

Annex XI

Summary

Title: JOint STudies for New And Mitigated Energy Systems (JOSTNAMES)
 Subtitle: Climate friendly, Secure and Productive Energy Systems

Duration: 2008 - 2010

Objectives:

- (a) *Research and Development*
 The main objective is to continually advance the state-of-the-art with respect to energy systems analyses and integrated energy / economic / environmental / engineering modelling.
- (b) *Co-ordinated Analyses*
 The methodologies will be used for carrying out joint developed and developing global and/or regional energy systems studies with technological details for policy impact evaluation.
- (c) *Capacity building*
 When necessary, and contingent to the availability of funds, activities will aim at maintaining/improving international/national capabilities, across developed and developing countries, for energy systems analyses and the use of ETSAP tools.
- (d) *Tools maintenance*
 The minimum objective of this Annex is to maintain and update ETSAP model generators (MARKAL, TIMES) and users' interfaces (ANSWER, VEDA), and to organize two semi-annual workshops every year.

Budget: The annual fee of the first year is EURO 20,000 and not more in the following years. The Executive Committee decides the annual budget taking into account the number of participants.

Project Head and Operating Agent: GianCarlo TOSATO (ASATREM srl)

Attachment N5-final, to the
Agenda Item 6.1 of the
Executive Committee Meeting held in Brasilia on November 22, 2007

Annex XI (2008-2010)

Joint Studies for New And Mitigated Energy Systems (JOSTNAMES) Climate friendly, Secure and Productive Energy Systems

(Final Draft, November 22, 2007)

1. Introduction

A joint international programme of energy systems analysis seems now even more necessary than thirty years ago, when ETSAP started under the aegis of the IEA under the pressure of the first oil crises.

The continuous volatility of global energy markets reflects the rigidity of the final energy supply systems and the risks to security of supply perceived by final energy users, who demand increasing amounts of energy services worldwide. The anthropogenic origin of climate changes has been made clearer and more evident by the scientists of the Intergovernmental Panel of Climate Change in their recent Fourth Assessment Report. The Working Group III of the IPCC highlights difficulties and uncertainties of global mitigation paths towards stabilization: stabilising at 2.0-2.4 degrees centigrade above pre-industrial levels requires peaking emissions not later than 2015 and reducing them to 50%-15% of 2000 emissions by 2050 and even more at the end of the century (table 5 of the Summary for Policy Makers). However the cost of heading towards new 'no / low carbon' energy systems is at least an order of magnitude lower than the damages that the world risks if climate changes are not timely mitigated, as shown by the Stern report.

The important news is that, pushed by this cumulative evidence and the pressure of the public opinion, decision makers recently started to consider policy objectives and practical measures on a longer time perspective. The final communiqué of the recent G8+5 summit states that participants "will consider seriously the decisions made by the EU, Canada and Japan, which includes at least a halving of emissions by 2050. ... [and] commit to achieving these goals and invite the major emerging economies to join [them] in this endeavour." A few months ago, the Member States of the EU took the year 2020 as time horizon for increasing to 20% the contribution of renewable energy sources to their energy balance and reducing by 20% their greenhouse gas emissions below the 2000 level.

ETSAP is well equipped to carry out studies in the field of mitigation pathways and associated costs/impacts, looking to provide decision makers with global/national highly differentiated paths / scenarios towards new energy systems through the development and deployment of better technology chains, an essential component of any mitigation strategy and a preferred means by the US and several other countries.

2. Objectives

Building on previous achievements and tools, which will be maintained, this task proposes to carry out new common analyses, increase the capacity building effort and continue research in systems analysis and modelling. Practically this annex has the following objectives:

(a) *Research and Development*

This objective aims at continually advancing the state-of-the-art with respect to energy systems analyses and integrated energy / economic / environmental / engineering modelling.

The tools can be improved, for instance, in the following directions:

- continued advancement of the methodology underlying the analysis of present energy systems;
- inclusion of consumer choice and multiple consumers in the economic equilibrium framework, learning from the departure of equilibrium solution to actual values of the base years; this could make it possible to model the substitution between modes in transportation sector (intermodal split). Two candidates: passengers (rail/ buses/ cars) and freight (rail/trucks);
- myopic foresight: Advanced myopic schemes with different foresight horizons for different sectors, e.g. longer foresight in industry compared to residential sector; the usage of myopic variant could be facilitated by an ex-ante identification of infeasibilities (often occurring) when switching from a clairvoyant to a myopic model run;
- stability analyses of the equilibria to key input parameters;
- starting from existing models and databases, establish an initial technology repository, directly or indirectly linkable to ETSAP models and tools;
- simulation of non-competitive oil market;
- endogenisation of the demand of materials (steel, non-ferrous, cement, glass, plastics, etc) of energy technologies (e.g. nuclear plant, car, house);
- Improvement of the pre-run and post run diagnostics on technologies that don't penetrate in runs and the supply – demand curves;
- combination of GHG marginal abatement cost (MAC) curves and decomposition analysis to identify the underlying measures (e.g. fuel switch, efficiency, renewables, nuclear, etc.) responsible for the GHG reduction along the MAC curve
- enhancement of the structural modelling features of MARKAL and TIMES models and introduction of remote joint work at the same model, remote use of existing models and procedures, some “expert systems” capabilities, and
- improvement in the “user-friendliness” of the model “shells” (ANSWER/VEDA) both for advanced users as well as to support new user capacity building.

