

Federal Statistical Office Germany November 1999

German Environmental Economic Accounting

Progress Report of the Federal Statistical Office Germany (FSO) for the 6th London Group Meeting on Environmental Accounting Canberra, Australia, 15 - 19.11.99

1 Resource use accounting

1.1 Material and energy flows

For physical flows (water and other materials) the Federal Statistical Office has developed a comprehensive and consistent system of bookkeeping for inputs (natural resource extraction and import of products) and outputs (residuals and export of products) by type of material in a detailed breakdown by tonnes and, as far as appropriate in other units like Joules for energy. The main residuals (air emissions, waste and waste water), are shown in a breakdown by 59 industries. For the year 1990 the physical flows including the flows within the economic system are shown in a **Physical Input-Output Tables (PIOT)**.

Work on updating this table for the year 1995 is in progress to achieve a reference system for Material Flow Accounting (MFA) with more actuality concerning time, area and statistical classification as well as to create a consistent framework for the regularly reporting activities of material flows within the MEFIS system.

On the level of disaggregated flow analysis, last year priority has been given to the extension of the **energy** aspect corresponding with the „**Emitter Structure**“ already realised for the areas of **air**, **waste** and **waste water** in the description of the respective emissions by production branches. For energy consumption, the results cover the direct effects that have been supplemented by calculations of the cumulative effects (direct and indirect effects) caused by production branches as well as by the final consumption aggregates, especially by private consumption.

For **water and waste water flows**, a general calculation scheme has been carried out to be able to balance the relevant inputs and outputs in a more consistent way corresponding with SNA methods. The results were used to improve the data quality and to complete the coverage of water and waste water flows on the levels of the total material balance and the Emitter Structure, respectively, to achieve results in the NAMEA context.

1.2 Land use by industries

There is a lot of evidence, that the importance of physical restructuring of the environment caused by economic activities was underestimated in national and international economic-environmental accounting systems up to now. The neglect of the **use of land as production factor** by economic activities (branches of the input output tables) in the past is not only a problem of non-consciousness, but also a consequence of lacking concepts and missing data. In 1998 and 1999 the concepts for a land use by industries (or products/branches) matrix were further developed. Some estimation models were build up for testing the possibilities to implement the concepts. First results were published for built-up and traffic areas in 1993 and 1997, but on a rather aggregated level in the industry classification (four industries/products and private households). In a project in the wider context of the task force on land accounting by Eurostat, a further breakdown by industries and regions and the inclusion of other land use categories is planed.

2 Resource stock accounting

The inclusion of natural assets in German Environmental Economic Accounting (GEEA) is in principle based on the asset boundary of the SEEA: In contrast to work in many other countries, which is often concentrated on quantitatively used assets (e.g. subsoil assets), the primary concern of the FSO is at present the inclusion of the **qualitative use of ecosystems** in physical accounts, because in terms of stock accounting this aspect of natural capital is much more relevant in Germany.

The description of the qualitative use of ecosystems in Germany is based on the CORINE Land Cover project, providing complete data on land cover in Germany, and the Ecological Area Sample (EAS). EAS is a precondition for more detailed information on ecosystems, the structural quality of landscapes and ecosystems as well as on species. Since the last London Group meeting the way of integrating information on biodiversity in GEEA was investigated in detail in a special study. Ecosystems and landscapes are described in physical terms by using **accounting methods** (integrated stock and flow matrices of ecosystems and land cover units in surface units) and by **indicators** showing the changes in quality of the corresponding stocks. In the long run structural indicators from EAS will be supplemented by state-indicators on „impacts of harmful substances" in ecosystems from existing monitoring schemes and „functionality"-indicators of ecosystems from ecosystem research. EAS has already been carried out as a pilot study, but no final decision on the implementation of EAS as a monitoring instrument with a periodicity of five years has been made to date.

Highly aggregated indicators for the quality of ecosystems on the basis of EAS data are beeing developed in a research project in intense co-operation with ecosystem research

and political sciences

3 Environmental protection expenditure accounting

3.1 Actual expenditure

Annual data about environmental protection expenditure of the industry and public administration is available for Germany since mid seventies. Detailed time series are published for the variables **investments, current expenditure, stock and consumption of fixed capital** for environmental protection purposes. They are derived from questionnaires for industrial sectors, budget statistics of the public administration and an accounting model for the calculation of **environmental balance sheets**. Yet our national concepts in this field are not fully consistent with the SERIEE approach of Eurostat (European System for the collection of Economic Information on the Environment), but for the accounting years 1991 and recently 1995 **environmental expenditure data according SERIEE** had been calculated from national data. Based on these experiences the national concepts will be revised step by step to offer regularly SERIEE data for Germany in the next future.

Data on **environmental taxes and fees** in Germany is now collected and published annually.

3.2 Abatement cost accounting and modelling

In the past FSO calculated abatement/avoidance cost curves for NO_x and N₂O emissions into air. The experiences of that EU-research project - also known as the **Greenstamp** approach - showed that such types of cost-effective calculations have to be carried out on different interlinked economic levels (micro-, meso- and macro level of calculation). At the moment for capacity reasons no micro based abatement cost calculations are conducted by FSO. Instead, emphasis has been put on the question, how to link the different levels of abatement cost calculations in an effective way.

To come closer to an answer on that question the Ministry of Environment and the Advisory Council for the German Environmental Economic Accounting in 1998 launched a scientific task force to assess for five different **German econometric models** if and to which extent they are able to simulate the macroeconomic effects of different environmental policy goals, e.g. reduction of CO₂ emissions by 25% up to 2005. The FSO delivered basic physical data on emissions and - where available - direct abatement costs for the required model calculations. The task force concluded that only two German models are able to simulate macroeconomic effects of given environmental goals in a satisfactory manner and seem flexible enough to integrate new basic environmental data.

In a follow-up project new model calculations with given environmental targets by the Ministry of Environment, now for the environmental domains waste-water and land-use, will be conducted for these two models. The aim is to identify more clearly advantages and limits of each one for such kind of questions and to allow a better assessment of the modelled results. FSO will closely accompany that new modelling project.

4 Other developments of interest

The GEEA division of the FSO is currently involved in the process of testing the set of **indicators for sustainable development** of the Commission on Sustainable Development (CSD) in Germany. In this context the role of GEEA is, on the one hand, to support analysis of interlinkages of the dimensions of sustainable development. On the other hand, GEEA is seen as a database for the development of indicators and as helpful tool for the interpretation of results for many indicators.

A core set of results from GEEA are presented regularly at an annual press conference to the public.

The **GEEA division** of the FSO comprises 25 members. The work programme is however a very broad one, including the production of „basic statistics" like CORINE Land Cover and the Ecological Area Sampling or the Co-ordination of the GIS-activities inside of the FSO.