other Participants, their governments, and the nationals of their respective countries designated by them on reasonable terms and conditions for use in all other countries.
- (g) *Arising Inventions.* Inventions made or conceived in the course of or under the Task (arising inventions) shall be owned in all countries by the inventing Participant. Information regarding inventions on which patent protection is to be obtained by the Participant shall not be published or publicly disclosed by the other Participants until a patent application has been filed, provided, however, that this restriction on publication or disclosure shall not extend beyond six months from the date of receipt of such information. It shall be the responsibility of the inventing Participant to appropriately mark reports which disclose inventions that have not been appropriately protected by the filing of a patent application.
- (h) *Licensing of Inventions.* Each Participant agrees to license all arising inventions and all pre-existing inventions necessary for and used in the Task to the other Participants, their governments and the nationals of their respective countries designated by them on reasonable terms and conditions for use in all countries.
- (i) *Copyright.* The Operating Agent or each Participant for its own Subtask results may take appropriate measures necessary to protect copyrightable material generated under the Task. Copyrights obtained shall be the property of that Participant or 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.

- (j) *Inventors and Authors.* Each Participant shall, without prejudice to any rights of inventors or authors under its national laws, take all necessary steps to provide the co-operation from its authors and inventors 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.
- (k) *Determination of "National".* The Participants may establish guidelines to determine what constitutes a "national" of a Participant.

10. *Participants in this Task*

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

The National Swedish Board for Technical Development (STU),

The Department of Energy (United States).

ANNEX II

DEVELOPING AN ENERGY ACCOUNTING METHOD FOR THE PULP AND PAPER INDUSTRY

1. *Background*

In order to compare the relative energy efficiency of products and processes, it is necessary to collect and process statistical data on energy consumption and production. Because of different starting points and assumptions in the energy accounting systems of different countries, industries, institutions, and individuals, it is difficult to make meaningful comparisons and draw valuable conclusions about data presented by industry officials and international specialists. In the absence of generally accepted rules, such energy comparisons are often meaningless. This lack of comparability precludes accurate evaluation of existing energy conservation strategies and the development of new ones.

2. *Objectives*

The objectives of this Task are:

- To develop a uniform, internationally accepted method of measuring and calculating energy usage in the pulp and paper industry at the process, department and mill levels;
- To establish a uniform method of measuring and calculating the energy content of any given paper and paperboard products. This method will define the energy content of the materials, equipment, and transportation used to manufacture and deliver a given product.

3. *Means*

The Participants will undertake a co-ordinated effort involving the approach and steps described in paragraph 4 below.

4. *Work Distribution and Responsibilities of the Participants*

The work performed under this Annex will be based on that of a Swedish study of energy accounting carried out in 1978. It will consist of the following steps:

- STEP 1: Translate the above mentioned Swedish study into English and send it to all Participants. (This step will be the responsibility of the Swedish Participant.);
- STEP 2: Review the study and make specific suggestions for improving and extending the methodology. (All Participants other than the Swedish Participant will be responsible for carrying out this step.);

- STEP 3: Develop a draft methodology that incorporates the comments of Participants. (The Swedish Participant will be responsible for executing this step.);
- STEP 4: Test and refine the draft methodology developed under Step 3 in the pulp and paper industries of the Participating Countries;
- STEP 5: Prepare and distribute a final report that incorporates the work of Step 4. (The Swedish Participant will be responsible for the final report.).

5. Special Responsibilities of Operating Agent

In addition to the responsibilities outlined in paragraph 4 above, the Operating Agent shall be responsible for the overall management of the work under this Annex and for implementing the decisions of the Executive Committee. To that end, the Operating Agent shall:

- (a) Prepare and submit for approval to the Executive Committee not later than one month after the adoption of this Annex a detailed programme of work and budget.
- (b) Report to the Executive Committee on the results and progress of work, at least semi-annually.
- (c) Maintain cost records for the common funds and submit an accounting statement to all Participants at the end of each step; this statement shall include an estimate of the costs to be incurred in succeeding steps.