Additionally, the ETSAP-TIAM global multi-regional model can be improved as follows:

- add a feedback loop from climate to the energy system to the present direct impact of the energy-emission system on the climate in TIMES, and
- introduce all emissions (GHG, local pollutants) and some interregional transport of pollutants (e.g. SO₂).

The regional models can be improved, for instance, in the following directions and fields:

- (1) industrial sectors, where the development is dominated by technology substitution processes;
- (2) agriculture, which competes with energy through bio-fuels and GHG emissions, and
- (3) other scientific fields, where the substitution among discrete alternatives determines the development under predefined constraints and objectives.

Improved methodologies and models will increase the level and credibility of studies carried out by the Contracting Parties.

(b) Co-ordinated Analyses

The main objective of this task is to carry out joint developed – developing global / regional / national energy systems studies with technological details for policy impact evaluation. A collection of these studies will be part of an ETSAP report, possibly published. This objective will be pursued by contributing to the improvement of existing global (for instance ETSAP-TIAM and related country models), regional (for instance EC-NEEDS), national and local models.

The natural umbrella for reaching this objective is the IEA secretariat and its ETO office. This objective includes contributions and support to ETP2010 and all other outreach activities related to the IEA-G8-POW. ETSAP partners will take appropriate steps to communicate to country decision-makers relevant results of co-ordinated studies. Carrying out joint / co-ordinated studies with an international team of independent experts with experimented tools will benefit all Contracting Parties that will be capable of providing authorities and organizations with highly credible studies and policy impact evaluations.

(c) *Capacity building*

This objective, strictly related to the previous ones, aims at maintaining and improving international and national capabilities, across developed and developing countries, for

- analysing of energy systems – markets and technologies,
- modelling their possible long term development paths,
- building consistent energy / engineering / economic / environment scenarios, and
- evaluating policies towards economic sustainability, energy security, environment protection, global climate mitigation and technical feasibility.

Training new groups in the methodologies of quantitative impact analyses using the ETSAP Tools brings to the Contracting Parties the advantages of establishing tighter collaborations with energy systems analysis groups in developed as well as developing countries, building compatible models to facilitate cross-country comparisons, sharing experiences, and improving the international dimension of their own analyses.

(d) *Tools maintenance*

Maintaining and updating ETSAP Tools is the minimum objective of the Annex. This objective can be achieved only through funds provided by the contracting parties, since the MARKAL/TIMES model generators are distributed free of charge.

3. Means

The Participants shall achieve the objectives through the following means:

- (a) Carrying out common analyses on key aspects of present energy technology systems and their possible future developments;
- (b) Collecting, analysing and disseminating information and consistent data related to energy systems, energy technologies, energy and environment models and scenarios;
- (c) Promotion of common research on energy systems analysis, integration of existing tools in the present methodology and development of new tools, together with other groups active in the field;
- (d) Enhancement of existing ETSAP Tools and implementation of new ones, also by linking ETSAP methodology to other approaches;
- (e) Improvement of ETSAP Tools documentation and dissemination of representative analyses carried out with them;
- (f) Organization of semi-annual meetings of experts, as appropriate, to exchange information and experience in the area of work covered by the Agreement;
- (g) Participation in joint meetings with related international projects, making a concerted effort to communicate with the wider professional community, and by otherwise involving decision-makers;
- (h) Promotion of, and participation to, relevant common projects;
- (i) Organization of training courses to inform new experts or to widen the analytic capabilities of existing experts domestically, locally and in outreach activities, including “in-reach” capability building for participants in the use of the global models;
- (j) Exchange of specialists, experts and students active in the sector;
- (k) Using national and multi-national reference groups for the development and analysis of the models and linkage to users;

- (l) Twinning established ETSAP Contracting Parties with new countries, providing materials to guide new and recent users of ETSAP methodologies, as part of “Outreach” initiatives, and
- (m) Carrying out such other activities as may be agreed in the Annual Programme of Work.

