

# Environmental Accounting in the Czech Republic

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## Session 1

### ENVIRONMENTAL ACCOUNTING – OVERVIEW OF THE CURRENT SITUATION IN THE CR AND EU

- **Steurer, A.: Environmental Accounting in EU: an Overview**

This paper summarises the environmental accounts work done so far at Eurostat, the European Union's Statistical Office. The likely future directions of work are also outlined. Environmental accounts are a range of physical and monetary accounts and statistics that are coherent with the core system of national accounts so as to provide comprehensive economic-environmental datasets. These datasets can be used to support policy analysis as well as for the derivation of indicators. Monetary valuation of previously unpriced environmental phenomena and of changes in the environment is not a particular focus of official statistics so far. This is in part due to conceptual and interpretation problems which render results of such valuation less useful in a statistical (i.e. ex post) macro-level perspective, in part due to the significant lack of primary data for valuation in terms of monetary values and quantitative as well as qualitative physical information.

- **Drápal, S.: Environmental Accounting at CSO**

- **Ritschelová, I., Ščasný, M.: Environmental Accounting in the Czech Republic: an Overview of the Main Projects Completed and Ongoing in the Period 1996-2004**

This paper presents a basic overview of the objectives and results of a selection of the main projects completed or still in progress that have been connected with the development of environmental accounting on the macroeconomic level in the Czech Republic in recent years. It is necessary to emphasize that during this period, there have been more projects supported by national or international organizations that, in some respect, relate to environmental accounting. But these projects were basically aimed at solving problems in areas other than environmental accounting. The aim of this brief analysis is to summarize what has been done and what has been achieved in recent years in the CR in this field and to indicate where the project can develop results that were achieved previously.

- **Obršalová, I.: Environmental Accounting at the Micro Level in the CR: an Overview**

## **Session 2**

### **ENVIRONMENTAL EXPENDITURE**

- **Steurer, A., Ritschelová, I.: Environmental Protection Expenditure Account (EPEA)**

An Environmental Protection Expenditure Account (EPEA) is a satellite account to the national accounts. It is constructed in the same way as the national accounts are constructed for the whole economy. The aggregate of national expenditure is therefore consistent with the gross domestic product (GDP). The paper describes in the first part the concepts and the methodology of creation of an EPEA in general terms. In the second part the paper describes a first attempt to implement an EPEA for the CR and to establish a first estimate of national expenditure for environmental protection for year 1997. In this context the different data sources on environmental expenditure available for the CR are described. Finally, the paper explores the possibilities for updating the environmental expenditure accounts and establishing a time series.

- **Tošovská, E.: „Environmental Activities“ and „Environmental Goods“ – Building Blocks of EPEA**

The aim of my presentation is to summarize the main methodological obstacles connected with the identification and classification of environmental activities and environmental goods. These components represent a relevant part of the development of satellite environmental accounts. One of the purposes why environmental activities and products are identified is to make it possible to construct accounts showing the supply of the relevant products and the nature of the expenditure on them. The final ambition for the second year of the project solution will be the mapping the environmental industry.

However, when we wish to identify those industries and products which are characteristic of the environment, simple industry and product classifications are not sufficient. We need to extend classifications in order to describe the purpose of the products and industries which make them and make possible to discriminate between those that are of interest and those which represent the rest of the economy. On the way to doing this there are a lot of open questions and methodological problems.

- **Ščasný, M.: Environmentally-Related Levies within the National Accounting Framework**

The main aim of the paper is discuss implementation of accounting for other environmentally related transactions, and environmentally levies in particular as it is described in Chapter 6 of SEEA-2003 (UN et al. 2003). Environmentally related levies present taxes, charges and fees whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment. This approach is followed by SEEA-2003. These levies can be divided into four groups: levies on energy, transport, pollution, and natural resource use. Some of them belong to group of levies on production and imports that are already included in supply and use framework. Other levies, however, rather belong to group of levies on the ownership or use of asset. Capital taxes seem to be not relevant. Last two groups of levies have not being appeared within the supply and use framework yet. We identify all possible environmentally levies has being introduced in the Czech Republic, classify them according Eurostat classes and, then, present database of their revenues for 1993-2003. Environmentally related levies amounted about 7% of total public revenues, 8% of tax revenues, or 3% of GDP respectively in the Czech Republic. It represents about 220 euro per

capita. Their revenues are dominated by revenues from excise tax on motor fuels; ecological charges present only a minor part about 4% of all of them. We provide an estimate of revenues from VAT applied on energies. Based on this assessment, we discuss further work on possible implementation of SEEA-2003 accounting framework in the Czech Republic.