6. Funding

- (a) The Participants agree to establish a common fund to finance the work under Steps 1, 3 and 5 as specified in paragraph 4 above.
- (b) The expenditures covered by the common fund shall be borne in shares as mentioned in sub-paragraph (c) below by the Participants, and shall not exceed 435,000 Swedish Kroners at July, 1979 price levels. The Executive Committee, acting by unanimity, may agree to increase the level of expenditure.
- (c) Each Participant shall bear directly all the costs not covered by the common fund which it incurs in carrying out this Task.
- (d) The Executive Committee, acting by unanimity, shall adjust Participants' contributions at half-yearly intervals to take account of changing price levels and to ensure that the necessary real resources will continue to be available to conduct the work called for. If significant changes in price levels occur, the Executive Committee, acting by unanimity, shall decide whether to adjust the Programme of Work to the available funds or to increase the Budget.

Table 1

(e) Participants' Contributions to the Common Fund (in SKr thousands)

Belgium	29
Japan	116
Netherlands	29
Norway	29
Spain	29
Sweden	29
United Kingdom	58
United States	116
Total	435

7. Time Schedule

This Annex shall enter into force on the date of signature of this Agreement and remain in force for an initial period of 24 months from that date. It may be extended by agreement of the Participants in the Executive Committee. Extension shall apply only to Participants who agree to the extension or notify the IEA Secretariat of their decision to continue to participate.

8. Operating Agent

The National Swedish Board for Technical Development (STU).

9. 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 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 Agency to carry out its functions 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 therefor;
 - (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 of all work performed under the Task and the results

thereof, including studies, assessments, analyses, evaluations and other documentation, but excluding proprietary information, to the Executive Committee.

- (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.

10. *Results*

The result of this Annex shall be a comprehensive report in two parts. The first will contain a general, internationally accepted, methodology of measuring and calculating energy usage in the pulp and paper industry at the process, department and mill level. The second part of the report will consist of a uniform, internationally accepted method of measuring and calculating the energy content of particular products; clearly understandable accounting rules for employing the second method will also be included.

11. *Participants in this Task*

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

The Government of Belgium,
The Japan Paper Association,
Nijverheidsorganisatie T.N.O. (Netherlands),
The Norwegian Pulp and Paper Research Institute,
Centro de Estudios de la Energía (Spain),
The National Swedish Board for Technical Development (STU),
The British Paper and Board Industry Federation,
The Department of Energy (United States of America).

ANNEX III

IMPROVING ENERGY CONSERVATION IN MECHANICAL DEFIBRATION, BEATING AND WATER REMOVAL

1. *Background*

The three most energy-intensive processes in the pulp and paper industry are wood defibration, which occurs during pulp-making; beating; and water removal.

Among the various processes used for wood defibration, mechanical defibration gives the highest yield of pulp, 95 per cent or more, although it has high electricity requirements (1,500-2,500 KWh/ton of pulp).

The largest energy use in stock preparation, the first step in papermaking, occurs during the beating process. Fibres are first mechanically treated in order to meet the requirements of the final product; then the pulp is diluted with water before the fibres are transported to the paper machine. During water removal, the pulp fibres are formed into a paper web by removing the water.

The remaining water in the sheet is then removed by a mechanical pressing step and, finally, by the application of heat in the drying step. This last step is another of the highly energy-intensive processes in papermaking.

2. *Objectives*

The objectives of this Task are:

- To investigate energy-conserving methods, techniques or processes to reduce energy consumption during the mechanical defibration, beating, and water-removal processes of pulp and paper manufacture;
- To exchange information on these methods, techniques and processes.

3. *Means*

The Participants in this Task will undertake projects related to the areas described in paragraph 1 on a task-sharing basis and provide the results of their efforts to each other. The Subtasks are described under paragraph 4 below.

4. *Work Distribution and Responsibilities of Participants*

Subtask 1: Investigating the feasibility of microbiological pretreatment of pulpwood to soften it before mechanical treatment.

Contribution by Sweden.

- (a) *Objective.* The objective of this Subtask is to assess the feasibility and energy savings of producing mechanical-grade pulp by means of biological pretreatment.
- (b) *Means.* The scope of the work to be accomplished at the laboratory and pilot-plant level is set out in the following steps:
- STEP 1: Select the mutants to be tested, and develop hyper-productivity of lignin-degrading enzymes;
- STEP 2: Select the types of wood to be tested;
- STEP 3: Conduct laboratory studies of the impact of mutants on the types of wood selected in terms of:
- Morphological changes in the wood structure;
 - Changes in the energy consumption of subsequent pulping and refining processes;
 - Quality of the resulting pulp; and
 - Environmental aspects of the process;
- STEP 4: Prepare recommendations about the next steps required (e.g., possible pilot plant) and distribute them to the Participants, along with a report on laboratory studies.
- (c) *Funding.* The Swedish Participant will bear all costs it incurs in carrying out this Subtask. The estimated cost is approximately 1,000,000 Swedish Kroner at July, 1979 price levels.