4. Deliverables

- (a) Publications of independent analyses and background material resulting from the studies carried out towards the achievement of the above objectives; this will materialise in a common report / book as well as contributions to journals and other reports;
- (b) Technical reports on the feasibility or actual extension of ETSAP-TIAM and ETSAP tools in general to neighbouring fields;
- (c) Updated common tools for energy systems analysis, including improved versions of users’ manuals and guides to the use of ETSAP tools;
- (d) An improved website to better support the global community of ETSAP Tool users, including a password protected area with models and data accessible only to Contracting Parties and others approved by the OA/ExCo;
- (e) Periodic reports on workshops or seminars, and on analytical studies undertaken in connection with the Task, including semi-annual publication of the ETSAP newsletter, and
- (f) A final report on the activities carried out under this Task.

5. Specific Obligations, Responsibilities and Rights of the Participants

Participants shall carry out, to the extent possible, the following activities and communicate the results to the Operating Agent:

- (a) Performance of national and co-operative, multi-national scenario studies using ETSAP Tools and energy systems analyses in general;
- (b) Collection and validation of national/regional quantitative data on flows of energy commodities, and the capital stock of technologies consistent with the national energy balances, emissions of pollutants and greenhouse gases consistent with existing inventories, status of emission control technologies, economic value of energy systems consistent with national accounts, any other information on energy system structure and related data;
- (c) Establishment of [multi-]national reference groups to discuss and advise on data bases, assumptions, methodology, model results and their application to the development of energy related policies;
- (d) Participation to the development of ETSAP models and Tools, including testing of newly developed versions of software, and
- (e) Contribution to the efforts of disseminating the methodologies and their use in assessing local, national, regional or multi-regional global systems, offering lessons and courses, carrying out “Outreach” activities.

Participants have special rights to the results of the joint work, not available to non-participants, as may be decided by the Executive Committee from time to time, subject only to the limitations laid out in paragraph 10 below. This includes privileged access to ETSAP Tools, the support systems and related services

contracted on behalf of ETSAP or made available to Participants by the Operating Agent acting on decisions made by the Executive Committee.

6. Specific Obligations and Responsibilities of the Operating Agent

In addition to the obligations and responsibilities enumerated in Article 4 of the Implementing Agreement, the Operating Agent shall:

(a) *Establish the Project Staff*

For the purpose of carrying out the above objectives and to fulfil this Task the Operating Agent shall establish a project staff and such additional assistance as may be required, including external staff. Following guidance and instructions from the Executive Committee, the Operating Agent shall give secretarial and administrative support to establishing activities of Contracting Parties on a task-sharing basis, subject to specific budgets made available for those purposes by the Executive Committee.

(b) *Prepare the Program of Work and Reports*

The common program of work will be proposed by the Operating Agent and be approved by the Executive Committee. The common work may be performed by the Project Head, by other Operating Agent staff, or by organizations or professionals from the participating countries, following the work plan(s) determined by the Executive Committee.

The Operating Agent shall submit yearly to the Executive Committee a draft Programme of Work, with an accompanying task-level budget, for the following year. The Operating Agent shall report yearly to the Executive Committee on the progress of the activities under this Task.

Upon completion of this Annex, the Operating Agent shall prepare and submit to the Executive Committee for approval, a draft final report on the activities carried out during the period of this Annex. Following approval, the Operating Agent shall transmit the report to the IEA secretariat and to the members of the IEA Committee on Energy Research and Technology.

The Committee on Energy Research and Technology may, during this Task, propose additions to the Programme of Work. The Executive Committee shall decide whether these proposals will be added to the Programme of Work, provided such additional work can be carried out within the resource levels set out in paragraph 9 below, or other sources of funds are secured.

(c) *Coordinate the Task and Manage the Program of Work*

The Operating Agent shall bear the following main responsibilities:

- (1) To manage the common program;
- (2) To supervise the maintenance of the ETSAP tools;
- (3) To assure appropriate communication among the Participants;
- (4) With the approval of the Executive Committee, to represent ETSAP in various international conferences, bodies, and groups;
- (5) To prepare and distribute material on the work of ETSAP for distribution through a Newsletter and/or the World Wide Web;
- (6) In co-ordination with the Participants, to use its best efforts to avoid duplication with activities of other related programmes and projects implemented by or under the auspices of the IEA or of other competent bodies;
- (7) To provide the Participants with the necessary guidance for the work they carry out, assuring minimum duplication of effort;
- (8) At the request of the Executive Committee, to organize workshops and seminars, and
- (9) At the request of the Executive Committee, to co-ordinate the work of a small group of experts charged with reviewing the consistency and accuracy of input data, national models, and the main findings.

