



EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR AGRICULTURE AND RURAL DEVELOPMENT
Directorate G. Economic analysis, perspectives and evaluations
L.2. Economic analysis of EU agriculture

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ANNEX 1 TERMS OF REFERENCE

**"INTEGRATED MODELLING PLATFORM FOR AGRO-ECONOMIC COMMODITY AND
POLICY ANALYSIS (IMAP PROJECT 2)"**

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12. PURPOSES OF THE WORK

12.1. Context

Over the years, DG AGRI has become an important user of quantitative economic analysis based on modelling tools, both for its market analysis and for its domestic and trade policy analysis. More recently, the development of an analytical capacity in the field of rural development policy has given rise to new modelling requirements in this domain. The use of models has now become an indispensable tool in the preparation and negotiation of policy decisions (recently Health Check, upcoming Common Agricultural Policy (CAP) post 2013 reform, DDA/multilateral negotiations etc.). On the one hand, validated economic models are crucial for providing a scientific basis for the evaluation and further design of the CAP. On the other hand, databases provide the necessary input to ensure the reliability and consistency of modelling tools employed for agricultural policy analysis.

Three partial equilibrium (PE) models (AGLINK, ESIM and CAPRI) have a significant importance for DG AGRI. The increasing importance of rural development policies and the CAP post 2013 reform discussions, require also the use of general equilibrium (CGE) models which provide additional insights into the interactions of the agricultural sector with the other sectors of the economy.

The JRC-IPTS, following its mission to deliver techno-economic support for policy-making, sets up an infrastructure for an Economic Modelling Centre. This Centre covers different thematic areas, so called platforms. At this stage, the Agro-Economic Modelling Platform at IPTS includes three PE models (CAPRI, AGMEMOD and CAPSIM) and two computable general equilibrium (CGE) models (GTAP, GLOBE), with different degrees of proficiency of use.

In 2008, an administrative arrangement was concluded between DG AGRI and JRC IPTS (No AGRI-2008-0339, 247kE) to carry out high level research, maintaining, further developing and using modelling tools which are currently used by DG AGRI.

The main objective of the long-term project "Integrated Modelling Platform for Agro-economic Commodity and Policy Analysis" is to contribute to the development of an Agro-Economic Modelling Platform which allows the maintenance, development and use of the main modelling tools which are currently used by DG AGRI and gradually the quantitative tools which would become necessary to DG AGRI in the management, evaluation and analysis of the CAP (for market, trade and rural development analysis). Main focus will remain on the three core PE models.

12.2. Achievements of the AA "iMAP 1"

Within the first AA the following tasks have been achieved (see also Progress Reports):

- the development of an in-house capacity and expertise on CAPRI, AGLINK, and ESIM; in addition, comprehensive documentations for newcomers working on the three models have been prepared;
- (ii) a database management system has been developed, which allows to flexibly managing, comparing, and visualising model datasets by maintaining their original

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structure. Currently, this data management tool (DMT) includes various datasets, namely from CAPRI, FAOSTAT, and EUROSTAT. The incorporation of AGLINK and ESIM data is envisaged for the near future. Furthermore, the functionality of the DMT will be improved to facilitate the comparison of base-scenarios and results across models;

- (iii) the maintenance and validation of models:
 - o update of CAPRI database from 2002 to 2004;
 - o checking and new model documentation of the updated ESIM version;
 - o versioning system installed for ESIM;
 - o first estimations of elasticities for AGLINK;
- (iv) the further development of the models: ideas have been gathered;
- (v) the implementation and use of quantitative tools for commodity market and agricultural policy analysis (including rural development): exploratory policy scenarios with AGLINK and ESIM;
- (vi) concepts for training courses on modelling for EC staff have been prepared (given in March and April 2009);
- (vii) installation of a Reference Group for iMAP for all core models;
- (viii) A seminar on European commodity markets was organised with participation of external market experts and about 25 officials from DG AGRI. The seminar provided a forum to discuss recent and forecasted market developments and outlined the reasons behind observed and prospected developments (proceedings prepared).

12.3. Objectives of the administrative arrangement

The main objective of the second administrative arrangement (iMAP 2) is to further contribute to the development of the Agro-Economic Modelling Platform which allows the maintenance, development and use of the main modelling tools which are currently used by DG AGRI and gradually the quantitative tools which would become necessary to DG AGRI in the management, evaluation and analysis of the CAP (e.g. for post 2013 reform, market, trade and rural development analysis).