- **Ritschelová, I., Krumpová, E., Převrátíl, B.: Statistical Survey on Environmental Expenditure in the CR – Development**

The paper presents a basic overview of the statistical survey on environmental investment and expenditure provided by the Czech Statistical Office. It includes basic information about the development of this survey, about methodological changes, about sets of respondents, about outputs etc. Special emphasis has been placed on the new survey, which was organised for the first time for the year 2003. The statistical survey of environmental expenditure and its results could in a reasonable way influence the future development of Environmental accounting in the CR, namely the development of Environmental protection expenditure accounts. This is valid especially for the last statistical survey for the year 2003, which includes for the first time information on current environmental expenditure.

## **Session 3**

### **RESOURCE AND MATERIAL FLOWS ACCOUNTING**

- **Sčasný: Environmental Accounting on Natural Resources: Accounting Method and Valuation of Subsoil Assets in the Czech Republic.**

The paper discusses three approaches and methods for subsoil asset accounting and their application in the Czech Republic. Firstly, we report total economic productivity of mining and quarrying sector. Doing so we provide macro analysis of sector contribution to gross value added by using national accounts. The sector has been experienced big structural changes. While this sector contributed to total GVA by 4%, now it is only 1.3%. More than 80% is generated by coal, lignite and peat extraction. Mining of uranium and iron was stopped in mid-nineties and has been in loss. Secondly, we briefly report implementation of material flow analysis, accounts and balances in the Czech Republic. We assess the share of extracted and imported subsoil assets on entire material inputs and consumption covering the period 1990-2002. Moreover, hidden flows are analysed. Although, the share of raw material extraction has continuously decreased, it still contributes significantly by 60% to direct material inputs. Thirdly, the application of SEEA-2003 in this field is discussed. We discuss the methods on classification of environmental assets with emphasis on subsoil assets as used in SNA-1993, or ESA-1995 respectively. Current practice in accounting of subsoil assets expressed in physical terms in the Czech Republic is described. A special attention is given to reserves of hard and brown coal. Following, we focus on the valuation techniques of assets and depletion. The methods for resource rent estimation used in SEEA-2003 are described in particular. There are three particular approaches to derive resource rent. The appropriation method based on taxes and fees levied on extraction of materials under ownership of the state presents the first one. The other two methods are based on resource rent estimation by partitioning the information on economic rent related to all firm assets into that part pertaining to its produced assets and the part relevant to the non-produced assets. The resource rent can be then derived either from perpetual inventory method or capital service flow. Data availability and applicability of these valuation approaches are discussed including preliminary estimate of resource rent is provided.

- **Kovanda: Economy-Wide Flow Indicators for the CR for 1990-2002.**

The economy and the environment are connected through material and energy flows. These flows are the key cause of environmental problems and can serve as an indirect indicator of pressure on the environment. The leading method for assessing material flows and dematerialization at an economy-wide level was developed during the 1990s by a number of research institutes and standardized by the Eurostat guide (Eurostat, 2001).

In the Czech Republic, economy-wide material flow accounts and indicators were compiled for the 1990-1999 period within the project „Methodology of state assessment and prediction of the environment by the material and energy flow (Direct as well as hidden) balances” funded by the Czech Ministry of the Environment in 2000-2001. Later on the 2000 was added and the results were published in a scientific journal (Scasny et al., 2003). Presently, the 2003-2004 project „Economy-wide material flow analysis, its application on the regional and micro-economic level and its use in the elaboration of sustainability indicators”, funded by the same Ministry, is being carried out. The goal of this project is to extend the time series of economy-wide material flow indicators in the Czech Republic up to 2002 and to develop a methodology on how to transfer particular economy-wide material flow indicators or their components to a regional and company level.

