

WP 4 Satellite accounts: environmental indicators

Work package number	WP 4			Start date or starting events:	Month 1
Work package title	Satellite accounts: environmental indicators				
Activity Type	RTD				
Beneficiary number	2	4	5		
Person-months per beneficiary	23	3	4		

Objectives

The overall objective of WP4 is to collect, process and organize a comprehensive set of satellite accounts with a view to complement as far as possible the IO data by covering the main environmental indicators for which data of satisfactory quality are available. These indicators will be sector-specific to match the industry-detail in this project. The environmental accounts will cover the following satellites: energy use broken down by several energy carriers including different fossil fuels, nuclear and the major non-renewables; water consumption; emissions of greenhouse gases (CO₂, N₂O, CH₄) and air pollutants relevant for acidification (SO₂, NO_x, NH₃) and tropospheric ozone formation (NO_x, NMVOC, CO, CH₄). Additionally, this work package will strive to include some water emissions, resource and land uses and the generation and treatment of various types of waste. However, the feasibility of this extension will have to be tested against the availability of data of acceptable quality. Also land use data by sector will be provided but probably with a less detailed industry allocation, depending on data availability.

Description of work

Task 4.1: Collection of environmental data sources and organization of lower tier data set (main responsible partner 2)
With respect to data acquisition, this work package will extensively build on the deliverables of the FP6 project EXIOPOL, of which several WIOD partners are consortium members. Furthermore the IPTS (partner 2), fulfilling its mandate as a directorate of a Commission service that provides scientific support to the EC, is charged with the task to organize the institutional embedment of the EXIOPOL deliverables, including maintenance and updating of the database.

It is expected that the coverage of environmental variables represented in EXIOPOL will be largely sufficient for WIOD as well. However, the EXIOPOL database is strictly limited to one single base year. Additional estimations of environmental interventions at industry level will therefore be necessary; data gaps will be closed using commonly accepted and transparent estimation methods.

Several steps/ alternatives are foreseen to carry out these additional estimations:

1. The first step is to use the protocol developed by EXIOPOL to the extent possible, to ensure that the updating of the delivered database be feasible with reasonable effort.
2. The second step is the use of the tables DEIA (Database Environmentally-extended Input-output Analysis). These tables are the result of current internal research activity in IPTS, and deal with the development of time series of environmental accounts compatible with the ESA-95 framework. It is based on national NAMEA surveys. To date, the IPTS has obtained the completion of a preliminary estimation of 1995-2002 time series of approximately thirty air and water emissions for 59 economic activities and for all EU25 countries.
3. The third step is the use of additional, less organized data sources, in cases where the two preceding options would not provide sufficient coverage (countries, years) or sufficient reliability of estimated values. The potential sources include Eurostat, IEA UNFCCC Greenhouse Gas Emission Inventories, EMEP-CLRTAP, the EDGAR database, FAOSTAT, EPER for the EU, several national PRTRs (Pollutant Release and Transfer Registries), but the data quality will have to be checked carefully. Other key sources of information in the EU are the results of the FP6 research project FORWAST, which includes as an objective to forecast waste generation in the EU27 in the period 2005-2030, using a hybrid IO methodology. Final deliverables of this project are scheduled for March 2009.

This task draws intensively on the deliverables of EXIOPOL. These deliverables are due in draft form in October 2008 and as final deliverables in October 2009. In order to ensure on the one hand that the work carried out by EXIOPOL be reflected at its best in WIOD, and on the other hand that the modelling work of WP7 and WP9 be not delayed excessively, the WIOD WP4 activities will be organized in two-stages: the first stage will deliver draft versions of all elements of the database of environmental variables, and the second stage will refine the draft by fully reflecting the final EXIOPOL deliverables.

Task 4.2: Transformation of the lower tier data set into a harmonized upper tier data set (partners 2 and 5 are involved) This task is the principal task of the work package, as it implies addressing several methodological problems. The following steps are foreseen:

4. Attain coherence and consistency between the environmental satellites and the IO based economic data set. Correspondence links will be therefore clearly defined between the industrial classification adopted in the IO tables (IOTs) with the definition of industries and of other entities by which the emission data sets, energy statistics and other environmental variables are recorded. This correspondence shows in fact an almost direct (one to one) matching in transport, but a progressive divergence moving to manufacturing industries and to services other than transport. Moreover, NAMEA-type accounts comprise energy as well as non-energy related (process) emissions for industries. Additional information is necessary to separate process emissions from energy related emissions, which is required to link to energy carrier consumption statistics as in the energy balances. This methodological endeavor will draw on previous experience gained by WIFO and IPTS in performance of an IPTS Exploratory Research project on the harmonization of NAMEA data for the EU countries with IEA energy statistics different types of energy consumption (final consumption, transformation, consumption of energy sector, etc.) by fuels, and on the experience gained in the compilation of the environmental accounts of the EXIOPOL project. The task will ultimately transform the data sources inventoried by Task 4.1 into environmental satellites coherent with the System of Economic Accounts developed by WP1-WP3. The data harmonization will be based on the data sources that will prove to be most complete and comparable across the time and geographical span of the WIOD-database, most likely energy statistics.
5. Specific environmental pressures such as data on waste and wastewater generation will be analyzed for consistency using UNFCCC national reports (NIR – National Inventory Reports). Harmonized data on waste and wastewater have been produced for the period 1990-2005 by national environmental offices of the countries signing Kyoto, as a step in the estimation of greenhouse gas generation from the waste and wastewater sectors. In the absence of national activity data on waste and wastewater, countries follow a common methodology specified by IPCC (Intergovernmental Panel on Climate Change) to estimate data series. The data obtained are thus in most cases homogeneous and it is proposed to use them in this project for quality check and harmonization. The database produced by this task will be delivered to WP7 and WP9 for further integration in the applied models' Excel workbooks or other format agreed with the partners.

Task 4.3: Further data integration and transformation linkages with applied models (partners involved: 2 and 4)

This task is concerned with integrating the environmental data with applied models, chiefly the core CGE model that will be developed in WP7.

6. This requires the development of transformation matrices or of a data interface. Additional data needs (e.g. substitution elasticities) will also be assessed. Furthermore, the CGE model will consider pollution control options. The associated abatement cost functions require detailed bottom-up analysis which subsequently needs to be fed back into the economy-wide CGE modeling framework. Within the work package, we will collect and organize available bottom-up information necessary for the implementation of abatement cost options as parameterized functions.

Deliverables

D4.1 (month of delivery: 3): Technical report on the conceptual framework for environmental satellites integrated in the WIOD system of SUTs and IOTs

D4.2 (month of delivery: 12): Preliminary database of environmental satellite accounts

D4.3 (month of delivery: 16) Preliminary dataset of environmental information for integration in the prototype CGE model

D4.4 (month of delivery: 36): Final database of environmental satellite accounts and final dataset of environmental information for integration in the core CGE model

D4.5 (month of delivery: 36): Technical report on the compilation of the environmental satellites database.