These modelling activities concern in particular (i) the development of an in-house capacity and expertise with regards to modelling tools, (ii) the development of a database, (iii) the maintenance and validation of models, (iv) the development of the models and (v) the implementation and use of quantitative tools for commodity market and agricultural policy analysis (including rural development).

An important element of the Agro-Economic Modelling Platform will be its close cooperation with DG AGRI and developers of existing modelling systems. This knowledge sharing will be of great importance regarding the further development of

expertise at the JRC-IPTS. The development and adaptation of models for in-house use at DG AGRI shall follow and anticipate the evolution of agricultural and trade policies, including rural development.

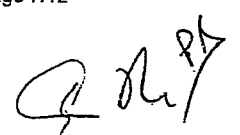
12.4. Sponsor and user of the administrative arrangement

The project is commissioned by DG AGRI. However, the modelling tools could become available to other DGs of the Commission as well as to the research community. The development of this modelling platform should strengthen the agro-economic modelling capacity of the Commission.

12.5. Scope of the work

The Agro-Economic Modelling Platform shall cover the main partial equilibrium models, computable generalised equilibrium models which are currently used by DG AGRI as well as those which will gradually be necessary for DG AGRI in the framework of the management, evaluation and analysis of the CAP (for market, trade and rural development analysis). Within the framework of the second Administrative Arrangement with DG AGRI for cooperation on the implementation of the Agro-Economic Modelling Platform, the Work Programme focuses on the use of the three core models for DG AGRI (CAPRI, ESIM, AGLINK) and, as a complementary activity on a general equilibrium model for quantitative analysis.

- The Common Agricultural Policy Regional Impact (CAPRI) model is a spatial economic model used to analyse the economic effects of the CAP and its successive reforms. As it allows analysis on a regional level (NUTS 2), the CAPRI model shall be applied primarily for monitoring rural development, analysis of biofuel impacts and environmental indicators, and bridging market and rural development outlooks.
- The European Simulation Model (ESIM) is a recursive, dynamic, partial-equilibrium, multi-country model covering European agricultural production, consumption of agricultural products, and some first-stage processing activities. ESIM is one of the models installed in DG AGRI and is used for commodity and policy analysis in DG AGRI. The model is acknowledged across Europe and occupies a central position in the Commission.
- The AGLINK model is a partial equilibrium, supply-demand model of world agriculture, and was developed by the Organisation for Economic Co-operation and Development (OECD) Secretariat in close co-operation with member countries and certain non-member economies. As such, AGLINK is acknowledged worldwide and therefore occupies a central position in commodity and policy analysis at the Commission.
- The GLOBE model (developed by McDonald et al., 2007) is a multi-country, computable general equilibrium (CGE) model, based on a global Social Accounting Matrix (SAM) that has been derived from the Global Trade Analysis Project's (GTAP) database. Other CGE models which of interest for the analysis of CAP, RD and trade are GTAP and MIRAGE, the latter widely used in the EC.



13. TASKS TO BE PERFORMED

The Work Programme is separated into different tasks to be performed by JRC-IPTS.

When specific expertise or access to specific scientific advice is required, outsourcing of some works might be envisaged. However, as the expertise of JRC-IPTS should be further developed, the need for outsourcing should correspondingly diminish.

When outsourcing is envisaged, specific contracts for modelling services will be established ensuring efficient, timely and high quality input from the model developers. In this respect, the planning and related terms of reference for these modelling services shall be first approved by DG AGRI.

Furthermore, required software for the modelling tools will be purchased by JRC-IPTS.

13.1. Task 1: Organisation of work

To ensure the performance of the tasks and to provide a tailor-made support to DG AGRI, mutual feedback on a regular basis is important. Therefore meetings or video-conferences of JRC-IPTS modelling team and DG AGRI shall take place on a two-monthly basis.

The JRC will prepare a reference, progress and final report, which include the main features of the work.

13.2. Task 2: Maintenance, development and documentation of CAPRI, ESIM, AGLINK and a CGE model (complementary activity)

13.2.1. Task 2.1 Maintenance of the models

The maintenance of the models will include the following:

- Updating of the database;
- Updating the models functions (e.g. elasticities) and other model parameters of the model;
- Calibrating the models and setting-up the validation procedures;
- the maintenance of the relevant interface(s).

Specific attention will be given in the first part of 2009 to the revision of the EU module of the AGLINK model in cooperation with DG AGRI and coordination with the OECD Secretariat.