This paper describes the application of economy-wide material flow analysis to the economy of the Czech Republic. Relevant indicators are derived on the basis of accounts and balances of material flows compiled for the Czech Republic for 1990-2002. The results show that indicators of material flows decreased during the period analyzed by approximately 30-50%. It is also demonstrated that material intensity and DPO and TDP share in GDP decreased significantly. Finally, the reasons for recorded decrease of material flow indicators are discussed.

- **Farský, Neruda: Leontief's Structural I-O Balance and Material Flow Accounts.**

A standard formulation of this balance is completed with a waste matrix  $N$ , in which vectors  $W$  record in subsistence units the emission of particular waste types from single production subsystems by a known input (lower index “0”) of production capacity, consumption of intermediate goods and production of market commodities. On condition of the constancy of consumption standards of raw materials and standards of level of waste emission, we can simulate different impacts on a waste balance – adequately with changing requirements of market commodities or the necessity for consumption reduction (problems with raw material purchase or pressure to decrease waste emission).

In the context of EIA it would be good to understand standards in balance used and coefficients as stochastic parameters, and that because of inaccuracies and mistakes connected with measuring the volume or level of emissions.

- **Krčma: Case Study on a Regional Disaggregation of Used Domestic Extraction in the Czech Republic.**

Presently the project “Economy-wide material flow analysis, its application on the regional and micro-economic level and its use in the elaboration of sustainability indicators“, funded by the Ministry of the Environment is being carried out by the Charles University Environmental Center and Czech Cleaner Production Centre. The goal of this project is to extend the time series of material flow indicators in the Czech Republic up to 2002 and to develop a methodology to transfer particular economy-wide material flow indicators or their components to a regional and enterprise level.

This presentation focuses on preliminary results of the regional disaggregation of domestic used extraction (a component of the Direct Material Input /DMI/ indicator)

according to the NUTS 3 regions in the Czech Republic. The presentation describes existing experience with material flow indicators at the enterprise level and relations to disaggregated national and regional indicators. Advantages and possible opportunities for those who evaluate and use the indicators determine whether indicators will be regularly applied. More complicated areas are interpretation and utilisation of the material flow indicators for the decision-making process. Material flow indicators at the enterprise level is one of tools interconnected with many other tools, and it especially relates to voluntary tools such as environmental accounting, life cycle assessment and management systems.

The Material Flow Analysis methodology has been widely used at the macroeconomic level and there are numerous studies and projects discussing the quality and evidence value of individual indicators compiled and used by the MFA.

The project "Economy-wide material flow analysis, its application on the regional and microeconomic level and its use in the elaboration of sustainability indicators" has set the ambition to trace the possibilities of using the MFA at microeconomic levels. In this paper, the project team would like to share the results so far achieved at the regional level.

For the purpose of evaluation of the possibilities of using MFA at the regional level, the project first searched within **sources, availability and quality of the data** used to compile selected material flow indicators, then continued with the **comparison of obtained regional data with the macroeconomic level** and finally carried out an **interpretation of the results** that could provide a basis for decision-making at a regional level with respect to sustainable development and the state of the environment in regions.

## **Session 4**

### **ENVIRONMENTAL ACCOUNTING AT THE MICRO LEVEL**

- **Obršálová, I.: Environmental Accounting at the Corporate Level**

The contribution focuses on the selected problems of environmental accounting at the corporate level. As a key term environmental cost was identified. There are many barriers to calculating environmental accounting costs and evaluate environmental benefits. Contemporary results of the research in this area in the Czech Republic and abroad are discussed. The role of companies, especially SME for sustainable development and their informational support is mentioned.

- **Sommer, P., Jopková, M.: German Experiences with Environmental Accounting at Micro Level**

This paper focuses on environmental accounting at the micro level. It represents experiences from a pilot project in Germany with the aim to integrate suitable solutions of environmental cost accounting in selected small and medium-sized enterprises (SME). On this basis some recommendations and future tasks for a more widespread application of environmental cost accounting in enterprises will be deduced.

## **Session 5**

### **FUTURE DEVELOPMENT**

- **Environmental Accounting Application - Future Steps and Aims in 2005**
- **Minutes of the Session**