Subtask 2: Optimizing the wet-pressing process

Contribution by the United States.

- (a) *Objective.* The objective of this project is to increase the efficiency of the wet-pressing process through computer simulation.
- (b) *Means.* The scope of the work to be accomplished through laboratory tests and the development of a computer model that will later be used at the mill level is set out in the following six steps:
- STEP 1: Perform laboratory tests to determine the effect of the compression rate on the compressibility and permeability of pulps. A specially designed compression tester will be developed for these tests;
- STEP 2: Formulate a wet-pressing model based on the experimental information developed in Step 1;
- STEP 3: Develop a general optimization model based on Step 2;
- STEP 4: Run pilot-plant tests to extend the wet-pressing model developed in Step 2 to the situation in which the operation occurs between felts in a roll-type pressing operation;

- STEP 5: Perform mill tests to test the model under actual mill conditions;
- STEP 6: Refine the optimization model developed in Step 3 to incorporate the pilot- and mill-test data and demonstrate the applicability of the optimization model to specific mill situations.

(c) *Funding.* . The United States Participant will bear all costs it incurs in carrying out this Subtask. The estimated cost is approximately \$1 million at July, 1979 price levels.

Subtask 3: Reducing energy consumption during the refining of hardwoods

Contribution by Norway.

(a) *Means.* The scope of the work to be accomplished is set out in the following three steps:

STEP 1: Investigate the effects of the following methods of pretreating wood before refining:

- (a) Pressure impregnation versus soaking;
- (b) Sulphite and alkali impregnation;
- (c) Power input during the impregnation stage (shredding).

This step will be carried out with selected softwood and hardwood species.

STEP 2: Analyze the effects of the following refining variables:

- (a) Consistency;
- (b) Temperature;
- (c) Power consumption;
- (d) Use of alkali, sulphite and bleaching chemicals;
- (e) Amount of chemicals used.

The programme will be run with selected hardwood and softwood species in order to establish a relationship between refiner results and different wood parameters.

STEP 3: Determine the effects of different post-treatments

Of particular concern will be the effect of ozone and peroxide at this stage and the combination of two-stage refining with an intermediate chemical treatment. The goal is to determine the best combination of chemical and mechanical fibre treatment that takes account of the restrictions imposed by paper properties and consumes the least energy.

(b) *Scale of Operation.* Most of the work will be done in a pilot plant 36'' double-disk refiner at high or normal temperatures. The impregnation may be done in open vessels or under pressure, and the combination of impregnation and mechanical treatment can also be done in an Impressafiner, where the power input may be 150 kWh/ton.

Certain pulp properties will be evaluated in a wet state, and dry properties will be evaluated by making handsheets. The posttreatment may be done in a pilot ozone reactor, if available, or in the pilot plant refiner, where bleaching chemicals may be added.

The most promising samples will be run on a pilot plant paper machine to permit a complete evaluation of printing characteristics.

- (c) *Funding.* The Norwegian Participant will bear all costs it incurs in carrying out this Subtask. The estimated cost is approximately \$300,000 at July, 1979 price levels.

Subtask 4: Improving water removal at paper machine press sections

Contribution by Canada.

- (a) *Objective.* To determine, select and demonstrate opportunities to reduce the amount of energy required to remove water during paper manufacture.

- (b) *Means.*

STEP 1: Review of information.

Review the available information on the performance of the press sections of Canadian paper machines when making various grades of paper.

Mill visits.

Visit approximately 20 mills to make measurements and to perform experiments on the paper machine press sections. Paper machines with either good or poor press performance will be studied first in order to identify the most important reasons for good or poor press operation.

Information will be obtained during these visits on press components, geometry and operating conditions so as to include all important pressing variables. Data will include machine speed, press geometry, roll types, roll crowns, operating press loads, maximum possible press loads, felt types, furnish properties, operating temperatures, vacuum levels, etc.