7. Operating Agent

The private consulting company ASATREM srl (Italy) is designated as Operating Agent.

8. Time Schedule

This Annex shall enter into force on January 1, 2008 and shall remain in force till December 31, 2010. Within the limits of the term of the Agreement, this Annex may be extended by two or more Participants, acting in the Executive Committee, and shall thereafter apply only to those Participants.

9. Funding

(a) *Common Financial Obligations*

The Common Program will be funded through the Operating Agent. The actual costs of the Common Program during this Annex will be divided equally among all Participants. If the number of Participants changes, the Executive Committee will decide whether or not to adjust the budget and the annual fees. New Participants will pay a full share of the costs beginning in the Task year in which they become Participants.

The annual fee for 2008 is EURO 20,000 per participant, and not more in the following years. The Executive Committee will decide the annual budget taking into account the number of participants. No more than EURO 100,000 can be used for base activities – maintenance of the ETSAP tools, workshops and management, i.e. objective (d) above. In the allocation of the remaining part of the budget priority is to be given to R&D, including the development of the ETSAP-TIAM model.

The Executive Committee will decide the annual budget for subsequent years, taking into account the actual number of Participants, inflation and any agreed changes in the Common Program.

(b) *Individual Financial Obligations*

In addition to the contributions set out in subparagraph (a) above, each Participant shall bear all costs it incurs in carrying out this Task, including the costs of its National Program and participation in workshops and seminars.

(c) *Additional contribution*

Any fees collected for carrying out training programs and for licensing the use of the ETSAP-TIAM model will add to the ETSAP budget.

Voluntary contributions from participants and other possible sponsors, if any, are welcome and will be used to increasing the common means and pursuing more actively some objectives, as approved by the Executive Committee.

ETSAP may provide seed money for (large) capacity building and analysis projects, to be decided on a case-by-case by the ExCo. In addition the Operating Agent and the Contracting Parties are urged to seek funding sponsors ready to co-finance projects for training and analysis based on ETSAP tools, similarly to what presently happens with competing modelling tools.

10. 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 shall have the right to publish all information provided to or arising from this Annex except proprietary information, but they shall not publish it with a view to profit, except as agreed by the Executive Committee, acting by unanimity.

(c) *Proprietary Information*

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

- (1) Is not generally known or publicly available from other sources;
- (2) Has not previously been made available by the owners 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 IEA Participating Countries to make available or to identify to the Operating Agent all published or otherwise freely available information known to them that is relevant to the Task. The Participants should notify the Operating Agent of all pre-existing information, and information developed independently of the Task known to them which is relevant to the Task and which can be made available to the Task without contractual or legal limitations.

(e) *Production of Available Information by Participants*

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

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

(f) *Use of Proprietary Information*

If a Participant or ETSAP collaborating institution has access to proprietary 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 in accordance with an agreement between the Operating Agent and the specific Participant/collaborating institution setting forth the terms and conditions for such acceptance, but the proprietary information shall not become part of reports, handbooks, or other documentation, nor be communicated to others except as may be agreed in writing between the Operating Agent and the Participant/collaborating institution which supplied 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 to the Participants and to the Executive Committee on all work performed under the Task and the results thereof, including studies, assessments, analyses, evaluations and other documentation, but excluding proprietary information.

(i) *Copyright*

The Operating Agent may take appropriate measures necessary to protect copyrightable material generated under this Task. Copyrights obtained shall be the property of the Operating Agent in trust for and 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.

11. Participants

The Contracting Parties which are Participants in this Task are the following:
(To be filled with the names of the Contracting Parties that will join the Annex XI.)

[For the record, Countries and Contracting Parties to Annex X or previous annexes are listed below.]

Country	IA Date of signature	Contracting Party	Participating till Annex:
IEA			
Austria	19.12.80	EVA	V
Australia	13.11.80	ABARE -	X
Belgium	08.09.81	The Government	X
Canada	07.07.82	NRC	X
Czech Republic			
Denmark	04.12.80	DEA	X
EC	11.01.82	DG Research	X
Finland	09.01.02	TEKES	X
France			
Germany	13.11.80	IER	X
Greece	01.12.80	CRES	X
Hungary			
Ireland			
Italy	13.11.80	IMAA/CNR	X
Japan	17.09.81	The Government	X
Korea	15.05.96	KEMCO	X
Luxembourg			
The Netherlands	02.04.82	ECN	X
New Zealand			
Norway	13.11.80	IFE	X
Portugal			
Spain			
Sweden	18.11.80	The Government	X
Switzerland	01.04.81	PSI	X
Turkey	22.03.96	Kocaeli -	X
United Kingdom	09.06.81	The Government	X
United States	13.11.80	DOE	X
Others			