13.2.2. Task 2.2 Development of the models

JRC-IPTS will further contribute to the development of the models and improvement of the database. In this respect the further development of the geographical coverage of the models, i.e. enlarging the geographical coverage to New Member States, candidate countries and countries of specific interest for the EU, should be further envisaged. The development of the geographical resolution with the national and/or regional dimension,

if possible, as well as of the product, market and policy instrument coverage (e.g. cotton, rice, biofuel - trade policy instruments, the various models of SPS, agri-environment) should also be envisaged. Moreover, JRC-IPTS shall also look for new potential methodological developments (e.g. inclusion of risk, imperfect competition etc...).

13.2.3. Task 2.3: Development of expertise and documentation of the models

JRC-IPTS will continue to develop its expertise with respect to the implemented modelling tools, economic and market analysis, programming, and database management. In this respect and to ensure a continuity and knowledge transfer, the documentation on the use of the models will be provided.

13.3. Task 3: Use of the models

By running simulations, JRC-IPTS will carry out various scenario exercises on important topics related to the CAP and market development on commodity markets (e.g. new products, new market trends), changes in Common Market Organizations (CMOs) and trade policies, as well as adequate analysis of rural development policies and future enlargements.

Main focus in the first semester of the AA will be on biofuels (indirect) land use change (ILUC), employing the three core PE models and additional work on the analysis of different land uses.

Furthermore, in cooperation with DG AGRI, the baseline(s) (to maximise policy and market relevance) shall be established.

13.4. Task 4: Additional support activities

JRC-IPTS will organise late fall 2009 a seminar on European commodity markets, inviting markets experts and modelers to present and discuss the newest developments in agricultural markets in the EU. Other topics such as the impact of the financial crisis on the agricultural sector will be included depending on the interest of DG AGRI.

JRC-IPTS will continue the activities of the Reference Group which provides strategic and technical support to the JRC-IPTS modelling platform. DG AGRI will be included in this process and will receive all necessary information. A follow-up project of a Reference Group is foreseen.

14. DELIVERABLES

During the implementation of the project, the deliverables listed below shall be submitted by JRC-IPTS. Each document will be examined by DG AGRI which may, if appropriate, ask for additional information or propose modifications in order to redirect the work, in mutual agreement with JRC-IPTS. All documents are to be submitted in English.

Each task requires the documentation of the developments and if required of the accompanying analysis in a self standing and fully referenced document.

14.1. Deliverables I (Timing: 1 month after signature of the AA):

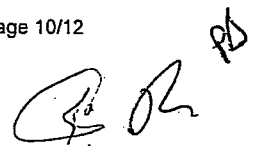
- **D1a: Reference report:** This report will present the detailed work programme, to be undertaken for each of the models (with specific attention on the maintenance and development activities and domains of simulation). This report should serve, after the approval of DG AGRI, as reference document for the project and specify two or three policy simulations to be prepared during the AA.
- **D1b: Manuals of model use:** Documentation of the three core models.
- **D1c: Draft report on the use of the core models for analysis of biofuel policy:** This report shall describe how the EU biofuel policy is modelled with ESIM, AGLINK and CAPRI, and provide preliminary results.

14.2. Deliverables II (Timing: 15. November 2009):

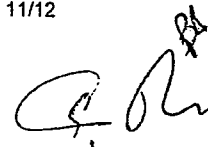
- **D2a: Progress report on the maintenance of models:** Maintenance of the models will include the updating of the database, updating the models functions, calibrating the models, setting-up the validation procedures, and the maintenance of the relevant interface(s).
- **D2b: Construction of the baseline for ESIM and AGLINK:** More details will be indicated in the reference report.
- **D2c: Organisation of the seminar on European commodity markets:** The meeting will be organised by JRC-IPTS after agreement with DG AGRI on the topics and experts and will take place in Seville.

14.3. Deliverables III (Timing: 31 March 2010):

- **D3a: Report on the Reference Group for market modelling**
- **D3b: Report based on policy simulations:** More details and delivery dates of two or three briefings on policy simulations will be indicated in the reference report.
- **D3c: Final Report:** This report shall summarise the activities of the Modelling Platform. Furthermore, it will also provide an overview of the



remaining difficulties related to next Work Programme. In this respect the final report will recommend DG AGRI on how these difficulties could be solved. This report shall serve as the basis for agreeing on the next Work Programme. Approval by DG AGRI of this report is a precondition for the release of the balance payment.

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