



**INSTITUT FÜR ÖKOLOGISCHE
WIRTSCHAFTSFORSCHUNG**

Environmental (Management) Accounting The Micro Macro Link

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EMA Micro Macro Link Project

- Comparison of definitions and disclosure requirements on a national and corporate level
- Participation in the revision process of the London Group on Environmental Accounting which has accepted the request by the UN Committee of Experts on Environmental-Economic Accounting to take a leading role in the revision of the SEEA-2003, the worldwide handbook of national environmental-economic accounting (UN SEEA 2003)
- Funded by the Austrian Ministry of Technology within the research framework „Company of Tomorrow“

Project goals

Improve consistency of data requirements for statistical purposes with the structure of financial accounting systems and the UN DSD and IFAC guidance documents.

This will significantly support the design of harmonised corporate information systems and help provide consistent, relevant and comparable data on a micro and macro level.

SEEA Handbook account categories

- 1) physical and hybrid **flow accounts of material and energy**; (related with material flow accounting on a corporate level). Hybrid accounts link the physical accounts with economic (monetary) flows (called NAMEA matrix).
- 2) accounts that portray the environmental transactions in the existing System of National Accounts (SNA) in more detail, e.g. **expenditures made by businesses, governments and households to protect the environment**;
- 3) environmental asset accounts in physical and monetary terms (natural capital in three categories: natural resource stocks, land and ecosystems); and
- 4) accounts that show depletion and degradation of the environment and **environmental defensive expenditure**.

Jasch Ch., EMA, Procedures and Principles, United Nations, New York, 2001

The book was prepared for the UN DSD, EMA WG. It was commissioned by the Austrian Ministry for Transport, Innovation and Technology, the Austrian Ministry for Agriculture, Forestry, Environmental Protection and Water Management and the Austrian Chamber of Commerce.

Translations available into German, Spanish, Portuguese, Japanese, Korean, Chinese, Czech, Lithuanian, Estonian, etc

You can also find the excel tool and case studies under www.ioew.at



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INTERNATIONAL GUIDANCE DOCUMENT
ON
**ENVIRONMENTAL
MANAGEMENT
ACCOUNTING
(EMA)**

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EMA Definition from UN DSD EMA WG

EMA is broadly defined to be the identification, collection, analysis, and use of two types of information for internal decision-making:

- physical information on the use, flows, and fates of energy, water, and materials (including wastes) *and*
- monetary information on environment-related costs, earnings, and savings.

System boundaries for mass balances

INPUT		System boundaries		OUTPUT
		Nations		
Materials	⇒	Regions	⇒	Products
Energy	⇒	Corporations	⇒	Waste
Water	⇒	Processes	⇒	Emissions
		Products		

Physical Mass Balance: Input and Output Types

Materials Inputs	Product Outputs
Raw and Auxiliary Materials	Products (including Packaging)
Packaging Materials	By-products (including Packaging)
Merchandise	Non-Product Outputs (Waste and Emissions)
Operating Materials	Solid Waste
Water	Hazardous Waste
Energy	Wastewater
	Air Emissions

Physical Flow Accounts SEEA

INPUTS	OUTPUTS
Products and Services by NACE Codes	Products and Services by NACE Codes
Natural Resources	Residuals
Ecosystem Inputs	

Recommendations related to material flow accounting

- Apply a distinction between material inputs and product outputs
- Clear definition of materials and consistent application of terminology for materials
- Classification of material inputs into raw and auxiliary materials, which become products, as well as packaging in opposition to operating materials.
- Clarification, if and when energy and water inputs are part of material inputs.
- Clarification of related disclosure requirements in statistical assessments.
- Separate recording of NACE code inputs of materials, water and energy.
- Separate recording of NACE code outputs of products and services.