Assessment of data.

Assess the data to identify the most promising opportunities and to define additional information required, either in pilot machine tests or by supplementary commercial machine measurements.

STEP 2: Pilot machine and laboratory tests.

Perform experiments to reproduce the existing behaviour of specific commercial machines and to demonstrate the effect of proposed modifications on water removal, paper quality and expected energy savings.

STEP 3: Technology transfer.

Identify suitable opportunities and, on selected commercial paper machines, demonstrate the application of recommended technological improvements.

- (c) Funding. The Canadian participant will bear all costs it incurs in carrying out this Subtask. The estimated cost is approximately 233,000 Canadian dollars at July, 1979 price levels.

5. *Special Responsibilities of Operating Agent*

The Operating Agent shall be responsible for the overall administrative management of the work under this Annex and for implementing the decisions of the Executive Committee. To that end the Operating Agent shall:

- Prepare and submit for approval to the Executive Committee not later than one month from adoption of the Annex a detailed programme of work;
- Report to the Executive Committee, at least semi-annually, on the results and the progress of the work performed.

6. *Funding*

The cost for the work to be carried out under this Annex will be funded by the Participants as indicated in paragraph 4 above.

7. *Time Schedule*

This Annex shall enter into force on the date of signature of this Agreement and remain in force for an initial period of 36 months from that date. It may be extended by agreement of the Participants in the Executive Committee. Extensions shall apply only to those Participants who agree to the extension or notify the IEA Secretariat of their decision to continue to participate.

8. *Operating Agent*

United States Department of Energy.

9. *Information and Intellectual Property*

- (a) *Executive Committee's Powers.* The publication, distribution, handling, protection and ownership of information and intellectual property arising from activities conducted under this Annex shall be determined by the Executive Committee, acting by unanimity, in conformity with this Agreement.

(b) *Right to Publish.* Subject only to the patents and copyright restrictions of this Annex to 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 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) which 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.* 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) *Reports on Programme Work.* Reports containing arising information and pre-existing information necessary for and used in each Subtask, including proprietary information, shall be provided to each Participant by the Participant performing the Subtask. It shall be the responsibility of each Participant to identify information which qualifies as proprietary information under this Annex and ensure that it is appropriately marked. The Operating Agent shall provide summary reports of work performed under this Annex and results thereof (arising information), excluding proprietary information, to the Executive Committee.

(f) *Licensing of Proprietary Information.* Each Participant agrees to license all pre-existing proprietary information necessary for and used in its work in the Task and which it owns or controls and arising proprietary information to the

other Participants, their governments, and the nationals of their respective countries designated by them on reasonable terms and conditions for use in all other countries.

- (g) *Arising Inventions.* Inventions made or conceived in the course of or under the Task (arising inventions) shall be owned in all countries by the inventing Participant. Information regarding inventions on which patent protection is to be obtained by the Participant shall not be published or publicly disclosed by the other Participants until a patent application has been filed, provided, however, that this restriction on publication or disclosure shall not extend beyond six months from the date of receipt of such information. It shall be the responsibility of the inventing Participant to appropriately mark reports which disclose inventions that have not been appropriately protected by the filing of a patent application.
- (h) *Licensing of Inventions.* Each Participant agrees to license all arising inventions and all pre-existing inventions necessary for and used in the Task to the other Participants, their governments and the nationals of their respective countries designated by them on reasonable terms and conditions for use in all countries.
- (i) *Copyright.* The Operating Agent or each Participant for its own Subtask results may take appropriate measures necessary to protect copyrightable material generated under the Task. Copyrights obtained shall be the property of that Participant or 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.
- (j) *Inventors and Authors.* Each Participant shall, without prejudice to any rights of inventors or authors under its national laws, take all necessary steps to provide the co-operation from its authors and inventors 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.
- (k) *Determination of "National".* The Participants may establish guidelines to determine what constitutes a "national" of a Participant.

10. Results

Participants responsible for the contributions as specified in paragraph 4 above shall prepare and circulate to all Participants comprehensive reports for each of the projects. They shall outline the results in terms of energy conservation for each process surveyed.

11. *Participants.*

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

The Pulp and Paper Research Institute of Canada,

The Norwegian Pulp and Paper Research Institute,

The National Swedish Board for Technical Development (STU),

The Department of Energy (United States of America).