Cost categories in the IFAC Document:

- **Materials Costs of Product Outputs**
- **Materials Costs of Non-Product Outputs**
- **Waste and Emission Control Costs**
- **Prevention and other Environmental Management Costs**
- **Research and Development Costs**
- **Less Tangible Costs**

Percent distribution of environmental costs for 2000

Environmental media ¹⁾	Air and climate	Waste water	Waste	Soil and groundwater	Other	Total
Environmental costs categories						
1. Waste and emission treatment						
1.1. Depreciation for related equipment	0.2%	3.2%	0.5%			3.9%
1.2. Maintenance, operating materials and services		5.0%		0.1%		5.1%
1.3. Related personnel	0.8%	1.6%	0.7%			3.1%
1.4. Fees, Taxes, charges	0.7%	1.3%	3.6%			5.6%
1.5. Fines and Penalties						
1.6. Insurance for environmental liabilities						
1.7. Provisions for clean up costs, remediation						
2. Prevention and environmental management						
2.1. External services for environmental management					0.1%	0.1%
2.2. Personnel for general environmental management activities	0.1%				0.9%	1.0%
2.3. Research and Development		1.5%				1.5%
2.4. Extra expenditure for cleaner technologies						
2.5. Other environmental management costs						
3. Material Purchase value of non product output						
3.1. Raw materials			23.0%			23.0%
3.2. Packaging			0.1%			0.1%
3.3. Auxiliary materials			2.1%			2.1%
3.4. Operating materials	0.1%	32.0%	0.5%			32.6%
3.5. Energy	22.6%					22.6%
3.6. Water		0.1%				0.1%
4. Processing costs of non product output		0.2%	0.9%			1.1%
Total environmental costs	24.5%	44.9%	31.4%	0.1%	1.0%	101.9%
5. Environmental earnings						
5.1. Subsidies, Awards		-0.8%				-0.8%
5.2. Other earnings		-0.2%	-0.9%			-1.1%
Total environmental earnings		-1.0%	-0.9%			-1.9%
Saldo costs/earnings	24.5%	43.9%	30.5%	0.1%	1.0%	100.0%

Classification of Technologies

End of pipe equipment – emission control

traditional focus of reporting requirements, comparatively easy to trace, as stand alone equipment not related to production – additional burden, expensive

Cleaner technologies

much more effective from an environmental protection point of view, much more cost efficient, as integrated into production processes, but difficult to estimate the „environmental share“. Inconsistent reporting requirements by statistical agencies, awareness problems.

Product oriented prevention measures

reducing the environmental impact of products, e.g. desulphurisation of petrol, part of integrated prevention

NPO equipment

relating material loss percentages to the responsible inefficient production equipment, most relevant for internal cost accounting

Environmental industries or products

Ideally what SEEA wants to measure are “expenditures connected with the designated environmental purposes”. For practical reasons SEEA looks into **defined environmental industries or environmental products**.

SEEA itself recognizes that “one of the most difficult distinctions to make is whether the primary purpose of the spending is environmental protection, or whether environmental protection is simply a result of decisions taken for some other purpose.” It provides the example of spending on equipment which may reduce pollutant emissions but which may also be more energy efficient.

But the solution taken by SEEA is **not to include the energy efficient equipment**, which is not really understandable also from an environmental point of view. This has e.g. led to a strong decline in environmental investments since 1990 (Statistisches Bundesamt, 2006) which is not at all related to a degradation in the state of environment, as companies at the same time have invested in integrated pollution prevention techniques and management systems and actually improved environmental performance in relation to production.

Efficiency gains and cost savings

The SEEA approach to environmental expenditure explicitly only “concentrates on steps taken to deal with residuals and **does not consider explicitly protection of the environment through means of water and energy conservation or the effects of recycling**” . In effect, this means that the SEEA approach only focuses on the output of waste and emissions and neglects all activities to reduce the inputs of materials, water and energy. It is thus in complete contrast to the approach of cleaner production and pollution prevention.

“Excluded are measures undertaken for cost saving reasons. (e.g. energy saving).”

Pollution Prevention Technologies

In opposition to IFAC, SEEA:

- Does not include measures to reduce the input of materials, energy and water and increase resource efficiency
- Does not include measures for energy efficiency and renewable resources as they would qualify under “resource management”
- Does not allow for measures which have a positive pay back
- Does not allow for measures, where the primary purpose is not environmental protection but resource and production efficiency
- Does not allow for measures related to reduction of the environmental impact of products.

The relevance of the data assessed and its acceptance by industry are thus questionable!